Standard Treatment Guidelines and Essential Medicines List for South Africa

Primary Healthcare Level
2024 Edition

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NOTE:
The information presented in these guidelines conforms to the current medical, nursing and pharmaceutical practice. Contributors and editors cannot be held responsible for errors, individual responses to medicines and other consequences.

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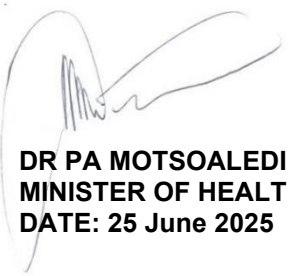
FOREWORD

I proudly present the updated 2024 editions of both the Primary Healthcare (PHC) and Adult Hospital Level (AHL) Standard Treatment Guidelines (STGs) and Essential Medicines List (EML). These guidelines aim to enhance transparency and support the delivery of high-quality treatment options at both PHC and hospital levels. They reflect the evolving clinical needs of our population as well as the introduction of new medicines.

Universal Health Coverage (UHC) aims to eliminate disparities in healthcare access and outcomes, providing financial protection and access to quality healthcare for all South Africans, as mandated by the constitution of South Africa. The National Essential Medicines List Committee (NEMLC) has incrementally increased the use of Health Technology Assessment processes in the selection of essential medicines, providing transparent priority-setting and value-based guidance for efficient resource allocation. The PHC and AHL STGs and EML are a key pillar of UHC, laying the groundwork for structuring health service benefits and ensuring equitable access to safe, effective and affordable medicines for all.

I commend the diligent work of the PHC and AHL Expert Review Committee (ERC), along with the NEMLC, in developing the 2024 editions of the PHC and AHL STGs and EML according to good governance and evidence-based decision principles.

I encourage stakeholders across all sectors to actively participate in the continuous review, development and implementation of these guidelines. I encourage engagement with the NEMLC process of STG development through the external comment process. I appreciate your engagement in presentations and webinars hosted by the NDoH, as well as dissemination of communication published on the National Department of Health web page. Your active involvement is crucial for the successful implementation of these STGs and the improvement of health outcomes for our nation.



DR PA MOTSOALEDI, MP
MINISTER OF HEALTH
DATE: 25 June 2025

INTRODUCTION

The Primary Healthcare (PHC) and Adult Hospital Level (AHL) Standard Treatment Guidelines (STGs) and Essential Medicines List (EML) enable the equitable access to safe, effective and affordable essential medicines across South Africa.

Historically, the PHC and AHL Expert Review Committees (ERCs) responsible for developing the PHC and AHL STGs were appointed as separate Committees. However, in 2020 the Committees were merged to streamline efforts and optimise resources, ensuring a seamless continuum of care between the PHC and AHL of care. The review cycle for these STGs commenced at the onset of the COVID-19 pandemic, necessitating a shift in priorities to address emerging needs and challenges faced by the healthcare system during the pandemic.

The ERC reviews the STGs and EML according to a topic prioritisation framework that includes consideration of clinical need, efficacy, safety, cost-effectiveness, feasibility and equity, presenting recommendations to the National Essential Medicines List Committee (NEMLC) for appraisal and ratification. The multidisciplinary team, which includes clinical experts, clinical pharmacologists and evidence-review and guideline-development methodologists has strengthened the STG development process. The National Department of Health's Essential Drugs Programme team supports this process and has ensured collaboration and alignment with other advisory groups in updating these guidelines.

The NEMLC has incorporated the latest advances in clinical care into various disorder and chapter updates, expanding medicine treatment options including (but not limited to) Blood and Blood-Forming Organs, HIV, Mental Health, Obstetrics and Gynaecology, as well as Palliative Care. Notably, the AHL STGs and EML features a new chapter on Adult Critical Care, developed through extensive consultation across both public and private sectors. This chapter aims to enhance our response capabilities and ensure comprehensive care for critically ill patients.

The 2024 editions of the PHC and AHL STGs and EML reflects the National Department of Health's commitment to continually evolving and enhancing the quality and accessibility of healthcare across our country.

DR SSS BUTHELEZI
DIRECTOR-GENERAL: HEALTH
DATE: 11 June 2025

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The publication of this edition of the Primary Healthcare (PHC) Standard Treatment Guidelines (STGs) and Essential Medicines List (EML) is testament of the enthusiasm, dedication, technical expertise and time given by the National Department of Health Essential Drugs Programme, the combined PHC/Adult Hospital Level Expert Review Committee and the National Essential Medicines List Committee (NEMLC). For continuum of care, the PHC STGs have been aligned with the approved NEMLC recommendations contained in the Adult Hospital Level (2024 edition), Paediatric Hospital Level (2023 edition) STGs and EML, in collaboration with the National Department of Health Programmatic Guidelines. The quality of this edition was further enhanced by the constructive collaboration with various stakeholders through the public comment stages of the 2020-2024 STG and EML review cycle.

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THE ESSENTIAL MEDICINES CONCEPT

The WHO describes Essential medicines as those that satisfy the priority health care needs of the population. Essential medicines are intended to be available within the context of functioning health systems at all times in adequate quantities, in the appropriate dosage forms, with assured quality and adequate information, and at a price the individual and the community can afford.

The concept of essential medicines is forward-looking. It incorporates the need to regularly update medicines selections to:

» reflect new therapeutic options and changing therapeutic needs;
» the need to ensure medicine quality; and
» the need for continued development of better medicines, medicines for emerging diseases, and medicines to meet changing resistance patterns.

Effective health care requires a judicious balance between preventive and curative services. A crucial and often deficient element in curative services is an adequate supply of appropriate medicines. In the health objectives of the National Drug Policy, the government of South Africa clearly outlines its commitment to ensuring availability and accessibility of medicines for all people. These are as follows:

» To ensure the availability and accessibility of essential medicines to all citizens.
» To ensure the safety, efficacy and quality of medicines.
» To ensure good prescribing and dispensing practices.
» To promote the rational use of medicines by prescribers, dispensers and patients through provision of the necessary training, education and information.
» To promote the concept of individual responsibility for health, preventive care and informed decision-making.

Achieving these objectives requires a comprehensive strategy that not only includes improved supply and distribution, but also appropriate and extensive human resource development. The implementation of an Essential Drugs Programme (EDP) forms an integral part of this strategy, with continued rationalisation of the variety of medicines available in the public sector as a first priority. The private sector is encouraged to use these guidelines and medicine list wherever appropriate.

The criteria for the selection of essential medicines for Primary Health Care in South Africa were based on the WHO guidelines for drawing up a national EML. Essential medicines are selected with due regard to disease prevalence, evidence on efficacy and safety, and comparative cost.

The implementation of the concept of essential medicines is intended to be flexible and adaptable to many different situations. It remains a national responsibility to determine which medicines are regarded as essential.

HOW TO USE THESE GUIDELINES

Principles

The National Drug Policy[1] provides for an Essential Drugs Programme (EDP) - a key component of promoting rational medicines use. Medicines are included or removed from the Essential Medicines List (EML) following an evidence-based review of safety and effectiveness and considering cost and other relevant practice factors. The review process is dynamic, and starts with prioritisation of chapters, medicines, or disease areas. The EML, STGs, and the reviews informing them are then updated and published on an ongoing basis. Each new review or update involves seeking input and comments from external stakeholders. Stakeholders are also given opportunity to input prior to final publication. All reasonable steps are taken to align the Standard Treatment Guidelines (STGs) with Department of Health guidelines available at the time of review. Some recommendations might not be aligned with the indications or doses included in South African Health Products Regulatory Authority (SAHPRA) approved professional information but are guided by the best available scientific evidence.

The perspective adopted in the Primary Healthcare (PHC) STGs is that of a competent authorised prescriber practising in a public sector facility. The STGs serve as a standard for practice but do not replace sound clinical judgment. It is important to remember that the treatments recommended are guidelines only, based on the assumption that prescribers can manage patients with the relevant conditions. This includes rational prescribing in the elderly and palliative care, as the use of some medicines, especially as people get older or more ill, can cause more harm than good. Optimizing medication use through targeted de-prescribing is vital in managing chronic conditions, avoiding adverse effects, improving outcomes, reducing pill burden, and maintaining or improving quality of life.

The PHC EML and STGs allow for managing patients with relatively common conditions at the primary level of care. They also guide the referral of patients with more complex or uncommon conditions to facilities with the skills and resources to provide further investigation and management. As such, they are a progression to the Adult and Paediatric hospital-level EMLs and STGs.

The PHC STGs and EML should be used by healthcare workers providing care at clinics, community health centres, mobile clinics, outreach programmes, and gateway or out-patient clinics at hospitals.
Pharmaceutical and Therapeutics Committees (PTCs) are the primary implementing bodies of medicine-related governance in the provinces, districts and health establishments in South Africa. They are a crucial component of the medicine supply chain as the custodians of medicine governance and the rational selection and use of medicines at all levels of

[1] National Drugs Policy, 1996. https://www.gov.za/documents/national-drugs-policy

care.[2]

Provincial PTCs are authorised to reasonably adapt the STGs/EML according to local circumstances and available expertise, and to facilitate and control access to medicines listed on the Adult and Paediatric hospital level EMLs at specific PHC facilities, where appropriate prescribers may be present.

Provincial PTCs are also responsible for facilitating access to medicines at PHC level for specific patients through down-referral from higher levels of care. This flexible approach aims to promote better utilisation of resources while providing access to healthcare that is more convenient for patients.

Given that the STGs and EMLs for the various levels of care are reviewed at different times, there may be periods when they are not perfectly aligned. Likewise, updated STGs and EMLs will not always be synchronised with public sector pharmaceutical tenders, and Provincial and local PTCs should facilitate the phase in/out of the relevant essential medicines.

Local formularies

A formulary is a continually updated list of medicines and related information on the diagnosis, prophylaxis, or treatment of disease and the promotion of health to satisfy the needs of the majority of the population served by a particular health establishment/s.[3]

All EML medicines should be available at the relevant level of care based on the package of services provided at a particular health establishment/s. PTCs should develop formularies aligned to treatment guidelines and protocols subjected to robust evidence-based interrogation and consideration of cost implications.

The EML has been developed to the generic or International Non-Propriety Name (INN) level. Each province, through the provincial PTC, is expected to review the EML and prevailing tenders and compile a formulary which:

» lists formulations and pack sizes that will facilitate care in alignment with the STGs and EML;
» selects the preferred member of a therapeutic class based on cost; and
» implement formulary restrictions that are consistent with the local environment.

Therapeutic classes are designated in the “Medicine treatment” sections of the STGs, which provide classes of medicines followed by an example of each class, such as ‘HMG-CoA reductase inhibitors (statins), e.g., simvastatin’. Therapeutic classes are designated where none of the class members offers

2 South African National Department of Health. 2019. National Guideline for the Establishment and Functioning of Pharmaceutical and Therapeutics Committees in South Africa. Pretoria, South Africa.
3 South African National Department of Health. 2022. National Guideline for the Development, Management and Use of Formularies. Pretoria, South Africa.

any significant benefit over the other registered class members. It is anticipated that by listing a class rather than a specific medicine, there is increased competition and, hence, an improved chance of obtaining the lowest possible price in the tender process.

Where therapeutic classes are listed in the STGs, the local formulary should be consulted to identify the specific medicine approved for the facility. A therapeutic interchange database has been developed that lists medicines grouped into a therapeutic class for a specific condition, as outlined in the policy for classifying medicines into therapeutic classes for purposes of therapeutic interchange. The database and policy are available on the National Department of Health website:

https://www.health.gov.za/nhi-hpp-edp/

Navigating the guidelines

Each chapter covers a broad organ system, with cross-referral to other chapters where necessary. Within each chapter, conditions are usually listed alphabetically.

ICD10 codes

Diagnosis codes from the International Statistical Classification of Diseases and Related Health Problems (ICD-10) are included for each condition to facilitate the accurate recording of diagnoses. The primary ICD-10 code may be accompanied by a secondary code that is bracketed to differentiate a secondary manifestation from the primary aetiology. (For example, uncomplicated broncho-pneumonia with severe penicillin allergy would be coded as: J18.0+(Z88.0)). All the rules and guidelines for using ICD-10 must be applied as per the World Health Organization (WHO), the agreed South African Morbidity Coding Standards and Guidelines document, and the South African Master Industry Table (MIT).
Available at: https://www.health.gov.za/icd-10-master-industry-table/

Diagnosis

A brief description and diagnostic criteria for each condition are included to assist healthcare workers in making a diagnosis.

Medicine treatment

Medicines may be listed in a preferential order (e.g., the first medicine is the first-line option, the second medicine is the second-line option, etc.). The dosing regimens provide the recommended doses for usual circumstances. The actual dose prescribed should consider the patient's capacity to eliminate the medicine, interactions, and co-morbid states.

Paediatric dose calculation

Paediatric doses are usually provided as weight-band dosing tables according to age. Doses should be calculated by weight, described as mg/kg. If this is not possible, choose a dose from the weight-band tables. Only use the dose according to age as a last resort. In particular, do not use age bands if the child appears small for his/her age or is malnourished. Particular care should also be exercised when treating neonates, as the doses provided for children may not always be appropriate in this age group.

Different conditions may require different doses of medicine. 'Standard' paediatric weight-band medicines dosing tables are in an appendix. Where a specific condition is not listed in the appendix, refer to the STG in the main text of the guidelines for the dose specific to that condition.

Prescription writing

All prescriptions must:

- be written legibly in ink OR typed, and printed OR entered electronically, where such systems exist by the authorised prescriber, and signed with the date on the prescription form (NOTE: only advanced electronic signatures are acceptable, and require access to specific software packages);
- include the full name, identification number and address of the patient;
- specify the age and, in the case of children, the weight of the patient;
- have prescriber details, including contact details, i.e., name, qualification, registration and/or practice number, address and contact telephone number;
- indicate the diagnosis on the prescription, where the patient has provided consent.

In all prescriptions:

- State the treatment regimen in full:
  - medicine name (preferably the generic name or INN), strength and formulation,
  - dose,
  - dose frequency,
  - route of administration,
  - duration of treatment,
  - e.g., amoxicillin 250 mg capsules, 8 hourly orally for 5 days.
- Write the name of the full medicine/preparation using the generic name.
- Avoid abbreviations to reduce the risk of misinterpretation. Avoid the Greek mu (ų): write mcg as an abbreviation for micrograms.
- Avoid unnecessary decimal point use. If necessary, write a zero in front of the decimal point only, e.g., 2 mg, not 2.0 mg, or 0.5 mL, not .5 mL.

- » Avoid Greek and Roman frequency abbreviations that cause considerable confusion (qid, qod, tds, tid, etc). Instead, state the frequency in terms of hours (e.g., '8 hourly') or times per day in numerals (e.g., '3x/d').
- » In the case of "as required", a minimum dose interval should be specified, e.g., 'every 4 hours as required'.
- » Most monthly outpatient prescriptions for chronic medication are for 28 days; check that the patient can access a repeat before the 28 days are completed. Repeats may be issued for Schedule 0 to 5 medicines for up to 6 months.
- » Prescriptions for Schedule 6 medicines are not repeatable and are to be issued monthly; the quantity should be expressed in words.

After writing a prescription, check that each item's dose, dose units, route, frequency, and duration are stated. Consider whether the number of items is too great to be practical for the patient, and check that there are no redundant items or potentially important drug interactions. Check that the prescription is dated and that the patient's name, identification number and diagnosis/diagnostic code are on the prescription form. Only then should you sign the prescription and provide another way for the pharmacy staff to identify the signature if there are problems (print your name, use a stamp, or use a prescriber number from your institution's pharmacy).

Nurses granted authorisation provided in terms of Section 56(6) of the Nursing Act 33, 2005, may prescribe medicines in accordance with the PHC STGs and EML and their scope of practice and the relevant Regulations. The STGs generally provide for all listed medicines to be prescribed by authorised nurse prescribers except where designated as "doctor prescribed" only or "doctor initiated". Additionally, in some instances, a listed medicine may only be initiated by a nurse with the prior approval of a medical practitioner. The "doctor initiated" category refers to an initial prescription prescribed by a doctor, which a nurse prescriber may repeat. However, the latter provision does not apply to Schedule 5 or 6 medicines. The PHC STGs have been updated to include "Doctor prescribed" for all Schedule 5 and 6 medicines as PHC nurses with section 56(6) permits are limited to prescribing medicines up to Schedule 4 (GN.R. 2418 of 1984).

NEMLC reports

To promote transparency of medicine selection decisions, NEMLC reports, summary slide decks, medicine reviews and costing reports are available on the National Department of Health website: https://www.health.gov.za/nhi-edp-stgs-eml/.

Other initiatives

The PHC STGs and EML supports the Ideal Clinic Framework (https://www.idealclinic.org.za/) and the Centralised Chronic Medicines Dispensing and Distribution (CCMDD) programme (See Central Chronic Medicine Dispensing and Distribution (CCMDD) at www.health.gov.za/ccmdd).

Medicines safety

Provincial and local PTCs should develop medicines safety systems to obtain information regarding medication errors, prevalence and severity of adverse medicine events, interactions, and medication quality. These systems should support the regulatory pharmacovigilance plan and provide pharmacoepidemiology data to inform future essential medicine decisions and local interventions to improve safety.

In accordance with the SAHPRA's guidance on reporting adverse drug reactions in South Africa, healthcare workers (with the support of PTCs) should report all relevant adverse reactions to the National Adverse Drug Event Monitoring Centre (NADEMC). The Adverse Drug Reaction form and guidance on its use may be found at the following link: https://www.sahpra.org.za/document/adverse-drug-reactions-and-quality-problem-reporting-form/

Feedback

Comments that aim to improve these treatment guidelines are appreciated The submission form and guidance for completing the form are included with these guidelines under Guidelines For The Motivation Of A New Medicine On The National Essential Medicines List. Motivations will be accepted from Provincial PTCs only.

These guidelines are also reviewed regularly. During the review process, comments are requested during a comment period and should be forwarded directly to the EML Secretariat. Queries may be submitted to the Essential Drugs Programme via electronic mail to SAEDP@health.gov.za.

A GUIDE TO PATIENT ADHERENCE IN CHRONIC CONDITIONS

Achieving health goals for chronic conditions such as asthma, diabetes, HIV and AIDS, epilepsy, hypertension, mental health disorders and TB requires attention to:

» Adherence to long term pharmacotherapy – incomplete or non-adherence can lead to failure of an otherwise sound pharmacotherapeutic regimen.
» Organisation of health care services, which includes consideration of access to medicines and continuity of care.

Patient Adherence

Adherence is the extent to which a person's behaviour – taking medication, following a diet and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider.

Poor adherence results in less than optimal management and control of the illness and is often the primary reason for suboptimal clinical benefit. It can result in medical and psychosocial complications of disease, reduced quality of life of patients, and wasted health care resources.

Poor adherence can fall into one of the following patterns where the patient:

» takes the medication very rarely (once a week or once a month);
» alternates between long periods of taking and not taking their medication e.g. after a seizure or BP reading;
» skips entire days of medication;
» skips doses of the medication;
» skips one type of medication;
» takes the medication several hours late;
» does not stick to the eating or drinking requirements of the medication;
» adheres to a purposely modified regimen; and
» adheres to an unknowingly incorrect regimen.

Adherence should be assessed on a regular basis. Although there is no gold standard, the current consensus is that a multi method approach that includes self-report be adopted such as that below.

Barriers that contribute toward poor adherence:

BARRIER	RECOMMENDED SUPPORT
Life style	
» It is often difficult to take multiple medications.	» Create a treatment plan with information on how and when to take the medications.
» A busy schedule makes it difficult to remember to take the medication.	» Use reminders such as cues that form part of the daily routine.
Attitudes and beliefs	
» The condition is misunderstood or denied.	» Remind patients that they have a long term illness that requires their involvement.
» Treatment may not seem to be necessary.	» Use change techniques such as motivational interviewing.
» May have low expectations about treatment.	» Identify goals to demonstrate improvement/stabilisation.
Social and economic	
» May lack support at home or in the community	» Encourage participation in treatment support programs.
» May not have the economic resources to attend appointments.	» Consider down referral or reschedule appointment to fit in with other commitments.
Healthcare team related	
» Little or no time during the visit to provide information.	» Encourage patient to ask questions.
» Information may be provided in a way that is not understood.	» Use patient literacy materials in the patient's language of choice.
» Relationship with the patient may not promote understanding and self-management.	» Engage active listening.
Treatment related	
» Complex medication regimens (multiple medications and doses) can be hard to follow.	» If possible reduce treatment complexity
» May be discouraged if they don't feel better right away.	» Help the patient understand the condition and the role of their medication
» May be concerned about adverse effects.	» Discuss treatment goals in relation to potential adverse effects.

Although many of these recommendations require longer consultation time, this investment is rewarded many times over during the subsequent years of management.

For a patient to consistently adhere to long term pharmacotherapy requires integration of the regimen into his or her daily life style. The successful integration of the regimen is informed by the extent to which the regimen differs from his or her established daily routine. Where the pharmacological proprieties

of the medication permits it, the pharmacotherapy dosing regimen should be adapted to the patient's daily routine. For example, a shift worker may need to take a sedating medicine in the morning when working night shifts, and at night, when working day shifts. If the intrusion into life style is too great alternative agents should be considered if they are available. This would include situations such as a lunchtime dose in a school-going child who remains at school for extramural activity and is unlikely to adhere to a three times a regimen but may very well succeed with a twice daily regimen.

Towards concordance when prescribing

Establish the patient's:

» occupation,
» daily routine,
» recreational activities,
» past experiences with other medicines, and
» expectations of therapeutic outcome.

Balance these against the therapeutic alternatives identified based on clinical findings. Any clashes between the established routine and life style with the chosen therapy should be discussed with the patient in such a manner that the patient will be motivated to change their lifestyle.

Note: Education that focuses on these identified problems is more likely to be successful than a generic approach toward the condition/medicine.

Education points to consider

» Focus on the positive aspects of therapy, but be supportive regarding negative aspects and offer guidance on how to manage this, if present.
» Provide realistic expectations regarding:
  – normal progression of the illness - especially important in those diseases where therapy merely controls the progression and those that are asymptomatic;
  – the improvement that therapy and non-medicinal treatment can add to the quality of life.
» Establish therapeutic goals and discuss them openly with the patient.
» Any action to be taken with loss of control or when side effects develop.
» In conditions that are asymptomatic or where symptoms have been controlled, reassure the patient that this reflects therapeutic success, and not that the condition has resolved.
» Where a patient raises concern regarding anticipated side effects, attempt to place this in context with respect to incidence, the risks vs. the benefits, and whether or not the side effects will disappear after continued use.

Note: Some patient's lifestyles make certain adverse responses acceptable which others may find intolerable. Sedation is unlikely to be acceptable to a student, but an older patient with insomnia may welcome this side effect. This is where concordance plays a vital role.

Notes on prescribing in chronic conditions.

» Do not change doses without good reason.
» Never blame anyone or anything for non-adherence before fully investigating

the cause.

» If the clinical outcome is unsatisfactory - investigate adherence (note that side effects may be an issue).
» Always think about side effects and screen for them from time to time.
» When prescribing a new medicine for an additional health related problem ask yourself whether or not this medicine is being used to manage a side effect.
» Adherence with a once daily dose is best. Twice daily regimens show agreeable adherence. However, adherence decreases as the number of administration interval increases.
» Keep the total number of tablets to an absolute minimum as too many may lead to medication dosing errors and may influence adherence.

Improving Continuity of Therapy

» Make clear and concise records.
» Involvement the patient in the care plan.
» Every patient on chronic therapy should know:
  - his/her diagnosis
  - the name of every medicine
  - the dose and interval of the regimen
  - his/her BP or other readings

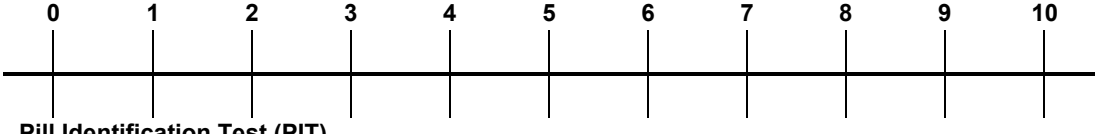
  Note: The prescriber should reinforce this only once management of the condition has been established.
» When the patient seeks medical attention for any other complaints such as a cold or headache he/she must inform that person about any other condition/disease and its management.
» If a patient indicates that he/she is unable to comply with a prescribed regimen, consider an alternative - not to treat might be one option, but be aware of the consequences e.g. ethical.

Patient Adherence Record

Folder No.	Date (dd/mm/yyyy) / /

Self-Reporting Question	**Yes**	**No**
Do you sometimes find it difficult to remember to take your medicine?		
When you feel better, do you sometimes stop taking your medication?		
Thinking back over the past four days, have you missed any of your doses?		
Sometimes if you feel worse when you take the medicine, do you stop taking it?		

Visual Analogue Scale (VAS)



Score ____%

Pill Identification Test (PIT)

Medication	Knows the name (Y/N)	Knows the number of pills per dose (Y/N)	Time the medication is taken			Knows any additional instruction
			Morning (hour)	Evening (hour)	Considered Acceptable (Y/N)	

Pill Count

Did the client return the medication containers? Yes* No

If yes, check that the client only used medication from this container since the date of their last visit. If leftover medication had been used or an emergency prescription obtained, then the calculation will be invalid – skip to adherence assessment.

$$\text{\% Adherence} = \frac{\text{Dispensed} - \text{Returned}}{\text{Expected to be taken}} \times 100 = \frac{\square - \square}{\square} \times 100 = \square\ \%$$

Adherence Assessment

Self-reporting	Answered 'No' to all questions	Answered 'Yes' to 1 question	Answered 'Yes' to 2 or more questions
VAS	≥ 95%	75–94%	Less than 75%
PIT—*Client knows the…*	Dose, Time, and Instructions	Dose and Time	Dose only or confused
Pill count	≥ 95%	75–94%	Less than 75%
Overall Adherence	High	Moderate	Low

CENTRAL CHRONIC MEDICINE DISPENSING AND DISTRIBUTION (CCMDD)/DABLAPMEDS

Shortcut to your chronic meds®

dablapmeds
The shortcut to your chronic medication

The Central Chronic Medicines Dispensing and Distribution programme (CCMDD)Dablapmeds, an innovation has been implemented to improve alternative access to chronic medicines for stable patients. with chronic conditions. Patients choose to collect their multimonth repeat medicines at a contracted pick-up point nearer to home or place of work. It is free, safe, convenient and no out of pocket payment. and it is no longer necessary to wait in long queues at health facilities just to collect repeat medicines.

Each province provides a list of medicines aligned to the EML and STGs including prescriber levels that can be utilised for recruitment of patients on the programme. Prescriptions for patients enrolled on CCMDD not meeting legal requirements and compliance to EML and STGs are rejected. The ultimate goal of the CCMDD programme is to improve adherence and better health outcomes.

CCMDD Benefits:

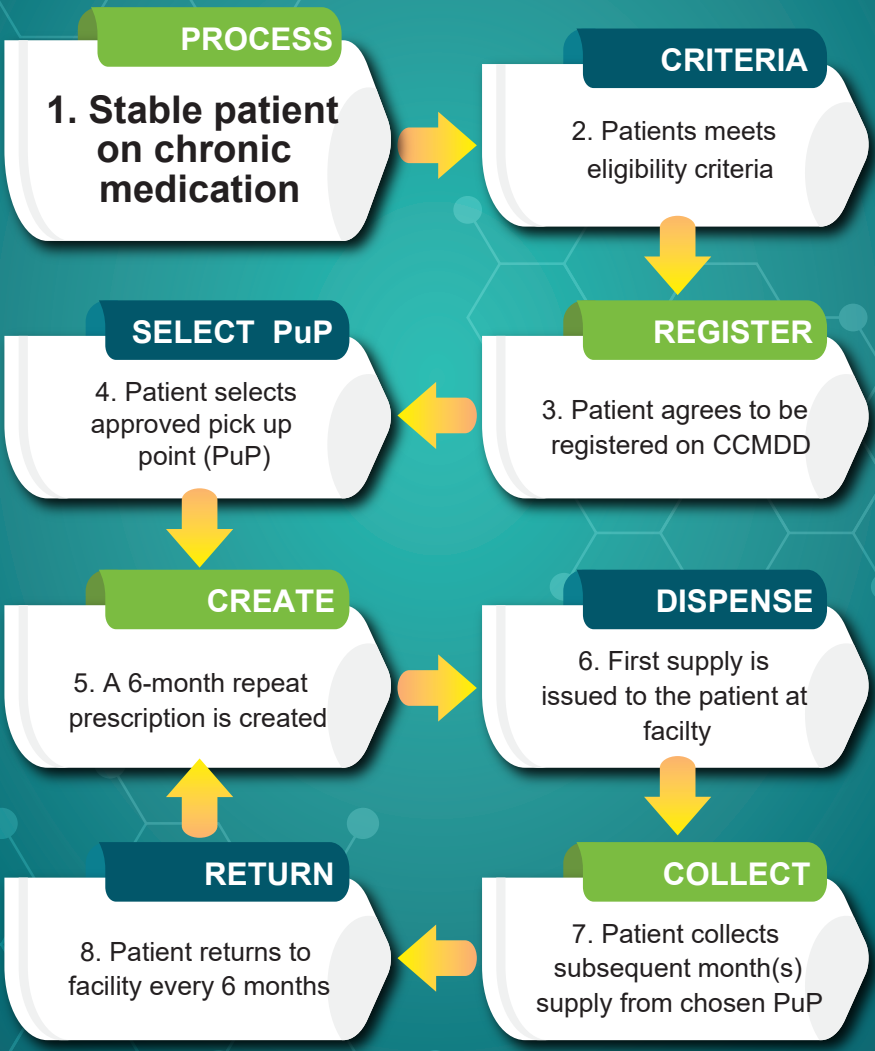
Improved **access** to chronic medicines;
Improved **quality** of care and service delivery;
Improved **patient experience** in the collection of chronic medication;
Improved treatment **adherence**;
Improved **supply chain** processes;
Improved availability of reliable **data** to inform decision-making at:
- Facilities, Service Providers, Pick up Points

Decreased **stigma** for HIV patients;
Reduced **workload** for public health facilities and healthcare workers;
Reduced patient **waiting times** and better time management;
Decongestion of health facilities through the use of alternative Pick up Points;

“CCMDD is a proven, successful, patient centric approach to service patients in a manner that is beneficial to patients, Departments of Health, communities and creates lasting partnerships with the private sector.”

Detailed information regarding the CCMDD process can be accessed at:
WWW.HEALTH.GOV.ZA/CCMDD

Central Chronic Medicine Dispensing and Distribution (CCMDD)



AWaRe Classification of Antibiotics

BACKGROUND

The World Health Organization (WHO) has categorised antibiotics into three groups based on their potential to induce and propagate resistance. This grouping is also used to identify antibiotics that are priorities for monitoring and surveillance.

Most medicines remain effective even if used by many people for prolonged periods. Unfortunately, antibiotics are an important exception as they can become ineffective because of anti-microbial resistance.

ANTIMICROBIAL RESISTANCE

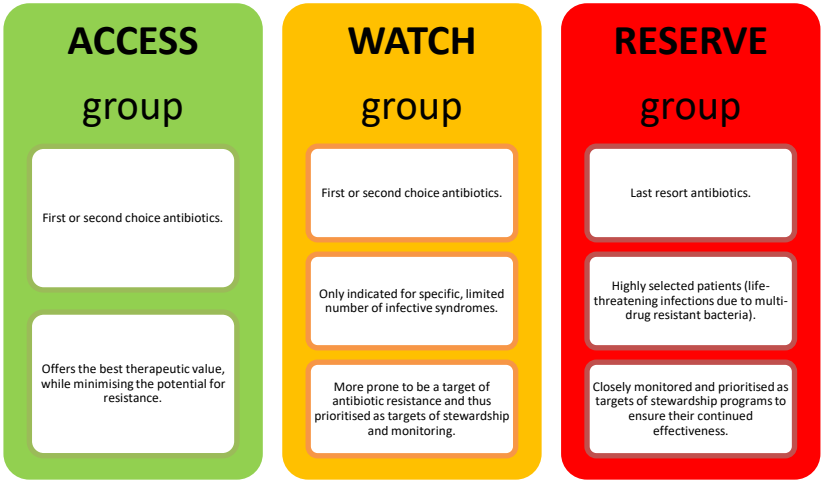
Antibiotic resistance refers to the ability of microorganisms to withstand the effects of an antibiotic.

Bacteria are said to develop resistance when they are no longer inhibited or killed by a given antibiotic.

Inappropriate use of antibiotics favours the emergence and spread of antibiotic resistance, amplifying natural ability of bacteria to resist.
In order to keep antibiotics effective, we need to take them only when needed and strictly as directed by the prescriber / healthcare professional

Furthermore, there is a need to select the right antibiotic for a given infection when they are needed. Those antibiotics that offer the best therapeutic advantage while minimizing the risk of resistance should be privileged.

The aim of the WHO AWaRe antibiotic categorization is to provide a tool to use antibiotics safely and effectively.



These groups have been highlighted in the Standard Treatment Guidelines with the following graphics:

A Indicates that this antibiotic falls within the Access group.

W Indicates that this antibiotic falls within the Watch group.

R Indicates that this antibiotic falls within the Reserve group.

Further information on the AWaRe categorisation, and for a full list of all antibiotics and which category they fall into, can be found at: https://aware.essentialmeds.org/groups.

PHC Chapter 1: Dental and oral conditions

1.1 ABSCESS AND CARIES, DENTAL

1.1.1 DENTAL ABSCESS

K04.7

DESCRIPTION

Acute or chronic suppuration related to teeth, due to infection. It is characterised by:

» acute, severe, throbbing pain,
» swelling adjacent to the tooth, or on the face,
» pain worsened by tapping on affected teeth,
» restricted mouth opening or difficulty chewing,
» pus collection located around the tooth or at the apex of the root.

MEDICINE TREATMENT

Initiate treatment before referral:

Children

- Amoxicillin, oral, 10–20 mg/kg 8 hourly for 5 days.

Weight kg	**Dose** mg	**Use one of the following:**				**Age** Months/years
		Susp		**Capsule**		
		125mg/ 5mL	250mg/ 5mL	250 mg	500 mg	
>11–25 kg	250 mg	10 mL	5 mL	1 cap	–	>18 months–7 years
>25 kg	500 mg	–	–	2 caps	1 cap	>7 years

AND

Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days. A See dosing table: Chapter 23.

Adults

- Amoxicillin, oral, 500 mg 8 hourly for 5 days. A

AND

- Metronidazole, oral, 400 mg, 8 hourly for 5 days. A

Severe penicillin allergy:

Z88.0

Children < 18 kg

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg/dose, daily for 3 days. See dosing table: Chapter 23. W

Children > 35 kg and adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days. W

Pain:

Children

Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

Note: Dental rinses are not recommended for prevention of COVID-19 transmission during dental procedures.

LoE: IIIb[1]

REFERRAL

All cases for dental treatment.

1.1.2 DENTAL CARIES

K02.0-5/K02.8-9

To be managed by a dentist or dental therapist.

For local anaesthesia for dental procedures:

- Lidocaine (Dentist and dental therapist).
- Lidocaine with adrenaline (epinephrine) (Dentist and dental therapist).

Note: Dental rinses are not recommended for prevention of COVID-19 transmission during dental procedures.

LoE: IIIb[2]

1.2 CANDIDIASIS, ORAL (THRUSH)

B37.0

DESCRIPTION

A candida infection of the mouth and sometimes of the pharynx.

Commonly presents as painful creamy white patches that can be scraped off the tongue and buccal mucosa.

Often occurs in healthy babies up to one month of age.

Risk factors for candidiasis include:

» poor oral hygiene,
» immunosuppression (may be responsible for severe cases of oral thrush),
» prolonged use of broad-spectrum antibiotics or corticosteroids (including inhaled),
» certain chronic diseases, e.g., diabetes mellitus,
» trauma e.g., from poorly fitting dentures or dentures worn whilst sleeping.

GENERAL MEASURES

» Identify underlying causes, based on risk factors.
» Improve oral hygiene.
» Feed infants using a cup instead of a bottle.
» Ensure proper fitting dentures.

MEDICINE TREATMENT

- Nystatin suspension, oral, 100 000 IU/mL, 1 mL 6 hourly after each meal/feed for 7 days.
  - Keep in contact with the affected area for as long as possible prior to swallowing.

- In older children, ask the child to swirl in the mouth, prior to swallowing.
- In infants, advise mothers to apply to front of the mouth and spread over the oral mucosa with a clean finger.
- Continue for 48 hours after cure.

Note: In PLHIV candidiasis may involve the oesophagus as well as the mouth. Pain and difficulty in swallowing in an HIV-infected patient with oral candidiasis suggest oesophageal involvement, which requires systemic treatment with fluconazole. See Section 11.3.3: Candidiasis, oesophageal.

REFERRAL
No improvement.

1.3 GINGIVITIS AND PERIODONTITIS

1.3.1 UNCOMPLICATED GINGIVITIS
K05.0/K05.1

DESCRIPTION
Inflammation of the gum margin causing the gums to separate from the teeth. Pockets (recesses) form between the gums and the teeth. Pus and bacteria can collect in these pockets, eventually causing periodontitis. See section 1.3.2: Periodontitis.

Characteristics of uncomplicated gingivitis:

» may be painful
» bleeding
» gum recession may occur
» redness
» swollen gums

PROPHYLAXIS AND GENERAL MEASURES
Oral hygiene is usually adequate to prevent superficial mouth and gum infection:
» Oral hygiene after each meal to remove plaque and food debris.
» Brush teeth twice daily.
» Floss teeth at least once daily.
» Rinse mouth with homemade salt mouthwash for one minute twice daily (i.e., ½ medicine measure of table salt in a glass of lukewarm water).

MEDICINE TREATMENT
Brush, floss, rinse mouth with water and then rinse with:
- Chlorhexidine 0.2%, 15 mL as a mouthwash, twice daily, after brushing teeth, for 5 days.
  - Do not swallow.

  Note: Do not eat or drink immediately after this.

Pain:

Children

Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

1.3.2 PERIODONTITIS

K05.2/K05.3

DESCRIPTION

Progressive gingivitis to the point where the underlying bone is eroded. It is characterised by loose teeth and is a cause of tooth loss in adults.

GENERAL MEASURES

» Provide advice on improving and maintaining oral hygiene.
» Brush teeth frequently, at least twice daily.

MEDICINE TREATMENT

Brush, floss, rinse mouth with water and then rinse with:

- Chlorhexidine 0.2%, 15 mL as a mouthwash, twice daily, for 5 days.
  - Do not swallow.

  Note: Do not eat or drink immediately after this.

Pain:

Children

Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

Note: Dental rinses are not recommended for prevention of COVID-19 transmission during dental procedures.

LoE: IIIb[3]

REFERRAL

All cases for dental treatment.

1.3.3 NECROTISING PERIODONTITIS

K05.2

DESCRIPTION

An acute, very painful infection of the gingival margin. It is characterised by:

» foul smelling breath,
» necrosis and sloughing of the gum margin, especially of the interdental papillae,
» loss of gingiva and supporting bone around teeth.

May be associated with underlying disease, e.g. HIV.
May lead to disease of surrounding lips and cheeks if not adequately treated.

GENERAL MEASURES

» Relieve pain.
» Improve oral hygiene.
» Exclude underlying disease e.g. HIV.

MEDICINE TREATMENT

Brush, floss, rinse mouth with water and then rinse with:

- Chlorhexidine 0.2%, 15 mL as a mouthwash, twice daily, for 5 days.
  - Do not swallow.

  Note: Do not eat or drink immediately after this.

Initiate treatment before transferral

Children

- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days. A See dosing table, Chapter 23.

Adults

- Metronidazole, oral, 400 mg, 8 hourly for 5 days. A

Pain:

Children

Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

Note: Dental rinses are not recommended for prevention of COVID-19 transmission during dental procedures.

LoE: IIIb[4]

REFERRAL

All cases for dental treatment.

1.4 HERPES SIMPLEX INFECTIONS OF THE MOUTH AND LIPS

B00.1-2

DESCRIPTION

Acute, painful vesicular eruptions of the lips or ulcerations of the lips and mouth caused by Herpes simplex virus and characterised by:

» shallow, painful ulcers on the lips, gingiva, tongue and pharynx,
» pain exacerbated by eating.

It is a self-limiting infection with symptoms subsiding within 10 days.

GENERAL MEASURES

» Rinse mouth with homemade salt mouthwash for one minute twice daily (i.e. ½ medicine measure of table salt in a glass of lukewarm water).
» Ensure adequate hydration.
» Fluid diet for children.
» Avoid acidic drinks, e.g. orange juice or soft drinks, as they may cause pain.

MEDICINE TREATMENT

- Cover lesions on the lips with petroleum jelly.

Pain:

Children

Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

Extensive oral herpes:

For children > 6 years and adults

- Tetracaine 0.5 %, topical, applied every 6 hours.
  - Apply a thin layer on the affected areas only (may be used inside mouth).

  Note: Safety in children < 6 years of age has not been established.

The following patients should be treated with an antiviral:

» Children with extensive oral herpes **provided treatment can be started within 72 hours of onset of symptoms.**
» PLHIV with herpes infections of the lips or mouth.

Children < 15 years of age

- Aciclovir, oral, 250 mg/m2/dose, 8 hourly for 7 days. See dosing table, Chapter 23.

Children ≥ 15 years of age and adults

- Antiviral, (active against herpes simplex) e.g.:
- Aciclovir, oral, 400 mg, 8 hourly for 7 days.

REFERRAL
» Severe condition.
» Dehydrated patients.
» No improvement after 1 week of treatment.

1.5 APHTHOUS ULCERS
K12.0

DESCRIPTION
Painful ulcers in the mouth, except the gums, hard palate and dorsum of the tongue. Minor ulcers (< 1 cm diameter) usually heal within 10 days. Major ulcers (> 1 cm diameter) are very painful, often very deep and persist. Major ulcers usually indicate advanced HIV infection.

MEDICINE TREATMENT

Minor aphthous ulcers:

Children < 6 years of age

Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Children > 6 years of age and adults

- Tetracaine 0.5 %, topical, applied every 6 hours.
  - Apply a thin layer on the affected areas only (may be used inside mouth).

  Note: Safety in children < 6 years of age has not been established.

REFERRAL
» Major ulcers for further diagnostic evaluation.
» Ulcers that are not healing within 10 days.

1.6 TEETHING, INFANT
K00.7

DESCRIPTION
Teething is the appearance of teeth through the gums in the mouth of infants and young children.
Symptoms often associated with teething include:
» Fretfulness,
» biting or chewing on hard objects,
» drooling, which may often begin before teething starts,
» gum swelling and tenderness,
» refusing food,
» sleeping problems.

Teething is not a cause of severe or systemic symptoms, such as high fever or diarrhoea. Exclude conditions other than teething in infants who are systemically unwell or in distress.

Advise caregivers to seek medical advice if the infant becomes systemically unwell.

GENERAL MEASURES

Teething is a normal physiological process; simple self-care measures are recommended.

» Gentle massage to the gum or biting on objects (such as teething rings) may produce relief by producing counter-pressure against the gums (beware of choking risks).
» Cold objects may help to ease symptoms.

Do not use local oral anaesthetic preparations in infants, as these have been associated with severe adverse events.

REFERRAL

All children with systemic symptoms (e.g., high fever or diarrhoea) that cannot be managed at primary healthcare level.

References:

[1] Dental rinses for prevention of COVID-19: National Department of Health: Affordable Medicines, EDP-PHC/Adult Hospital level. Medicine Review: Dental rinses as IPC for COVID-19, 20 May 2021. https://www.knowledgehub.org.za/content/standard-treatment-guidelines-and-essential-medicines-list

[2] Dental rinses for prevention of COVID-19: National Department of Health: Affordable Medicines, EDP-PHC/Adult Hospital level. Medicine Review: Dental rinses as IPC for COVID-19, 20 May 2021. https://www.knowledgehub.org.za/content/standard-treatment-guidelines-and-essential-medicines-list

[3] Dental rinses for prevention of COVID-19: National Department of Health: Affordable Medicines, EDP-PHC/Adult Hospital level. Medicine Review: Dental rinses as IPC for COVID-19, 20 May 2021. https://www.knowledgehub.org.za/content/standard-treatment-guidelines-and-essential-medicines-list

[4] Dental rinses for prevention of COVID-19: National Department of Health: Affordable Medicines, EDP-PHC/Adult Hospital level. Medicine Review: Dental rinses as IPC for COVID-19, 20 May 2021. https://www.knowledgehub.org.za/content/standard-treatment-guidelines-and-essential-medicines-list

PHC Chapter 2: Gastro-intestinal conditions

2.1 ABDOMINAL PAIN

R10.0-4

DESCRIPTION

Abdominal pain is a common symptom, which may be non-specific. It is frequently benign but may indicate a serious acute pathology. A thorough evaluation is necessary to exclude a surgical abdomen or other serious conditions.

The history should include:

» duration, location, type, radiation, and severity of pain,
» relieving or aggravating factors e.g. food, antacids, exertion,
» associated symptoms e.g. fever or chills, weight loss or gain, nausea, vomiting, diarrhoea, cramps, fresh blood per rectum, melaena stools, jaundice, change in stool or urine colour, and/or vaginal discharge,
» past medical and surgical history,
» medication history,
» alcohol intake or intake of other recreational substances,
» family history of bowel disorders,
» menstrual and contraceptive history in women,
» associated vaginal discharge in women with lower abdominal pain.

Examination should emphasise detection of:

» tachycardia,
» fever,
» jaundice or pallor,
» abdominal masses, distension, tenderness,
» signs of peritonitis (peri-umbilical percussion and guarding),
» possible associated diseases (e.g. HIV).

MEDICINE TREATMENT

Urinary tract infection:

See Section 8.4: Urinary tract infection.

Dyspepsia:

See Section 2.2: Dyspepsia, heartburn and indigestion, in adults.

Cancer pain e.g. pancreatic, gastric cancer

See Section 20.4: Chronic cancer pain.

Renal and biliary colic or acute surgical abdomen:

- Morphine, IM, 5–10 mg, (Doctor prescribed) *LoE:IVb*[1]
  - May be repeated after 4–6 hours if needed or until patient is referred.

OR

- Morphine, IV, (Doctor prescribed).
  - Dilute 10 mg up to 10 mL with sodium chloride, 0.9%.

» Administer morphine, IV, 3–5 mg as a single dose, then further boluses of 1–2 mg/minute and monitor closely.
  - Total maximum as a single dose: 10 mg.
  - Repeat after 4 hours if needed or until the patient is referred. *LoE:IVb*[2]
  - Monitor response to pain and effects on respiration and BP.

Symptomatic treatment if no specific cause or indication for referral is found:

Pain relief (adults):
Analgesia as appropriate. See Section 20.2 Acute Pain.

Abdominal cramp-like pains (adults):
- Hyoscine butylbromide, oral, 10 mg 6 hourly for a maximum of 3 days.

REFERRAL
» Severe pain that cannot be managed at primary level of care.
» Signs of acute abdomen.
» Associated bloody non-diarrhoeal stools. (Red currant jelly stools in children).
» Associated abdominal mass.

2.2 DYSPEPSIA, HEARTBURN AND INDIGESTION, IN ADULTS
K30/R12

DESCRIPTION
» Dyspepsia, heartburn and indigestion are common conditions and may be caused by gastro-oesophageal reflux or gastroduodenal pathology. These conditions often present with epigastric discomfort and minimal change in bowel habits.
» Intermittent indigestion, heartburn or dyspepsia may be associated with:
  - use of NSAIDs e.g. aspirin, ibuprofen, pain powders,
  - spicy food, alcohol, carbonated drinks,
  - smoking.

Note: Dyspeptic symptoms may possibly be due to acute coronary syndrome. *LoE:IIIb*[3]

GENERAL MEASURES
» Stop smoking.
» Limit alcohol intake.
» Eat small frequent meals.
» Avoid late night meals.
» Avoid fatty meals.
» Avoid carbonated beverages.
» Lose weight if overweight.
» Sleep with upper body elevated.

» Sleep on the left side.
» Stop the use of potential ulcerogenic medicines e.g. NSAIDs.
» If pale, check haemoglobin and refer if anaemic.

MEDICINE TREATMENT

- Proton-pump inhibitor e.g.:
- Pantoprazole, oral, 40 mg daily for a maximum of 14 days.
  - Also indicated for short-term use in pregnancy.
  - Refer if symptoms recur after 14-day course of therapy.

REFERRAL

» Presence of warning signs:
- weight loss
- persistent vomiting
- dysphagia
- anaemia
- haematemesis
- palpable abdominal mass

» No response within 7 days of starting proton-pump inhibitor therapy treatment.
» Recurrence of symptoms, especially:
- > 50 years of age
- family history of gastric carcinoma

» previous gastric surgery

2.3 GASTRO-OESOPHAGEAL REFLUX/DISEASE IN INFANTS

P78.8-9

DESCRIPTION

Gastro-oesophageal reflux (GOR) is the passive regurgitation of gastric content into the oesophagus. It may be a normal physiological phenomenon in infants, children and adults. It is noted by frequent positing/regurgitation of small amounts of milk/food. Gastro-oesophageal reflux disease (GORD) is when GOR results in abnormal or pathological complications.

GENERAL MEASURES

» Medicine treatment is not required in the absence of indications that necessitate referral (e.g. features of GORD).
» Counsel parent/guardian on the following:
- Explain that GOR is common and resolves in most children by the age of 12–18 months.
- Position infant upright after feeds.

REFERRAL

» Failure to thrive (growth faltering).
» Abnormal posturing with opisthotonus or torticollis (Sandifer's syndrome).

» Respiratory symptoms, i.e. recurrent wheeze or cough, chronic obstructive airway disease, recurrent aspiration/pneumonia, stridor, apnoea and apparent life-threatening events.
» Infants with suspected cow's milk allergy.
» Infants who are overweight or obese.

2.4 NAUSEA AND VOMITING, NON-SPECIFIC

R11

DESCRIPTION

There are many possible causes of nausea and vomiting. Some important causes to exclude are:

» gastro-intestinal disease
» liver disease
» renal failure
» alcohol abuse
» early pregnancy
» medicines

Establish if the vomiting is associated with:

» abdominal pain
» diarrhoea
» headache
» constipation

GENERAL MEASURES

» Maintain adequate hydration with clear fluids (see Section 2.9: Diarrhoea).
» Neonates and infants should not stop feeds for more than 1 hour. Restart feeds in smaller and more frequent amounts.
» Exclude pregnancy in women of child-bearing age.

MEDICINE TREATMENT

Children

Do not use anti-emetics. Give small volumes of fluids more frequently.

Adults

- Metoclopramide, IM/IV, 10 mg 8 hourly.

OR

- Metoclopramide, oral, 10 mg 8 hourly.

REFERRAL

Refer urgently if any of these are noted:

» Severe dehydration
» Shock
» Diabetes
» Severe pain
» Wasting
» Jaundice
» Clinical features of sepsis
» Associated abdominal tenderness with guarding during peri-umbilical percussion
» Signs of intestinal obstruction i.e. no stool or flatus passed
» Infants with that have projectile vomiting or are vomiting everything
» Vomiting with presence of fresh or digested blood/ melaena

2.5 ANAL CONDITIONS

2.5.1 ANAL FISSURES

K60.0-2

DESCRIPTION

Painful small cracks just inside the anal margin, sometimes a linear ulcer. It is often seen together with a sentinel pile or external haemorrhoids. These may cause spasm of the anal sphincter, or bleeding on defaecation.

GENERAL MEASURES

» Dietary advice to promote soft stools.

MEDICINE TREATMENT

Children

- Lactulose, oral, 0.5 mL/kg/dose once daily. See dosing tables: Chapter 23.
  - If poor response, increase frequency to 12 hourly.

Adults

- Lactulose, oral, 10–20 mL once daily.
  - If poor response, increase frequency to 12 hourly.

AND

- Bismuth subgallate compound, ointment, topical, applied 2–4 times daily.

AND

Topical anaesthetic:

- Lidocaine 2%, cream, topical, applied before and after each bowel action.

OR

- Amethocaine 1% topical, applied before and after each bowel action.

REFERRAL

» Severe pain.
» Recurrent episodes.
» Poor response to symptomatic treatment.
» Persistent anal bleeding.

2.5.2 HAEMORRHOIDS

K64.0-5/K64.8-9

DESCRIPTION

Varicose veins of the ano-rectal area that are usually accompanied by a history of constipation. Consider a diagnosis of underlying carcinoma in older patients.

GENERAL MEASURES

» High-fibre diet.
» Counsel against chronic use of laxatives.

» Avoid straining at stool.

MEDICINE TREATMENT

Painful haemorrhoids:

- Bismuth subgallate compound, ointment, topical, applied 2–4 times daily.

OR

- Bismuth subgallate compound suppositories, insert one into the rectum 3 times daily.

AND

Topical anaesthetic:

- Lidocaine 2%, cream, topical, applied before and after each bowel action.

OR

- Amethocaine 1% topical, applied before and after each bowel action.

Constipation:

See Section 2.8: Constipation.

REFERRAL

» For surgical intervention if necessary:
  - if the haemorrhoid cannot be reduced,
  - if the haemorrhoid is thrombosed,
  - poor response to conservative treatment.
» Children.
» Persistent anal bleeding.

2.5.3 PERIANAL ABSCESSES

K61.0-4

DESCRIPTION

» An abscess adjacent to the anus.
» Caused by organisms spreading through the wall of the anus into peri-anal soft tissues.
» Presents as an indurated or tender area adjacent to the anus.

GENERAL MEASURES

» Treatment is by surgical drainage.
» Treat associated pain (See Section 20.2: Acute Pain).

2.6 APPENDICITIS

K35.0-3/K35.8-9/K36/K37

DESCRIPTION

This is characterised by inflammation of the appendix, and usually requires urgent surgical intervention. Clinical features include:

» Sudden peri-umbilical pain often migrating to the right iliac fossa.

» Nausea and vomiting.
» Loss of appetite.
» Fever.
» Constipation or occasionally diarrhoea.
» Bloated abdomen.
» Abdominal tenderness with guarding and rigidity during peri-umbilical percussion.
» Right iliac fossa tenderness.
» Right iliac fossa rebound pain.
» Severe persistent abdominal pain.

GENERAL MEASURES
» Keep nil per mouth and stabilise as appropriate.

MEDICINE TREATMENT
Hydrate if required:
- Sodium chloride, 0.9%, IV.

REFERRAL
» All patients.

2.7 CHOLERA
A00.0-1/A00.9

Note: This is a notifiable condition.

DESCRIPTION
Very acute severe watery diarrhoea due to infection with *Vibrio cholerae.* Clinical features include:
» rice water appearance of stools:
  - no blood in stools,
  - no pus in stools,
  - no faecal odour.
» possible vomiting,
» rapid severe dehydration.

GENERAL MEASURES
Rehydrate aggressively with oral rehydration solution (ORS).

MEDICINE TREATMENT
To treat dehydration:

Children

Treat dehydration. See Section 2.9.1: Diarrhoea, acute in children.

Adults

Oral treatment:
- Oral rehydration solution (ORS).

OR

- Homemade sugar and salt solution. See Section 2.9: Diarrhoea.

Note:

» The volume of fluid required for oral rehydration depends on the severity of the dehydration.
» Oral rehydration is preferred. Administer IV fluids or ORS by nasogastric tube in patients with reduced levels of consciousness.

IV treatment:

- Ringers lactate, IV (preferred).

OR

- Sodium chloride, 0.9%, IV.

LoE:IVb[4]

Antibiotic treatment:

Children

- Ciprofloxacin, oral, 20 mg/kg as a single dose (W) (see dosing table: Chapter 23).
  - Maximum dose: 750 mg.

LoE:IVb[5]

Adults

- Ciprofloxacin, oral, 1 g as a single dose. (W)
  - Adjust antibiotic choice, according to the sensitivity of the isolate responsible for the local epidemic.

LoE:IVb[6]

Nutritional supplementation:

In all children who are able to take oral medication:

- Zinc (elemental), oral 10 mg/day for 14 days.

LoE:IV[7]

Caution

Dextrose 5% should not be used for fluid replacement in patients with cholera as it does not contain electrolytes, which are required to ensure adequate fluid resuscitation.

REFERRAL

» Severely ill patients.
» According to provincial and local policy.

2.8 CONSTIPATION

K59.0

DESCRIPTION

» A condition characterised by a change in usual bowel habits, along with dry, hard stools.
» There is a decreased frequency of bowel action.
» Constipation may have many causes, including:

- incorrect diet (insufficient fibre and fluid)
- pregnancy
- medicines, e.g. opiates and anticholinergics
- hypothyroidism
- lower bowel abnormalities
- chronic use of enemas and laxatives
- behavioural problems in children
- lack of exercise
- old age
- ignoring the urge
- neurogenic
- psychogenic disorders
- bowel cancer

CAUTION
Be especially suspicious of a change in bowel habits in adults, as this may indicate cancer of the large bowel.

GENERAL MEASURES

» Patients should be assessed individually.
» Encourage exercise.
» Increase intake of fibre-rich food, e.g. vegetables, coarse maize meal, bran, and cooked dried prunes.
» Ensure adequate hydration.
» Encourage regular bowel habits.
» Discourage continuous use of laxatives.
» Refer people at risk of neurogenic bowel dysfunction to rehabilitation services for multidisciplinary bowel care (e.g. frail older people, postpartum women following obstetric injury, and people with neurological or spinal disease/injury, severe cognitive impairment, urinary incontinence, pelvic organ prolapse and/or rectal prolapse and who have had colonic resection or anal surgery.

MEDICINE TREATMENT

Children >12 months of age:

- Lactulose, oral, 0.5 mL/kg/dose once daily. See dosing table: Chapter 23.
  - If poor response, increase frequency to 12 hourly.

Children > 15 years of age and adults:

- Sennosides A and B, oral, 13.5 mg, 1 tablet at night.
  - Total daily dose may be increased up to 4 tablets if initial response is inadequate.

OR

- Lactulose, oral 10–20 mL once or twice daily.

CAUTION
Prolonged severe constipation may present with overflow “diarrhoea”. Rectal examination should be done in all adults.

REFERRAL

» Recent change in bowel habits.
» Faecal impaction.
» Poor response to treatment.

» Uncertain cause of constipation.

2.9 DIARRHOEA

CAUTION
There is no place for anti-diarrhoeal preparations in the treatment of acute diarrhoea in children or in dysentery.

2.9.1 DIARRHOEA, ACUTE IN CHILDREN
A09.0/A09.9

DESCRIPTION
A sudden onset of increased frequency of stools that are looser than normal, with or without vomiting. Commonly caused by a virus but may be caused by bacteria or parasites. The cause of acute diarrhoea cannot be diagnosed without laboratory investigation. It may be an epidemic if many patients are infected at the same time.

GENERAL MEASURES
» Assess and manage dehydration according to the table below.
» All children with severe dehydration require referral. Begin management for dehydration immediately whilst awaiting referral (see below).
» All children should be assessed and treated for associated conditions e.g. hypothermia, convulsions, altered level of consciousness, respiratory distress, surgical abdomen.

Special types of diarrhoea:
» Bloody diarrhoea: consider dysentery. See Section 2.10: Dysentery.
» Diarrhoea with high fever or very ill: consider typhoid. See Section 2.13: Typhoid fever.
» Persistent diarrhoea: See section 2.9.2: Diarrhoea, persistent in children.
» Diarrhoea in children in the context of an adult epidemic: consider cholera. See Section 2.7: Cholera.

Treatment according to hydration classification			
Assess level of hydration and start with appropriate management plan (Plan A, B or C). Re-assess and review management regularly. →			
Classification	**Plan C: Severe dehydration**	**Plan B: Some dehydration**	**Plan A: No visible dehydration**
	Two or more of the signs below: » lethargic or unconscious » eyes sunken » drinks poorly or not able to drink » severe decrease in skin turgor (skin pinch returning ≥ 2 seconds)	Two of the signs below, but not severely dehydrated: » restless or irritable » eyes sunken » thirsty, drinks eagerly » moderate decrease in skin turgor - by slow skin pinch, returning in < 2 seconds	Only one or none of the signs of dehydration.
Treatment	**Plan C: Severe dehydration**	**Plan B: Some dehydration**	**Plan A: No visible dehydration**
	Give rapidly: • Ringers lactate or sodium chloride, 0.9%, IV, 20 mL/kg. o If signs of acute severe malnutrition: decrease the bolus to 10 mL/kg over 10 minutes. o Repeat up to twice if radial pulse is weak or undetectable. o Continue with 20 mL/kg every hour for the next 5 hours. o If using Ringers lactate: See caution box below on use of ceftriaxone and calcium-containing fluids in neonates. **Then:** o Refer urgently for further management, continuing with 20 mL/kg every hour for the next 5 hours unless child is reclassified as **Plan B: Some dehydration**.	Give: • ORS, oral, 80 mL/kg over 4 hours, e.g. 5 mL/kg every 15 minutes. » Give more if the child wants more. » Show the caregiver how to give ORS with a cup and spoon using frequent small sips. » If child vomits wait 10 minutes and then continue more slowly. » Encourage the caregiver to continue feeding the child, especially breastfeeding. If after 4 hours there are: » No signs of dehydration – treat with **Plan A: No visible dehydration**	» Show the caregiver how to give ORS with a cup and spoon using frequent small sips. » Encourage caregiver to give: • Oral rehydration solution, oral, 10 mL/kg after each diarrhoeal stool until diarrhoea stops. o Child ≤ 2 years of age: 50–100 mL. o Child >2 years of age: 100–200 mL. » Continue at home. » Encourage the caregiver to continue feeding the child, especially breastfeeding. » Provide instructions to the caregiver on how to make ORS/Homemade sugar salt

	○ Reassess every 2 hours while awaiting transfer. ○ If hydration status does not improve, give IV fluids more rapidly. » As soon as the child can drink, usually after 3–4 hours in infants and 1–2 hours in children, also give: • ORS, oral, 5 mL/kg/hour. ○ If IV administration is not possible, insert a nasogastric (NG) tube. » While awaiting, and during urgent transfer, give: • ORS, NG, 20 mL/kg/hour over the next 6 hours. » If only oral administration is possible, or the condition is not improving, transfer the child urgently. While awaiting, and during urgent transfer, give: • ORS, oral, 20 mL/kg/hour. » Reassess and reclassify the child every **4 hours**. If hydration status improves, reclassify as **Plan B: Some dehydration** and treat accordingly.	» Still some dehydration signs – Continue as above. (Refer if dehydration still present after 8 hours of treatment). » Signs of severe dehydration: – Treat as **Plan C: Severe dehydration**.	solution (SSS) at home and to continue treatment.

Table 2.1: Management of patients according to severity of dehydration

Child should return immediately if:

- » condition does not improve
- » condition deteriorates
- » poor drinking or feeding
- » blood in stool
- » fever develops
- » eyes sunken
- » slow skin pinch

MEDICINE TREATMENT

The following children should receive ceftriaxone prior to referral:

- Neonates with severe dehydration.
- Children with Severe Acute Malnutrition (SAM) AND severe dehydration or shock.

- Ceftriaxone, IM/IV, 100 mg/kg/dose immediately as a single dose. See dosing table: Chapter 23 W.
  - For IM administration: do not inject more than 1 g at one injection site. *LoE:IVb*[8]
  - For IV administration: doses greater than 2 g must be given in two divided doses (i.e. 12 hourly), preferably by intravenous infusion over 30 minutes. *LoE:IVb*[9]

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

- » If neonate is suspected to have a serious bacterial infection, give ceftriaxone, even if jaundiced.
- » Avoid giving calcium-containing IV fluids (e.g. Ringers Lactate) together with ceftriaxone:
  - If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
  - If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride, 0.9% before and after.
  - Preferably administer IV fluids without calcium contents.
- » Always include the dose and route of administration of ceftriaxone in the referral letter.

In children who are able to take oral medication:

- Zinc (elemental), oral 10 mg/day for 14 days.

AND

- Homemade sugar and salt solution (SSS) for use at home to prevent dehydration. *LoE:IVb*[10]

Homemade sugar and salt solution (SSS)

½ level medicine measure of table salt

plus

8 level medicine measures of sugar

dissolved in 1 litre of boiled (if possible) then cooled water

(1 level medicine measure = approximately 1 level 5 mL teaspoon)

REFERRAL

» Severe dehydration: failure to maintain hydration with oral fluids/feeds, i.e. continued dehydration despite managing with "Plan B: Some dehydration".
» Children with general danger signs, e.g.:
  - convulsions,
  - altered level of consciousness,
  - intractable vomiting,
  - inability to feed or drink.
» Children with dysentery if:
  - < 12 months of age,
  - signs of dehydration.
» Malnourished children.
» Suspected acute abdomen or other surgical problem.

2.9.2 DIARRHOEA, PERSISTENT IN CHILDREN

A09.0/A09.9/K52.2/K52.8/K52.9

DESCRIPTION

Defined as diarrhoea for 7–14 days.

GENERAL MEASURES

» Assess for possible HIV infection and manage appropriately (see Section 11.1: Antiretroviral therapy, adults and adolescents).
» Prevent dehydration using homemade sugar and salt solution.
» Counsel mother regarding feeding.
  - If breastfeeding, give more frequent, longer feeds.
» If replacement feeding, replace milk with breast milk or with fermented milk products such as amasi (maas) or yoghurt, if available.
  - Continue with solids: give small, frequent meals at least 6 times a day.
» Follow-up 5 days later. If diarrhoea persists, refer to doctor.

MEDICINE TREATMENT

Vitamin A supplementation:

- Vitamin A (retinol), oral.

Age range	Dose IU	Capsule 100 000 IU	Capsule 200 000 IU
Infants 6–11 months old	100 000	1 capsule	–
Children 12 months to 5 years	200 000	2 capsules	1 capsule

Administration of a vitamin A capsule:

- Cut the narrow end of the capsule with scissors.
- Open the child's mouth by gently squeezing the cheeks.
- Squeeze the drops from the capsule directly into the back of the child's mouth. If a child spits up most of the vitamin A liquid **immediately**, give one more dose.
- Do **NOT** give the capsule to the mother or the caregiver to take home.

Zinc supplementation:

- Zinc (elemental), oral 10mg/day for 14 days.

REFERRAL

» Child < 2 months of age.
» Signs of dehydration. See Section 2.9.1: Diarrhoea, acute in children.
» Malnutrition or weight loss.
» Diarrhoea still present at 5-day follow-up.

2.9.3 DIARRHOEA, ACUTE, WITHOUT BLOOD, IN ADULTS

A09.0/A09.9/K52.2/K52.8/K52.9

DESCRIPTION

Acute diarrhoea is usually self-limiting and is managed by fluid replacement.

MEDICINE TREATMENT

Treat dehydration vigorously:

- Oral rehydration solution (ORS).

OR

- Homemade sugar and salt solution (SSS).

Homemade sugar and salt solution (SSS)
½ level medicine measure of table salt
plus
8 level medicine measures of sugar
dissolved in 1 litre of boiled (if possible) then cooled water
(1 level medicine measure = approximately 1 level 5 mL teaspoon)

- Loperamide, oral, 4 mg immediately and 2 mg as required after each loose stool. *LoE:IVb*[11]
  - Maximum daily dose for adults: refer to dose table below.

Weight band	Maximum daily dose (equivalent maximum number of 2 mg tablets per day)
34-39 kg	10 mg (5 tablets)
40-46 kg	12 mg (6 tablets)
47-53 kg	14 mg (7 tablets)
≥ 54 kg	16 mg (8 tablets)

REFERRAL

» Suspected acute surgical abdomen.
» Dehydration not corrected with rehydration.

2.9.4 DIARRHOEA, CHRONIC, IN ADULTS

A07.1/A09.0/A09.9/K52.2/K52.8/K52.9

DESCRIPTION

Defined as diarrhoea lasting > 4 weeks. LoE:IVb[12]

GENERAL MEASURES

» Encourage HIV testing: most cases are likely to be HIV related.
» Send a stool sample for microscopy for ova, cysts and parasites.
» Do not request culture and sensitivity of the stool sample. Giardiasis is a common cause of chronic diarrhoea in adults and may be difficult to diagnose on stools. Empiric treatment for giardiasis is recommended before referring such patients.

MEDICINE TREATMENT

Giardiasis:

- Metronidazole, oral, 2 g daily for 3 days. A
  - Avoid alcohol.

Chronic diarrhoea in HIV/AIDS:

See Section 11.3.5: Diarrhoea, HIV-associated.

REFERRAL

All HIV negative cases with no pathogen identified and significant diarrhoea.

2.10 DYSENTERY

A06.0

DESCRIPTION

Dysentery, or diarrhoeal stool with blood or mucus, is usually due to bacteria. Commonly encountered infectious conditions include *Shigella, Salmonella*, *E. Coli*, *Entamoeba histolytica* and *Campylobacter*.

GENERAL MEASURES

» Treat initial presentations as bacillary dysentery (see Section 2.10.1: Dysentery, bacillary).
» If there is no clinical response within three days, manage as amoebic dysentery (see Adult Hospital Level STGs and EML, Section 1.3.5: Amoebic dysentery) or refer for formal assessment.
» Exclude surgical conditions, e.g. intussusception in children.

REFERRAL

» No response to treatment.
» Abdominal distension.
» Intussusception.

2.10.1 DYSENTERY, BACILLARY

A02.0/A02.9/A03.0-3/A03.8-9/A04.2-3/A04.5/A04.8-9

DESCRIPTION

Acute infection of the bowel usually caused by *Shigella*, *Salmonella* or *Campylobacter*.

There is sudden onset diarrhoea with:

» blood (not due to haemorrhoids or anal fissure) or mucous in the stools,
» convulsions (in children),
» fever,
» tenesmus.

GENERAL MEASURES

Prevent spread of micro-organism by:

» good sanitation to prevent contamination of food and water,
» washing hands thoroughly before handling food,
» washing soiled garments and bed clothes.

MEDICINE TREATMENT

Fluid replacement in dehydration

Treat dehydration vigorously.

Children

Treat dehydration according to Section 2.9.1: Diarrhoea, acute in children.

Adults

If dehydration is not severe:

- Oral rehydration solution (ORS).

OR

- Homemade sugar and salt solution (SSS).

Homemade sugar and salt solution (SSS)
½ level medicine measure of table salt
plus
8 level medicine measures of sugar
dissolved in 1 litre of boiled (if possible) then cooled water
(1 level medicine measure = approximately 1 level 5 mL teaspoon)

Note:

» Oral rehydration volume will depend on the severity of dehydration.

If dehydration is severe:

- Sodium chloride, 0.9%, IV.

OR

- Ringers lactate, IV.

Antibiotic therapy

Indicated in:

» Children < 12 months of age.
» Children ≥ 1 year of age and adults with blood in the stools.
» All people living with HIV.

Children < 12 months of age

Give single dose of ceftriaxone and refer. *LoE:IVb*[13]

- Ceftriaxone, IM/IV, 100 mg/kg/dose immediately as a single dose. W See dosing table: Chapter 23.
  - For IM administration: do not inject more than 1 g at one injection site.
  - For IV administration: doses greater than 2 g must be given in two divided doses (i.e. 12 hourly), preferably by intravenous infusion over 30 minutes. *LoE:IVb*[14]

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If neonate is suspected to have a serious bacterial infection, give ceftriaxone, even if jaundiced.
» Avoid giving calcium-containing IV fluids (e.g. Ringers Lactate) together with ceftriaxone:
  - If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
  - If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with Sodium chloride, 0.9% before and after.
  - Preferably administer IV fluids without calcium contents.
» Always include the dose and route of administration of ceftriaxone in the referral letter.

Children ≥ 12 months of age

- Ciprofloxacin, oral, 15 mg/kg/dose 12 hourly for 3 days. W See dosing table: Chapter 23

Adults

- Ciprofloxacin, oral, 500 mg 12 hourly for 3 days. W

Note:

» Check for complications such as intestinal perforation or peritonitis.
» Ensure adequate urine output to exclude haemolytic uraemic syndrome.

REFERRAL

» Severe illness.
» Persistent blood in urine macroscopically, or on dipstick urinalysis.
» Acute abdominal signs (severe pain, acute tenderness, persistent or bilious vomiting).
» Bloody mucous passed in absence of diarrhoea.
» Failure to respond within 3 days.
» Malnutrition in children.
» Dehydration in children.

» Children < 12 months of age.

2.11 HELMINTHIC INFESTATION

2.11.1 HELMINTHIC INFESTATION, TAPEWORM

B68.0-1/B68.9

DESCRIPTION

Infestation with tapeworm that occurs after eating infested, undercooked or raw meat like beef or pork.

Infestation may be caused by:
» beef tapeworm – *Taenia saginata*
» pork tapeworm – *Taenia solium*

Signs and symptoms include:
» vague abdominal pain
» diarrhoea
» flat white worm segments seen in the stool (blunt ended)
» weight loss
» anal (nocturnal) itch

GENERAL MEASURES

Health education about adequate preparation and cooking of meat.

MEDICINE TREATMENT

If the patient has diarrhoea, wait for it to settle.

- Albendazole, oral, daily for 3 days.
  - Children 1–2 years: 200 mg
  - Children ≥ 2 years and adults: 400 mg

REFERRAL

» Abdominal tenderness or pain.
» Abdominal masses.
» Vomiting.

2.11.2 HELMINTHIC INFESTATION, EXCLUDING TAPEWORM

B76.0-1/B76.8-9/B77.0/B77.8/B77.9/B79/B80/B81.4/B82.0

Note: Soil-transmitted helminth infections are notifiable conditions (i.e. *Ascaris Lumbricoides*, *Trichuris trichiura*, *Ancylostoma duodenale*, *Necator americanus*).

DESCRIPTION

Types of worm infestation and the characteristics are shown in the table below. Infestations are often asymptomatic:

Type of worm	Description	Signs and symptoms
Common Roundworm *Ascaris lumbricoides*	» Long pink/white worms with sharp ends. » Up to 25–30cm long. » Often seen in the stools and vomitus.	» Cough. » If there is vomiting consider intestinal obstruction.
Pinworm *Enterobius vermicularis*	» White and thread-like. » Up to 10 mm long. » Often seen in the stools. » Self-infection common.	» Anal itching; worse at night. » Sleeplessness.
Hookworm *Ancylostoma duodenale* *Necator americanus*	» Up to 8 mm long.	» No symptoms or pain. » Anaemia.
Whipworm *Trichuris trichiura*	» Up to 5 cm long. » Anterior half thinner than posterior half.	» No symptoms. » Abdominal pain. » Diarrhoea. » Possible anaemia and rectal prolapse. » Abdominal discomfort. » Weight loss.

Table 2.2: Types of helminthic infestations (excluding taenia) and their signs and symptoms

GENERAL MEASURES

» Many children with worms who have pica may have iron deficiency. Check for anaemia and failure to thrive (growth faltering).
» Patient counselling and education.
» Wash hands with soap and water, especially:
  - after passing stool(s),
  - before working with food or eating.
» Keep fingernails short.
» Wash fruit and vegetables well before eating or cooking.
» Keep toilet seats clean.
» Teach children how to use toilets and wash hands.
» Do not pollute the soil with sewage or sludge.
» Dispose of faeces properly.
» De-worm all children between 1–5 years of age every 6 months as part of routine child health care.

MEDICINE TREATMENT

***Taenia* (tapeworm):**

See section 2.11.1: Helminthic infestation, tapeworm.

***Enterobius* (pinworm):**

- Mebendazole, oral,
  Children >1 year and adults:
  - 100 mg as a single dose and repeated after 2 weeks.

  OR

- Albendazole, oral
  Children 1-2 years of age:
  - 200mg as a single dose.

  Children ≥ 2 years and adults:
  - 400 mg as a single dose.

All other helminths excluding *Enterobius* (pinworm) and Taenia (tapeworm):

- Mebendazole, oral,
  Children 1–2 years:
  - 100 mg 12 hourly for 3 days.

  Children ≥ 2 years and adults:
  - 500 mg as a single dose.

  OR
- Albendazole, oral,
  Children 1–2 years:
  - 200 mg as a single dose.

  Children ≥ 2 years and adults:
  - 400 mg as a single dose.

LoE:IIIb[15]

If patient has iron deficiency:
See Section 3.1.1: Anaemia, iron deficiency.

REFERRAL

» Signs of intestinal obstruction.
» Abdominal tenderness.
» Pain.
» Persistent vomiting.
» Complications related to migration of worm larvae.

2.12 IRRITABLE BOWEL SYNDROME (IBS)

K58.0/K58.9

DESCRIPTION

» IBS (also known as “spastic colon” or “irritable colon”) is defined as recurrent abdominal pain that has occurred at least one day per week in the last three months on average, and is associated with two or more of the following:
  - Related to defecation.
  - Associated with a change in stool frequency.
  - Associated with a change in stool form (appearance).

LoE:IVb[16]

» The diagnosis is suggested by a protracted and intermittent history of these symptoms which are frequently more pronounced when there is also stress.
» It is a functional disorder, most commonly seen in women between the ages of 15 and 45 years.

GENERAL MEASURES

For patients with an established diagnosis:

» Reassure patient while their symptoms are not due to life-threatening disease, they can have a significant impact on quality of life and should be managed appropriately.
» Patients with constipation may benefit from a high fibre/bran diet.
  - Warn about temporary increased flatus and abdominal distension.
  - High fibre/bran diets do not have a significant effect on global IBS (i.e. all symptoms).
» Dietary advice by dietician.

MEDICINE TREATMENT

» Not specifically indicated.
» Based on patients' predominant symptoms.
» Short-term symptomatic treatment for spasms, diarrhoea and/or constipation.

Abdominal cramps:
See Section 2.1: Abdominal pain for treatment with anti-spasmodics.

For constipation predominant IBS:
See Section 2.8: Constipation for treatment with laxatives.

For diarrhoea predominant IBS:
See Section 2.9: Diarrhoea for treatment with anti-diarrhoeals.

REFERRAL

» Blood or mucous in the stool.
» Weight loss.
» Age > 50 years of age.
» Features suggestive of IBD.

2.13 TYPHOID FEVER

A01.0

Note: This is a notifiable condition.

DESCRIPTION

» A septicaemic illness with fever caused by the micro-organism *Salmonella typhi*.
» The cause of the fever is difficult to diagnose except in an epidemic. It may present with:
  - acute abdomen (see Section 2.1: Abdominal pain),
  - prolonged or high fever in a previously healthy individual,
  - fever with a slower pulse rate than expected,
  - headache and convulsions,
  - constipation during the first week,
  - diarrhoea that can occur later in the illness and may be accompanied by frank bleeding.
» Diagnosis requires confirmation by stool culture or blood tests.

MEDICINE TREATMENT

» Treat dehydration if present and refer.

REFERRAL

Urgent

» All suspected or confirmed cases.

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PHC Chapter 3: Nutrition and Anaemia

3.1 ANAEMIA

DESCRIPTION

A condition characterised by low haemoglobin (Hb), clinically recognised by pallor, tiredness, shortness of breath.

It is commonly caused by:

» Nutritional deficiency of iron or folate or vitamin B_{12}.
» Chronic systemic diseases such as HIV, TB, malignancy.
» Blood loss (bleeding/haemorrhage) e.g. caused by parasites, ulcers, tumours, abnormal menstruation.

Other causes include:

» Infiltration or replacement of the bone marrow.
» Abnormal Hb or red cells.
» Haemolysis.

DIAGNOSIS

Age/gender category	Hb less than:
women	12 g/dL; 11 g/dL in pregnancy
men	13 g/dL
children 1–5 years of age	10 g/dL
children >5 years of age	11 g/dL

Children < 5 years of age

Anaemia is most often due to iron deficiency. See Section 3.1.1: Anaemia, iron deficiency.

Children > 5 years of age and adults

Request a full blood count.

» If MCV is normal (normocytic):
» then systemic disease or haemolysis are likely causes.
» If MCV is low (microcytic):
» then iron deficiency is the most likely cause.
» If MCV is high (macrocytic):
» then folate and/or vitamin B_{12} deficiency is the most likely cause.

Pregnant women

See Section 6.4.3: Anaemia in pregnancy.

REFERRAL

» Unknown cause.
» Symptomatic anaemia e.g. palpitations and shortness of breath.
» Evidence of cardiac failure.
» Signs of chronic disease (investigate for HIV and TB before referral).
» Anaemia associated with enlargement of the liver, spleen or lymph nodes.
» Evidence of acute blood loss or bleeding disorder.
» Menorrhagia or dysfunctional uterine bleeding.
» Blood in stool, or melaena.
» Pregnant women > 34 weeks of gestation and Hb < 7 g/dL.
» Children with Hb ≤ 7 g/dL (If Hb cannot be done, look for severe palmar pallor).
» Anaemia associated with other abnormalities on FBC or smear.

» No improvement despite correct treatment.

3.1.1 ANAEMIA, IRON DEFICIENCY

D50.0/D50.8/D50.9

DESCRIPTION

A common cause of anaemia in young children and women of child-bearing age.
A full blood count showing a low MCV suggests the diagnosis of iron deficiency anaemia.
A full blood count is not required for children, unless referral criteria above are present.

Note: Iron deficiency anaemia in children > 5 years of age, adult males and non-menstruating women, is generally due to occult or overt blood loss. Refer all cases for investigation and treatment of the underlying cause.

GENERAL MEASURES

» Identify and treat the cause.
» Exclude other causes. See referral criteria in Section 3.1: Anaemia.
» Dietary advice:
  - Avoid drinking tea/coffee with meals.
  - Increase vitamin C intake (e.g. citrus fruit, orange juice, broccoli, cauliflower, guavas, strawberries) with meals to increase iron absorption from the diet.
» Increase dietary intake of iron. Foods rich in iron include liver, kidney, beef, dried beans and peas, green leafy vegetables, fortified wholegrain breads, cereals.

MEDICINE TREATMENT

Treatment
Treat the underlying cause.

Children < 5 years of age

- Iron, oral, 1–2 mg/kg/dose of elemental iron 8 hourly with meals.
  - Follow up Hb after 14 days.
  - Hb lower than before: refer.
  - Hb the same/higher: continue treatment and repeat after another 28 days.
  - Continue treatment for 3 months after Hb normalises.

Empiric treatment for worms (this will not treat tapeworm)

- Mebendazole, oral.
  - Children 1–2 years: 100 mg 12 hourly for 3 days.
  - Children > 2–5 years: 500 mg as a single dose.

OR

- Albendazole, oral, single dose.
  - Children 1–2 years: 200 mg as a single dose.
  - Children ≥ 2 years and adults: 400 mg as a single dose. *LoE:IIb*[1]

Adults

- Ferrous sulphate compound BPC (dried), oral, 170 mg (± 55 mg elemental iron) 12 hourly with meals. *LoE:IIIb*[2]

OR

- Ferrous fumarate, oral, 200 mg (± 65 mg elemental iron) 12 hourly.
  - Do not ingest with tea, antacids or calcium supplements/milk.
  - Doses should be taken on an empty stomach, but if gastrointestinal side effects occur doses should be taken with meals.
  - Continue with treatment for 3–6 months once Hb has normalised to replace iron stores.

Follow the patient after one month of treatment and Hb should rise by at least 2 g/dL in 4 weeks in the adherent patient without ongoing blood loss.

If daily iron is poorly tolerated (e.g. epigastric pain, nausea, vomiting and constipation), intermittent iron supplementation may be administered:

- Ferrous sulfate compound BPC (dried), oral, 340 mg per week, (± 110 mg elemental iron), with meals.

OR

- Ferrous fumarate, oral, 400 mg per week (± 130 mg elemental iron). *LoE:IVb*[3]

Pregnant women

See Section 6.4.3: Anaemia in pregnancy.

Consider the following if there is failure to respond to iron therapy:

» non-adherence,
» continued blood loss,
» wrong diagnosis,
» malabsorption, or
» mixed deficiency; concurrent folate or vitamin B_{12} deficiency. *LoE: IVb*[4]

Prophylaxis

Infants from 6 weeks (Z29.2)

If < 2.5 kg at birth:

- Ferrous lactate, oral, 0.6 mL daily (provides ± 15 mg elemental iron) until 6 months of age.

OR

- Ferrous gluconate syrup, oral, 2.5 mL daily (provides ± 15 mg elemental iron) until 6 months of age. *LoE: IIIb*[5]

Pregnant women

See Section 6.4.1: Antenatal supplements.

Elemental iron per preparation

Ferrous gluconate elixir	350 mg/5 mL	40 mg elemental iron per 5 mL	8 mg elemental iron per mL
Ferrous gluconate syrup	250 mg/5 mL	30 mg elemental iron per 5 mL	6 mg elemental iron per mL
Ferrous lactate drops	25 mg/mL	25 mg elemental iron per mL	1 mg elemental iron per 0.04 mL
Ferrous sulphate compound BPC (dried) tablets	170 mg	± 55 mg elemental iron per tablet	
Ferrous fumarate	200 mg	± 65 mg elemental iron per tablet	

LoE:IVb[6]

CAUTION
Iron is extremely toxic in overdose, particularly in children.
Store all medication out of reach of children.

REFERRAL
» As in Section 3.1: Anaemia.
» Children > 5 years of age, men and non-menstruating women.
» No or inadequate response to treatment.

3.1.2 ANAEMIA, MACROCYTIC OR MEGALOBLASTIC
D52.0/D52.1/D52.8/D52.9/D53.1

DESCRIPTION
Anaemia with large red blood cells is commonly due to folate or vitamin B_{12} deficiency.
Folate deficiency is common in pregnant women and in the postpartum period, and in alcoholics. Macrocytic anaemia in these patients can be assumed to be due to folate deficiency and does not require further investigation. See Section 6.4.3: Anaemia in pregnancy.
Vitamin B_{12} deficiency occurs mainly in middle-aged or older adults and can cause neurological damage if not treated.
Macrocytic anaemia outside of pregnancy or the postpartum period requires further investigations to establish the cause.

INVESTIGATIONS
FBC will confirm macrocytic anaemia.
» MCV will be elevated.
» White cell count and/or platelet count may also be reduced.
If there is a poor response to folate, measure serum vitamin B_{12}.

Note: Zidovudine and stavudine cause elevated MCV. Zidovudine often causes anaemia and/or decreased white cell count. It is not necessary to measure folate and B_{12} if the patient is not anaemic.

GENERAL MEASURES

» Dietary advice: Increase intake of folic acid rich foods such as:
  - Liver, eggs, fortified breakfast cereals, citrus fruit, spinach and other green vegetables, lentils, dry beans, peanuts.
  - Reduce alcohol intake.

» Vitamin B_{12} deficiency anaemia:
  - High protein diet is recommended (1.5 g/kg/day).
  - Increase intake of dietary vitamin B_{12} sources, including meat (especially liver), eggs and dairy products.

MEDICINE TREATMENT

Folic acid deficiency:

- Folic acid, oral, 5 mg daily until Hb is normal.
  - Check Hb monthly.

Folic acid given to patients with vitamin B_{12} deficiency can mask vitamin B_{12} deficiency and lead to neurological damage, unless vitamin B_{12} is also given.

REFERRAL

» Patients with suspected B_{12} deficiency.
» Chronic diarrhoea.
» Poor response within a month of treatment.
» Macrocytic anaemia of unknown cause.

3.2 CHILDHOOD MALNUTRITION, INCLUDING NOT GROWING WELL/ GROWTH FALTERING

E40/E41/E42/E43/E44.0/E44.1/E45/E46

In all children, check for malnutrition and anaemia:

» Plot the weight on the Road to Health chart/booklet.
» Look at the shape of the weight curve:
  - Is the weight curve rising parallel to the reference lines?

  OR

  - Is it flattening?

  OR

» Is there weight loss?
» Look for visible wasting.
» Look and feel for oedema of both feet.
» Look for palmar pallor.
» Check Hb if anaemia is suspected.

3.2.1 SEVERE ACUTE MALNUTRITION (SAM)

E40/E41/E42/E43

DESCRIPTION

Diagnostic criteria for SAM in children aged 6–60 months (any one of the following):

Indicator	Measure	Cut-off
Severe wasting	Weight-for-Height z-score (WHZ)	< -3
	Mid Upper Arm Circumference (MUAC)	< 11.5 cm
Bilateral nutritional oedema	Clinical signs of nutritional oedema*	

Where a suitable measuring device is not available the following less sensitive findings would also indicate the need to manage as severe acute malnutrition:

» **Severe underweight**
- WHZ < -3 (usually clinically reflective of marasmus) where no other explanation is present, and/or
- clinically severe wasting (usually clinically reflective of marasmus – thin arms, thin legs, "old man" appearance, baggy pants folds around buttocks, wasted buttocks).

» ***Nutritional oedema** supported by findings of skin changes, fine pale sparse hair, enlarged smooth soft liver, moon face.

Exception

Babies who were premature and are growing parallel to or better than the z-score lines, should not be classified as failure to thrive or not growing well.

3.2.1.1 COMPLICATED SAM

E40/E41/E42/E43

DESCRIPTION

Any child with SAM who has any **ONE** of the following features:

» < 6 months of age or weighs < 4 kg.
» Pitting oedema.
» Refusing feeds or is not eating well.
» Any of the danger signs listed below.

Danger Signs

- dehydration
- vomiting
- respiratory distress (including fast breathing)
- not able to feed
- lethargy (not alert)
- weeping skin lesions
- hypoglycaemia
- hypothermia
- convulsions
- shock
- jaundice
- bleeding

All children with complicated SAM are at risk of complications or death.
Refer urgently!
Stabilise before referral.

Initiate treatment while waiting for transport to hospital.

GENERAL MEASURES

» Keep the child warm.
» Test for and prevent hypoglycaemia in all children.

If the child is able to swallow:

- If breastfed: ask the mother to breastfeed the child or give expressed breastmilk.
- If not breastfed: give a 30–50 mL of a stabilising feed (F-75) or a breastmilk substitute before the child is referred.
- If no F-75 or breastmilk substitute is available, give 30–50 mL of sugar water. To make sugar water: Dissolve 4 level teaspoons of sugar (20 g) in a 200 mL cup of clean water.
- Repeat 2 hourly until the child reaches hospital.

If the child is not able to swallow:

- Insert a nasogastric tube and check the position of the tube.
- Give 50 mL of breastmilk, F-75, breastmilk substitute or sugar water by nasogastric tube (as above).
- Repeat 2 hourly until the child reaches hospital.

If blood sugar < 3 mmol/L treat with:

- 10% Glucose:
  - Nasogastric tube: 10 mL/kg.
  - Intravenous line: 2 mL/kg.

CAUTION

In malnutrition, if IV fluids are required for severe dehydration/shock, give sodium chloride 0.9%, 10 mL/kg/hour and monitor for volume overload. Once stable continue with ORS orally or by nasogastric tube

MEDICINE TREATMENT

Note: Signs of infection such as fever are usually absent. Treat infection while awaiting transfer. If there are no danger signs, give 1st dose while arranging referral to hospital:

- Amoxicillin, oral, 45 mg/kg as a single dose. See dosing table: Chapter 23.

If the child has any danger signs:

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose and refer. W See dosing Table: Chapter 23.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If SUSPECTING SERIOUS BACTERIAL INFECTION in neonate, give ceftriaxone, even if jaundiced.
» Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:
  - If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
  - If >28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
  - Preferably administer IV fluids without calcium contents.
» Always include the dose and route of administration of ceftriaxone in the referral letter.

Give an additional dose of Vitamin A:

- Vitamin A (retinol), oral.

Age range	Dose Units	Capsule 100 000 IU	Capsule 200 000 IU
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsules	1 capsule

3.2.1.2 UNCOMPLICATED SAM

E43

DESCRIPTION

Children with SAM who meet the following criteria:

» The child is > 6 months of age and weight > 4 kg, and
» There is no pitting oedema, and
» The child is alert (not lethargic), and
» The child has a good appetite and is feeding well, and
» The child does not have any danger signs or severe classification (and does not require referral for another reason).

All cases require careful assessment for possible TB or HIV.

GENERAL MEASURES

» Provide RTUF and/or other nutritional supplements according to supplementation guidelines.
» Counsel according to IMCI guidelines.
» Regular follow-up to ensure that the child gains weight and remains well.
» Discharge with supplementation, once the following criteria are met:
  - WHZ (weight-for-height z-score): > -2 WHZ for two consecutive visits at least one month apart and/or
  - MUAC: > 11.5cm (preferably at 12 cm, if MUAC used alone).
» Follow patients for at least 6 months to ensure sustained growth.

MEDICINE TREATMENT

Do not repeat if child has received these during inpatient stay:

Give an additional dose of Vitamin A:

- Vitamin A (retinol), oral.

Age range	Dose Units	Capsule 100 000 IU	Capsule 200 000 IU
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsules	1 capsule

- Multivitamin, oral, daily.

Empiric treatment for worms:

- Mebendazole, oral.
  - Children 1–2 years: 100 mg 12 hourly for 3 days.
  - Children > 2–5 years: 500 mg as a single dose.

OR

- Albendazole, oral, single dose.
  - Children 1–2 years: 200 mg as a single dose.
  - Children ≥ 2 years and adults: 400 mg as a single dose. LoE:IIIb[7]

REFERRAL

» When regular nutritional supplements (e.g. RTUF) cannot be provided and follow-up on an ambulatory (outpatient) basis is not possible.
» The child develops pitting oedema or any of the danger signs (see above).
» Failure to gain weight despite provision of nutritional supplements.
» Children showing developmental delay to be referred for rehabilitation. LoE:IIIb[8]

3.2.2 MODERATE ACUTE MALNUTRITION (MAM)

E44.0

DESCRIPTION

Children and infants older than 6 months who have either:
» A WHZ-score between -2 and -3.
» MUAC between 11.5 cm and 12.5 cm.
» No pitting oedema or SAM danger signs (see above).
» Good appetite.
All cases require careful assessment for possible TB or HIV.

GENERAL MEASURES

» Provide ready to use therapeutic food (RTUF) and/or other nutritional supplements according to supplementation guidelines.
» Counsel according to IMCI guidelines.
» Follow-up frequently to ensure that the child gains weight and remains well.
» Discharge with supplementation, once the following criteria are met:
  - WHZ (weight-for-height z-score): > -2 WHZ for two consecutive visits at least one month apart and/or
  - MUAC: > 11.5 cm (preferably at 12 cm, if MUAC used alone).
» Follow patients for at least 6 months to ensure sustained growth.

MEDICINE TREATMENT

Do not repeat if child has received these during inpatient stay:

Give an additional dose of Vitamin A:

- Vitamin A (retinol), oral.

Age range	Dose Units	Capsule 100 000 IU	Capsule 200 000 IU
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsules	1 capsule

LoE: IVb[9]

- Multivitamin, oral, daily.

LoE:IVb[10]

Empiric treatment for worms:

- Mebendazole, oral.
  - Children 1–2 years: 100 mg 12 hourly for 3 days.
  - Children > 2–5 years: 500 mg as a single dose. *LoE:IVb*[11]

OR

- Albendazole, oral, single dose.
  - Children 1–2 years: 200 mg as a single dose.
  - Children ≥ 2 years and adults: 400 mg as a single dose. *LoE:IIb*[12]

REFERRAL

» No response to treatment.
» All children other than those with insufficient food intake (If there is inadequate food intake, refer to a social worker, if available).
» Severe malnutrition.
» Children showing developmental delay to be referred for rehabilitation. *LoE:IIIb*[13]

3.2.3 NOT GROWING WELL (INCLUDING FAILURE TO THRIVE/ GROWTH FALTERING)

R62.0/R62.8/R62.9

DESCRIPTION

Children and infants who have either:

» Unsatisfactory weight gain (growth curve flattening or weight loss) on the Road to Health chart/booklet.

OR

» Low weight for age (but WHZ > -2).

Note: Babies who were premature and are growing parallel to or better than the z-score line, should not be classified as having failure to thrive or not growing well.

Not growing well may be due to:

» Insufficient food intake due to anorexia and illness or poor availability of food.
» Insufficient uptake of nutrients, e.g. malabsorption.
» Insufficient use of nutrients for growth due to chronic disease.
» Increased demand for nutrients due to illness such as TB and HIV/AIDS.

Conduct a feeding and clinical assessment to determine the cause. Exclude anaemia.

GENERAL MEASURES

» Counselling on nutrition (see below).
» Nutritional supplementation should be supplied unless there is a correctable cause.
» Assess the general condition of the child.
» Assess the child for possible HIV and TB and manage appropriately.
» Assess for other long-term health conditions and manage appropriately.
» Assess the child's feeding and recommend actions as outlined below.
» Provide supplements according to child's age to meet specific nutritional needs.
» Provide adequate micronutrients.
» Ensure that immunisations are up to date. Record the dose given on the Road to Health chart/booklet.

» Follow up monthly. If responding, review the child every two months.
» Refer for social assistance if needed.

Feeding recommendations for all children:

0–6 months of age
Breastfeed exclusively- feed at least 8 times in 24 hours.
If formula is medically indicated (refer below) or if the mother has chosen to formula-feed the child, discuss safe preparation and use with the mother.

6–12 months of age
Continue breastfeeding (breastfeed before giving foods).
Introduce complementary foods at six months of age. Start by giving 2–3 teaspoons of iron-rich food such as mashed vegetables or cooked dried beans.
Children 6–8 months should be given two meals daily, gradually increasing the number of meals so that at 12 months the child is receiving 5 small meals.
For children who are not growing well, mix margarine, fat, or oil with their porridge.

12 months to 2 years of age
Continue breastfeeding. If the child is not breastfed, give 2 cups of full cream cow's milk every day. Make starchy foods the basis of the child's meal. Give locally available protein at least once a day, and fresh fruit or vegetables twice every day.

2–5 years of age
Give the child his/her own serving of family foods 3 times a day. In addition, give 2 nutritious snacks e.g. bread with peanut butter, full cream milk or fresh fruit between meals.

CONDITIONS WHICH JUSTIFY RECOMMENDING THAT MOTHERS DO NOT BREASTFEED

Infants with a small number of metabolic diseases qualify to receive specialised infant formula. These infants should be managed in tertiary centres.
Maternal medical condition that may justify temporary or permanent avoidance of breastfeeding:
» Severe illness that prevents a mother from caring for her infant, e.g.: sepsis, renal failure.
» Herpes simplex virus type 1 (HSV-1): direct contact between lesions on the mother's breasts and the infant's mouth should be avoided until all active lesions have resolved.
» Maternal medications: sedating psychotherapeutic medicines, anti-epileptic medicines and opioids (may cause drowsiness and respiratory depression in the infant), radioactive iodine-131, excessive use of topical iodine or iodophors (especially on open wounds or mucous membranes), cytotoxic chemotherapy.

Infants who qualify to receive infant formula as part of the supplementation scheme:
» The mother has died, or infant has been abandoned.
» Other individual circumstances deemed necessary by a multidisciplinary team.
» Infants of mothers who are failing second- or third-line ARV treatment (VL >1000 copies/mL) should be advised not to breastfeed. *LoE:IVb*[14]

MEDICINE TREATMENT

- Multivitamin, oral, daily.

Empiric treatment for worms (this will not treat tapeworm):

- Mebendazole, oral.
  - Children 1–2 years: 100 mg 12 hourly for 3 days.
  - Children > 2–5 years: 500 mg as a single dose.

OR

- Albendazole, oral, single dose.
  - Children 1–2 years: 200 mg as a single dose.
  - Children ≥ 2 years and adults: 400 mg as a single dose. *LoE:IIb*[15]

- Vitamin A (retinol), oral, 6 monthly.

Age range	Dose Units	Capsule 100 000 IU	Capsule 200 000 IU
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsules	1 capsule

Anaemia:
See Section 3.1: Anaemia.

REFERRAL

» No response to treatment.
» All children other than those with insufficient food intake (If there is inadequate food intake, refer to a social worker, if available).
» Severe malnutrition.

3.3 OVERWEIGHT AND OBESITY

E66.0/E66.8/E66.9

DESCRIPTION

Overweight and obesity are abnormal or excessive fat accumulation that may impair health.
Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults (> 19 years). It is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m^2).

For adults:

» overweight is a BMI ≥25 kg/m^2; and
» obesity is a BMI ≥30 kg/m^2.

Children aged between 5–19 years:

» overweight is BMI-for-age > 1 standard deviation above the WHO Growth Reference median; and
» obesity is > 2 standard deviations above the WHO Growth Reference median.

For children < 5 years of age:

» overweight is weight-for-height > 2 standard deviations above WHO Child Growth Standards median; and
» obesity is weight-for-height > 3 standard deviations above the WHO Child Growth Standards median.

GENERAL MEASURES

» maintain ideal weight, i.e. BMI ≤ 25 kg/m^2,
» weight reduction, i.e. if BMI > 25 kg/m^2,
» follow a prudent eating plan i.e. low fat, high fibre and unrefined carbohydrates, with fresh fruit and vegetables,
» regular moderate aerobic exercise, e.g. 30 minutes brisk walking 3–5 times/week (150 minutes/week),
» screen for hypertension, diabetes and hyperlipidaemia, and manage appropriately (See Sections: 4.7: Hypertension, 9.2: Type 2 Diabetes mellitus, 4.1: Prevention of ischaemic heart disease and atherosclerosis),
» calculate risk of developing cardiovascular events and manage appropriately (See Section: 4.1: Prevention of ischaemic heart disease and atherosclerosis).

REFERRAL

Dietician, physiotherapist and support group, where available and relevant. *LoE:IIb*[16]

3.4 VITAMIN A DEFICIENCY

E50.0-9

DESCRIPTION

A condition predominantly affecting the skin, mucous membranes and the eyes.
It is most common in children of 1–5 years of age.
If associated with measles and diarrhoea, there is an increased risk of illness and death.
If not identified and treated early, it can cause blindness.
Clinical features include:
» night blindness or inability to see in the dark,
» white foamy patches on the eye (Bitot's spot) or conjunctival and corneal dryness,
» keratomalacia or wrinkling and cloudiness of cornea,
» corneal ulceration or the cornea becomes soft and bulges.

GENERAL MEASURES

Increase dietary intake of vitamin A rich food including fortified maize meal and/or bread; carrots, sweet potato, mangoes and pawpaw, broccoli, sprouts; dark green leafy vegetables e.g. morogo/imifino and spinach; apricots, melon, pumpkin, and liver, eggs, full cream milk and fish.

MEDICINE TREATMENT

Prophylaxis

- Vitamin A (retinol), oral, every 6 months up to the age of 5 years.

Age range	Dose Units	Capsule 100 000 IU	Capsule 200 000 IU
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsules	1 capsule

Children with the following conditions should be given an additional dose:
» Severe Acute Malnutrition.
» Persistent diarrhoea.
» Measles.

- Vitamin A (retinol), oral.

Age range	Dose Units	Capsule 100 000 IU	Capsule 200 000 IU
Infant < 6 months	50 000	½ capsule	–
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsules	1 capsule

Administration of a vitamin A capsule

- Cut the narrow end of the capsule with scissors.
- Open the child's mouth by gently squeezing the cheeks.
- Squeeze the drops from the capsule directly into the back of the child's mouth. If a child spits up most of the vitamin A liquid immediately, give one more dose.
- Do **NOT** give the capsule to the mother or the caretaker to take home.

Treatment

If any clinical eye signs of vitamin A deficiency are present (see clinical features above), give a pre-referral dose:

- Vitamin A (retinol), oral, as a pre-referral dose.

Age range	Dose Units (IU)	Capsule 100 000 IU	Capsule 200 000 IU
Infant < 6 months	50 000	½ capsule	–
Infants 6–11 months	100 000	1 capsule	–
Children > 12 months and adults	200 000	2 capsules	1 capsule

Note:

» Children (6 months to 5 years of age) who received a routine prophylactic dose within the previous month should not receive any additional doses of vitamin A.
» If a child is scheduled to receive a routine prophylactic dose of vitamin A and has received a treatment dose within the past month, postpone the routine dose for approximately one month.
» Wait at least one month between doses.
» Children receiving routine multivitamin syrup can still receive vitamin A supplements.

REFERRAL

All cases with clinical signs.

3.5 VITAMIN B DEFICIENCIES

3.5.1 VITAMIN B_3/NICOTINIC ACID DEFICIENCY (PELLAGRA)

E52

DESCRIPTION

Pellagra is a condition associated with nicotinic acid deficiency. It is usually accompanied by other vitamin deficiencies.

Clinical features include:

» diarrhoea,
» dementia,
» dermatitis with darkening of sun-exposed skin.

GENERAL MEASURES

» Lifestyle adjustment including discouraging of alcohol abuse.
» Dietary advice. Increase intake of liver, kidneys, other meats, poultry and fish, milk, marmite and Brewer's yeast, peanuts, pulses, whole meal wheat and bran.

MEDICINE TREATMENT

For severe deficiency

Children

- Nicotinamide, oral, 50 mg 8 hourly until resolution of major signs and symptoms.

Adults

- Nicotinamide, oral, 100 mg 8 hourly until skin lesions heal. *LoE:IVb*[17]

For mild deficiency

Children

- Nicotinamide, oral, 50 mg daily for one week.

Adults

- Nicotinamide, oral, 100 mg daily for one week.

REFERRAL

Failure to respond.

3.5.2 VITAMIN B_6/PYRIDOXINE DEFICIENCY

E53.1

DESCRIPTION

Commonly presents as signs of peripheral neuropathy including:
» tingling sensation,
» burning pain or numbness of the feet.
Pyridoxine deficiency is related to:
» malnutrition,
» alcoholism,
» isoniazid or combination TB therapy.

GENERAL MEASURES

Dietary advice: Increase intake of pyridoxine rich foods such as:
» Liver, meat, fish and offal.
» Wholegrain cereals, fortified breakfast cereals.
» Peanuts, bananas, raw vegetables.
» Walnuts and seeds, avocados, dried fruits.
» Potatoes and baked beans.

MEDICINE TREATMENT

For deficiency

Children

- Pyridoxine, oral, 12.5 mg daily for 3 weeks.

Adults
- Pyridoxine, oral, 25 mg daily for 3 weeks.

For medicine-induced neuropathy

Children
- Pyridoxine, oral, daily for 6 months.
  - < 5 years of age: 12.5 mg daily.
  - ≥ 5 years of age: 25 mg daily.

LoE:IVb[18]

Adults
- Pyridoxine, oral, 200 mg daily for 3 weeks.

Then follow with:
- Pyridoxine, oral, 25 mg daily as maintenance dose (for patients on TB therapy/ isoniazid).

REFERRAL
Failure to respond.
Children.

3.5.3 VITAMIN B_1/THIAMINE DEFICIENCY (WERNICKE ENCEPHALOPATHY AND BERIBERI)
E51.1-2/E51.8-9

DESCRIPTION
Clinical features include:
» confusion,
» short-term memory loss,
» paralysis of one or more of the ocular muscles or ophthalmoplegia,
» nystagmus,
» ataxia,
» peripheral neuropathy,
» cardiac failure.

Alcoholics may present with Wernicke encephalopathy, neuropathies or cardiac failure associated with multiple vitamin deficiencies.

GENERAL MEASURES
» Lifestyle adjustment including discouraging alcohol abuse.
» Dietary advice to increase intake of thiamine rich foods such as: wholewheat breads, oatmeal, pulses, nuts, yeast, fortified cereals, pork, bacon, marmite and potatoes and peas.

MEDICINE TREATMENT

Peripheral neuropathy and cardiac failure

- Thiamine, oral, 100 mg daily.

In susceptible patients, administration of intravenous glucose precipitates Wernicke encephalopathy if administered before thiamine supplementation. Thiamine should be given first in all patients treated with intravenous glucose who are at risk of thiamine deficiency, e.g. alcoholics.

REFERRAL

All patients with encephalopathy, eye muscle paralysis or cardiac failure.

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PHC Chapter 4: Cardiovascular conditions

4.1 PREVENTION OF ISCHAEMIC HEART DISEASE AND ATHEROSCLEROSIS

I20.0-1/I20.8-9/I21.0-4/I21.9/I22.0-1/I22.8-9/I24.0-1/I24.8-9/I25.0-6/I25.8-9/I63.0-6/I63.8-9/I64/I65.0-3/I65.8-9/I73.8-9/G45.0-2/G45.8-9

Patients at risk for cardiovascular events (such as stroke or myocardial infarction) may benefit from lifestyle modification and lipid-lowering medicine therapy. Patients should be managed according to their level of risk, and lipid lowering medicines should be given to those with a high risk of CVD even if cholesterol is within the desirable range.

Indications for lipid lowering medicine therapy

Patients with any of the following factors are at a relatively high risk for a cardiovascular event and should receive lipid lowering therapy:

- Established atherosclerotic disease:
  - ischaemic heart disease.
  - peripheral vascular disease.
  - atherothrombotic stroke.
- Type 2 diabetes with age >40 years.
- Diabetes for >10 years. *LoE:IIa*[1]
- Diabetes with chronic kidney disease (eGFR <60 mL/min).

Patients with any of the following factors are also potentially at risk for cardiovascular disease (other than the categories above)

- Diabetes mellitus.
- Hypertension.
- Central obesity: waist circumference ≥ 94 cm (men) and ≥ 80 cm (women).
- Smoking.
- Age: men >55 years of age, women >65 years of age. *LoE:IIIb*[2]
- Psychological stress.

These patients should be managed according to their 10-year risk of a cardiovascular event (See Appendix III: Cardiovascular risk assessment), as calculated using either:

A. BMI - based risk assessment, or
B. Framingham risk score (cholesterol-based assessment).

Management is based on the patient's 10-year risk of a cardiovascular event as follows:

- <10% risk: lifestyle modification and risk assess patient every 5 years.
- 10–20% risk: lifestyle modification and risk assess patient annually.
- ≥ 20% risk: lifestyle modification and start statin treatment.

Screening for familial hypercholesteroleamia:

In addition to the above cardiovascular risk assessment, measure random total cholesterol in patients with the following features (suggestive of familial hypercholesterolaemia or other heritable dyslipidaemias), regardless of their cardiovascular risk:

- Cardiovascular event <55 years in men or <65 years in women.
- Family history of early onset cardiovascular disease in male relatives <55 years of age and in female relatives <65 years of age.

» Skin or tendon xanthomata in patient or first degree relative.
» Family history of familial hyperlipidaemia.

Refer patients with random total cholesterol >7.5 mmol/L for further investigation.

GENERAL MEASURES

All patients with any risk factors for cardiovascular disease should be encouraged to make the following lifestyle changes as appropriate:

LoE:IIIb[3]

» Maintain ideal weight, i.e. BMI 18 to 25 kg/m^2. Weight reduction in the overweight patient.
» Reduce alcohol intake to no more than 2 standard drinks per day for males and 1 for females. (1 standard drink = a can of beer = a glass of wine = a shot of spirits.)
» Follow a prudent eating plan i.e. low fat, high fibre and unrefined carbohydrates, with fresh fruit and vegetables.
» Regular moderate aerobic exercise, e.g. 30 minutes brisk walking 5 to 7 times/week (150 minutes/week).
» Stop smoking.

MEDICINE TREATMENT

» Lipid lowering medicines should be given to those with a high risk of CVD even if cholesterol is within the desirable range.
» When lipid-lowering medicines are used, this is ALWAYS in conjunction with ongoing lifestyle modification.

▪ HMGCoA reductase inhibitors (statins), according to table below:

INDICATION	HMGCoA REDUCTASE INHIBITOR (STATIN)
A: Primary prevention - no existing CVD	
» Type 2 diabetes with age >40 years. » Diabetes for >10 years. » Diabetes with chronic kidney disease. » ≥20% 10-year risk of cardiovascular event.	▪ HMGCoA reductase inhibitors (statins), e.g.: • Simvastatin, oral, 10 mg at night.
» Patients on protease inhibitors. (Risks as above, after switching to atazanavir – see section below).	• Atorvastatin, oral, 10 mg at night.
B: Secondary prevention – existing CVD	
» Ischaemic heart disease. » Atherothrombotic stroke. » Peripheral vascular disease.	▪ HMGCoA reductase inhibitors (statins), e.g.: • Rosuvastatin, 10 mg at night. *LoE:Ia*[4]
» Patients on protease inhibitors.	• Atorvastatin, oral, 10 mg at night. *LoE:Ia*[5]
» Patients on amlodipine (and not on protease inhibitor).	• Simvastatin, oral, 10–20 mg at night. *LoE:IIIb*[6]
» If patient complains of muscle pain.	Reduce dose: ▪ HMGCoA reductase inhibitors (statins), e.g.: • Simvastatin, oral, 20 mg at night.

	○ If 20 mg not tolerated, reduce to 10 mg. **OR** Consult specialist for further management. LoE:IIIb[7]

Table 4.1: Management with HMGCoA reductase inhibitors

Protease inhibitor-induced dyslipidaemia:

» Certain antiretroviral medication, particularly protease inhibitors, can cause dyslipidaemia. Fasting lipid levels should be done 3 months after starting lopinavir/ritonavir. Lopinavir/ritonavir is associated with a higher risk of dyslipidaemia (specifically hypertriglyceridaemia) than atazanavir/ritonavir.

» Patients at high risk (>20% risk of developing a CV event in 10 years or existing CVD) should switch to atazanavir/ritonavir and repeat the fasting lipid profile in 3 months.

» Patients with persistent dyslipidaemia despite switching, qualify for lipid lowering therapy. Criteria for initiating lipid lowering therapy are the same as for HIV-negative patients. Many statins (including simvastatin) cannot be used with protease inhibitors, as protease inhibitors inhibit the metabolism of the statin resulting in extremely high blood levels.

» Patients at high risk for CVD who fail to respond to lifestyle modification and have dyslipidaemia on atazanavir/ritonavir treat with:

- Atorvastatin, oral, 10 mg at night.

REFERRAL

» Random cholesterol >7.5 mmol/L (to be evaluated for genetic disorders), after excluding secondary causes such as uncontrolled diabetes, hypothyroidism, or protease inhibitor use.

» Tendon or skin xanthomata (except xanthelasma around the eyes).

» Statins not tolerated by patients, despite lower dose (for consideration of alternative treatment).

4.2 ANGINA PECTORIS, STABLE

I20.20

DESCRIPTION

Characteristic chest pain (burning or heavy discomfort behind the sternum), of duration <15 minutes, due to myocardial ischaemia, usually with exercise and relieved by rest.

GENERAL MEASURES

Lifestyle modification. See Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

MEDICINE TREATMENT (doctor initiated)

Long-term prophylaxis for thrombosis:

- Aspirin, oral, 150 mg daily. LoE:Ia[8]

AND

Relief of angina:

- Nitrates, short acting e.g.:
- Isosorbide dinitrate, sublingual, 5 mg.
  - May be repeated if required at 5-minute intervals for 3 or 4 doses.
  - Instruct patients to keep the tablets in the airtight and lightproof container in which they are supplied.
  - Instruct patients that nitrates are not addictive.
  - Instruct patients to use prophylactically, before activities which may provoke angina. *LoE:IVb*[9]

AND

Step 1

- Beta-blocker
- Atenolol, oral, 50 to 100 mg daily.
  - Titrate to resting heart rate of approximately 60 beats/minute.

If beta-blocker cannot be tolerated or is contraindicated, consider long-acting calcium channel blocker.

Step 2

ADD

- Long-acting calcium channel blocker e.g.:
- Amlodipine, oral, 5 mg daily.

Step 3

ADD

- Isosorbide mononitrate, oral, 10–20 mg twice daily. *LoE:IIIb*[10]

OR

- Isosorbide dinitrate, oral, 20–30 mg twice daily.
  - Take either medicine at 8:00 and 14:00 in order to provide a nitrate-free period to prevent tolerance. *LoE:IIIb*[11]
  - Modify for night shift workers.

Angina is a high-risk condition for cardiovascular disease and an indication for a statin.

- HMGCoA reductase inhibitors (statins), e.g.:
- Rosuvastatin, oral, 10 mg at night. *LoE:Ia*[12]

Patients on protease inhibitor:

- Atorvastatin, oral, 10 mg daily. *LoE:Ia*[13]

Patients on amlodipine (and not on a protease inhibitor):

- Simvastatin, oral, 10 to 20 mg at night. *LoE:IVb*[14]

If patient complains of muscle pain:

Reduce dose e.g.:

- If simvastatin 20 mg not tolerated, reduce to 10 mg.

OR

Refer for further management. *LoE:IIIb*[15]

REFERRAL

» When diagnosis is in doubt.

» Failed medical therapy.

4.3 ANGINA PECTORIS, UNSTABLE / NON-ST ELEVATION MYOCARDIAL INFARCTION (NSTEMI)

I21.4/ I21.9/I22.0-1/I22.8-9/I24.8-9/I25.6/I25.8-9

DESCRIPTION

Unstable angina is a medical emergency and if untreated can progress to NSTEMI.
Presents as chest pain or discomfort similar to stable angina but with the following additional characteristics:

» angina at rest or minimal effort,
» angina occurring for the first time, particularly if it occurs at rest,
» prolonged angina >10 minutes, not relieved by sublingual nitrates,
» the pattern of angina accelerates and gets worse.

DIAGNOSIS

» Made from good history.
» ECG may show ST segment depression, transient ST segment elevation or T wave inversion.
» Normal ECG does not exclude the diagnosis. For this reason, history is of paramount importance.

MEDICINE TREATMENT

- Oxygen 40% via facemask, if saturation <94% or if in distress.

CAUTION
Do not administer oxygen to acutely ill patients who are not hypoxic (SPO_2 ≥96%).

ADD

- Aspirin, oral, 150 mg as a single dose (chewed or dissolved) as soon as possible.

ADD

- Nitrates, short acting, e.g.:
- Isosorbide dinitrate, sublingual, 5 mg immediately as a single dose.
  - May be repeated at 5-minute intervals for 3 or 4 doses.

LoE:Ia[16] *LoE:IIb*[17] *LoE:IVb*[18]

ADD

- Morphine 10 mg diluted with 10 mL of water for injection or sodium chloride 0.9%, slow IV. (Doctor prescribed.)
  - Start with 5 mg; thereafter slowly increase by 1 mg/minute up to 10 mg.
  - Can be repeated after 4 to 6 hours, if necessary, for pain relief.
  - Beware of hypotension.

Continuation of aftercare treatment initiated at higher level of care:
Continue therapy with appropriate lifestyle modification and adherence support.

- Aspirin, oral, 150 mg daily (continued indefinitely in absence of contraindications).

LoE:Ia[19]

When clinically stable without signs of heart failure, hypotension, bradydysrhythmias or asthma:

- Cardio-selective beta-blocker, e.g.: (doctor initiated)
- Atenolol, oral, 50 mg daily.

AND

- HMGCoA reductase inhibitors (statins), e.g.:
- Rosuvastatin, oral, 10 mg at night. *LoE:Ia*[20]

Patients on protease inhibitor:

- Atorvastatin, oral, 10 mg at night. *LoE:Ia*[21]

Patients on amlodipine (and not on a protease inhibitor):

- Simvastatin, oral, 10 to 20 mg at night. *LoE:IVb*[22]

If patient complains of muscle pain:

Reduce dose e.g.:If simvastatin 20 mg not tolerated, reduce to 10 mg. *LoE:IIIb*[23]

OR

Refer for further management.

AND

If there is cardiac failure or LV dysfunction (doctor initiated):

- ACE-inhibitor, e.g.:
- Enalapril, oral, target dose 10 mg 12 hourly (usually titrated from 2.5 mg 12 hourly).

LoE:IVb[24]

Angioedema is a potentially serious complication of ACE-inhibitor treatment and if it occurs it is a contraindication to continue therapy or to re-challenge.

REFERRAL

Urgent

All suspected or diagnosed cases.

4.4 MYOCARDIAL INFARCTION, ACUTE (AMI)/ ST ELEVATION MYOCARDIAL INFARCTION (STEMI)

I21.0-3/I21.9/I22.0-1/I22.8-9/I24.8-9/I25.6/I25.8-9

DESCRIPTION

AMI/STEMI is caused by the complete or partial occlusion of a coronary artery and requires prompt hospitalisation and intensive care management.

The major clinical feature is severe chest pain with the following characteristics:

» site: retrosternal or epigastric,
» quality: crushing, constricting, or burning pain or discomfort,
» radiation: to the neck and/or down the inner part of the left arm,
» duration: at least 20 minutes and often not responding to sublingual nitrates,
» occurrence: at rest.

May be associated with:

- » pallor
- » sweating
- » arrhythmias
- » pulmonary oedema
- » a decrease in blood pressure

Note: Not all features have to be present.

EMERGENCY TREATMENT

Before transfer

Cardio-pulmonary resuscitation if necessary (see Section 21.1: Cardiac arrest – cardiopulmonary resuscitation).

- Oxygen 40% via facemask, if saturation <94% or if in distress.

CAUTION

Do not administer oxygen to acutely ill patients who are not hypoxic ($SPO_2 \geq 96\%$)

LoE:IIb[25]

AND

- Aspirin, oral, 150 mg as a single dose (chewed or dissolved) as soon as possible.

AND *LoE:Ia*[26]

- Nitrates, short acting, e.g.:
- Isosorbide dinitrate, sublingual, 5 mg immediately as a single dose.
  - May be repeated at 5-minute intervals for 3 or 4 doses. *LoE:IVb*[27]

AND

- Morphine 10 mg diluted with 10 mL of water for injection or sodium chloride 0.9%, slow IV (doctor prescribed).
  - Start with 5 mg; thereafter slowly increase by 1 mg/minute up to 10 mg.
  - Can be repeated after 4 to 6 hours, if necessary, for pain relief.
  - Beware of hypotension.

AND *LoE:IIb*[28]

- Thrombolytic (see table for time window below) (Doctor initiated), e.g.:
- Streptokinase, IV 1.5 million units diluted in 100 mL sodium chloride 0.9%, infused over 30 to 60 minutes. **Do not use heparin if streptokinase is given.** *LoE:IIb*[29]
  - Hypotension may occur. If it does, reduce the rate of infusion but strive to complete it in <60 minutes.
  - Streptokinase is antigenic and should not be re-administered in the period of 5 days to 2 years after 1st administration.
  - Severe allergic reactions are uncommon but antibodies which may render it ineffective may persist for years.

Considerations for initiating thrombolytics	Contra-indications
» <u>For acute myocardial infarction with ST elevation or left bundle branch block:</u> » maximal chest pain is ≤ 6 hours doctor to initiate treatment.	» <u>Absolute:</u> – streptokinase used within the last year, » previous allergy, – CVA within the last 3 months, – history of recent major trauma, – bleeding within the last month, – aneurysms,

– If beyond 6 hours and chest pain, consult a specialist. » >6 hours and no chest pain, thrombolytic not indicated. Manage as above and refer patient. ***LoE:Ia[30]***	– brain or spinal surgery or head injury within the preceding month, or recent (<3 weeks) major surgery, – active bleeding or known bleeding disorder, – aortic dissection. » Relative (consult specialist): – refractory hypertension, – warfarin therapy, – recent retinal laser treatment, – subclavian central venous catheter, – pregnancy, – TIA in the preceding 6 months, – traumatic resuscitation.

Table 4.2: Streptokinase therapy

Note: Refer all suspected or diagnosed cases urgently.

Continuation of aftercare treatment initiated at higher level of care:

Continue therapy with appropriate lifestyle modification and adherence support.

- Aspirin, oral, 150 mg daily (continued indefinitely in absence of contraindications).

LoE:Ia[31]

When clinically stable without signs of heart failure, hypotension, bradydysrhythmias or asthma:

- Cardio-selective beta-blocker, e.g.: (doctor prescribed)
- Atenolol, oral, 50 mg daily.

AND

- HMGCoA reductase inhibitors (statins), e.g.:
- Rosuvastatin, oral, 10 mg at night. *LoE:Ia[32]*

Patients on protease inhibitor:

- Atorvastatin, oral, 10 mg at night. *LoE:Ia33*

Patients on amlodipine (and not on a protease inhibitor):

- Simvastatin, oral, 10 to 20 mg at night. *LoE:IVb[34]*

If patient complains of muscle pain:

Reduce dose e.g.:

If simvastatin 20 mg not tolerated, reduce to 10 mg. *LoE:IIIa[35]*

OR

Refer for further management. *LoE:IVb[36]*

AND

If there is cardiac failure or LV dysfunction (Doctor initiated):

- ACE-inhibitor, e.g.:
- Enalapril, oral, target dose 10 mg 12 hourly (usually titrated from 2.5 mg 12 hourly).

Angioedema is a potentially serious complication of ACE-inhibitor treatment and if it occurs it is a contraindication to continued therapy or to re-challenge.

REFERRAL

Urgent

All suspected or diagnosed cases.

4.5 CARDIAC ARREST, CARDIO-PULMONARY RESUSCITATION

See Chapter 21: Emergencies and injuries.

4.6 CARDIAC FAILURE, CONGESTIVE (CCF)

4.6.1 CARDIAC FAILURE, CONGESTIVE (CCF), ADULTS

I50.0-1/I50.9

DESCRIPTION

CCF is a clinical syndrome and has several causes. The cause and immediate precipitating factor(s) must be identified and treated to prevent further damage to the heart.

Symptoms of CCF include:

- Progressive effort intolerance (worsening breathlessness, or fatigue with physical activity such as walking uphill, climbing stairs, sweeping or carrying a heavy load). If severe, breathlessness, or fatigue, may occur when doing activities of daily living such as dressing and washing and may even occur at rest.
- Orthopnoea (breathless when lying down flat).
- Paroxysmal nocturnal dyspnoea (PND) (sudden awakening with breathlessness).
- Ankle (or body) swelling.
- Fatigue.

Signs of CCF include:

- dyspnoea (breathlessness)
- ankle swelling with pitting oedema
- tachycardia
- raised jugular venous pressure
- inspiratory basal crackles or wheezing on auscultation of the lungs
- tachypnoea
  - men: breathing rate >18 breaths/ minute
  - women: breathing rate >20 breaths/ minute
- enlarged liver, often tender

GENERAL MEASURES

- Monitor body weight to assess changes in fluid balance.
- Salt (sodium chloride) restriction to less than 2 to 3 g/day.
- Regular exercise within limits of symptoms.

MEDICINE TREATMENT

All patients should be assessed by a doctor for initiation or change of treatment.

- Many of the medicines used can affect renal function and electrolytes.
- Monitor sodium, potassium and serum creatinine.

STEP 1: Diuretic plus ACE-inhibitor

Mild volume overload (mild CCF) and normal renal function – thiazide/thiazide-like diuretic e.g.:

- Hydrochlorothiazide, oral 25 to 50 mg daily. *LoE:IIb*[37]
  - Caution in patients with gout.
  - Less effective in impaired renal function.
  - Higher doses can cause hyponatremia.
  - Caution in patients with a history or family history of skin cancer; and counsel all patients on sun avoidance and sun protection.

Significant volume overload or abnormal renal function – loop diuretic

- Furosemide, oral, daily (doctor initiated).
  - Initial dose: 40 mg daily.
  - If dose >80 mg/day is required, change dose interval to 12 hourly.
  - Higher doses may be needed if co-morbid kidney impairment is present.
  - Once CCF has improved, consider switching to hydrochlorothiazide.
  - Monitor electrolytes and creatinine.

Acute pulmonary oedema

- Furosemide, IV. See Section 21.2.8: Pulmonary oedema, acute.

Note:

» Use a lower diuretic dose when given in combination with an ACE-inhibitor.

» Routine use of potassium supplements with diuretics is not recommended. They should only be used short-term to correct documented low serum potassium level.

All patients with CCF, unless contraindicated or poorly tolerated

- ACE-inhibitor, e.g.:
- Enalapril, oral, 2.5 mg 12 hourly, up to maximum of 10 mg twice daily.
  - Titrate dosages gradually upwards until an optimal dose is achieved.
  - Absolute contraindications include: (refer to package insert for a complete list)
    - cardiogenic shock,
    - bilateral renal artery stenosis, or stenosis of an artery to a dominant/single kidney,
    - aortic valve stenosis and hypertrophic obstructive cardiomyopathy,
    - pregnancy,
  - history of angioedema associated with previous ACE-inhibitor or angiotensin II receptor blocker (ARB) therapy.

STEP 2: After titration of ACE-inhibitor add carvedilol (alpha 1 and non-selective beta blocker) unless contra-indicated (Refer to package insert for full prescribing information).

Note: Do not use atenolol for cardiac failure. *LoE:IIIb*[38]

- Carvedilol, oral (doctor initiated).
  - Starting dose: 3.125 mg twice daily.
  - Increase dose at two-weekly intervals by doubling the daily dose until a maximum of 25 mg twice daily, if tolerated.
  - If >85 kg and target heart rate has not been achieved, titrate to a maximum of 50 mg twice daily, if tolerated. *LoE:IIIb*[39]

- If not tolerated, i.e., worsening of cardiac failure manifestations, reduce the dose to the previously tolerated dose.
- Up-titration may take several months.
- Should treatment be discontinued for >14 days, reinstate therapy as above.
- Absolute contraindications include: (refer to package insert)
  - cardiogenic shock, bradycardia, various forms of heart block,
  - severe fluid overload,
  - hypotension,
  - asthma.

OR

- Spironolactone, oral, 25 mg daily (doctor initiated).

CAUTION

Spironolactone can cause severe hyperkalaemia and should only be used when serum potassium and renal function can be monitored. Check potassium levels within one month of starting therapy and thereafter, as per clinical need. Routine monitoring of potassium levels is essential if spironolactone is used with an ACE-inhibitor, other potassium sparing agents or in the elderly. Avoid concomitant potassium supplements and use of NSAIDs. **Do not use in kidney failure (Do not use if eGFR <30 mL/min).**

STEP 3:

- Spironolactone, oral, 25 mg daily (doctor initiated).

OR

LoE:IVb[40]

- Carvedilol, oral (doctor initiated).
  - Starting dose: 3.125 mg twice daily.
  - Increase dose at two-weekly intervals by doubling the daily dose until a maximum of 25 mg twice daily, if tolerated.
  - If >85 kg and target heart rate has not been achieved, titrate to a maximum of 50 mg twice daily, if tolerated.
  - If not tolerated, i.e. worsening of cardiac failure manifestations, reduce the dose to the previously tolerated dose.
  - Up-titration can take several months.
  - Should treatment be discontinued for >14 days, reinstate therapy as above.
  - Absolute contraindications include: (refer to package insert)
    - cardiogenic shock, bradycardia, various forms of heart block,
    - severe fluid overload,
    - hypotension,
    - asthma.

STEP 4:

Symptomatic CCF despite above-mentioned therapy:

- Refer to hospital for step up therapy with digoxin.

CAUTION

Patients with CCF on diuretics may become hypokalaemic.
Digoxin therapy should not be initiated if the patient is hypokalaemic.

REFERRAL

Urgent

» Patients with prosthetic heart valve.
» Suspected infective endocarditis.
» Fainting spells.

Non urgent

» Initial assessment and initiation of treatment.
» Poor response to treatment.

4.6.2 CARDIAC FAILURE, CONGESTIVE (CCF), CHILDREN

I50.0/I50.1-9

DESCRIPTION

The congestion of the systemic or pulmonary venous systems due to cardiac dysfunction of various different causes; including congenital heart disease and acquired cardiac and lung conditions (e.g. cor-pulmonale due to bronchiectasis in children living with HIV). Often mistaken for respiratory infection.

Signs and symptoms

Infants

» rapid breathing
» rapid heart rate
» cardiomegaly
» enlarged tender liver
» chest indrawing
» crackles or wheezing in lungs
» active cardiac impulse

Often presents primarily with shortness of breath, difficulty in feeding and sweating during feeds. Oedema is usually not an obvious feature.

Children

» rapid breathing
» rapid heart rate
» cardiomegaly
» enlarged tender liver
» chest indrawing
» crackles or wheezing in lungs
» active and displaced cardiac impulse
» oedema of the lower limbs or lower back

GENERAL MEASURES

While arranging transfer:

- Oxygen, using nasal cannula at 2 to 3 L per minute.

OR

- Oxygen 40%, using face mask at 2 to 3 L per minute.
  - Semi-Fowlers position.

Note: If hypertensive, consider glomerulonephritis in children.

MEDICINE TREATMENT

While arranging transfer:

If CCF is strongly suspected

- Furosemide, IV, 1 mg/kg, over 5 minutes. See dosing table: Chapter 23.

- Do not put up a drip or run in any IV fluids.

REFERRAL
All children with suspected congestive cardiac failure.

4.7 HYPERTENSION

4.7.1 HYPERTENSION IN ADULTS
I10

DESCRIPTION
A condition characterised by an elevated blood pressure (BP) measured on 3 separate occasions, a minimum of 2 days apart:
» Systolic BP ≥ 140 mmHg.
and/or
» Diastolic BP ≥ 90 mmHg.

However, when BP is severely elevated (refer to the table below), a minimum of 3 BP readings must be taken at the 1st visit to confirm hypertension. Ensure that the correct cuff size is used in obese patients.

LEVELS OF HYPERTENSION IN ADULTS

Level of hypertension	Systolic mmHg	Diastolic mmHg
Mild	140–159	90–99
Moderate	160–179	100–109
Severe	≥ 180	≥ 110

Table 4.3: Classification of hypertension

LoE:IIb[41]

The aim of hypertension management is to achieve and maintain target BP: Systolic <140 mmHg and diastolic <90 mmHg (applicable to patients of all ages with uncomplicated hypertension).

MONITORING
At every visit:
» Weight.
» Blood pressure.
Baseline:
» Serum creatinine concentration (and eGFR) – see Section 8.1: Chronic Kidney Disease (CKD).
» Urine protein by dipstix to screen for secondary causes of hypertension.
- In patients with diabetes see Section 9.2: Type 2 diabetes mellitus.
» BMI for cardiovascular risk assessment (see Section 4.1: Prevention of ischaemic heart disease and atherosclerosis).
» Abdominal circumference.
» Serum potassium concentration, if on ACE-inhibitor or eGFR <30 mL/min. (See Section 9.2.2: Type 2 Diabetes Mellitus, Adults.)

Six monthly:
- » Serum potassium concentration in patients on spironolactone or eGFR <30 mL/min.

Annually:
- » Finger prick blood glucose (see Section 9.2.2: Type 2 Diabetes Mellitus, Adults).
- » Urine protein by dipstix (see Section 8.1: Chronic Kidney Disease (CKD)).
- » Serum creatinine concentration (and eGFR) in patients who have:
  - proteinuria 1+ or more,
  - existing cardiovascular disease,
  - hypertension present for 10 years or more,
  - if uncontrolled hypertension,
  - chronic kidney disease (eGFR <60 mL/min).

GENERAL MEASURES

Screen all patients for cardiovascular disease risk factors (see Section 4.1: Prevention of ischaemic heart disease and atherosclerosis) and prescribe a statin if required.
Screen for presence of compelling indications (see table below) and manage patients accordingly.

Lifestyle modification

All people with hypertension should be encouraged to make the following lifestyle changes as appropriate.

- » Smoking cessation.
- » Maintain ideal weight, i.e. BMI 18 to 25 kg/m^2. Weight reduction in the overweight patient. *LoE:IIIb*[42]
- » Salt restriction with increased potassium intake from fresh fruits and vegetables (e.g. remove salt from the table, gradually reduce added salt in food preparation and avoid processed foods). Dietician's advice recommended.
- » Reduce alcohol intake to no more than 2 standard drinks per day for males and 1 for females.
- » Follow a healthy eating plan i.e. low fat, high fibre and unrefined carbohydrates, with adequate fresh fruit and vegetables. Dietician's advice recommended.
- » Regular moderate aerobic exercise, e.g. 30 minutes brisk walking at least 5 to 7 times a week. *LoE:IIIb*[43]

MEDICINE TREATMENT

Initial medicine choices are dependent on the presence or absence of compelling indications for specific medicines. See Table 4.5: Treatment of hypertension with compelling indications, for a list of compelling indications and recommendations for specific medicines.

In the absence of compelling indications, see Table 4.4: Stepwise approach of treating hypertension without compelling indications.

Advise patient to take medication regularly, including on the day of the clinic visit, but a single missed dose does not account for severe elevations in BP.

Note:

- » Check adherence to antihypertensive therapy by doing pill counts and questioning family members.
- » The use of fixed dose combination medication for control of hypertension results in greater adherence and such agents should be used when they are available. *LoE:IIIb*[44]
- » The prescribing of antihypertensive medication should be guided by the time of day that is most convenient for patients and that would optimize adherence and minimize side effects for individual patients
- » Monitor patients monthly and adjust therapy, if necessary, until the BP is stable.
- » Check adherence to medication before escalating therapy.
- » After target BP is achieved, patients may be seen at 3 to 6 monthly intervals.

Mild hypertension

When there are no cardiovascular risk factors, initiate lifestyle modification measures (Step 1). If there is poor response to lifestyle modification measures after 3 months, initiate medicine therapy (Step 2).

If mild hypertension with the presence of risk factors (see Section 4.1: Prevention of ischaemic heart disease and atherosclerosis), initiate medicine therapy as well as lifestyle modification (Step 2).

Moderate hypertension

Confirm diagnosis within 2 weeks. Initiate treatment after confirmation of diagnosis (medicine and lifestyle modification) at Step 2.

Severe hypertension

Confirm diagnosis within 1 hour.

In patients who are not symptomatic, initiate treatment (medicine and lifestyle modification) at Step 3.

Patients with symptoms of progressive target organ damage or associated clinical conditions: See hypertensive urgency, below and Section 4.7.2: Hypertensive emergency.

Special cases

Pregnancy-induced hypertension

See Section 6.4.2: Hypertensive disorders of pregnancy.

Asymptomatic severe hypertension

- » These patients have severe hypertension, are asymptomatic and have no evidence of progressive target organ damage.
- » Observe the patient in the health care setting and repeat BP measurement after the patient has rested for 1 hour.
- » If the second measurement is still elevated at the same level, start oral treatment with 2 agents (Step 3), one of which should be low dose hydrochlorothiazide and the second medicine is usually a calcium channel blocker, e.g. amlodipine.
- » Patient should be followed up within a week.
- » Refer to doctor if BP >160/100 mmHg after 4 weeks.

Hypertensive urgency

- » Most have a systolic BP >180 mmHg and/or diastolic BP >110 mmHg.

- » Patients are symptomatic, usually with severe headache, shortness of breath and oedema, but there are no immediate life threatening neurological or cardiac complications such as are seen in hypertensive emergencies (see Section 4.7.2: Hypertensive emergency).
- » Start treatment with 2 oral agents (Step 3) with the aim to lower diastolic BP to 100 mmHg slowly, over 48–72 hours.
- » Amlodipine and furosemide or hydrochlorothiazide should be used, if there is renal insufficiency or evidence of pulmonary congestion (see Section 4.6.1: Cardiac failure, congestive (CCF), adults).
- » All patients with hypertensive urgency should be referred to a hospital.

Stroke

BP is often elevated in acute stroke. Do not treat elevated BP at PHC but refer patient urgently.

Elderly

In patients without co-existing disease, initiate medicine treatment only when the BP >160/90 mmHg.

CAUTION

Lower BP over a few days.
A sudden decrease in BP can be dangerous, especially in the elderly.

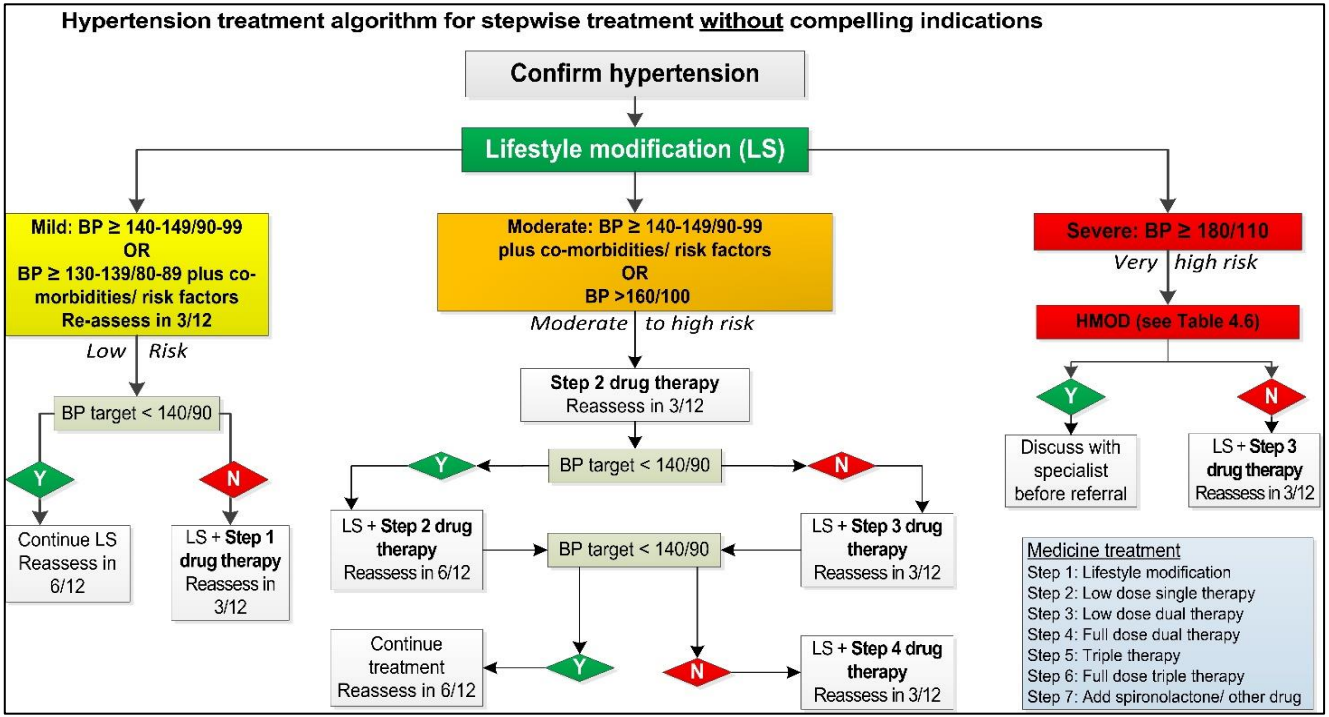
RISK ASSESSMENT OF HYPERTENSIVE PATIENTS

- » Cardiovascular risk should be assessed in all hypertensive patients based on BP levels, additional risk factors, hypertension-mediated organ damage (HMOD), and previous disease, before starting treatment. Refer to the simplified classification of hypertension risk, below.
- » **Other risk factors** include: Age (>65 years), sex (male>female), heart rate (>80 beats/min), increased body weight, diabetes, high LDL-C/triglyceride, family history of CVD, family history of hypertension, early-onset menopause, smoking habits, psychosocial or socioeconomic factors.
- » **HMOD** includes: LVH (LVH on ECG), moderate-severe CKD (eGFR <60 mL/min/1.73m^2), any other available measure of organ damage. *LoE:IIIb*[45]
- » **Previous disease includes:** previous coronary heart disease (CHD), CCF, stroke, peripheral vascular disease, atrial fibrillation, CKD stage 3+.

Other risk factors, HMOD, or disease	BP (mmHg) grading			
	High normal SBP 130-139 DBP 85-89	Mild SCP 140-159 DBP 90-99	Moderate SBP 160-179 DBP 100-109	Severe SBP≥180 Or DBP ≥110
No other risk factors	Low risk	Low risk	Moderate risk	High risk
1 or 2 risk factors	Low risk	Moderate risk	Moderate to High risk	High risk
≥ 3 risk factors	Low to Moderate risk	Moderate to High risk	High risk	High risk
HMOD, CKD grade 3, or diabetes mellitus without organ damage	Moderate to High risk	High risk	High risk	High to very high risk
Established CVD, CKD grade ≥4, or diabetes mellitus with organ damage	Very high risk	Very high risk	Very high risk	Very high risk

Figure 4.1: Simplified classification of hypertension risk

Source: Williams B, et al. Authors/Task Force Members. 2018 ESC/ESH Guidelines for the management of arterial hypertension: The Task Force for the management of arterial hypertension of the European Society of Cardiology and the European Society of Hypertension.. J Hypertens. 2018 Oct;36(10):1953-2041.



***Caution**: Consider monotherapy in low-risk grade 1 hypertension and patients >80 years or the frail (monitor for postural hypotension).*

LoE:IIIb[46]

Figure 4.2: Algorithm for the stepwise approach of treating hypertension without compelling indications

STEPWISE TREATMENT WITHOUT COMPELLING INDICATION

STEP 1: Lifestyle modification.

Entry to Step 1	Treatment	Target
» Diastolic BP 90–99 mmHg and/or systolic BP 140–159 mmHg without any existing disease. **AND** » No major risk factors.	» Lifestyle modification.	» BP control within 3 months to <140/90 mmHg.

STEP 2: Add thiazide/thiazide-like diuretic e.g.:hydrochlorothiazide.

Entry to Step 2	Treatment	Target
» Diastolic BP 90–99 mmHg and systolic BP 140–159 mmHg without any existing disease. **AND** » No major risk factors. **AND** » Failure of lifestyle modification alone to reduce BP after 3 months. **OR** » Mild hypertension with major risk factors or existing disease. **OR** » Moderate hypertension at diagnosis.	» Lifestyle modification. **AND** ▪ **Thiazide/thiazide-like diuretic e.g.:** • Hydrochlorothiazide, oral, 12.5 mg daily. ***LoE:IIIb***[47]	» BP control within 1 month to <140/90 mmHg.

STEP 3: Add a second antihypertensive medicine.

Entry to Step 3	Treatment	Target
» Failure to achieve targets in Step 2 after 1 month despite adherence to therapy. **OR** » Severe hypertension (see table).	» Lifestyle modification. **AND** ▪ **Thiazide/thiazide-like diuretic e.g.:** • Hydrochlorothiazide, oral, 12.5 mg daily. **ADD** ▪ Long-acting calcium channel blocker, e.g.: • Amlodipine, oral, 5 mg once daily. **OR** ▪ ACE-inhibitor. e.g.: • Enalapril, oral, 10 mg once daily. *LoE:IVb*[48]	» BP control within 1 month to <140/90 mmHg.

STEP 4: Increase the dose of the second antihypertensive medicine.

Entry to Step 4	Treatment	Target
» Failure of step 3 after 1 month of adherence.	» Lifestyle modification. **AND** ▪ **Thiazide/thiazide-like diuretic e.g.:** • Hydrochlorothiazide, oral, 12.5 mg. daily. **AND** Increase dose of antihypertensive started in Step 3: ▪ Long-acting calcium channel blocker, e.g.: • Amlodipine, oral, increase to 10 mg once daily. **OR** ▪ ACE-inhibitor, e.g.: • Enalapril, oral, increase to 20 mg once daily.	» BP control within 1month to <140/90 mmHg with no adverse reactions.

STEP 5: Add a third antihypertensive medicine

Entry to Step 5	Treatment	Target
» Failure of step 4 after 1 month of adherence.	» Lifestyle modification. **AND** ▪ **Thiazide/thiazide-like diuretic e.g.:** • Hydrochlorothiazide, oral, 12.5 mg daily. **AND** ▪ ACE-inhibitor, e.g.: Enalapril, oral: continue Step 4 dose, or if not started previously start at 10 mg once daily. **AND** ▪ Long-acting calcium channel blocker, e.g.: • Amlodipine, oral: continue Step 4 dose, or if not started previously start at 5 mg once daily.	» BP control within 1 month to <140/90 mmHg with no adverse medicine reactions.

STEP 6: Increase the dose of the third antihypertensive medicine

Entry to Step 6	Treatment	Target
» Failure of step 5 after 1 month of adherence.	» Lifestyle modification **AND** ▪ **Thiazide/thiazide-like diuretic e.g.:** • Hydrochlorothiazide, oral, 12.5 mg daily **AND** ▪ ACE-inhibitor, e.g.:	» BP control within 1 month to <140/90 mmHg with no adverse medicine reactions.

	• Enalapril, oral, 20 mg once daily. **AND** ▪ Long-acting calcium channel blocker, e.g.: • Amlodipine, oral, 10 mg once daily.	

STEP 7: Increase the dose of HCTZ and add a fourth antihypertensive medicine

Entry to Step 7	Treatment	Target
» Failure of step 7 after 1 month of adherence.	» Lifestyle modification. **AND** ▪ **Thiazide/thiazide-like diuretic e.g.:** • Hydrochlorothiazide, oral, 25 mg daily. **AND** ▪ ACE-inhibitor, e.g.: • Enalapril, 20 mg once daily **AND** ▪ Long-acting calcium channel blocker, e.g.: • Amlodipine, oral 10 mg once daily. *LoE:Ia*[49] **AND ADD** • Spironolactone, oral, 25 mg daily (doctor initiated).	» BP control within 1 month to <140/90 mmHg, with no adverse medicine reactions.

Table 4.4: Stepwise approach of treating hypertension without compelling indications

CAUTION
Spironolactone can cause severe hyperkalaemia and should only be used when serum potassium and renal function can be monitored. Check potassium levels within one month of starting therapy and thereafter, as per clinical need. Routine monitoring of potassium levels is essential if spironolactone is used with an ACE-inhibitor, other potassium sparing agents or in the elderly.
Do not use together with potassium supplements. *LoE:IVb*[50]
Avoid NSAIDs with spironolactone use.
Do not use in kidney failure (Do not use if eGFR <30 mL/min).

If not controlled on step 7– refer.

Note:
» If lifestyle modification failed to achieve BP control: Counsel patient on the risk of major cardiovascular events associated with elevated BP; and initiate monotherapy. *LoE:IIIb*[51]
» If BP control is suboptimal: Up titrate treatment (maximise dose of current antihypertensive and/or add additional medicine). Evidence suggests that treatment inertia contributes to suboptimal BP control with patients remaining on

monotherapy and/or suboptimal doses.
» Initiate combination medicine therapy in cases of severe hypertension and hypertension urgency (see Section 4.7.2: Hypertensive emergency).

TREATMENT OF HYPERTENSION WITH COMPELLING INDICATIONS

Compelling indications for specific medicines	Medicine therapeutic class
Angina	• Beta-blocker **OR** • Long-acting calcium channel blocker
Prior myocardial infarction	• Beta-blocker **AND** • ACE-inhibitor
Heart failure	• ACE-inhibitor **AND** • Carvedilol, oral **OR** • Spironolactone, oral For significant volume overload: • Loop diuretic
Left ventricular hypertrophy (confirmed by ECG)	• ACE-inhibitor
Stroke: secondary prevention	• Hydrochlorothiazide, oral **AND** • ACE-inhibitor
Diabetes type 1 and 2 with/without evidence of microalbuminuria/proteinuria	• ACE-inhibitor, usually in combination with diuretic
Chronic kidney disease	• ACE-inhibitor, usually in combination with diuretic
Isolated systolic hypertension	• Hydrochlorothiazide, oral **OR** • Long-acting calcium channel blocker
Pregnancy	• Methyldopa, oral

Table 4.5: Treatment of hypertension with compelling indications

Contraindications to individual medicines

Hydrochlorothiazide *LoE:IIIb*[52]

» gout,
» pregnancy,
» severe liver impairment,
» kidney impairment (eGFR <30 mL/min),
» use with caution in patients with a history or family history of skin cancer, and counsel all patients on sun avoidance and sun protection.

Calcium channel blockers

» untreated heart failure.

Spironolactone
- » kidney impairment (eGFR <30 mL/min), LoE:IVb[53]
- » pregnancy.

ACE-inhibitors
- » pregnancy,
- » bilateral renal artery stenosis or stenosis of an artery to a dominant/single kidney,
- » aortic valve stenosis,
- » history of angioedema,
- » hyperkalaemia, LoE:IVb[54]
- » severe renal impairment (eGFR <30 mL/min), unless dose-adjusted usage is recommended by a specialist – See Section 8.1: Chronic kidney disease (CKD).

CAUTION
Advise all patients receiving ACE-inhibitors about the symptoms of ACE-induced angioedema.

REFERRAL
- » Young adults (<30 years of age).
- » BP not controlled by 4 medicines and where there is no doctor available.
- » Pregnancy.
- » Signs of hypertension-mediated organ damage e.g. oedema, dyspnoea, proteinuria, angina, etc.
- » If severe adverse drug reactions develop.
- » Hypertensive urgency and hypertensive emergency.
- » Severe renal impairment (eGFR <30 mL/min).

4.7.2 HYPERTENSIVE EMERGENCY
I10

DESCRIPTION
A markedly elevated BP: systolic BP >180 mmHg and/or a diastolic BP >130 mmHg **associated with** one or more of the following:
- » unstable angina/chest pain,
- » neurological signs, e.g. severe headache, visual disturbances, confusion, coma or seizures,
- » pulmonary oedema,
- » renal failure.

MEDICINE TREATMENT
- Amlodipine, oral, 10 mg immediately as a single dose.

If pulmonary oedema:
- Furosemide, IV, 40 mg as a single dose (see Section 21.2.8: Pulmonary oedema, acute).

CAUTION
A hypertensive emergency is life threatening and needs immediate referral to hospital.

REFERRAL

Urgent

All patients.

4.7.3 HYPERTENSION IN CHILDREN

I10

DESCRIPTION

Hypertension is defined as systolic and/or diastolic blood pressure ≥ the 95th percentile for gender, age, and height percentile on at least 3 consecutive occasions. Refer to table below.

The use of appropriate cuff size is important. Too small a cuff for the arm leads to false high BP. The cuff bladder must encircle at least 80% of the upper arm and should cover at least 75% of the distance between the acromion and the olecranon. It is better to use a cuff that is slightly too large than one that is too small. Large cuffs, if covered with linen-like material, can be folded to the appropriate size in smaller infants as long as the bladder encompasses the arm.

Infants and preschool-aged children are almost never diagnosed with essential hypertension and are most likely to have secondary forms of hypertension.

With age, the prevalence of essential hypertension increases, and after 10 years of age, it becomes the leading cause of elevated BP. Obesity currently is emerging as a common comorbidity of essential hypertension in paediatric patients, often manifesting during early childhood.

DIAGNOSIS

Age years	**95th BP percentiles for boys mmHg**	**95th BP percentiles for girls** mmHg
1	103/56	104/58
3	109/65	107/67
5	112/72	110/72
6	114/74	111/74
8	116/78	115/76
9	118/79	117/77
10	119/80	119/78
11	121/80	121/79
12	123/81	123/80

Table 4.6: Diagnosis of high blood pressure in children and adolescents

Adapted from U.S Department of Health and Human Services National Institutes of Health (National Heart, Lung, and Blood Institute): The 4th report on the diagnosis, evaluation, and treatment of high blood pressure in children and adolescents, May 2005 (using the 50th height percentile).

REFERRAL

All cases with BP above the 95th percentile.

4.8 PULMONARY OEDEMA, ACUTE

See Section 21.2.8: Pulmonary oedema, acute.

4.9 RHEUMATIC FEVER, ACUTE

I00/I01.0-2/I01.8-9

Note: notifiable condition.

DESCRIPTION

A condition in which the body develops antibodies against its own tissues, following a streptococcal throat infection. Effective treatment and prevention of recurrent of streptococcal pharyngitis can markedly reduce the occurrence and repeat episodes of rheumatic carditis.

Commonly occurs in children, 3 to 15 years of age.

Recurrences are frequent.

Clinical signs and symptoms include:

- » arthralgia or arthritis that may shift from one joint to another,
- » carditis, including cardiac failure,
- » heart murmurs,
- » subcutaneous nodules,
- » erythema marginatum,
- » chorea (involuntary movements of limbs or face),
- » other complaints indicating a systemic illness e.g. fever.

MEDICINE TREATMENT

Eradication of streptococci in throat:

Children: 18 months–11 years of age

- Phenoxymethylpenicillin, oral, 250 mg 12 hourly for 10 days. A

Children >11 years of age and adults

- Phenoxymethylpenicillin, oral, 500 mg 12 hourly for 10 days. A

OR

Children

- Amoxicillin, oral, 50 mg/kg daily for 10 days. A

Weight kg	Dose mg	Use one of the following				Age Months/years
		Susp		Capsule		
		125 mg/5mL	250 mg/5mL	250 mg	500 mg	
>2–2.5 kg	100 mg	4 mL	2 mL	–	–	>34–36 weeks
>2.5–3.5 kg	150 mg	6 mL	3 mL	–	–	>36 weeks–1 month
>3.5–5 kg	200 mg	8 mL	4 mL	–	–	>1–3 months
>5–7 kg	275 mg	11 mL	5.5 mL	–	–	>3–6 months
>7–11 kg	400 mg	–	8 mL	–	–	>6–18 months
>11–17.5 kg	575 mg	–	11.5 mL	–	–	>18 months–5 years
>17.5–25 kg	750 mg	–	15 mL	3	–	>5–7 years

>25–35 kg	1000 mg	–	20 mL	4	2	>7–11 years
>35 kg	2000 mg	–	–		4	>11years

LoE:IIb[55]

Adults

- Benzathine benzylpenicillin, IM, single dose. A
  - Children <30 kg: 600 000 IU.
  - Children ≥ 30 kg and adults: 1.2 MU.
  - Dissolve benzathine benzylpenicillin 1.2 MU in 3.2 mL lidocaine 1% without adrenaline (epinephrine) or 3 mL water for injection.

LoE:IIIb[56]

OR

- Amoxicillin, oral, 1 000 mg 12 hourly for 10 days. A

LoE:IIb[57]

Severe penicillin allergy:

Z88.0

Children

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg daily for 3 days. W See dosing table: Chapter 23.

Children >35 kg and adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days. W

Prophylaxis for rheumatic fever: (Z29.2)

All patients with confirmed rheumatic fever and no persistent rheumatic valvular disease

» Treat for 10 years or until the age of 21 years, whichever is longer.

All patients with confirmed rheumatic fever and persistent rheumatic valvular disease

» Treat lifelong.

- Phenoxymethylpenicillin, oral, 12 hourly. A
  - Children: 125 mg
  - Adults: 250 mg

OR

- Amoxicillin, oral, daily. A
  - Children <30 kg: 125 mg
  - Children ≥30 kg and adults: 250 mg

LoE:IVb

OR

- Benzathine benzylpenicillin, IM, every 21 to 28 days (i.e., 3 to 4 weeks). A
  - Children <30 kg: 600 000 IU
  - Children ≥ 30 kg and adults: 1.2 MU
  - For benzathine benzylpenicillin, IM injection, dissolve benzathine benzylpenicillin 1.2 MU in 3.2 mL lidocaine 1% without adrenaline (epinephrine) or 3 mL water for injection.

CAUTION
Avoid IM injections if patients are on warfarin.

Note: For guidance on warfarin management, see Adult Hospital Level STGs and EML, Appendix II: Prescribing information for specific medicines.

Severe penicillin allergy:
Z88.0

Children <11 years
- Macrolide, e.g.:
- Azithromycin, oral, 10mg/kg/day, 3 times weekly. W See dosing table: Chapter 23.

LoE:IVb[58]

Children ≥ 11 years and adults
- Macrolide, e.g.:
- Azithromycin, oral, 250 mg daily. W

LoE:IVb[59]

REFERRAL
All patients for diagnosis and management.

4.10 VALVULAR HEART DISEASE AND CONGENITAL STRUCTURAL HEART DISEASE
I05.0-2/I05.8-9/I06.0-2/I06.8-9/I07.0-2/I07.8-9/I08.0-3/I08.8-9/I34.0-2/I34.8-9/I35.0-2/I35.8-9/I36.0-2/I36.8-9/I37.0-2/I37.8-9/Q22.0-6/Q22.8-9/Q23.0-4/Q23.8-9

DESCRIPTION
Damage to heart valves or chamber, or vessel wall anomalies caused by rheumatic fever or other causes, e.g. congenital heart defects, degenerative disease and ischaemic heart disease.
May be complicated by:
- » heart failure
- » infective endocarditis
- » pulmonary hypertension
- » atrial fibrillation
- » systemic embolism

GENERAL MEASURES
- » Advise all patients with a heart murmur regarding the need for prophylactic treatment prior to undergoing certain medical and dental procedures.
- » Advise patients to inform health care providers of the presence of the heart murmur when reporting for medical or dental treatment.

MEDICINE TREATMENT
Prophylactic antibiotic treatment for infective endocarditis:
- » Should be given prior to certain invasive diagnostic and therapeutic procedures e.g. tooth extraction, to prevent infective endocarditis.
- » Is essential for all children with congenital or rheumatic heart lesions needing dental extraction.

Dental extraction, if no anaesthetic is required:

Z29.2

- Amoxicillin, oral, 50 mg/kg (maximum dose: 2 g), 1 hour before the procedure. A
  - Repeat dose 6 hours later.

Age	Dose
<5 years	750 mg
5 to 10 years	1 500 mg
≥ 10 years	2 g

Severe penicillin allergy:

Z88.0

Refer.

If anaesthetic is required:

Refer.

Prophylaxis for rheumatic fever:

See Section 4.9: Rheumatic fever, acute.

REFERRAL

» All patients with pathological heart murmurs for assessment.
» All patients with heart murmurs not on a chronic management plan.
» Development of cardiac signs and symptoms.
» Worsening of clinical signs and symptoms of heart disease.
» Any newly developing medical condition, e.g. persistent fever.
» All patients with valvular heart disease for advice on prophylactic antibiotic treatment prior to any invasive diagnostic or therapeutic procedure.

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PHC Chapter 5: Skin Conditions

5.1 DRY SKIN

L85.3

DESCRIPTION

» The skin is dry and rough, together with varying degrees of scaling.
» Severe forms are mainly inherited, e.g. ichthyosis.
» Milder forms (xeroderma), seen as dryness with only slight scaling are common in the elderly and some chronic conditions, e.g. HIV disease, malignancies and atopic eczema.

GENERAL MEASURES

» Avoid the use of soap.

MEDICINE TREATMENT

- Soap substitutes, e.g.:
- Aqueous cream (UEA).
  - Rub on skin, before rinsing off completely.
  - Aqueous cream should not be used as an emollient.
- Emollient, e.g.:
- Emulsifying ointment (UE)

5.2 ITCHING (PRURITUS)

L29.0-3/L29.8-9

DESCRIPTION

Itching may be:

» localised or generalised,
» accompanied by obvious skin lesions or skin conditions e.g. eczema, chicken pox,
» accompanied by many systemic diseases, e.g. hepatitis,
» caused by scabies and insect bites.

GENERAL MEASURES

» Diagnose and treat the underlying condition.
» Trim fingernails.
» Avoid scratching.

MEDICINE TREATMENT

- Calamine lotion, apply when needed.

For pruritus associated with dry skin:

- Emollient, e.g.:
- Emulsifying ointment (UE).

If pruritis is severe and requires short term control:

Children

Chlorphenamine, oral, 0.1 mg/kg/dose 6 to 8 hourly. See dosing table: Chapter 23.

Adults

LoE:IVb[1]

- Chlorphenamine, oral, 4 mg, 6 to 8 hourly.

Note: Chlorphenamine is sedating and may only be required in the evening for mild cases.

If pruritis is severe and requires long term control, e.g. for chronic pruritus:

Children: 2 to 6 years of age

Cetirizine, oral, 5 mg once daily. See dosing table: Chapter 23.

Children >6 years of age and adults

- Cetirizine, oral, 10 mg once daily.

REFERRAL

» No improvement after 2 weeks.
» Underlying malignancy or systemic disease suspected.

5.3 ACNE VULGARIS

L70.0-5/L70.8-9

DESCRIPTION

» Acne is an inflammatory condition of the hair follicle.
» It is caused by hormones and sebum gland keratinisation, leading to follicular plugging producing comedomes and proliferation of *Propioni bacterium* acnes.
» Distributed on face, chest and back.
» Occurs more commonly in adolescence, but may also occur in adulthood.
» May also occur as a result of the inappropriate use of topical steroids, or as a side effect of medicine e.g. Isoniazid.

Mild acne:
Predominantly consists of non-inflammatory comedones.

Moderate acne:
Consists of a mixture of non-inflammatory comedones and inflammatory papules and pustules.

Severe acne:
It is characterised by the presence of widespread nodules and cysts, as well as a preponderance of inflammatory papules and pustules.

GENERAL MEASURES

» Do not squeeze lesions.
» Avoid greasy or oily cosmetics and hair grooming products that block the hair follicle openings.
» Discourage excessive facial washing.

MEDICINE TREATMENT

Mild inflammatory acne:

- Benzoyl peroxide 5%, gel, apply in the morning to affected areas as tolerated.
  - Wash off in the evening.
  - If ineffective and tolerated, increase application to 12 hourly.
  - Avoid contact with eyes, mouth, angles of the nose and mucous membranes.

LoE:IVb[2]

Moderate inflammatory acne:

- Benzoyl peroxide 5%, gel, apply in the morning to affected areas as tolerated.
  - Wash off in the evening.
  - If ineffective and tolerated, increase application to 12 hourly.
  - Avoid contact with eyes, mouth, angles of the nose and mucous membranes.

LoE:IVb[3]

AND

- Doxycycline, oral, 100 mg daily for 3 months. A
  - Review patient after 3 months of treatment.
  - It should be taken with meals.
  - Do not take it together with iron preparations and antacids.

LoE:IVb[4]

Note: Doxycyline should always be used with a topical agent and should not be used as monotherapy.

For non-inflammatory acne:
Topical retinoids

» Main therapeutic objective is to control comedone formation.
» Introduce topical retinoids gradually as a night-time application to limit skin irritant effects, as they are not photo-stable and degrade when exposed to sunlight (e.g. start twice a week and titrate up).

CAUTION
Do not use if pregnant or planning pregnancy.
Limit exposure to sunlight. If sunburn occurs, discontinue therapy until the skin has recovered.

LoE:IIIa[5]

- Tretinoin, topical, apply at night to affected areas for at least 6 weeks.
  - Review patient after 6 weeks' treatment.
  - Minimise exposure to sunlight. If sunburn occurs, discontinue therapy until the skin has recovered.
  - Acne may worsen during the first few weeks.
  - Apply about a pea-sized amount to entire face. Avoid contact with eyes and area around mouth and nose.

REFERRAL
» All severe cases.
» Poor response to treatment.

5.4 BACTERIAL INFECTIONS OF THE SKIN

5.4.1 BOIL, ABSCESS
L02.0-4/L02.8-9/H00.0/H60.0/N76.4/J34.0 + (B95.6)

DESCRIPTION
» Localised bacterial skin infection of hair follicles or dermis, usually with S. aureus.
» The surrounding skin becomes:
- swollen
- red
- hot
- tender to touch

Note:
» Check blood glucose level if diabetes is suspected or if the boils are recurrent. Boils in diabetic or immunocompromised patients require careful management.
» For axillary abscesses and pustules, see Section 5.17: Hidradenitis suppurativa.

GENERAL MEASURES
» Encourage general hygiene e.g.: frequent showering, keeping nails short.
» Drainage of abscess is the treatment of choice. Perform surgical incision only when the lesion is fluctuant.

MEDICINE TREATMENT

Systemic antibiotics are seldom necessary, unless the following features are present:
» swollen, tender lymph nodes in the area
» fever
» extensive surrounding cellulitis
» boils on the face

Antibiotics are also indicated in immunocompromised patients, diabetic patients, and neonates:

Children ≤ 7 years of age:

- Cefalexin, oral, 25 mg/kg/dose 12 hourly for 5 days. A See dosing table:Chapter 23.

OR

- Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. A See dosing table:Chapter 23.

Children >7 years of age and adults:

- Cefalexin, oral, 500 mg 6 hourly for 5 days. A

OR

- Flucloxacillin, oral, 500 mg 6 hourly for 5 days. A

For severe penicillin allergy:

Z88.0

Children

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg /kg/dose daily for 3 days. W See dosing table: Chapter 23.

Adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days. W

REFERRAL

» Poor response to treatment.
» Abscesses of the palm of the hand and pulp space abscess of the fingers.
» Features of severe sepsis requiring intravenous antibiotics.
» Deep abscess e.g. ischiorectal and breast abscess.

5.4.2 IMPETIGO

L01.0-1

DESCRIPTION

» A common contagious skin infection caused by streptococci or staphylococci.
» Predominantly occurs in children.
» Often secondary to scabies, insect bite, eczema or tinea capitis.
» Clinical features:
  » pus containing blisters
  - commonly starts on the face or buttocks
  - erosion of blisters with honey-coloured crusts
  » spreads to neck, hands, arms and legs
» Post-streptococcal glomerulonephritis is a potential complication.

GENERAL MEASURES

» Counsel on good personal and household hygiene to avoid spread of the infection and to reduce carriage of organisms.
» Trim finger nails.
» Wash and soak sores in soapy water to soften and remove crusts.
» Continue with general measures until the sores are completely healed.
» Check urine for blood if the sores have been present for more than a week.

MEDICINE TREATMENT

- Povidone iodine 5%, cream or 10% ointment, apply 8 hourly.

If extensive or systemic signs of infection (fever, unwell, fatigued), ADD:

Children ≤ 7 years of age:

- Cefalexin, oral, 25 mg/kg/dose 12 hourly for 5 days. A See dosing table: Chapter 23.

OR

- Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. A See dosing table: Chapter 23.

Children >7 years of age and adults:

- Cefalexin, oral, 500 mg 6 hourly for 5 days. A

OR

- Flucloxacillin, oral, 500 mg 6 hourly for 5 days. A

LoE:IVb[6]

For severe penicillin allergy:

Z88.0

Children

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg/dose daily for 3 days. W See dosing table: Chapter 23.

Adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days. W

Note: If impetigo has improved, but has not completely cured, give a 2nd 5-day course of antibiotics.

REFERRAL

» No improvement after second course of antibiotics.
» Presence of blood on urine test strip for longer than 5 to 7 days.
» Clinical features of glomerulonephritis. See Section 8.3.1: Nephritic syndrome.

5.4.3 CELLULITIS

L03.0-3/L03.8-9

DESCRIPTION

» A diffuse, spreading, acute infection within skin and soft tissues, commonly caused by streptococci.
» Characterised by:
- oedema
- redness
- increased local temperature
- no suppuration

» Frequently associated with lymphangitis and regional lymph node involvement.
» Commonly occurs on the lower legs, but may occur elsewhere.
» May follow minor trauma.
» May present as an acute fulminant or chronic condition.
» May occur with systemic manifestations of infection:
- fever
- tachycardia
- chills
- delirium/altered mental state
- hypotension

GENERAL MEASURES

» Elevate the affected limb to reduce swelling and discomfort.

MEDICINE TREATMENT

Children ≤ 7 years of age

- Cefalexin, oral, 25 mg/kg/dose 12 hourly for 5 days. A See dosing table: Chapter 23.

OR

- Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. A See dosing table:Chapter 23.

Children >7 years of age and adults

- Cefalexin, oral, 500 mg 6 hourly for 5 days. A

OR

- Flucloxacillin, oral, 500 mg 6 hourly for 5 days. A

LoE:IVb[7]

For severe penicillin allergy:

Z88.0

Children:

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg/dose daily for 3 days. A See dosing table: Chapter 23.

Adults:

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days. A

Severe cellulitis:

Refer for parenteral antibiotics.

REFERRAL

Urgent

» Children who have significant pain, swelling or loss of function (to exclude osteomyelitis).
» Haemorrhagic bullae, gas in the tissues or gangrene.
» Extensive cellulitis.
» Recurrent cellulitis associated with underlying conditions, e.g. lymphoedema.
» Cellulitis with systemic manifestations, e.g. confusion, hypotension.
» Poorly controlled diabetic patients.
» Involvement of the hand, face and scalp.

Non-urgent

» Inadequate response to initial antibiotic treatment.

5.4.4 CHRONIC LOWER LEG ULCERS

L97

DESCRIPTION

» A chronic relapsing disorder of the lower limbs.
» Associated with vascular insufficiency (predominantly venous insufficiency) and patient immobility.
» Commonly associated with neuropathy, infections, neoplasia, trauma or other rare conditions.

GENERAL MEASURES

» If the ulcer is oedema- or stasis-related, rest the leg in an elevated position.
» In venous insufficiency, compression (bandages or stockings) are essential to achieve and maintain healing, provided the arterial supply is normal.
» In patients with arterial insufficiency, avoid pressure on bony prominences and toes.
» In patients with neuropathy, relieve pressure from the area.
» Exclude diabetes with finger prick blood glucose test.
» Avoid topical application of home remedies.
» Stress meticulous foot care and avoidance of minor trauma. Encourage patients with neuropathy not to walk barefoot, check their shoes for foreign objects, examine their feet daily for trauma and to test bath water before bathing to prevent getting burnt.
» Avoid excessive local heat.
» Walking and exercises are recommended.

MEDICINE TREATMENT

Refer for assessment and initiation of treatment.

Local wound care:

Topical cleansing:
Use bland, non-toxic products to clean the ulcer and surrounding skin.

For clean uninfected wounds:

- Sodium chloride, 0.9% or sterile water.

Dress frequently with:

- Moistened dressing e.g. gauze with sodium chloride, 0.9%. *LoE: IIIb*[8]

For exudative, infected wounds:

- Povidone-iodine 5% cream, topical apply daily *LoE: IVb*[9]

For venous ulcers:

- Paraffin gauze dressing.

REFERRAL

» No improvement after 1 month.
» All foot ulcers.
» Ulcers with atypical appearance.
» Venous ulcers that are persistently infected, or have offensive odour.

5.5 FUNGAL INFECTIONS OF THE SKIN

5.5.1 CANDIDIASIS, SKIN

B37.2

Vaginal candidiasis: See Section 12.1: Vaginal discharge syndrome (VDS).

DESCRIPTION

A skin infection caused by *C. albicans*.

Most common sites for infection are skin folds such as:

» under the breasts
» axillae
» nail folds
» natal cleft
» groins
» neck folds, peri-anal, perineum and groins in infants

The skin lesions or sores:

» are red raw-looking patches
» appear moist (weeping)
» have peripheral outlying white pustules, red scaly lesions which become confluent

GENERAL MEASURES

» Exclude diabetes.

MEDICINE TREATMENT

- Imidazole, e.g.:
- Clotrimazole 1%, topical, apply 3 times daily for 14 days.

5.5.2 RINGWORM AND OTHER TINEAS

Fungal infections affecting the body (tinea corporis; tinea versicolor), feet (tinea pedis), scalp (tinea capitis) and nails (tinea unguium). These infections may be contagious.

5.5.2.1 RINGWORM – TINEA CORPORIS

B35.4

DESCRIPTION

» Clinical features include:
- itchy ring-like patches
- patches slowly grow bigger
- raised borders

» As the patch extends a clear area develops in the center which may become hyper-pigmented in dark skin.
» Extensive disease is common in HIV, often with no evidence of the patches developing clear centres.

GENERAL MEASURES

» Prevent spreading the infection to others.
» Do not share clothes, towels, or toiletries (especially combs and hair brushes).
» Wash skin well and dry before applying medicine treatment.

MEDICINE TREATMENT
- Imidazole, e.g.:
- Clotrimazole 1%, topical, apply 3 times daily.
  - Continue using cream for at least 2 weeks after lesions have cleared.

Note: Treat any secondary skin infection with antibiotics. See Section 5.4.2: Impetigo.

REFERRAL
» Extensive disease.

5.5.2.2 ATHLETE'S FOOT – TINEA PEDIS
B35.3

DESCRIPTION
» A common contagious fungal infection of the foot, characterised by itching, burning and stinging between the toes or on the sole.
» The skin between the toes is moist and white (maceration) and may become fissured. There is also associated erythema, scaling and peeling.
» Secondary eczema of the hands may be an associated condition. See Section 5.8.1: Eczema, atopic.
» Vesicles may occur in inflammatory cases.
» Pain and tenderness in the web spaces may indicate secondary bacterial infection.
» Re-infection is common.

GENERAL MEASURES
» Discourage the use of shared bathing or swimming areas, whilst infected.
» Keep feet dry:
  - wear open sandals,
  - do not wear socks of synthetic material,
  - dry between toes after washing the feet or walking in water.
» Wash and dry feet twice daily before applying medicine treatment.

MEDICINE TREATMENT
- Imidazole, e.g.:
- Clotrimazole 1%, topical, apply twice daily for 4 weeks.

Note: For nail infection, see Section 5.6.3: Nail infections – *tinea unguium*.

REFERRAL
» No improvement after 4 weeks.

5.5.2.3 SCALP INFECTIONS – TINEA CAPITIS

B35.0

DESCRIPTION

» Round or patchy bald areas with scales and stumps of broken off hair.

GENERAL MEASURES

» Avoid shaving head in children.
» Do not share toiletries such as combs and hair brushes.

MEDICINE TREATMENT

Children:

- Fluconazole, oral, 6 mg/kg once daily, for 28 days. See dosing table:Chapter 23.

LoE: IIb[10]

Adults:

- Fluconazole, oral, 200 mg weekly, for 6 weeks.

LoE:IIIb[11]

Note: Do not give to women of child-bearing age unless they are on effective contraceptive.

5.5.2.4 PITYRIASIS VERSICOLOR – TINEA VERSICOLOR

B36.0

DESCRIPTION

» Round macules which are often lighter than normal skin (but may be darker).
» Mostly found on the upper chest and back, less common on the neck, face, abdomen and upper limbs.
» Macules on the chest and back often coalesce, and the condition spreads with the formation of new macules on the periphery.
» Pigmentation may take months to return to normal after treatment.
» Recurrences are common, especially in hot weather.

GENERAL MEASURES

» Avoid wearing clothing that impairs ventilation in hot weather to reduce perspiration.

MEDICINE TREATMENT

» Oral antifungal therapy is not indicated.

- Selenium sulfide, 2.5% suspension, apply once weekly for three weeks.
  - Lather shampoo on affected parts.
  - Leave on overnight, then wash off the following day.

LoE:IVb[12]

5.5.2.5 NAIL INFECTIONS – TINEA UNGUIUM

See Section 5.6.3: Nail infections – *tinea unguium*.

5.6 NAILFOLD AND NAIL INFECTIONS

5.6.1 PARONYCHIA, ACUTE

L03.0

DESCRIPTION

» Small subcutaneous collection of pus under the nailfold.
» Often associated with cutting nails too short, or nail biting.

GENERAL MEASURES

» Avoid cutting finger nails too short.
» Avoid nail biting.

MEDICINE TREATMENT

» Drain abscess by puncture or incision.

Adults:

- Flucloxacillin, oral, 500 mg 6 hourly for 5 days. A

5.6.2 PARONYCHIA, CHRONIC

L03.0

DESCRIPTION

» Chronic, red, swollen nailfold, lifted off the nail plate with whitish pus.
» Commonly caused by working in water and contact with household detergents.

GENERAL MEASURES

» Avoid hand contact with household detergents, washing powders and fabric softeners.
» Wear rubber gloves when washing clothes, linen and kitchen utensils to keep hands clean and dry as far as possible.

MEDICINE TREATMENT

- Corticosteroid, potent, topical, e.g.: (Doctor prescribed)
- Betamethasone 0.1%, topical, apply at night until lesions have cleared.
  - Wash hands, then massage cream into the nailfold.

If secondary infection is present, indicated by pain and tenderness in the nail fold, treat with antibiotics (see Section 5.4.2: Impetigo).

LoE: IIIb[13]

REFERRAL
» No response to treatment.

5.6.3 NAIL INFECTIONS – TINEA UNGUIUM
B35.1

DESCRIPTION
» Nails are lifted, distorted, crumbling and discoloured.
» One or more nails may be affected.

GENERAL MEASURES
» Topical treatment is generally ineffective for fungal nail infections.
» Systemic treatment is often unsuccessful and recurrent infections are common if repeat exposure is not prevented.

REFERRAL
» Patients that are distressed by cosmetic appearance.

5.7 PARASITIC INFESTATIONS OF THE SKIN

5.7.1 LICE (PEDICULOSIS)

DESCRIPTION
An infestation of the body with parasitic lice.
Clinical features include:
» Itching,
» bite marks,
» presence of secondary eczema, or secondary infection.

CAUTION
Do not use commercial insect sprays as they are toxic.
Lotions used for the treatment of lice are toxic when swallowed.

Note: Treat secondary infection with antibiotics. See Section 5.4.2: Impetigo.

5.7.1.1 HEAD LICE

B85.0

DESCRIPTION

Head lice are common in children. The eggs (nits) appear as fixed white specks on the hair.

GENERAL MEASURES

» Use a fine tooth comb to comb out the nits after washing hair.
» Shaving of the head may expedite treatment, where socially acceptable.
» Prevent spread by treating other contacts.
» Remove nits from eyelashes by application of white soft paraffin.

MEDICINE TREATMENT

- Permethrin 5%, topical
  - Apply permethrin 5% lotion to towel-dried or dry hair. Comb into hair repeatedly with a normal comb until scalp is covered completely.
  - Remove lice and nymphs with fine lice comb by dividing scalp into sections and combing away from scalp.
  - Rinse lice comb in a white bowl filled with hot water between hair strokes to identify removed lice, or detach on white tissue paper. Paralysed and dead lice will present as dark spots (like ground pepper).
  - Take note of the physical size of removed lice and nymphs, as the size should get smaller with consecutive treatments.
  - Keep on combing with fine lice comb, rinsing or wiping comb frequently.
  - Permethrin 5% lotion is safe and can be left in the hair for up to one hour.
  - After combing, rinse hair with lukewarm water and wash permethrin 5% lotion out with normal shampoo (more than one foaming might be needed).
  - Repeat this procedure every 5 days for 3 weeks.
  - Thereafter, carry out frequent inspections to detect new infestations early.
  - **Do not** apply to broken skin or sores. *LoE: IIIb*[14]
  - **Avoid** contact with eyes.

5.7.1.2 BODY LICE

B85.1/B85.4

DESCRIPTION

» Body lice live in the seams of clothing and only come to the skin to feed.
» **Note:** Body lice may carry typhus fever.

GENERAL MEASURES

» Regularly wash bed linen and underclothes in hot water and expose to sunlight.

MEDICINE TREATMENT

Adolescents and adults:

- Benzoyl benzoate 25% lotion, undiluted, once weekly for 3 weeks.
  - Apply over the whole body, excluding the neck and face.
  - Leave on overnight and wash off the next day.
  - **Note:**
  - Avoid contact with eyes and broken skin or sores.
  - The lotion is toxic if swallowed.
  - Do not continue if a rash or swelling develops.
  - Itching may continue for 2–3 weeks after treatment.

LoE:IIIb[15]

5.7.1.3 PUBIC LICE

B85.3/B85.4

DESCRIPTION

» Pubic lice are acquired as STIs and nits are found on pubic hair and eyelashes.

GENERAL MEASURES

» Prevent spread by treating other contacts.

MEDICINE TREATMENT

- Benzoyl benzoate 25% lotion, apply once weekly for two weeks
  - Apply to affected area.
  - Leave on for 24 hours, then wash thoroughly.
  - Repeat in 7 days.

For pediculosis of the eyelashes or eyebrows:

- Yellow petroleum jelly (Note: Do not use white petroleum jelly near the eyes).
  - Apply to the eyelid margins (cover the eyelashes) daily for 10 days to smother lice and nits.
  - Do not apply to eyes.

LoE: IVb

REFERRAL

» Lice infestation of eyelashes in children to exclude suspected sexual abuse.

5.7.2 SCABIES

B86

DESCRIPTION

» An infestation with the parasite *Sarcoptes scabei*.

» Commonly occurs in the skin folds. The infestation spreads easily, usually affecting more than one person in the household.
» Clinical features include:
  - intense itching, which is more severe at night,
  - small burrows between fingers, toes, elbow areas and buttocks where the parasite has burrowed under the skin,
  - secondary infection which may occur due to scratching with dirty nails,
  - vesicles and pustules on the palms, soles, and sometimes scalp, in small babies.

GENERAL MEASURES

» Treat all close contacts simultaneously even if they are not itchy.
» Cut finger nails and keep them clean.
» Wash all linen and underclothes in hot water.
» Expose all bedding to direct sunlight.
» Put on clean, washed clothes after medicine treatment.

MEDICINE TREATMENT

Children <6 years of age:

- Permethrin 5%, topical, apply lotion undiluted to the whole body from neck to feet
  – Leave on overnight (8 to 12 hours) and wash off the following morning. *LoE: IVb[16]*

If permethrin is unavailable for children <6 years of age:

- Benzoyl benzoate 25% lotion:
  – Children 0 months to 1 year of age:
    o Dilute 1 part of benzoyl benzoate to 3 parts of water to form an emulsion of 6%.
    o Apply diluted emulsion to the whole body from neck to feet as described above.

  – Children 1 to 6 years of age:
    o Dilute 1 part of benzoyl benzoate with an equal amount of water to form an emulsion of 12.5%.
    o Apply diluted emulsion to the whole body from neck to feet as described above. *LoE:IVb[17]*

Children ≥ 6 years of age and adults:

- Benzoyl benzoate 25% lotion, applied undiluted to the whole body from neck to feet.
  – Allow the lotion to remain on the body for 24 hours, then wash off using soap and water.
  – Treatment may be repeated after 24 hours **once** within 5 days for severe infestations.
  – All infested persons living in the household, or likely to contract the infestation, should be treated at the same time.

If benzoyl benzoate is unsuccessful:

- Permethrin 5%, topical, apply lotion undiluted to the whole body from neck to feet.
  - Leave on overnight (8–12 hours) and wash off the following morning. *LoE: IIIb*[18]

Note:
- Benzoyl benzoate and permethrin are toxic if swallowed.
- Avoid contact with eyes and broken skin or sores.
- Do not continue if rash or swelling develops.
- Itching may continue for 2–3 weeks after treatment.
  - Treatment may need to be repeated againafter one week.
- Treat secondary infection with antibiotics. See Section 5.4.2: Impetigo.

5.7.3 SANDWORM

B76.0

DESCRIPTION

» Creeping eruption (cutaneous larva migrans) caused by *Ancylostoma braziliense*, a hookworm of dog or cat.
» Larvae of ova in soil penetrate skin commonly through the feet, legs, buttocks or back and cause a winding thread-like trail of inflammation with itching, scratching dermatitis and bacterial infection.

MEDICINE TREATMENT

- Albendazole, oral:
  - Children <2 years of age: 200 mg daily for 3 days
  - Children ≥ 2 years of age and adults: 400 mg daily for 3 days

AND

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose 6 to 8 hourly. See dosing table: Chapter 23.

Adults *LoE:IVb*[19]

- Chlorphenamine, oral, 4 mg, 6 to 8 hourly.

Note: Chlorphenamine is sedating and may only be required in the evening for mild cases.

5.8 ECZEMA AND DERMATITIS

5.8.1 ECZEMA, ATOPIC

L20.0/L20.8-9

DESCRIPTION

» An inflammatory disorder with an itchy red rash or dry rough skin.
» In babies it appears at approximately 3 months.
» Family history of asthma, hay fever or atopic dermatitis is common.
» Clinical features:

  - occurs on the inner (flexural) surfaces of elbows and knees, the face and neck,
» can become chronic with thickened scaly skin (lichenification),
  - secondary bacterial infection may occur with impetigo or pustules,
» can be extensive in infants ,
  - very itchy at night.
» Eczema is usually a chronic condition and requires long-term care.
» Sufferers of atopic eczema are particularly susceptible to herpes simplex and may present with large areas of involvement with numerous vesicles and crusting surrounded by erythema (eczema herpeticum). See Section 5.13: Herpes simplex.

GENERAL MEASURES

» Avoid direct skin contact with woollen or rough clothes.
» Avoid overheating by blankets at night.
» Trim fingernails to prevent scratching.
» Counsel on good personal hygiene with regular washing to remove crusts and accretions, and to avoid secondary infection.
» Diet modification has no role in atopic eczema treatment.
» Avoid soap on affected areas.

MEDICINE TREATMENT

(For management of severe eczema, start at step 3.)

STEP 1

- Avoid soap, use soap substitutes such as aqueous cream (UEA).
  – Rub on skin, then rinse off completely.
  – Do not use aqueous cream as an emollient.
- Emollient, e.g.:
- Emulsifying ointment (UE).

<u>If no response within seven days/worsening symptoms:</u>

STEP 2

- Hydrocortisone 1% topical, applied twice daily for 7 days.
  – Apply sparingly to the face.
  – Do not apply around the eyes.

<u>If there is a response:</u>

Reduce the use of the hydrocortisone cream to once daily for a further few days, then stop and maintain treatment with:

- Aqueous cream (UEA) as a wash-off soap.

AND

- Emollient, e.g.:
- Emulsifying ointment (UE).

<u>If no response within seven days or severe eczema:</u>

STEP 3

- Corticosteroid, potent, topical, e.g.: (Doctor prescribed)

- Betamethasone 0.1%, topical, apply ointment once daily for 7 days.
  - **Do not** apply to face, neck and flexures.

LoE: IIb[20]

If there is a response:
Reduce use of corticosteroid ointment for a further few days, then stop and maintain treatment with:

- Aqueous cream (UEA) as a soap.

AND

- Emollient, e.g.:
- Emulsifying ointment (UE).

If the patient is itching:

Children:

- Chlorphenamine, oral, 0.1 mg/kg/dose at night for a maximum of 2 weeks. See dosing table: Chapter 23.

LoE:IVb[21]

Adults:

- Chlorphenamine, oral, 4 mg, at night for a maximum of 2 weeks.
  - **Note:** Chlorphenamine is sedating.

If itch is not controlled or is more severe during the day, switch to:

Children: 2 to 6 years of age:

- Cetirizine, oral, 5 mg once daily. See dosing table: Chapter 23.

Children >6 years of age and adults:

- Cetirizine, oral, 10 mg once daily.

LoE:IVb

REFERRAL

» No improvement in 2 weeks.
» Infants and children requiring more than 1% hydrocortisone cream.
» Extensive involvement.
» Eczema herpeticum.

5.8.2 ECZEMA, ACUTE, MOIST OR WEEPING

L20.0/L20.8-9

DESCRIPTION

» A form of eczema with small or large vesicles, associated with oozing and eventual crusting and scaling.
» Yellow pustules with crust indicate secondary sepsis.

GENERAL MEASURES

» Sodium chloride, 0.9% dressings, applied daily or twice daily.
Avoid use of soap on affected areas.

MEDICINE TREATMENT

- Topical steroids, e.g.:
- Hydrocortisone 1% topical, applied 12 hourly, until improved.
  - Topical steroids should be applied to both moist and dry inflamed areas.

Antibiotic treatment if secondary infection is present:

Children ≤7 years of age:

- Cefalexin, oral, 25 mg/kg/dose 12 hourly for 5 days. A See dosing table: Chapter 23.

OR

- Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. A See dosing table: Chapter 23.

Children >7 years of age and adults:

- Cefalexin, oral, 500 mg 6 hourly for 5 days. A

OR

- Flucloxacillin, oral, 500 mg 6 hourly for 5 days. A

Severe penicillin allergy:

Z88.0

Children:

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg /kg/dose daily for 3 days. W See dosing table: Chapter 23.

Adults:

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days. W

If the patient is itching:

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose at night. See dosing table: Chapter 23.

Adults

- Chlorphenamine, oral, 4 mg, at night. *LoE: IVb*[22]

Note: Chlorphenamine is sedating.

If itch is not controlled or is more severe during the day, switch to:

Children: 2–6 years of age

- Cetirizine, oral, 5 mg once daily. See dosing table: Chapter 23.

Children >6 years of age and adults

- Cetirizine, oral, 10 mg once daily. *LoE: IVb*

For itching in children <2 years of age:
- Calamine lotion, applied on the skin.

REFERRAL
» No improvement after a week.
» Severe acute moist or weeping eczema.

5.8.3 DERMATITIS, SEBORRHOEIC
L21.0-1/L21.8-9

DESCRIPTION
» Dandruff is an uninflamed form of seborrhoeic dermatitis.
» Pruritus may or may not be present in seborrhoeic dermatitis.
» The scalp, face, ears and skin folds e.g. axillae, groins, under the breasts are commonly affected.
» May become very extensive, particularly in infants and HIV infected patients.

GENERAL MEASURES
» Trim nails.
» Avoid scratching affected areas.
» Avoid perfumed soap.

MEDICINE TREATMENT
- Hydrocortisone 1% topical, apply twice daily until improved.
  - Then apply once or twice weekly for maintenance as needed.

For severe dermatitis:
- Corticosteroid, potent, topical, e.g.: (Doctor prescribed)
- Betamethasone 0.1%, topical, apply ointment once daily for 5–7 days.
  - Do not apply to face neck and flexures.

LoE: IIb[23]

For itching scalp, scaling and dandruff:
- Selenium sulphide, 2.5% suspension, apply weekly.
  - Lather on the scalp.
  - Rinse off after 10 minutes.
    - Apply weekly, until improved, then every second week to maintain control.

5.9 NAPPY RASH
L22

DESCRIPTION
» A diffuse reddish eruption in the nappy area, usually caused by irritation from:

- persistent moisture and irregular cleaning and drying of the nappy area,
- diarrhoeal stools,
- underlying skin conditions in some cases, or
- improper rinsing of nappies to remove urine and stool breakdown products.

» Rash is predominantly on areas in contact with the nappy, and spares the flexures.

GENERAL MEASURES

» Prompt changing of soiled nappies.
» Avoid waterproof pants.
» Expose nappy area to air if possible especially with severe nappy dermatitis.
» Educate caregiver on washing, rinsing and drying of the nappy when soiled.

MEDICINE TREATMENT

- Zinc emollient, e.g.:
- Zinc and castor oil, topical, apply ointment after each nappy change.

<u>If rash involves the flexures, suspect candida:</u>

- Imidazole, e.g.:
- Clotrimazole 1%, topical, apply cream beneath zinc and castor oil ointment after each nappy change until symptoms are resolved.

REFERRAL

» No improvement after 3 days of treatment.

5.10 ALLERGIES

5.10.1 URTICARIA

L50.0-6/L50.8-9

DESCRIPTION

» Urticaria is a skin disorder characterised by itchy wheals (hives).
» There are many causes, including allergic, toxic or physical:
» Allergic urticaria may be caused by drugs, plant pollen, insect bites or foodstuffs, e.g. fish, eggs, fruit, milk and meat.
  - Commonly caused by medicines e.g. aspirin, NSAIDs, or codeine.

GENERAL MEASURES

» Take detailed history to determine trigger factors.
» Lifestyle adjustment.

MEDICINE TREATMENT

Note: Avoid the use of oral corticosteroids.

LoE: IVb

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose at night. See chlorphenamine dosing table, Chapter 23. *LoE:IVb*[24]

Adults

- Chlorphenamine, oral, 4 mg, 6 to 8 hourly.

For long term use in adults and school going children:

Children: 2–6 years of age

- Cetirizine, oral, 5 mg once daily. See dosing table: Chapter 23.

Children >6 years of age and adults

- Cetirizine, oral, 10 mg once daily.

- Calamine lotion, applied on the skin.

REFERRAL

» No improvement or response after 24 hours.

5.10.2 ANGIOEDEMA

T78.3 + (Y14.99/Y34/Y57.9)

DESCRIPTION

» Localised oedema of the subcutaneous tissue affecting particular parts of the face i.e. lips, eyes and tongue. May also affect the larynx, causing life threatening airway obstruction and anaphylaxis.
» ACE-inhibitors are the most common cause in adults. Other causes include other medicines and allergies.

GENERAL MEASURES

» Stop all suspected agents e.g. ACE-inhibitor.
» In the case of airway obstruction, a definitive airway must be established if oedema is extensive or progressing.

MEDICINE TREATMENT

If urticaria and/or itch present (no imminent airway compromise):

- Cetirizine, oral, 10 mg as a single dose. *LoE:IVb*

OR

- Promethazine, IM, 25 to 50 mg immediately.

In severe cases where airway obstruction is present:

Adults

- Adrenaline (epinephrine), 1:1000 solution, 0.5 mL into the lateral thigh, administered immediately and repeated every 5 to 15 minutes as needed.

Children
- Adrenaline (epinephrine), IM, 0.01 mL/kg of 1:1000 solution, administered immediately.
  - Maximum dose of 0.3 mL

AND
- Hydrocortisone, IV, 100 mg as a single dose.

Note: Observe all cases until resolution.

REFERRAL
» Failure to respond.
» No obvious cause found.
» Severe ACE-inhibitor induced angioedema.

5.10.3 FIXED DRUG ERUPTIONS
L27.0-1

DESCRIPTION
» Dark coloured round macules that can occur anywhere on the body following the ingestion of a medicine to which the patient has become allergic.
» They recur on the same spot and increase in number with each successive attack.
» In the acute stage they are itchy, red around the edge or even bullous.

GENERAL MEASURES
» Stop the suspected offending medicine(s).

MEDICINE TREATMENT

Acute/active stage
- Hydrocortisone 1%, topical, apply daily for 5 days. *LoE: IVb*

REFERRAL
» Widespread eruptions.

5.10.4 PAPULAR URTICARIA
L50.8

DESCRIPTION
» Hypersensitivity response to insect bites.
» Initial lesion is a red papule, which may blister, become excoriated, and then heal with hyperpigmentation. Usually occur in crops over several months.

» Common and often severe in HIV infections. (See Section 11.3.12: Papular pruritic eruption.)

GENERAL MEASURES

» Reduce exposure to insects by treating pets, using mosquito nets and fumigating houses regularly. Use of insect repellents may be helpful.

MEDICINE TREATMENT

New, inflamed lesions:

- Hydrocortisone 1%, topical, apply daily for 5 days.

For relief of itch:

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table: Chapter 23. *LoE:IVb*[25]

Adults

- Chlorphenamine, oral, 4 mg, 6–8 hourly.

Note: Chlorphenamine is sedating and may only be required in the evening for mild cases.

For long term use in adults and school going children:

Children 2–6 years of age:

- Cetirizine, oral, 5 mg once daily. See dosing table: Chapter 23.

Children >6 years of age and adults:

- Cetirizine, oral, 10 mg once daily.

REFERRAL

» Non-responsive and chronic cases.

5.10.5 ERYTHEMA MULTIFORME

L51.0/L51.8-9

DESCRIPTION

» A self-limiting and commonly recurrent inflammatory eruption of the skin.
» May involve mucous membrane (but not more than one surface), and usually without systemic symptoms.
» Usually lasts for 10–14 days before complete recovery occurs.
» Symmetrically distributed crops of target lesions (dark centre, an inner, pale ring surrounded by an outer red ring) occur on the extremities, and in particular, on the backs of the hands and forearms, palms and soles.
» This condition is usually due to an infection, commonly herpes simplex or mycoplasma.

REFERRAL
» All patients with systemic symptoms or mucosal involvement.
» Unsure of the diagnosis.

5.10.6 SEVERE CUTANEOUS ADVERSE DRUG REACTIONS

5.10.6.1 STEVENS-JOHNSON SYNDROME (SJS)/TOXIC EPIDERMAL NECROLYSIS (TEN)

L51.1/ L51.2

DESCRIPTION
» An acute, systemic condition with vesico-bullous lesions involving the skin and mucous membranes (≥2 mucosal surfaces), but occasionally only the mucous membranes.
» The eruption may start as widespread red irregular macules and patches. There may be a vesicle or bulla in the central area of the lesion. The blisters rupture leaving denuded areas of skin. Mucous membrane erosions often with slough covering the surface are frequently seen.
» Toxic epidermal necrolysis (TEN) is a more severe form of the condition and is suggested if the skin lesions cover >30% of the body surface area. The mucous membranes such as the mouth, eyes and vagina are also more severely affected.
» The condition is usually caused by medicines e.g. sulphonamides, anti-retrovirals (nevirapine), anti-epileptics (phenytoin, phenobarbitone, carbamazepine, lamotrigine).
» Systemic involvement with multi-organ dysfunction is common.

GENERAL MEASURES
» Immediate withdrawal of offending medicine.
» Patients usually require care in a high or intensive care unit with dedicated nursing.

REFERRAL
» All patients.

5.10.6.2 DRUG REACTION WITH EOSINOPHILIA AND SYSTEMIC SYMPTOMS (DRESS)

L27.0 + (D72.1)

DESCRIPTION
» Severe hypersensitivity reaction to a medicine.
» Typically occurs within 3 months of starting the offending medicine.
» Clinical symptoms include:
- maculopapular rash
- lymphadenopathy
- fever >38˚C
- hepatitis or other organ involvement

- eosinophilia and/or other blood count abnormalities

» Medicines that commonly induce the DRESS syndrome include phenobarbital, carbamazepine, phenytoin, lamotrigine, allopurinol, sulphonamides, abacavir, nevirapine.

REFERRAL

» All patients.

5.11 PITYRIASIS ROSEA

L42

DESCRIPTION

» A common disease of unknown cause, probably due to a viral infection as it occurs in minor epidemics.
» Most common in young adults but any age may be affected.
» The rash involves the trunk, neck and mainly proximal parts of the limbs.
» Presents as pink papules and macules. The macules are oval and have a thin collar of scale towards, but not at, the periphery of the lesions.
» The eruption is usually preceded by a few days by one larger, oval, slightly scaly area ("herald patch"), commonly found in the scapular area or abdomen. The macules on the thorax characteristically lie parallel to the long axis of the ribs ("Christmas tree" distribution).
» The itch is usually mild and there are few or no constitutional symptoms. It is self-limiting and resolves within about 6–8 weeks.

GENERAL MEASURES

» Counsel on the benign but prolonged nature of the condition.

MEDICINE TREATMENT

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose at night. See dosing table: Chapter 23. *LoE:IVb*[26]

Adults

- Chlorphenamine, oral, 4 mg at night.

Note: Chlorphenamine is sedating.

If itch is not controlled or more severe during the day, switch to:

Children: 2 to 6 years of age

- Cetirizine, oral, 5 mg once daily. See dosing table: Chapter 23.

Children >6 years of age and adults:

- Cetirizine, oral, 10 mg once daily. *LoE: IVb*

5.12 MOLLUSCUM CONTAGIOSUM

B08.1

DESCRIPTION

» Infectious disease caused by a poxvirus.
» Presents with dome-shaped papules with a central depression (umbilication). Varies from occasional lesions to large crops of lesions particularly in immunocompromised or HIV-infected patients.
» Papules are commonly seen on the face in children, but may be found at any skin site, except on the palms and soles. They may also occur on the genitalia as an STI.
» Most infections resolve spontaneously except in the immunocompromised.

GENERAL MEASURES

In non-genital molluscum contagiosum:

» Allow lesions to heal spontaneously if the lesions are few in number and the patient not immunocompromised.
» Manual removal of lesions or expression of contents is not recommended as it may result in unintentional inoculation of other parts of the body, increase the risk of spread to others, or result in secondary bacterial infection.

LoE:IVb[27]

In genital molluscum contagiosum:

» Counsel on risk reduction for transmission of STIs.
» Counsel that the partner(s) should be notified, examined, and treated.

MEDICINE TREATMENT

- Tincture of iodine BP, applied to core of individual lesions using an applicator.

LoE:IIIb[28]

CAUTION
Beware of hypersensitivity to iodine.

REFERRAL

» Extensive disease.
» Those failing to respond to simple measures.
» Peri-ocular lesions to an ophthalmologist.

5.13 HERPES SIMPLEX

B00.0-4/B00.7-9

DESCRIPTION

» Infection caused by herpes simplex virus type 1 or 2.
» Primary herpes infection involving gingivostomatitis (usually type 1) or the genital area (usually type 2) may be extensive, and may occur at other sites, e.g. the face.

» It is characterised by grouped crusted vesicles surrounded by erythema. The vesicles rupture soon after forming, producing discrete ulcers.
» Recurrences are usually mild and last a few days, except in immunosuppressed patients. Recurrences of oral herpes may be triggered by other respiratory tract infections or exposure to ultraviolet light.
» Sufferers of atopic eczema are particularly susceptible to the virus and may present with large areas of involvement with numerous vesicles and crusting surrounded by erythema (eczema herpeticum).
» Herpes simplex mucocutaneous ulceration that persists for >1 month is an AIDS–defining illness. See Section 11.3.10: Herpes simplex ulcers, chronic.
» Herpes simplex infection may be the precipitating event in many cases of erythema multiforme.

GENERAL MEASURES

Keep the skin lesions clean and dry.

MEDICINE TREATMENT

Extensive herpes, eczema herpeticum or chronic mucocutaneous ulcerations:

Children <15 years of age:

- Antiviral, (active against herpes simplex) e.g.:
- Aciclovir, oral, 250 mg/m^2/dose, 8 hourly for 7 days. See dosing table: Chapter 23.

Children ≥ 15 years of age and adults:

- Antiviral, (active against herpes simplex) e.g.:
- Aciclovir, oral, 400 mg, 8 hourly for 7 days. *LoE: IIIb*[29]

5.14 HERPES ZOSTER

See Section 11.3.11: Herpes zoster (Shingles).

5.15 WARTS

DESCRIPTION

A common, infectious, self-limiting condition of the skin or mucous membrane caused by human papilloma virus.

5.15.1 COMMON WARTS

B07

DESCRIPTION

» Seen most often on the hands and fingers, but can be found anywhere on the body.
» Raised nodules with a rough 'warty' surface.

GENERAL MEASURES
» Usually does not require treatment as they will resolve spontaneously .

MEDICINE TREATMENT
- Salicylic acid, 15 to 30%, topical liquid application.
  - Protect surrounding skin with petroleum jelly.
  - Apply daily to wart and allow to dry.
  - Occlude for 24 hours.
  - Soften lesions by soaking in warm water and remove loosened keratin by light abrasion.
  - Wash affected area well, dry, reapply the wart paint, and occlude.
  - Repeat process daily until the wart disappears.

LoE: IIIb[30]

REFERRAL
» Extensive warts.

5.15.2 PLANE WARTS
B07

DESCRIPTION
» Very small warts that are just slightly raised.
» Present as smooth, flat, skin-coloured or slightly pigmented surface.
» Frequently present on the face, backs of the hands, and knees.
» Commonly seen in immunocompromised patients.

MEDICINE TREATMENT
These warts are notoriously difficult to treat with a poor response.
- Salicylic acid, 2%, topical.

LoE: III[31]

REFERRAL
» Failure to respond.
» Extensive cases involving the face.

5.15.3 PLANTAR WARTS
B07

DESCRIPTION
» Commonly appear on the pressure-bearing areas of the soles and can be painful and interfere with walking.
» Lesions often have a flat, circular appearance, as pressure on the sole of the foot forces them deep into the dermis. They have a rough surface and are often thick and hard due to increased keratin formation.
» As they are contagious, walking barefoot in communal areas should be discouraged.

MEDICINE TREATMENT

- Salicylic acid, 15 to 30%, topical liquid application.
  - Protect surrounding skin with petroleum jelly.
  - Apply daily to wart and allow to dry.
  - Occlude for 24 hours.
  - Soften lesions by soaking in warm water and remove loosened keratin by light abrasion.
  - Wash affected area well, dry, reapply the wart paint and occlude.
  - Repeat process daily until the wart disappears. *LoE:IIIb*[32]

REFERRAL

» No response to treatment.
» Diabetic patients.

5.15.4 GENITAL WARTS: CONDYLOMATA ACCUMINATA

See Section 12.12: Genital warts (GW): condylomata accuminata.

5.16 PSORIASIS

L40.0-5/L40.8-9

DESCRIPTION

» Inflammatory condition of the skin and joints of unknown aetiology.
Lesions present as scaly, itchy plaques, especially on the extensor surfaces of the knees, elbows, sacrum and scalp.
» Psoriasis may spread to involve other sites, although the face is usually spared.
» The nails and skin folds are often involved.
» Often aggravated by stress, and may be provoked by HIV disease.

GENERAL MEASURES

» Counselling regarding precipitating factors and chronicity.
» HIV test, if acute onset and patient has risk factors for HIV infection.
» Encourage sun exposure as tolerated.

MEDICINE TREATMENT

For flares (if delay experienced in obtaining a dermatological consultation):

- Coal tar (Liquor picis carbonis - LPC) BP 5%, topical one to four times daily.

OR

- Corticosteroid, potent, topical, e.g.: (Doctor prescribed) *LoE: IVb*[33]
- Betamethasone 0.1%, topical, apply 12 hourly.
  - Decrease according to severity, reduce to hydrocortisone 1%, topical, and then stop.

REFERRAL
» All patients, if diagnosis is not already confirmed.
» Complications such as pustular psoriasis, acute flares, chronic local plaques.

5.17 HIDRADENITIS SUPPURATIVA
L73.2

DESCRIPTION
» A chronic disorder of the pilosebaceous follicles, involving the formation of abscesses and cysts, often accompanied by scarring and sinus tract formation.
» Commonly found in axillae, groin, between the thighs, perianal and perineal areas.
» Flare-ups may be triggered by perspiration, hormonal changes (such as menstrual cycles), humidity and heat, and friction from clothing.

GENERAL MEASURES
» Avoid tight clothing or clothing made of non-breathable material.

REFERRAL
» All patients with abscesses, infected cysts or sinuses suspected to be due to hidratenitis suppurativa.

5.18 HYPOPIGMENTORY DISORDERS

5.18.1 ALBINISM
E70.3

DESCRIPTION
» Congenital disorder characterised by the complete or partial absence of pigment in the skin, hair and eyes.
» Albinism is associated with a number of visual symptoms or defects such as photophobia, nystagmus, strabismus, and amblyopia.
» Lack of skin pigmentation increases a person's susceptibility to sunburn and skin cancers.

GENERAL MEASURES
To avoid sunburn and skin damage:
» Avoid sun exposure during periods of maximum intensity (i.e. between 10:00 and 15:00).
» Wear a wide-brimmed hat and long-sleeved top when exposed to the sun.
» Wear sunscreens with a high sun protection factor (SPF); a SPF of between 20 and 30 will provide adequate protection. The product should also provide protection against both UVA and UVB rays.
» To reduce photophobia and prevent retinal damage:

- Wear sunglasses that preferably have UV filters.
  Check skin regularly for signs of skin cancer such as a new spot or growth on their skin.

MEDICINE TREATMENT

- Zinc oxide, topical ointment.
  - Apply evenly to all sun exposed areas at least 15 minutes before going out into the sun. *LoE: IVb[34]*

OR

- High potency (SPF) sunblock, topical (UV block).
  - Apply evenly to all sun exposed areas at least 15 minutes before going out into the sun. *LoE: IVb[35]*

REFERRAL

» To dermatologist for regular skin checks.
» To ophthalmologist for visual rehabilitation and regular eye checks.

5.18.2 VITILIGO

L80

» Autoimmune disease characterised by patches of the skin losing their pigment.
» Presents as pale patchy areas of depigmented skin which tend to occur on the extremities.
» They are most prominent on the face, hands and wrists. The loss of pigmentation is particularly noticeable around body orifices such as the mouth, eyes, nostrils, genitalia, and umbilicus.
» The patches often begin in areas of skin that are exposed to the sun.
» New patches appear over time and can occur over large portions of the body, or can be restricted to a particular area.

GENERAL MEASURES

» Encourage sun exposure, moderate sun exposure is beneficial.

MEDICINE TREATMENT

- High potency (SPF) sunblock, topical (UV block)
  - Apply evenly to all sun exposed areas at least 15 minutes before going out into the sun. *LoE: IVb[36]*

REFERRAL

» All patients.

5.19 PRESSURE ULCERS/SORES

L89.0-3/L89.9

DESCRIPTION

» Localised damage to the skin and underlying tissue that usually occurs over bony
» prominences as a result of pressure, or pressure in combination with shear force and/or friction.
» The most common sites are the skin overlying the sacrum, coccyx, heels, and hips, but other sites can also be affected.
» Pressure ulcers most commonly develop in individuals who are immobile, including those bedridden or confined to a wheelchair.
» Other factors increasing the risk of pressure ulcer development are:
  - Skin wetness e.g. incontinence.
  - Reduced blood flow e.g. arteriosclerosis.
  - Reduced skin sensation e.g. paralysis or neuropathy.

GENERAL MEASURES

Skin care

» The skin should be kept clean and dry. Ensure that the skin folds are dried thoroughly.

Wound odour

» Regular cleansing, debridement and management of infection.
» Activated charcoal dressings may be used.

Pressure redistribution

» Repositioning and turning at regular intervals, every 2-4 hours. Individual receiving palliative care should be repositioned in accordance with the individual's wishes, comfort and tolerance.
» Avoid positioning the individual on the wound if erythema is present.

MEDICINE TREATMENT

Cleanse the skin prior to application of a barrier product.

- Zinc and castor oil, topical ointment. *LoE:IIIb*[37]

For pain:
See Chapter 20: Pain.

REFERRAL

» Patients with pressure sores or those at high risk of development of pressure sores to rehabilitation services, if available.

LoE:IIb[38]

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PHC Chapter 6: Obstetrics & gynaecology

OBSTETRICS

6.1 BLEEDING IN PREGNANCY

6.1.1 PREGNANCY, ECTOPIC

See Section 6.10: Pregnancy, ectopic.

6.2 MISCARRIAGE

O02.1/O03.4/O03.9

DESCRIPTION

Bleeding from the genital tract <22 weeks' gestation, which may or may not be associated with lower abdominal pain (LAP).

» Miscarriage is classified as follows:

Cervix closed on digital examination	Cervix dilated on digital examination
» Threatened miscarriage: – mild vaginal bleeding, usually no associated LAP » fetus is still in the uterus	» Inevitable miscarriage: – moderate vaginal bleeding with associated LAP » fetus is still in the uterus
» Complete miscarriage: – complete passage of all products of conception – bleeding and pain have settled – usually still requires referral for confirmation	» Incomplete miscarriage: – vaginal bleeding often with clots – partial expulsion of products of conception

» Miscarriage is considered to be safe or unsafe (septic) miscarriage:

Safe miscarriage	Unsafe (septic) miscarriage
– Normal vital signs: pulse, BP, temperature, respiratory rate, Hb – No clinical signs of infection, e.g. chills, malaise – Uterus <12 weeks in size – No offensive products of conception – No purulent vaginal discharge	– History of interference – Abnormal vital signs: any of tachycardia, hypotension, pyrexia, tachypnoea, pallor – Persistent heavy bleeding – Clinical signs of infections, e.g. chills, malaise – Uterus palpable abdominally (≥ 12 weeks in size) – Offensive vaginal discharge/ products of conception

For perinatal mortality audit and statistics (DHIS or PPIP), all fetuses ≥500 g are included.

GENERAL MEASURES

» Monitor vital parameters, e.g. Hb, pulse, BP, temperature.
» Treat for shock if indicated.
» Counselling and support.

» There is no specific treatment for threatened miscarriages: reassure the patient that bleeding usually stops spontaneously. Advise to return if bleeding worsens or persists or abdominal pain develops.

MEDICINE TREATMENT

For inevitable/incomplete miscarriages:

- Oxytocin, IV, 20 units, diluted in 1000 mL sodium chloride 0.9% and infused at 125 mL/hour (avoid where threatened miscarriage is suspected).

For all Rh-negative non-sensitised women who had a surgical procedure to manage a miscarriage:

- Anti-D immunoglobulin, IM, 50 mcg preferably within 72 hours but may be given up to 7 days following management of miscarriage.

Do not offer Anti-D prophylaxis to women who:

» only received medical management for a miscarriage, or
» had a threatened miscarriage, or
» had a complete miscarriage.

LoE:IVb[1]

If unsafe (septic) miscarriage is suspected, also give before referral:

O03.0/O08.0 + (A41.9/R57.2)

- Ceftriaxone, IV, 1 g as a single dose

CAUTION: USE OF CEFTRIAXONE

Do not administer calcium-containing fluids, e.g. Ringer's Lactate, concurrently with ceftriaxone.

AND

- Metronidazole, oral, 400 mg as a single dose.

REFERRAL

Urgent

» All patients with unsafe miscarriage
» Suspected ectopic pregnancy.
» Previous miscarriage or previously diagnosed incompetent cervix.

Note: For patients with safe miscarriage the need for referral is determined by skills and facilities at the primary health care level. A local referral policy should be in place. Ideally, midwife obstetric units and community health centres should be able to manage safe miscarriage using manual vacuum aspiration or medical management.

6.2.1 MANAGEMENT OF INCOMPLETE MISCARRIAGE IN THE 1ST TRIMESTER, AT PRIMARY HEALTH CARE LEVEL

O02.1/O03.4

Both Manual Vacuum Aspiration (MVA) and medical evacuation are equally effective for miscarriage.

GENERAL MEASURES

» Counselling.
» Evacuation of the uterus.

MEDICINE TREATMENT

Medical evacuation:

- Misoprostol, SL/PV/buccal, 800 mcg immediately as a single dose.
  - Repeat after 24 hours if necessary. *LoE:IIIb*[2]

Manual vacuum aspiration:

Routine analgesia for vacuum aspiration:

- Morphine, IM, 0.1 mg/kg 30 minutes before aspiration procedure, to a maximum of 10 mg (Doctor prescribed). *LoE:IVb*[3]

Alternatively, consider paracervical block if trained in technique. See the Adult Hospital Level STGs and EML, Section 5.9.1: TOP: Management of pregnancies up to the Twelfth week of gestation (12 weeks and 0 days)

Oral analgesia as required for 48 hours:

- Paracetamol, oral, 500 mg–1 g, 4–6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

AND

- Ibuprofen, oral, 400 mg 8 hourly with or after a meal, for 2 to 3 days.

Follow up after one week to ensure that bleeding has stopped, or sooner if worsening symptoms.
Perform a pregnancy test three weeks after medical management.

LoE:IIIb[4]

REFERRAL

» Unsafe miscarriage.
» Miscarriage ≥13 weeks' gestation.
» Anaemia.
» Haemodynamic instability.
» Failed medical evacuation
» Positive pregnancy test 3 weeks after medical management.

6.2.2 ANTEPARTUM HAEMORRHAGE

O46.0/O46.8-9

DESCRIPTION

Vaginal bleeding in pregnancy from 22 weeks' gestation.
Important causes include the following:

» abruptio placentae,
» placenta praevia,
» uterine rupture (particularly when misoprostol was used to attempt an unlawful TOP).

GENERAL MEASURES

» Monitor vital parameters, e.g. Hb, pulse, BP, temperature.

» Treat for shock if indicated.
Avoid digital vaginal examination, unless placenta praevia excluded with ultrasound.

MEDICINE TREATMENT

- Sodium chloride 0.9%, IV.

REFERRAL

Urgent
All patients.

6.3 TERMINATION OF PREGNANCY (TOP)

DESCRIPTION

Under the Choice of Termination of Pregnancy Act, 1996, as amended, a TOP may be carried out in the following circumstances:

Women eligibility

If gestation ≤ 12 weeks and 0 days:
» On request.

If gestation 12 weeks and 1 day to 20 weeks and 0 days:
If Doctor is satisfied that:
» Pregnancy was from rape or incest, or
» There is a substantial risk that the fetus would suffer from a severe mental or physical abnormality, or
» The continued pregnancy would pose a risk to mother's physical or mental health, or
» Continued pregnancy will significantly affect the social or economic circumstances of the woman.

If gestation ≥20 weeks and 0 day:
» If the Doctor after consulting with a second Doctor or registered midwife or registered nurse is satisfied that continuing the pregnancy would endanger the mothers' life, pose a risk of injury to the fetus, or result in a severe fetal malformation.

Venue
Any facility that has a 24-hour maternity service can provide TOP service without specific designation - *The Choice on Termination of Pregnancy Act, 1996 (as amended by Act 38 of 2004), expanded access to abortions, allows registered nurses, as well as registered midwives, to perform abortions up to the twelfth week of pregnancy.*

Practitioner

If gestation ≤11 weeks and 6 days:
» Doctor, midwife or registered nurse with appropriate training.

If gestation ≥12 weeks and 0 day:
» Doctor is responsible for decision and prescription of medication. Registered nurse/midwife may administer medication according to prescription.

GENERAL MEASURES

» Pre- and post-termination counselling is essential.

» Consent for TOP and related procedures (e.g. laparotomy) may be given by minors. Minors are encouraged to consult parents or others, but parental consent is not mandatory.
» Consent of spouse/partner is not necessary.
» Offer contraception post TOP.

REFERRAL

» If service not available, refer to appropriate district or regional facility as soon as possible (within 2 weeks).
» If gestation ≥12 weeks and 0 day.

6.3.1 MANAGEMENT OF TERMINATION OF PREGNANCY AT PRIMARY HEALTH CARE LEVEL: GESTATION UP TO 12 WEEKS AND 0 DAYS

O04.9

GENERAL MEASURES

» Confirm pregnancy with urine pregnancy test.
» Determine gestational age with ultrasound. If ultrasound is unavailable, use dates (LMP) and bimanual (pelvic) examination.
» If unsure of dates, or examination disagrees with dates, or uterus palpable abdominally, or the woman is obese or difficult to examine, arrange pre-procedure ultrasound.
» Ultrasound is mandatory if suspected ectopic pregnancy – refer if uncertain.
» Counselling.
» Outpatient procedure by nursing staff with specific training.
» Screen for STIs (if treatment needed, do not delay TOP).
» Arrange Pap smear if needed.
» Check HIV status, Hb and blood group (Rh).
» Counsel and start contraception post TOP, before leaving facility. Arrange contraception follow-up.

MEDICINE TREATMENT

Medical TOP - if gestation ≤12 weeks and 0 days:

- Mifepristone, oral, 200 mg, immediately as a single dose. *LoE:IIIb*[5]

Followed 24 to 48 hours later by:

- Misoprostol, SL, 800 mcg by self-administration at home*.
  - If expulsion does not occur within 4 hours of misoprostol administration, a second dose of misoprostol 400 mcg, oral/PV may be given.
  - *From >9 weeks to ≤12 weeks- return to the facility within 48 hours to take misoprostol on-site (early morning) due to the risk of heavy bleeding.

LoE:IIIb[6]

Note: Bleeding may persist for up to 1 week. If there is no bleeding after the second dose of misoprostol, the woman must return to the facility as soon as possible as there is a possibility of an incomplete procedure or ectopic pregnancy. LoE:IIIb[7]

For pain:

After administration of mifepristone, start:

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

LoE:IVb[8]

ADD

After expulsion is complete:

- Ibuprofen, oral, 400 mg 8 hourly with or after a meal, as needed for 2 to 3 days. LoE:IVb[9]

OR

TOP using manual vacuum aspiration (MVA) - if gestation ≤12 weeks and 0 days:

- Misoprostol, PV, 400 mcg 3 hours before vacuum aspiration of the uterus. LoE:IVb[10]

Routine analgesia for vacuum aspiration:

- Morphine, IM, 0.1 mg/kg 30 minutes before aspiration procedure, to a maximum of 10 mg (Doctor prescribed). LoE:IVb[11]

Alternatively, consider paracervical block if trained in technique. See the Adult Hospital Level STGs and EML, Section 5.9.1: TOP: Management of pregnancies up to the Twelfth week of gestation (12 weeks and 0 days)

Oral analgesia as required for 48 hours:

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

LoE:IVb[12]

AND

- Ibuprofen, oral, 400 mg 8 hourly with or after a meal, as needed for 2 to 3 days. LoE:IVb[13]

For both medical and surgical TOPs (MVA):

In Rh-negative, non-sensitised women: (O36.0)

- Anti-D immunoglobulin, IM, 50 mcg preferably within 72 hours but may be given up to 7 days following TOP. LoE:IIIb[14]

Contraception:

Counsel all women on effective contraception, especially long-acting reversible methods.

All methods can be given at the time of the procedure, with the exception of the IUCD at a medical TOP. LoE:IVb[15]

Review all patients after 7 days: if bleeding persists, arrange urgent ultrasound.

REFERRAL

» If gestation ≥12 weeks and 1 day.

» If gestation uncertain.
» If any signs or symptoms of ectopic pregnancy or other early pregnancy complications.
» Co-morbid conditions (heart disease, asthma, diabetes, anaemia, clotting disorder, seizure disorder, substance abuse, hypertension).
» Large fibroids (may interfere with determining gestation age and/or MVA).
» Any signs of sepsis (tachycardia, hypotension, pyrexia, tachypnoea, offensive vaginal discharge).
» If gestation ≥9 weeks and 1 day and MVA not available or declined, refer.

6.4 ANTENATAL CARE

6.4.1 ANTENATAL SUPPLEMENTS

Z36.9 + (Z29.9)

DESCRIPTION

Supplements before and during pregnancy and lactation can help to prevent, or lessen the effect of, a number of conditions or complications associated with pregnancy. Specifically:

» Folic acid, given for at least one month before conception and during pregnancy (particularly the first 12 weeks) can help to prevent neural tube defects (abnormal development of spinal cord/brain).
» Iron can help to prevent anaemia.
» Calcium can help to prevent pre-eclampsia.
» Low dose aspirin can reduce the risk for early onset pre-eclampsia in women at risk.

GENERAL MEASURES

» Eat a balanced diet to prevent nutritional deficiency.
» Avoid unpasteurised milk, soft cheeses, raw or undercooked meat or poultry, raw eggs, and shellfish.
» Cut down on caffeine. Reduce intake of tea. Do not drink tea within 2 hours of taking iron tablets.

MEDICINE TREATMENT

Prevention of Neural Tube Defects (NTD)

- Folic acid, oral, 5 mg daily:
  - All women intending to become pregnant or pregnant women (first trimester of pregnancy).
  - If high risk, throughout pregnancy, i.e.:
    - on anticonvulsants - especially valproic acid and carbamazepine,
  - previous child with NTD, or
    - family history of NTD.

LoE:Ia[16]

CAUTION

Children born to women taking valproic acid are at significant risk of birth defects (10%) and persistent developmental disorders (40%).

Valproic acid is contra-indicated and should be avoided in pregnancy and women of child-bearing potential. *LoE:IIb*[17]

Prevention of anaemia:

During pregnancy, after delivery and during lactation:

- Ferrous sulfate compound BPC (dried), oral, 170 mg (± 55 mg elemental iron) 12 hourly with meals.

OR

- Ferrous fumarate, oral, 200 mg once daily (± 65 mg elemental iron).
  - Taking iron tablets with meals decreases iron absorption, but improves tolerability. (Note: Do not take iron tablets with milk).

If daily iron is poorly tolerated (e.g. epigastric pain, nausea, vomiting and constipation), intermittent iron supplementation may be administered:

- Ferrous sulfate compound BPC (dried), oral, 340 mg per week, (± 110 mg elemental iron), with meals.

OR

- Ferrous fumarate, oral, 400 mg per week (± 130 mg elemental iron).

Note: Established anaemia i.e. Hb <10 g/dL, see Sections 3.1: Anaemia and 6.4.3: Anaemia in pregnancy. *LoE:IVb*[18]

Prevention of pre-eclampsia:

From confirmation of pregnancy (all women):

- Calcium, elemental, oral, 1 g daily.
  - Although the benefit is greatest in high-risk women, consider use of this agent in all pregnant women.
  - Calcium reduces iron absorption from the gastro-intestinal tract. Take supplements 4 hours apart from each other. *LoE:IIIb*[19]

From confirmation of pregnancy (all women with risk factors. including: pre-eclampsia in a previous pregnancy, chronic hypertension, diabetes, antiphospholipid syndrome, or systemic lupus erythematosus (SLE)):

- Aspirin, oral, 150 mg, taken at bedtime, preferably not on an empty stomach, until 36 weeks.
  - Start at 6 weeks of gestation but preferably before 16 weeks.
  - Stop at 36 weeks to reduce risk of bleeding during labour.
  - Administration at bedtime reduces the risk of gastric irritation.

LoE:IVb[20]

» Refer to the next level of care as appropriate for the condition (see below). Women with a prior history of pre-eclampsia, but otherwise well, can be referred for the next available appointment, preferably around 20 weeks.

6.4.2 HYPERTENSIVE DISORDERS IN PREGNANCY

DESCRIPTION

Hypertension in pregnancy, pre-eclampsia and eclampsia may have very serious and fatal consequences for both the mother and the baby.

Hypertension is defined by:

» A systolic BP ≥140 and/or a diastolic BP ≥90 mmHg measured on 2 occasions, 4 hours apart.

OR

» A systolic BP ≥160 and/or a diastolic BP ≥110 mmHg measured on a single occasion.

(Always measure BP in the left lateral or sitting position (and not supine position).

Hypertensive disorders of pregnancy can be classified as:

» **Chronic hypertension:**
  - Hypertension diagnosed before pregnancy or <20 weeks of pregnancy.

» **Gestational hypertension:**
  - Hypertension without proteinuria, with onset ≥20 weeks of pregnancy.

» **Pre-eclampsia:**

» Hypertension with proteinuria, with onset ≥20 weeks of pregnancy (high risk patients include: nulliparity, obesity, multiple pregnancy, chronic hypertension, kidney disease, diabetes, pre-eclampsia in a previous pregnancy, advanced maternal age or adolescent pregnancy).

» **Eclampsia:**

» Generalised tonic-clonic seizures in women with pre-eclampsia.

» **Chronic kidney disease:**
  - Proteinuria with/without hypertension, diagnosed at <20 weeks of pregnancy.

Categorising hypertensive disease:

» A diastolic BP of 90 to 109 mmHg and/or systolic BP of 140 to 159 mmHg; but with **NO** symptoms or organ dysfunction is classified as hypertensive disease without severe features.

» Maternal features of severe hypertensive disease are any or more of the following:
  - Acute severe hypertension (diastolic BP of 110 mmHg and/or systolic >160 mmHg).

» Thrombocytopenia (platelet count <100 000/µL).
  - Impaired liver function (ALT or AST >40 IU/L).
  - Severe persistent right upper quadrant or epigastric pain.

» HELLP syndrome (platelets <100 000 and AST >70 µl and LDH >600 µl).

» Serum creatinine ≥120 micromol/L.
  - Pulmonary oedema.
  - New-onset severe headache unresponsive to medication.
  - Visual disturbances.

REFERRAL

Urgent

» Hypertension with severe features (refer to high risk labour ward urgently).

» Pre-eclampsia with or without severe features (refer to high risk labour ward, urgently if severe features present).

Non-urgent

» Chronic hypertension.
» Chronic kidney disease.

6.4.2.1 CHRONIC HYPERTENSION

O10.0

Stop oral antihypertensive medicines when pregnancy is planned or as soon as pregnancy is diagnosed, change to methyldopa and refer for assessment and management.

MEDICINE TREATMENT

- Methyldopa, oral, 250 mg 8 hourly.
  - Titrate to a maximum dose: 750 mg 8 hourly.
  - When using iron together with methyldopa, ensure that iron and methyldopa are not taken concurrently.

LoE:IIIb[21]

REFERRAL

Urgent (within 2 days)
All cases.

6.4.2.2 GESTATIONAL HYPERTENSION: NO SEVERE FEATURES

O13

DESCRIPTION

Hypertension occurring for the first time at ≥ 20 weeks' gestation with no proteinuria.

GENERAL MEASURES

» May be managed without admission <38 weeks' gestation, provided no proteinuria.
» Review the following on a weekly basis:
  - BP
  - weight
  - urine analysis
  - height of fundus (every two weeks)
  - » fetal heart rate and movements

» Educate on signs requiring urgent follow-up (headache, epigastric pain, visual disturbances, vaginal bleeding etc.).

MEDICINE TREATMENT

- Methyldopa, oral, 250 mg 8 hourly.
  - Titrate to a maximum dose: 750 mg 8 hourly.
  - When using iron together with methyldopa, ensure that iron and methyldopa are not taken concurrently.

LoE:IIIb[22]

REFERRAL

» All patients with gestational hypertension at 38 weeks for delivery.
» Pre-eclampsia (all levels of severity).
» Poor control of hypertension.
» Hypertension with severe features (urgent referral).

6.4.2.3 GESTATIONAL HYPERTENSION: WITH SEVERE FEATURES

O13

Management is the same as for treatment of pre-eclampsia with severe features – See Section 6.4.2.4: Pre-eclampsia.

6.4.2.4 PRE-ECLAMPSIA

O11/O14.0-2/O14.9

DESCRIPTION

» A systolic BP ≥140 and/or diastolic BP ≥90 mmHg with proteinuria, after 20 weeks of pregnancy (significant proteinuria defined as ≥1+ proteinuria).
» Pre-eclampsia with severe features is a life-threatenig condition and needs urgent stabilsation and referral.
» The following indicate a higher risk of developing pre-eclampsia: nulliparity, obesity, multiple pregnancy, chronic hypertension, kidney disease, diabetes, pre-eclampsia in a previous pregnancy, advanced maternal age or adolescent pregnancy.

GENERAL MEASURES

» Advise all pregnant patients to urgently visit the clinic if severe persistent headache, visual disturbances, epigastric pain (not discomfort).
» If severe features are present:
» Insert a Foley's catheter and monitor urine output hourly.
  - Monitor BP every 30 minutes.
  - Check reflexes every hour.

MEDICINE TREATMENT

Prevention of pre-eclampsia

See Section 6.4.1: Antenatal Supplements.

Treatment if severe features are present

- Magnesium sulfate, IV, 4 g as a loading dose diluted with 200 mL sodium chloride 0.9% and infused over 20 minutes.

FOLLOWED BY *LoE:Ia*[23]

- Magnesium sulfate, IM, 10 g given as 5 g in each buttock.
  - Then IM, 5 g every 4 hours in alternate buttocks.

CAUTION: USE OF MAGNESIUM SULFATE

Stop magnesium sulfate if knee reflexes become absent or if urine output <100 mL/4 hours or respiratory rate <16 breaths/minute.

If respiratory depression occurs:

- Calcium gluconate 10%, IV, 10 mL given slowly at a rate not >5 mL/minute.

AND

If systolic BP ≥ 160 and/or a diastolic BP ≥110 mmHg:

- Nifedipine, oral, 10 mg (not sublingual) as a single dose.
  - May be repeated after 30 minutes if diastolic BP remains ≥110 mmHg or if systolic BP remains ≥160 mmHg. *LoE:Ia*[24]

REFERRAL

Urgent

» Pre-eclampsia with severe features.

Non urgent

» Pre-eclampsia without severe features (within 24 hours).

6.4.2.5 ECLAMPSIA

O15.0-2/O15.9

GENERAL MEASURES

» Stabilise prior to urgent referral.
» Ensure safe airway.
» Place patient in left lateral position.
» Insert a Foley's catheter and monitor urine output hourly.
» Monitor BP and check reflexes every 30 minutes.

MEDICINE TREATMENT

- Administer oxygen.
- Magnesium sulfate, IV, 4 g as a loading dose diluted with 200 mL sodium chloride 0.9% and infused over 20 minutes.

AND

- Magnesium sulfate, IM, 10 g given as 5 g in each buttock
  - Then IM, 5 g every 4 hours in alternate buttocks.

CAUTION: USE OF MAGNESIUM SULFATE

Stop magnesium sulfate if knee reflexes become absent or if urine output <100 mL/4 hours or respiratory rate <16 breaths/minute.

If respiratory depression occurs:

- Calcium gluconate 10%, IV, 10 mL given slowly at a rate not >5 mL/minute. *LoE:IVb*[25]

If recurrent eclamptic seizures despite magnesium sulfate loading dose administration:

- Magnesium sulfate, IV, 2 g, diluted with 100 mL sodium chloride 0.9%, over 10 minutes. *LoE:IVb*[26]

If seizures still persist and are continuous, there may be another cause of the seizures: treat as for status epilepticus (see Section 21.2.11: Seizures and status epilepticus).
AND
If systolic BP ≥160 and/or a diastolic BP ≥110 mmHg and patient becomes alert:

- Nifedipine, oral, 10 mg (not sublingual) as a single dose.
  - May be repeated after 30 minutes if diastolic BP remains ≥ 110 mmHg or if systolic BP remains ≥160 mmHg.

LoE:Ia[27]

REFERRAL

Urgent
All cases.

6.4.3 ANAEMIA IN PREGNANCY

O99.0 + (D64.9)

DESCRIPTION

Anaemia in pregnancy is a Hb <11 g/dL, most commonly due to iron deficiency. Hb levels should be checked at the booking visit, between 28 and 32 weeks, and at ± 36 weeks.
Treatment is recommended when the Hb falls below 10 g/dL.
Women with iron deficiency often have 'pica', e.g. eating substances such as soil, charcoal, ice, etc.

GENERAL MEASURES

» A balanced diet to prevent nutritional deficiency.
» Reduce intake of tea.
» Do not drink tea within 2 hours of taking iron tablets.

MEDICINE TREATMENT

Established anaemia with Hb <10 g/dL:

Continue for 3 months after the Hb normalises in order to replenish body iron stores. Hb is expected to rise by at least 1.5 g/dL in two weeks.

- Ferrous sulfate compound BPC (dried), oral, 170 mg (± 55 mg elemental iron) 12 hourly with meals.
  - Taking iron tablets with meals decreases iron absorption, but improves tolerability (Note: Do not take iron tablets with milk).

OR

- Ferrous fumarate, oral, 200 mg (± 65 mg elemental iron) 12 hourly.
  - Taking iron tablets with meals decreases iron absorption, but improves tolerability. (Note: Do not take iron tablets with milk).

LoE:IIb[28]

REFERRAL

Urgent (same day)
» Hb <6 g/dL.
» Hb = 6-7.9 g/dL with symptoms (dizziness, tachycardia, shortness of breath at rest).

Non-urgent (within 1 week)

» Hb = 6-7.9 g/dL without symptoms (to high-risk clinic if available).
» Hb = 8-9.9 g/dL and no improvement after one month of treatment (to high-risk clinic, if available).
» Hb <10 g/dL at 36 weeks' gestation or more: transfer to hospital for further antenatal care and delivery.

6.4.4 SYPHILIS IN PREGNANCY

O98.1

DESCRIPTION

A sexually transmitted infection with many manifestations that has a latent phase and may be asymptomatic in pregnant women. It is caused by the spirochaete, T pallidum. Vertical transmission to the fetus occurs in up to 80% of cases in untreated mothers. Untreated maternal syphilis may lead to miscarriage, stillbirth, non-immune hydrops fetalis, or congenital syphilis in the newborn.

DIAGNOSIS

» All pregnant women should have a syphilis test at the first booking visit.
» Women who booked in the first trimester and tested negative should have a repeat test done around 32 weeks' gestation.
» Diagnosis is made by positive serology. Clinical signs and symptoms are most recognisable in secondary syphilis. These include rash on palms of the hand and/or soles of the feet; and condylomata lata on genital areas.
» There are 2 types of diagnostic tests:

Specific treponemal test (e.g. TPAb//TPHA/FTA-ABS):	Non-treponemal test (e.g. RPR):
» Specifically diagnoses syphilis. » Available as rapid on-site finger-prick syphilis tests or laboratory-based assays. » Dual HIV/syphilis rapid on-site test may be used when HIV status is negative/unknown. » Once positive, a specific treponemal test generally remains positive for life, and therefore the presence of specific treponemal antibodies cannot differentiate between current and past infections. » A person with previously successfully treated syphilis will retain lifelong positive specific treponemal test results. » Thus a positive test should be immediately followed by an RPR test to confirm active disease; however treatment can be started while awaiting the RPR result.	The RPR can be used: » To determine if the patient's syphilis disease is active or not, » To measure a successful response to therapy (at least a fourfold reduction in titre, e.g. 1:256 improving to 1:64), or » To determine a new re-infection. **Note:** » False RPR positive reactions may occur, notably in patients with connective tissue disorders (these are usually low titre <1:8). For this reason, positive RPR results should be confirmed as due to syphilis by further testing of the serum with a specific treponemal test; if the specific test result cannot be obtained the same day, start treatment while awaiting the result. » If specific treponemal test e.g. TPAb is performed first and gives a positive result, serum can be further tested for RPR to determine the presence of active syphilis (reverse testing algorithm). » Some patients, even with successful treatment for syphilis, may retain life-long positive RPR results at low titres (≤1:8), which does not change by more than one dilution difference over time (so-called serofast patients).

GENERAL MEASURES

» Encourage partner notification and treatment after confirmon the diagnosis.
» Provide counselling and promote HIV testing.
» Educate on treatment adherence.
» Promote condom use.

MEDICINE TREATMENT

Pregnant woman

- Benzathine benzylpenicillin, IM, 2.4 MU weekly for 3 weeks.
  - Reconstitute with 6 mL of lidocaine 1% without adrenaline (epinephrine).
  - Follow up at 3 months after the last injection to confirm a fourfold (i.e. 2 dilution) reduction in RPR titres, provided the initial titre was ≥1:8. If initial titre <1:8, further reductions may not occur (serofast reaction). *LoE:IVb*[29]

Severe penicillin allergy:

Z88.0

Refer for in-patient penicillin desensitisation.

Newborn baby

If baby asymptomatic, well and mother not fully treated >1 month before delivery, give:

- Benzathine benzylpenicillin (depot formulation), IM, 50 000 units/kg as a single dose into the lateral thigh.

CAUTION

Benzathine benzylpenicillin (depot formulation) must never be given intravenously.

REFERRAL (BABY)

» Mother was not treated.
» Mother has received <3 doses of benzathine benzylpenicillin.
» Mother delivered within 4 weeks of commencing treatment.
» Baby has any of the following:
  - Hepatosplenomegaly
  - Snuffles
  - Jaundice
  - Purpura
» Pseudoparesis
  - Oedema
  - Anaemia
  - Desquamative rash (especially involving palms and soles)

6.4.5 URINARY TRACT INFECTION, IN PREGNANCY

6.4.5.1 CYSTITIS

O23.1

DESCRIPTION

This condition usually presents with lower abdominal pain, frequency of micturition and/or dysuria. There are no features of sepsis, e.g. fever.
Urine dipstick testing usually shows nitrites and/or leukocytes; protein and/or blood may also be detected.

GENERAL MEASURES

» Encourage oral fluid intake.
» Midstream urine for microscopy, culture and sensitivity (start empiric treatment while awaiting results).

MEDICINE TREATMENT

See Section 8.4: Urinary tract infection.

REFERRAL

» No response to treatment, or resistant organism on culture.
» Features of pyelonephritis (see Section 6.4.5.2: Pyelonephritis)

6.4.5.2 PYELONEPHRITIS

O23.0

DESCRIPTION

Features of pyelonephritis include: temperature ≥38°C, renal angle tenderness, vomiting, tachypnoea, tachycardia, hypotension, confusion.
This condition is more serious and may result in preterm labour.

GENERAL MEASURES
» Collect midstream urine for microscopy and culture and sensitivity.
» Ensure adequate hydration with IV fluids while awaiting transfer.

MEDICINE TREATMENT
Empiric therapy:

- Ceftriaxone, IV, 1 g as a single dose. W

CAUTION: USE OF CEFTRIAXONE

Do not administer calcium-containing fluids, e.g. Ringer's Lactate, concurrently with ceftriaxone. *LoE:IVb*

REFERRAL
All cases.

6.4.6 LISTERIOSIS
A32.0-1/A32.7-9

Note: If you have any questions or concerns, visit www.nicd.ac.za or call the NCID hotline on 082 883 9920.

DESCRIPTION
Listeriosis is a preventable and treatable bacterial disease spread through food. Most listerial infections are sporadic but outbreaks do occur. Pregnancy is a predisposing factor for developing serious Listeriosis.
Patients present with a flu-like illness (with fever). They may also have sore joints, backache, diarrhoea and vomiting, and/or signs of meningitis (headache, neck stiffness, confusion).
Listeriosis has been added to the national list of notifiable diseases.

GENERAL MEASURES
Educate your patients on how to prevent it: wash hands, knives, and cutting boards after handling uncooked food, avoid luncheon meats/delicatessen meats, wash raw vegetables thoroughly, avoid unpasteurised milk, thoroughly cook raw food from animal sources.

MEDICINE TREATMENT
During outbreaks, if signs of meningitis are present, give pre-referral treatment (see Section 15.8.1: Acute Meningitis). *LoE:IVb*[30]

REFERRAL
All cases.

6.4.7 PRETERM LABOUR (PTL) AND PRETERM PRELABOUR RUPTURE OF MEMBRANES (PPROM)

6.4.7.1 PRETERM LABOUR (PTL)

O60.0

DESCRIPTION

Regular painful contractions: 3 per 10 minutes, occurring <37 weeks of gestation.

Note: Women with a previous spontaneous preterm delivery are at higher risk for preterm delivery in the next pregnancy. Refer the following high-risk cases for cervical screening:

» A history of 2nd trimester miscarriage (between 16 and 26 weeks).
» Previous history of spontaneous preterm birth between 27 and 34 weeks.
» No need to refer previous late preterm deliveries (34 to 37 weeks). *LoE:IVb*[31]

GENERAL MEASURES

<26 weeks:
» Refer without tocolysis (medicines to inhibit uterine contractions). *LoE:IVb*[32]

26–34 weeks of gestation:
» Refer with initial tocolysis and corticosteroids.

>34 weeks of gestation:
» Allow labour to continue at midwife obstetric unit.

MEDICINE TREATMENT

<u>To improve fetal lung maturity at 26–34 weeks:</u>

Z29.2

- Betamethasone, IM, 12 mg, 2 doses 24 hours apart. *LoE:Ia*[33]

<u>Tocolysis:</u>

Z29.2

Preload with:

- Sodium chloride 0.9%, IV, 200 mL.

THEN

- Nifedipine, oral, 20 mg as a single dose.
  - Follow with 10 mg after 30 minutes, if contractions persist.
  - Then 10 mg every 4 hours until patient is transferred.
  - Maximum duration: 24 hours.

REFERRAL

All cases before 34 weeks.

6.4.7.2 PRETERM PRELABOUR RUPTURE OF MEMBRANES (PPROM)

O42.0-1/O42.9

DESCRIPTION

Rupture of the membranes before 37 weeks' gestation.
Confirmed with a sterile speculum examination demonstrating leakage of amniotic fluid.
If there is clinical uncertainty test for pH – liquor is alkaline.
Avoid digital vaginal examination.

MEDICINE TREATMENT

To improve fetal lung maturity at 26 to 34 weeks: (Z29.2)

- Betamethasone, IM, 12 mg, 2 doses 24 hours apart. *LoE:Ia*[34]

Initiate antibiotic therapy:(Z29.2)

- Ampicillin, IV, 1 g 6 hourly for 48 hours. A

Follow with:

- Amoxicillin, oral, 500 mg 8 hourly for a further 5 days. A

AND

- Azithromycin 1 g orally as a single dose. W *LoE:IIa*[35]

Severe penicillin allergy:(Z88.0)

- Azithromycin 1 g orally as a single dose and refer urgently. W

REFERRAL

All cases, but refer **urgently** if PPROM <34 weeks or cases of severe penicillin allergy.

6.4.7.3 PRELABOUR RUPTURE OF MEMBRANES AT TERM (PROM)

O42.0-1/O42.9

DESCRIPTION

Rupture of membranes before the onset of labour at term (>37 weeks).
A sterile speculum examination is required to visually confirm amniotic fluid draining through the cervical os.

GENERAL MEASURES

» If PROM is followed by uterine contractions at >34 weeks' gestation, allow labour to proceed.
» If the woman does not develop uterine contractions within 12 hours of PROM, commence antibiotics and transfer for induction of labour.

MEDICINE TREATMENT

Prolonged pre-labour rupture of membranes >12 hours/ suspected chorio-amnionitis:

Initiate antibiotic therapy and refer urgently:

O41.1

- Ampicillin, IV, 1 g as a single dose. A

AND

- Metronidazole, oral, 400 mg as a single dose and refer. A

Severe penicillin allergy:

Z88.0

- Azithromycin, oral, 500 mg as a single dose. W

AND

- Metronidazole, oral, 400 mg as a single dose and refer. A

LoE:IIa[36]

REFERRAL

Urgent

» Suspected chorio-amnionitis (refer after starting antibiotics).
» Prolonged pre-labour rupture of membranes (>12 hours).
» Meconium stained liquor.

6.5 INTRAPARTUM CARE

O80.0-1/O80.8-9

For the comprehensive management of women in labour refer to the most recent National Maternity Care and Intrapartum Care Guidelines.

DESCRIPTION

Labour is divided into 4 stages:

» First stage:
  - onset of regular painful uterine contractions at term to full dilatation of cervix.
» Second stage:
  - full dilatation to delivery of the baby.
» Third stage:
  - delivery of the baby to delivery of the placenta.
» Fourth stage:
  - 1 hour post-delivery of the placenta.

GENERAL MEASURES

» Encourage companion support.
» Ensure that the mother is adequately hydrated (can be done orally).
» Monitor progress of labour on partogram.

MEDICINE TREATMENT

First stage with cervical dilatation <10 cm:

Analgesia:

O62.9 + (Z51.2)

- Morphine, IM, 0.1 mg/kg to a maximum of 10 mg, 4 hourly.

LoE:IVb[37]

OR

Especially in advanced first stage of labour:

- Nitrous oxide 50% mixed with oxygen 50%, given by mask.

AND

For nausea and sedation, if needed:
- Promethazine, IM, 25 mg 4 hourly.

Second stage

If episiotomy is needed, local anaesthetic:
O62.9 +(R10.2+Z51.2)
- Lidocaine1%.
  - Do not exceed 20 mL.

Fetal distress during labour
O68.0-3/O68.8-9/O75.9
Place the woman in the left lateral position.
Tocolysis, then refer:
- Salbutamol, IV, 0.5 mg/mL, 250 mcg administered slowly over 2 minutes.
  - Reconstitute as follows:
  - Salbutamol 1 mL (0.5 mg/mL) added to 9 mL of water for injection, to make a 50 mcg/mL solution. Monitor pulse.
  - Inject 5 mL (250 mcg) over at least 2 minutes. Monitor pulse.
  - If pulse increases >120 beats/minute, discontinue the injection.
  - Do not administer if mother has cardiac disease.

Third stage

Prevention of post-partum haemorrhage (PPH):
Z29.2
» Check for twins.
- Oxytocin, IM, 10 units.

» Clamp and cut cord after 1 minute.
» Controlled cord traction of the placenta.
If >500 mL blood loss, manage as postpartum haemorrhage (see Section 6.7.1: Postpartum haemorrhage (PPH)).

Rh-negative mother
O36.0
» Check baby's Rh status; do not given anti-D if the baby is Rh-negative, or if the mother has Anti-Rh antibodies.

Administer to Rh-negative mother, if baby is Rh-positive or baby's Rh group is unknown:
- Anti-D immunoglobulin, IM, 100 mcg, preferably within 72 hours but can be given up to 7 days after delivery.

Care of the newborn baby
If baby not crying/breathing well, see Section 6.6.2: Neonatal Resuscitation.
For routine care of the neonate, see Section 6.6.1: Routine care of the neonate.
Observe mother and neonate for 1–2 hours before transfer to the postnatal ward.

For pain after delivery
- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

If needed

- Ibuprofen, oral, 400 mg 8 hourly with or after a meal as needed for up to 5 days. *LoE:IVb*

REFERRAL

» Prolonged labour according to charting on partogram.
» Fetal distress during labour
» Post-partum haemorrhage.
» Retained placenta.
» Other complications of mother or baby.

6.6 CARE OF THE NEONATE

6.6.1 ROUTINE CARE OF THE NEONATE

Z76.2

For the comprehensive management of the newborn refer to the most recent Newborn Care Charts.

GENERAL MEASURES

Routine care for baby after delivery

» Dry the baby thoroughly at birth.
» If there is meconium, clear the airway first.
» **If baby is not crying**
  - Clear airway, stimulate.
  - If baby not breathing well, clamp and cut the cord and start resuscitation (see Section 6.6.2: Neonatal Resuscitation).
» **If the baby is crying and breathing well**
  - Place on mother's chest, keep warm and check breathing.
  - Clamp and cut cord after 1 minute.
  - Monitor with mother and initiate breastfeeding.

Check and record the Apgar score:

Apgar score	0	1	2
Heart rate	Absent	<100/min	>100/min
Respiration	Absent	Slow or irregular	Good, crying
Muscle tone	Limp	Slight flexion	Active, moves
Response to stimulation	No response	Grimace	Vigorous cry
Colour	Blue or pale	Body pink, limbs blue	Pink all over

Check baby from head to toe including baby's back

» Check weight and head circumference.
» If any of the following, provide immediate management (see Section 6.6.3: Care of sick and small neonates) and refer to a neonatal unit:
  - Grunting or chest indrawing
  - Central cyanosis
  - Less than normal movements
  - Major congenital abnormality

- Fast breathing
- Abnormal tone (floppy/stiff)
- Head circumference >39 cm
- Birth weight <2.0 kg

Identify the infant at risk or needing special treatment

» Birth weight <2.5 kg.
» Suspected chorio-amnionitis (membranes ruptured for >18 hours, offensive liquor at birth).
» Neurological or congenital problem.
» Hospital stay >3 days after delivery.
» Mother blood group O and/or Rh –ve.
» Possible social problem (mother has died or is ill, teenage caregiver, social deprivation).
» Mother diabetic.
» Mother syphilis positive (partially treated or untreated or treated <1 month before delivery).
» Mother HIV-infected.
» Infant not breastfed.
» Mother on TB treatment.

Initiate bonding and feeding

» Place the baby skin-to-skin with mother and initiate breastfeeding immediately.

Identify and record

» Formally identify the baby with the mother.
» Place a label with the mother's name and folder number, baby's sex, and time and date of birth on the baby's wrist and ankle.
» After giving vitamin K and chloramphenicol eye ointment, give the baby back to the mother, unless there is a reason for the baby to be transferred to a neonatal unit.

MEDICINE TREATMENT

Bleeding prophylaxis

Z29.2

- Vitamin K, IM, 1 mg immediately after birth routinely.
  - Administer in the antero lateral aspect of the mid-thigh.

Neonatal conjunctivitis prophylaxis

Z29.2

- Chloramphenicol ophthalmic ointment 1%, applied routinely to each eye after birth.

Routine EPI immunisation:

- BCG vaccination, intradermal, once neonate is stable. (Z23.2)
- bOPV (polio vaccine), oral, once neonate is stable. (Z24.0)

No baby must be sent home without immunisation.

REFERRAL

Refer to a neonatal unit if:

» Baby needed resuscitation.
» Apgar score <8 at 5 minutes.

6.6.2 NEONATAL RESUSCITATION

P29.8

Be prepared
Be at the delivery
Check the equipment and emergency medicines

» Follow the algorithm at the end of this section.
» Check that each step has been effectively applied before proceeding to the next step. The algorithm follows the assumption that the previous step was unsuccessful and the baby is deteriorating.
» Use oxygen concentration that alleviates central cyanosis, obtains target pulse oximetry readings (if pulse oximeter is available), and restores a heart rate >100 beats/minute. Bag and mask ventilation should be initially done with room air. (There is evidence that routine resuscitation with 100% oxygen is potentially harmful to the baby.)

An unsatisfctory response to resuscitation includes:
» A sustained slow heart rate, usually ≤60 beats/minute or a progressive decrease in heart rate until cardiac arrest occurs.
» Episodes of cardiac arrest, with a progressively weaker response to chest compressions, positive pressure ventilation and medicines.
» A decreasing blood pressure, increasing acidosis, severe hypotonia with central cyanosis or intense pallor.
» Apnoea or weak, irregular and inefficient respiratory efforts.

MEDICINE TREATMENT

If baby's response to resuscitation is inadequate once ventilation and circulation are adequately supported the following steps should be carried out:

If the mother is known or suspected to have had narcotic pain relief and the baby has normal heart rate and colour response to bag-mask ventilation, but has not initiated sustained regular respiratory effort:

- Naloxone, IV, 0.1 mg/kg.

Naloxone is not routinely indicated for neonatal resuscitation.

Check the blood glucose of the baby.If hypoglycaemia is present:

E16.0-2/P70.4

- Dextrose 10%, IV, 2.5 to 5 mL/kg.

Medicines used during neonatal resuscitation

Medicine and dose	Indications	Effect
• Adrenaline (epinephrine) ○ 0.1 mL/kg of a 1:10 000 dilution IV, (0.01 mg/kg/dose). ○ ET, up to 1 mL/kg of a 1:10 000 dilution (0.1 mg/kg/dose).	» Asystole. » Heart rate <60 beats/minute.	» ↑Heart rate. » ↑Myocardial contractility. » ↑Arterial pressure.

• Naloxone, IV/IM, 0.1 mg/kg. ○ May need repeating after 2 hours.	» Maternal administration of opiates with apnoeic infant.	» Corrects apnoea and/or hypoventilation.

• Dextrose,10% IV.
  ○ 2.5–5 mL/kg of 10% dextrose (250–500 mg/kg).
  ○ 10% solution: draw up 4 mL of 50% dextrose into a 20 mL syringe then draw up 16 mL water for injection – mix by agitating the syringe.
	» Hypoglycaemia (usually only occurs after acute resuscitation).	» Corrects hypoglycaemia.

Fluid for volume expansion: • Sodium chloride 0.9%, IV, 10–20 mL/kg, slow IV (5–10 minutes).	» Hypovolaemia (usually history of blood loss, child pale shocked with poor pulses and perfusion).	» ↑Blood Pressure and improve tissue perfusion.

If no adequate response has occurred by this stage, a person skilled in neonatal resuscitation should be consulted and the baby transferred with ongoing resuscitation to a higher level of care:

» Discontinue resuscitation if the unsatisfactory response to resuscitation persists for >20 minutes and underlying conditions e.g. pneumothorax, diaphragmatic hernia has been excluded or >10 minutes of unresponsive cardiac arrest (asystole) and/or >20 minutes of unsustained respiration.

» Babies requiring minimal resuscitation with prompt and complete response may be watched with their mothers.

» Babies with a favourable response to resuscitation should be referred to a neonatal high or intensive care unit, if available, for post resuscitation care.

» Babies, who, after resuscitation, are not completely normal, should be referred to a higher level for care using transport with necessary support, e.g. oxygen, temperature control.

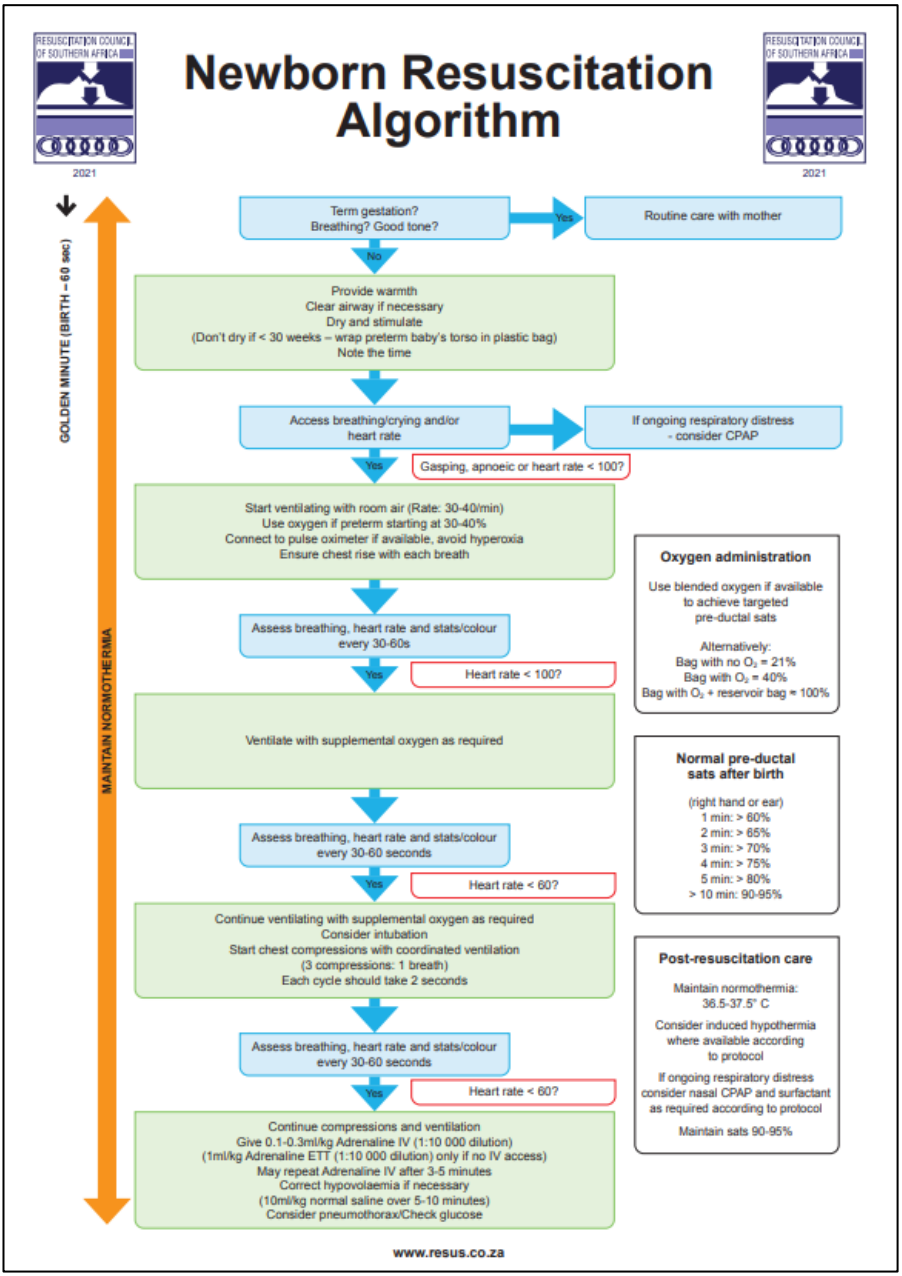

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Figure 6.1: Newborn resuscitation algorithm

6.6.3 CARE OF SICK AND SMALL NEONATES

DESCRIPTION

Neonates can become ill very rapidly and signs of disease are often not readily appreciated unless specifically looked for. Neonates should be referred urgently.
Neonates <2.5 kg are at higher risk of feeding and growth problems and need careful follow-up.

Urgently manage and refer neonates with any of the following signs of possible serious bacterial infection and/or jaundice:

- » Convulsions
- » Lethargic/ unconscious
- » Bulging fontanelle
- » Apnoea (<30 breaths/min)
- » Severe chest indrawing
- » Nasal flaring or grunting
- » Swollen eyes; pus draining from eye
- » Low or high temperature
- » Not able to feed
- » Passing blood per rectum
- » Pallor
- » Jaundice in 1st 24 hours of life
- » Diarrhoea
- » Many or severe skin pustules
- » Fast breathing (>60 breaths/min)
- » Vomiting everything/bile-stained vomitus
- » Only moves when stimulated
- » Umbilical redness extending to the skin and draining pus

GENERAL MEASURES

- » Keep the neonate warm (skin-to-skin/kangaroo mother care or in an incubator), the axillary temperature should be 36.5–37°C.
- » Check blood glucose concentration and treat if low (<2.6 mmol/L). Check blood glucose concentration again after 15 minutes. If normal, feed 2 to 3 hourly. If still low, treat as severe hypoglycaemia (see below).
- » Check mother able to successfully establish breastfeeding in the small neonate and check health and weight gain more frequently.

MEDICINE TREATMENT

If grunting or severe chest indrawing

P22.0-1/P22.8-9

- Oxygen, using nasal catheter at 1 L/minute.

If infection is suspected and jaundice has been excluded

Z29.2

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a **single dose**. W
  - Administer into the lateral thigh.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

- » If SUSPECTING SERIOUS BACTERIAL INFECTION in neonate, give ceftriaxone, even if jaundiced.
- » Avoid giving calcium-containing IV fluids (e.g. Ringer's Lactate) together with ceftriaxone:
  - If ≤28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.

- If >28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
- Preferably administer IV fluids without calcium contents.

» Always include the dose and route of administration of ceftriaxone in the referral letter.

If blood glucose <2.6 mmol/L and baby able to suckle or take orally:

» Breastfeed or give expressed breastmilk (only if breastfeeding is not possible, give replacement milk feed 10 mL/kg).

» If unable to take orally consider nasogastric tube feeding. Check blood glucose concentration again after 15 minutes. If normal, feed 2 to 3 hourly. If still <2.6 mmol/L, manage as below.

If blood glucose <1.4 mmol/L or remains <2.6 mmol/L after an oral feed:

- Dextrose 10%, IV, 2 mL/kg as a bolus.

AND

- Dextrose 10%, IV, 3 mL/kg/hour. *LoE:IVb*[38]
  - Repeat in 15 minutes.
  - If blood glucose still low, repeat dextrose bolus.

REFERRAL

Urgent

» All neonates with a possible serious bacterial infection.

» All neonates with jaundice on the first day of life, with pallor or with poor feeding.

» All other neonates with increasing, deep or persistent (>10 days) jaundice should be referred as soon as possible.

» All small neonates (<2.5 kg) not able to feed.

» Persistent hypoglycaemia despite treatment.

(If possible, always send mother with the neonate as well as any clinical notes).

6.6.4 CARE OF THE HIV-EXPOSED INFANT

See Section 11.5: The HIV-exposed infant.

6.6.5 PERINATAL TRANSMISSION OF HEPATITIS B

P00.2

DESCRIPTION

Babies born to mothers with acute hepatitis B infection at the time of delivery or to mothers who are HBsAg-positive or HBeAg-positive.

MEDICINE TREATMENT

- Hepatitis B immunoglobulin, IM, 0.5 mL within 12 hours of delivery. *LoE:IVb*[39]

AND

- Hepatitis B vaccine, IM, 0.5 mL, first dose within 12 hours of delivery. *LoE:IVb*[40]
  - Continue hepatitis B immunisation according to the recommended immunisation schedule.

» Check the baby's hepatitis B surface antigen (HBsAg) and hepatitis B surface antibody (HBsAb) at 9 months:
  - If HBsAg positive: baby has hepatitis B infection – refer.
» If HBsAg negative and HBsAb negative: repeat vaccination with hepatitis B containing vaccine, with a repeat dose in 1 month. Repeat HBsAb one month after the second dose; if still HBsAb negative then refer.
» If HBsAb positive: baby is immune to hepatitis B. Reassure parents, no further testing required.

Note: Do not check hepatitis B serology before 9 months of age as antibodies from the birth dose of immunoglobulin might still be present. Refer if hepatitis B serology is not available.

6.7 POSTPARTUM CARE

6.7.1 POSTPARTUM HAEMORRHAGE (PPH)

O72.0-3

DESCRIPTION

Primary postpartum haemorrhage (PPH) is blood loss >500 mL that occurs within 24 hours of birth.
Secondary PPH occurs 24 hours to 12 weeks after delivery (late or delayed PPH).
The most common cause of primary PPH is an atonic uterus.

GENERAL MEASURES

» Massage fundus and expel clots from vagina.
» Empty the bladder.
» Two intravenous lines (wide bore if possible).
» Bimanually compress the uterus to stop the bleeding.
» If no response to medicine treatment, insert a condom catheter (an open condom slipped over a large Foley's catheter and secured at its base with string to provide a makeshift balloon catheter) into uterus, inflate with 400 to 500 mL of saline and clamp. Pack vagina with swabs to prevent expulsion and refer urgently.

MEDICINE TREATMENT

Replace fluids:

- Sodium chloride 0.9%, IV, infused as fast as possible in one IV line.

AND

- Oxytocin, IV 20 units in 1 000 mL sodium chloride 0.9% infused at 250 mL/hour in 2nd IV line. *LoE:IIb*[41]

AND

Tranexamic acid, IV, 1g in 200 mL sodium chloride 0.9% over 10 minutes, or 1 g by slow IV injection,

which may be initiated by a nurse, but only with prior approval of a medical practitioner. *LoE:IIIb*[42]

If no response:

- Ergometrine, IM, 0.5 mg. *LoE:IVb*

OR

- Oxytocin/ergometrine, IM, 5 units/0.5 mg.
  - Avoid ergometrine in hypertensive women and those with heart disease, unless haemorrhage is life threatening (woman haemodynamically unstable).
  - Repeat after 10 to 15 minutes if no response to 1st dose, while arranging referral.

Only in settings where oxytocin is not available:

- Misoprostol, sublingual/rectal, 600mcg as a single dose. *LoE:IIa*[43]

REFERRAL

All cases.

6.7.2 PUERPERAL SEPSIS

O85/O86.0-4/O86.8

DESCRIPTION

Clinical features include a temperature ≥38°C (usually ≥2 days after delivery), often accompanied by offensive vaginal discharge (lochia) and/or abdominal pain within the first 10 days postpartum. In post caesarean section (CS) cases, there may additionally be tenderness around the CS wound and offensive discharge from the wound.

GENERAL MEASURES

» Monitor vital parameters, e.g. Hb, pulse, BP, temperature.
» Treat for shock if indicated.

MEDICINE TREATMENT

- Ceftriaxone, IV, 1 g as a single dose. W

CAUTION: USE OF CEFTRIAXONE
Do not administer calcium-containing fluids, e.g. Ringer-Lactate, concurrently with ceftriaxone.

AND

- Metronidazole, oral, 400 mg as a single dose. A

REFERRAL

All cases.

6.7.3 CRACKED NIPPLES DURING BREASTFEEDING

O92.1

DESCRIPTION

The areola and nipple are protected by the secretion of a lubricant from Montgomery's glands. Cracked nipples may lead to infection and mastitis.

Causes of cracked nipples include:

» poor positioning of the baby and incorrect attachment to the breast,

» removing the baby from the breast before suction is broken,
» the four signs of good attachment are:
» chin touching breast (or very close),
  - mouth wide open,
  - lower lip turned outward,
  - more areola visible above than below the mouth.

GENERAL MEASURES

» Apply expressed breast milk to the nipples between feeds and air dry.
» If too painful, express the milk and nurse the baby on the other breast until improvement.
» Keep areola and nipple clean and dry.
» Avoid use of soap, creams and lotions on the nipples.

MEDICINE TREATMENT

- Zinc and castor oil ointment.
  - Apply between feeds.

If oral thrush is present, treat neonate with:

- Nystatin solution, oral. See Section 1.2: Candidiasis, oral (thrush).

REFERRAL

No improvement after 2 days.

6.7.4 MASTITIS

O91.2

DESCRIPTION

Inflammation of the breast tissue surrounding the milk ducts.
Risk factor includes retrograde infection from a fissured nipple and milk stasis.
Commonly isolated pathogens include *S. aureus* and *S. epidermidis*. Presentation includes painful breast(s), fever, erythema and malaise.

GENERAL MEASURES

Compresses.
Regular expressing of breast milk.
Do not stop breastfeeding, unless a breast abscess has developed.
If breast abscess present, refer for incision and drainage.

MEDICINE TREATMENT

- Flucloxacillin, oral, 500 mg 6 hourly for 5 days. A

Severe penicillin allergy:

Z88.0

Macrolide, e.g.:

- Azithromycin, oral, 500 mg daily for 3 days. W

Pain:

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).

- Maximum dose: 15 mg/kg/dose.

REFERRAL

» Breast abscess.
» No improvement after 2 days.

6.8 HIV IN PREGNANCY

O98.7

DESCRIPTION

HIV is currently the commonest cause of maternal deaths in South Africa. Transmission of HIV from mother to infant may occur during pregnancy, delivery and/or breastfeeding. Without intervention, 25–40% of infants born to women living with HIV may become infected. With appropriate interventions, maternal mortality as well as perinatal transmission of HIV can be substantially reduced. 4% of women who were initially HIV-negative become positive later during pregnancy. Repeat HIV testing is essential.
For comprehensive information on the care of HIV-infected pregnant women refer to the current National Consolidated Guidelines for the Prevention of Mother-to-Child Transmission of HIV (PMTCT) and the management of HIV in Children, Adolescents and Adults as well as the current Guidelines for Maternity Care in South Africa. See Chapter 11: HIV and AIDS.

GENERAL MEASURES

HCT in all pregnant and breastfeeding women

» Provide routine counselling and voluntary HIV testing to all pregnant women (if HIV status is negative or unknown) at their very first antenatal visit, and treat other STIs if necessary.
» All women who test negative must be offered repeat HIV testing at every routine visit throughout pregnancy, at labour/delivery, at the 6-week EPI visit and 3-monthly throughout breastfeeding.
» Perform a TB symptom screen at each visit.

Women who choose not to be tested

» Provide with individual 'post-refusal' counselling and offer HIV testing at every subsequent visit.
» Perform a TB symptom screen at each visit.
» Counsel on risks of MTCT to unborn baby, HIV risk reduction behaviour and offer HIV prevention services.

Pregnant women who test HIV positive

» Confirm result with a 2nd rapid HIV test of another type in compliance with current HCT policy.
» If results are discordant, repeat both first and confirmatory rapid HIV tests and if still discordant, send blood for a laboratory HIV ELISA.
  - All confirmed HIV-infected women must be fast-tracked for ART regardless of CD4 count.
» Perform clinical staging and TB symptom screen, and take a blood sample for CD4 cell count and creatinine, on the day of testing. Obtain results within a week.

» If CD4 <200 cells/mm^3, do a serum cryptococcal antigen (CrAg) test.
» Start ART on the day of diagnosis (unless there are symptoms of TB).
» Investigate all those with TB symptoms before ART initiation. If TB treatment is started, defer ART for 2 weeks.
» HIV-infected women (WLHIV) must return 1 week after their initial ANC visit to get their creatinine, and CD4 cell count results and be managed accordingly.
» Refer women with unwanted pregnancies <20 weeks' gestation for termination of pregnancy (TOP) services.
» Perform a TB symptom screen at each visit.

Pregnant women already known to be HIV-infected

» If not on ART, do clinical staging; take blood for CD4 count (to determine eligibility for cotrimoxazole prophylaxis) and creatinine. If CD4 <200 cells/mm^3, do a serum cryptococcal antigen (CrAg) test.
  - Start ART the same day if no contraindication.
» If already on ART for >3 months, take blood for viral load measurement irrespective of when it was last done.
» Perform a TB symptom screen at each visit.

Antenatal support

» Counsel about the importance of adherence and virological suppression for PMTCT.
» Counsel on infant feeding, safer sex, family planning, postnatal contraception, partner testing, routine cervical cancer screening.
» Provide appropriate nutritional care and support including iron, folate and calcium supplementation and Hb testing.

Postpartum support

» Provide adequate support and counselling, particularly addressing ART adherence during breastfeeding.
» Educate mothers about the benefits of breastfeeding. Only in circumstance where the mother has confirmed 2nd or 3rd line ART regimen failure, advise not to breastfeed and prescribe replacement feeds.
» Refer mother to appropriate services to continue lifelong ART as part of the general adult ART population.

MEDICINE TREATMENT

Opportunistic infection treatment and prophylaxis for HIV-infected pregnant women:

Pregnant women diagnosed with pulmonary TB:

» First line TB treatment is safe and effective in pregnant women.
» See Section 17.4.1: Pulmonary tuberculosis (TB) in adults.

Pregnant women on ART with no symptoms of TB:

» See Section 11.2.2: Tuberculosis preventive therapy (TPT).

Women with CD4 ≤ 200 cells/mm^3 or WHO clinical stage 3 or 4:

- Cotrimoxazole, oral, 160/800 mg daily, until CD4 >200 cells/mm^3. A

If CrAg-positive, consult an infectious disease expert, and refer.
See Section 11.3.4: Cryptococcosis.
Note: All CrAg positive women need a LP, unless contra-indicated, regardless of symptoms.

CAUTION

» Although fluconazole should generally be avoided in the 1st trimester, pregnant women should be counselled that the benefits of fluconazole outweigh the risks in the management of cryptococcosis.
» All pregnant women <20 weeks gestation exposed to fluconazole should have an ultrasound scan to detect congenital abnormalities. *LoE:IIIb*[44]
» Fluconazole is present at concentrations similar to maternal plasma concentrations in breast milk. *LoE:IVb*[45]

FIRST-LINE ART REGIMENS *(Also see Section 11.1: Antiretroviral therapy, adults and adolescents)*		
1ST ANC VISIT		
Pregnant women	• Tenofovir, oral 300 mg daily **AND** • Lamivudine, oral, 300 mg daily **AND** • Dolutegravir, oral, 50 mg daily **Note:** Provide as a fixed dose combination (FDC). *LoE:IIa*[46]	» Contraindication to TDF: renal insufficiency with creatinine >85 µmol/L.
If TDF contraindicated	Start alternative regimen (Doctor consult): • Abacavir, oral, 600 mg, daily **AND** • Lamivudine, oral, 300 mg, daily **AND** • Dolutegravir, oral, 50 mg daily *LoE:IIIb*[47]	
Pregnant women currently on ART	• Continue current ART regimen.	» Do a VL as soon as pregnancy is confirmed.
Pregnant women not currently on ART but ART exposed (previous PMTCT or ART loss to follow-up)	• Tenofovir, oral, 300 mg daily **AND** • Lamivudine, oral, 300 mg daily **AND** • Dolutegravir, oral, 50 mg daily **Note:** Provide as a fixed dose combination (FDC). If HBsAg positive: ensure patient is on TDF-containing regimen. *LoE:IIb*[48]	*LoE:IIIb*[49] » Resistance testing for WLHIV failing a DTG-based regimen and who meet the definition of confirmed virological failure may be authorized by an expert on a case-by-case basis.
2ND ANC VISIT (1 WEEK LATER)		
Creatinine ≤ 85 mmol/L	• Continue FDC: TDF+3TC+DTG	

Creatinine >85 mmol/L (TDF is contra-indicated)	• Stop tenofovir Start alternative regimen (Doctor consult): • Abacavir, oral, 600 mg, daily **AND** • Lamivudine, oral, 300 mg, daily **AND** • Dolutegravir, oral, 50 mg daily *LoE:IIIb*[50]	» High-risk pregnancy: change to alternate triple therapy within 2 weeks (Doctor consult) **and refer for renal dysfunction investigation**.
VL <50 c/mL (pregnant women currently on ART)	If still on EFV-based ART, offer switch to: • Tenofovir, oral, 300 mg daily **AND** • Lamivudine, oral, 300 mg daily **AND** • Dolutegravir, oral, 50 mg daily	
VL ≥ 50 c/mL (pregnant women currently on ART)	Continue current regimen whilst investigating and managing cause of elevated VL. Determine if the client should switch to 2nd line.	» Doctor/ expert consult or refer for expert advice. » Pregnant women with confirmed 2nd or 3rd line ART regimen failures should not breastfeed their infants, if they can safely formula feed.
WOMEN DIAGNOSED HIV POSITIVE IN LABOUR		
All unbooked women who test positive during labour should be given prophylactic ART during labour and initiated on lifelong ART before being discharged.	• Nevirapine, oral, 200 mg single dose as early as possible in labour. **AND** • Tenofovir, oral, 300 mg daily **AND** • Lamivudine, oral, 300 mg daily **AND** • Dolutegravir, oral, 50 mg daily **Note:** Provide TDF + 3TC + DTG as a FDC.	Before discharge: Start lifelong ART the day after delivery, if there are no contraindications, regardless of CD4: • TDF+3TC+DTG as a FDC.
POST-DELIVERY		
The mother should start ART within 24 hours of delivery to protect the baby during breastfeeding.	Start lifelong ART regardless of CD4: TDF+3TC+DTG as a FDC	
BABY		
See Section 11.5: The HIV-exposed infant, to decide whether infant is low risk or high risk and what HIV prophylactic management is needed.		

LoE:IIIb[51]

Note:

» eGFR and creatinine clearance are not reliable for diagnosing renal impairment in pregnancy.

» Monitor response to ART within 3 months of ART initiation with a plasma VL. If VL is not suppressed, refer or consult for expert advice.

Viral load monitoring for 1st line regimen in pregnant and breastfeeding women:
Newly diagnosed and initiated ART for the first time:
» Do 1st VL at 3 months on ART.
» If VL <50 c/mL, repeat VL at delivery.

Known HIV-positive women already on ART:
» Measure VL at first/booking visit in ANC,
» If VL <50 c/mL, repeat VL at delivery. *LoE:IIIb*[52]

Known HIV-positive women, who are not currently on ART, but are ART exposed (e.g. previous PMTCT, or ART loss to follow-up) and who are initiating a DTG-containing regimen:

» Do 1st VL at 3 months on ART.
» If VL <50 c/mL, repeat VL at delivery.

REFERRAL

» Refer mothers suspected of non-adherence early.

Urgent

» Creatinine >85 mmol/L.
» ALT >100 IU/L.
» Pregnant women who are CrAg+, and
  - LP cannot be performed, or
  - symptomatic (headache, confusion), or
  - asymptomatic, but in the 1st trimester.

6.9 MATERNAL MENTAL HEALTH

In vulnerable women, pregnancy exacerbates the risk of developing a mental illness. Approximately one in three women in South Africa have depression and/or anxiety in the perinatal period. Globally, postpartum psychosis affects 1 to 2 women in every 1000 after childbirth .

Risk factors for maternal mental illness include past history of mental illness, recent major life event, (e.g. bereavement) early childhood adversity/ abuse, domestic violence, a history of trauma, displacement from home of origin, low socio-economic status, food insecurity. Women who learn that they are HIV positive during pregnancy have a particular vulnerability to mental health conditions.

Untreated maternal mental illness is associated with the following:

» unplanned and unwanted pregnancy,
» poor adherence to health advice; poor uptake of antenatal services,
» tobacco, alcohol and other substance use,
» self-harm and suicide,
» relapse of the mental illness during the pregnancy or postpartum,
» gestational hypertension and/or diabetes,
» poor pregnancy outcomes, including preterm labour and low birth weight,

» increased risk of neonatal morbidity and stillbirth in mothers with bipolar and psychotic disorders,
» poor engagement with the infant,
» poor family relationships; paternal mental health conditions,
» behavioural and neurodevelopmental disorders in the offspring.

Suspect maternal mental illness if:

» unreliable antenatal clinic attendance,
» continued smoking and/or other substance use during pregnancy,
» any odd or eccentric speech or behaviour,
» screened positive using the 3-item tool in the Maternity Case Record.

Pre-conception care:

» Identify at-risk women – any current or past symptoms of mental illness, emotional problems, substance use, poor social support, abusive relationships, recent trauma, socio-economic deprivation.
» Initiate management for mental disorders/ substance use/ psychosocial stress as needed.
» Use medicines which are safe in pregnancy, unless benefit outweighs risk and patient consents to use (if valproate use, sign acknowledgement of risk form https://www.sahpra.org.za/wp-content/uploads/2025/05/GLF-CEM-PV-S01_v2-Valproate-Annual-Risk-Acknowledgement-Form-ARF.pdf.
» Discuss planning for pregnancy and initiate contraception according to individual choice.

6.9.1 PERINATAL DEPRESSION AND/OR ANXIETY

O28.8-9/ O90.9 + (F32.0-3/F32.8-9/ F33.0-4/F33.8-9/F34.1/F53.0-1/F53.8-9)

DESCRIPTION

See Sections 16.4.1: Depressive disorders and 16.3 Anxiety disorders, for symptoms of depression and/or anxiety. Note that these conditions may occur together in the same person.

» Depression and /or anxiety may be antenatal or postpartum. Postpartum depression usually begins within a month of delivery but can present up to a year after delivery.
» Anxiety disorders may present as fear of labour and childbirth, or other fears e.g. needle phobia. Such fears may interfere with antenatal and postnatal care if they are not addressed.
» Postpartum blues last less than a week, are characterised by irritability, tearfulness, anxiety beginning by day 3 to 5 postpartum. Usually resolve with gentle support but may progress to depression.

CAUTION: Suicide

» Highest risk period is from 6 weeks before to 12 weeks after delivery.
» Adolescent mothers are at particular risk.
» Those with a prior history of self-harm at particular risk.
» See Section 16.7: Suicide risk assessment.
» Inform all healthcare providers involved of suicide risk.
» Ensure psychosocial support – partner/ family/ NGO/ welfare support.

» Optimise treatment of mental illness.
» Do not leave unattended if high risk of self-harm.

GENERAL MEASURES

Antenatal

» Don't stop psychiatric medication if stable on treatment: assess course of illness, severity, and suicide risk. Refer if any or increasing signs of severity.
» Discuss potential benefits/harms of medication to patient and baby as well as alternatives (see Adult Hospital Level Sections 15.2: Anxiety and obsessive-compulsive disorders and 15.3.1: Depressive disorders).
» Antenatal care: provide active adherence support; provide regular, frequent CHW home visits; watch for preterm labour and/or SGA baby; follow-up on any up-referral.
» Explore and address psychosocial stressors: *LoE:IIIb*[53]
  - Mobilise patient's support system.
  - Stress management/coping skills – refer for counselling e.g. at www.sadag.org.
  - Relationship and family issues – refer for counselling, e.g. at www.famsa.org.za
  - Abuse or interpersonal violence - refer to a social worker and for support, e.g. by www.genderjustice.org.za or www.powa.co.za.

Postnatal

» Continue close home-based support of mother and baby for at least the first year.
» Encourage breastfeeding, if not contraindicated medically. (Breastfeeding difficulties may also be associated with depression and anxiety.)
» Optimise treatment of mental illness and co-morbid physical health conditions. *LoE:IIIb*[54]
» Optimise psychosocial and parenting support – utilise support groups e.g. at www.sadag.org Refer to Social Welfare if suspect child-care is seriously impaired.

MEDICINE TREATMENT

See Sections 16.4.1: Depressive disorders and 16.3: Anxiety disorders, for treatment of depression and/or anxiety.

» Mild to moderate anxiety – refer for psychotherapy if available (and/or psychosocial support from mothers' groups, NGOs, counsellors) and monitor response.
» Moderate – severe anxiety and/ or depression - antidepressant (SSRI) treatment for early symptom control and prevention of relapse is generally necessary.

REFERRAL

» All severe depression where functioning is severely impaired.

» Poor response to psychological and supportive medication.
» Poor response to first line SSRI (antidepressant) medication.
» Factors requiring urgent admission, invoke the MHCA if necessary:
  - Suicide risk.
  - Any possible psychotic features.
  - Risk to infant.

6.9.2 BIPOLAR, SCHIZOPHRENIA, AND RELATED DISORDERS

O28.8-9/ O90.9 + (F28/F29/F53.0-1/F53.8-9)

DESCRIPTION

Bipolar disorders (BD):

See Adult Hospital STG Sections 15.3.2: Bipolar and related disorders for description and management in the perinatal period.

Note that:

» BD may present with antenatal or postnatal depression, hypomania, mania or psychosis.
» the index episode often occurs postpartum – may be no prior history of mental illness.
» risk of relapse in those known to have BD is increased in pregnancy and postpartum.
» women with bipolar disorder have a 1 in 4 chance of postpartum psychosis.
» BD is associated with increased risk of pre-eclampsia, placental abnormalities, preterm delivery, LBW and SGA babies, neonatal morbidity, and maternal suicide.

Schizophrenia and related disorders:

See Section 16.5: Psychosis and Adult Hospital STG Section 15.5: Psychotic disorders for description and management.

Note that:

» Psychotic disorders are associated with poor pregnancy outcomes as with BD plus increased risk of diabetes, stillbirth, sudden infant death syndrome.
» The rate of deterioration from a non-psychotic to psychotic state may be more rapid in the postpartum period than usual. Take any reports of unusual behaviour by family members as serious and urgent.

CAUTION: Psychosis

» Is a medical emergency; requires urgent hospitalisation.
» Always exclude delirium due to puerperal sepsis.
» May present with subtle, odd behaviour and/or thoughts; women may be blunted, withdrawn, agitated, or aggressive.
» High risk for harm to self or others, suicide, infanticide.
» May severely impair mother-infant bonding and child-care.
» Manage aggressive or disruptive behaviour (see Section 16.1.2: Aggressive disruptive behaviour in adults).

GENERAL MEASURES

» Manage all pregnancies as high-risk in conjunction with obstetrician and psychiatrist.

» Don't stop psychiatric medication – discuss with Doctor/ psychiatrist.
» Actively monitor adherence to antenatal care and hospital referrals.
» Provide regular, frequent CHW home visits.
» Arrange for hospital delivery.
» Postpartum – keep in hospital, monitor mother and new-born, and ensure home-based care and outpatient follow-up before discharge.

Factors requiring urgent admission, invoke the MHCA if necessary:

» Suicide risk.
» Any possible psychotic features.
» Risk to infant.

REFERRAL

All patients.

GYNAECOLOGY

6.10 ECTOPIC PREGNANCY

O00.0-2/O00.8-9

DESCRIPTION

Pregnancy outside the uterus, usually presenting with the combination of:

» amenorrhoea (missed menstrual period),
» sudden lower abdominal pain/ pelvic pain,
» vaginal bleeding (os closed),
» dizziness,
» shock,
» anaemia,
» urine pregnancy test usually positive,
» shoulder tip pain.

Note: Consider ectopic pregnancy in young women who complain of lower abdominal pain.

GENERAL MEASURES

» Monitor vital parameters, e.g. Hb, pulse, BP, temperature.
» Treat for shock if indicated.

MEDICINE TREATMENT

- Sodium chloride 0.9%, IV.

REFERRAL

Urgent

All suspected cases of ectopic pregnancy.

6.11 VAGINAL BLEEDING

Note: Women should receive regular screening for cervical cancer after the age of 30 years. Any opportunity to perform screening should be taken; this includes taking pap smears during pregnancy.

6.11.1 ABNORMAL VAGINAL BLEEDING DURING REPRODUCTIVE YEARS

N92.0-2/3-6

DESCRIPTION

Increased vaginal blood flow in either volume, duration, and/or frequency, including menorrhagia or dysfunctional uterine bleeding.

GENERAL MEASURES

» Assess current contraceptives used.
» Exclude pregnancy complication or organic disease e.g. cervical cancer, fibroids.

MEDICINE TREATMENT

- Combined oral contraceptive pill (ethinylestradiol/levonorgestrel) for 3 to 6 months.
- Ibuprofen, oral, 400 mg 8 hourly with or after a meal as needed for 2 to 3 days.
  - Ibuprofen may reduce blood loss in menorrhagia associated with intrauterine contraceptive device (IUCD) or chronic salpingitis (see Chapter 12: Sexually transmitted infections).

If blood loss has been severe or there are signs of anaemia:

- Ferrous sulfate compound BPC (dried), oral, 170 mg (± 55 mg elemental iron) 12 hourly with meals.

OR

- Ferrous fumarate, oral, 200 mg (± 65 mg elemental iron) 12 hourly.

  - Continue for 3 months after Hb normalises - to replenish body iron stores.
  - Taking iron tablets with meals decreases iron absorption, but improves tolerability. (**Note:** Do not take iron tablets with milk.) *LoE:IIb*[55]

REFERRAL

» No improvement.
» Girls <12 years of age with vaginal bleeding before the development of their secondary sexual characteristics.
» For investigation of other causes such as:
  - sexual abuse,
  - foreign bodies,
  - tumours of the genital tract.
» Severe anaemia.

6.11.2 POST-MENOPAUSAL BLEEDING

N95.0

DESCRIPTION

Vaginal bleeding six months following the complete cessation of menstruation.
Note: If bleeding is profuse, stabilise before referral.

REFERRAL

All cases, to exclude underlying malignancy and other pathology.

6.12 DYSMENORRHOEA

N94.4-6

DESCRIPTION

Pain associated with menstrual cycles. In primary dysmenorrhoea there is no known cause. Secondary dysmenorrhoea usually has an organic cause.

GENERAL MEASURES

» Advise and reassure women with primary dysmenorrhoea about the nature of the condition.

» Encourage patient to carry on with normal everyday activities.

MEDICINE TREATMENT

- Ibuprofen, oral, 400 mg 8 hourly with or after a meal as needed for 2 to 3 days.

ADD

- Combined oral contraceptive pill, if symptoms still problematic, and if pregnancy is not planned.

Treat for pelvic infection when present.

REFERRAL

» Poor response to treatment.
» If an organic cause is suspected, e.g. fibroids.

6.13 HORMONE THERAPY (HT)

N95.1-2/N95.8-9

Indications:
Short-term symptomatic relief for severe menopausal symptoms.
For menopausal women, treatment should be ≤5 years.
Risk-benefit assessment should be individualised in all patients.

Contra-indications include:

» Known or suspected estrogen-dependent malignant tumours (such as endometrial cancer).
» Coronary heart disease.
» Active liver disease.
» Women ≥ 60 years of age.
» Current, past or suspected breast cancer.
» Thrombophilia.
» Undiagnosed genital bleeding.
» Previous idiopathic or current venous thromboembolism.
» Untreated endometrial hyperplasia.
» Porphyria cutanea tarda.

GENERAL MEASURES

Prior to starting HT:

» Do breast and gynaecological examination.
» Cervical screening.

MEDICINE TREATMENT (Doctor initiated)

Uterus present (no hysterectomy)
HT can be offered as sequentially opposed or continuous combined preparations. Continuous combined preparations are often preferred if the woman had her last menstrual period (menopause) over a year ago, as they will not usually cause bleeding then. For women who are still menstruating or have recently stopped, sequentially opposed preparations are preferred and will result in regular menstrual periods, whereas continuous combined may result in irregular bleeding.

CONTINUOUS COMBINED THERAPY
• Estradiol/norethisterone acetate, oral, 1mg/0.5mg for 28 days.
OR
• Estradiol/norethisterone acetate, oral, 2mg/1mg for 28 days.
OR
• Conjugated estrogens, oral, 0.3 to 0.625 mg for 28 days. **AND** • Medroxyprogesterone acetate, oral, 2.5 to 5mg daily for 28 days.

OR

SEQUENTIALLY OPPOSED THERAPY
• Estradiol valerate/cyproterone acetate, oral: • Estradiol valerate, oral, 2 mg for 11 days. • Estradiol valerate/cyproterone acetate, oral, 2mg/1mg for 10 days. • Placebo, oral, for 7 days.
OR
• Estradiol valerate, oral, 1 to 2 mg daily for 21 days. **ADD** • Medroxyprogesterone acetate, oral, 5 -10 mg daily from day 12 to 21. Followed by no therapy from day 22 to 28.
OR
• Conjugated estrogens, oral, 0.3 to 0.625 mg daily for 21 days. **ADD** • Medroxyprogesterone acetate, oral, 5–10 mg daily from day 12 to 21. Followed by no therapy from day 22 to 28.

LoE:IVb[56]

Note: Where a dose range is provided start at the lowest possible dose to alleviate symptoms. The need to continue HT should be reviewed annually.

Women with no uterus (post-hysterectomy)

- HT is given as estrogen only, e.g.:
- Estradiol valerate, oral, 1–2 mg daily.

OR

- Conjugated estrogens, oral, 0.3 mg daily to a maximum of 1.25 mg daily.

REFERRAL

» Premature menopause, i.e. <40 years of age.
» Severe osteoporosis
» Management difficulties, e.g. where oestrogen therapy is contra-indicated, poorly tolerated, or ineffective.
» Post-menopausal bleeding.
» If HT needed (symptoms persist) after 5 years of HT or woman ≥ 65 years.

6.14 VAGINAL ULCERS

See Section 12.5: Genital ulcer syndrome (GUS).

6.15 VAGINAL DISCHARGE/LOWER ABDOMINAL PAIN IN WOMEN

See Sections 12.1: Vaginal discharge syndrome (VDS) and 12.2: Lower abdominal pain (LAP).

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PHC Chapter 7: Family planning

The guidance contained in this chapter is currently limited to contraception and does not cover all aspects of family planning such as pre-conception care. Refer to the National guidelines for safe conception and infertility for further guidance.

INTRODUCTION TO CONTRACEPTION

For comprehensive guidance, consult the most recent National Contraception Clinical Guidelines (especially for women with medical conditions), the National Clinical Guidelines for Safe Conception and Infertility, as well as the WHO Medical eligibility criteria for contraceptive use and the WHO family planning handbook for providers.

LoE:IVb[1]

Women should decide their own family planning method in consultation with their healthcare professional, taking into account the individual considerations of safety, efficacy, acceptability, and access. Always obtain a complete medical and sexual history and perform an appropriate physical examination to ensure that there are no contra-indications to using a particular method. Provide counselling and always exclude pregnancy before commencing contraception.

Contraceptive methods

Hormonal contraception and IUCDs do not prevent sexually transmitted infections (STIs), including HIV. Dual protection, i.e. the use of a condom in combination with another contraceptive method, is recommended to reduce the risk of STIs, including HIV.

Contraceptive method	Advantages include:	Disadvantages include:
Copper IUCD (see Section 7.1)	» Suitable for most women, including nulliparous women. » Provides long-term protection, i.e. 5 years. » Convenient, does not require frequent follow up. » Works immediately upon insertion. » Non-hormonal, therefore no interaction with other medication and no hormonal side effects. » Fertility returns immediately upon removal of IUCD in women of child-bearing age. » Can be used for emergency contraception (see Section 7.4). » Safe to use during breastfeeding.	» Some discomfort or cramping during, and following insertion. » IUCD must be inserted or removed by a trained healthcare professional. » Should not be used in women with menorrhagia, high risk of STIs, active STIs and active pelvic inflammatory disease (PID), purulent cervicitis, unexplained uterine bleeding, cervical and endometrial cancers or other uterine abnormalities.
Levonorgestrel Intrauterine device (LNG-IUD) (see Section 7.2.2)	» Suitable for most women, including nulliparous women. » Provides long-term protection (up to 5 years). » Convenient, does not require frequent follow-up. » Works immediately upon insertion. » Immediate return to fertility upon removal.	» Bleeding changes are common but not harmful. Typically, lighter and fewer days of bleeding, or infrequent or irregular bleeding. » LNG-IUD must be inserted or removed by a trained healthcare professional.

	» Reduces menstrual cramps, heavy menstrual bleeding, and symptoms of endometriosis. » Similar to the Copper IUCD, can be inserted at the time of a caesarean section and postpartum (within 48 hours after delivery). *LoE:IIb*[2]	» Should not be used in women with active PID. *LoE:IIIb*[3]
Hormonal subdermal: progestin-only implant (see Section 7.2.1)	» Provides long-term protection, i.e. 3 years (etonogestrel) or 5 years (levonorgestrel). » Convenient, does not require frequent follow up. » Can also be used in women >35 years who are obese, who smoke, or who have diabetes, hypertension, or a history of venous thromboembolism. » Fertility returns upon removal of the implant in women of child-bearing age.	» Frequent bleeding irregularities. » Implant must be inserted or removed by a trained health care professional under aseptic conditions to prevent infection. » Incorrect insertion and removal techniques may result in complications.
Hormonal injectable: progestin-only (see Section 7.2.3)	» Daily adherence is not required. » Long-acting, i.e. given every 8 or 12 weeks. » Interactions with other medicines do not lower the contraceptive effect. » Can be used postpartum. » Can also be used in women >35 years who are obese, who smoke, or who have diabetes, hypertension, or a history of venous thromboembolism.	» Delayed return to fertility of up to 9 months after the last injection. » Frequent bleeding irregularities (irregular, prolonged and/or heavy bleeding, or amenorrhoea). » Associated with a possible weight gain *LoE:IIIb*[4]
Hormonal oral: progestin-only (see Section 7.2.4)	» Fertility returns within 3 months of discontinuing the pill. » Can be used postpartum. » Can also be used in women >35 years who are obese, who smoke, or who have diabetes, hypertension, or a history of venous thromboembolism.	» Daily adherence is required. » Interactions with other medicines can lower contraceptive effect. » Lower efficacy compared with COC. » Frequent bleeding irregularities.
Hormonal oral: combined oral contraceptive (COC) (see Section 7.2.4)	» Non-contraceptive benefits, e.g.: alleviation of dysmenorrhoea, premenstrual syndrome, and menorrhagia. » Fertility returns after discontinuation of COC but can take upto 3 months.	» Daily adherence is required. » Interactions with other medicines can lower contraceptive effect. » Cannot be used in women with venous thrombo-embolic disease. » Cannot be used immediately postpartum.

Barrier: male and female condoms (see Section 7.3)	» Protects against STIs, including HIV.	» Possibility of breakage or slipping off. » Possible allergic reaction to latex. » Lower efficacy than other contraceptive methods therefore advised as dual contraception. » Consistent and correct use is required to prevent pregnancy

Refer to the most recent SAHPRA registered professional information for detailed information.

Effectiveness of family planning methods

Rates of unintended pregnancies per 100 women:

Contraceptive method	Failure rate in 1st year (%)	
	Consistent and correct use	Typical use
Sterilisation: male – vasectomy	0.1	0.15
Sterilisation: female - tubal ligation	0.5	0.5
Progestin-only subdermal implant	0.1	0.1
LNG-IUD	0.5	0.7
Copper IUCD	0.6	0.8
Progestin-only injectable	0.2	4
Progestin-only oral pill (during breastfeeding)	0.3	7
Combined oral contraceptive (COC) pill	0.3	7
Progestin-only oral pill (not breastfeeding)	0.3	8
Barrier: male condoms	2	13
Barrier: female condoms	5	21
No method	85	85

Key:

0-0.9: very effective	1-9: effective	
10-19: moderately effective	20+: less effective	*LoE:IVb*[5]

7.1 INTRAUTERINE CONTRACEPTIVE COPPER DEVICE (IUCD)

Z30.0/Z30.1/Z30.5

Dual protection with barrier methods is recommended to reduce the risk of STIs, including HIV.

The copper IUCD (also known as the Copper T) is a long-term contraceptive method that is effective, safe and reversible. It has no hormonal effects or drug interactions. It does not require daily adherence or frequent follow up.

HIV infection is NOT a contra-indication to the use of an IUCD.

IUCDs are often the most suitable contraceptive for women on enzyme-inducing medicines, because of the absence of drug interactions.

- Copper IUCD, e.g:
- Cu T380A, 380mm² copper device.
  - Devices with lower copper surface area are not recommended.

The IUCD can be inserted at any time during the menstrual cycle, once pregnancy has been excluded (by clinical history or with a pregnancy test if required). Insertion at menstruation may be easier for the woman and results in less discomfort and spotting.

Copper IUCDs may be inserted immediately postpartum, or post miscarriage and post choice termination of pregnancy (CTOP) within 48 hours, by specially trained healthcare professionals, provided that no contra-indications are present (chorioamnionitis, ruptured membranes for more than 18 hours, or postpartum haemorrhage).

Alternatively, an IUCD may be inserted at least 4 weeks postpartum. *LoE:IIb*[6]

Advise women to check the strings of the IUCD monthly to ensure that the device is still in place.

Advise women when to return:

» Expulsion of IUCD or if strings of the IUCD become visible.
» Complications (excessive bleeding, excessive pain, fever, or foul-smelling discharge). *LoE:IVb*[7]
» Routine follow-up 4–12 weeks after insertion.
» If the strings of the IUCD cannot be felt.

Copper IUCD is not recommended for women with menorrhagia, active STI, active pelvic inflammatory disease (PID), purulent cervicitis, unexplained uterine bleeding, cervical and endometrial cancers or other uterine abnormalities. If a woman has a very high individual likelihood of exposure to STIs, she should generally not have a Copper IUCD inserted unless other methods are not available or not acceptable.

<u>For mild pain and discomfort after insertion:</u>

- Ibuprofen, oral, 400 mg 8 hourly with or after a meal as needed for up to 3 days.

REFERRAL

» Excessive pain or bleeding after insertion.

» Signs of infection within 7 days of insertion (e.g. fever, abdominal pain and/or foul-smelling discharge).
» Abnormal or heavy menstrual bleeding for > 3 months.

7.2 CONTRACEPTION, HORMONAL

CAUTION

Before starting hormonal contraception, advise women about the expected bleeding patterns, both initially and in the longer term.

7.2.1 SUBDERMAL IMPLANT

Z30.0/Z30.4/Z30.8

Dual protection with barrier methods is recommended to reduce the risk of STIs, including HIV.

The subdermal implant is an effective, safe, reversible, and convenient long-term contraceptive method that does not require daily adherence or frequent follow-up.

- Progestin-only subdermal implant contraceptive, e.g.:
  - Etonogestrel, subdermal, 68 mg, single-rod implant.

The progestin-only subdermal implant can be inserted at any time during the menstrual cycle, once pregnancy has been excluded. If the implant is inserted within day 1 to day 5 of the onset of the menstrual cycle, the contraceptive effect is achieved within 24 hours of placement.

The main reason for discontinuation of the implant is irregular bleeding. This requires good counselling before the implant is inserted to inform women that this side effect can occur and can be treated. See Section 7.6: Breakthrough bleeding with contraceptive use.

The progestin-only subdermal implant is contraindicated in certain conditions, e.g. unexplained vaginal bleeding, active liver disease. Consult the package insert in this regard.

CAUTION

Medicines that induce the metabolism of progestins could reduce contraceptive efficacy. These medicines include efavirenz, rifampicin, phenytoin, carbamazepine, and phenobarbital.
Women receiving any of the above listed hepatic enzyme-inducing medicines should be advised that the efficacy of the subdermal implant may be reduced. If it is decided to continue using the subdermal implant, women should be advised to also use a non-hormonal contraceptive method during the time of concomitant use (the subdermal implant is not contra-indicated when using the above medicines). Dolutegravir, however, can be effectively used in combination with subdermal implants. *LoE:IIIb*[8]

Insertion and removal procedures

» Training on the techniques for insertion and removal of the sub-dermal implant is strongly recommended.
» Only health care professionals familiar with these procedures should insert and remove subdermal implants, under aseptic conditions.
» Insert the implant **subdermally just under the skin of the upper non-dominant arm.**
» **Important: Refer to the specific professional information for detailed guidance on the product available on the National contract**.

Insertion of etonogestrel 68 mg implant:

» Insertion should only be performed with the preloaded applicator.
» Ask the woman to lie on her back on the examination table with her non-dominant arm flexed at the elbow and externally rotated, so that her hand is underneath her head (or as close as possible).
» Identify the insertion site, which is on the inner side of the non-dominant upper arm. The insertion site overlies the triceps muscles about 8 to 10 cm from the medial epicondyle of the humerus and 3 to 5 cm posterior to the sulcus (groove between the biceps and triceps muscles). This location is intended to avoid large blood vessels and nerves lying within and surrounding the sulcus. If it is not possible to insert the implant in this location (e.g. in women with thin arms), it should be inserted as far posterior from the sulcus as possible.
» Make two marks with a surgical marker: First, mark the spot where the implant will be inserted, and second, mark a spot at 5 cm proximal (toward the shoulder) to the first mark. This second mark (guiding mark) will later serve as a direction guide during insertion.
» Clean the insertion site with an antiseptic solution.
» Anaesthetise the insertion area. *LoE:IVb*[9]
» Insert the implant subdermally:
  - Hold the applicator just above the needle at the textured surface area. Remove the transparent protection cap by sliding it horizontally in the direction of the arrow away from the needle.
  - Puncture the skin with the tip of the needle slightly angled less than 30° relative to the skin surface. If you insert the needle past the bevel, withdraw it until only the bevel is beneath the skin.
  - Lower the applicator to a horizontal position. To facilitate subdermal placement, lift the skin with the needle, while sliding the needle to its full length. You should be able to see the applicator just below the skin. In a seated position, look at the applicator from the side and NOT from above to clearly see the insertion and positioning of the needle just under the skin.
  - While keeping the applicator in the same position and the needle inserted to its full length, the purple slider should be unlocked by pushing it slightly down. The slider should be moved fully back until it stops.
  - The implant is now in its final subdermal position. Remove the applicator.

» Always verify the presence of the implant in the woman's arm immediately after insertion by palpation, and allow her to feel the implant as well.
» Apply sterile gauze with a pressure bandage to minimise bruising. The woman may remove the pressure bandage in 24 hours, and the small bandage over the insertion site after 3–5 days.

Insertion of levonorgestrel 2 x 75 mg implants:

» Clean the woman's upper arm with an antiseptic solution.
» The optimal insertion area is on the medial aspect of the upper arm about 6-8 cm above the fold of the elbow.
» The implants will be inserted subdermally, in the shape of a narrow V, opening towards the armpit.
» Anesthetise two areas about 4.5 cm long, to mimic the V shape of the implantation site.
» Mark the insertion site with a marker.
» Use the scalpel to make a small incision (about 2 mm) just through the dermis of the skin. Alternatively, the trocar may be inserted directly through the skin without making an incision.
» Open the implant pouch by pulling apart the film of the pouch and let the two implants drop on a sterile cloth. Note: Always use sterile gloves or forceps when handling the implants. If an implant is contaminated (e.g. falls on the floor), leave it for later disposal, open a new package, and continue with the procedure.
» The implant is provided with a disposable trocar that is sharp enough to penetrate the skin directly. Thus, the disposable trocar can be used to puncture the skin and insert the rods, without the need for an incision.
» The trocar has two marks. One mark is close to the handle and one close to the tip. When inserting the implants, the mark closest to the handle indicates how far the trocar should be introduced under the skin before loading each implant. The mark closest to the tip indicates how much of the trocar should be left under the skin after the insertion of the first implant. When inserting the trocar, avoid touching the part of the trocar that will go under the skin.
» Once the tip of the trocar is beneath the skin it should be directed along the subdermal plane horizontally by pointing it slightly upwards and raising the skin (tenting). Failure to keep the trocar in the subdermal plane may result in deep placement of the implants, causing a more difficult removal. The trocar should be oriented with the bevel up throughout the insertion procedure.
» Advance the trocar beneath the skin, about 5.5 cm from the incision to the mark closest to the handle of the trocar. Do not force the trocar; if you feel any resistance, try another direction.
» Remove the plunger when the trocar is advanced to the correct mark.
» Load the first implant into the trocar with either tweezers or fingers.
» Push the implant gently with the plunger to the tip of the trocar until you feel resistance. Never force the plunger.

» Hold the plunger steady and pull the trocar back along it until it touches the handle of the plunger. It is important to keep the plunger steady and not to push the implant into the tissue.
» Do not completely remove the trocar until both implants have been placed. The trocar is withdrawn only to the mark closest to its tip.
» When you can see the mark near the tip of the trocar in the incision, the implant has been released and will remain in place beneath the skin. You can check this by palpation.
» Insert the second implant next to the first one, to form a V shape. Fix the position of the first implant with the left fore-finger and advance the trocar along the side of the finger. This will ensure a suitable distance between implants. To prevent expulsions, leave a distance of about 5 mm between the incision and the ends of the implants. You can check their correct position by cautious palpation of the insertion area.
» After inserting the second implant, press the edges of the incision together, close with a skin closure and dress the wound.
» Advise the woman to keep the insertion area dry for 3 days.
» The gauze and the bandage may be removed as soon as the incision has healed, usually after 3 to 5 days.

For pain after insertion:

- Ibuprofen, oral, 400 mg 8 hourly with or after a meal as needed for up to 5 days.

Removal of progestin-only subdermal implants:

Remove etonogestrel implants at the end of 3 years and levonorgestrel implants at the end of 5 years.

» Locate the implant/s by palpation. If impalpable, refer for ultrasound-guided removal.
» Mark the distal end (end closest to the elbow) with a surgical marker.
» Clean the removal site with an antiseptic solution.
» Anaesthetise the removal area. Inject the local anaesthetic under the implant to keep the implant close to the skin surface.
» Push down the proximal end of the implant. A bulge may appear to indicate the distal end of the implant.
» Make a longitudinal (parallel to the implant) incision of approximately 2 mm towards the elbow.
» Very gently remove the implant, using a small forceps (preferably curved mosquito forceps). Where an implant is encapsulated, dissect the tissue sheath to remove the implant with the forceps.
» Confirm that the complete implant has been removed by measuring the length (etonogestrel rod: 40 mm; levonorgestrel rods: 43 mm). Close the incision with a steristrip or plaster and dress.
» Advise the woman to keep the arm dry for a few days.

REFERRAL

» Heavy or prolonged bleeding, despite treatment with COCs.
» Infection at the insertion site, inadequately responding to an initial course of antibiotic treatment. See Section 5.4.3: Cellulitis.
» Failure to locate an implant (in the arm) by palpation.

7.2.2 LEVONORGESTREL INTRA-UTERINE DEVICE (LNG-IUD)

Z30.0/Z30.5/Z30.8

Dual protection with barrier methods is recommended to reduce the risk of STIs including HIV.

The LNG-IUD is an effective, safe, reversible, long-term contraceptive method that has minimal hormonal adverse effects and is not prone to drug interactions. It does not require daily adherence or frequent follow up.

- Progestin-only intrauterine device, e.g.:
- Levonorgestrel, intrauterine device, 52 mg.

LoE:IIb[10]

HIV infection is NOT a contra-indication to the use of an LNG-IUD.

LoE:IIIb[11]

The LNG-IUD is a T-shaped plastic device that steadily releases a small amount of levonorgestrel every day. It has the added benefit of reducing menstrual cramping and heavy menstrual bleeding. It can be inserted by specially trained health care professionals, at any time during the menstrual cycle, once pregnancy has been excluded (by clinical history or with a pregnancy test if required). Insertion at menstruation may be easier for the woman, and results in less discomfort and spotting. It may be used by women of any age, regardless of whether they have had children before.

LNG-IUD may be inserted immediately postpartum or post miscarriage (within 48 hours), provided that no contra-indications are present (chorioamnionitis, ruptured membranes for more than 18 hours or postpartum haemorrhage). Providers require specific training in postpartum insertion by hand or using a ring forceps.

LNG-IUD may also be inserted 4 or more weeks postpartum.

Advise women when to return:
» Expulsion of LNG-IUD or if strings of the LNG-IUD protrude.
» Complications (excessive bleeding, excessive pain, fever or foul smelling discharge).
» Routine follow-up 3 to 6 weeks after insertion.
» First time migraine or severe headaches during use.

LoE:IIIb[12]

LNG-IUD is not recommended for women with acute venous thromboembolism, severe liver cirrhosis, active pelvic inflammatory disease (PID), purulent cervicitis, unexplained uterine bleeding, cervical- breast- ovarian- or endometrial cancers, or other uterine abnormalities.

For mild pain and discomfort after insertion:

- Ibuprofen, oral, 400 mg 8 hourly with or after a meal as needed for up to 3 days. *LoE:IVb*

REFERRAL

» Excessive pain or bleeding after insertion.
» Signs of infection within 7 days of insertion (e.g. fever, abdominal pain and/or foul-smelling discharge).
» Abnormal or heavy menstrual bleeding for > 3 months.
» First time migraine or severe headaches.

LoE:IVb[13]

7.2.3 INJECTABLE

Z30.0/Z30.4

Dual protection with barrier methods is recommended to reduce the risk of STIs, including HIV.

- Progestin-only injectable contraceptive, e.g.:
- Medroxyprogesterone (long-acting), IM, 150 mg, 12 weekly. *LoE:IIIb*[14]

OR

- Medroxyprogesterone (long-acting), SC, 104 mg, 12 weekly.

Progestin-only hormonal contraceptives are contraindicated in certain conditions, e.g. unexplained vaginal bleeding. Cons

ult the individual professional information in this regard.

Using the Progestin-only IM Injection

When to start the injection

» The injection can be started anytime within the menstrual cycle, provided pregnancy has been excluded. If the first injection is given within 7 days of the onset of the menstrual cycle, the contraceptive effect is achieved on the day of the first injection.
» If started after day 7, advise the woman to abstain from intercourse or use condoms for the next 7 days.
» Can be started immediately postpartum in both breastfeeding and non-breastfeeding women if no other method is acceptable or available. *LoE:IVb*[15]

Late injection

» The next injection can be as much as 4 weeks late if using the medroxyprogesterone acetate DMPA (long-acting), or 2 weeks late if using norethisterone enanthate (NET-EN).
Injectable contraceptive may be administered later than recommended (>4 weeks late for DMPA or >2 weeks late for NET-EN) if:
  - She has not had sexual intercourse since 2 weeks after the scheduled date of her injection, or

- She has used a backup method or has taken emergency contraceptive pills after any unprotected sexual intercourse since 2 weeks after the scheduled date of her injection, or
- She is fully or nearly fully breastfeeding and she gave birth less than 6 months ago.

However, in all three cases she will need a backup method for the first 7 days after the injection. *LoE:IVb*[16]

Assess the need for emergency contraception in the event of a late injection (See Section 7.4: Contraception, Emergency).

Using the Progestin-only SC Injection

May be administered by a healthcare professional (HCP) or with adequate training when considered appropriate by the HCP, self-injected by the patient, with medical follow up as necessary.

When to start the injection

» The first injection of 104 mg SC should be given during the first 5 days of a normal menstrual cycle to ensure the client is not pregnant.
» The second and subsequent injections should be given at a 3 month interval (12 -14 weeks).
» Can be started immediately postpartum in both breastfeeding and non-breastfeeding women if no other method is acceptable or available.

CAUTION

» Alternative contraceptive options should be considered if the continued use of medroxyprogesterone acetate (IM or SC) is extended beyond 2 years. All effective contraceptive options should be considered, taking into account client preferences and circumstances.
» A small increased risk of meningiomas (rare, and mostly benign tumours) have been reported following long-term administration of medroxyprogesterone acetate (long-acting).
» Medroxyprogesterone (long-acting) should be discontinued if a meningioma is diagnosed.
» Caution is advised when recommending medroxyprogesterone (long-acting) to patients with a history of meningioma.

LoE:IVb[17]

REFERRAL

Heavy or prolonged bleeding, despite adequate treatment with combined oral contraceptives (see Section 7.6: Breakthrough bleeding with contraceptive use).

7.2.4 ORAL

Z30.0/Z30.4

Dual contraception with barrier methods, are recommended to reduce the risk of STIs, including HIV.

Monophasic preparations:

- Progestin only pills, e.g.:
- Levonorgestrel, oral, 30 mcg daily. *LoE:IIIa*[18]
- Progestins and estrogen, fixed combinations, e.g.:
- Ethinylestradiol/levonorgestrel, oral, 30 mcg/150 mcg:
  - 21 tablets ethinylestradiol/levonorgestrel, 30 mcg/150 mcg; and
  - 7 tablets placebo. *LoE:IIIa*[19]

Triphasic preparations:

- Progestins and estrogen, sequential preparations, e.g.:
- Ethinylestradiol/levonorgestrel, oral:
  - 6 tablets ethinylestradiol/levonorgestrel, 30 mcg/50 mcg;
  - 5 tablets ethinylestradiol/levonorgestrel, 40 mcg/75 mcg;
  - 10 tablets ethinylestradiol/levonorgestrel, 30 mcg/125 mcg; and
  - 7 tablets placebo. *LoE:IIIa*[20]

Counselling:

» Hormonal oral pills must be taken at the same time every day without interruption.
» Taking the hormonal oral pill with food or at bedtime may alleviate nausea.
» If the woman is not using dual contraception with barrier methods and vomits within 2 hours, or has severe diarrhoea within 12 hours of taking the hormonal oral pill, repeat the dose as soon as possible. Recommend condom use.
» Women who have persistent vomiting or severe diarrhoea resulting in two or more missed pills must follow instructions for missed pills (see Section 7.2.4: Oral). Recommend condom use.

Contraindications and guidance to starting the hormonal oral pill

	Progestin only	Combined estrogen/progestin
Contra-indications	Progestin only preparations are contraindicated in certain conditions (consult the package insert in this regard). Contraindications include: » Abnormal uterine bleeding of unknown cause. » Myocardial infarction/stroke. » Liver disease. » Cancer of the breast/ genital tract. » Known or suspected pregnancy. *LoE:IVb*[21]	Combination preparations contraindicated in certain conditions (consult the package insert in this regard). Contraindications include: » Women >35 years of age who smoke ≥15 cigarettes a day or have risk factors for cardiovascular disease: – heart disease – liver disease – thromboembolism – certain cancers

When to start the pill	» Exclude pregnancy. » May be started anytime within the menstrual cycle, but it is advisable to start during menses. » If the first pill is given between days 1 and 5 of the menstrual cycle, the contraceptive effect is achieved immediately. » If the pill is started at any other time, it needs to be taken for at least 7 days before contraceptive efficacy is established. The use of condoms is recommended during these 7 days.

Medicine interactions

Enzyme-inducing medicines interacting with oral contraceptives		Recommendation
Therapeutic class	**Examples**	
Anti-tuberculosis	Rifampicin	Use copper IUCD or alternatively use dual contraception, e.g. condoms in combination with COCs.
Anti-epileptics	Phenobarbital	
	Phenytoin	
	Carbamazepine	
Antiretrovirals	Nevirapine	
	Lopinavir/ritonavir	
	Efavirenz	

Lamotrigine:
» Lowering of contraceptive effect not expected.
» Oral contraceptives may reduce lamotrigine concentration, increasing the risk of seizures. Change to IUCD or progesterone only methods (i.e levonorgestrel implant, etonogestrel implant, or LNG-IUD), if lamotrigine is going to be used long term.

LoE:IVb[22]

Breastfeeding
» Women who are intending to breastfeed should delay initiation of COCs until cessation of breastfeeding or at 6 months postpartum, whichever occurs earlier.

REFERRAL
Abnormal vaginal bleeding for >3 months.

7.2.5 MISSED PILLS

Progestin only pills
Efficacy is rapidly lost if one pill is forgotten or taken >3 hours late. Recommend dual contraception for all scenarios for at least 7 days.

LoE:IVb[23]

Scenario	Action
One pill forgotten or pill taken >3 hours late, and unprotected sexual intercourse has not occurred in the past 5 days.	Take pill as soon as remembered and continue taking one pill daily at the usual time.

One pill forgotten or taken 3 hours late, and unprotected sexual intercourse has occurred in the past 5 days.	Give emergency contraception (see Section 7.4). Take one pill the next day and continue taking one pill daily at the usual time.

Combination of progestin and estrogen in each pill

Missing active pills and extending hormone free interval leads to decreased contraceptive efficacy. Recommend dual contraception for all scenarios for at least 7 days. *LoE:IVb*[24]

LoE:IVb[25]

Scenario	Action
One active pill forgotten.	Take pill as soon as remembered and take next one at usual time.
Two or more pills forgotten during the first 7 active pills of the pack and unprotected sexual intercourse has occurred in the past 5 days.	Give emergency contraception (see Section 7.4). Restart active pills 12 hours later.
Two or more pills forgotten during the middle 7 active pills of the pack.	Take the most recent missed pill immediately (discard the other missed pills). Continue taking remaining pills as usual. No emergency contraception required.
Two or more pills forgotten in the last 7 active pills of the pack and unprotected sexual intercourse has occurred in past 5 days.	Continue active pills of current pack. Omit the inactive pills and immediately start the active pills of the next pack.

7.3 CONTRACEPTION, BARRIER METHODS

Z30.0

Condoms (male and female) alone are the least effective contraceptive method and should be used in combination with other contraceptive methods (e.g. copper IUCD). Condoms are recommended to reduce the risk of the acquisition of HIV infection and other STIs.

Condoms (male and female) or other barrier methods may be an option for contraception where other methods are contraindicated.

7.4 CONTRACEPTION, EMERGENCY

Z30.0/Z30.4

Emergency contraception is indicated to prevent pregnancy after unprotected intercourse in women not using contraception, or where contraception is likely to be ineffective:

» Forgotten tablets (see Section 7.2.5: Missed pills).
» Slipped or broken condom.
» Injectable contraception given late (>2 weeks for NET-EN, >4 weeks for DMPA).
» Sexual assault.

A woman who needs emergency contraception often should be counselled to consider a longer-acting and more effective family planning method.

Emergency contraception after pregnancy is excluded

Do a pregnancy test in all women and female adolescents. Children must be tested and given emergency contraception from Breast Tanner Stage III.

- Copper IUCD inserted as soon as possible after unprotected intercourse and no later than 5 days.

OR *LoE:IIIb*[26]

- Levonorgestrel, 1.5 mg, oral, as a single dose as soon as possible after unprotected intercourse, and not later than 5 days.
  - If the client vomits within 2 hours, repeat the dose. *LoE:Ia*[27]

Advise women that their period should be on time. It is rarely delayed but it should not be more than 7 days late. If this occurs, they should come back for a pregnancy test.

If using enzyme inducing drugs or woman weighs > 80 kg / BMI ≥ 30:

» It is recommended to have a copper IUCD inserted.

» If this is not possible, double the dose of levonorgestrel administered:
- Levonorgestrel, 1.5 mg, oral, 2 tablets taken as a single dose.

» If the dedicated product is not available, use COCs containing 30 µg ethinylestradiol + 150 µg levonorgestrel (e.g. Nordette®/Oralcon®):
- Ethinylestradiol/levonorgestrel, oral, 30 mcg/150 mcg, 6 tablets taken as a single dose, followed by 6 tablets 12 hours later.

CAUTION

» Emergency contraceptive tablets must be taken as soon as possible, preferably within 72 hours of unprotected intercourse, and not later than 5 days.

» Enzyme inhibitors (ketoconazole, fluconazole) significantly increase the bioavailability of levonorgestrel and may increase nausea and vomiting. Women taking these medicines should preferably have copper IUCD inserted.

LoE:IIIb[28]

REFERRAL

Women in need of emergency contraception must be referred for HIV counselling and testing and PEP (see Section 21.3.6.2: Post exposure prophylaxis, rape and sexual assault).

7.5 VOLUNTARY STERILISATION, MALE AND FEMALE

Z30.2

Female sterilisation

Also known as tubal occlusion or tubal ligation. This is a permanent, surgical contraceptive method for women who do not intend to have more children.

Women who opt for sterilisation should be adequately counselled and referred.

Male sterilisation

Also known as vasectomy. This is a permanent surgical contraceptive method for men who do not intend to have more children.

Men who opt for this method should be adequately counselled and referred.

CAUTION

Sterilisation does not protect against sexually transmitted infections (STIs), including HIV. If there is a risk of STI/HIV, the correct and consistent use of condoms is recommended.

LoE:IIIb[29]

7.6 BREAKTHROUGH BLEEDING WITH CONTRACEPTIVE USE

N92.0/N92.1/N92.4

DESCRIPTION

Breakthrough bleeding refers to unscheduled or irregular vaginal bleeding, which often presents as spotting, or prolonged or frequent bleeding in women using hormonal contraception. The pattern and duration of these unscheduled bleedings vary with the contraceptive method used.

GENERAL MEASURES

Before starting hormonal contraception, counsel women regarding possible bleeding patterns, both initially and in the longer term.

Clinical assessment:

» Current method of contraception and duration of use.
» Drug interactions.
» Cervical screening history.
» Risk of sexual transmitted infections (e.g. Chlamydia trachomatis).
» Menstrual and break though bleeding history prior to current method being initiated.
» Exclude pregnancy.

Hormonal contraceptives causing breakthrough bleeding	Treatment
Progestin-only injectables	• COC containing 30 mcg ethinylestradiol, oral, for 14 days. *LoE:IIIb*[30]
Progestin subdermal implants	Progestins and estrogen, fixed combinations, e.g.: • Ethinylestradiol/levonorgestrel, oral, 30 mcg/150 mcg for daily for 20 days.
Progestin intrauterine devices	Refer – see Section 7.2.2: Levonorgestrel intra-uterine device (LNG-IUD)
Combined oral contraceptive pill » Unscheduled bleeding with COC usually settles with time. » Changing to another COC in the first 3 months is not recommended.	• Change COC to another COC containing the lowest dose of ethinylestradiol, oral, daily. If bleeding persists: • Change COC to a COC containing at least 30mcg ethinylestradiol, oral, daily. *LoE:IVb*

REFERRAL

» Pelvic pain.
» Pelvic mass.
» Heavy bleeding.
» Abnormal cervix on speculum examination (e.g. polyps).
» Bleeding not controlled by the treatment above.

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PHC Chapter 8: Kidney and urological disorders

Kidney disorders

Urology disorders

Kidney disorders

8.1 CHRONIC KIDNEY DISEASE (CKD)

N18.1-5/N18.9

CAUTION
Check all medicines for possible dose adjustment based on eGFR

The doses of many medicines need to be adjusted when there is impairment of kidney function. Close attention for dose adjustments should be made once the estimated glomerular filtration rate (eGFR) falls <60 ml/min/1.73m^2, and especially when eGFR<15 ml/min/1.73m^2 or when the patient is on dialysis.
Recommendations for medicines that require dose adjustment in renal impairment can be found in the South African Medicines formulary (SAMF), package insert, and from many online resources e.g.: https://globalrph.com/renal/

DESCRIPTION

Structural or functional kidney damage present for > 3 months, with or without a decreased glomerular filtration rate (eGFR).
Markers of kidney damage include:

» abnormalities in urine e.g. proteinuria or haematuria,
» abnormalities in blood e.g. serum creatinine or low eGFR,
» abnormalities in imaging tests e.g. small kidneys or cysts on ultrasound,
» or abnormalities on pathological specimens, e.g. glomerular disease on kidney biopsy.

Common causes of chronic kidney disease (CKD) include:

» hypertension
» diabetes mellitus
» glomerular diseases
» polycystic kidney disease
» HIV/AIDS

Chronic kidney disease can be entirely asymptomatic, BUT early detection and management can improve the outcome of this condition.

Treatment and prevention strategies according to prognostic category
Estimation of the degree of kidney damage is important to guide management to prevent adverse outcomes of CKD.
Use eGFR and albumin: creatinine ratio to put patient into prognostic category - see Table 8.1 below.
The calculation eGFR using the CKD-EPI equation is currently the formula of choice for calculation of the eGFR.

LoE:IVb[1]

Note:

» Adults with mild to moderate decline in eGFR (G3a) and no albuminuria can be managed at primary care level once the cause and plan for care has been established.

» All children should be referred for investigation and initial management.

Table 8.1: Prognosis of CKD by GFR and albuminuria categories: KDIGO 2024

				Persistent albuminuria categories Description and range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				ACR* <30 mg/g <3mg/mmol	ACR* 30–300 mg/g 3–30 mg/mmol	ACR* >300 mg/g >30 mg/mmol
eGFR categories (ml/min per 1.73m2) description and range	G1	Normal or high	≥90		Refer	Refer
	G2	Mildly decreased	60–89		Refer	Refer
	G3a	Mildly to moderately decreased	45–59		Refer	Refer
	G3b	Moderately to severely decreased	30–44	Refer	Refer	Refer
	G4	Severely decreased	15–29	Refer	Refer	Refer
	G5	Kidney failure	<15	Refer	Refer	Refer

*ACR: albumin to creatinine ratio in urine specimen.

Green: low risk (if no other markers of kidney disease, no CKD); yellow: moderately increased risk; orange: high risk; red: very high risk; A1, A2, A3 = categories of albuminuria; G1, G2, G3a, G3b, G4, G5 = categories of eGFR

LoE:IVb[2]

Send blood annually for measurement of creatinine in all patients at increased risk (eGFR will be calculated by the laboratory, based on the serum creatinine).

GENERAL MEASURES

LoE:IVb[3]

» Limit total daily salt intake (including salt in food). Consult with dietician as required.

» Reduce cardiovascular disease risk factors. See Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

» Avoid nephrotoxic drugs, e.g. NSAIDs, tenofovir and aminoglycosides.

» Screen for proteinuria.

- If urine dipstick 1+ or greater, repeat on a properly collected midstream urine specimen on another occasion. If proteinuria persists, quantify protein with a spot urine protein-creatinine ratio. Significant proteinuria = spot urine protein-creatinine ratio (PCR) of > 0.15 g/mmol. This is equivalent to 1 g per 24 hours.
- **Note:** Proteinuria is screened for differently in diabetics. See Section 9.4.3: Diabetic nephropathy.

MEDICINE TREATMENT

Treat underlying conditions.

Proteinuria

Measure serum potassium at baseline.

Adults:

- ACE-inhibitor, e.g.:
- Enalapril, oral, start with 5 mg 12 hourly.
  - Titrate up to 10 mg 12 hourly, if tolerated.
  - Start with low dose of ACE-inhibitor and titrate up to the maximum dose, or until the proteinuria disappears – whichever comes first. Ensure BP remains in normal range and that no side effects are present.

ACE-inhibitors can be used in renal impairment (eGFR < 30 mL/min/1.73m^2) if potassium can be monitored safely.

  - Monitor creatinine and potassium:
    - 1–2 weeks after treatment initiation if eGFR < 60 mL/min, and after 4 weeks if eGFR > 60 mL/min.
    - If creatinine increases by > 20% from the baseline, stop ACE-inhibitor and refer.
  - If stable, monitor thereafter at regular clinic visits. *LoE:IVb*

ACE-inhibitors are contraindicated in, amongst others:

» hyperkalaemia
» known hypersensitivity to an ACE-inhibitor or an ARB
» bilateral renal artery stenosis
» pregnancy

Hyperlipidaemia

If hyperlipidaemia is a co-existent risk factor, manage according to Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

Diabetes mellitus

» In diabetics, optimise control according to Section 9.2.2: Type 2 diabetes mellitus, adults.
» Replace oral sulphonylureas with insulin when eGFR < 60 mL/min, because of an increased risk of hypoglycaemia.
» Replace metformin with insulin when eGFR < 30 mL/min, because of the potential risk of lactic acidosis.
» Insulin is preferred to control blood glucose in patients with eGFR < 30 mL/min.

Hypertension

Treat if present. See Section 4.7: Hypertension.

Target BP: Systolic < 140 mmHg and diastolic < 90 mmHg (See Sections 4.7 Hypertension; 9.1.2: Type 1 diabetes mellitus, in adults; and 9.2.2: Type 2 diabetes mellitus, adults).

Fluid overload
Treat fluid overload if present and refer.

Adults
- Furosemide, oral or IV, 20 mg to 80 mg daily, as a single or in divided doses, initiating at the lowest effective dose and titrating upwards.
    - Dose may be increased to 160mg IV or oral daily, in divided doses.
    - First establish an effective dose and ascertain if urination occurs within 1-2 hours of intake. If urination does not occur within 1-2 hours, the dose should be increased further until urination ensues.
    - Do not give IV fluids – use heparin lock or similar IV access.

Children
- Furosemide, IV, 1 mg/kg, over 5 minutes. See dosing table: Chapter 23.
  Use the smallest volume possible to administer medication. Do not administer any resuscitation or maintenance fluids intravenously. **Note:** Exclude heart failure in patients with persistent pedal oedema.

REFERRAL
» All cases of suspected chronic kidney disease stages 3–5 for assessment and planning.
» In addition, patients with chronic kidney disease stages 3–5 may also require rehabilitation support for optimisation of function outcomes e.g., improved muscle strength and cardiovascular fitness, reduced blood pressure, weight management.
» All children. *LoE:IIIb*[4]
» All cases of CKD with:
- haematuria.
- significant proteinuria with urine protein-creatinine ratio > 0.1 g/mmol.

» eGFR < 60 mL/min for initial assessment and planning.
- eGFR < 30 mL/min.

» Uncontrolled hypertension/fluid overload.
» CKD associated with hyperlipidaemia.
» No reduction of proteinuria despite ACE-inhibitor therapy.
» If ACE-inhibitors are contraindicated or are not tolerated.

Patients who might qualify for dialysis and transplantation or who have complications should be referred early to ensure improved outcome and survival on dialysis, i.e. as soon as eGFR drops < 30 mL/min, or as soon as diagnosis is made/suspected.

8.2 ACUTE KIDNEY INJURY

N17.9

DESCRIPTION

This is (potentially) reversible kidney failure, commonly as a result of:

» hypovolaemia and fluid loss
» medicines/toxins
» urinary tract obstruction
» acute tubular necrosis
» acute glomerulonephritis
» sepsis

It is often recognised by:

» fluid overload (e.g. pulmonary oedema),
» decreased or no urine output,
» abnormalities of serum urea, creatinine and/or electrolytes, or
» convulsions in children.

GENERAL MEASURES

» Give oxygen, and nurse in Semi-Fowlers position if patient has respiratory distress. Early referral is essential.
» If fluid overloaded: stop all IV fluids.
» If dehydrated or shocked:
» treat immediately as shock. See Section 21.2.9: Shock.
» Stop and avoid any nephrotoxic medicines, e.g. NSAIDs, aminoglycosides.

MEDICINE TREATMENT

» Review all prescribed medications regularly in the setting of kidney failure to ensure that they are safe and at the correct dose for the eGFR.
» Currently, the most reliable measure of eGFR is CKD-EPI in adults and Schwartz equation for children. Nephrotoxic drugs should be avoided in the setting of any kidney dysfunction. Prior to starting any medication review for previous drug allergies and adverse events. Monitoring of drug toxicity and levels is important where available (e.g. aminoglycoside).
» In acute kidney injury (AKI) the once-off eGFR is not reliable as kidney function changes rapidly. Therefore, it is essential to monitor eGFR and doses of medications regularly.

Children:

<u>If fluid overloaded (rapid respiration, chest indrawing):</u>

- Furosemide, IV, 1 mg/kg, over 5 minutes. See dosing table: Chapter 23.
  - Do not put up a drip or run in any IV fluids.

<u>If hypertension present:</u>

< 6 years of age:	> 120 mmHg systolic BP **or** > 90 mmHg diastolic BP
6–15 years:	> 130 mmHg systolic BP **or** > 95 mmHg diastolic BP

- Nifedipine, oral, 0.25–0.5 mg/kg squirted into mouth.
  - Withdraw contents of 5 mg capsule with a 1 mL syringe:

10–25 kg:	2.5 mg
25–50 kg:	5 mg
>50 kg:	10 mg

Adults:

If fluid overloaded/respiratory distress:

- Furosemide, oral or IV, 20 to 80 mg daily, as a single or divided doses, initiating at the lowest effective dose and titrating upwards.
  - Dose may be increased to 160 mg, IV or oral, daily in divided doses.
  - First establish an effective dose and ascertain if urination occurs within 1-2 hours of intake. If urination does not occur, increase the dose further until urination occurs.

If blood pressure is elevated hypertension is present (Diastolic BP > 100 mmHg or systolic BP > 150 mmHg):

- Amlodipine, oral, 5 mg as a pre-referral dose.

If eGFR is currently unknown or < 30 ml/min, **ADD**:

- Furosemide, oral, 40–80 mg as a pre-referral dose.

LoE:IIIb[5]

REFERRAL

All cases.

8.3 GLOMERULAR DISEASES (GN)

DESCRIPTION

Glomerular disease may be a result of a primary condition of the kidney, or may be secondary to a systemic disorder. Can present with any, or a combination of the following:

» Proteinuria,
» reduced eGFR,
» haematuria,
» hypertension and oedema.

Approach to care is outlined under the syndromes which follow.

Diabetic nephropathy

See Section 9.4.3: Diabetic nephropathy.

REFERRAL

» Unexplained haematuria on two to three consecutive visits.
» Proteinuria > 1 g/24 hours or PCR > 0.1 g/mmol.
» Elevated or rising creatinine.
» Nephritic syndrome.
» Nephrotic syndrome.
» Chronic kidney disease.

Note: Where facilities are available, investigation should be done, e.g. serum creatinine to calculate the eGFR, or PCR.

8.3.1 NEPHRITIC SYNDROME

N05.9

DESCRIPTION

Presents with a varied combination of:

» painless, turbid, brownish, or macroscopically bloody urine,
» peripheral and periorbital oedema,
» pulmonary oedema (circulatory overload),
» hypertension or hypertensive encephalopathy with impaired level of consciousness or convulsions,
» little or no urine excretion.

In children, this is commonly due to acute post streptococcal glomerulonephritis.

GENERAL MEASURES

» Give oxygen, and nurse in Semi-Fowlers position if patient has respiratory distress.
» Early referral is essential, especially if patient had a hypertensive episode or fluid overload.
» If dehydrated or shocked: Treat immediately. See Section 21.2.9: Shock.
» The definitive treatment of nephritis depends on the cause – an assumption of acute post streptococcal nephritis or any other disease cannot be made without specific investigation which may include renal biopsy.
»

MEDICINE TREATMENT

For management, see Section 8.2: Acute kidney injury.

REFERRAL

» All cases.

8.3.2 NEPHROTIC SYNDROME

N04.9

DESCRIPTION

Glomerular disease is characterised by:

» severe proteinuria, defined as:
  - children: ≥ 3+ proteinuria on dipstick test, or urine protein-creatinine ratio (PCR) ≥ 0.2 g/mmol on spot urine sample.
» adults: ≥ 2.5 g/day, as determined by a spot urine protein-creatinine ratio measurement, i.e. PCR > 0.25 g/mmol.
» and resultant 'classic' clinical picture (not always present) which includes:
  - oedema,
  - hyperlipidaemia.
» hypoalbuminaemia,

Accurate diagnosis requires a kidney biopsy.

MEDICINE TREATMENT
The management of glomerular disease depends on the type/cause of the disease and is individualised, guided by a specialist according to the biopsy result.

REFERRAL
All cases.

8.4 URINARY TRACT INFECTION (UTI)
N10/N30.9/N39.0/O23.4

DESCRIPTION
Urinary tract infections may involve the upper or lower urinary tract. Infections may be complicated or uncomplicated. Uncomplicated UTI is a lower UTI, where there are no functional or anatomical anomalies in the urinary tract, no kidney impairment, or no concomitant disease that would promote the UTI.
Complicated UTIs exist in patients with an increased chance of a complicated course, i.e. all men, pregnant women, patients with relevant anatomical or functional abnormalities of the urinary tract, indwelling urinary catheters, kidney diseases, and/or other concomitant immunocompromising diseases for example, diabetes.

Differentiation of upper from lower urinary tract infection in young children is not possible on clinical grounds.
Upper UTI is a more serious condition and requires longer, and sometimes intravenous, treatment.

Features of upper UTI (pyelonephritis) that may be detected in adults and adolescents include:
» flank pain/tenderness,
» temperature 38°C or higher,
» other features of sepsis, i.e.: tachypnoea, tachycardia, confusion, hypotension,
» vomiting.

In complicated, recurrent, or upper UTIs, urine should be sent for microscopy, culture and sensitivity.

LoE:IVb[6]

Features of urinary tract infections in children
Signs and symptoms are related to the age of the child and are often non-specific.
Uncomplicated urinary tract infections may cause very few signs and symptoms, while complicated infections may present with a wide range of signs and symptoms.

Neonates may present with:
» fever
» poor feeding
» vomiting
» failure to thrive
» hypothermia
» sepsis
» prolonged jaundice
» renal failure

Infants and children may present with:

» failure to thrive
» persisting fever
» abdominal pain
» diarrhoea
» frequency
» dysuria
» enuresis or urgency

In any child with fever of unknown origin, the urine must be examined to assess whether a urinary tract infection is present.

Perform a urine dipstick test on a fresh bag urine specimen.

DIPSTIX RESULT	ACTION
No leukocytes/nitrites	UTI unlikely.
Leukocytes only	Repeat dipstix on a second specimen. If leucocytes on second specimen, suspect UTI and treat empirically. Collect urine aseptically if possible for urine MC&S.
Leukocytes or nitrites with symptoms of UTI	Treat empirically for UTI. Collect urine aseptically if possible for urine MC&S.
Leukocytes and nitrites	Collect urine aseptically if possible for urine MC&S. Treat empirically for UTI.

GENERAL MEASURES

» Women with recurrent UTIs should be advised to:
  - void bladder after intercourse and before retiring at night,
  - not postpone voiding when urge to micturate occurs,
  - change from use of diaphragm to an alternative type of contraception.

MEDICINE TREATMENT

Empirical treatment is indicated only if:

» positive leukocytes and nitrites on freshly passed urine, or
» leucocytes or nitrites with symptoms of UTI, or
» systemic signs and symptoms.

Alkalinising agents are not advised.

Uncomplicated cystitis

Adults

- Gentamicin, IM, 160 mg, as a single dose. A
  - **Note:** Gentamicin should not be used in patients with known chronic kidney disease or pregnancy.

LoE:IIb[7]

If gentamicin is unavailable/contraindicated:

- Fosfomycin, oral, 3 g as a single dose. W

LoE:IIb[8]

If fosfomycin is unavailable:

- Nitrofurantoin, oral, 100 mg 6 hourly for 5 days. A

LoE:IIb[9]

Complicated cystitis

Adults

- Ciprofloxacin, oral, 500 mg 12 hourly for 7 days. W

For pregnant women: O23.4

- Fosfomycin, oral, 3 g as a single dose. W — *LoE:IIb*[10]

OR

- Nitrofurantoin, oral, 100 mg 6 hourly for 5 days. A — *LoE:IIb*[11]

Children ≤ 35 kg who do not meet criteria for urgent referral:

- Amoxicillin/clavulanic acid oral, 15–25 mg/kg/dose of amoxicillin component, 8 hourly for 7 days. A

Weight kg	Dose mg (amoxicillin component)	Use one of the following			Age months/years
		Susp 125/31.5 mg/5 mL	Susp 250/62.5 mg/5 mL	Tablet 500/125 mg/tab	
>5–7 kg	100 mg	4 mL	2mL	–	>3–6 months
>7–9 kg	150 mg	6 mL	3 mL	–	>6–12 months
>9–11 kg	200 mg	8 mL	4 mL	–	>12–18 months
>11–14 kg	250 mg	10 mL	5 mL	–	>18 months–3 years
>14–17.5 kg	300 mg	12 mL	6 mL	–	>3–5 years
>17.5–25	375 mg	15 mL	7.5 mL	–	>5–7 years
>25–35 kg	500 mg	20 mL	10 mL	1 tablet	>7–11 years

LoE:IIIb[12]

Acute pyelonephritis

N10

Outpatient therapy is only indicated for women of reproductive age, who do not have any of the manifestations requiring referral (see referral criteria below). All other patients should be referred.

- Ciprofloxacin, oral, 500 mg 12 hourly for 7–10 days. W
  - It is essential to give at least a 7-day course of therapy.

REFERRAL

Urgent

» Acute pyelonephritis with:
- vomiting,
- sepsis,
- diabetes mellitus.

» Acute pyelonephritis in:
- pregnant women,
- women beyond reproductive age,
- men.

» Children ≥3 months of age who appear ill.

» Children ≤3 months of age with any UTI.

Ill patients awaiting transfer

» Ensure adequate hydration with intravenous fluids.

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose. (W) See dosing table: Chapter 23.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If SUSPECTING SERIOUS BACTERIAL INFECTION in neonate, give ceftriaxone, even if jaundiced.
» Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:
  - If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
  - If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
  - Preferably administer IV fluids without calcium contents.
» Always include the dose and route of administration of ceftriaxone in the referral letter.

Non-urgent

» All proven UTIs (positive culture) in children after completion of treatment.
» No response to treatment.
» UTI > 3 times within a one-year period in women, and more than once (at any point in time) in men.
» Recurrent UTI in children for assessment and consideration of prophylaxis.

8.5 PROSTATITIS

N41.0/N41.9 + (N34.2)

DESCRIPTION

Infection of the prostate caused by urinary or STI pathogens.
Clinical features include:

» perineal, sacral or suprapubic pain,
» dysuria and frequency,
» varying degrees of obstructive symptoms which may lead to urinary retention,
» sometimes fever,
» acutely tender prostate on rectal examination.

The condition may be chronic, bacterial or non-bacterial, the latter usually being assessed when there is failure to respond to antibiotics.

MEDICINE TREATMENT

Acute bacterial prostatitis

If there are features of associated urethritis (STI regimen):

- Ceftriaxone, IM, 250 mg as a single dose. (W)

AND

- Azithromycin, oral, 1 g as a single dose. (W)

LoE:IIIb[13]

If there are no features of associated urethritis:

- Ciprofloxacin, oral, 500 mg 12 hourly for 14 days. (W)

LoE:IIIb[14]

REFERRAL
» No response to treatment.
» Urinary retention.
» High fever.
» Chronic/relapsing prostatitis.Urology disorder

Urology Disorders

8.6 HAEMATURIA
R31

DESCRIPTION
Bleeding from the urinary tract, which can be from the kidneys, collecting system, bladder, prostate and urethra.
Glomerular disease is suggested if proteinuria, red blood cell casts and/or dysmorphic red blood cells are present on microscopy.
Exclude schistosomiasis (bilharzia), a common cause of haematuria, as well as haematuria which could be the result of anticoagulant therapy.
When haematuria is accompanied by colicky pain, a kidney stone should be excluded.
Note: The presence of blood on the urine test strips does not indicate infection and should be investigated as above.

MEDICINE TREATMENT
If evidence of schistosomiasis, treat as in Section 10.12: Schistosomiasis (bilharzia).
If symptoms of UTI; leucocytes and/or nitrite test positive in urine, treat as UTI.
If haematuria does not resolve rapidly after treatment, refer for formal investigation, i.e. next 48 hours.

REFERRAL
» All cases not associated with schistosomiasis or UTI.
» All cases not responding to specific medicine treatment.
» When glomerular disease is suspected.

8.7 BENIGN PROSTATIC HYPERPLASIA (BPH)
N40

DESCRIPTION
BPH is a noncancerous (benign) growth of the prostate gland.
May be associated with both obstructive (weak, intermittent stream and urinary hesitancy) and irritative (frequency, nocturia and urgency) voiding symptoms.
Digital rectal examination reveals a uniform enlargement of the prostate.
Urinary retention with a distended bladder may be present in the absence of severe symptoms, therefore it is important to palpate for an enlarged bladder during examination.

GENERAL MEASURES
Annual follow-up with digital rectal examination.

For patients presenting with urinary retention, insert a urethral catheter as a temporary measure while patient is transferred to hospital.
Remove medicines that prevent urinary outflow e.g. tricyclic antidepressants, neuroleptics.

REFERRAL
All patients with suspected BPH.

8.8 PROSTATE CANCER
C61/D07.5/D29.1/D40.0

DESCRIPTION
Usually occurs in men >50 years of age and is most often asymptomatic.
Systemic symptoms, i.e. weight loss, bone pain, etc. occur in 20% of patients.
Obstructive voiding symptoms and urinary retention are uncommon.
The prostate gland is hard and may be nodular on digital rectal examination.
As the axial skeleton is the most common site of metastases, patients may present with back pain or pathological spinal fractures.
Lymph node metastases can lead to lower limb lymphoedema.

REFERRAL
All patients with suspected cancer.

8.9 ENURESIS
F98.0

DESCRIPTION
Enuresis is bedwetting that occurs in children > 5 years of age.
It is a benign condition which mostly resolves spontaneously.
It is important, however, to differentiate between nocturnal enuresis and daytime wetting with associated bladder dysfunction.
Secondary causes of enuresis include:
» diabetes mellitus
» urinary tract infection
» physical or emotional trauma

Note:
» Clinical evaluation should attempt to exclude the above conditions.
» Urine examination should be done on all patients.

GENERAL MEASURES
» Motivate, counsel and reassure child and parents.
» Advise against punishment and scolding.
» Spread fluid intake throughout the day.
» Diapers are not advised, as this will lower the child's self-esteem.

REFERRAL
» Suspected underlying systemic illness or chronic kidney disease.
» Persistent enuresis in a child.

» Diurnal enuresis.

8.10 IMPOTENCE/ERECTILE DYSFUNCTION

F52.2/N48.4

DESCRIPTION

The inability to attain and maintain an erect penis with sufficient rigidity for penetration. Organic causes include neurogenic, vasculogenic, endocrinological (e.g. diabetes mellitus) as well as many systemic diseases and medications.

GENERAL MEASURES

» Thorough medical and psychosexual history.
» Physical examination should rule out gynaecomastia, testicular atrophy or penile abnormalities.
» Consider the removal of medicines (e.g. beta-blockers) possibly associated with the problem.
» A change in lifestyle or medications may resolve the problem, e.g. advise cessation of smoking and alcohol use.

TREATMENT

Treat the underlying condition, if present.

8.11 RENAL CALCULI

N20.0-2/N20.9/N21.0/N21.8/N21.9

DESCRIPTION

This is a kidney stone or calculus which has formed in the renal tract i.e. pelvis, ureters or bladder as a result of urine which is supersaturated with respect to a stone-forming salt.
Clinical features of obstructing urinary stones may include:
» sudden onset of acute colic, localised to the flank, causing the patient to move constantly,
» nausea and vomiting,
» referred pain to the scrotum or labium on the same side as the stone moves down the ureter.

Urinalysis usually reveals microscopic or macroscopic haematuria.

GENERAL MEASURES

Ensure adequate hydration.

MEDICINE TREATMENT

Adults:
Analgesia for pain, if needed:

- Morphine, IM, 0.1 mg/kg 30 minutes, to a maximum of 10 mg (doctor initiated).

LoE:IVb

REFERRAL

» Referral, even with a single first stone episode:
  - All patients < 19 years of age.
  - Pregnant woman (refer postpartum).
  - Morbidly obese patients.
  - Patients known to have polycystic kidney disease.
» Patients with inherited metabolic disorders of kidney function.(e.g. Fanconi syndrome, and inherited conditions resulting in renal tubular acidosis or nephrolithiasis.)
» Referral (for metabolic work-up to identify the cause and provide treatment in order to limit future episodes) to a nephrologist is indicated as follows:
  - Patients with first episode of multiple stones in both kidneys.
  - Patients with three or more kidney stone episodes within 2-3 years.

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PHC Chapter 9: Endocrine conditions

9.1 TYPE 1 DIABETES MELLITUS

DESCRIPTION

Type 1 diabetes mellitus, previously known as juvenile onset diabetes mellitus and as insulin-dependent diabetes mellitus (IDDM), occurs because of a lack of insulin. The result is an increase in blood glucose concentration.

CLINICAL PRESENTATION

- » hunger
- » polyuria
- » ketoacidosis
- » thirst
- » unexplained weight loss
- » tiredness

DIAGNOSIS

Type 1 diabetes mellitus is diagnosed when the classic symptoms of polyuria and polydipsia are associated with hyperglycaemia:

- » Random blood glucose ≥ 11.1 mmol/L.
- » Random is defined as any time of day without regard to time since last meal.

OR

- » Fasting blood glucose ≥ 7.0 mmol/L.
- » Fasting is defined as no caloric intake for ≥ 8 hours.

OR

- » 2-hour plasma glucose in a 75 g oral glucose tolerance test ≥ 11.1 mmol/l. *LoE:III*[1]

GENERAL MEASURES

- » Education regarding diabetes and its complications.
- » Even and regular meal consumption.
- » Dietary emphasis should be on regulating carbohydrate, fibre and fat intake (See Section 9.2.2: Type 2 Diabetes mellitus, in adults for recommended diet plan).
- » Increased physical activity: aim for 30 minutes 5 times a week.
- » Appropriate weight loss if body mass index > 25 kg/m2.
- » Education about foot care.
- » Monitor for development of depression.
- » All patients should wear a notification bracelet.

REFERRAL

All patients.

9.1.1 TYPE 1 DIABETES MELLITUS, IN CHILDREN AND ADOLESCENTS

E10.9

MEDICINE TREATMENT

Oral anti-diabetic medicines should not be used to treat children with type 1 diabetes mellitus.

REFERRAL

All children with confirmed or suspected type 1 diabetes mellitus must be referred to a hospital immediately for management.

9.1.2 TYPE 1 DIABETES MELLITUS, IN ADULTS

E10.9

Type 1 diabetes mellitus is a rare condition and should be diagnosed and monitored at hospital level. Only stable patients may be down referred for chronic medicines.

MONITORING FOLLOWING DOWN REFERRAL

At every visit:

» Finger-prick blood glucose.
» Weight.
» Blood pressure.

Annually:

» HbA1c, one month before next hospital appointment.

TARGETS FOR CONTROL

Glycaemic targets for control:

Patient type	Target HbA1c	Target FBG*	Target PPG*
» Young, low risk » Newly diagnosed » No CVS disease	< 6.5%	4.0–7.0 mmol/L	4.4–7.8 mmol/L
» Majority of patients	< 7.0%	4.0–7.0 mmol/L	5.0–10.0 mmol/L
» Elderly » High risk » Hypoglycaemic unawareness » Poor short-term prognosis	< 7.5%	4.0–7.0 mmol/L	< 12.0 mmol/L

***FBG: fasting blood glucose; PPG: post-prandial blood glucose.**

Non-glycaemic targets:

» Body mass index ≤ 25 kg/m2.
» BP < 140/90 mmHg.

The increased risk of hypoglycaemia must always be weighed against the potential benefit of reducing microvascular and macrovascular complications.

MEDICINE TREATMENT

As type 1 diabetes mellitus usually presents with diabetic ketoacidosis, treatment is usually initiated with insulin and the patient is stabilised at hospital level. Oral anti-diabetic medicines should not be used to treat type 1 diabetics.

Insulin dose requirements will decrease as kidney disease progresses.

Types of insulin

- Insulin, short acting, SC, three times daily, 30 minutes before meals.
  - Regular human insulin.
  - Onset of action: 30 minutes.

  - Peak action: 2–5 hours.
  - Duration of action: 5–8 hours.
- Insulin, intermediate acting, SC, once or twice daily usually at night at bedtime, approximately 8 hours before breakfast.
  - Intermediate acting insulin.
  - Onset of action: 1–3 hours.
  - Peak action: 6–12 hours.
  - Duration of action: 16–24 hours.
- Insulin, biphasic, SC, once or twice daily.
  - Mixtures of regular human insulin and intermediate acting insulin in different proportions, e.g. 30/70 (30% regular insulin and 70% intermediate acting insulin).
  - Onset of action: 30 minutes.
  - Peak action: 2–12 hours.
  - Duration of action: 16–24 hours.

Insulin regimens

Basal bolus regimen

All type 1 diabetics should preferentially be managed with the "basal bolus regimen" i.e. combined intermediate acting (basal) and short acting insulin (bolus). This consists of pre-meal, short acting insulin and bedtime intermediate acting insulin not later than 22h00.

The initial total daily insulin dose:

  - 0.6 units/kg body weight.

The total dose is divided into:

  - 40–50% basal insulin
  - The rest as bolus insulin, split equally before each meal.

Adjust dose on an individual basis.

Pre-mixed insulin

Twice daily pre-mixed insulin, i.e. a mixture of intermediate- or short acting insulin provides adequate control when used with at least daily blood glucose monitoring. It is a practical option for patients who cannot monitor blood glucose frequently.

Education related to insulin therapy

» Types of insulin.
» Injection technique and sites of injection.
» Insulin storage.
» Recognition and treatment of acute complications, e.g. hypoglycaemia and hyperglycaemia.
» Diet:
  - Meal frequency, as this varies according to the type and frequency of insulin, e.g. patients may need a snack at night, about 3–4 hours after the evening meal.
  - Consistent carbohydrate intake for patient receiving fixed mealtime doses of insulin.
» Self-monitoring of blood glucose and how to self-adjust insulin doses.

Drawing up insulin from vials
» Clean the top of the insulin bottle with an antiseptic swab.
» Draw air into the syringe to the number of marks of insulin required and inject this into the bottle; then draw the required dose of insulin into the syringe.
» Before withdrawing the needle from the insulin bottle, expel the air bubble if one has formed.

Injection technique
» The skin need not be specially cleaned.
» Repeated application of antiseptics hardens the skin.
» Stretching the skin at the injection site is the best way to obtain a painless injection. In thin people, it may be necessary to pinch the skin between thumb and forefinger of one hand.
» The needle should be inserted briskly at almost 90□ to the skin to almost its whole length (needles are usually 0.6–1.2 cm long).
» Inject the insulin.
» To avoid insulin leakage, wait 5–10 seconds before withdrawing the needle.
» Injection sites must be rotated to avoid lipohypertrophy.

Prefilled pens and cartridges
In visually impaired patients and arthritic patients, prefilled pens and cartridges may be used.

Home blood glucose monitoring
Patients on basal/bolus insulin should measure glucose 3-4 times daily.
Once patient is stable, reduce the frequency of monitoring. *LoE:III*

REFERRAL
All patients.

9.2 TYPE 2 DIABETES MELLITUS

9.2.1 TYPE 2 DIABETES MELLITUS, IN ADOLESCENTS
E11.9

DESCRIPTION
The majority of adolescent diabetics are of type 1. However, an increasing number of adolescents are being diagnosed with type 2 diabetes mellitus.

Criteria for screening for diabetes in children
» Body mass index > 85th percentile for age and sex.
» Family history of type 2 diabetes mellitus.
» Presence of hyperlipidaemia, hypertension or polycystic ovarian syndrome.

AND
» Physical signs of puberty or age > 10 years of age.

DIAGNOSIS
» Symptoms of diabetes plus a random blood glucose ≥ 11.1 mmol/L.
  - Random is defined as any time of day without regard to time since last meal.

- Classic symptoms of diabetes mellitus include polyphagia, polyuria, polydipsia.

OR

» Fasting blood glucose ≥ 7.0 mmol/L.
- Fasting is defined as no caloric intake for ≥ 8 hours.

OR

» 2-hour plasma glucose in a 75 g oral glucose tolerance test ≥ 11.1 mmol/l. *LoE:III*[2]

It is difficult to distinguish type 2 from type 1 diabetes mellitus, as many type 1 diabetics may be overweight, or have a family history of type 2 diabetes mellitus, given the increasing prevalence of both obesity and type 2 diabetes mellitus. The diagnosis of type 2 diabetes mellitus in adolescents should be made in consultation with a specialist.

REFERRAL
All patients.

9.2.2 TYPE 2 DIABETES MELLITUS, ADULTS
E11.9

DESCRIPTION
Type 2 diabetes mellitus is a chronic debilitating metabolic disease characterised by hyperglycaemia with serious acute and chronic complications. It is an important component of the metabolic syndrome (see Section 9.5.1: Obesity in diabetes).
Most type 2 diabetes mellitus adults are overweight with a high waist to hip ratio.
In adults, the condition might be diagnosed when presenting with complications, e.g.:

» ischaemic heart disease
» peripheral artery disease
» stroke
» deteriorating eyesight
» foot ulcers
» erectile dysfunction

CLINICAL PRESENTATION
Symptoms of hyperglycaemia are:

» thirst, especially noticed at night
» polyuria
» tiredness
» periodic changes in vision due to fluctuations in blood glucose concentration
» susceptibility to infections, especially of the urinary tract, respiratory tract and skin

Note: It is important to distinguish type 2 diabetes mellitus from type 1diabetes mellitus. Suspect type 1 diabetes mellitus among younger patients with excessive weight loss and/or ketoacidosis.

DIAGNOSIS
» Symptoms of diabetes plus a random blood glucose ≥ 11.1 mmol/L.
- Random is defined as any time of day without regard to time since last meal.

OR

» Fasting blood glucose ≥ 7.0 mmol/L.
- Fasting is defined as no caloric intake for ≥ 8 hours.

OR

» 2-hour plasma glucose in a 75 g oral glucose tolerance test ≥ 11.1 mmol/l.

Note: If screening and not symptomatic: 2 positive tests done on separate days are required for diagnosis. *LoE:III*[3]

MONITORING

At every visit:
» Finger-prick blood glucose.
» Weight.
» Blood pressure.

Baseline:
» Serum creatinine concentration (and calculate eGFR).
» Serum potassium concentration, if on ACE-inhibitor or eGFR < 30 mL/min.
» Urine protein by dipstix.
  - If dipstix negative, send urine to laboratory for albumin: creatinine ratio, unless already on an ACE-inhibitor. (See Section 9.4.3: Diabetic nephropathy).
  - If dipstix positive, see Section 9.4.3: Diabetic nephropathy.
» BMI for cardiovascular risk assessment if appropriate (See Section 4.1: Prevention of ischaemic heart disease and atherosclerosis).
» Blood lipids (fasting total cholesterol, triglycerides, HDL and LDL cholesterol).
» Foot examination.
» Eye examination to look for retinopathy.
» Abdominal circumference.

Annually:
» Serum creatinine concentration (and calculate eGFR).
» Serum potassium concentration, if on ACE-inhibitor or eGFR < 30 mL/min.
» Urine protein by dipstix.
  - If dipstix negative, send urine to laboratory for albumin: creatinine ratio, unless already on an ACE-inhibitor. (See Section 9.4.3: Diabetic nephropathy.)
» HbA1c, in patients who meet treatment goals (3–6 monthly in patients whose therapy has changed, until stable).
» Eye examination to look for retinopathy.
» Foot examination.

TARGETS FOR CONTROL

Glycaemic targets for control:

Patient type	Target HbA1c	Target FBG*	Target PPG*
» Young, low risk » Newly diagnosed » No CVS disease	< 6.5%	4.0–7.0 mmol/L	4.4–7.8 mmol/L
» Majority of patients	< 7.0%	4.0–7.0 mmol/L	5.0–10.0 mmol/L
» Elderly » High risk » Hypoglycaemic unawareness » Poor short-term prognosis	< 7.5%	4.0–7.0 mmol/L	< 12.0 mmol/L

***FBG: fasting blood glucose; PPG: post-prandial plasma glucose.**

» In the elderly, the increased risk of hypoglycaemia must be weighed against the potential benefit of reducing microvascular and macrovascular complications.
» Prevent acute complications, e.g. hyperglycaemic and hypoglycaemic coma.

Non-glycaemic targets:
» Body mass index ≤ 25 kg/m2.
» BP ≤ 140/90 mmHg and ≥ 120/70 mmHg.

Management of type 2 diabetes mellitus includes:

» Treatment of hyperglycaemia.
» Management of chronic conditions associated with diabetes. For treatment of hypertension and dyslipidaemia after risk-assessment, see Section 4.7: Hypertension and Section 4.1: Prevention of Ischaemic heart disease and atherosclerosis.
» Prevention and treatment of microvascular complications. See Section 9.4: Microvascular complications of diabetes.
» Prevention and treatment of macrovascular complications. See Section 9.5: Cardiovascular risk in diabetes.

GENERAL MEASURES

» Lifestyle modification, including self-care practices.
» Refer to a dietician if available for annual follow-up.
» Refer to a support group if available.
» Education about diabetes and its complications.
» Increased regular physical activity, aim for 30 minutes 5 times a week.
» Appropriate weight loss if weight exceeds ideal weight.
» Discourage smoking.
» Moderate or no alcohol intake (≤ 2 standard drinks per day for males and ≤ 1 for females).
» Education about foot care.
» All patients should wear a notification bracelet.

Diet

Encourage: *LoE: III*[4]

» regular, evenly-spaced meals, with small portions
» nutritionally balanced meals, with a variety of healthy foods
» meals that consist of one meat dish option with an option of vegetarian for those who are vegetarian, one starch option, two vegetable options, one fruit option and water

Carbohydrates

» Strict control of carbohydrate intake:
  - encourage small portions of healthy carbohydrates, such as vegetables, fruits, whole grains (e.g. whole wheat bread, oats, brown rice, pearled wheat, maise meal porridge, sorghum porridge, samp, wheat rice), legumes (lentils, beans), and dairy products
  - discourage intake of less healthy, highly processed/refined carbohydrate foods, especially those with added fats, sugars, or salt (e.g. takeaways, deep-fried foods, pies, doughnuts, cakes, biscuits, white bread, sugary drinks)

Fruit and vegetables

» Aim for 5 servings of fruit or vegetables per day (e.g. vegetables: spinach, morogo, cabbage, tomato, imifino (amadumbe, amaranth, cowpea, pumpkin and sweet potato leaves); fruit: apple, orange, naartjie, banana, mango, pear, peach)
» Limit fruit to 2 servings per day, preferably in small portions throughout the day rather than all at one meal
» Limit intake of starchy vegetables like potatoes, sweet potatoes, mielies, butternut, and pumpkin
» Limit intake of concentrated fruit sources such as dried or tinned fruit, or juices.

Legumes

» Soy beans, dry beans, chickpeas, lentils, and split peas are an economical source of protein and fibre
» They do contain starch, so contribute to total carbohydrate intake (see portion sizes below)

Dairy

» Advise fat-free or lower fat options.

Meat, fish, and eggs

» Encourage less fatty cuts of meat if possible.
» Encourage low fat cooking methods such as baking, grilling, or steaming. Trim excess fat from meat and remove skin from chicken before cooking.
» Encourage patients to eat oily fish e.g. sardines and pilchards 2-3 times a week.
» Limit eggs to 1 per day.
» Avoid processed meats such as polony and viennas.

Fats

» Replace unhealthy animal fats (fatty beef, pork, lamb and chicken) and tropical oils (e.g. coconut and palm kernel oil) with healthier fats (e.g. avocado pear, fatty fish such as pilchards and plant oils such as canola, olive, sunflower, or peanut butter).
» Do not reheat oil, and use softer margarines where possible.
» Limit intake of takeaway foods, and rather prepare food at home most of the time.

Sugar

» Avoid sugar and sugary foods and drinks, such as: table sugar, honey, sugary drinks (fizzy drinks, fruit juices, energy drinks, sport drinks, sweetened flavoured milk/drinking yoghurt, flavoured water), sweets, desserts and baked goods.
» If eaten on special occasions, advise in very small portions.

Salt

» Do not exceed a half teaspoon of salt per day. This includes hidden salt in processed foods (e.g. stock cubes, gravy and soup powders, deli meats like polony and viennas, take-away foods, chips/crisps).
» Avoid adding salt to food.
» Use less salt when preparing food. Use herbs and spices to enhance the flavour of foods instead of salt.

Portion control guide:

A portion is the amount of food that a person eats at one time, for a meal or snack. Advise the following portion sizes:

» Make protein (e.g. fish, chicken, or meat) food portions the size of the palm of your hand (about 90 g or 1/2 cup).
» Make fruit, vegetables and starchy food (such as rice, pasta and potatoes) portions no greater than the size of your clenched fist (1 cup).
» Make healthy fat portions the size of the tip of your thumb (1 teaspoon).
» Make hard cheese or peanut butter portions the length of your thumb (1 tablespoon).

MEDICINE TREATMENT

Oral blood glucose lowering agents

Stepwise approach:

» Add metformin to the combination of dietary modifications and physical activity/exercise.
» Combination therapy with metformin plus a sulphonylurea is indicated if therapy with metformin alone (together with dietary modifications and physical activity/exercise) has not achieved the HbA1c target.
» For persisting HbA1c above acceptable levels and despite adequate adherence to oral hypoglycaemic agents: add insulin and withdraw sulphonylurea.
» Ensure patient is adherent at each step.
» Oral agents should not be used in type 1 diabetes mellitus, renal impairment or clinical liver failure.

STEP 1

Lifestyle modification plus metformin

Entry to Step 1	Treatment and duration	Target
» Typical symptoms - thirst, tiredness, polyuria. **AND** » Random blood glucose >11.1mmol/L. **OR** » Fasting blood glucose ≥ 7 mmol/L.	» Lifestyle modification for life. » Appropriate diet. » Weight loss until at ideal weight. Initiate drug therapy with: • Metformin. » Assess monthly.	» 2-hour post-prandial finger-prick blood glucose: 8–10 mmol/L. **OR** » fasting finger-prick blood glucose: 6–8 mmol/L. **AND/OR** » HbA1c:7–8%.

- Metformin, oral, 500 mg daily with meals.
  - Titrate dose slowly depending on HbA1c and/or fasting blood glucose concentrations to a maximum dose of 850 mg 8 hourly.
  - Contraindicated in:
    - uncontrolled congestive cardiac failure
    - severe liver disease
    - patients with significant respiratory compromise
    - renal impairment i.e. eGFR <30 mL/minute,

In patients with renal impairment, adjust dose according to table:

eGFR	Metformin dose
» eGFR >60 mL/min	Normal daily dose (see above).
» eGFR 45–60 mL/min	Standard dose, measure eGFR 3–6 monthly.
» eGFR 30–45 mL/min	**Maximum dose 1 g per day**; measure eGFR 3–6 monthly.
» eGFR <30 mL/min	Stop metformin.

LoE:III[5]

STEP 2

Add sulphonylurea:

Entry to Step 2	Treatment and duration	Target
» Failed step 1: HbA1c > 8 % or fasting finger-prick blood glucose >8 mmol/L despite adherence to treatment plan in step 1 and maximal dose of metformin for 2–3 months. **OR** » 2-hour post-prandial finger-prick blood glucose >10 mmol/L despite adherence to treatment plan in step 1 and maximal dose of metformin for 2–3 months.	» Lifestyle modification. **AND** » Combination oral hypoglycaemic agents, i.e.: • Metformin, oral. **AND** • Sulphonylurea.	» 2-hour post-prandial finger prick blood glucose < 8–10 mmol/L. **OR** » fasting finger prick blood glucose: 6–8 mmol/L. **AND/OR** » HbA1c:7–8%.

- Sulphonylurea derivatives
- Glimepiride, oral, daily with breakfast.
  - Titrate the dose by 1 mg at weekly intervals up to 6 mg daily (according to blood glucose levels). *LoE:III*[6]
  - Usual dose: 4 mg daily.
  - Maximum dose: 8 mg daily.
  - Preferred in the elderly.

OR

- Glibenclamide, oral, 2.5 mg daily 30 minutes with breakfast.
  - Titrate dose slowly depending on HbA1c and/or fasting blood glucose levels to a maximum of 15 mg daily.
  - When ≥ 7.5 mg per day is needed, divide the total daily dose into 2, with the larger dose in the morning.
  - **Avoid in the elderly and patients with renal impairment.**

All sulphonylureas should be avoided in patients with renal impairment i.e. eGFR < 60 mL/minute.

Sulphonylureas are contraindicated in:
» severe hepatic impairment
» pregnancy

Missing meals while taking sulphonylureas may lead to hypoglycaemia.

STEP 3

Insulin therapy: See Section 9.1.2: Type 1 diabetes mellitus, in adults.

» Insulin is indicated when oral combination therapy fails.
» Continue lifestyle modification.
» Insulin therapy must be initiated and titrated by a doctor until stabilised.
» Stop sulphonylurea once insulin therapy is initiated but continue metformin.

LoE: III[7]

Education for patients on insulin therapy:

» Types of insulin.
» Injection technique and sites of injection.
» Insulin storage.
» Self-monitoring of blood glucose and how to self-adjust insulin doses.
» Diet:
  - Meal frequency, this varies according to the type and frequency of insulin, e.g. patients may need a snack at night about 3–4 hours after the evening meal.
  - Consistent carbohydrate intake for patients receiving fixed mealtime doses of insulin.
» Recognition and treatment of acute complications, e.g. hypoglycaemia and hyperglycaemia.

Insulin type	Starting dose	Increment
Add on therapy: • Insulin, intermediate to long acting, SC	10 units in the evening before bedtime, but not after 22h00.	If 10 units not effective: increase gradually to 20 units (2–4 units increase each week).
Substitution therapy: • Insulin, biphasic, SC	Twice daily. Total daily dose: Start with 0.3 units/kg/day* divided as follows: *LoE: III*[8] o 2/3 of total daily dose, 30 minutes before breakfast. o 1/3 of total daily dose, 30 minutes before supper.	4 units weekly. First increment is added to dose before breakfast. Second increment is added to dose before supper.

*Example of a dose calculation:

- For a 70 kg adult: 0.3 units x 70 kg = 21 units per day; divided as 14 units 30 minutes before breakfast and 7 units 30 minutes before breakfast.

REFERRAL

Urgent (same day)

» Acidotic breathing.
» Dehydration and hypotension.
» Nausea, vomiting and abdominal pain.
» Ketonuria (more than 1+).
» Hyperglycaemia >25 mmol/L.

» Gangrene.
» Sudden deterioration of vision.
» Serious infections.

Note: Consider IV infusion with sodium chloride 0.9%, before transferring very ill patients.

Non-urgent

» Pregnancy.
» Failure of step 3 to control diabetes.
» eGFR< 30 mL/minute.
» Ischaemic heart disease.
» Cerebrovascular disease.
» Refractory hypertension.
» Progressive loss of vision.

9.3 DIABETIC EMERGENCIES

DESCRIPTION

Diabetics may present with a decreased level of consciousness owing to:

» hyperglycaemia diabetic ketoacidosis (DKA) or hyperosmolar hyperglycaemic state (HHS), or
» hypoglycaemia.

DIAGNOSIS

Check blood glucose concentration and test urine for ketones, immediately.

	Hyperglycaemia		Hypoglycaemia
	DKA	HHS	
Blood glucose	≥ 11.1 mmol/L	Usually > 40 mmol/L	< 4 mmol/L
Urine test for ketones	Usually positive and > 1+	Usually negative	Usually negative

If a diagnosis cannot be made, treat as hypoglycaemia and refer urgently.
Low blood glucose presents the most immediate danger to life.

9.3.1 HYPOGLYCAEMIA IN DIABETICS

E10.0/E11.0/E12.0/E13.0/E14.0

DESCRIPTION

Diabetic patients on therapy may experience hypoglycaemia for reasons such as intercurrent illness (e.g. diarrhoea); missed meals; inadvertent intramuscular injections of insulin or miscalculated doses of insulin or progressive renal failure leading to decreased insulin clearance; alcohol ingestion; and exercise without appropriate dietary preparation.

Risk factors include age < 6 years of age, low HbA1c, and longer duration of diabetes.

Hypoglycaemia in diabetic patients can be graded according to the table below:

Mild/moderate hypoglycaemia	Severe hypoglycaemia
» Capable of self-treatment*.	» Semi-conscious

	or » Unconscious/comatose.
» Conscious, but requires help from someone else.	» Requires medical help.

**Except children < 6 years of age.*

Autonomic symptoms/signs	Neurological symptoms/signs
» Tremors » Palpitations » Sweating » Hunger » Fatigue » Pallor	» Headache » Mood changes » Low attentiveness » Slurred speech » Dizziness » Unsteady gait » Depressed level of consciousness/ convulsions

***Note:**

» Children, particularly < 6 years of age, generally are not capable of self-management and are reliant on supervision from an adult.

» Patients may fail to recognise that they are hypoglycaemic when neuroglycopenia (impaired thinking, mood changes, irritability, dizziness, tiredness) occurs before autonomic activation.

DIAGNOSIS

» Blood glucose < 4mmol/L with symptoms in a known diabetic patient.

» Blood glucose concentrations should be measured with a glucometer to confirm hypoglycaemia.

Hypoglycaemia must be managed as an emergency.
If a diabetic patient presents with an altered level of consciousness and a glucometer is not available, treat as hypoglycaemia.

EMERGENCY TREATMENT

» Measure blood glucose concentration with glucometer/testing strip, immediately.

Conscious patient, able to feed

Breastfeeding child

- give breast milk

Older children

- a formula feed of 5 mL/kg

OR

- oral sugar solution

dissolve 3 teaspoons of sugar (15 g) in 200 mL cup of water, administer 5 mL/kg

OR

- sweets, sugar, glucose by mouth

Adults

- sweets, sugar, glucose by mouth

OR

- oral sugar solution
  - dissolve 3 teaspoons of sugar (15 g) in 200 mL cup of water, administer 5 mL/kg

Conscious patient, not able to feed without danger of aspiration

Administer via nasogastric tube:

- Dextrose 10%, 5mL/kg
  - Add 1 part 50% dextrose water to 4 parts water to make a 10% solution.

OR

- milk

OR

- sugar solution
  - dissolve 3 teaspoons of sugar (15 g) in 200 mL of water; administer 5 mL/kg

Unconscious patient

Children

- Dextrose 10%, IV, 2–5 mL/kg.

IV administration of dextrose in children with hypoglycaemia:

» Establish an IV line. Do not give excessive volumes of fluid: usually can keep line open with 2mL/kg/hour.

» Take a blood sample for emergency investigations and blood glucose.

» Check blood glucose.

- **If low, i.e. < 2.5 mmol/L or if testing strips are not available, administer 2–5 mL/kg of 10% dextrose solution IV rapidly.**
  In the majority of cases, an immediate clinical response can be expected.

» Re-check the blood glucose after infusion.

- If still low, repeat 2 mL/kg of 10% dextrose solution.

» After recovery, maintain with 5–10% dextrose solution until blood glucose is stabilised.

» Feed the child as soon as conscious.

Adults

- Dextrose 10% solution, IV, 2–5 mL/kg.
  - Do not give unless hypoglycaemic or hypoglycaemia strongly suspected.
  - Do not give excessive volumes of fluid.
  - If hypoglycaemia is treated:
    - re-check blood glucose 10–15 minutes later;
    - if still low, give a further bolus of dextrose 10%, IV, 2 mL/kg, and commence dextrose 5 or 10%, infusion, 3–5 mL/kg/hour to prevent blood glucose dropping again.

Assess continuously until the patient shows signs of recovery. *LoE:III*[9]

Alcoholics (or where alcohol intake cannot be excluded)

- Thiamine, IV/IM, 100 mg immediately.

CAUTION

Thiamine should preferably be administered prior to intravenous glucose to prevent permanent neurological damage.
Do not delay the dextrose administration in a hypoglycaemic patient.

REFERRAL

Urgent

» All hypoglycaemic patients on oral hypoglycaemic agents.
» Hypoglycaemic patients who do not recover completely after treatment.
» All children with documented hypoglycaemia unless the cause is clearly identified and safe management instituted to prevent recurrence.

9.3.2 SEVERE HYPERGLYCAEMIA (DIABETIC KETOACIDOSIS (DKA) & HYPEROSMOLAR HYPERGLYCAEMIC STATE (HHS)

E10.0-1/E11.0-1/E12.0-1/E13.0-1/E14.0-1

DESCRIPTION

Clinical features of severe hyperglycaemia include:

» dehydration
» abdominal pain
» vomiting
» deep sighing respiration
» drowsiness, confusion, coma
» acetone/fruity-smelling breath
» elevated blood glucose

MEDICINE TREATMENT

Adults

Average fluid deficit 6 L, and may be as much as 12 L.
Be cautious in renal and cardiac disease.
In the absence of renal or cardiac compromise:

- Sodium chloride 0.9%, IV, 15–20 mL/kg in the first hour.
  - Subsequent infusion rate: 10 mL/kg/hour with 20 mL/kg boluses if shocked.
  - Do not exceed 50 mL/kg in the first 4 hours.
  - Correct estimated deficits over 24 hours.

Refer urgently with drip in place and running at planned rate.

When referral will take more than 2 hours and a diagnosis of diabetes with hyperglycaemia is confirmed:

- Insulin, short acting, IM, 0.1 unit/kg.
  - When giving insulin IM, do not use insulin needle.

CAUTION

Do not administer short acting insulin if the serum electrolyte status, especially potassium, is not known.
Continue with fluids, but delay giving insulin in these cases in consultation with referral facility as this delay should not negatively affect the patient, but hypokalaemia with resultant cardiac dysrhythmias definitely will.

Children

If in shock:

- Sodium chloride 0.9%, IV, 20 mL/kg as a bolus.
  - If shock not corrected, repeat the bolus.

- If a 3rd bolus is required, consult with a paediatrician.

If no shock or aftershock is corrected:

- Sodium chloride 0.9%, IV.

Fluid rates of sodium chloride 0.9%, IV (if no shock) in children awaiting transfer.	**Check regularly for shock or increasing dehydration**
Weight range kg	**Rate**(mL/hr) (2–10 kg: 6 mL/kg/hr) (>10-–20 kg: 5 mL/kg/hr) (>20–40 kg: 4 mL/kg/hr)
>4–6	25
>6–10	40
>10–15	60
>15–20	85
>20–30	100
>30–45	150
>45–80	200

Refer urgently with drip in place and running at planned rate.

When referral will take > 2 hours and a diagnosis of diabetes with hyperglycaemia is confirmed and provided glucose is monitored hourly:

- Insulin, short acting, IM, 0.1 units/kg after 1st hour of infusion of saline
  - When giving insulin IM, do not use insulin needle.

9.4 MICROVASCULAR COMPLICATIONS OF DIABETES

9.4.1 DIABETIC NEUROPATHY

E10.4/E11.4 + (G63.2*/G99.0*/G59.0*)

DESCRIPTION

Neuropathies are a common complication of diabetes. They play an important role in the morbidity and mortality suffered by people with diabetes.

There are three major categories:

» peripheral neuropathy
» autonomic neuropathy
» acute onset neuropathies

GENERAL MEASURES

» Educate patient regarding appropriate footwear and good foot care.
» Patients with neuropathy should have their feet examined at every visit.

MEDICINE TREATMENT

Ensure appropriate glycaemic control.

Exclude or treat other contributory factors e.g.:

» alcohol excess
» vitamin B12 deficiency, if suspected
» uraemia
» HIV infection

Pain

- Amitriptyline, oral, 10–25 mg at night increasing to 100 mg, if necessary.

AND/OR

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

Gastroparesis:

- Metoclopramide, oral, 10 mg 8 hourly before meals.

REFERRAL

For further treatment, if the above measures do not control symptoms adequately.

9.4.2 DIABETIC FOOT ULCERS

L97/L08.8 + (E10.5/E11.5/E12.5/E13.5/E14.5)

DESCRIPTION

Ulcers develop at the tips of the toes and on the plantar surfaces of the metatarsal heads and are often preceded by callus formation.
If the callus is not removed, then haemorrhage and tissue necrosis occur below the plaque of callus, which leads to ulceration. Ulcers can be secondarily infected by staphylococci, streptococci, coliforms, and anaerobic bacteria which can lead to cellulitis, abscess formation, gangrene, and osteomyelitis.

DIAGNOSIS

The three main factors that lead to tissue necrosis in the diabetic foot are:

» neuropathy,
» infection, and
» ischaemia.

GENERAL MEASURES

» Metabolic control.
» Treat underlying comorbidity.
» Relieve pressure: non-weight bearing is essential.
» Smoking cessation is essential.
» Frequent (e.g. weekly) removal of excess keratin by a chiropodist with a scalpel blade to expose the floor of the ulcer and allow efficient drainage of the lesion.
» Cleanse with sodium chloride 0.9% solution daily and apply non-adherent dressing.

MEDICINE TREATMENT

- Amoxicillin/clavulanic acid, oral, 875/125 mg 12 hourly for 10 days.

<u>Severe penicillin allergy:</u>
Z88.0
Refer.

REFERRAL

Urgent

Threatened limb, i.e. if the ulcer is associated with:

» cellulitis,
» severe hyperglycaemia,
» abscess,
» discolouration of surrounding skin, or
» crepitus.

Non-urgent

» Claudication.
» Ulcers not responding to adequate treatment.
» Severe penicillin allergy.

9.4.3 DIABETIC NEPHROPATHY

E10.2/E11.2/E12.2/E13.2/E14.2 + (N18.1-5/N18.9)

DESCRIPTION

Screening

» Check annually for proteinuria using dipstix.
» A diagnosis of nephropathy can be made on either a positive dipstix or, if dipstix negative, send urine to laboratory for albumin: creatinine ratio. If ratio > 30 mg/g (3 mg/mmol), diagnose nephropathy.
» Measure serum creatinine annually and estimate eGFR. *LoE: III[10]*

Diet and lifestyle

» Limit protein intake < 0.8 g/kg daily, if proteinuric.
» Advise smoking cessation.

MEDICINE TREATMENT

Start treatment with an ACE-inhibitor and increase gradually to maximal dose if tolerated.

- ACE-inhibitor, e.g.:
- Enalapril, oral, initiate with 5 mg 12 hourly.
  - Increase to maximum daily dose of 20 mg.
  - Monitor potassium, at baseline, within 1 month, and annually. *LoE: I[11]*

Persistent proteinuria

See Chapter 8: Kidney and urological disorders.

Hypertension

Target BP: < 140/90 mmHg. See Section 4.7: Hypertension.

Diabetes mellitus

Target HbA1c < 7.5%.

Intensify other renal and cardiovascular protection measures (not smoking, aspirin therapy, lipid-lowering therapy).

REFERRAL

To specialist: When eGFR<30 mL/minute or earlier if symptomatic.

9.5 CARDIOVASCULAR RISK IN DIABETES

E10.5-9/E11.5-9

See section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

9.5.1 OBESITY IN DIABETES

E66.0/E66.8-9 + (E10.5-9/ E11.5-9)

DESCRIPTION

Abdominal obesity is a waist circumference >94 cm in men, and > 80 cm in women. BMI is determined by weight in kg/height in m2.

BMI (kg/m^2)	
18.5–24.9	normal
25.0–29.9	overweight
30.0–34.9	mildly obese
35.0–39.9	moderately obese
>40	extremely obese

GENERAL MEASURES

A decrease in food intake together with an increase in physical activity is crucial to losing weight.

MEDICINE TREATMENT

Treat the metabolic risk factors, i.e. dyslipidaemia, hypertension, and hyperglycaemia.

9.5.2 DYSLIPIDAEMIA IN DIABETES

E78.0-6/E78.8-9

DESCRIPTION

Dyslipidaemia in type 2 diabetes is usually characterised by increased fasting plasma triglycerides (> 1.7 mmol/L), decreased HDL cholesterol (< 1.0 mmol/L in men and < 1.3 mmol/L in women) and to a lesser extent, increased LDL cholesterol. In those with type 1 diabetes, triglycerides, and to a lesser extent cholesterol concentration, are usually increased.

MONITORING

See Section 9.2.2: Type 2 diabetes mellitus in adults.

MEDICINE TREATMENT

Dyslipidaemia may successfully be treated through lifestyle modifications alone.

- HMGCoA reductase inhibitor (statin) therapy should be added to lifestyle modifications, regardless of baseline lipid concentrations, for all type 2 diabetic patients, who:
  - are > 40 years of age;
  - have had diabetes for > 10 years;
  - have existing cardiovascular disease (for example angina pectoris, previous myocardial infarction, peripheral vascular disease or stroke);
  - have chronic kidney disease (eGFR < 60 mL/minute);

- type 1 diabetes with microalbuminuria *LoE:I*[12]
- e.g., Simvastatin, oral, 10 mg at night.

In patients < 40 years of age, risk assess as for dyslipidaemia; patients on protease inhibitors or amlodipine, see Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

REFERRAL

Random cholesterol > 7.5 mmol/L.
Fasting (14 hours) triglycerides > 10 mmol/L.

9.5.3 HYPERTENSION IN DIABETES

I10

BP lowering in hypertensive patients reduces cardiovascular risk. The diagnosis of hypertension is confirmed if the blood pressure remains > 140/90 mmHg on two separate days. See Section 4.7: Hypertension.

9.6 HYPOTHYROIDISM

9.6.1 HYPOTHYROIDISM IN NEONATES

E03.0-5/E03.8-9

DESCRIPTION

Congenital deficiency of thyroid hormone due to aplasia/hypoplasia of the thyroid gland, defects in thyroid hormone biosynthesis or intrauterine exposure to antithyroid medicines. Congenital hypothyroidism is one of the common treatable causes of preventable mental retardation in children. Congenital hypothyroidism must be treated as early as possible to avoid intellectual impairment.

DIAGNOSIS

Clinical

- » prolonged jaundice
- » feeding difficulties
- » lethargy
- » constipation
- » swollen hands, feet and genitals
- » decreased muscle tone
- » delayed achievement of milestones
- » enlarged tongue

REFERRAL

All patients for investigation and initiation of therapy.

9.6.2 HYPOTHYROIDISM IN CHILDREN AND ADOLESCENTS

E03.0-5/E03.8-9

DESCRIPTION

Hypothyroidism in children causes decreased growth, lethargy, cold intolerance and dry skin. Physical signs may include goitre, short stature, bradycardia and delayed deep tendon reflexes.

Congenital hypothyroidism may present in childhood. Acquired hypothyroidism in children and adolescents may be caused by:

» chronic lymphocytic thyroiditis
» iodine deficiency
» surgery
» radioactive iodine
» infiltrations

DIAGNOSIS

Elevated TSH and low T4 concentrations.

MEDICINE TREATMENT

- Levothyroxine, oral, 100 mcg/m2 once daily, preferably on an empty stomach (Doctor initiated).

REFERRAL

All cases for investigation and initiation of therapy.

9.6.3 HYPOTHYROIDISM IN ADULTS

E03.0-5/E03.8-9

DESCRIPTION

Hypothyroidism causes general slowing of metabolism, which results in symptoms that include fatigue, slow movement and speech, hoarse voice, weight gain, constipation, cold intolerance, depression and impaired memory. Physical signs may include bradycardia, dry, coarse skin, hair loss and delayed relaxation of deep tendon reflexes.

Common causes of primary hypothyroidism are:

» thyroiditis
» amiodarone
» post-surgery
» radio-active iodine

Secondary hypothyroidism (< 1% of cases) may be due to any cause of anterior hypopituitarism.

DIAGNOSIS

» Check TSH concentration. If elevated, check T4 concentration.
» If TSH is elevated, and T4 is low, diagnose hypothyroidism.

MEDICINE TREATMENT

- Levothyroxine, oral, 100 mcg daily, preferably on an empty stomach.
  - If there is a risk of ischaemic heart disease, start at 25 mcg daily and increase by 25 mcg every 4 weeks.
  - In the elderly, start at 50 mcg daily, increased by 25 mcg at 4 week intervals, according to response.
  - Check TSH and T4 after 2–3 months and adjust dose if required.
  - Once stable, check TSH andT4 annually.

REFERRAL

» Suspected hypopituitarism.
» Hypothyroidism in pregnancy.

9.7 HYPERTHYROIDISM

9.7.1 HYPERTHYROIDISM IN CHILDREN AND ADOLESCENTS

E05.0-5/E05.8-9

DESCRIPTION

Hyperthyroidism is a pathological syndrome in which tissue is exposed to excessive amounts of circulating thyroid hormones. The most common cause is Grave's disease, although thyroiditis may also present with thyrotoxicosis.

DIAGNOSIS

Clinical

- » fatigue
- » nervousness or anxiety
- » weight loss
- » palpitations
- » heat insensitivity
- » tachycardia
- » warm moist hands
- » thyromegaly
- » tremor

REFERRAL

Urgent

All patients.

9.7.2 HYPERTHYROIDISM IN ADULTS

E05.0-5/E05.8-9

DESCRIPTION

Most common cause of hyperthyroidism is Graves' disease, which is an autoimmune condition resulting from the presence of thyroid stimulating autoantibodies. Other common causes are toxic single or multinodular goitre and sub-acute thyroiditis.

DIAGNOSIS

Suppressed TSH and elevated T4.
Note: T4 may be normal in hyperthyroidism.

REFERRAL

Urgent

All patients.

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PHC Chapter 10:
Infections and related conditions

10.1 ANTISEPTICS AND DISINFECTANTS

DESCRIPTION

Disinfectants are used to kill micro-organisms on working surfaces and instruments, but cannot be relied on to destroy all micro-organisms.
Antiseptics are used for reducing bacterial load on skin and mucous membranes.

Disinfecting surfaces

Guidelines for the use of disinfectants

» Cleansing (removal of visible soiling) is the first and most important step in chemical disinfection.
» The disinfectant fluid must entirely cover the object and penetrate all crevices.
» Use the recommended strengths for specific purposes.
» Disinfectants cannot sterilise surgical instruments.
» No chemical agent acts immediately; note the recommended exposure time.
» Equipment must be rinsed with sterile water after immersion in a chemical disinfectant e.g. chlorhexidine solution, 0.5% in 70% alcohol.
» Avoid recontamination at this stage.
» Make sure that the rinsing water and all other apparatus are sterile.
» Equipment must not be stored in chemical disinfectants.
» The best disinfectant for killing HIV and other pathogens is a chlorinated solution such as bleach or hypochlorite:
  - Solutions must be freshly prepared.
  - Discard after 24 hours to disinfect properly.
  - Do not use on the skin.

Intact skin

» Use alcohol swabs to clean skin surface before injections are administered.
» Use antiseptics like povidone iodine or chlorhexidine for surgical scrubbing.

Wounds and mucous membranes

- Use chlorhexidine 0.05% aqueous solution to clean dirty wounds.
- Use sodium chloride 0.9% and sterile water on clean wounds.

Disinfectant	Indications	Directions for application
• Chlorhexidine solution: 0.05% aqueous solution.	» Cleaning dirty wounds.	» Remove all dirt, pus and blood before use.
• Chlorhexidine solution: 0.5% in 70% alcohol.	» Skin disinfection before surgery.	» Apply as a preoperative skin prep agent to the relevant area.
• Povidone iodine: o solution 10%. o ointment 10%. o cream 5%.	» Skin and wound infections **Contraindication**: iodine allergy.	» Use ointment for skin infection. » Use solution for cleaning skin and wounds. » **Avoid** using on large wounds because of danger of iodine absorption.

Table 10.1: Disinfectants

Articles and instruments
Adhere to the appropriate cleansing and disinfection policy.

10.2 CHICKENPOX
B01.9/B01.8

DESCRIPTION
A mild viral infection that presents 2–3 weeks after exposure, with:
» mild fever preceding the rash,
» lesions beginning on the trunk and face, later spreading to the arms and legs,
» small, red, itchy spots that turn into blisters and crusts. These stages may all be present at the same time.

Chickenpox is infective from the start of the fever until 6 days after the lesions have appeared or until all the lesions have crusted.
The infection is self-limiting, with a duration of about 1 week.
Complications such as secondary bacterial infection, encephalitis, meningitis and pneumonia may occur (more common in adults and immunocompromised patients).

GENERAL MEASURES
» Isolate from immunocompromised people and pregnant women until all lesions have crusted.
» Ensure adequate hydration.
» Cut fingernails short and discourage scratching.

MEDICINE TREATMENT

CAUTION
Avoid the use of aspirin in children and adolescents <16 years of age with acute febrile illness because of risk of Reye's syndrome.

For itch:
- Calamine lotion, applied as needed.

In severe cases
Children
- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table: Section 23.

Adults
- Chlorphenamine, oral, 4 mg, 6–8 hourly.

For fever with distress:
Children
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults
- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).

- Maximum dose: 15 mg/kg/dose.

If skin infection is present due to scratching, treat as for bacterial skin infection. See Section 5.4: Bacterial infections of the skin.

Treatments with antiviral agents are recommended for:

» Immunocompromised patients.
» All patients with severe chickenpox (irrespective of duration of rash).
- Extensive rash.
- Haemorrhagic rash.
- Visceral involvement.
- Presence of complications.

» Adults and adolescents presenting within 48 hours of the onset of the rash.
» Pregnant women.

Children

- Aciclovir, oral, 20 mg/kg/dose 6 hourly for 7 days (Doctor prescribed).

Weight kg	Dose mg	Use one of the following:			Age months/years
		Susp 200 mg /5 mL	Tablet 200 mg	Tablet 400 mg	
>3.5–5	100	2.5 mL	–	–	>1–3 months
>5–7	140	3.5 mL	–	–	>3–6 months
>7–9	160	4 mL	–	–	>6–12 months
>9–11	200	5 mL	1 tablet	½ tablet	>12–18 months
>11–14	240	6 mL	–	–	>18 months–3 years
>14–25	400	10 mL	2 tablets	1 tablet	>3–5 years
>25–35	600	15 mL	3 tablets	1½ tablet	>7–11 years
>35–55	700	–	3 ½ tablets	–	>11–15 years

Adults

- Antiviral, (active against varicella zoster) e.g.:
- Aciclovir, oral, 800 mg 6 hourly for 7 days. Doctor prescribed. *LoE:IIIb*[1]

REFERRAL

» Complications such as:
- meningoencephalitis,
- pneumonia.

» Severely ill patients.
» Pregnant women.
» Asymptomatic neonates whose mothers had developed chickenpox during the period from 7 days before to 7 days after delivery.
» Neonates with clinical chickenpox.

10.3 CHOLERA

See Chapter 2: Gastrointestinal conditions.

10.4 DYSENTERY, BACILLARY

See Chapter 2: Gastrointestinal conditions.

10.5 FEVER

R50.0-1/R50.8-9

DESCRIPTION

Fever, i.e. temperature ≥ 38°C, is a natural and sometimes useful response to infection, inflammation or infarction.

Fever alone is not a diagnosis.

Fever may be associated with convulsions in children <6 years of age, but is not a cause of the convulsions.

Note:

» Temperature >40°C needs urgent lowering in children.
» Fluid losses are increased with fever.
» Malaria must be considered in anyone with fever who lives in a malaria endemic area, or who has visited a malaria area in the past 12 weeks.

GENERAL MEASURES

Children

» Caregivers should offer the child fluids regularly to keep them well hydrated (where a baby or child is breastfed the most appropriate fluid is breast milk).
» Dress child appropriately for the weather.
» Ensure the child is rested.
» Following contact with a healthcare professional, parents and carers who are looking after their feverish child at home should seek further advice if:
  - the child has a convulsion,
  - the child develops a non-blanching rash,
  - the parent or carer feels that the child is less well than when they previously sought advice,
  - the parent or carer is more concerned than when they previously sought advice
  - the fever lasts >2 days.

Note: Tepid sponging and evaporative cooling are not recommended, as this causes the child to shiver which actually increases the core temperature.

Adults

Maintain hydration.

MEDICINE TREATMENT

Consider treatment with paracetamol in adults with associated tachycardia, possibility of worsening cardiac conditions, and adults and children who are in distress.

Antipyretic agents are not indicated with the sole aim of reducing body temperature in children and adults with fever.

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table: Secton 23.

Adults

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

CAUTION

Do not treat undiagnosed fever with antibiotics, except in children <2 months of age who are classified as having

POSSIBLE SERIOUS BACTERIAL INFECTION.

Do not give aspirin to children and adolescents with acute febrile illness.

Children <2 months of age, fulfilling any criterion of possible serious bacterial infection (see referral criteria):

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose. W See dosing table: Chapter 23.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If SUSPECTING SERIOUS BACTERIAL INFECTION in neonate, give ceftriaxone, even if jaundiced.

» Avoid giving calcium-containing IV fluids (e.g. Ringer's Lactate) together with ceftriaxone:
- If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
- If >28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
- Preferably administer IV fluids without calcium contents.

» Always include the dose and route of administration of ceftriaxone in the referral letter.

REFERRAL

» All children <2 months of age with any one of the following criteria of possible serious bacterial infection:
- axillary temperature >37.5°C,
- bulging fontanelle,
- decreased movement/moves only when stimulated,
- convulsions with current illness,
- decreased level of consciousness,
- breathing difficulties, i.e. respiratory rate >60, nasal flaring, chest in-drawing or apnoea,
- pus forming conditions, i.e. umbilical redness extending to the skin or draining pus, many or severe skin pustules, pus draining from eye.

» All children in whom a definite and easily managed cause is not found.

» Fever that lasts >2 days without finding a treatable cause.

» Fever that recurs.

» Fever combined with:
- signs of meningitis
- coma or confusion

- toxic-looking patient
- convulsion
- jaundice
- failure to feed

10.6 GIARDIASIS

See Chapter 2: Gastrointestinal conditions.

10.7 MALARIA

Note: notifiable medical conditions.

Refer to the most recent Malaria Treatment Guidelines from the Department of Health for the most suitable management in the various endemic areas.

Global malaria endemic areas:
https://www.iamat.org/risks/malaria?gclid=CjwKEAiAjIbBBRCitNvJ1o257WESJADpoUt072u5_X4Wb0fVtkQLiEFrWye263Ef_on8eykkOwLK_hoCFtDw_wcB

Local endemic areas:
https://www.santhnet.co.za/index.php/travel-health-advice/travel-advice/malaria-advice-for-travellers/item/330-malaria-risk-map-for-south-africa-2017.html

DESCRIPTION

Malaria is an infection of red blood cells by a parasite micro-organism called Plasmodium. Five species of Plasmodium are known to cause malaria in humans in Africa. The five species are:

» *Plasmodium falciparum (P. falciparum),*
» *Plasmodium vivax (P. vivax),*
» *Plasmodium ovale (P. ovale),*
» *Plasmodium malariae (P. malariae),*
» *Plasmodium knowlesi (P. knowlesi).*

The parasites are usually transmitted to humans by the bite of a vector mosquito. In South Africa, *P. falciparum* is the most common and the most dangerous of the malaria species. Malaria caused by *P. falciparum* is an acute febrile illness that may progress rapidly to severe disease if not diagnosed early and treated adequately.
Symptoms and signs of malaria are non-specific.
The most important element in the diagnosis of malaria is a high index of suspicion in both endemic and non-endemic areas. Any person resident in or returning from a malaria area **and** who presents with fever (usually within 3 months of possible exposure to vector mosquito bites) should be tested for malaria. The progression of *P. falciparum* malaria to severe disease is rapid, and early diagnosis and effective treatment is crucial. **Pregnant women, young children ≤5 years of age and people living with HIV/AIDS are at particularly high risk of developing severe malaria**.

Symptoms and signs of malaria may include:

» severe headache
» shivering episodes

» fever >38°C
» muscle and joint pains
» diarrhoea
» nausea and vomiting
» flu-like symptoms
» dry cough

Severe disease may present with one or more of the following additional clinical features:

» prostration (severe general body weakness),
» sleepiness, unconsciousness or coma, convulsions,
» respiratory distress and/or cyanosis,
» jaundice,
» renal failure,
» shock,
» repeated vomiting,
» hypoglycaemia,
» severe anaemia (Hb <7 g/dL),
» haemoglobinuria/black urine,
» abnormal bleeding.

DIAGNOSIS

Microscopic examination of thick and thin blood smears. Thick films are more sensitive than thin films in the detection of malaria parasites.

Where rapid diagnostic tests, e.g. HRP2 antigen dipsticks are available, these can be used to diagnose malaria within 10–15 minutes.

Note:

» Rapid tests may remain positive up to 1 month after successful treatment.
» One negative malaria test does not exclude the diagnosis of malaria. Request 2nd test.

GENERAL MEASURES

» Provide supportive and symptomatic relief.
» Monitor for complications.
» Ensure adequate hydration.
» Carefully observe all patients with *P. falciparum* malaria for the first 24 hours for features of severe malaria.

MEDICINE TREATMENT

All first doses of antimalarial medicines must be given under supervision and patients must be observed for at least an hour as vomiting is common in patients with malaria. Treatment must be repeated if the patient vomits within the first hour. Vomiting oral treatment is one of the commonest reasons for treatment failure.

In areas with high incidence of malaria (whether locally transmitted or imported) it should be definitively diagnosed and treated at PHC level. In other areas, patients should be referred for treatment.

10.7.1 MALARIA, NON-SEVERE/UNCOMPLICATED

B50.9/B51.9/B52.9/B53.0/B54

Note: notifiable medical condition.

MEDICINE TREATMENT

- Artemether/lumefantrine, oral, 20/120 mg, with fat-containing food/full cream milk to ensure adequate absorption.
  - Give the first dose immediately.
  - Follow with second dose 8 hours later.
  - Then 12 hourly for another 2 days (total number of doses in 3 days = 6).

Weight kg	Artemether/lumefantrine 20/120 mg/tablet	**Tablet(s)**	**Age** months/years
>5–15	20/120 mg	1 tablet	6 months–3 years
>15–25	40/240 mg	2 tablets	>3–8 years
>25–35	60/360 mg	3 tablets	>8–12 years
>35	80/ 480 mg	4 tablets	>12 years and adults

For fever in children <5 years of age:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

REFERRAL

Urgent

» All patients with any sign of severe (complicated) malaria, see Section 10.7.2: Malaria, severe/complicated.
» All patients presenting to PHC clinics in areas that do not stock antimalarials.
» Vomiting leading to inability to retain medication.
» Patients not responding to oral treatment within 48 hours.
» After 1st dose of artemether/lumefantrine 20/120 mg:
  - All children <2 years of age.
  - Pregnant women.
  - Patients with co-morbidities such as HIV, diabetes etc.
  - Patients >65 years of age.

10.7.2 MALARIA, SEVERE/COMPLICATED

B50.0/B50.8

Note: notifiable medical condition.

DESCRIPTION

Any one of the following is a sign of severe (complicated) malaria, is associated with a higher mortality, and requires urgent referral (after initial artesunate dose as below):

» prostration (severe general body weakness),
» sleepiness, confusion, unconsciousness or coma, convulsions,
» respiratory distress and/or cyanosis,

» jaundice,
» renal failure,
» shock,
» repeated vomiting,
» hypoglycaemia,
» severe anaemia (Hb <7 g/dL),
» haemoglobinuria/black urine,
» abnormal bleeding.

MEDICINE TREATMENT

Treatment may be commenced before referral in clinics designated by the regional malaria control programme provided they have facilities to diagnose malaria (either microscopy or rapid antigen point of care tests) and healthcare workers trained in the management of severe malaria.
Correct hypoglycaemia immediately, if present.

Adults and children ≥20 kg:

- Artesunate IM, 2.4 mg/kg immediately as a single dose and refer urgently.
  - If transfer to referral hospital is delayed, administer second dose at 12 hours and third dose at 24 hours.

LoE:Ia[2]

Children <20 kg:

» Aresunate IM, 3 mg/kg immediately as a single dose and refer urgently.
  - If transfer to referral hospital is delayed, administer second dose at 12 hours and third dose at 24 hours.

LoE:IIIb[3]

Note: For all patients requiring referral, the patient must be transferred to reach the referral hospital **within 6 hours** of being seen at the PHC facility.
Advise referral hospital that an initial dose has been administered.

REFERRAL

Urgent
All patients.

For dosing of artesunate, see Figure 10.1: Dosing of artesunate, below.

GUIDELINES FOR ADMINISTRATION OF INJECTABLE ARTESUNATE FOR SEVERE MALARIA

WHO RECOMMENDED TREATMENT [2]

PRODUCT DESCRIPTION [1]

Dose: For children < 20 kg: 3.0 mg/kg
For children > 20 kg and adults: 2.4 mg/kg

Can be given by intravenous route (IV) or intramuscular route (IM).
IV is the preferred route of administration.
Please refer to the patient information leaflet for more information.

* Water for injection is not an appropriate dilutant

1 WEIGH THE PATIENT

2 DETERMINE THE NUMBER OF VIALS NEEDED

Weight	less than 25 kg	26-50 kg	51-75 kg	76-100 kg
60 mg vial	1	2	3	4

3 RECONSTITUTE

■ Activate the drug: artesunate powder + bicarbonate ampoule (immediately before use)

4 DILUTE

■ Reconstituted artesunate + saline solution (or dextrose 5%)

■ Volume for dilution

	IV	IM
Bicarbonate solution volume	1 ml	1 ml
Saline solution volume	5 ml	2 ml
Total volume	**6 ml**	**3 ml**
Artesunate 60 mg solution concentration	10 mg/ml	20 mg/ml

IMPORTANT

Water for injection is not an appropriate dilutant

1. World Health Organization (WHO) List of Prequalified Medicinal Products (http://apps.who.int/prequal/query/ProductRegistry.aspx?list=any) artesunate injectable, reference N° MA061, prequalified on 05-Nov-2010.
2. World Health Organization, Management of Severe Malaria - A practical handbook - Third edition - April 2013 - (http://www.who.int/malaria/publications/atoz/9789241548526/en/index.html)

5 CALCULATE THE DOSE

■ Calculate and withdraw the required dose in ml according to route of administration:

Less than 20 kg

For intravenous route (IV)

Concentration: 10 mg/ml

3.0 mg x body weight (kg)
IV artesunate solution concentration 10 mg/ml
Round up to the next whole number

Example:

Dose needed (ml) for 8 kg child:

$\frac{3.0 \times 8}{10} = 2.4$ ml

2.4 ml rounded up to 3 ml

Weight kg	Dose mg	Dose ml
6 - 7	20	2
8 - 10	30	3
11 - 13	40	4
14 - 16	50	5
17 - 20	60	6

For intramuscular route (IM)

Concentration: 20 mg/ml

3.0 mg x body weight (kg)
IM artesunate solution concentration 20 mg/ml
Round up to the next whole number

Example:

Dose needed (ml) for 8 kg child:

$\frac{3.0 \times 8}{20} = 1.2$ ml

1.2 ml rounded up to 2 ml

Weight kg	Dose mg	Dose ml
6 - 7	20	1
8 - 10	30	2
11 - 13	40	2
14 - 16	50	3
17 - 20	60	3

More than 20 kg

Concentration: 10 mg/ml

2.4 mg x body weight (kg)
IV artesunate solution concentration 10 mg/ml
Round up to the next whole number

Example:

Dose needed (ml) for 26 kg child:

$\frac{2.4 \times 26}{10} = 6.24$ ml

6.24 ml rounded up to 7 ml

Weight kg	Dose mg	Dose ml
20 - 25	60	6
26 - 29	70	7
30 - 33	80	8
34 - 37	90	9
38 - 41	100	10
42 - 45	110	11
46 - 50	120	12
51 - 54	130	13
55 - 58	140	14
59 - 62	150	15
63 - 66	160	16
67 - 70	170	17
71 - 75	180	18
76 - 79	190	19
80 - 83	200	20
84 - 87	210	21
88 - 91	220	22
92 - 95	230	23
96 - 100	240	24

Concentration: 20 mg/ml

2.4 mg x body weight (kg)
IM artesunate solution concentration 20 mg/ml
Round up to the next whole number

Example:

Dose needed (ml) for 26 kg child:

$\frac{2.4 \times 26}{20} = 3.12$ ml

3.12 ml rounded up to 4 ml

Weight kg	Dose mg	Dose ml
20 - 25	60	3
26 - 29	70	4
30 - 33	80	4
34 - 37	90	5
38 - 41	100	5
42 - 45	110	6
46 - 50	120	6
51 - 54	130	7
55 - 58	140	7
59 - 62	150	8
63 - 66	160	8
67 - 70	170	9
71 - 75	180	9
76 - 79	190	10
80 - 83	200	10
84 - 87	210	11
88 - 91	220	11
92 - 95	230	12
96 - 100	240	12

Remark: the upper limit for each weight band is 0.9 kg e.g. 14 - 16 kg covers 14 - 16.9 kg.

6 ADMINISTER

7 DOSING SCHEDULE

1. Give **3 parenteral doses** over 24 hours as indicated in the opposite table

2. Give **parenteral doses** for a minimum of 24 hours once started irrespective of the patients ability to tolerate oral treatment earlier.

- **Day 1** **Dose 1: on admission (0 Hours)**
  Dose 2: 12 hours later
- **Day 2** **Dose 3: 24 hours after first dose**

- When the patient can take oral medication, prescribe a full 3-day course of recommended first line oral Artemisinin Combination Therapy (ACT).
  The first dose of ACT should be taken **between 8 and 12 hours** after the last injection of artesunate.
- Until the patient is able to take oral medication, continue parenteral treatment (one dose a day) **for a maximum of 7 days.**
- A course of injectable artesunate should always be followed by a 3-day course of ACT.

- Evaluate the patient's progress regularly.

IMPORTANT

- **Prepare a fresh solution for each administration.**
- **Discard any unused solution after use.**

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10.7.3 MALARIA, PROPHYLAXIS

Z29.1

DESCRIPTION

In South Africa, malaria chemoprophylaxis should be used, together with preventive measures against mosquito bites, from September to May in moderate-risk malaria-endemic areas. Risk areas in South Africa are shown in the map included in the National Guidelines for the Prevention of Malaria (2018) found at: https://www.nicd.ac.za/wp-content/uploads/2019/03/National-Guidelines-for-prevention-of-Malaria_updated-08012019-1.pdf

Malaria chemoprophylaxis is recommended for persons intending to travel to malaria-endemic areas within and outside of South Africa. There are moderate- and high-risk areas in neighbouring countries. Chemoprophylaxis must be started before entering the malaria area, and continued for a period of time after exiting the malaria area.

GENERAL MEASURES

Always use preventative measures, in addition to pharmacological therapy, against mosquito bites between dusk and dawn:

» Use di-ethyl 3-methylbenzamid (DEET) insecticide-impregnated mosquito nets, insecticide coils or pads.
» Apply insect repellent to exposed skin and clothing. Aim for 30% DEET. Don't get on lips, eyes, breaks in skin.
» Wear long sleeves, long trousers and socks, if outside, as mosquitoes are most active at this time.
» Visit endemic areas only during the dry season.

MEDICINE TREATMENT

Prophylaxis

CAUTION

Immunocompromised patients, pregnant women and children <8 years of age should avoid visiting malaria-endemic areas, as they are more prone to the serious complications of malaria.

However, if this cannot be avoided, malaria chemoprophylaxis should be considered (as recommended by the National Guidelines for the Prevention of Malaria (2018) found at: https://www.nicd.ac.za/wp-content/uploads/2019/03/National-Guidelines-for-prevention-of-Malaria_updated-08012019-1.pdf

However, as only doxycycline is provided in the public sector, alternative options for pregnant women and children <8 years of age need to be purchased in the private sector.)

Non-pregnant adults:

- Doxycycline oral, 100 mg daily. A

- Take from 2 days prior to entering endemic area until 4 weeks after exiting the endemic area.

Children ≥8 years of age: LoE:IIIb[4]

- Doxycycline oral, 2 mg/kg/dose daily. A
  - Take from 2 days prior to entering endemic area until 4 weeks after exiting the endemic area. LoE:IVb[5]

Note: Doxycycline is contra-indicated in pregnant women, and in children <8 years of age.

10.8 MEASLES

B05.0-4/B05.8-9

Note: notifiable medical condition.

CASE DEFINITION

» Fever.

AND

» Red maculopapular (blotchy) rash.

AND

» Cough or coryza (runny nose) or conjunctivitis.

Inform the local EPI co-ordinator about all cases of suspected measles, (i.e. which fulfil the case definition criteria). Send clotted blood and throat swabs to confirm (or exclude) a diagnosis of measles.

DESCRIPTION

A viral infection that is especially dangerous in malnourished children or in children who have other diseases such as TB or HIV/AIDS.

Initial clinical features, that occur 7–14 days after contact with an infected individual, include:

» coryza
» fever
» diarrhoea
» conjunctivitis which may be purulent
» cough

After 2–3 days of the initial clinical features, a few tiny white spots, like salt grains appear in the mouth (Koplik spots).

The skin rash appears 1–2 days later, lasting about 5 days and:

» usually starts behind the ears and on the neck,
» then on the face and body,
» thereafter, on the arms and legs.

Secondary bacterial infection (bronchitis, bronchopneumonia, and otitis media) may occur, especially in children with poor nutrition or other concomitant conditions.

GENERAL MEASURES

» Isolate the patient in the clinic to prevent spread.
» In the clinic use face masks and gloves when examining the patient.
» Counsel the caregiver to isolate the patient in the home (if feasible).
» Reduce exposure of children <12 months of age and pregnant women to the index patient.
» Ensure that the caregiver and other close contacts have been previously immunised.

MEDICINE TREATMENT

All children <5 years of age with measles should be given an extra dose of vitamin A, unless the last dose was received within a month:

- Vitamin A (retinol), oral, as a single dose.

Age range	Dose units	Capsule 100 000 IU	Capsule 200 000 IU
Infants 6–11 months	100 000	1 capsule	–
Children 12 months–5 years	200 000	2 capsules	1 capsule

In children <5 years of age, give the 1st dose immediately. If the child is sent home, the caregiver should be given a 2nd dose to take home, which should be given the following day.

Administration of a vitamin A capsule

- Cut the narrow end of the capsule with scissors.
- Open the child's mouth by gently squeezing the cheeks.
- Squeeze the drops from the capsule directly into the back of the child's mouth. If a child spits up most of the vitamin A liquid immediately, give one more dose.

For fever with distress:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

Children with diarrhoea:

Treat according to Section 2.9.1: Acute diarrhoea in children.

Children with pneumonia (1st dose before referral):

- Amoxicillin, oral, 45 mg/kg/dose. A See Section 17.3.4.1: Pneumonia in children.

Children with otitis media:

- Amoxicillin, oral, 45 mg/kg/dose. A See Section 19.4.2 Otitis media, acute.

Pneumonia or otitis media with severe penicillin allergy:

Z88.0

Children

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg/dose daily for 3 days. W See dosing table: Chapter 23. *LoE:IVb*[6]

Purulent conjunctivitis:

- Chloramphenicol, 1%, ophthalmic ointment 8 hourly into lower conjunctival sac.

REFERRAL

» All adults.
» Children <6 months of age.
» Children who are malnourished or immunocompromised, or who have TB.
» Where serious complications are present. These include:
  - stridor/croup,
  - pneumonia,
  - dehydration,
  - neurological complications,
  - severe mouth and eye complications.

Provide emergency treatment, if needed, before referral.

10.9 MENINGITIS

See Chapter 15: Central nervous system conditions.

10.10 MUMPS

B26.0-3/B26.8-9

DESCRIPTION

Incubation period: 14–21 days.
A viral infection primarily involving the salivary glands.
Signs and symptoms:
» Fever.
» Pain on opening the mouth or eating.
» About two days later a tender swelling appears below the ears at the angle of the jaw, often first on one side and later on the other. The swelling disappears in about 10 days.

GENERAL MEASURES

» Bed rest during febrile period.
» Advise on oral hygiene.
» Recommend plenty of fluids and soft food during acute stage.
» Patient is infectious from 3 days before parotid swelling to 7 days after it started. Isolate until swelling subsides.
» Children may return to school 1 week after initial swelling.

MEDICINE TREATMENT

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

REFERRAL
» Abdominal pain (to exclude pancreatitis).
» Painful swollen testes (orchitis).
» Suspected meningo-encephalitis.

10.11 RUBELLA (GERMAN MEASLES)
B06.0/B06.8-9

DESCRIPTION
Incubation period: 14–21 days. A viral infection with skin lesions that is less severe than measles and lasts only 3–4 days.
A maculopapular red rash starts on the face spreading to the trunk, arms, and legs. It usually fades as it spreads.
Note: If cough, coryza or conjunctivitis are also present, it is essential to exclude measles. See case definition of measles (see Section 10.8: Measles).
Clinical features include:
» mild rash,
» swollen and tender lymph nodes behind the ears or at the back of the neck(suboccipital),
» in adults, a small joint arthritis may occur.
Note: Infection during the first or second trimester of pregnancy may lead to severe permanent deformities in the baby. All pregnant women should be referred for confirmation of diagnosis of rubella and counselling.

GENERAL MEASURES
» Bed rest, if needed.
» Isolate from pregnant women for 7 days after onset of the rash.

MEDICINE TREATMENT
Children
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults
- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

REFERRAL
Urgent
» Pregnant women with rubella.
» Pregnant women who have been in contact with a patient with rubella.

10.12 SCHISTOSOMIASIS (BILHARZIA)

B65.0-3/B65.8-9

Note: notifiable medical condition.

DESCRIPTION

A parasitic infestation with:

» *Schistosoma haematobium*: primarily involves the bladder and renal tract, or
» *Schistosoma mansoni:* primarily involves the intestinal tract.

Infestation occurs during washing, bathing or paddling in water harbouring snails shedding this parasite.
Clinical features vary with the location of the parasite.
Most cases are asymptomatic.
Chronic schistosomiasis may present with local or systemic complications due to fibrosis, including urinary tract obstruction with ensuing renal failure, portal hypertension or other organ involvement.

	Schistosoma haematobium	*Schistosoma mansoni*
Clinical features	» blood in the urine » recurrent cystitis » other urinary symptoms	» diarrhoea with blood and mucus in the stools » colicky abdominal pain » enlarged liver and spleen
Diagnosis	» eggs in urine or stool on microscopy	» eggs in urine or stool on microscopy, rectal biopsy

Table 10.2: Differences between *Schistosoma haematobium* and *Schistosoma mansoni*

Acute schistosomiasis occurs several weeks after exposure and may present with non-specific signs such as fever, cough, headache, and urticaria.
Life threatening cardiac and neurological complications may occur.
Refer all suspected cases for diagnosis and further management.
Diagnosis is made by assessing for eosinophilia and conducting serological testing.

GENERAL MEASURES

If bilharzia is endemic, educate the community to avoid contact with contaminated water:

» Do not urinate or pass stools near water used for drinking, washing or bathing.
» Do not swim in contaminated water.
» Collect water from rivers and dams at sunrise when risk of infestation is lowest.
» Boil all water before use.

MEDICINE TREATMENT

In endemic areas where urine microscopy cannot be done patients should be treated empirically after first excluding possible glomerulonephritis, i.e. no raised blood pressure, no oedema, and no shortness of breath. See Section 8.3: Glomerular diseases (GN).
In non-endemic areas treatment should be given only if eggs of *S. haematobium* or *S. mansoni* are found in the urine/faeces.

Children
- Praziquantel, oral, 40 mg/kg as a single dose. See dosing table: Chapter 23.

Adults
- Praziquantel, oral, 40 mg/kg as a single dose. LoE:Ia[7]

Note: Praziquantel may cause life-threatening deterioration if given in acute schistosomiasis. If the acute phase is suspected, consult with a specialist.

REFERRAL
» Children <2 years of age.
» Ongoing urinary tract symptoms including haematuria persisting for 60 days after treatment.
» Signs of bleeding disorders or glomerulonephritis.
» Suspected acute schistosomiasis.

10.13 SHINGLES (HERPES ZOSTER)
B02.0-3/B02.7-9

DESCRIPTION
Dermatomal eruption of vesicles on an erythematous base due to varicella zoster virus (lies dormant in nerve ganglia following chickenpox).

GENERAL MEASURES
» Isolate patient from immunocompromised or pregnant non-immune individuals (who may develop severe chickenpox).
» Offer HIV test, especially to patients.

MEDICINE TREATMENT
Antiviral therapy, indicated for herpes zoster:
» in immunocompetent individuals - only of benefit within 72 hours of onset, and
» in immunocompromised patients - beyond 72 hours, provided that there are active lesions.

Adults:
- Antiviral, (active against herpes zoster) e.g.:
- Aciclovir, oral, 800 mg five times daily for 7 days (4 hourly missing the middle of the night dose). LoE:Ia[8]

For pain:
Pain is often very severe and requires active control. A combination of different classes of analgesics is often necessary.
- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

AND/OR LoE:IVb[9]

During acute presentation if pain is severe and not adequately controlled:
- Tramadol, oral, 50 to 100 mg, 6 hourly as a starting dose. (Doctor prescribed.)

- May be increased to a maximum daily dose of 400 mg.

To treat post-herpetic neuralgia:
Initiate treatment with adjuvant therapy early.

- Amitriptyline, oral, 25 mg at night. (Doctor prescribed.)
  - Titrate as necessary to a maximum of 75 mg.

LoE:IVb[10]

REFERRAL

» Herpes zoster with secondary dissemination or neurological involvement.
» Ocular involvement (if the tip of the nose is involved then ocular involvement is more likely).
» Uncontrolled pain.
» All children.

10.14 TICK BITE FEVER

A77.1/A79.8/A79.9

DESCRIPTION

Tick-borne infection due to *Rickettsia conorii*, acquired from dogs, or *Rickettsia africae*, acquired from cattle and game. The hallmark of tick bite fever is the eschar, i.e. round black lesion ± 5 mm in diameter with an inflammatory halo. A rash develops on about the third day of illness in about two thirds of patients with *R. conorii* and in fewer cases of *R. africae* infection. In *R. conorii* infection the rash is maculopapular and involves the palms and soles. In *R. africae* infection the rash is sparse and may be vesicular. The classic triad of fever, eschar, and rash occurs in 50-75% of patients. Signs of severe tick bite fever include severe headache, hypotension, shortness of breath, and neurological manifestations.

GENERAL MEASURES

» Application of insect repellent to exposed skin and clothing.
» Wearing long sleeves, long trousers, and socks, if outside.
» Inspect clothing for presence of ticks after suspected exposure.

Complications include:

» vasculitis
» encephalitis
» thrombosis
» renal failure
» myocarditis
» pneumonitis
» thrombocytopaenia

MEDICINE TREATMENT

Antibiotic therapy:
Treatment must be started before confirmation of diagnosis by serology.
Although not recommended for children <8 years of age, doxycycline is still regarded as the medicine of choice for children with tick bite fever. However, due to the unavailability of lower dosage forms of doxycycline alternative medicines are considered in children <8 years of age or those weighing <45 kg with mild infection.

Mild to moderate infection:

Children <45 kg

- Azithromycin, oral, 10 mg/kg/dose daily for 3 days. W See dosing table: Chapter 23. *LoE:IIIb*[11]

Children ≥ 45 kg and adults

- Doxycycline, oral, 100 mg 12 hourly, for at least 3 days after the fever subsides with clinical improvement. A
  - Maximum duration of treatment is 7 days. *LoE:IIIb*[12]

In pregnancy:

- Doxycycline, oral, 100 mg 12 hourly for 2 days. A

Then switch to:

- Azithromycin, oral, 500 mg once daily for 3 days. W *LoE:IVb*[13]

For headache and fever:

Children

- Paracetamol, oral, 15 mg/kg/dose, 6 hourly as required. See dosing table: Chapter 23. *LoE:IVb*[14]

Adults

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

REFERRAL

» Patients unable to take oral therapy.
» Patients not responding to adequate therapy, e.g. fever persisting for >48 hours after initiation of treatment.
» Patients with complications.
» Patients with severe tick bite fever.

10.15 TYPHOID FEVER

See Section 2.13: Typhoid fever.

10.16 TUBERCULOSIS

See Chapter 17: Respiratory conditions. Section 17.4: Pulmonary tuberculosis.
Note: notifiable medical condition.

10.17 TUBERCULOSIS, EXTRAPULMONARY

A18.0-8

Note: notifiable medical condition.

DESCRIPTION

Extra-pulmonary tuberculosis is defined as infection of organ systems other than the lung with Mycobacterium tuberculosis. Extra-pulmonary TB can present with non-specific

symptoms such as unintentional weight loss (>1.5 kg in a month), night sweats, and fever for more than 2 weeks. Other symptoms depend on the organ affected. The most common types of extra-pulmonary TB are listed below along with commonly associated signs and symptoms:

Extra-pulmonary TB type	Common presenting sign/symptom
TB lymphadenitis	» Audible wheeze or typical brassy cough caused by large mediastinal lymph nodes. » Peripheral TB lymphadenopathy occurs in neck and armpits. Typically nodes are large (>2 cm), tender, non-symmetrical, matted, firm to fluctuant and rapidly growing.
TB pleural effusion (usually single-sided)	» Non-productive cough. » Chest pain. » Shortness of breath. » High temperature. » Tracheal and mediastinal shift away from the side of the effusion. » Decreased chest movement. » Stony dullness on percussion on the side of the effusion.
TB of spine, bones and joints	» Decreased movement in the joints. » Excessive sweating, especially at night. » Joint swelling with warm, tender joints. » Low-grade fever. » Muscle atrophy and/or spasms. » Numbness, tingling, or weakness below the infection (if the spine is involved).
TB pericardium	» Chest pain. » Shortness of breath. » Dizziness and weakness from low cardiac output. » Signs and symptoms of right-sided heart failure (tachycardia, low BP, peripheral oedema, liver congestion, ascites).
TB meningitis	» During the early phase of TB meningitis, malaise, low-grade fever, headache and personality change may be present. » With suspected established infection assess for: – gradual onset of headache, – malaise, – confusion, – decreased consciousness, – vomiting, – neck stiffness and positive Kernig's sign. » In children, TB meningitis may be acute, sub-acute or chronic and typically presents between 23-49 months of age with: – altered level of consciousness, – history of fever, – irritability, – headache, – convulsions, – poor feeding and failure to thrive, – vomiting,

	– cough, – meningism.
Disseminated/miliary TB	» Most often seen in children and young adults. » Fever. » Cough. » Generalised lymphadenopathy. » Hepatomegaly. » Consider in febrile patients presenting with HIV wasting syndrome.
TB empyema	» Similar to pleural effusion, but aspiration reveals thick pus.
TB peritoneum	» Ascites with no signs of portal hypertension. » Possible palpable abdominal masses. » Possible bowel obstruction.

Table 10.3: Types of extra-pulmonary TB

REFERRAL

All suspected cases of extra-pulmonary TB should be referred immediately to secondary or tertiary care for diagnosis and further management.

10.18 VIRAL HAEMORRHAGIC FEVER (VHF)

A98.0-5/ A98.8/A99/A91

Note: notifiable medical conditions.

Consult the most recent Viral Haemorrhagic Fever Guidelines from the National Department of Health.

DESCRIPTION

Viral haemorrhagic fevers (VHF) are uncommon conditions in South Africa. They may present with non-specific signs or with signs strongly suggestive of VHF (Table 10.4). Other symptoms and organ involvement may be variable.

Signs strongly suggesting VHF	Non-specific signs that may occur with VHF
» Petechial rash. » Ecchymoses. » Other haemorrhagic signs (e.g. epistaxis, haematemesis, melaena). » Non-specific signs of infection.	» Fever. » Headache. » Conjuctivitis. » Pharyngitis. » Myalgia (especially lower back pain). » Vomiting. » Abdominal pain. » Diarrhoea.

Table 10.4: Signs and symptoms of viral haemorrhagic fevers (VHF)

More than 90% of suspected cases of VHF in South Africa prove to be severe forms of common diseases. Many of the diseases mistaken for VHF are treatable if diagnosed early.

These include:

» Severe tick bite fever.
» Fulminant hepatitis.

» Severe falciparum malaria.
» Leptospirosis.
» Severe bacterial infections, particularly *N.meningitidis*.

Endemic causes of VHF in South Africa are Crimean-Congo fever and Rift Valley Fever, both of which may be transmitted between humans by means of blood and body fluids. Imported conditions include Lassa, Ebola and Marburg Fever amongst others.
Obtaining a history of possible exposure to infection (including a detailed travel history) is crucial to diagnosing VHF. Relatives and friends often provide more reliable information than severely ill patients.

GENERAL MEASURES

All suspected, probable VHF cases and contacts of VHF cases must be discussed and managed in consultation with the Regional Virologist or Infectious Diseases Consultant at the referral centre.
Cases should also be discussed with the Special Pathogens Unit of the National Institute for Communicable Diseases (NICD):

Tel: 011 386 6000; Outbreak hotline: 082 883 9920

Transfer of patients will only occur once all relevant arrangements have been made to limit further exposure to a potentially contagious and life threatening agent.

Viral haemorrhagic fevers (VHF) are readily transmitted to healthcare workers, so it is essential to apply strict contact precautions.
ISOLATE ALL SUSPECTED SYMPTOMATIC CASES AT ALL TIMES

If VHF is considered, isolate patient in a single room and take proper precautions to limit further exposure. These include where available:
» long-sleeved disposable gown,
» waterproof apron if the patient is bleeding,
» two pairs of latex gloves, one underneath the gown and one with the wrist of the glove pulled over the gown cuff,
» disposable face mask (preferably with a visor),
» goggles if a mask without the visor is used,
» waterproof boots or 2 pairs of overshoes, one over the other.

Note: Do not touch your own skin with your gloved hands.

MANAGEMENT

Management of VHF contact
» Consult clinician, discuss with NICD and isolate patient (see above).
» Record and follow-up all patient contacts.

Management of suspected/possible/probable VHF
» Non-specific signs:
  - Consult with clinician, discuss with NICD, isolate patient, initiate ceftriaxone and record and follow-up all patient contacts.
» Signs strongly suggestive of VHF:

- Consult with a clinician, discuss with NICD, isolate patient, initiate ceftriaxone and arrange transfer with EMS (providing patient's VHF status, and names, addresses and telephone numbers of patient contacts).

Adults

- Ceftriaxone, IV, 2 g immediately. W *LoE:IVb*[15]

Children

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose. W See dosing table: Chapter 23.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If *SUSPECTING SERIOUS BACTERIAL INFECTION* in neonate, give ceftriaxone, even if jaundiced.

» Avoid giving calcium-containing IV fluids (e.g. Ringer's Lactate) together with ceftriaxone:
- If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
- If >28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
- Preferably administer IV fluids without calcium contents.

» Always include the dose and route of administration of ceftriaxone in the referral letter.

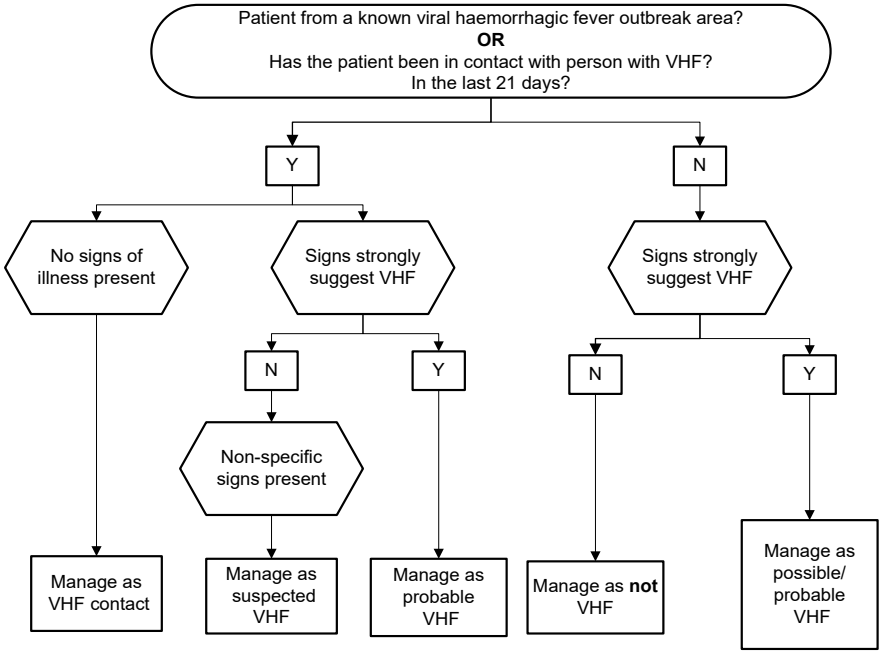

Figure 10.2: Algorithm for management of VHF

REFERRAL

» All cases, after consultation with clinician, discussion with NICD, isolation of patient and management of acute condition.

Manage all contacts of VHF cases according to the current national guidelines. Ensure that contact details are obtained and that there is a plan to manage contacts.

10.19 EMERGING RESPIRATORY PATHOGENS, E.G. COVID-19: CORONAVIRUS DISEASE-19; MIDDLE EAST RESPIRATORY SYNDROME CORONAVIRUS INFECTION: MERS COV

Note: notifiable medical conditions.

Consult the most recent guidelines from the National Department of Health or NICD.

DESCRIPTION

Viral respiratory illness caused by coronaviruses, including Middle East respiratory syndrome (MERS-CoV), severe acute respiratory syndrome (SARS), and severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). SARS-CoV-2 causes coronavirus infectious disease-2019 (COVID-19).

Individuals present with a wide spectrum of clinical presentations ranging from asymptomatic infection to acute upper respiratory illness, and rapidly progressing lower respiratory illness; respiratory failure, septic shock and multi-organ failure resulting in death.

A typical presentation includes:

» fever (>38°C), chills or rigors, cough, shortness of breath

Presentation may include:

» hemoptysis, sore throat, myalgias, diarrhoea, vomiting, abdominal pain

Complications:

» severe pneumonia
» acute respiratory distress syndrome (ARDS)
» acute renal failure
» refractory hypoxaemia

GENERAL MEASURES

All suspected, probable cases and contacts must be discussed and managed in consultation with the regional virologist or infectious diseases specialist at the referral centre. Transfer of patients will only occur once all relevant arrangements have been made to limit further exposure to a potential contagious and life threatening agent.

Droplet precautions should be added to the standard precautions. Airborne precautions should be applied when performing aerosol-generating procedures.

Isolate suspected symptomatic cases at all times.

Management

Treatment

Treatment is supportive.

No antiviral agents are currently available.
Management of contact: consult with NICD and isolate contact.
Record and follow-up all patient contacts.

Prevention
Handwashing and the careful disposal of materials infected with nasal secretions. Antiseptic/disinfectant solutions: choroxylenol, benzalkonium chloride, and cetrimide. Chlorhexidine has been shown to be ineffective.

REFERRAL
All cases, after consultation with infectious diseases and NICD.

10.19.1 COVID-19: CORONAVIRUS DISEASE-19
U07.1/U07.2

Note: notifiable medical condition.

Consult the most recent guidelines on the clinical management of suspected or confirmed Covid-19 disease available at:
https://www.knowledgehub.org.za/content/covid-19

DESCRIPTION
» Viral respiratory illness caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2).
» The mean incubation period is 4-5 days but may be up to 14 days. Patients may however be infectious for 2-3 days prior to the onset of symptoms.
» The elderly are at high risk for severe COVID-19 disease. Other risk factors include cardiopulmonary comorbidities, uncontrolled diabetes mellitus, obesity, TB, HIV, mental illness and substance use disorders. *LoE:IIIb*[16]
» COVID-19 presents as an asymptomatic infection; or as a respiratory tract infection that may range from mild to severe, with atypical manifestations such as diarrhoea, skin manifestations, hyperglycaemic syndromes, and large vessel strokes.

» A suspected COVID-19 case includes any person presenting with an acute (≤14 days) respiratory tract infection or other clinical illness compatible with COVID-19, or an asymptomatic person who is a close contact to a confirmed case.
» In the context of COVID-19, the key respiratory syndrome consists of ANY of:
  - cough,
  - sore throat,
  - shortness of breath,
  - anosmia (loss of smell) or dysgeusia (loss of taste).
» This may present with or without other symptoms (such as fever, weakness, myalgia or diarrhoea).

» Complications include refractory hypoxaemia, acute respiratory distress syndrome (ARDS), long-COVID and multisystem inflammatory syndrome in children (MIS-C) and in adults (MIS-A).

Testing

» Rapid antigen tests or PCR-based tests are both acceptable options to use for diagnosis. Rapid antigen tests may be performed on all patients for whom the PCR test is indicated in situations where no PCR tests are available, or when the PCR turnaround time limits the clinical or public health response utility.
» Upper respiratory tract (nasopharyngeal or oropharyngeal) samples should be sent on all patients. Sputum can be sent when available.
» A single positive rapid or PCR test is sufficient proof of COVID-19 infection.
» A negative rapid test should be followed up by a PCR test if the patient has symptoms compatible with COVID or if the patient has had a recent exposure to a confirmed case.
» Due to poor sensitivity within the first 1-2 weeks after symptom onset, serology (antibody test) is not recommended for the diagnosis of acute COVID-19 infection.
» All healthcare workers should wear appropriate personal protective equipment (PPE) for both contact and respiratory precautions when obtaining specimens
» Record and report and notify all confirmed COVID-19 cases. *LoE:IVb*[17]

GENERAL MEASURES

» Manage patients who are asymptomatic or who meet criteria for mild disease at home, provided they can safely self-isolate and seek urgent health care if required.
» Give strict advice to patients who self-isolate at home and how to reduce possible transmission to others.

Criteria for management at home (for age >12 years):

Mild disease:

» SpO2 ≥95%.
» Respiratory rate <25 breaths/minute.
» HR <120 beats/minute.
» Mental status normal.

Able to safely self-isolate:

» Separate bedroom available for patient to self-isolate in.
» Able to maintain physical distancing at home.
» Able to maintain hand hygiene.
» Patient able to contact, and return to, healthcare facility in case of progression to severe disease.

MEDCINE TREATMENT

Note: Antibiotics are of no value for the treatment of confirmed COVID-19, unless there is clear evidence of a coexisting infection.

Paracetamol is recommended for symptomatic treatment of patients with pain in preference to nonsteroidal anti-inflammatory drugs (NSAIDs).

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

Note:

» Any deterioration in the ability to perform activities of daily living at home as a result of dyspnoea should prompt re-evaluation at a healthcare facility.

» Corticosteroids should not be used for the treatment of COVID-19 in patients who do not require supplemental oxygen or mechanical ventilation, unless they are required for another reason such as an acute exacerbation of asthma or chronic obstructive pulmonary disease.

COVID-19 HOTLINE NUMBER
0800 029 999
http://www.nicd.ac.za/; https://sacoronavirus.co.za/

Infection Prevention and Control (IPC)

» Practice hand hygiene.

» Use healthcare worker PPE: gloves, gown (or apron), and a medical mask.

» Practice safe waste management.

» Use either disposable or dedicated equipment (e.g. stethoscopes, blood pressure cuffs and thermometers). If equipment needs to be shared among patients, clean and disinfect between each patient use.

» Limit patient movement within the institution and ensure that patients wear medical masks when outside their rooms.

Comprehensive national IPC guidelines for COVID-19 are available at: https://www.knowledgehub.org.za/content/covid-19.

REFERRAL

Urgent

Refer cases urgently where there is a respiratory rate of >25 breaths/minute, SpO2 <94% in patients breathing room air or oxygen, heart rate of >120 beats/minute, are confused, agitated or have decreased consciousness. Administer oxygen and monitor oxygen saturation during referral. If unsure, consult with ID expert or NICD (see above).

LoE:IIIb [18]

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PHC Chapter 11: Human immunodeficiency virus and acquired immune deficiency syndrome (HIV AND AIDS)

HIV infection in adults and adolescents (10-19 years old)

Comprehensive guidelines are available for ART and the care of adults and children with HIV infection in the 2023 ART Clinical Guidelines for the Management of HIV in Adults, Pregnancy and Breastfeeding, Adolescents, Children, Infants and Neonates. [1]

HIV INFECTION IN ADULTS AND ADOLESCENTS (10-19 YEARS OLD)

DESCRIPTION

HIV replicates in CD4 lymphocytes and monocytes, leading to progressive destruction of CD4 lymphocytes and impaired immunity.
Primary infection is characterised by:

- glandular fever-type illness,
- maculopapular rash,
- small orogenital ulcers.

After primary infection, patients may have generalised lymphadenopathy and are usually asymptomatic for several years. Subsequently, if untreated, inflammatory skin conditions and an increased frequency of minor infections occur, followed by more severe infections (especially tuberculosis), weight loss and/or chronic diarrhoea. Eventually, severe opportunistic infections, HIV-associated cancers, or other severe HIV manifestations develop, known as the Acquired Immune Deficiency Syndrome (AIDS).

DIAGNOSIS

- Provide adequate pre- and post-test counselling.
- Ensure patient confidentiality.
- A positive rapid HIV test in adults must be confirmed with a 2nd rapid test from a different manufacturer. If the screening and confirmation rapid test result differ, repeat the tests. If the repeated test series differ, do a laboratory test (usually ELISA).
- HIV antibodies are not detected during the 1st few weeks after infection. This is known as the window period.

PROGNOSIS

- HIV disease progression is variable. The CD4 lymphocyte count and clinical features of immune suppression (see WHO staging below) both provide independent information on prognosis. Patients may be asymptomatic with very low CD4 counts or have severe clinical features with well-preserved CD4 counts. CD4 counts <200 cells/mm^3 indicate severe immune suppression. All HIV-infected patients must have a CD4 count and WHO clinical staging done at diagnosis.
- All PLHIV are eligible for ART, irrespective of CD4 count or WHO stage. Patients should be counselled about the benefits and risks of early ART initiation, and encouraged to initiate ART as soon as feasible. However, should a patient elect to defer ART, the CD4 count should be repeated every 6 months until ART can be initiated.

South African modified WHO staging of HIV/AIDS for adults and adolescents

Clinical Staging	Clinical Features
Stage 1	• Asymptomatic. • Persistent generalised lymphadenopathy.
Stage 2	• Unexplained moderate weight loss (<10% of presumed or measured body weight). • Recurrent respiratory tract infections (sinusitis, otitis media and pharyngitis). • Herpes zoster (shingles). • Angular stomatitis. • Recurrent oral ulceration. • Papular pruritic eruption. • Seborrhoeic dermatitis. • Fungal nail infections.
Stage 3	• Unexplained severe weight loss (>10% of presumed or measured body weight). • Unexplained chronic diarrhoea for >1 month. • Unexplained persistent fever (>37.5°C intermittent or constant for >1 month). • Persistent oral candidiasis (thrush). • Oral hairy leukoplakia. • Pulmonary TB. • Severe bacterial infections (such as pneumonia, empyema, pyomyositis, bone or joint infection, meningitis, or bacteraemia). • Acute necrotizing ulcerative stomatitis, gingivitis, or periodontitis. • Unexplained anaemia (<8 g/dL), neutropaenia (<0.5 × 10^9/L) and/or chronic thrombocytopaenia (<50 × 10^9/L).
Stage 4	• HIV wasting syndrome. • Extrapulmonary tuberculosis. • Pneumocystis pneumonia. • Recurrent severe bacterial pneumonia. • Chronic herpes simplex infection (orolabial, genital or anorectal of >1 month duration or visceral at any site). • Oesophageal candidiasis (or candidiasis of trachea, bronchi or lungs). • Kaposi's sarcoma. • Cytomegalovirus infection (retinitis or infection of other organs). • Central nervous system toxoplasmosis. • HIV encephalopathy. • Extrapulmonary cryptococcosis including meningitis. • Disseminated non-tuberculous mycobacterial infection. • Progressive multifocal leukoencephalopathy. • Chronic cryptosporidiosis.

Clinical Staging	Clinical Features
	• Chronic isosporiasis. • Disseminated mycosis (extrapulmonary histoplasmosis or coccidiomycosis). • Recurrent septicaemia (including non-typhoidal Salmonella). • Lymphoma (cerebral or B cell non-Hodgkin). • Invasive cervical carcinoma. • Atypical disseminated leishmaniasis. • Symptomatic HIV-associated nephropathy or symptomatic HIV-associated cardiomyopathy.

GENERAL MEASURES

- Encourage patients and their families to join support or peer groups.
- Counsel patients on methods to reduce the spread of HIV:
  - Use condoms during sexual intercourse
  - ART in HIV-infected. See Section 11.1: Antiretroviral therapy, adults and adolescents
  - PrEP where indicated. See Section 11.11: Pre-exposure prophylaxis (PrEP)
  - Seek early treatment for sexually transmitted infections. See Chapter 12: Sexually transmitted infections.
  - Safe handling of blood spills.

11.1 ANTIRETROVIRAL THERAPY, ADULTS AND ADOLESCENTS (10-19 YEARS OLD)

B24

DESCRIPTION

Antiretroviral therapy (ART) suppresses viral replication (measured with the viral load test), increases the CD4 count and reduces HIV-associated diseases and death. ART guidelines are regularly updated, so it is important to consult the current National Guidelines.

ELIGIBILITY FOR ART

All adults with confirmed HIV infection, irrespective of CD4 count or WHO clinical stage.

Timing of ART initiation: *LoE: Ia*[2]

ART may be started on the day of diagnosis if the patient has no clinical contraindication, and the patient is willing to start after receiving pre-ART counselling. For clinical indications for deferring ART initiation, see below.

Immediate initiation:

Initiate ART immediately in pregnancy and during breastfeeding if the patient has no clinical contraindication. *LoE:IIa*[3]

Clinical indications for deferring ART initiation:
Early ART initiation increases the risk of the immune reconstitution inflammatory syndrome (IRIS) (see Section 11.13.1: Immune Reconstitution Inflammatory Syndrome (IRIS)). Defer ART in patients with cryptococcal meningitis (see Adult Hospital EML Section 10.2.4.2: Cryptococcal meningitis) or TB meningitis (see Section 10.17: Tuberculosis, extrapulmonary) as there is increased risk of mortality due to IRIS with early ART initiation (see below for timing).

TB co-infection:
- In TB co-infection, start with TB treatment first, followed by ART initiation according to CD4 count (except TB meningitis – see below):
  - CD4 counts <50 cells/mm^3: start ART within 2 weeks of starting TB treatment.
  - CD4 count ≥ 50 cells/mm^3: defer ART until 8 weeks after starting TB treatment, which does not increase the risk of mortality and reduces the risk of deterioration due to the immune reconstitution inflammatory syndrome (IRIS).

LoE:Ia[4]

TB meningitis co-infection:
- In patients with TB meningitis (irrespective of CD4 count), defer ART until 8 weeks after starting TB treatment.

LoE:IIIa[5]

Cryptococcal meningitis co-infection:
- Defer ART until 4–6 weeks after starting antifungal therapy (earlier initiation has been shown to increase the risk of death).

LoE:IIIa[6]

Positive cryptococcal antigen and no evidence for meningitis on LP:
- No need to delay ART. ART can be started immediately.

LoE:IVb[7]

PSYCHOSOCIAL INDICATORS OF READINESS FOR ART

It is essential that patients have good insight into the need for long-term therapy and high levels of adherence. Give careful attention to adherence planning. Encourage patients to disclose their HIV status to somebody to act as a treatment supporter. If this is not possible then the patient should join a support group.
Manage depression.
Active substance abuse/alcohol is an impediment to adherence and, where possible, should be addressed before initiating ART.

LoE:IIIb[8]

ART REGIMENS

INITIATING ART	
Treatment-naïve patients	Individuals ≥30kg and ≥10 years TDF + 3TC + DTG ("TLD") *LoE:IIa*[9] **Note***:* DTG-based regimens are now recommended as first line ART in all women of child-bearing potential.

	Patients on rifampicin-based TB treatment: *LoE:IIa*[10] TDF + FTC + EFV **OR** TDF + 3TC + DTG *plus* additional dose of DTG 50 mg 12 hours later. The extra DTG dose can be stopped two weeks after stopping rifampicin. *LoE:IIIb*[11] (Also see PHC STG Section 6.8: HIV in pregnancy.)
Contraindications/ intolerance to DTG	TDF + 3TC/FTC + EFV
Contraindications to EFV and DTG	Start protease inhibitor-based regimen: TDF + 3TC/FTC + ATV/r *LoE:IIb*[12] **Note:** if patient requires rifampicin-based TB treatment, substitute ATV/r with LPV/r at 800/200 mg 12-hourly. **Note:** There is an increased risk of ALT/AST elevations and gastrointestinal disorders. LPV/r dose should be gradually titrated upward over 1-2 weeks (e.g. 600/150 mg and then 800/200 mg). The LPV/r can be switched back to ATV/r two weeks after completion of TB therapy.
Contraindication to TDF » eGFR <50 mL/minute.	If chronic hepatitis B coinfection and eGFR 30-50 ml/min: TAF + FTC + DTG. Other scenarios: *LoE:IIb*[13] ABC + 3TC + DTG *LoE:IIb*[14]
Contraindication to TDF/TAF and ABC intolerance/hypersensitivity	AZT + 3TC with DTG
Note: In the unlikely scenario where there is intolerance/contraindication to all currently available NRTIs, the following alternative dual-therapy regimens may be used **after** consulting a specialist: • DTG + 3TC (if no resistance/intolerance to 3TC and VL <500 000 copies/mL) • EFV + LPV/r • DTG + LPV/r *LoE:IIb*[15]	
VIROLOGICAL FAILURE	

Management of viraemia on TLD	<u>If plasma VL >50 copies/mL:</u> » Address adherence, tolerability, medicine interactions & psychosocial factors. » Repeat VL test 3 months later. <u>If plasma VL remains >50:</u> » Assess adherence, tolerability, medicine interactions & psychosocial factors again. » If on TLD <2 years, or persistent low-level viraemia (50-999 copies/mL), or adherence suboptimal, repeat VL at next scheduled visit (i.e. in 6 months' time). » If on TLD >2 years and ≥2 consecutive VL ≥1000 copies/mL (or 1 VL ≥1000 copies/mL plus CD4 <200 or opportunistic infection), discuss with an HIV expert* whether a resistance test is indicated (as a rule it is not, and efforts to resolve adherence issues should be intensified instead).
SWITCHING **EXISTING CLIENTS TO DTG-CONTAINING REGIMENS**	
Patient on: » **TDF/FTC/EFV** » **ABC/3TC/EFV (or NVP)** » **AZT/3TC/EFV (or NVP)** » **AZT/3TC/DTG** » **Any LPV/r- or ATV/r-containing regimen for <2 years** » **Any LPV/r- or ATV/r-containing regimen with latest VL <1000 copies/mL**	Switch to DTG-containing regimen regardless of VL result: TDF + 3TC + DTG ("TLD") (*Refer to Figure 11.1 below.*) If contraindications to DTG or TDF, use alternative regimen as in "Initiating ART" section above. *LoE:IIb*[16]
Patient on: » **ATV/r or LPV/r regimen for >2 years and ≥2 consecutive VL ≥1000 copies/mL**	If adherence >80%, discuss with an HIV expert to authorise and interpret a resistance test before switching.* Provide individualised regimen as recommended by HIV expert. If adherence <80%. switch to DTG-containing regimen: TDF + 3TC + DTG ("TLD") If contraindications to DTG or TDF, use alternative regimen as per "Initiating ART" section above. *LoE:IIb*[17]
CLIENTS WITH DTG RESISTANCE	

Any DTG resistance shown on genotype authorised by HIV expert	Discuss case with an HIV expert*. The regimen will be determined by an Expert Committee based on the pattern of resistant mutations and the prior history of antiretroviral exposure. Application for 3rd line using the standard motivation form may be required (available from TLART@health.gov.za or from https://knowledgehub.health.gov.za/elibrary/third-line-antiretrovirals)
RIFAMPICIN-BASED TB TREATMENT	
Rifampicin-based TB treatment	If on DTG: Add DTG 50 mg 12 hours after TLD dose. If on ATV/r: *LoE:IIIb*[18] Switch ATV/r to LPV/r 800/200 mg 12 hourly (i.e. double dose). **Note:** There is an increased risk of ALT/AST elevations and gastrointestinal disorders. LPV/r dose should be gradually titrated upward over 1-2 weeks. The LPV/r can be switched back to ATV/r two weeks after completion of TB therapy.

ABC=Abacavir, ATV/r=Atazanavir/ritonavir, AZT=Zidovudine, 3TC=Lamivudine, DTG= Dolutegravir, EFV=Efavirenz FTC=Emtricitabine, LPV/r=Lopinavir/ritonavir, TDF=Tenofovir disoproxil fumarate TAF= Tenofovir alafenamide

Table 11.1: ART regimens

*For advice from an HIV expert, approach an HIV Hotline, an infectious disease specialist, or the Third Line ART committee.

HIV Hotlines:

» National HIV & TB Health Care Worker Hotline: **0800 212 506**
» Right to Care Paediatric, Adolescent and Adult HIV Helpline: **082 352 6642**
» KZN Paediatric Hotline: **0800 006 603**

Note: Always check hepatitis B surface antigen (HBsAg) before stopping TDF:
» If patient has chronic hepatitis B, stopping TDF may lead to a fatal hepatitis flare.
» If HBsAg positive, TDF should be incorporated as part of the ART regimen.

Currently available ARV FDC preparations on contract:

- ABC 600 mg + 3TC 300 mg
- TDF 300 mg + FTC 200 mg
- AZT 300 mg + 3TC 150 mg
- LPV 100 mg + ritonavir 25 mg
- LPV 200 mg + ritonavir 50 mg
- TDF 300 mg + FTC 200 mg + EFV 600 mg

- TDF 300 mg + DTG 50 mg + 3TC 300 mg
- ATV 300 mg + ritonavir 100 mg
- ABC 600 mg + 3TC 300 mg + DTG 50 mg

Source: Contract circular HP13-2022ARV http://www.health.gov.za/

Switching existing clients to DTG-containing regimens

Non VL-dependent regimen switches
Regimens where the VL result will not influence nor delay the decision to switch to DTG-containing regimen

VL considerations	Current Regimen	Criteria for switch	Regimen if change indicated
Switching regardless of VL result	TEE ABC/3TC/EFV AZT/3TC/EFV AZT/3TC/DTG Any LPV/r or ATV/r regimen for less than 2 years	**Switch all to a DTG-containing regimen, regardless of VL result** Review VL in last 12 months. If VL in last 12 months was not suppressed, continue to switch same day, but do ABCDE assessment and provide enhanced adherence counselling (EAC) if needed. If VL was not done in last 12 months, do it at this visit, but do not wait for results to switch.	**TLD** Provided no renal dysfunction and age > 10 years and weight > 30 kg If client does not quality for TDF **ABC[1]/3TC/DTG** If client does not quality for TDF and has ABC hypersensitivity **AZT/3TC/DTG**

VL-dependent regimen switches
Relevant to all clients who have been on PI-based regimens for more than two years: their VL result in the last 12 months will influence the decision of how and when to switch to a DTG-containing regimen

VL considerations	Current Regimen	Criteria for switch	Regimen if change indicated
VL < 1000 c/mL	**Any LPV/r or ATV/r regimen for more than 2 years**	**Switch all to a DTG-containing regimen** If VL in last 12 months was not < 50 c/mL, continue to switch same day, but do ABCDE assessment and provide EAC if needed.	**TLD** provided no renal dysfunction and age > 10 years and weight > 30 kg If clients does not qualify for TDF **ABC[1]/3TC/DTG**
[2]Two or more VLs ≥ 1000 c/mL taken two or more years after starting PI regimen	Adult or adolescent on any **LPV/r or ATV/r** regimen and adherence **less than 80%[3]**	**Switch all to a DTG-containing regimen** **Do not do a resistance test** These clients are unlikely to have PI resistance mutations. Rather switch to a more tolerable once daily FDC regimen which is likely to support adherence.	**TLD** provided no renal dysfunction and age > 10 yrs and weight > 30 kg If clients does not qualify for TDF **ABC[1]/3TC/DTG**
	Adult or adolescent on any **LPV/r or ATV/r regimen and adherence more than 80%[3]**	Clients who meet the definition of confirmed virological failure despite confirmed adherence more than 80% may need a resistance test. **These clients do not qualify for a same-day switch.** Discuss with an HIV expert[4] to authorise and interpret a resistance test. Provide individualised regimen as recommended by HIV expert.	
	Child < 10 years, or weight < 30 kg on any **LPV/r or ATV/r regimen**	These clients do not yet qualify for TLD and may require a resistance test. Refer to algorithm **"Switching children on PI-containing regimens to DTG-containing regimens"**	

1. If clients are not eligible to use TDF and they have ABC hypersensitivity, use AZT/3TC/DTG.
2. Confirmed virological failure is defined as two or more VLs ≥ 1000 c/mL taken two or more years after starting a DTG or PI containing regimen, despite adherence > 80% by objective measurement. A patient who has only 1 VL > 1000 after 2 years on a PI-based regimen should have an ABCDE assessment, EAC if applicable, and their VL repeated in 3 months. The result of the repeat VL will allow the patient to be grouped into one of the categories in the table above and will inform the further course of action.
3. Objective measures of good adherence include at least one of:
   - Pharmacy refills > 80% in the last 6-12 months (if this is known).
   - Attendance of > 80% of scheduled clinic visits in the last 6-12 months (if this is known).
   - Detection of current antiretroviral drug/s in the client's blood or urine, if available.

   Note: Self-reported adherence is not considered a reliable measure of good adherence.
4. For advice from an HIV expert, approach an HIV Hotline, an infectious disease specialist, or the Third Line ART committee.

Figure 11.1: Switching existing clients to DTG-containing regimens (adopted from the NDoH 2023 ART Clinical Guidelines for the Management of HIV in Adults, Pregnancy and Breastfeeding, Adolescents, Children, Infants and Neonates.

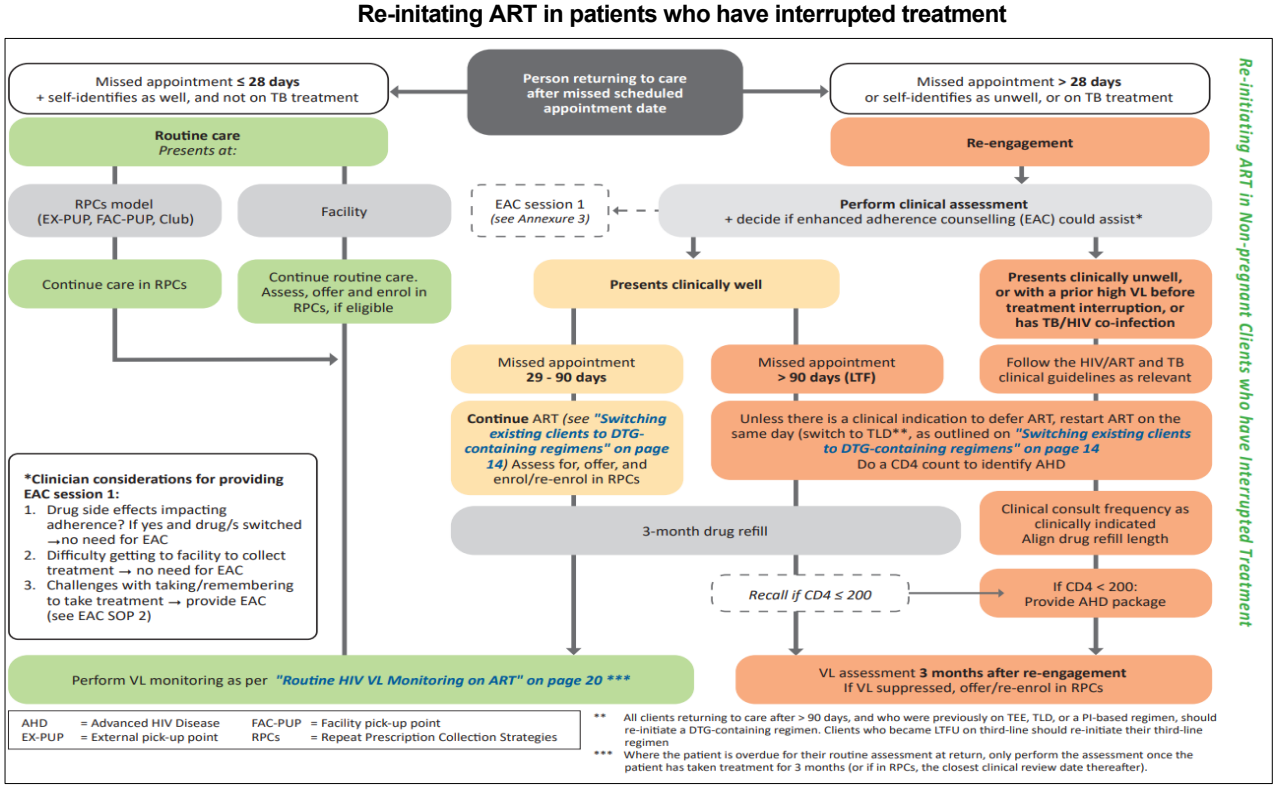


Figure 11.2: Management algorithm of a patient who returns to care after interrupting treatment. Incorporated from the NDoH 2023 ART Clinical Guidelines for the Management of HIV in Adults, Pregnancy and Breastfeeding, Adolescents, Children, Infants and Neonates.

MONITORING ON ART	

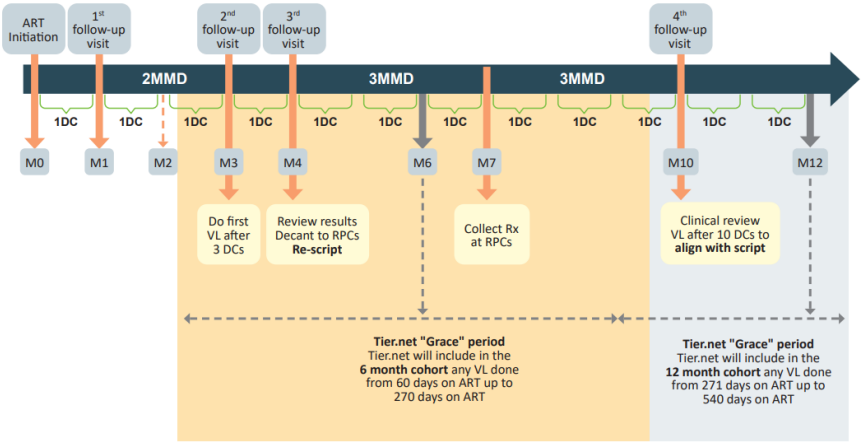
Baseline evaluation	» WHO staging (See table above).
	» Check CD4 count.
	» <u>If CD4 <200 cells/mm^3:</u>
	  » Check cryptococcal antigen (If positive, perform LP regardless of whether symptoms are present or not). CrAg testing is done reflexly on the CD4 sample if CD4 <100 cells/mm^3. If patient's CD4 is 100-199, a serum CrAg test must be ordered separately.
	  » Initiate cotrimoxazole prophylaxis (See Section 11.2.1: Cotrimoxazole prophylaxis). *LoE:IVb*[19]
	» Screen for pregnancy or ask if planning to conceive.
	» Screen for mental health, STIs and NCDs.
	» Screen for TB using the WHO screening questionnaire (any one of cough, fever, night sweats, or weight loss).
	» Sputum TB-NAAT* in all who can produce sputum, regardless of symptoms.
	» Urine LAM for inpatients, or outpatients who are symptomatic if CD4 <200 or advanced HIV disease or current serious illness.
	» If planning to use TDF: check creatinine (avoid TDF if eGFR <50 mL/minute).
	» Haemoglobin *LoE:IIIb*[20]
	» Check HBsAg (if positive, TDF should form part of the regimen).
	» Cervical cancer screening *LoE:IIb*[21]
	
	*TB-NAAT: TB Nucleic Acid Amplification Test (e.g. GeneXpert Ultra MTB/RIF)

On ART	» Monitoring schedule has been adapted to minimise the number of visits required per annum. » VL at 3 and 10 months after initiating ART and every 12 months thereafter, if virologically suppressed. Align timing with client's scripting cycle. » CD4 at 10 months after initiating ART (align with VL). Stop CD4 count monitoring when >200 cells/mm^3 and virologically suppressed. If virological or clinical failure occurs, or if client returns >90 days after missing an appointment, then a CD4 count should be done as cotrimoxazole may need to be commenced/re-commenced. Repeat CD4 count every 6 months if VL remains ≥1000 copies/mL » If on TDF: creatinine at month 3, month 10, and every 12 months thereafter. Align with VL monitoring schedule. » If on AZT: FBC and differential count at 1 and 3 months after initiating AZT, then only if clinically indicated. » ALT if symptoms of hepatitis develop. » If on a protease inhibitor (PI): cholesterol and triglycerides at 3 months after initiating PI. If above acceptable range, do fasting cholesterol and TGs and if still above acceptable range, obtain expert advice.

Table 11.2: Monitoring on ART

HIV VIRAL LOAD MONITORING SCHEDULE

Routine VL monitoring	Intervention	Comments
First VL after ART initiation	Do 1st VL after **3 dispensing cycles**	• Allows for earlier detection of factors influencing viral suppression • Allows for earlier decanting for suppressed clients to minimise visits and promote continued engagement in care • This VL will form part of the **6 month VL completion cohort** in Tier.net
Second routine VL after ART initiation (in clients who remain virally suppressed)	This VL can be done from **10 dispensing cycles** but should be aligned with the clients scripting cycle	• This VL will form part of the **12 month VL completion cohort** in Tier.net
Third routine VL after ART initiation (in clients who remain virally suppressed)	This VL can be done **from 22 dispensing cycles**, but should be aligned with the clients scripting cycle	• This VL will form part of the 24 month **VL completion cohort** in Tier.net
Fourth and all subsequent VLs	VLs will be taken at intervals of 12 dispensing cycles for all clients who remain virally suppressed	
The timing of dispensing cycles, follow-up visits, and VL monitoring is illustrated in the diagram below		



- For the 1st VL taken after 3 dispensing cycles, clients should be requested to return to the facility one DC later to review results and so that the client can be assessed for RPCs eligibility.
- For all subsequent VL monitoring (and other routine monitoring investigation) in clinically well clients: Clients should be rescripted at the same visit that their VL is taken. Clients should not be required to come back to the facility the following month for VL result review prior to rescript. Rather, recall to the facility only those clients with an elevated VL or other abnormal result.
- Facilities should ensure that results management processes are in place to ensure that results are reviewed by a clinician, that abnormal results are identified, and the client is appropriately actioned. The NHLS Results for Action (RfA) reports are a useful tool to facilitate the review of results.

! Breastfeeding women should have their VL monitored every 6 months starting from the time of delivery

Figure 11.3: Incorporated from the NDoH 2023 ART Clinical Guidelines for the Management of HIV in Adults, Pregnancy and Breastfeeding, Adolescents, Children, Infants and Neonates.
DC: Dispensing cycle; MMD: Multi-month dispensing; RPCs: Repeat prescription collection strategies

ART: DOSING AND IMPORTANT ADVERSE EFFECTS				
Generic name	**Class**	**Usual dose**	**Renal adjusted dose**	**Important adverse drug reactions and timing**
Dolutegravir (DTG)	InSTIs	50 mg once daily	Dose adjustment not required.	» Hypersensitivity (rare, weeks). » Insomnia (common). » Headache (common). » Other neuropsychiatric symptoms. » Nausea, diarrhoea (common). » Hepatitis (uncommon). » Increase in serum creatinine (<30 mmol/L within the first few weeks of DTG initiation) due to inhibition of creatinine secretion by DTG; this is clinically insignificant as glomerular filtration rate is not reduced but will modestly affect eGFR which is determined using serum creatinine.
Tenofovir disoproxil fumarate (TDF)	NRTI	300 mg daily	Avoid in renal impairment (eGFR <50 mL/min).	» Acute kidney injury (rare - weeks to months). » Decline in eGFR (months to years). » Fanconi syndrome (rare – months to years). » Reduced bone mineral density (months to years).
Abacavir (ABC)	NRTI	600 mg daily	Dose adjustment not required.	» Hypersensitivity reaction (1 to 6 weeks): fever, rash, constitutional symptoms, gastrointestinal symptoms and respiratory symptoms.
Zidovudine (AZT)	NRTI	300 mg 12 hourly	eGFR <10 mL/min: 300 mg daily	» Anaemia, neutropenia (weeks to months). » Gastro-intestinal upset. » Headache. » Myopathy (rare). » Hyperlactataemia / steatohepatitis (medium risk - months). » Lipoatrophy (months to years).
Lamivudine (3TC)	NRTI	300 mg daily (or 150 mg 12 hourly)	eGFR 10-30 mL/min: 150 mg daily eGFR <10 mL/min: 50 mg daily	» Anaemia due to pure red cell aplasia (rare).
Emtricitabine (FTC)	NRTI	200 mg daily	eGFR 15-29 mL/min: 200 mg every 3 days eGFR <15 mL/min: 200 mg every 4 days Note: FTC is not available as a single-ingredient formulation.	» Palmar hyperpigmentation. » Anaemia due to pure red cell aplasia (rare). *LoE:IVb*[22]

Tenofovir alafenamide (TAF)	NRTI	25 mg daily If coformulated with FTC, avoid if eGFR <30 ml/min. If used as a single agent, avoid if eGFR <15 ml/min and not on haemodialysis.		» Acute kidney injury (rare - weeks to months). » Decline in eGFR (months to years) » Fanconi syndrome (rare – months to years). » Reduced bone mineral density (months to years).
Efavirenz (EFV)	NNRTI	600 mg at night	Dose adjustment not required.	» Central nervous system symptoms: vivid dreams, problems with concentration, confusion, mood disturbance, psychosis (days to weeks). » Encephalopathy, often with cerebellar features (uncommon – months to years). » Rash (1 to 6 weeks). *LoE:IVb*[23] » Hepatitis (weeks to months). » Gynaecomastia.
Lopinavir/ ritonavir (LPV/r)	Boosted PI	400/100 mg 12-hourly **OR** 800/200 mg daily (only if PI-naïve)	Dose adjustment not required.	» Gastrointestinal upset. » Dyslipidaemia (weeks). » Rash and/or hepatitis (1 to 6 weeks).
Atazanavir/ ritonavir (ATV/r)	Boosted PI	ATV 300 mg taken with ritonavir 100 mg daily	Dose adjustment not required.	» Unconjugated hyperbilirubinaemia (common, but benign). » Dyslipidaemia (low risk). » Hepatitis (rare - 1 to 6 weeks). » Renal stones (uncommon).

Table 11.3: Dosing and important adverse effects associated with ART

The time-onset information with respect to adverse drug reactions (ADRs) serves as an estimate. Patients may present with ADRs with the onset deviating from that indicated in the table. InSTI: integrase strand transfer inhibitor; NRTI: nucleoside reverse transcriptase inhibitor; NNRTI: non-nucleoside reverse transcriptase inhibitor; PI: protease inhibitor.

LoE:IIIb[24]

ART: DRUG-DRUG INTERACTIONS

Information can be accessed from:

- https://www.hiv-druginteractionslite.org/checker
- http://www.mic.uct.ac.za/ and download the ARV/EML interaction checker.
- Package inserts.

ART INTERACTIONS WITH RIFAMPICIN AND RECOMMENDATIONS FOR ADMINISTRATION			
Class	**ARV**	**Interaction with rifampicin**	**Dose of ARV with rifampicin**
NRTI	3TC/FTC/TDF/ AZT/ABC	No clinically significant pharmacokinetic interactions.	No dose adjustment required.
NNRTI	EFV	Non-significant change (EFV concentrations may increase in patients who are genetic slow metabolisers of EFV and are on isoniazid (INH) which also inhibits EFV metabolism).	No dose adjustment required (600 mg at night).
InSTI	DTG	Significant reduction in concentration of DTG.	Increased dose frequency to 50 mg 12 hourly. **Note:** Continue increased dose for 2 weeks after rifampicin is stopped, then decrease to usual dose.
PI	LPV/r	LPV plasma concentrations significantly decreased.	Double the dose of LPV/r to 800/200 mg 12-hourly. **Note: There is an increased risk of ALT/AST elevations and gastrointestinal disorders. Increase dose gradually over 1-2 weeks.** Adjusted dose should be continued for 2 weeks after rifampicin is stopped.
	All other PIs	Marked reduction in PI concentrations.	Do not prescribe concomitantly – replace rifampicin with rifabutin 150 mg daily.

Table 11.4: ART interactions with rifampicin and dose-adjustment recommendations

LoE:IIIb[25]

In patients on atazanavir or darunavir, or if double dose LPV/r is not tolerated, replace rifampicin with rifabutin (doctor prescribed) – see Adult Hospital Level STGs and EML, Section 10.1: Antiretroviral therapy.

DRUG INTERACTIONS WITH DOLUTEGRAVIR		
Interacting medicine	**Effect of co-administration**	**Recommendation**
Preparations containing polyvalent cations (Mg^{2+}, Ca^{2+}, Fe^{2+}, Al^{3+}, Zn^{2+}) Antacids Sucralfate Mineral supplements	Significant reduction in concentration of DTG.	Magnesium- and aluminum-containing preparations should be taken 6 hours before or 2 hours after DTG. Calcium- and iron- containing preparations can be taken concomitantly with DTG when administered with food. **Note:** Iron and calcium should be taken at least 4 hours apart from one another.

Anticonvulsants: Carbamazepine Phenobarbital Phenytoin	Significant reduction in DTG concentration.	Avoid co-administration if possible. Consider valproate or lamotrigine. *For carbamazepine:* Double DTG dose to 50 mg 12 hourly.
Metformin	May increase metformin concentration.	*Metformin initiation:* Initiate metformin at a low dose (500 mg to 1000 mg total daily dose), titrating up as needed. Do not exceed 2 g daily. *DTG initiation:* If patient stabilised on metformin dose ≤ 2g daily, retain metformin dose and monitor for side effects. If patient stabilised on >2 g daily, reduce dose of metformin to ≤2 g daily and monitor. *Patients with renal impairment:* Close monitoring of renal function required. Do not co-prescribe if eGFR <30 mL/min.
Rifampicin	Significant reduction in DTG concentration	Double DTG dose to 50 mg 12 hourly.

Table 11.5: Drug interactions with DTG *LoE:IIIb*[26]

DRUG INTERACTIONS WITH BOOSTED PIs		
Interacting medicine	**Effect of co-administration**	**Recommendation**
Substrates of cytochrome P450 3A4 (e.g. most statins, calcium channel blockers, most SSRIs, most benzodiazepines)	Significant increase in concentrations of CYP3A4 substrates.	Avoid co-administration or use lower doses of CYP3A4 substrates (always consult interaction resources).
Anticonvulsants: Carbamazepine Phenobarbital Phenytoin	Significant reduction in concentration of PI.	Avoid co-administration. Consider valproate or lamotrigine.
Proton pump inhibitors	Significant reduction in ATV concentration.	Avoid co-administration. *LoE:IIIb*[27]
Rifampicin	Significant reduction in PI concentration.	Double LPV/r dose. **Note:** There is an increased risk of ALT/AST elevations and gastrointestinal disorders. LPV/r dose should be gradually titrated upward over 1-2 weeks (e.g. 600/150 mg and then 800/200 mg). Adjusted dose of LPV/r should be continued for 2 weeks after rifampicin is stopped.

		The LPV/r can be switched back to ATV/r two weeks after completion of TB therapy. If ATV/r or DVR/r is required, rifampicin must be replaced with dose-adjusted rifabutin (doctor prescribed) - see Adult Hospital Level STG Section 10.1: Antiretroviral therapy.

Table 11.6: Drug interactions with boosted PIs.

REFERRAL
Dolutegravir resistance demonstrated on resistance testing.

11.2 OPPORTUNISTIC INFECTIONS, PROPHYLAXIS IN ADULTS

11.2.1 COTRIMOXAZOLE PROPHYLAXIS
Z29.2 + (B24)

DESCRIPTION
Primary prophylaxis reduces the probability of developing many infections, e.g.:
- pneumocystis pneumonia
- toxoplasmosis
- bacterial pneumonia
- bacteraemia
- cystoisosporiasis

Indications for primary prophylaxis:
- WHO Clinical stage 3 or 4.
- CD4 count <200 cells/mm^3. *LoE:IIIb*[28]

MEDICINE TREATMENT
Prophylaxis
- Cotrimoxazole, oral, 160/800 mg daily. *LoE:IIb*[29]

Note:
- Once the CD4 >200 cells/mm^3 discontinue prophylaxis. If the CD4 count was >200 cells/mm^3 when cotrimoxazole was commenced (e.g. patients with TB) continue for 6 months. (See Section 17.3.4.2.4: Pneumocystis pneumonia, for secondary prophylaxis.)
- Cotrimoxazole hypersensitivity is common and usually presents as a maculopapular rash. If there are systemic features or mucosal involvement associated with the use of cotrimoxazole, stop the medicine immediately and permanently, and refer the patient to hospital. *LoE:IIIb*[30]

11.2.2 TUBERCULOSIS PREVENTIVE THERAPY (TPT)
Z29.2 + (B24)

PLHIV, at any CD4 count, are more susceptible to TB infection than HIV-uninfected people. TPT is an effective intervention for reducing the incidence of TB in PLHIV.

Eligibility
All adult PLHIV, irrespective of CD4 count and ART status.

Exclusions
- suspected or confirmed TB
- liver disease
- previous MDR- or XDR-TB
- painful peripheral neuropathy
- alcohol use disorder

Note:
- Exclude TB before initiating TPT by screening for the following:
  - cough (any duration)
  - cever
  - weight loss
  - night sweats
- Do not start TPT if any of the above symptoms are present. These patients require further investigation for active TB.
- Start TPT together with ARVs.
- TPT, e.g.:
- Isoniazid, oral, 300 mg daily for 12 months.

LoE:IIb[31]

Adults and adolescents initiating a DTG-containing ART regimen:
- Isoniazid daily for 12 months is the preferred regimen.

For patients who are already virally suppressed on a DTG-based regimen:
- A weekly combination of isoniazid (900 mg if weight >30 kg) plus rifapentine (900 mg if weight >30 kg) for three months may be used.
  - Do not use rifapentine-containing TPT in patients on protease inhibitor-based ART, or in women on hormonal contraceptives. [*See the therapeutic interchange database for details regarding the rifapentine-containing TPT regimen*].
  - Educate patients on the symptoms of hepatotoxicity (nausea, vomiting, yellow eyes, brown urine, and pain in right upper quadrant) associated with TPT.

ADD

LoE:IIb[32]

- Pyridoxine, oral, 25 mg once daily for the full duration of the TPT regimen.
  - Instruct patient to present early if any of these symptoms arise.
  - Follow patients up monthly for the first 3 months.

NOTE: For pregnant women:

LoE:IIb[33]

- Defer TPT until after delivery.
- Ensure that routine screening against TB is conducted at each antenatal visit.

11.3 OPPORTUNISTIC INFECTIONS, TREATMENT IN ADULTS

11.3.1 APHTHOUS ULCERS IN HIV INFECTION

K12.0 + (B24)

DESCRIPTION

Painful ulcers in the mouth, except the gums, hard palate and dorsum of the tongue.
Minor ulcers (<1 cm diameter) usually heal within 2 weeks.
Major ulcers (>1 cm diameter) are very painful, often very deep, and persistant. Major ulcers generally resolve rapidly on ART.

Herpes simplex, histoplasmosis and mycobacteria may also present with major mucosal ulcers.

MEDICINE TREATMENT

Minor aphthous ulcers:

- Tetracaine 0.5 %, oral, topical, applied every 6 hours.
  - Apply a thin layer on the affected areas only.

REFERRAL

Major aphthous ulcers for further diagnostic evaluation.

11.3.2 CANDIDIASIS, ORAL

B20.4

See Section 1.2: Candidiasis, oral (thrush).

- Commence ART.

11.3.3 CANDIDIASIS, OESOPHAGEAL

B20.4

DESCRIPTION

Infection of the oesophagus with candida, a fungus that causes oral thrush.
Patients with oral thrush who also have pain or difficulty on swallowing may have oesophageal candidiasis. See Section 1.2: Candidiasis, oral (thrush).

GENERAL MEASURES

Maintain hydration.

MEDICINE TREATMENT

- Fluconazole, oral, 200 mg daily for 14 days. *LoE:IIIb*[34]

REFERRAL

- Inability to swallow.
- Frequent relapses.
- Poor response to fluconazole.

11.3.4 CRYPTOCOCCOSIS

B20.5 + B45.0-3/B45.7-9

DESCRIPTION

A life-threatening fungal infection caused by the fungus *Cryptococcus*. The fungi remain inactive unless a person's immune system is weakened, such as in transplant recipients or persons with untreated HIV.

INVESTIGATIONS

- All ART-naïve adults and adolescents with CD4 <200 cells/mm^3 should have a serum cryptococcal antigen (CrAg) test done (unless confirmed diagnosis of

cryptococcal infection). This is performed as a reflex test on the patient's CD4 sample if it is <100 cells/mm^3. If the CD4 cell count is between 100 and 199, a separate sample should be sent for CrAg testing.

- All patients with a positive serum CrAg test should have a lumbar puncture (LP) to exclude cryptococcal meningitis. The CSF is tested for cryptococcal meningitis by CSF CrAg. *LoE:IIa*[35]

MEDICINE TREATMENT

If CSF CrAg positive:

Refer for liposomal amphotericin B, IV (induction phase) and monitoring of intracranial pressure symptoms - See Adult Hospital STGs and EML, Section 10.2.4: Cryptococcosis. Patients may be down referred for consolidation and maintenance phase therapy; see below.

If there is any delay in performing LP, start oral fluconazole therapy:

- Adults: Fluconazole, oral, 1200 mg immediately. *LoE:IVb*[36]
- Children: 12 mg/kg to a maximum dose of 800 mg immediately

No symptoms present and CSF CrAg negative (LP):

Induction phase

- Fluconazole, oral 1200 mg daily for 14 days. *LoE:IIIb*[37]

Consolidation phase

Follow with:

- Fluconazole, oral, 800 mg daily for 8 weeks.

Maintenance phase

- Fluconazole, oral, 200 mg daily.
  - **Continue for at least 1 year provided that the CD4 count increases to >200 cells/mm^3 on ART. If the CD4 count does not increase, continue treatment indefinitely.**

LoE:IIIb[38]

- Commence ART: See Section 11.1: Antiretroviral therapy, adults and adolescents.
  - Cryptococcal meningitis: 4–6 weeks after starting antifungal therapy.
  - Asymptomatic cryptococcosis: No need to delay ART. ART can be started immediately. *LoE:IIIb*[39]

CAUTION

- Fluconazole is potentially teratogenic when used during the 1st trimester, but pregnant women should be counselled that the benefits of fluconazole likely outweigh the risks in the management of cryptococcosis.
- All pregnant women <20 weeks gestation exposed to fluconazole should have an ultrasound scan to detect congenital abnormalities. *LoE:IIIb*[40]

- Although fluconazole is excreted into breast milk at concentrations similar to maternal plasma concentrations, the dose that the infant is exposed to with doses <400 mg is similar to the dose used in systemic treatment in infants. Even for higher doses, the benefits will likely outweigh the risks, though this can be discussed with a specialist. *LoE:IVb*[41]

REFERRAL
- If LP unavailable: Refer all serum CrAg positive patients to a facility where LP is available.
- If LP available:
  - Refer all patients that are CSF CrAg positive (cryptococcal meningitis).
  - Refer all symptomatic patients that are CSF CrAg negative (non-meningeal cryptococcosis).
- All patients with complications.

11.3.5 DIARRHOEA, HIV-ASSOCIATED
B20.8 + (A07.2-3)

DESCRIPTION
Diarrhoea that persists for >2 weeks.
Often associated with wasting.
Diarrhoea persisting for 4 weeks is a WHO stage 3 condition (if there is weight loss or fever it is stage 4).
Send stool sample to look for ova, cysts and parasites in all cases.
Note: A negative stool specimen does not exclude *Cryptosporidium*. If *Cryptosporidium* infection is suspected, request specific laboratory testing for the parasite.

MEDICINE TREATMENT
If stool is negative for parasites or shows *Cryptosporidium*:
- Loperamide, oral, 2 mg as required.
  - Maximum 8 mg daily.
- Commence ART.

If stool shows *Isospora belli*:
- Cotrimoxazole, oral, 320/1600 mg (4 single strength (80/400 mg) tablets) 12 hourly for 10 days.
  - Followed by 160/800 mg (2 single strength (80/400 mg tablets) daily until CD4 >200 cells/mm^3 on ART.
- Commence ART.

REFERRAL
Stool contains blood or mucus.

11.3.6 ECZEMA, SEBORRHOEIC
See Section 5.8.3: Dermatitis, seborrhoeic.

11.3.7 FUNGAL NAIL INFECTIONS

B20.5 + B35.1

This is common in PLHIV and can involve multiple nails. Treatment is not generally recommended because it is mostly of only cosmetic importance and therefore the risk of systemic therapy is not warranted. It generally resolves when patient is on ART.

11.3.8 FUNGAL SKIN INFECTIONS

B20.5

See Section 5.5: Fungal infections of the skin.

11.3.9 GINGIVITIS, ACUTE NECROTISING ULCERATIVE

See Section 1.3.3: Necrotising periodontitis.

11.3.10 HERPES SIMPLEX ULCERS, CHRONIC

B20.3 + (B00.1-2)

DESCRIPTION

Painful ulcers due to herpes simplex virus, involving the skin around the anogenital area or in and around the mouth and nostrils in patients with advanced HIV infection. Ulcers persist for weeks and may be several centimetres in diameter.

GENERAL MEASURES

Keep affected areas clean with soap and water or diluted antiseptic solution.

MEDICINE TREATMENT

- Antiviral (active against herpes simplex) e.g.: *LoE: IIIb*[42]
- Aciclovir, oral, 400 mg 8 hourly for 7 days.
- Commence ART.

Pain:

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

REFERRAL

- No response to therapy.
- Frequent recurrences.

11.3.11 HERPES ZOSTER (SHINGLES)

B20.3 + (B02.0-3/B02.7-9)

DESCRIPTION

Painful vesicular rash in a dermatomal distribution, usually presenting as a band on one side of the body, due to recrudescence of the varicella-zoster virus that causes chickenpox. The surrounding skin is inflamed and the vesicles often contain cloudy fluid. Secondary bacterial infection is very uncommon.
The elderly and PLHIV are most affected.

Severe pain can occur after shingles has healed (post-herpetic neuralgia).
Shingles is less infectious than varicella (chickenpox) and isolation is not warranted.

MEDICINE TREATMENT

If fresh vesicles are present:

- Antiviral (active against herpes zoster) e.g.:
- Aciclovir, oral, 800 mg five times daily for 7 days (4 hourly missing the middle of the night dose). *LoE:IIa*[43]

If secondary infection is present:

ADD

- Flucloxacillin, oral, 500 mg 6 hourly for 5 days.

Pain:

- Paracetamol, oral, 500mg to 1 g, 4 to 6 hourly as required (maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

If inadequate pain relief:

ADD

- Tramadol, oral, 50 to 100 mg, 6 hourly as a starting dose. (Doctor prescribed.)
  - May be increased to a maximum daily dose of 400 mg.

For prolonged pain occurring after shingles has healed (post-herpetic neuralgia), or if pain not responding to paracetamol and tramadol:

- Amitriptyline, oral, 25 mg at night.
  - Increase dose to 50 mg after two weeks if needed.
  - Increase to 75 mg after a further two weeks if needed.

REFERRAL

- Involvement of the eye.
- Disseminated disease (many vesicles extending beyond the main area).
- Features of meningitis (headache and neck stiffness).
- Severe post-herpetic neuralgia not responding to amitriptyline.

11.3.12 PAPULAR PRURITIC ERUPTION

L29.8

DESCRIPTION

Itchy inflamed papules at different stages of evolution. Healed lesions are often hyperpigmented. The itch is difficult to manage. May flare after starting ART, but generally improves as the CD4 count increases. It is essential to exclude scabies.

GENERAL MEASURES

Minimise exposure to insect bites, e.g. by regularly dipping pets.

MEDICINE TREATMENT

- Cetirizine, oral, 10 mg daily.
- Hydrocortisone 1%, topical cream, applied twice daily for 7 days.

- Apply sparingly to the face.

11.3.13 PNEUMONIA, BACTERIAL

See Section 17.3: Respiratory infections.

11.3.14 PNEUMONIA, PNEUMOCYSTIS

See Section 17.3.4.2.4: Pneumocystis pneumonia.

11.3.15 TOXOPLASMOSIS

B58 + (B20.8)

DESCRIPTION

Initial diagnosis should only be made at hospital level.

MEDICINE TREATMENT

- Cotrimoxazole, oral, 320/1600 mg 12 hourly for 4 weeks.
  - Then 160/800 mg 12 hourly for 12 weeks.

Secondary prophylaxis

- Cotrimoxazole, oral 160/800 mg daily.
  - Continue until the CD4 count has risen to >200 cells/mm^3 on ART.
- Commence ART.

REFERRAL

Patients with suspected toxoplasmosis infection requiring further investigation to confirm diagnosis.

11.3.16 TUBERCULOSIS (TB)

See Section 17.4: Pulmonary tuberculosis (TB).

11.4 HIV AND KIDNEY DISEASE

N04.9/N05.9/N17.9 + (B24)

DESCRIPTION

Various forms of kidney disorders are described among PLHIV.
Early detection of HIV kidney disease may be beneficial in an attempt to protect the kidney from further disease progression and for adjusting the dose of relevant medicines (See Table 11.3: Dosing and important adverse effects associated with ART).
Screen all patients for renal disease at time of HIV diagnosis.
Patients at high risk or susceptible for HIV renal disease include:

- CD4 count <200 cells/mm^3.
- History of nephrotoxic medications.
- Comorbidity such as diabetes mellitus, hypertension, or hepatitis C virus co-infection.

Screening for renal disease in HIV

- Tests should include:
  - Urine dipstix for haematuria and proteinuria.
  - Serum creatinine and eGFR.
- If there is no evidence of kidney disease at the initial evaluation, repeat screening annually.
- In patients receiving tenofovir, monitor creatinine/eGFR at month 3, month 10, and every 12 months thereafter. Align with VL monitoring schedule.

REFERRAL

- Patients with persistent significant proteinuria (1+ or more).
- Unexplained haematuria on 2 consecutive visits.
- Estimated eGFR <60 mL/min.

HIV INFECTION IN CHILDREN (<10 YEARS OLD)

DESCRIPTION

HIV is a retrovirus affecting immune cells, especially CD4 T-lymphocytes. In advanced HIV disease the body loses its ability to fight infections and this is characterised by organ damage, opportunistic infections, malignancies and very low CD4 counts.

In infants and children, most infection is transmitted from mother to child. In adolescents and adults sexual spread is the usual cause.

Infants born of HIV-infected mothers may be:

- HIV-infected,
- HIV-exposed uninfected, or
- HIV-exposed, unknown infection status (at risk of becoming HIV-infected).

For the purpose of the ART guidelines:

- Children <10 years of age: follow the paediatric antiretroviral therapy (ART) guidelines.
- Adolescents (10 to 19 years of age): follow the adult ART guidelines. *LoE:IIIb*[44]

DIAGNOSIS IN CHILDREN

Testing must be done with counselling of parent/legal guardian/primary caregiver and, where appropriate, the child. The appropriate consent/assent should be obtained.

HIV TESTING IN CHILDREN

Age	Test	Note
HIV-exposed		
Birth	HIV PCR	If the HIV PCR is positive at any time, confirm with a second HIV PCR.
10 weeks	HIV PCR	
6 months	HIV PCR	
6 weeks post-cessation of breastfeeding	Age appropriate testing: <18 months: HIV PCR ≥18 months: HIV rapid/ELISA	
Universal screening		
18 months	HIV rapid/ELISA	Perform on all children, unless known to be HIV infected.
HIV infected confirmatory test (any child with positive HIV test)		
<24 months	HIV PCR	Between 18 and 24 months, the initial test will be HIV rapid/ELISA, but is confirmed with an HIV PCR.
≥24 month	HIV rapid/ELISA	Perform the second test on a different blood specimen with a test kit from a different manufacturer.

Possible/suspected symptomatic HIV infection		
Any age if IMCI classification of: • Pneumonia. • Ear discharge (ever). • Persistent diarrhoea in past 3 months. • Not growing well, moderate acute malnutrition (MAM) or severe acute malnutrition (SAM). • ≥ 2 enlarged glands of: neck, axilla or groin. • Oral thrush. • Parotid enlargement	Age appropriate testing: <18 months: HIV PCR ≥18 months: HIV rapid/ELISA	
Other situations		
• Parents request testing. • Breastfed infant of a newly diagnosed HIV infected mother. • Suspicion of sexual assault. • Wet-nursed/breastfed infant fed by a woman of unknown or HIV-infected status (and repeat age-appropriate test 6 weeks later). • Children considered for adoption or fostering.	Age appropriate testing: <18 months: HIV PCR ≥18 months: HIV rapid/ELISA	

If an HIV PCR test is indeterminate or discordant, refer to the National Department of Health Guidelines for prevention of Mother to Child Transmission of Communicable Infections, 2023.

Table 11.7 HIV testing in children

WHO clinical staging of HIV and AIDS for infants and children

https://iris.who.int/bitstream/handle/10665/69058/WHO_HIV_2005.02.pdf

Adapted WHO clinical staging of HIV and AIDS for infants and children
For persons ≤15 years of age with confirmed laboratory evidence of HIV infection
Clinical Stage 1 • Asymptomatic, • persistent generalised lymphadenopathy (PGL).
Clinical Stage 2

- unexplained persistent weight loss,
- hepatosplenomegaly,
- papular pruritic eruptions,
- extensive human papilloma virus infection,
- extensive molluscum contagiosum,
- fungal nail infections,
- recurrent oral ulcerations,
- lineal gingival erythema (LGE),
- unexplained persistent parotid enlargement,
- herpes zoster,
- recurrent or chronic RTIs, i.e.
  - otitis media,
  - otorrhoea,
  - sinusitis.

Clinical Stage 3

- moderate unexplained malnutrition (not adequately responding to standard therapy).
- unexplained persistent diarrhoea (14 days or more).
- unexplained persistent fever (above 37.5°C, intermittent or constant, for longer than one month).
- persistent oral candidiasis (after first 6-8 weeks of life).
- oral hairy leukoplakia.
- acute necrotising ulcerative gingivitis/periodontitis.
- lymph node TB.
- pulmonary TB.
- severe recurrent bacterial pneumonia.
- chronic HIV-associated lung disease including bronchiectasis.
- symptomatic lymphoid interstitial pneumonitis (LIP).
- unexplained anaemia (<8 g/dL), and or neutropaenia (<500/mm^3) and/or thrombocytopaenia (<50 000/mm^3) for more than one month.

Clinical Stage 4

- unexplained severe wasting, stunting or severe malnutrition not adequately responding to standard therapy.
- pneumocystis pneumonia.
- recurrent severe presumed bacterial infections, e.g.
  - empyema
  - pyomyositis
  - bone or joint infection
  - meningitis
- *but* excluding pneumonia,
- chronic herpes simplex infection; (orolabial or cutaneous of more than one month's duration or visceral at any site),
- extrapulmonary TB,
- Kaposi's sarcoma,
- oesophageal candidiasis (or candidiasis of trachea, bronchi or lungs),
- CNS toxoplasmosis (outside the neonatal period),
- HIV encephalopathy,
- CMV infection (CMV retinitis or infections of organs other than liver, spleen or lymph nodes; onset at age one month of more),
- extrapulmonary cryptococcosis including meningitis,
- any disseminated endemic mycosis, e.g.
  - extrapulmonary histoplasmosis,
  - coccidiomycosis,
  - chronic cryptosporidiosis,

- chronic isosporiasis,
- disseminated non-tuberculous mycobacteria infection,
- HIV associated recto-vaginal fistula,
- cerebral or B cell non-Hodgkin lymphoma,
- progressive multifocal leukoencephalopathy (PML),
- HIV-associated cardiomyopathy or HIV-associated nephropathy.

Table 11.8: WHO clinical staging for infants and children

11.5 THE HIV-EXPOSED INFANT

Z20.6

DESCRIPTION

An HIV-exposed infant or child is one born to a mother living with HIV, until HIV infection in the infant or child is reliably excluded and the infant or child is no longer exposed through breastfeeding.

Transmission of HIV infection from mother to child may occur during pregnancy, during delivery or via breastfeeding. Transmission of infection from mother to child can be effectively prevented with a very high success rate by means of suppressing the mother's VL and giving post-exposure prophylaxis to the infant, a strategy now known as Vertical Transmission Prevention (VTP; formerly termed Prevention of Mother to Child Transmission).

The risk of transmission from breast milk is low when the mother is virally suppressed. Ensure maternal VL monitoring is done every 6 months while breastfeeding and offer enhanced adherence counselling to ensure viral suppression is achieved and maintained.

When to test HIV-exposed children

- Birth (HIV PCR).
- For recommendations on when to perform additional tests, refer to the guidance on "HIV Testing in Children". (See section above: HIV infection in children (<10 years old))

Feeding advice

- It is strongly recommended that exclusive breastfeeding be initiated within 1 hour of birth and continued for the first 6 months of life, after which the child's nutritional requirements will require the introduction of complementary foods in addition to breastfeeding.
- Women living with HIV should be fully supported for ART adherence during the breastfeeding period and thereafter.
- Women with a VL >50 copies/mL on TLD1 should continue breastfeeding while every effort is made to regain viral suppression. Their infants should receive high-risk prophylaxis during breastfeeding.
- The following may be indications to discontinue breastfeeding:
  - » Infants of mothers who are failing TLD2.
  - » Infants of mothers who are failing third-line PI-based treatment.

- Discuss appropriate feeding practices with the mother regarding the risks and benefits of continuing breastfeeding vs replacement feeding.
- The use of flash pasteurisation or 'Pretoria' pasteurisation to reduce HIV transmission is supported but may pose significant barriers to successful breast milk feeding due to the effort involved. For instance, it can be used as an interim measure during maternal mastitis.

  NOTE: For the above,
  - » TLD1 = TLD as a first line ART regimen.
  - » TLD2 = TLD in patient who has failed a previous ART regimen.

MEDICINE TREATMENT

Mother

The VTP plan starts with initiation of ART in the mother (either pre or post conception). See Section 6.8: HIV in pregnancy.

Infant

Thereafter, the HIV-exposed infant may be classified into one of the following categories which determines the appropriate infant prophylaxis regimen:

- Low risk.
- High risk.
- Unknown risk, e.g. abandoned infant (manage as high risk). *LoE:IIa*[45]

Maternal VL	Risk profile	Prophylaxis	Comment
Maternal delivery VL as yet unknown at discharge from labour ward (results pending).	High-risk (until maternal delivery VL results become available).	Provide dual prophylaxis: AZT at birth and then twice daily for 6 weeks. NVP at birth and then daily for a minimum of 12 weeks.	All HIV-exposed infants will be considered high-risk until the final risk profile can be determined by the maternal delivery VL. If the maternal delivery VL result is not available at discharge from labour ward, review result at the 3 to 6 day postnatal visit and reclassify the infant accordingly. Dispense a full 6 weeks supply of dual prophylaxis. Ask the mother to return with all medication at the 3

Maternal VL	Risk profile	Prophylaxis	Comment
			to 6 day postnatal visit.
Maternal delivery VL ≥ 50 copies/mL in a breastfeeding mother.	High-risk.	Provide dual prophylaxis: AZT at birth and then twice daily for 6 weeks. NVP at birth and then daily for a minimum of 12 weeks.	Do an ABCDE assessment and get the mother's VL resuppressed as a matter of urgency. Stop infant NVP only after confirmation of maternal VL being <50 copies/mL, or until 4 weeks after cessation of all breastfeeding.
Maternal delivery VL ≥ 50 copies/mL in a mother who is exclusively formula feeding her infant from birth.*	High-risk.	Provide dual prophylaxis: AZT at birth and then twice daily for 6 weeks. NVP at birth and then daily for 6 weeks.	Do an ABCDE assessment and get the mother's VL resuppressed as a matter of urgency.
Maternal delivery VL <50 copies/mL regardless of feeding choice.	Re-classify as low risk.	Change to low risk prophylaxis: NVP at birth and then daily for 6 weeks.	Affirm and encourage good adherence. Repeat maternal VL 6-monthly during breastfeeding.

*Non-breastfeeding mother diagnosed HIV-positive >72 hours after delivery: Do not start the infant on prophylaxis. Start maternal ART. Perform an HIV PCR test on the infant and, if positive, initiate ART. If negative, continue to monitor HIV risk and perform HIV testing as above.

Table 11.9: Risk categories for HIV-exposed infants

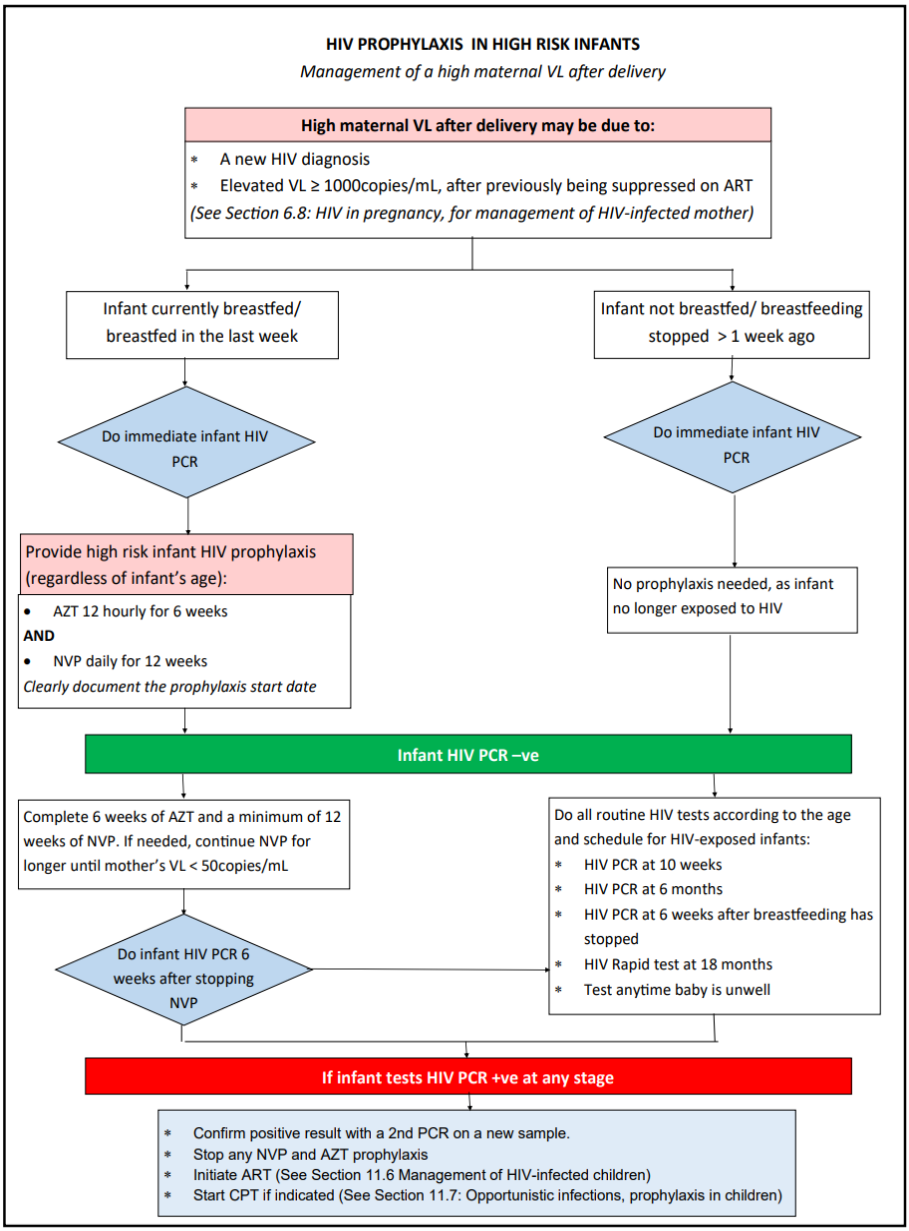


Figure 11.4: HIV prophylaxis in HIV-exposed infant at high risk after delivery *LoE:IIIb*[46]

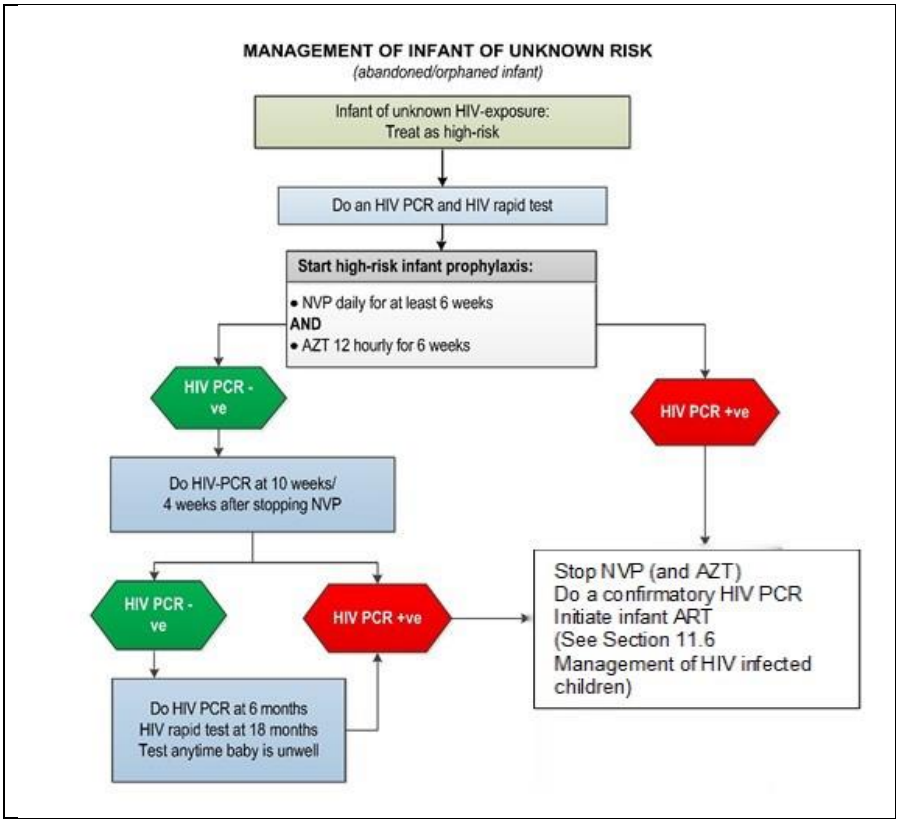


Figure 11.5: Management of HIV-exposed infant of unknown risk

LoE:IIIb[47]

Non-breastfeeding mother diagnosed HIV positive >72 hours after delivery:
Do not start NVP. Perform an HIV PCR on infant and if positive initiate ART.

Infant VTP dosages:
Daily prophylaxis for 6 or 12 weeks administered to infants, as indicated above:

- Give 1st dose as soon as possible after birth.
- If baby vomits: Repeat dose once only.
- If infant HIV PCR is positive at any time, stop prophylactic ARV, confirm with 2nd PCR and initiate/refer for ART, while awaiting 2nd PCR result.
- Continue normal breastfeeding .

Nevirapine (NVP) and Zidovudine (AZT) doses for infant on VTP:

LoE:IIb[48]

Newborns and infants:

- Nevirapine, oral, 4 mg/kg daily.
- Zidovudine, oral, 4mg/kg/dose 12 hourly.

	Birth–6 weeks			6 weeks – 6 months	6 – 9 months	9 – 24 months
	1.5-1.9 kg	2.0– 2.49 kg	≥ 2.5 kg			
NVP (Daily)	0.35 mL (0.35 mg) for 2 weeks THEN 0.6 mL (0.6 mg)	1 mL (10 mg) daily	1.5 mL (15 mg) daily	2 mL (20 mg) daily	3 mL (30 mg) daily	4 mL (40 mg) daily
AZT (Twice daily)	2mg/kg for 2 weeks THEN 3mg/kg for 2 weeks THEN 4mg/kg	1 mL (10 mg) twice daily	1.5 mL (15 mg) twice daily	6 mL (60 mg) twice daily	Children >6 months of age requiring AZT prophylaxis should use treatment doses.	

Table 11.10: Dose bands for NVP and AZT in VTP.

REFERRAL
Mother declines infant ARV prophylaxis.

11.6 MANAGEMENT OF HIV-INFECTED CHILDREN (<10 YEARS)
B24

DESCRIPTION
HIV-infected child: An infant/child in whom HIV infection has been confirmed with two age-appropriate tests. See Section 11.5: The HIV-exposed infant.

GENERAL AND SUPPORTIVE MEASURES
- Identify a caregiver who can supervise the child's treatment.
- Link the HIV interventions to the regular well infant visits/nutritional care. Ensure the road to health booklet is correctly completed and used to reflect and guide care.
- Counselling is a vital part of the successful care of children with HIV infection and their families. Specific matters requiring attention are:
  - The implications of the disease to the family.
  - Implications of treatment and understanding of the condition and its care.
  - The disclosure process within the family and extended family should be encouraged. Besides the caregiver, help from the family is often useful.
- Disclosure to the child as appropriate to age and maturity, with the parents' support.
  - Find out what the child understands of their illness and what they would like to know.
  - Disclosure should be child-led in terms of information required, language used and educational/emotional readiness.
  - Anticipate the effects of disclosure on the child, family and other contacts such as friends and school colleagues.

- Ensure that in disclosure, the child is constantly reassured of the parents'/caregivers' love.

Treatment of mothers, caregivers and other family members:

- Always ask about the caregiver's health, and the health of other family members.
- Ensure that mothers and other family members have timeous access to medical care including ART.
- Encourage breastfeeding in all mothers with HIV-infected children, with introduction of complementary foods from 6 months of age.
- At every visit ask about TB contacts and symptoms in children and their caregivers.

STANDARDISED NATIONAL MONITORING FOR INFANTS & CHILDREN WITH HIV

AT INITIAL DIAGNOSIS OF HIV	PURPOSE
Verify HIV status.	To ensure that national testing algorithm has been followed.
Document weight, height, head circumference (<2 years of age) and development.	To monitor growth and development.
Screen for TB symptoms.	To identify TB and HIV co-infection
Do CD4 count.	Determine eligibility for cotrimoxazole prophylaxis (CPT): <1 year: CPT irrespective of CD4 count. 1 to 5 years: CPT if CD4 count <25% or WHO Stage 3 and 4. >5 Years: CPT if CD4 count <200 cells/mm3 or WHO Stage 3 and 4.
Hb or FBC if available.	To detect anaemia or neutropaenia.
AT INITIATION OF ART (BASELINE)	**PURPOSE**
Hb or FBC.	If <8 g/dL: Manage appropriately.
CD4 count (if not performed in last 6 months).	Baseline assessment.
ALT (If jaundiced or on TB treatment).	To detect liver dysfunction.
ON ART	**PURPOSE**
Height, weight, head circumference (if child <2 years) and development.	To monitor growth and development. Adjust dosing at each visit according to weight gain.
Clinical assessment including medicine-related adverse events.	To monitor response to ART and detect adverse effects.
CD4: At 1 year on ART, and then every 6 months until meets criteria to stop cotrimoxazole. Thereafter stop CD4 count monitoring if patient remains virologically supressed. If not virologically supressed monitor CD4 count every 6 months.	To monitor response to ART. Stop cotrimoxazole prophylaxis if indicated.
Viral load: At month 3 on ART, after 12 months on ART, then every 12 months if virologically suppressed.	To monitor viral response to ART. To identify treatment failure and adherence problems.

More frequent monitoring (3 to 6 monthly) recommended in patients with treatment failure.	For management of an elevated VL, see algorithm, below: Monitoring and management of viral loads.
Hb or FBC at months 3 and 6 if on AZT. Thereafter, repeat if clinically indicated	To identify AZT-related anaemia.
If on PI-based regimen: Cholesterol + triglyceride at month 3. If above acceptable range, do fasting cholesterol and TGs; and if still above acceptable range consult with doctor/specialist.	To monitor for PI-related metabolic side effects.

Table 11.11: Monitoring for infants and children with HIV on ART *LoE:IIIb*[49]

MEDICINE TREATMENT

Prophylaxis for opportunistic infections

See Section 11.7: Opportunistic infections, prophylaxis in children.

Immunisation, deworming and vitamin A programme

- Continue deworming and vitamin A programme as in the HIV-uninfected child.
- Continue immunisation as per the SA-EPI (See Section 13.3: Vaccines for routine administration).

Nutritional support

Treat specific nutritional deficiencies appropriately.

Antiretroviral therapy

Initiation of ART in well infants shown to be PCR-positive should be carried out at PHC level.

The preparation of the child and family to start ART is critical to the success of the treatment. Failure to achieve adherence and understanding may lead to resistance and adversely affect the prognosis of the child.

Eligibility for ART

Clinical criteria

- Confirmation of diagnosis of HIV infection, irrespective of CD4 count/percentage or WHO clinical stage. *LoE:IIIb*[50]

AND

- No indications for deferral (e.g. major organ dysfunction). If medical contraindications are present, refer to hospital for rapid review and planning.

Social issues that must be addressed to ensure successful treatment

These are extremely important for success and impact on adherence. Social challenges should be overcome and not be barriers to care. Disclosure to another adult living in the same house is encouraged so that there is someone else who can assist with the child's treatment. However, absence of disclosure should not preclude ART initiation.

- Mandatory component: At least one identifiable caregiver able to supervise the child and/or administer medication. All efforts should be made to ensure that the social

circumstances of vulnerable children (e.g. orphans) be addressed to facilitate treatment.

- Adherence:
  - High levels of adherence are required for adequate virological response and prevention of viral resistance. This can be achieved with regular education and support.
  - All efforts to encourage this level of adherence should be made.
  - Viral load measurements are useful for monitoring adherence.
  - Sensitive, age-appropriate disclosure facilitates adherence.
- Mother and other family members should be assessed and treated.

Counselling before ART is initiated

The health care worker should ensure the caregiver/s understanding of HIV, ART and the importance of virological suppression and train caregivers on practical skills to adhere to ART.

ART regimens

- Treatment regimens are chosen according to age, weight, expected adverse effects, efficacy and prior antiretroviral exposure.
- Adjust the dosage of ART according to weight during follow up visits. Assess weight gain and need for adjustment at each visit.
- Do not change regimens or move to an alternative regimen, without clear guidance from a paediatric expert, as unnecessary loss of effective regimens can shorten life expectancy. Address adherence problems thoroughly before switching to an alternative regimen.
- Single medicine substitutions may only be made when medicine-specific adverse effects are encountered, on condition that virological suppression is documented and the matter is discussed with a practitioner experienced in child ART.

First-line ART regimens for infants and children:

ALD1: Clients on a DTG-containing regimen, having never failed a previous regimen (old 'first-line' terminology).

ALD2: Clients on a DTG-containing regimen, who have failed a previous regimen (old 'second- line' terminology).

ALD: abacavir, lamivudine, dolutegravir.

General ART comments

- Switch to tablets or capsules from pellets, syrups or solutions as soon as possible.
- Fixed-dose combinations are preferred to single agents.
- If available, use once daily dose regimens.

Side effects:

In patients being considered for an AZT-containing regimen, monitor for anaemia prior to initiation of ART.

A small proportion of patients initiated on ABC are at risk of abacavir hypersensitivity reaction, which presents with fever, rash and gastrointestinal disturbances. If this reaction is suspected, consult an expert.

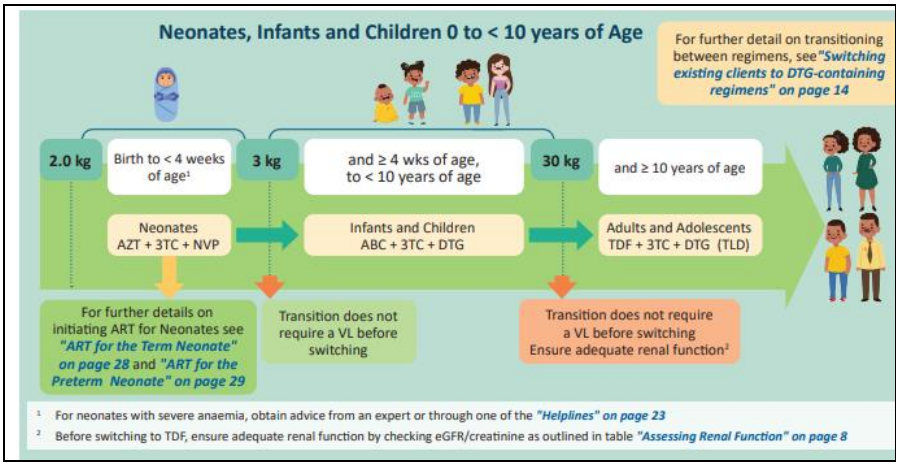


Figure 11.6: First-line paediatric ART-switching algorithm for neonates/infants/children (adopted from the NDoH 2023 ART Clinical Guidelines for the Management of HIV in Adults, Pregnancy and Breastfeeding, Adolescents, Children, Infants and Neonates).

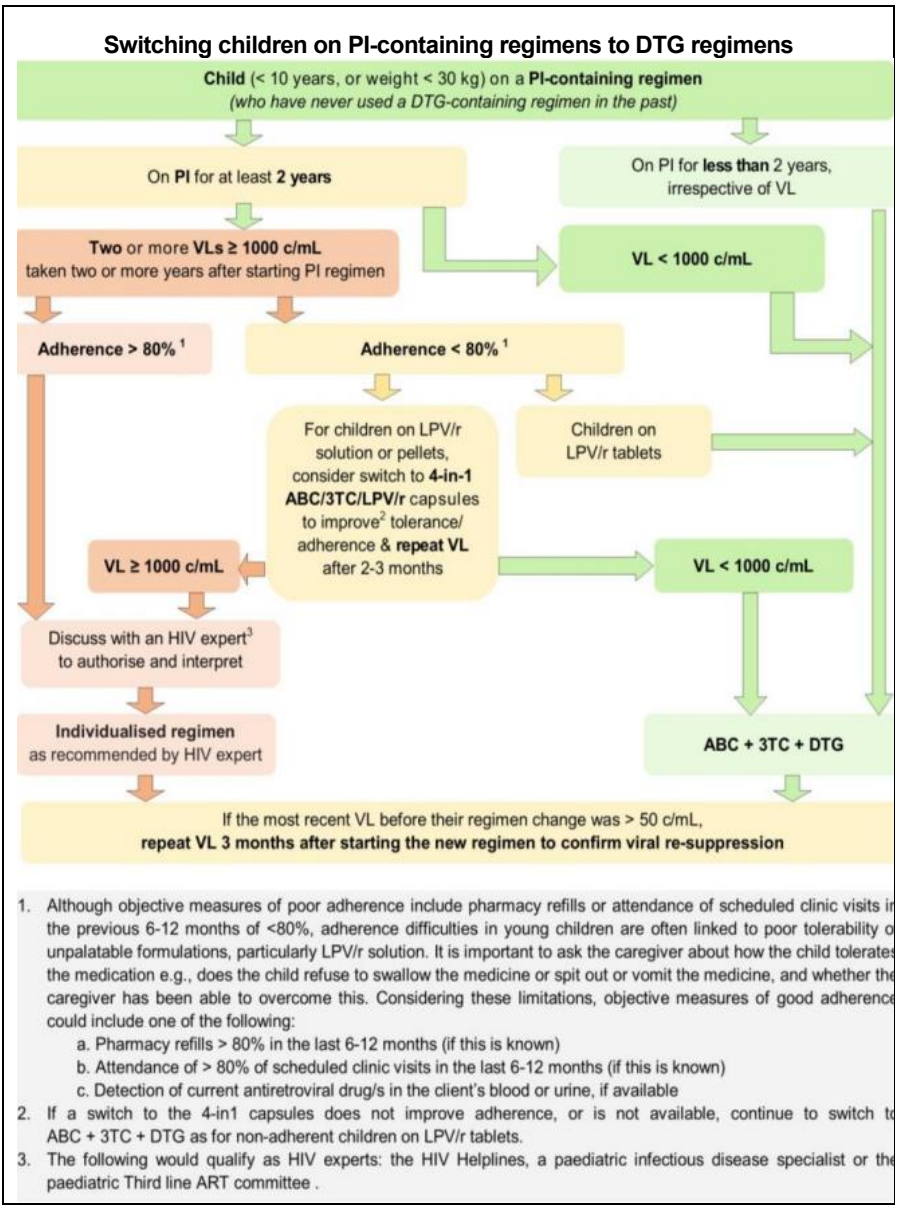
LoE:IIIb[51]

Transition from ABC/3TC/LPV/r to DTG based regimens

- Children <10 years or weight <30 kg
  - On PI based regimen for <2 years: switch to DTG based regimen (no VL required)
  - On PI based regimen for ≥2 years: review VL results, manage as per algorithm in figure 11.7.

For patients not eligible for transition to DTG based regimen

- Consider switching to ABC/3TC/LPV/r 4-in-1 formulation and repeating HIV VL in 3 months. If HIV VL <1000 copies/mL, change to ABC/3TC/DTG and if >1000 copies/mL, perform an HIV drug resistance test (DR).
- Perform an HIV DR if 4-in-1 formulation not available.
- If NRTI mutations on the HIV DR show:
  - No mutations or only M184V – switch to ABC/3TC/DTG.
  - M184V + other mutations – discuss with an experienced practitioner in child ARV medicine.



1. Although objective measures of poor adherence include pharmacy refills or attendance of scheduled clinic visits in the previous 6-12 months of <80%, adherence difficulties in young children are often linked to poor tolerability o unpalatable formulations, particularly LPV/r solution. It is important to ask the caregiver about how the child tolerates the medication e.g., does the child refuse to swallow the medicine or spit out or vomit the medicine, and whether the caregiver has been able to overcome this. Considering these limitations, objective measures of good adherence could include one of the following:
    a. Pharmacy refills > 80% in the last 6-12 months (if this is known)
    b. Attendance of > 80% of scheduled clinic visits in the last 6-12 months (if this is known)
    c. Detection of current antiretroviral drug/s in the client's blood or urine, if available
2. If a switch to the 4-in1 capsules does not improve adherence, or is not available, continue to switch to ABC + 3TC + DTG as for non-adherent children on LPV/r tablets.
3. The following would qualify as HIV experts: the HIV Helplines, a paediatric infectious disease specialist or the paediatric Third line ART committee .

Figure 11.7: Switching children on PI-containing regimens to DTG regimens (adopted from the NDoH 2023 ART Clinical Guidelines for the Management of HIV in Adults, Pregnancy and Breastfeeding, Adolescents, Children, Infants and Neonates).

Treatment failure

The HIV viral load is the most sensitive method to detect failure of response to ART.

Virological failure can be defined as a measurable viral load despite optimal adherence and dosage over 4 months. Treatment failure is primarily defined by viral loads, as waiting for clinical or immunological failure increases the chances of increasing viral resistance to other available antiretroviral agents.

Poor adherence is the most common cause of treatment failure. Adherence issues should be assessed and then implement strategies to improve adherence.

*For guidance on the step-up adherence package, refer to the National adherence guidelines. https://www.nacosa.org.za/wp-content/uploads/2016/11/Integrated-Adherence-Guidelines-NDOH.pdf

Third-line (patients failing ALD2)

Discuss with expert

» Application forms for third-line antiretroviral therapy (patients failing ALD2) can be accessed at the following link: https://knowledgehub.health.gov.za/elibrary/third-line-antiretrovirals.

» Important information to assist in applying for third-line antiretrovirals can be found at https://knowledgehub.health.gov.za/elibrary/third-line-antiretrovirals.

Applications can be emailed to TLART@health.gov.za. *LoE:IIIb*[52]

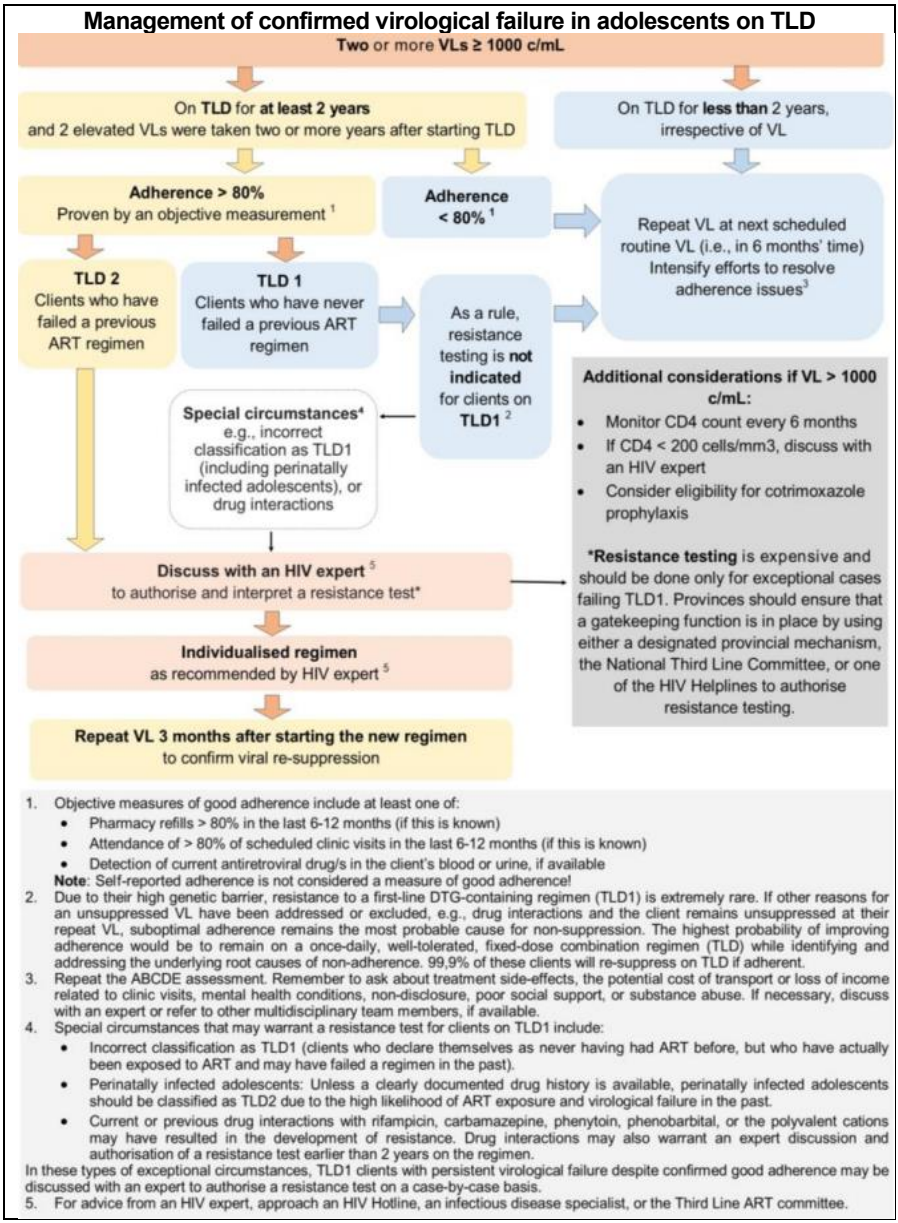
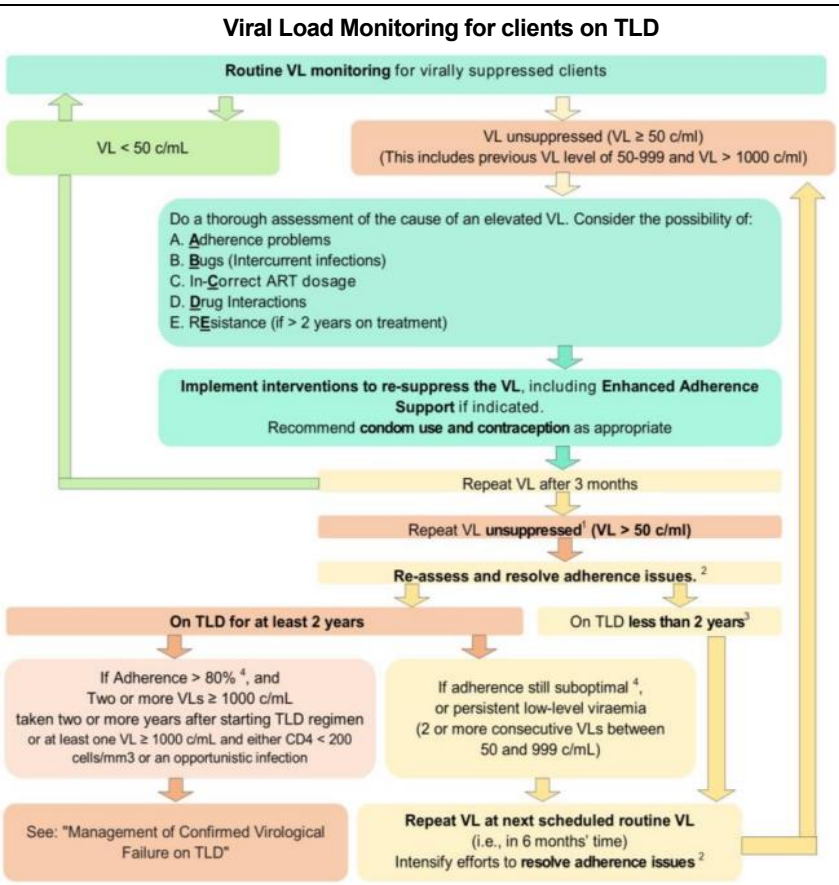


Figure 11.8: Management of confirmed virological failure in adolescents on TLD (adopted from the NDoH 2023 ART Clinical Guidelines for the Management of HIV in Adults, Pregnancy and Breastfeeding, Adolescents, Children, Infants and Neonates).TLD1 = TLD as a first line ART regimen and TLD2 = TLD in patient who has failed a previous ART regimen



1. Due to their high genetic barrier, resistance to a first-line DTG-containing (TLD1) regimen is extremely rare. If other reasons for an unsuppressed VL have been addressed or excluded, e.g., drug interactions, and the client remains unsuppressed at their repeat VL, suboptimal adherence remains the most probable cause for non-suppression. The highest probability of improving adherence would be to remain on a once-daily, well-tolerated, fixed-dose combination regimen (TLD) while identifying and addressing the underlying root causes of non-adherence. 99,9% of these clients will re-suppress on TLD if adherent!
2. Repeat ABCDE assessment as outlined on "ABCDE assessment of an Elevated Viral Load" on page 20. Remember to ask about treatment side-effects, the potential cost of transport or loss of income related to clinic visits, non-disclosure, gender-based violence (GBV), and current or prior drug interactions. Current or previous drug interactions with rifampicin, carbamazepine, phenytoin, phenobarbital, or the polyvalent cations may have resulted in the development of resistance.
3. Drug interactions may also warrant an expert discussion and authorisation of a resistance test earlier than 2 years on the regimen. If necessary, discuss with an expert
4. Objective measures of good adherence include at least one of:
   a. Pharmacy refills > 80% in the last 6-12 months (if this is known)
   b. Attendance of > 80% of scheduled clinic visits in the last 6-12 months (if this is known)
   c. Detection of current antiretroviral drug/s in the client's blood or urine, if available

Note: Self-reported adherence is not considered a measure of good adherence.

Figure 11.9: Viral load monitoring for clients on TLD (adopted from the NDoH 2023 ART Clinical Guidelines for the Management of HIV in Adults, Pregnancy and Breastfeeding, Adolescents, Children, Infants and Neonates).

ART dosing tables for infants and children

	Abacavir (ABC)	Lamivudine (3TC)	Abacavir + Lamivudine (ABC + 3TC)	Dolutegravir (DTG)	Dolutegravir when on rifampicin
Target dose	8 mg/kg **TWICE daily** **OR** If ≥ 10 kg: 16 mg/kg **ONCE daily**	4 mg/kg **TWICE daily** **OR** If ≥ 10 kg: 8 mg/kg **ONCE daily**	As for individual medications **ONCE daily**	By weight band **ONCE daily**	By weight band **TWICE daily**
Available formulations	Sol. 20 mg/mL Tabs 60 mg (scored, dispersible), 300 mg (not scored)	Sol. 10 mg/mL, Tabs 150 mg (scored)	Dispersible tablets (FDC): ABC/3TC 120/60 mg Tablet FDC: ABC/3TC 600/300 mg ABC/3TC/DTG 600/300/50 mg	Dispersible tabs (DT) 10 mg, film coated (FC) tabs 50 mg, FDC: TLD 300/300/50 mg **OR** ABC/3TC/DTG 600/300/50 mg **DT AND FC TABLETS ARE NOT BIOEQUIVALENT**	Dispersible tabs (DT) 10 mg, film coated (FC) tabs 50 mg, FDC: TLD 300/300/50 mg **OR** ABC/3TC/DTG 600/300/50 mg **DT AND FC TABLETS ARE NOT BIOEQUIVALENT**
Weight (kg)	Consult with a clinician experienced in paediatric ARV prescribing for neonates (< 28 days of age) and infants weighing < 3 kg.				
3–5.9	3 mL 12 hourly **OR** 1 x 60 mg tab 12 hourly	3 mL 12 hourly	1 x 120/60 mg tab daily	0.5 x 10 mg DT daily	0.5 x 10 mg DT 12 hourly
6-9.9	4 mL 12 hourly **OR** 1.5 x 60 mg tabs 12 hourly	4 mL 12 hourly	1.5 x 120/60 mg tabs daily	1.5 x 10 mg DT daily	1.5 x 10 mg DT 12 hourly
10–13.9	4 x 60 mg tabs daily **OR** 12 mL daily	12 mL daily	2 x 120/60 mg tabs daily	2 x 10 mg DT daily	2 x 10 mg DT 12 hourly

Table 11.12: ART dosing tables for infants and children (adopted from the NDoH 2023 ART Clinical Guidelines for the Management of HIV in Adults, Pregnancy and Breastfeeding, Adolescents, Children, Infants and Neonates).

<table>
<tr><th></th><th>Abacavir (ABC)</th><th>Lamivudine (3TC)</th><th>Abacavir + Lamivudine (ABC + 3TC)</th><th>Dolutegravir (DTG)</th><th>Dolutegravir when on rifampicin</th></tr>
<tr><td>14–19.9</td><td>5 x 60 mg tabs daily
OR
1 x 300 mg tab daily</td><td>1 x 150 mg tab daily</td><td>2.5 x 120/60 mg tabs daily</td><td>2.5 x 10 mg DT daily</td><td>2.5 x 10 mg DT 12 hourly</td></tr>
<tr><td>20–24.9</td><td>1 x 300 mg tab
PLUS
1 x 60 mg tab daily
OR
6 x 60 mg tabs daily</td><td rowspan="4">2 x 150 mg tabs daily</td><td rowspan="4">1 x ABC/3TC 600/300 mg tab daily
OR
ABC/3TC/DTG FDC (600/300/50 mg) if eligible, daily</td><td>3 x 10 mg DT daily
OR
1 x 50 mg FC tab daily</td><td>3 x 10 mg DT 12 hourly
OR
1 x 50 mg FC tab 12 hourly</td></tr>
<tr><td>25–29.9</td><td rowspan="3">2 x 300 mg tabs daily</td><td>1 x 50 mg tab daily
OR
FDC: ABC/3TC/DTG 600/300/50 mg tab daily</td><td>1 x 50 mg tab 12 hourly
OR
FDC: ABC/3TC/DTG 600/300/50 mg tab 12 hourly</td></tr>
<tr><td>30–39.9</td><td rowspan="2">1 x 50 mg FC tab daily
OR
FDC: TLD if eligible daily
OR
FDC: ABC/3TC/DTG if eligible daily</td><td rowspan="2">1 x 50 mg FC tab 12 hourly
OR
FDC: TLD if eligible daily + 50 mg DTG FC tab 12 hours later
OR
FDC: ABC/3TC/DTG if eligible daily + 50 mg DTG FC tab 12 hours later</td></tr>
<tr><td>≥ 40</td></tr>
</table>

Table 11.12: ART dosing tables for infants and children (continued) (adopted from the NDoH 2023 ART Clinical Guidelines for the Management of HIV in Adults, Pregnancy and Breastfeeding, Adolescents, Children, Infants and Neonates).

	Lopinavir/ritonavir (LPV/RTV)	Abacavir + Lamivudine + Lopinavir/ ritonavir	Lopinavir/ritonavir when on rifampicin (and for 2 weeks after stopping rifampicin) *Choose one of the 2 options below as appropriate*		#Atazanavir (ATV) + ritonavir (RTV)	Efavirenz (EFV)	Zidovudine (AZT)
Target dose	300/75 mg/m^2/dose LPV/RTV **TWICE daily**	By weight band **TWICE daily**	LPV/RTV std dose + super-boosting with ritonavir (RTV) powder **TWICE daily** (≥ 0.75 x LPV dose 12 hourly)	Double-dose LPV/RTV tabs ONLY if able to swallow whole LPV/RTV tabs **TWICE daily**	By weight band **ONCE daily**	By weight band **ONCE daily**	180–240 mg/m^2/dose **TWICE daily**
Available formulations	Sol. 80/20 mg/mL Adult tabs 200/50 mg, Paed tabs 100/25 mg **TABLETS MUST BE SWALLOWED WHOLE** Pellets 40/10 mg per capsule **ONLY FOR USE IF NOT TOLERATING LPV/RTV SOLUTION. CAPSULES ARE NOT RECOMMENDED < 6 MONTHS OF AGE**	Caps 30/15/ 40/10 mg **IF PATIENT IS ON RIFAMPICIN TB TREATMENT, ADD RTV POWDER** (next column)	Oral powder 100 mg per packet	Adult tabs 200/50 mg, Paed tabs 100/25 mg	ATV caps 150, 200 mg: RTV tabs 100 mg; FDC: ATV/RTV 300/100 mg; **RTV TABLETS AND ATV/R FDC TABLETS MUST BE SWALLOWED WHOLE**	Caps/tabs 50, 200, 600 mg; FDC: TEE 300/200/600 mg; **TABLETS MUST BE SWALLOWED WHOLE**	Sol. 10 mg/mL Tabs 100 mg, 300 mg (not scored), AZT/3TC 300/150 mg
Weight (kg)	Consult with a clinician experienced in paediatric ARV prescribing for neonates (< 28 days of age) and infants weighing < 3 kg.						

Table 11.12: ART dosing tables for infants and children (continued) (adopted from the NDoH 2023 ART Clinical Guidelines for the Management of HIV in Adults, Pregnancy and Breastfeeding, Adolescents, Children, Infants and Neonates).

<table>
<tr><th></th><th>Lopinavir/ritonavir (LPV/RTV)</th><th>Abacavir + Lamivudine + Lopinavir/ ritonavir</th><th colspan="2">Lopinavir/ritonavir when on rifampicin (and for 2 weeks after stopping rifampicin)
Choose one of the 2 options below as appropriate</th><th>#Atazanavir (ATV) + ritonavir (RTV)</th><th>Efavirenz (EFV)</th><th>Zidovudine (AZT)</th></tr>
<tr><td>3–5.9</td><td>*1 mL 12 hourly
OR
2 capsules 12 hourly</td><td>2 capsules
12 hourly</td><td rowspan="2">LPV/RTV std dose
PLUS
oral RTV powder 100 mg (1 packet) 12 hourly</td><td rowspan="2">Do not use double-dose LPV/RTV tabs</td><td rowspan="2">Not recommended</td><td rowspan="2">Not recommended</td><td>6 mL 12 hourly</td></tr>
<tr><td>6–9.9</td><td>*1.5 mL 12 hourly
OR
3 capsules 12 hourly</td><td>3 capsules
12 hourly</td><td>9 mL 12 hourly</td></tr>
<tr><td>10–13.9</td><td>2 mL 12 hourly
OR
4 capsules 12 hourly
OR
2 x 100/25 mg paed tabs in morning PLUS
1 x 100/25 mg paed tab at night</td><td>4 capsules
12 hourly</td><td rowspan="2">LPV/RTV std dose
PLUS
oral RTV powder 200 mg (2 packets) 12 hourly</td><td>3 x 100/25 mg tabs
12 hourly</td><td rowspan="2">ATV 1 x 200 mg cap daily
PLUS
RTV 1 x 100 mg tab or 100 mg oral powder (1 packet) daily</td><td>1 x 200 mg cap/tab at night</td><td>12 mL
12 hourly
OR
1 x 100 mg tab 12 hourly</td></tr>
<tr><td>14–19.9</td><td>2.5 mL 12 hourly
OR
5 capsules 12 hourly
OR
2 x 100/25 mg paed tabs 12 hourly
OR
1 x 200/50 mg adult tab 12 hourly</td><td>5 capsules
12 hourly</td><td>4 x 100/25 mg paed tabs 12 hourly
OR
2 x 200/50 mg adult tabs 12 hourly</td><td>1 x 200 mg cap/tab + 2 x 50 mg caps/tabs at night</td><td>2 x 100 mg tab in morning
PLUS
1 x 100 mg tab at night
OR
15 mL 12 hourly</td></tr>
</table>

Table 11.12: ART dosing tables for infants and children (continued) (adopted from the NDoH 2023 ART Clinical Guidelines for the Management of HIV in Adults, Pregnancy and Breastfeeding, Adolescents, Children, Infants and Neonates).

<table>
<tr><th></th><th>Lopinavir/ritonavir (LPV/RTV)</th><th>Abacavir + Lamivudine + Lopinavir/ ritonavir</th><th colspan="2">Lopinavir/ritonavir when on rifampicin (and for 2 weeks after stopping rifampicin)
Choose one of the 2 options below as appropriate</th><th>#Atazanavir (ATV) + ritonavir (RTV)</th><th>Efavirenz (EFV)</th><th>Zidovudine (AZT)</th></tr>
<tr><td>20–24.9</td><td>3 mL 12 hourly
OR
6 capsules 12 hourly
OR
2 x 100/25 mg paed tabs 12 hourly
OR
1 x 200/50 mg adult tab 12 hourly</td><td>6 capsules 12 hourly</td><td></td><td></td><td></td><td></td><td>2 x 100 mg tabs 12 hourly
OR
20 mL 12 hourly</td></tr>
<tr><td>25–29.9</td><td>3.5 mL 12 hourly
OR
7 capsules 12 hourly
OR
3 x 100/25 mg paed tabs 12 hourly
OR
1 x 200/50 mg adult tab 12 hourly PLUS 1 x 100/25 mg paed tab 12 hourly</td><td rowspan="3">Not recommended</td><td rowspan="3">LPV/RTV std dose
PLUS
oral RTV powder 300 mg (3 packets) 12 hourly</td><td>6 x 100/25 mg paed tabs 12 hourly
OR
3 x 200/50 mg adult tabs 12 hourly</td><td rowspan="3">1 x ATV/RTV 300/100 mg FDC daily
OR
ATV 2 x 150 mg caps daily
PLUS
RTV 1 x 100 mg tab or 100 mg oral powder (1 packet) daily</td><td rowspan="2">2 x 200 mg caps/tabs at night</td><td rowspan="3">1 x 300 mg tab 12 hourly
OR
1 x AZT/3TC 300/150 mg tab 12 hourly</td></tr>
<tr><td>30–39.9</td><td rowspan="2">5 mL 12 hourly
OR
10 capsules 12 hourly
OR
4 x 100/25 mg paed tabs 12 hourly</td><td>8 x 100/25 mg paed tabs 12 hourly
OR</td></tr>
<tr><td>≥ 40</td><td>2 x 200 mg caps/tabs at night
OR</td></tr>
</table>

Table 11.12: ART dosing tables for infants and children (continued) (adopted from the NDoH 2023 ART Clinical Guidelines for the Management of HIV in Adults, Pregnancy and Breastfeeding, Adolescents, Children, Infants and Neonates).

	Lopinavir/ritonavir (LPV/RTV)	Abacavir + Lamivudine + Lopinavir/ ritonavir	Lopinavir/ritonavir when on rifampicin (and for 2 weeks after stopping rifampicin) *Choose one of the 2 options below as appropriate*		#Atazanavir (ATV) + ritonavir (RTV)	Efavirenz (EFV)	Zidovudine (AZT)
	OR 2 x 200/50 mg adult tabs 12 hourly			4 x 200/50 mg adult tabs 12 hourly		FDC: TEE if eligible, daily	

*Avoid LVP/r solution in any full-term infant < 14 days of age and any preterm infant < 42 weeks post conceptual age (corrected gestational age) or obtain expert advice.
Children weighing 25 to 29.9 kg may also be dosed with LPV/r 200/50 mg adult tabs: 2 tablets in the morning and 1 tablet at night.
#Atazanavir plus ritonavir should not be used in children/adolescents on treatment with rifampicin, obtain expert advice.
No dosage adjustments are required for children receiving treatment with efavirenz and rifampicin.

Table 11.12: ART dosing tables for infants and children (continued) (adopted from the NDoH 2023 ART Clinical Guidelines for the Management of HIV in Adults, Pregnancy and Breastfeeding, Adolescents, Children, Infants and Neonates).

Instructions to administer LPV/r pellets to children are:

- Hold the capsule at both ends and, twisting in opposite directions, pull apart to pour out the pellets inside the capsule.
- Add the pellets (from the required number of capsules) to a spoonful of food a little at a time. For example, porridge can be used (must be at room temperature)
- Do not stir, crush, or dissolve the pellets: rather sprinkle over the food.
- Use only a small amount of food, to ensure child can consume all the pellets. Discard food with pellets after 2 hours.
- The capsule can be discarded with usual waste.

LoE:IIIb[53]

11.7 OPPORTUNISTIC INFECTIONS, PROPHYLAXIS IN CHILDREN

Z29.2 + (B24)

Cotrimoxazole prophylaxis

Initiation

LoE:IIIb[54]

- All HIV-infected infants (<1 year), starting from 6 weeks of age.
- Any child 1–5 years of age with CD4 <25%, or WHO stage 3 and 4.
- Any child >5 years of age with CD4 count <200 cells/mm^3, or WHO stage 3 and 4.

• Cotrimoxazole (sulfamethoxazole/trimethoprim), oral, once daily.

Recommended daily dosage by weight band	Dose of sulfamethoxazole/ trimethoprim	Suspension (200/40 mg per 5 mL)	Single strength tablet (400/80 mg)	Double strength tablet (800/160 mg)
3 to 5.9 kg	100/20 mg	2.5 mL	¼ tablet	-
6 to 13.9 kg	200/40 mg	5 mL	½ tablet	-
14 to 24.9 kg	400/80 mg	10 mL	1 tablet	½ tablet
25 kg	800/160 mg	-	2 tablets	1 tablet

Table 11.13: Dose bands for cotrimoxazole

Discontinuation

Prophylaxis may be discontinued if the immune system is fully reconstituted on ART i.e. Child >1 year of age, *AND* immune system shows signs of full reconstitution on two CD4 tests at least 3-6 months apart (regardless of clinical stage), i.e.:

Child 1-5 years of age: CD4 >25%.

Child >5 years of age: CD4 >200 cells/mm^3.

TB prophylaxis

See Section 17.4.2.1: TB chemoprophylaxis/Isoniazid preventive therapy (IPT) in children.

Immunisation

Continue immunisation as per the SA-EPI (see Section 13.3: Vaccines for routine administration).

11.8 OPPORTUNISTIC INFECTIONS, TREATMENT IN CHILDREN

11.8.1 CANDIDIASIS, ORAL (THRUSH), RECURRENT

B20.4

MEDICINE TREATMENT

- Nystatin suspension, oral, 100 000 IU/mL, 0.5 mL after each feed.
  - Keep in contact with the affected area for as long as possible prior to swallowing.
  - In the older child, ask child to swirl in the mouth, prior to swallowing.
  - In the infant, advise caregiver to apply to front of the mouth and spread over the oral mucosa with a clean finger.
  - Continue for 48 hours after resolution of symptoms.

If there is oral candidiasis and the child cannot swallow, this indicates the presence of oesophageal candidiasis. See Section 11.8.2: Candidiasis, oesophageal.

11.8.2 CANDIDIASIS, OESOPHAGEAL

B20.4

MEDICINE TREATMENT

- Fluconazole, oral, 6 mg/kg once daily for 21 days. See dosing table: Chapter 23.

11.8.3 DIARRHOEA, HIV-ASSOCIATED

See Section 2.9: Diarrhoea.

11.8.4 PNEUMONIA

See Section 17.3.4: Pneumonia

11.8.5 MEASLES AND CHICKENPOX

Refer all patients.

11.8.6 SKIN CONDITIONS

These are common and include scabies, seborrhoeic eczema and others.
See Chapter 5: Skin conditions.
If no response to care as directed in the chapter, refer.

11.8.7 TUBERCULOSIS (TB)

A15.0-6/A15.7-9/A16.0-5/A16.7-9/A17.0-1/A17.8-9/A18.0-8/A19.0-2/A19.8-9 + B20.0

DESCRIPTION

TB and HIV are often comorbid conditions. Exclude TB in all patients before starting ART. See Section 17.4.2: Pulmonary tuberculosis, in children.

Re-evaluate the risk for TB and TB contact at each visit on history (including contact history) and clinical examination.

TB should be considered early in non-resolving pneumonias. At every follow up visit, ask about symptoms of cough, night sweats, fever, TB contacts and check for failure to thrive.

Refer early for diagnostic evaluation. If TB is suspected:

- Chest radiograph (CXR).
- GeneXpert on any relevant specimen including stool.
- Culture on respiratory or appropriate specimen.
- Urine-LAM. If no sample obtained, continue evaluation.

MEDICINE TREATMENT

TB prophylaxis Z29.2 + (B24)

Give TB prophylaxis to all HIV-infected children in whom no evidence of TB disease is present and who are:

- Exposed to a close contact with infectious pulmonary TB, or
- TST-positive (this test is only reliable the first time TPT is given).
- Isoniazid, oral, 10 mg/kg/dose once daily for 6 months.
  - Maximum dose: 300 mg daily.
  - See Section 17.4.2.1: TB chemoprophylaxis/Isoniazid preventive therapy (IPT) in children.

Repeat course if an HIV-infected patient, irrespective of age, is re-exposed to a TB contact at any point after completing TB treatment or prophylaxis.

Refer if patient has been exposed to a known MDR or XDR-TB source case or the contact case has failed standard TB treatment.

TB treatment

If the child is not yet on ART:

» TB treatment and ART can be started at the same time, with the exception of children with TB meningitis – start ART at 4 weeks regardless of CD4 count to avoid IRIS.
» Assess the child for possible disseminated TB disease.
» Be aware of the possibility of Immune Reconstitution Inflammatory Syndrome (IRIS).

If the child is already on ART:

» Commence TB treatment, considering possible drug interactions and the need for ART dosage adaptations.

If the child needs to take concomitant ART and rifampicin-containing treatment:

- Dolutegravir: use dolutegravir twice daily.
- Efavirenz: use the normal recommended dosage as per the dosing table.
- Abacavir and lamivudine: no adjustment of dosages.
- Lopinavir/ritonavir: refer to the dosage table for the ritonavir boosting doses.
  - Avoid using double-dose lopinavir/ritonavir solution in young children. If ritonavir powder is not available, consult an expert.
- Give pyridoxine (vitamin B6) to all children on TB treatment and ART, to avoid development of peripheral neuropathy.

11.9 DEVELOPMENTAL DELAY OR DETERIORATION

GENERAL MEASURES

Refer children with cognitive (learning problems) and motor delays for assesment and neurodevelopmental rehabilitation.

11.10 ANAEMIA

See Section 3.1: Anaemia.

HIV PREVENTION

11.11 PRE-EXPOSURE PROPHYLAXIS (PREP)

Z20.6 + Z29.2

Consult the most recent National Department of Health Guideline for PrEP eligibility criteria.

DESCRIPTION

Pre-exposure prophylaxis (PrEP) is the use of antiretroviral medicines by HIV-negative individuals before potential exposure to HIV to prevent them from acquiring HIV infection. PrEP only protects against HIV infection; it does not offer protection against other STIs or pregnancy.

PrEP should be used as part of a package that also includes condoms; lubricants for anal sex; STI management; screening and management of intimate partner violence; sexual and reproductive health services; medical male circumcision; and HIV services, including counseling and testing, HIV management, ART, and PEP.

All individuals requesting PrEP should be assessed and initiated if elgible.

Individuals initiated on PrEP must meet the following criteria:

- HIV-negative.
- At substantial risk of HIV infection.
- Willing and able to adhere to PrEP.
- Prepared to come for repeat HIV testing every 3 months.
- No contra-indications to tenofovir or emtricitabine.
- No suspicion of acute HIV-infection (see clinical features, below).

Clinical features of acute HIV infection

Symptoms	Signs
Malaise, anorexia, myalgia, headache, sore throat, sore glands, rash	Fever, sweating, viral meningitis, generalised lymphadenopathy, hepatosplenomegaly, pharyngitis, truncal rash, orogenital herpetiform ulceration, oral/oesophageal candidiasis, cervical adenopathy

CONTRAINDICATIONS TO PrEP

- Pre-existing HIV infection.
- Estimated creatinine clearance or eGFR <60 mL/min.
- Use of nephrotoxic medicines e.g. aminoglycosides.
- Young women/men <35 kg or <15 years of age who are not Tanner stage 3 (sexual maturity) or greater.
- Unwilling or unable to adhere to daily PrEP.

ORAL PREP REGIMEN

A fixed dose combination formulation of:

- Tenofovir disoproxil fumarate (TDF), oral, 300 mg daily.

AND

- Emtricitabine, oral, 200 mg daily. *LoE:Ia*[55]

Note: To reach adequate protective levels in tissues, 7 days of daily dosing are required. Individuals should be counselled that additional barrier protection should be used until therapeutic levels achieved. *LoE:IIIb*[56]

Screening investigations before starting PrEP

Investigation	Purpose	Action
HIV test (using algorithm in the HTS guidelines*)	Assessment of HIV status.	If HIV-negative, consider PrEP If HIV-positive: Link to treatment and care services.
Estimated creatinine clearance (eGFR)	To identify pre-existing renal disease.	Do not initiate PrEP if creatinine clearance/eGFR <60 mL/min. Repeat creatinine clearance after two weeks. If renal function returns to normal and other PrEP criteria are met, PrEP may be initiated. Refer for further investigation if renal function remains abnormal.
Hepatitis B surface antigen (HBsAg)	To diagnose chronic hepatitis B infection. To identify those eligible for vaccination against hepatitis B.	Assess eligibility for vaccination if available (see table below). If HBsAg-positive, do ALT prior to PrEP initiation.
ALT if HBsAg-positive		If ALT persistently elevated or other abnormal liver function tests, refer for assessment.
Urine pregnancy test	To identify if pregnant.	Provide counselling covering risk of HIV infection during pregnancy and benefits of taking PrEP.
RPR	To diagnose syphilis infection for treatment.	Manage according to STI guidelines.
Syndromic STI screening	To diagnose and treat STI.	Manage according to STI guidelines.

Table 11.13: Screening investigations before starting PrEP

*HIV Testing Services guidelines

Note:

- If symptoms or signs of acute HIV infection are present, PrEP should be postponed until symptoms subside and a repeat rapid HIV test after 4 weeks remains negative.
- TDF + FTC is active against hepatitis B (HBV) infection. HBV infection is not a contra-indication to PrEP, but will require LFT monitoring. Discontinuation of TDF + FTC in patients with HBV requires referral to a specialist because of a risk of a hepatitis flare.

Hepatitis B immune status and PrEP eligibility

Hepatitis B surface antigen (HBsAg)	Hepatitis B surface antibody (HBsAb)	Action
Negative (-)	Negative (-)	Start PrEP. Vaccinate concurrently if available
Negative (-)	Positive (+)	Start PrEP. No vaccine needed
Positive (+)	N/A	Refer for evaluation, if ALT >2 times upper limit of normal.

Table 11.14: PrEP eligibility determined by hepatitis B immune status

Note:

- PrEP users with chronic hepatitis B infection who develop abnormal liver function tests should be referred for assessment.

PrEP follow up and monitoring

Activity	Frequency
Confirmation of HIV-negative status	At 1 month, then every 3 months.
Address side effects	Every visit.
Adherence counseling	Every visit.
Estimated creatinine clearance	Frequency dependant on pregnancy status, age and co-morbidity: *LoE:IVb*[57]
STI screening and treatment	Every visit.
PrEP dispensing	1 month supply, then 3 monthly supply.
Behavioural sexual risk reduction counseling	Every visit.

Age/ pregnant	Co-morbidity	Creatinine
<30 years	None	n/a
30–49 years	None	Baseline
<49 years	Diabetes/ hypertension	Baseline, annually
≥ 50 years	None	Baseline
≥ 50 years	Diabetes/ hypertension	Baseline, annually
Pregnant	n/a	Baseline, 3 & 6 months

Table 11.15: Monitoring of person(s) on PrEP

PREP SAFETY

Relevant medicine interaction information

Medicine	Interaction information	Advise
Standard TB medicines	No interaction.	No need for dose adjustments.
Hormonal contraception	No interaction.	Hormonal contraception does not affect PrEP effectiveness, nor does PrEP affect hormonal contraceptive effectiveness.
Nephrotoxic medicines	Increase risk of renal side effects.	Avoid PrEP. Advise other prevention methods.

Table 11.16: Oral PrEP drug interactions

Side effects of TDF + FTC combination

Major	Renal toxicity, decreased bone mineral density, extremely small risk of lactic acidosis and hepatic steatosis or steatohepatitis.
Minor	Gastrointestinal symptoms (diarrhoea, nausea, vomiting and flatulence), unintentional weight loss.

Table 11.17: Side effects of oral PrEP

Note:

- Minor side effects are relatively common (approximately 1 in 10 individuals in the first 1 to 2 months).
- Mild and self-limiting; do not require discontinuation.
- Renal toxicity and decreased bone mineral density usually reversible upon stopping PrEP.

STOPPING PREP

PrEP should be stopped if:

- Tests HIV-positive.
- Renal disease develops.
- Non-adherent to PrEP.
- Does not need or want PrEP.
- No longer meets eligibility criteria.
- There are safety concerns where the risks of PrEP use outweigh potential benefit.

Continue PrEP for 7 days after the last potential HIV exposure. *LoE:IVb*[58]

Note: Patients with chronic HBV may experience a hepatitis flare on discontinuation of PrEP.

REFERRAL

- HBsAg-positive, with abnormal ALT.
- Discontinuation of TDF + FTC in patients with HBV.

PREP INITIATION ALGORITHM

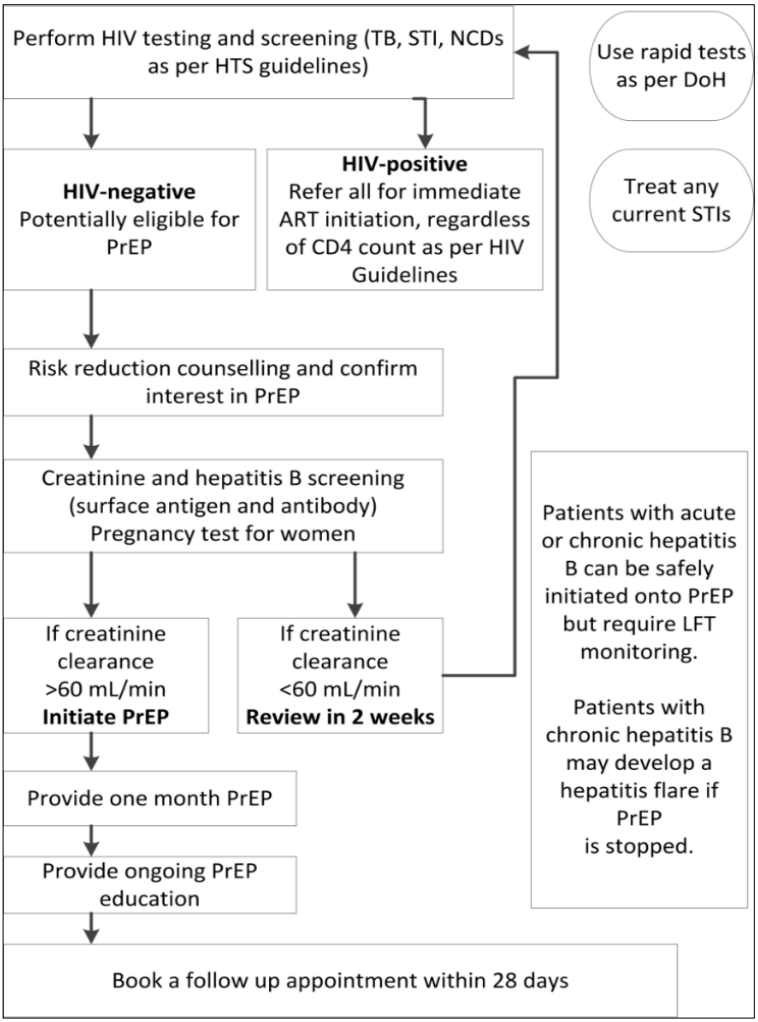


Figure 11.10: PrEP initiation algorithm

NOTE: In patients with Chronic Kidney Disease (CKD) with eGFR <60mL/min, PrEP is contraindicated.

11.12 POST EXPOSURE PROPHYLAXIS

Is oka Section 21.3.6: Post exposure Prophylaxis (PEP).

11.13 SIDE EFFECTS AND COMPLICATIONS OF ART

Refer to the Adult Hospital Level STGs and EML: Section 10.1.1 Management of selected antiretroviral adverse drug reactions, and consult with an infectious disease specialist as required.

11.13.1 IMMUNE RECONSTITUTION INFLAMMATORY SYNDROME (IRIS)

D89.3 + (Y41.5 + B24)

DESCRIPTION

Clinical deterioration can occur after starting ART due an improvement in the immune system response to organisms already causing infection, e.g.

- *M. bovis* (BCG).
- *M. tuberculosis* (MTB).

There are 2 types of IRIS:

1. Unmasking: when a previously unsuspected condition becomes manifest.
2. Paradoxical: known condition on appropriate treatment becomes worse.

DIAGNOSTIC CRITERIA

- Exclude other active or inadequately treated diseases (including DR-TB).
- Presentation:
  - Usually during the first 6 weeks after starting ART.
  - Depends on the causative organism and the organ system involved, e.g. TB presents with fever, lymphadenopathy, worsening of the original tuberculous lesion, and/or deteriorating chest radiographic manifestations such as miliary pattern or pleural effusion.

REFERRAL

All patients.

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PHC Chapter 12: Sexually transmitted infections

The syndromic approach to Sexually Transmitted Infections (STIs) diagnosis and management is to treat the signs or symptoms (syndrome) of a group of diseases rather than treating a specific disease. This allows for the treatment of one or more conditions that often occur at the same time and has been accepted as the management of choice.

Causative organisms and medicine management for STI syndromes:

ORGANISM	SYNDROME/S	MEDICINE MANAGEMENT
Neisseria gonorrhoeae	VDS, MUS, LAP	ceftriaxone + azithromycin *LoE:III*[1]
Chlamydia trachomatis	VDS, MUS, LAP, GUS, Bubo	azithromycin
Trichomonas vaginalis	VDS, LAP	metronidazole
Bacterial vaginosis (overgrowth of *Gardnerella vaginalis*, lactobacillus, anaerobes etc.)	VDS	metronidazole
Candida albicans	VDS	clotrimazole
Treponema pallidum	GUS	doxycycline/ benzathine benzylpenicillin
Herpes simplex	GUS	aciclovir
Haemophilus ducreyi	GUS, Bubo	azithromycin

It is important to take a good sexual history and undertake a thorough ano-genital examination in order to perform a proper clinical assessment. The history should include questions concerning symptoms, recent sexual history, sexual orientation, type of sexual activity (oral, vaginal, anal sex), the possibility of pregnancy (females), use of contraceptives including condoms, recent antibiotic history, antibiotic allergy, recent overseas travel and domestic violence. Refer to a social worker, as required.

Note: Standard referral letter for treatment failure must include the following:

» reason for referral: presumptive diagnosis (e.g. persistent cervicitis with suspected resistant gonorrhoea)
» clinical findings including speculum examination for vaginal discharge
» treatment history (including all medicines with dose and duration)
» details of notification and treatment history of partner(s)

Suspected STI in children should be referred to hospital for further investigation and management.

GENERAL MEASURES

» **C**ounselling and education, including HIV testing.
» **C**ondom promotion, provision and demonstration to reduce the risk of STIs.
» **C**ompliance/ adherence with treatment.
» **C**ontact treatment/ partner management.
» **C**ircumcision promotion (counselling to continue condom use).
» **C**ervical cancer screening.

Promote HIV counselling and testing.
For negative test results repeat test after 6 weeks, because of the window period.

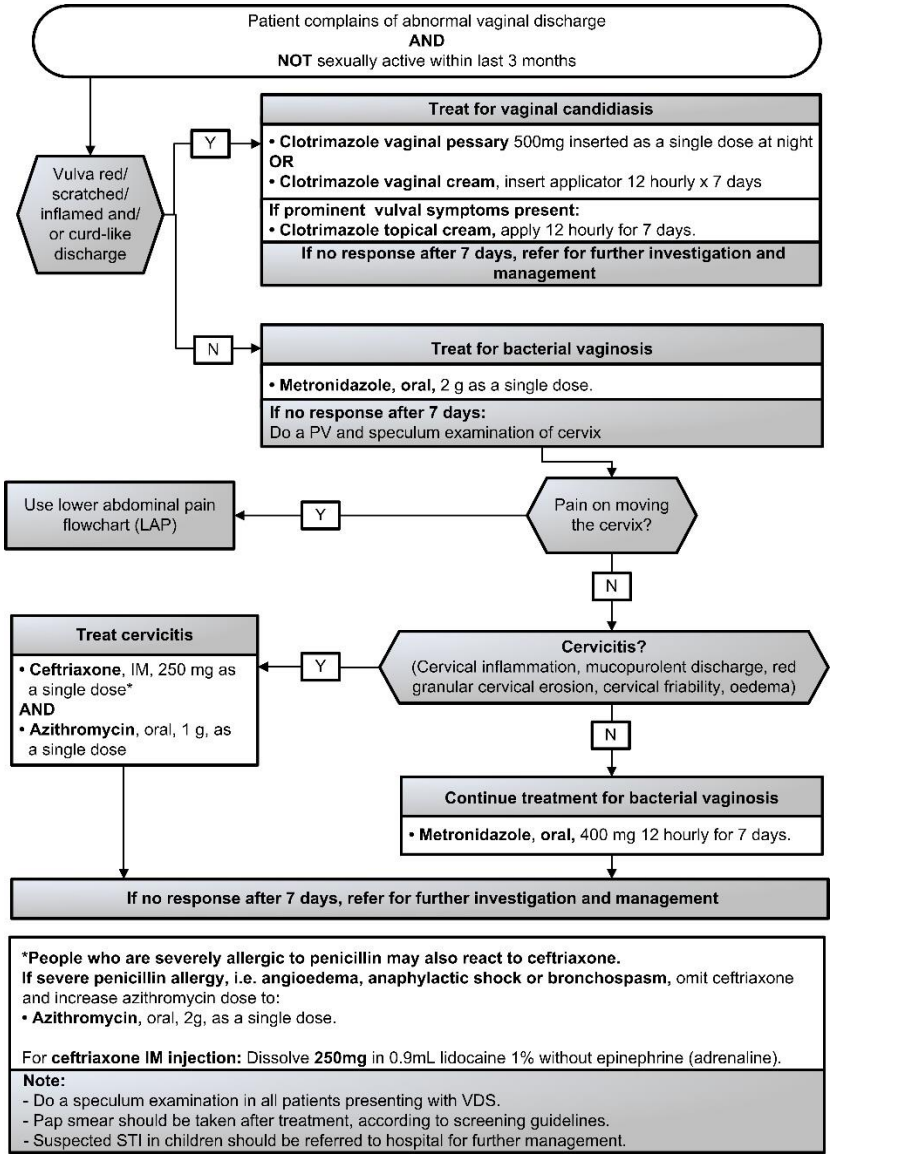
Benzathine benzylpenicillin

Benzathine benzylpenicillin remains the recommended treatment for syphilis. Azithromycin is not recommended for the treatment of syphilis in pregnancy as azithromycin does not effectively treat syphilis in the fetus, and resistance develops rapidly to macrolides. Therefore, benzathine benzylpenicillin should be reserved for use in pregnant women and children during times of a confirmed stock shortage.

12.1 VAGINAL DISCHARGE SYNDROME (VDS)

B37.3/N76.0/N89.8

12.1.1 SEXUALLY NON-ACTIVE WOMEN



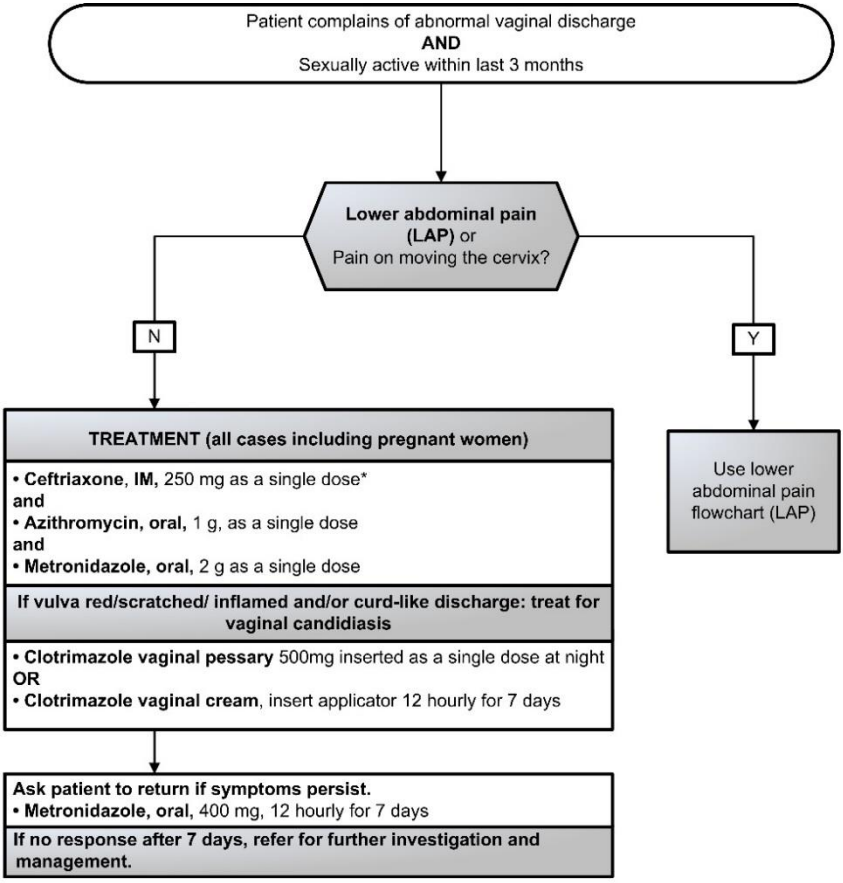
*People who are severely allergic to penicillin may also react to ceftriaxone.
If severe penicillin allergy, i.e. angioedema, anaphylactic shock or bronchospasm, omit ceftriaxone and increase azithromycin dose to:
• Azithromycin, oral, 2g, as a single dose.

For ceftriaxone IM injection: Dissolve 250mg in 0.9mL lidocaine 1% without epinephrine (adrenaline).

Note:
- Do a speculum examination in all patients presenting with VDS.
- Pap smear should be taken after treatment, according to screening guidelines.
- Suspected STI in children should be referred to hospital for further management.

LoE:III[2]

12.1.2 SEXUALLY ACTIVE WOMEN



***People who are severely allergic to penicillin may also react to ceftriaxone.**
If severe penicillin allergy, i.e. angioedema, anaphylactic shock or bronchospasm, omit ceftriaxone and increase azithromycin dose to:
• **Azithromycin,** oral, 2 g, as a single dose.

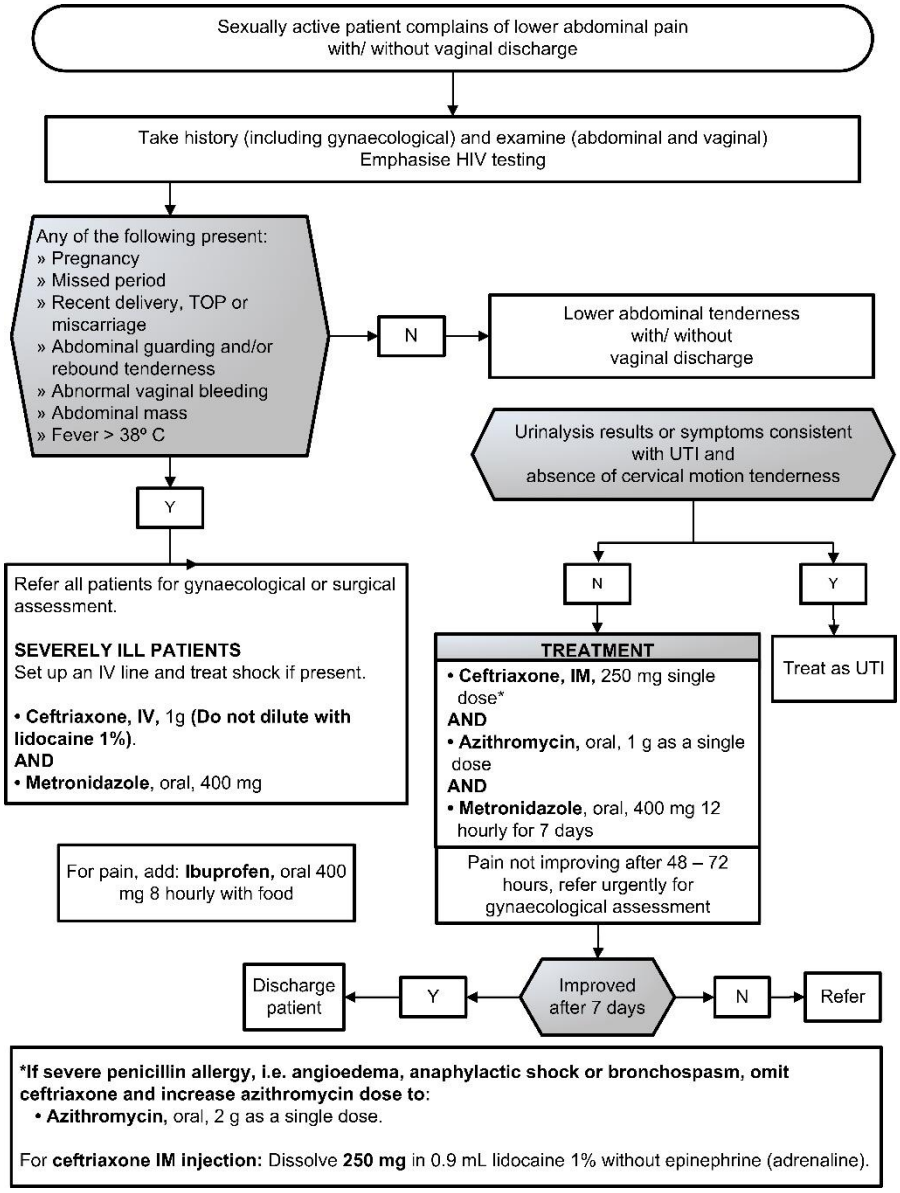
For **ceftriaxone IM injection:** Dissolve **250 mg** in 0.9 mL lidocaine 1% without epinephrine (adrenaline).

Note:
- Do a speculum examination in all patients presenting with VDS.
- Pap smear should be taken after treatment, according to screening guidelines.
- Suspected STI in children should be referred to hospital for further management.

LoE:III[3]

12.2 LOWER ABDOMINAL PAIN (LAP)

N73.9

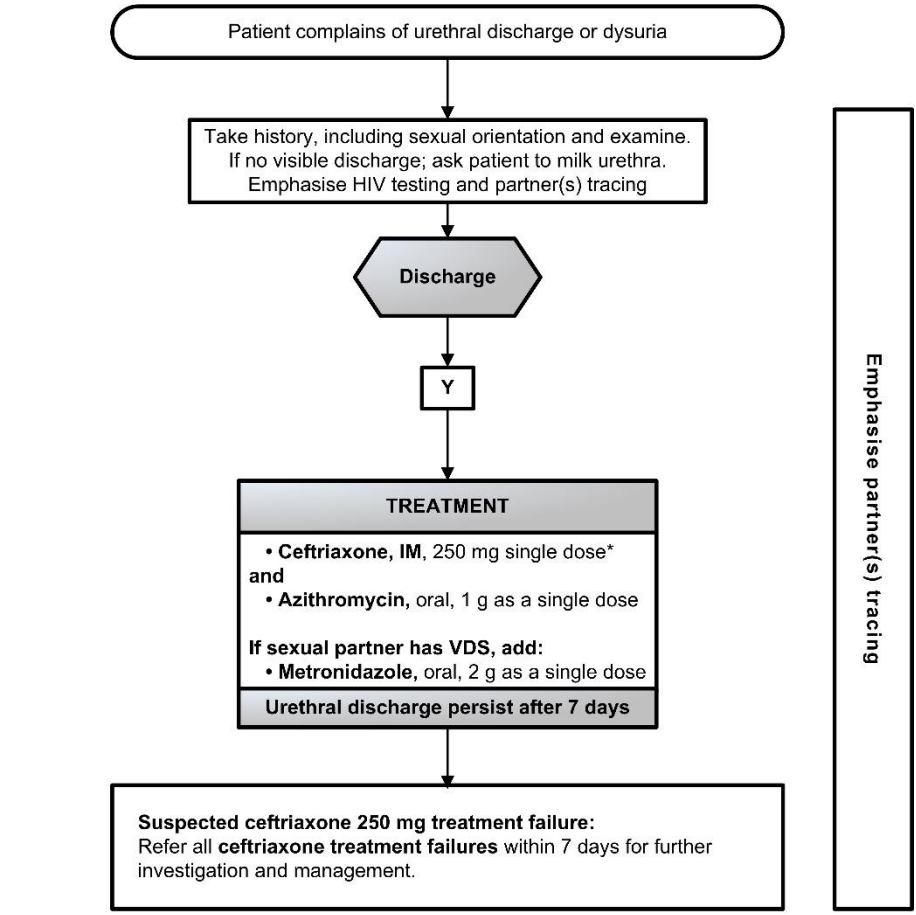


*If severe penicillin allergy, i.e. angioedema, anaphylactic shock or bronchospasm, omit ceftriaxone and increase azithromycin dose to:
- **Azithromycin,** oral, 2 g as a single dose.

For **ceftriaxone IM injection:** Dissolve **250 mg** in 0.9 mL lidocaine 1% without epinephrine (adrenaline).

12.3 MALE URETHRITIS SYNDROME (MUS)

A64 + N34.1



*If severe penicillin allergy, i.e. angioedema, anaphylactic shock or bronchospasm, omit ceftriaxone and increase azithromycin dose to:

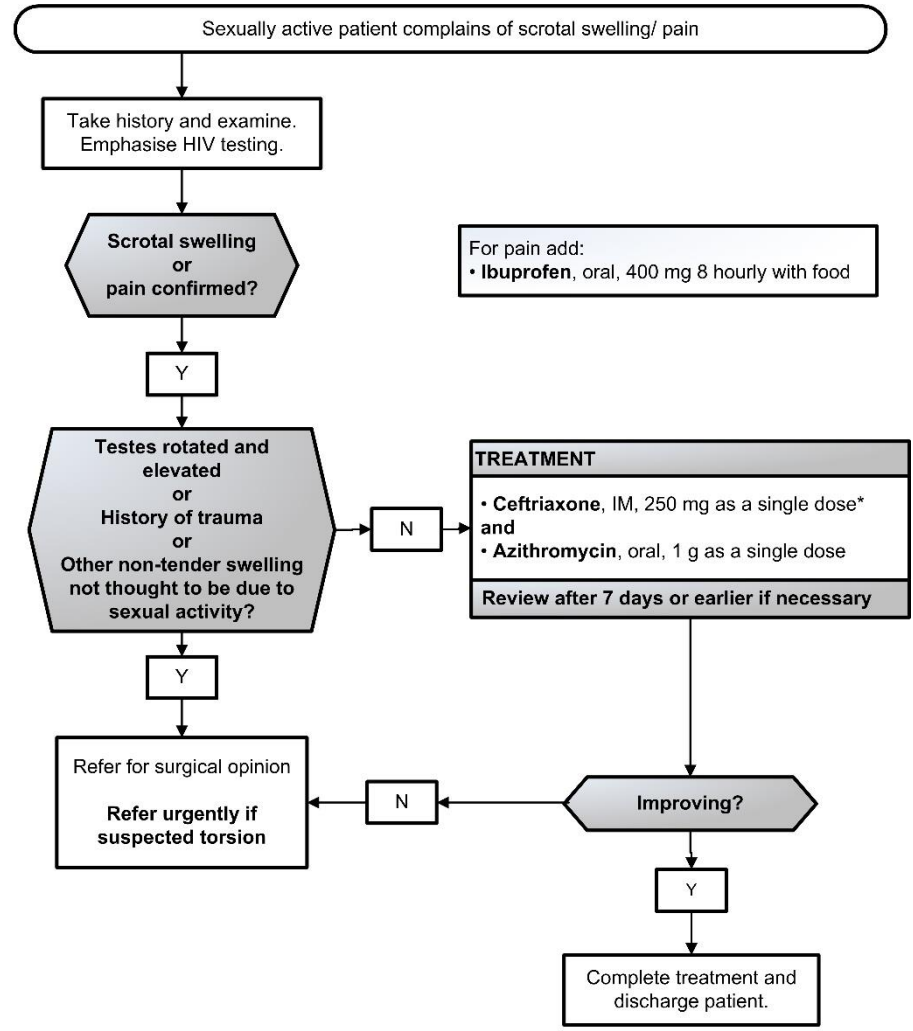
- **Azithromycin,** oral, 2 g as a single dose.

For **ceftriaxone IM injection:**

- Dissolve ceftriaxone **250 mg** in 0.9 mL lidocaine 1% without epinephrine (adrenaline).

12.4 SCROTAL SWELLING (SSW)

N45.1



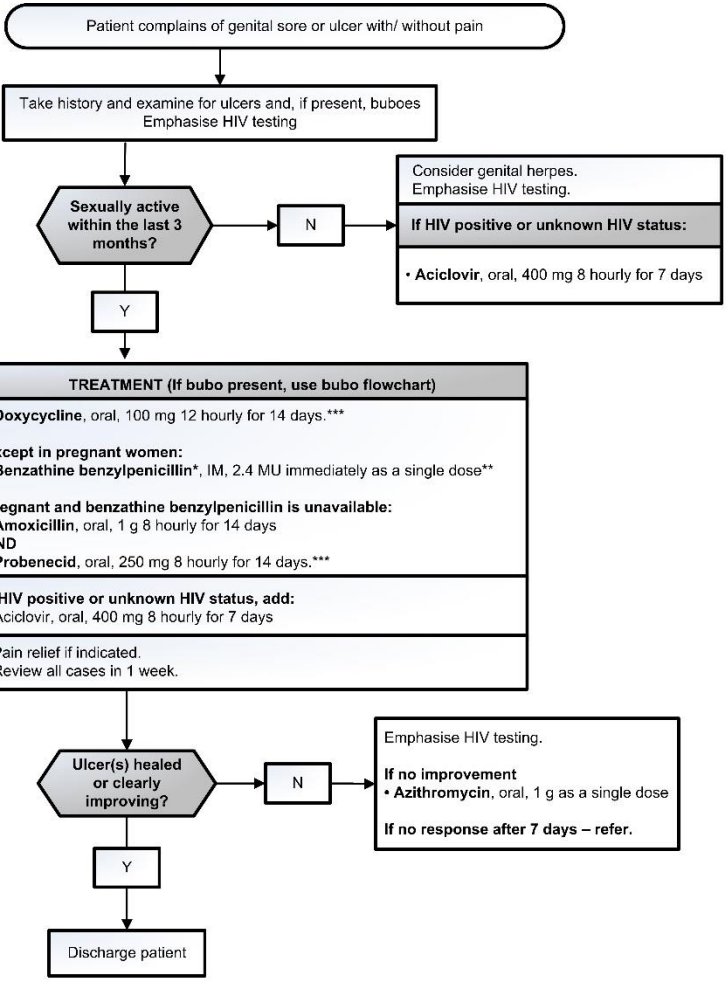
***If severe penicillin allergy, i.e. angioedema, anaphylactic shock or bronchospasm, omit ceftriaxone and increase azithromycin dose to:**
• **Azithromycin,** oral, 2 g as a single dose.

For **ceftriaxone IM injection:** dissolve **250 mg** in 0.9 mL lidocaine 1% without epinephrine (adrenaline).

12.5 GENITAL ULCER SYNDROME (GUS)

A60.9/A51.0

LoE:III[4]



***Penicillin allergic pregnant women: refer for confirmation of new syphilis infection and possible penicillin desensitisation.**

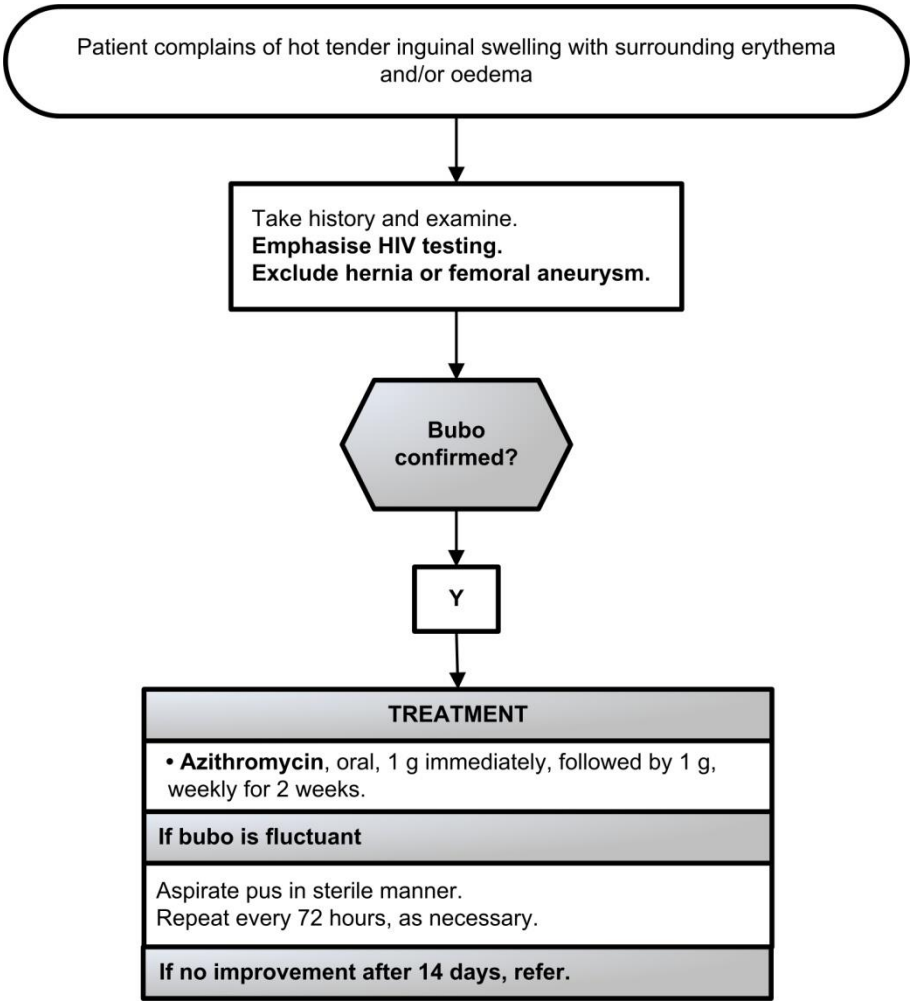
****For benzathine benzylpenicillin**, IM, 2.4 MU: Dissolve benzathine benzylpenicillin **2.4 MU** in 6 mL lidocaine 1% without epinephrine (adrenaline).

Note: Pregnant women presenting with genital ulcer(s) in the third trimester should be referred (risk of neonatal herpes).

LoE:II[5]

12.6 BUBO

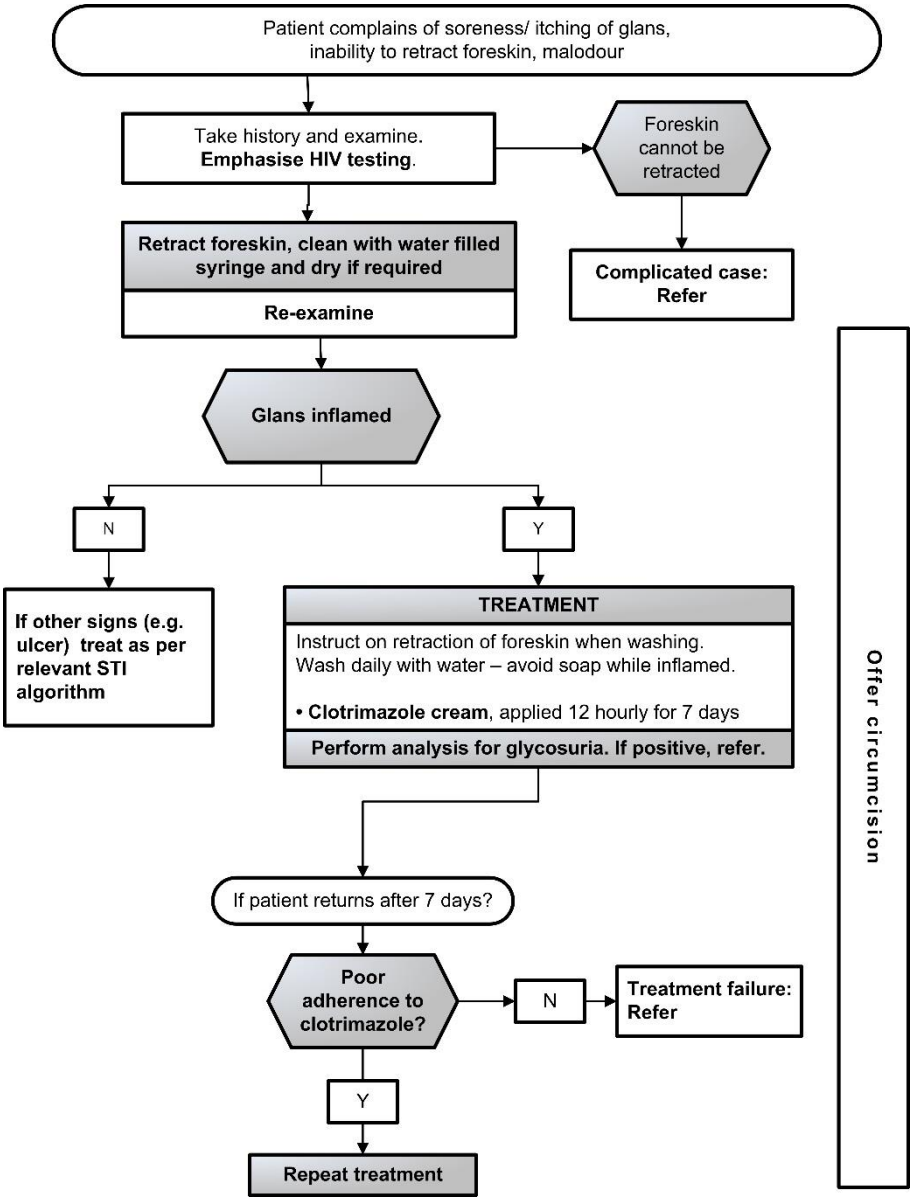
A58



LoE:III[6]

12.7 BALANITIS/BALANOPOSTHITIS (BAL)

N48.1



12.8 SYPHILIS SEROLOGY AND TREATMENT

A53.9

Syphilis serology

The Rapid Plasmin Reagin (RPR) measures disease activity, but is not specific for syphilis. False RPR-positive reactions may occur, notably in patients with connective tissue disorders (false positive reactions are usually low titre <1:8). For this reason, positive RPR results should be confirmed due to syphilis by further testing of the serum with a specific treponemal test, e.g.:

» *Treponema pallidum* haemagglutination (TPHA) assay.
» *Treponema pallidum* particle agglutination (TPPA) assay.
» Fluorescent Treponemal Antibody (FTA) assay.
» *Treponema pallidum* ELISA.
» Rapid treponemal antibody test (TPAb)

Screening can also be done the other way around starting with a specific treponemal test followed by a RPR in patients who have a positive specific treponemal test. This is sometimes referred to as the "reverse algorithm".

- Once positive, specific treponemal tests generally remain positive for life and therefore the presence of specific treponemal antibodies cannot differentiate between current and past infections
- A person with previously successfully treated syphilis will retain lifelong positive specific treponemal test results.

The RPR can be used:

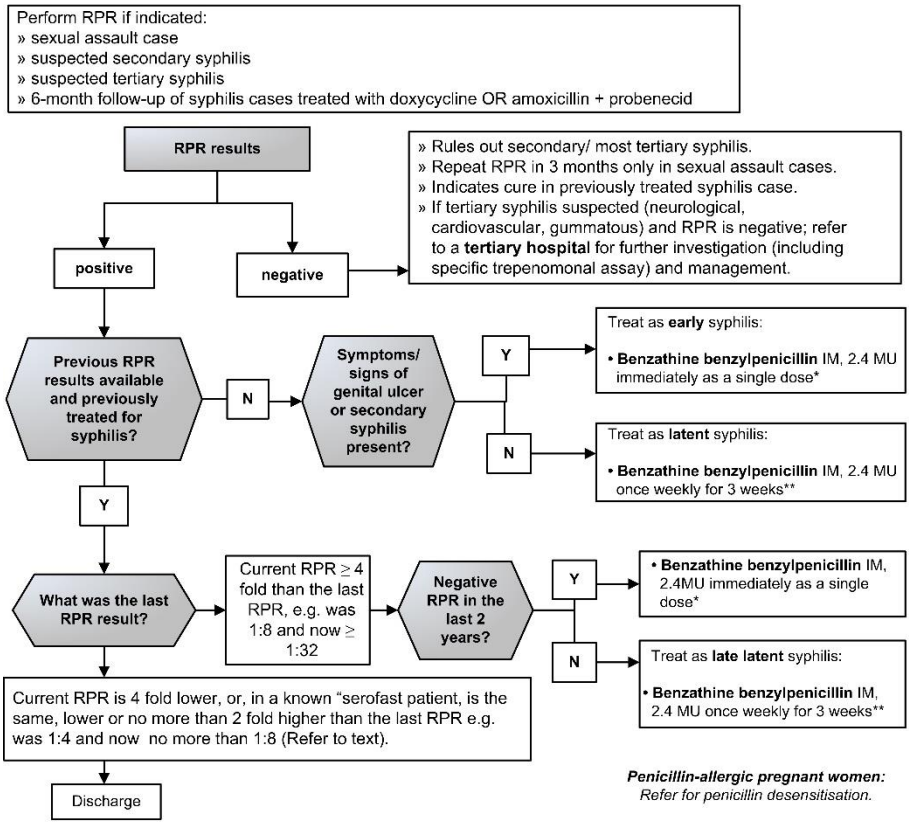
» To determine if the patient's syphilis disease is active or not,
» To measure a successful response to therapy (at least a fourfold reduction in titre, e.g. 1:256 improving to 1:64), or
» To determine a new re-infection.

Some patients, even with successful treatment for syphilis, may retain life-long positive RPR results at low titres (≤1:8), which do not change by more than one dilution difference (up or down) over time (so-called serofast patients).

Note:

» Up to 30% of early primary syphilis cases, i.e. those with genital ulcers may have a negative RPR.
» The RPR is always positive in the secondary syphilis stage and remains high during the first two (infectious) years of syphilis. *LoE:II*[7]

For syphilis treatment in pregnancy, see Section 6.4.4: Syphilis in pregnancy.



***Early syphilis treatment:**

Severe penicillin allergy or benzathine benzylpenicillin is unavailable:

- **Doxycycline,** oral, 100 mg 12 hourly for 14 days.

Pregnant or benzathine benzylpenicillin is unavailable:

- **Amoxicillin**, oral, 1 g 8 hourly for 14 days

AND

- **Probenecid**, oral 250 mg 8 hourly for 14 days.

****Latent/ late latent syphilis treatment:**

Severe penicillin allergy or benzathine benzylpenicillin is unavailable:

- **Doxycycline**, oral, 100 mg 12 hourly for 30 days.

Pregnant or benzathine benzylpenicillin is unavailable:

- **Amoxicillin**, oral, 1 g 8 hourly for 28 days

AND

- **Probenecid,** oral 250 mg 8 hourly for 28 days.

For **benzathine benzylpenicillin**, IM, 2.4 MU: Dissolve **2.4 MU** in 6 mL lidocaine 1% without epinephrine (adrenaline).

MEDICINE TREATMENT

Early syphilis treatment
Check if treated at initial visit.

- Benzathine benzylpenicillin, IM, 2.4 MU immediately as a single dose A .
  - Dissolve benzathine benzylpenicillin, IM, 2.4 MU in 6 mL lidocaine 1% without adrenaline (epinephrine).

In penicillin-allergic patients or if benzathine benzylpenicillin is unavailable:
Z88.0

- Doxycycline, oral, 100 mg 12 hourly for 14 days A . *LoE:III*[8]

If pregnant and benzathine benzylpenicillin is unavailable:

- Amoxicillin, oral 1 g 8 hourly for 14 days (Doctor initiated) A .

AND

- Probenecid, oral 250 mg, 8 hourly for 14 days (Doctor initiated). *LoE:III*[9]

If penicillin-allergic and pregnant: Refer for penicillin desensitisation.

Late/ late latent syphilis treatment
Check if treatment was commenced at initial visit.

- Benzathine benzylpenicillin, IM, 2.4 MU once weekly for 3 weeks A .
  - Dissolve benzathine benzylpenicillin, IM, 2.4 MU in 6 mL lidocaine 1% without adrenaline (epinephrine).

In penicillin-allergic patients or if benzathine benzylpenicillin is unavailable:
Z88.0

- Doxycycline, oral, 100 mg 12 hourly for 30 days A . *LoE:III*[10]

If pregnant and benzathine benzylpenicillin is unavailable:

- Amoxicillin, oral 1 g 8 hourly for 28 days (Doctor initiated) A .

AND

- Probenecid, oral 250 mg, 8 hourly for 28 days (Doctor initiated). *LoE:III*[11]

If penicillin-allergic and pregnant: Refer for penicillin desensitisation.

REFERRAL

» Tertiary syphilis: neurosyphilis, cardiovascular syphilis; gummatous syphilis.
» Clinical congenital syphilis.

12.9 TREATMENT OF MORE THAN ONE STI SYNDROME

STI SYNDROMES	TREATMENT (NEW EPISODE)
MUS + SSW	Treat according to SSW flow chart.
MUS + BAL	Treat according to MUS flow chart. **AND** • Clotrimazole cream, 12 hourly for 7 days.
MUS + GUS	• Ceftriaxone, IM, 250 mg immediately as a single dose W . **AND** • Azithromycin, oral, 1 g as a single dose W . **AND**

	• Aciclovir, oral, 400 mg 8 hourly for 7 days*.
VDS + LAP	Treat according to LAP flow chart. **AND** Treat for candidiasis, if required (see VDS flow chart).
VDS + GUS	• Ceftriaxone, IM, 250 mg immediately as a single dose (W). **AND** • Metronidazole, oral, 2 g immediately as a single dose (A). **AND** • Azithromycin, oral, 1 g as a single dose (W). **AND** • Aciclovir, oral, 400 mg 8 hourly for 7 days*. **AND** Treat for candidiasis, if required (see VDS flow chart).
LAP+ GUS	• Ceftriaxone, IM, 250 mg immediately as a single dose (W). **AND** • Metronidazole, oral, 400 mg 12 hourly for 7days (A). **AND** • Aciclovir, oral, 400 mg 8 hourly for 7 days*. **AND** • Azithromycin, oral, 1 g as a single dose (W).
SSW+ GUS	• Ceftriaxone, IM, 250 mg immediately as a single dose (W). **AND** • Aciclovir, oral, 400 mg 8 hourly for 7 days*. **AND** • Azithromycin, oral, 1 g as a single dose (W).
***Treat with aciclovir only if HIV status is positive or unknown.** ****Penicillin allergic men and non-pregnant women avoid ceftriaxone and refer to relevant algorithms.** **Penicillin allergic pregnant/breastfeeding women, refer for penicillin desensitisation.**	

12.10 TREATMENT OF PARTNERS

Syndrome	Asymptomatic partner	Symptomatic partner
VDS	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Metronidazole, oral, 2 g immediately as a single dose. **AND** • Azithromycin, oral, 1 g as a single dose.	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Metronidazole, oral, 2 g immediately as a single dose. **AND** • Azithromycin, oral, 1 g as a single dose. PLUS treatment for syndrome present if not included in the above.
LAP	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND**	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND**

	• Metronidazole, oral, 2 g immediately as a single dose. **AND** • Azithromycin, oral, 1 g as a single dose.	• Metronidazole, oral, 2 g immediately as a single dose. **AND** • Azithromycin, oral, 1 g as a single dose. PLUS treatment for syndrome present if not included in the above.
MUS	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Azithromycin, oral, 1 g as a single dose.	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Azithromycin, oral, 1 g as a single dose. PLUS treatment for syndrome present if not included in the above (see VDS flow chart).
Scrotal swelling	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Azithromycin, oral, 1 g as a single dose.	• Ceftriaxone, IM, 250 mg immediately as a single dose. **AND** • Azithromycin, oral, 1 g as a single dose. PLUS treatment for syndrome present if not included in the above.
GUS	• Doxycycline, oral, 100 mg 12 hourly for 14 days. <u>Except pregnant women:</u> • Benzathine benzylpenicillin, IM, 2.4 MU immediately as a single dose. o Dissolve benzathine benzylpenicillin, IM, 2.4 MU in 6 mL lidocaine 1% without epinephrine (adrenaline). (If pregnant and benzathine benzylpenicillin is unavailable, see syphilis flow chart).	• Doxycycline, oral, 100 mg 12 hourly for 14 days. <u>Except pregnant women:</u> • Benzathine benzylpenicillin, IM, 2.4 MU immediately as a single dose. o Dissolve benzathine benzylpenicillin, IM, 2.4 MU in 6 mL lidocaine 1% without epinephrine (adrenaline). PLUS treatment for syndrome present if not included in the above. (If pregnant and benzathine benzylpenicillin is unavailable, see syphilis flow chart).
Bubo	• Azithromycin, oral, 1 g as a single dose.	• Azithromycin, oral, 1 g as a single dose. PLUS treatment for syndrome present if not included in the above.

LoE:III[12]

12.11 GENITAL MOLLUSCUM CONTAGIOSUM (MC)

B08.1

DESCRIPTION

This is a viral infection which can be transmitted sexually and non-sexually. It is usually self-limiting but can be progressive in an advanced stage of immunodeficiency.
Clinical signs include papules at the genitals or other parts of the body.
The papules usually have a central dent (umbilicated papules).

MEDICINE TREATMENT

- Tincture of iodine BP, topical.
  - Apply with an applicator to the core of the lesions.

12.12 GENITAL WARTS (GW): CONDYLOMATA ACCUMINATA

A63.0

DESCRIPTION

The clinical signs include:

» Warts on the ano-genital areas, vagina, cervix, meatus or urethra.
» Warts can be soft or hard.

In most cases, warts resolve without treatment after 2 years in non-immunosuppressed patients.

GENERAL MEASURES

» If warts do not look typical or are fleshy or wet, perform a RPR test to exclude secondary syphilis, which may present with similar lesions.
» Emphasise HIV testing.

REFERRAL

» All patients with:
  - warts > 10 mm
  - inaccessible warts, e.g. intra-vaginal or cervical warts
  - numerous warts
  -

12.13 PUBIC LICE (PL)

B85.3

DESCRIPTION

Infestation of lice mostly confined to pubic and peri-anal areas, and occasionally involves eyelashes.

The bites cause intense itching, which often results in scratching with bacterial super-infection.

GENERAL MEASURES

Thoroughly wash clothing and bed linen that may have been contaminated by the patient in the 2 days prior to the start of treatment in hot water and then iron.

MEDICINE TREATMENT

- Benzyl benzoate 25%
  - Apply to affected area.
  - Leave on for 24 hours, then wash thoroughly.
  - Repeat in 7 days.

Pediculosis of the eyelashes or eyebrows

- Yellow petroleum jelly (Note: Do not use white petroleum jelly near the eyes).
  - Apply to the eyelid margins (cover the eyelashes) daily for 10 days to smother lice and nits.
  - Do not apply to eyes.

LoE:III

REFERRAL

All children with lice on pubic, perianal area and eyelashes to exclude sexual abuse.

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PHC Chapter 13: Immunisation

The contents of this chapter are based on the current on the current National Vaccinators Manual and recommendations from the National Advisory Group on Immunisation (NAGI).

13.1 IMMUNISATION SCHEDULE

Any medical incident that takes place after immunisation and may be potentially related to immunisation should be reported (see Section 13.6: Adverse Events Following Immunisation (AEFI)).

- » Every clinic day is an immunisation day.
- » Never miss a chance to immunise – never turn a person away if an immunisation is needed, even if it means opening a multi-dose vial for just one person.
- » Check the Road to Health Booklet every time the child visits the clinic and give missed immunisations. These should be given according to the catch-up schedule which is shown in the table on page 13.4.
- » Mild illnesses are not a contra-indication to immunisation – most children who are well enough to be sent home, are well enough to be immunised. Do not immunise a sick child if the mother seriously objects but encourage her to bring the child for immunisation on recovery.
- » Give an extra dose if in doubt whether a child has had a certain dose or not, as extra doses are not harmful.
- » The measles/rubella vaccine must not be given with other childhood vaccines when administered at 6 months of age. The measles/rubella vaccine can be co-administered with other vaccines from 9 months of age. All other vaccines listed in the table below can be given safely at the same time but should not be given in the same syringe or at the same site.
- » Serious adverse events following immunisation are uncommon. All adverse events should be reported.
- » For management of anaphylaxis associated with vaccinations, see Section 21.2.10: Anaphylaxis.

Adverse events following immunisation (AEFI) definition

Any untoward medical occurrence which follows immunisation, irrespective of whether there is a causal relationship with the vaccine. The adverse event may be any unfavourable or unintended sign, abnormal laboratory finding, symptom or disease.

All AEFI should be reported. Serious and severe AEFI or cluster of events are investigated, and causality assessed by the National Immunisation Safety Expert Committee (NISEC) which is an independent committee appointed by the Minister of Health. Further information is available in the *vaccine safety surveillance in South Africa-Manual for Surveillance and Response to Adverse Events Following Immunisation*.

Conditions that are not contraindications to any of the standard EPI vaccines

There are very few contra-indications, but many missed opportunities.

» Family history of any adverse reactions following vaccination.
» Family history of convulsions.
» Previous convulsions.
» Egg allergy.
» Previous measles, mumps, rubella, or pertussis-like illness.
» Preterm birth.
» History of jaundice after birth.
» Stable neurological conditions such as cerebral palsy or trisomy 21.
» Contact with an infectious disease.
» Minor illness (without systemic illness and with a temperature below 38.5°C).
» Treatment with antibiotics.
» Asthma, eczema, hay fever or 'snuffles'.
» Treatment with locally acting (inhaled or low-dose topical) steroids.
» Child's mother is pregnant.
» Child being breastfed.
» Underweight, but otherwise healthy child.
» Over the age recommended in vaccination schedule but not above the allowable upper age limit per manufacturer's recommendations.
» Recent or imminent surgery.

13.2 CHILDHOOD IMMUNISATION SCHEDULE

Immunisation schedule

Age of child	Vaccine
At birth	OPV0 BCG
6 weeks	OPV1 RV1 Hexavalent (DTaP-IPV-HB-Hib)1 PCV1
10 weeks	Hexavalent (DTaP-IPV-HB-Hib)2
14 weeks	RV2 Hexavalent (DTaP-IPV-HB-Hib)3 PCV2
6 months	Measles/Rubella1
9 months	PCV3
12 months	Measles/Rubella2
18 months	Hexavalent (DTaP-IPV-HB-Hib)4
6 years	Tdap
12 years	Tdap

Note:
» Exception: patients with primary immune deficiency or known HIV-infection should not be given BCG vaccine.
» Children with HIV should receive the rest of the full schedule of vaccines.

Catch-up doses

Any child who is unimmunised should be given a full schedule of immunisations.

Vaccine	Age of child	First dose	Interval for subsequent doses		
			Second	Third	Fourth
BCG	< 10 years	Give one dose			
	≥ 10 years	Do not give			
OPV	< 6 months	Give first dose	4 weeks		
	≥ 6 months	Do not give			
Hexavalent (DTaP-IPV-HB-Hib)	Up to 5 years	Give first dose	4 weeks	4 weeks	12 months (do not give before child is 18 months old)
Rotavirus	< 20 weeks	Give first dose	4 weeks		
	20–24 weeks	Give one dose			
	> 24 weeks	Do not give			
PCV	< 6 months	Give first dose	4 weeks	Give at 9 months of age	
	6–24 months	Give first dose	4 weeks	8 weeks	
	2-6 years	Give one dose			
Measles/rubella	< 11 months	Give first dose	At 12 months of age		
	≥ 11 months	Give first dose	4 weeks		
Tdap	> 6 years	Give first dose	At 12 years of age		

13.3 VACCINES FOR ROUTINE ADMINISTRATION

Vaccine	Form	Dose	Route	Recommended site	Age
BCG	Powder	0.05 mL	Intra-dermal	Right upper arm, at the deltoid muscle	Birth
OPV	Liquid	2 drops	Oral	Oral	Birth, 6 weeks
RV	Liquid	Administer the full vial (1 or 2 mL depending on the product used)	Oral	Oral	6, 14 weeks
Hexavalent (DTaP-IPV-HB-Hib	Liquid and Powder	0.5 mL	IM	< 1 year: lateral aspect of the left thigh ≥ 1 year: left upper arm	6,10,14 weeks, 18 months
Measles/Rubella	Powder	0.5 mL	SC	< 1 year: lateral aspect of the left thigh ≥ 1 year: right upper arm	6, 12 months
PCV	Liquid	0.5 mL	IM	Lateral aspect of the right thigh	6, 14 weeks, 9 months
Tdap	Liquid	0.5 mL	IM	Upper arm	5-7 years, ≥12 years

BCG *(Bacillus Calmette Guérin)*

Z23.2

Protects against TB meningitis and miliary TB in children < 2 years of age.

- BCG, 0.05 mL of reconstituted intradermal BCG vaccine.
  - Administered into the skin (intradermally) on the right upper arm, overlying insertion of the deltoid.
  - Storage:
    - Fridge: In a vaccine fridge at 2–8°C.
    - Discard opened vial after 6 hours or at end of immunisation session, whichever occurs first. (It is acceptable to open a BCG vial for just one infant)
  - Adverse events:
    - Initial reaction to intradermal vaccination is a papule formation that lasts a maximum of 4–6 weeks. This develops into a scar (visible in 40% of vaccinated infants).
    - In 1–10% there is oozing, ulceration and lymphadenopathy after vaccination. This is a usual reaction and not a cause for alarm. Lymphadenopathy < 1.5 cm is not clinically significant.
    - Occasionally the papule becomes a pustule.

- Complete AEFI notification[1] and refer all cases with significant lymphadenopathy or a draining sinus.

- Recommendations for providing BCG Vaccine:

» **Initial dose of BCG vaccine**

- All newborns regardless of HIV status or TB exposure status should receive BCG at discharge.
- For infants that are transferred to a neonatal unit, the timing of BCG vaccination will depend on the infant's clinical status. Neonatal units should have a policy to ensure vaccination occurs prior to hospital discharge.

» **Repeat dose of BCG vaccine**

- If the infant initiates TPT or TB treatment in the first six weeks of life, the effectiveness of the live, attenuated BCG vaccine may be negatively impacted. Therefore, the BCG vaccine should be repeated on completion of either TPT or TB treatment.
- Infants or children living with HIV should only receive a repeat dose if they are: 1) on ART, 2) clinically well, and 3) have a CD4 > 25%.
- If the criteria to receive BCG are not met, i.e., the infant is: 1) Not on ART, 2) or Unwell, or 3) CD4 < 25%.
    - Delay repeat dose of BCG until on ART and immunologically stable (CD4 > 25%).
    - Start/continue TPT until the child is eligible to receive BCG.
- After TPT/TB treatment is completed, a CD4 count should be done to determine if the infant meets the above criteria for receiving BCG even if the annual CD4 count is not yet due. Do not wait for the routine annual CD4 count, as this delay may result in many infants not receiving BCG at all.
- If the infant received the standard first-line TB treatment regimen BCG vaccination may be administered from 24 hours after the last anti-TB treatment dose. If the infant received rifapentine give BCG from 5 days after the last dose, and if the infant received bedaquiline or clofazamine give BCG vaccination two months after the last dose.

» **Catch-up dose of BCG vaccine**

- A 'catch-up' BCG should be administered to any child <10 years of age who did not get a BCG at birth.
- Infants or children living with HIV should only receive "catch up" BCG vaccination if they are: 1) on ART, 2) clinically well, and 3) have a CD4 > 25% (if ≤5 years of age) or >200 cells (if >5 years of age).
- Children older than > 10 years of age should not get BCG vaccination.

CAUTION

Children with suspected or confirmed inborn errors of immunity or other acquired immunodeficiencies should be evaluated by an expert before BCG vaccination.

[1] https://www.nicd.ac.za/wp-content/uploads/2021/03/Case-Report-Form_AEFI_All-vaccines-incl-COVID-19_20210128.pdf

Hexavalent (DTaP-IPV-HB-Hib) vaccine

Z27.8

(Diphtheria, tetanus, acellular pertussis, inactivated polio, hepatitis B and *Haemophilus influenzae* type b vaccine.)

Protects against diphtheria, tetanus, pertussis, poliomyelitis, hepatitis B infection, and invasive infections caused by *Haemophilus influenzae* type b.

- Hexavalent (DTaP-IPV-HB-Hib), IM, 0.5 mL.
  - < 1 year of age: administer into outer side of left thigh.
  - > 1 year of age: administer into upper left arm.

Hexavalent (DTaP-IPV-HB-Hib) vaccine is a fully liquid combination of diphtheria toxoid, Tetanus toxoid, acellular pertussis vaccine, inactivated polio vaccine, hepatitis B vaccine and Haemophilus influenzae type b vaccine.

- Storage:
  - Fridge: In a vaccine fridge at 2–8°C.
  - Hexavalent (DTaP-IPV-HB-Hib) vaccine should never be frozen.
- Adverse events:
  - Irritability.
  - Fever ≥ 38°C and acute illness.
  - Redness and induration at the site of the injection.
- Contra Indications:
  - Known hypersensitivity to any component of the vaccine or pertussis vaccine (acellular or whole cell pertussis) or a life-threatening reaction after previous administration of the vaccine or a vaccine containing the same substance.

Tdap (Tetanus, reduced diphtheria and acellular pertussis vaccine)

Z27.8

Protects against diphtheria, tetanus and pertussis.

- Tdap, IM, 0.5 mL in upper arm.
  - Storage:
    - Fridge: In a vaccine fridge at 2–8°C.
    - Easily damaged by freezing.
  - Adverse events:
    - Mild fever.
    - Pain.
    - Local swelling occasionally.
  - Contraindications:
    - Previous anaphylaxis to the vaccine.
    - Children < 4 years of age should not get Tdap.

Tdap in pregnancy

Tdap protects pregnant women and newborn infants against tetanus, diphtheria and pertussis.

- Pregnant women should routinely receive a single dose of Tdap during each pregnancy between 26–34 weeks' gestation to maximise protection of preterm infants.

- If not administered between 26–34 weeks, a catch-up dose should be given at any time, including in the immediate post-partum period.

bOPV (Oral polio vaccine)
Z24.0

Protects against polio.

- bOPV, oral, 2 drops given by mouth.
  - If spat out or vomited, repeat immediately.
  - Not affected by feeding (breast or other).
  - Storage:
    - Fridge: In a vaccine fridge at 2–8°C; or freezer (in pharmacy).
    - Not damaged by freezing.

Easily damaged by temperature > 8°C.

    - Keep open, uncontaminated vials at the correct temperature.
    - Record date of opening on the vial.
    - Discard after 30 days.
  - Adverse events:
    - May be associated with a flu-like illness and gastroenteritis.
    - Mild fever.
  - Contraindications:
    - Previous anaphylaxis to the vaccine.
    - bOPV is not contraindicated in HIV-infected children but should not be administered to children with primary immune deficiency.

RV (Rotavirus vaccine)
Z25.8

Protects against gastro-enteritis caused by rotavirus.

- RV, oral, administer the full vial (1 or 2 mL depending on the product used).
  - Squeeze the entire contents of the tube in the inner cheek.
  - Storage:
    - Fridge: In a vaccine fridge at 2–8°C.
    - Easily damaged by freezing.
    - Protect the vaccine from light.
  - Adverse events:
    - Mild fever.
    - Irritability.
  - Contra-indications:
    - Previous anaphylaxis to rotavirus or any ingredients in the formulation.
    - Do not give rotavirus vaccine if a child has a history of chronic gastro-intestinal disease or severe diarrhoea including children with any history of uncorrected congenital malformation of the gastrointestinal tract. Refer the child for medical opinion.
    - A history of intussusception (severe abdominal pain, persistent vomiting, bloody stools, abdominal bloating and/or high fever).
    - Rotavirus vaccine should not be given after 24 weeks of age. (See table on Section 13.2: Childhood immunisation schedule, for catch-up schedule.)

PCV (Pneumococcal conjugated vaccine)

Z23.8

Protects against invasive pneumococcal disease (meningitis, septicaemia), pneumonia and otitis media.

- PCV, IM, 0.5 mL
  - < 1 year of age: administer into outer side of right thigh.
  - > 1 year of age: administer into upper arm in the deltoid muscle.
  - PCV and Hexavalent (DTaP-IPV-HB-Hib) can be administered at the same time, but at different sites.
  - Storage:
    - Fridge: middle shelf at 2–8°C.
    - Do not freeze as the vaccine is easily damaged by freezing.
    - Do not mix PCV in the same syringe with other vaccines.
    - Shake the vaccine well before use.
  - Contra- indications:
    - Previous anaphylaxis to the vaccine.

Measles/Rubella

Z24.4

- Measles/Rubella vaccine, SC, 0.5 mL.
  - < 1 year of age: administer subcutaneously on lateral aspect of the left thigh.
  - ≥ 1 year of age: administer subcutaneously on right upper arm.
  - Avoid administering the measles/rubella vaccine at the same time as other vaccines at 6 months of age. However, it is considered safe to co-administer the measles/rubella vaccine with other vaccines in children 9 months and older. If a child requires measles/rubella vaccine and other vaccines at 6 months, give measles/rubella vaccine immediately and schedule visit to receive remaining vaccines 1 month later.
  - Storage:
    - Fridge: In a vaccine fridge at 2–8°C.
    - Discard opened vial after 6 hours or at end of immunisation session (whichever occurs first).
  - Adverse events:
    - Burning or stinging at the injection site, fever.
    - Transient morbilliform rash and mild pyrexia up to 30 days after vaccination.
  - Contra-indications:
    - Previous anaphylaxis to the vaccine.
    - Uncontrolled convulsions: consult a doctor.

13.4 THE COLD CHAIN

Maintaining the cold chain means keeping vaccines at the right temperature throughout distribution, storage, and use. The cold chain can be maintained by:

» Never exposing vaccines to heat or freezing conditions, especially during transportation from one point to another.
» Always using a cold box to keep the vaccines cold during transport and immunisation.
» All vaccines should be kept in a refrigerator at a temperature of 2–8°C.

» Open vials of OPV should not be kept in the freezer or be allowed to freeze again. However, closed vials of OPV may be thawed and frozen, multiple times and should ideally be stored at -20°C.
» Use continuous temperature monitoring device e.g. fridge-tag for all vaccines (Min-max thermometer/dial thermometer not recommended).
» Ensure that Hexavalent (DTaP-IPV-HB-Hib), HPV, PCV, RV, Tdap, and TT vaccines do not come into contact with the refrigerator's evaporator at the back/sides, as they are sensitive to freezing. Do not freeze these vaccines, and do not use any vaccines that have been frozen. If there is a suspicion of freezing, conduct the shake test to determine if the vaccines have frozen and need to be discarded.
» Monitor and record fridge temperature twice daily.
» Leave space between each tray to allow cold air to circulate.
» Do not keep food in the same fridge as the vaccines.
» If possible do not keep other medications e.g. insulin etc. in the vaccine fridge.
» Do not keep blood and other specimens in the vaccine fridge.

Correct packing of the cold box

» Conditioned ice packs (the ice should rattle inside the pack) are placed on the bottom, at the sides and on top.
» If there are not enough ice packs, place available ice packs at the sides and on top of the vaccines.
» Tdap, TT, HPV, PCV, RV and Hexavalent vaccines must not be allowed to freeze.
» Keep measles/rubella and polio vaccines very cold - place on bottom of the cold box, closest to the ice packs.
» BCG can be placed anywhere in the box.
» Keep the lid firmly closed and the box out of the sun.
» Keep a continuous temperature monitoring device in the cold box with the vaccines and the temperature at 2–8°C.
» Live attenuated vaccines (BCG, OPV, measles/rubella) are very sensitive to heat, sunlight, and skin antiseptics.

How to pack your fridge correctly

» Vaccines should be stored in a purpose-built vaccine fridge. However, if unavailable store the vaccines in a domestic fridge, as follows:
  - Top shelf: measles and polio vaccines in the coldest part.
  - Middle shelf: BCG, Tdap, Hexavalent (DTaP-IPV-HB-Hib), HPV, RV, PCV and TT vaccines (do not freeze) with sufficient diluent for the BCG and measles/rubella for 2 days.
  - Do not let Tdap, Hexavalent (DTaP-IPV-HB-Hib) HPV, RV, PCV and TT vaccines touch the evaporator plate at the back/side of the fridge as they are destroyed by freezing.
  - Do not keep vaccines in the fridge door.
  - Store the same kind of vaccines together in one tray.
  - Leave about 2 cm space between each tray to allow the cold air to move around.
  - Saltwater-filled bottles placed at the bottom of the fridge can prolong the holdover time, enabling the fridge to return promptly to its set temperature after being opened.

- **Do not keep food in the same fridge as the vaccines to avoid unnecessary opening of the door.**

» There should be a contingency plan written and posted on every vaccine fridge of what to do in the event of a power failure.
» Monitor and record temperature twice daily.

CAUTION
Do not use vaccines that have expired, reached discard point as indicated by the vaccine vial monitor (VVM), or where the cold chain has been compromised.
Keep the fridge temperature between 2–8°C.

Note: All vaccines with a "T" in the name are sensitive to freezing: TT, Tdap, HexavalenT, RoTavirus, HepaTiTis B and even diluenTs. Diluents (for measles/rubella and BCG) should never be frozen.

13.5 OPEN MULTI-DOSE VIAL POLICY

Opened vials of TT HepB and OPV vaccines:

» May be used in subsequent immunisation sessions **for a maximum of one month**, if each of the following conditions have been met:
  - the expiry date has not passed,
  - each vial must be dated when opened,
  - the vaccines are stored under appropriate cold chain conditions (2–8°C with temperature monitoring and recording),
  - the vaccine vial septum has not been submerged in water,
  - aseptic technique has been used to withdraw all doses.

Opened vials of measles/rubella, BCG

Check the vaccine vial monitor (VVM) and expiration date prior to reconstitution.
Reconstituted vials of measles/rubella and BCG vaccines must be discarded at the end of each immunisation session or at the end of 6 hours, whichever occurs first.
Always label the vials with the date and time when opening or reconstituting.
All opened vials must be discarded immediately if:

» sterile procedures have not been fully observed,
» there is even a suspicion that the opened vial has been contaminated,
» there is visible evidence of contamination such as a change in appearance or floating particles, etc.

Discard the needle after using a multi-dose vial to avoid compromising the sterility of the vial.

INJECTION SAFETY

» Always wash hands before and after administering the vaccine.
» Always keep a fully equipped emergency tray at the immunisation point.
» Use a sterile syringe and sterile needle for each immunisation.
» Clean the skin adequately with cotton wool and water, do not use alcohol swabs.
» Check all vaccines for safety.

» Return all unsafe vaccines back to the pharmacy.
» Use the same needle for drawing up and administering the vaccine. “One Needle, One Syringe”.
» Diluents are not interchangeable. Different vaccines require different diluents.
» Always use the same diluent from the same manufacturer as the vaccine.
» Used needles and syringes must be disposed of safely.
» Discard all used empty vaccines in the sharps container.

13.6 ADVERSE EVENTS FOLLOWING IMMUNISATION (AEFI)

Report all AEFIs to the local EPI Coordinator.

AEFI form may be accessed at: at https://www.nicd.ac.za/diseases-a-z-index/adverse-event-following-immunization-aefi/ and https://www.sahpra.org.za/health-products-vigilance/ . AEFI forms should be emailed to AEFI@health.gov.za.

Alternatively, AEFI can be reported on the MedSafety application on a mobile device. To download the application on your mobile phone, go to https://medsafety.sahpra.org, and choose either the iOS or ANDROID version to download. Select **South Africa**. If you need any additional information on what to report and how to report, please contact SAHPRA on 012 501 0311.

13.7 OTHER VACCINES

TT (Tetanus toxoid)

Z23.5

Protects against tetanus (post trauma)

- TT, IM, 0.5 mL into arm.
  - Storage:
    - Fridge: middle shelf at 2–8°C.
    - Easily damaged by freezing.
    - Keep opened vials for next session if kept at correct temperature and not contaminated.
    - Discard after 30 days.
    - Record date of reconstitution.
  - Contraindications:
    - Previous anaphylaxis.

Trauma

- Give booster dose of TT/Tdap after every traumatic injury (unless administered in previous 5 years).

Human Papilloma Virus (HPV) Vaccine

Z25.8

Protects against infection with HPV serotypes 16 and 18.
Persistent HPV infection is associated with the development of several reproductive tract cancers, especially cancer of the cervix.

A single dose is offered as part of the **Integrated School Health programme** to Grade 5 girls (≥ 9 years of age) in public schools.

- HPV, IM, 0.5 mL.
  - Administered into the deltoid of the non-dominant arm.
  - Storage:
    - Fridge: middle shelf at 2–8°C.
    - Easily damaged by freezing – do not freeze and discard any vaccine which has been frozen.
    - Store in original package and protect from light.
    - Use immediately once withdrawn into a syringe.
  - Contraindications:
    - Previous anaphylaxis to the vaccine.
    - Febrile illness (≥ 38.5°C).
    - Should not be administered to girls/women who are known to be pregnant.
  - Adverse events:
    - Injection site pain and swelling in the arm are common.
    - Itching, rash, redness and urticaria may also occur.
    - Nausea, diarrhoea, abdominal pain, headache, myalgia, fever (38ºC) are not uncommon.
    - Syncope, dizziness, lymphadenopathy, and anaphylaxis have been reported.

Hepatitis B

Z24.6

All personnel working in a health care facility (including support staff) and student health care workers.

- Hepatitis B vaccine, IM, 3 adult doses of 1 mL.
  - **first dose** administered immediately;
  - **second dose** 1 month after the first dose;
  - **third dose** 6 months after the first dose.

Perinatal transmission

Babies born to mothers with acute hepatitis B infection at the time of delivery or to mothers who are HBsAg-positive or HBeAg-positive, see Section 6.6.5: Perinatal transmission of hepatitis B.

Influenza vaccine

Z25.1

- Influenza vaccine, IM, 0.5 mL.
  - Trivalent influenza vaccine or quadrivalent influenza vaccines may be used, depending on cost and availability considerations.
  - Contraindication: < 6 months of age. *LoE:IVb*[1]
  - Severe egg allergy is not a contraindication to the inactivated influenza vaccine. However, it is recommended that individuals reporting a history of severe egg allergy are vaccinated in a setting equipped to manage allergic reactions. *LOE:IVb*[2]

- Based on available data and resources, the following groups are prioritised for influenza vaccination in the annual influenza campaign and during influenza or COVID-19 pandemic:
  - » Healthcare workers.
  - » Age > 65 years.
  - » People with the following risk factors for severe influenza:
    - Chronic cardiac or pulmonary conditions (including chronic heart disease, hypertension, stroke, and diabetes), chronic lung disease (including asthma and chronic obstructive pulmonary disease) and malignancy. *LoE:IVb*[3]
    - HIV infection.
  - » Pregnant women at all stages of pregnancy, including women up to 6 weeks postpartum.
- Commercially available products may differ in terms of the age-groups in which they can be used – check the specific package insert.
- General recommended dosage of influenza vaccine for patients of different age groups:

Age group	Dose	Number of doses
• ***Trivalent influenza vaccine:***		
Adults and children ≥ 9 years	0.5 mL, IM	Single dose.
Children: > 3 to < 9 years	0.5 mL, IM	2 doses ≥ 4 weeks apart during first year of immunisation, thereafter one dose per annum.
Children: > 6 months to < 3 years	0.25 mL, IM	2 doses ≥ 4 weeks apart during first year of immunisation, thereafter one *LoE:IIIb*[4] dose per annum.
• ***Quadrivalent influenza vaccine:***		
Adults and children ≥ 9 years	0.5 mL, IM	Single dose
6 months to < 9 years	0.5 mL, IM	2 doses ≥ 4 weeks apart during first year of immunisation, thereafter one *LoE:IIIb*[5] dose per annum.

LoE:IVb[6]

Note:
- » The influenza vaccine should not be given at the same time as the live measles/rubella vaccine at 6 months of age.
- » Influenza vaccines can be given concurrently with other injectable vaccines but must be administered at different injection sites.

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PHC Chapter 14: Musculoskeletal conditions

14.1 ARTHRALGIA

M25.50-59

DESCRIPTION

Joint pain without swelling, warmth, redness or systemic manifestations such as fever.
It is usually self-limiting. May be an early manifestation of degenerative joint conditions (osteoarthrosis) or local and systemic diseases. May follow injury to the joint, e.g. work, play and position during sleep.
Suspect rheumatic fever in children, especially if arthralgia affects several joints in succession.

GENERAL MEASURES

» Advise patient to:
  - apply heat locally to the affected joint, taking precautions not to burn themselves
  - exercise once their pain is relieved
  - reduce weight, if overweight, to decrease stress on the joint
» Exclude systemic causes.
» Reassure patient.

MEDICINE TREATMENT

Treat for 1 week (maximum 2 weeks) provided no new signs develop.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.
- Methyl salicylate ointment, topical, may provide some relief.

REFERRAL

» Pain for 1 week in children, and pain for > 2 weeks in adults.
» Recurrent pain.
» Severe pain.
» Fever.
» Involvement of several joints in succession
» Evidence of systemic illness e.g. e.g. sore throat in children, presence of jaundice, anaemia.

14.2 ARTHRITIS, RHEUMATOID

M06.90-99

DESCRIPTION

A chronic inflammatory systemic condition. May affect many organs, but the musculoskeletal system is predominantly affected with several joints becoming painful and swollen. There is usually symmetrical involvement of small joints from early on. The small joints of the fingers and hands with the exception of the distal interphalangeal joints, are usually involved, although any joint can be involved.

» Four 'S factors' are useful to screen for early joint disease:
  - Stiffness: Early morning stiffness lasting > 30 minutes.
  - Swelling: Persistent swelling of 1 or more joints, particularly hand joints.
  - Squeeze test hands: Tenderness on squeezing across all 4 metarcarpo-phalangeal joints.
  - Squeeze test feet: Tenderness on squeezing across all 4 metartarso-phalangeal joints.

Late disease may have destruction and deformity of affected joints especially of the fingers e.g. ulnar deviation, buttonhole and swan neck deformities. *LoE:III*[1]

GENERAL MEASURES

» Advise patient to:
  - reduce weight
  - stop smoking
» Manage co-morbidities.
» Educate on joint-care (refer for occupational therapy, if available).

MEDICINE TREATMENT

All newly diagnosed patients must be referred for specialist management with Disease Modifying Anti-rheumatic Drugs (DMARDs).

For control of acute symptoms whilst awaiting referral (Doctor initiated):

- NSAIDs, e.g.:
- Ibuprofen, oral, 400 mg 8 hourly with or after a meal.
  - Continue for no longer than 3–6 months.

For control of acute symptoms during disease flares and in severe extra-articular manifestations e.g. scleritis (Doctor prescribed):

- NSAIDs, e.g.:
- Ibuprofen, oral, 400 mg 8 hourly with or after a meal for 2 weeks. *LoE:III*[2]

NSAIDsare used for symptomatic relief in patients with active inflammation and pain. They have no long-term disease modifying effects.
NSAIDs are relatively contra-indicated in patients with significantly impaired renal function, i.e. eGFR < 60 mL/minute.

CAUTION: NSAIDS

Concomitant use of more than one oral NSAID has no additional clinical benefit and only increases toxicity.

Chronic use of all NSAIDsis associated with increased risks of gastrointestinal bleeding, renal failure, and cardiovascular events (stroke and myocardial infarction).
NSAIDs should be used judiciously at the lowest effective dose for the shortest duration. Explore and manage exacerbating factors for pain. See chapter 20: Pain.
Do not use NSAID in pregnancy and breastfeeding.

LoE:III[3]

If NSAIDS are contraindicated for acute flares e.g. warfarin therapy, renal dysfunction (Doctor prescribed): *LoE:III*[4]

- Corticosteroids (intermediate-acting) e.g.:
- Prednisone, oral, 7.5 mg daily for a maximum of 2 weeks. *LoE:III*[5]

In high-risk patients: > 65 years of age; history of peptic ulcer disease; on concomitant warfarin, aspirin, or corticosteroids: *LoE:II*[6]

ADD

- Proton pump inhibitor, e.g.
- Lansoprazole, oral, 30 mg daily whilst on an NSAID.

For confirmed rheumatoid arthritis, NSAIDs and corticosteroids will be continued by a specialist as bridging therapy until DMARDs have taken effect.

REFERRAL

Urgent (to a specialist)

» Severe extra-articular articular manifestations.

Non-urgent

» Refer all patients early for confirmation of diagnosis and management.
» Known rheumatoid arthritis patients with acute disease flares.

14.3 ARTHRITIS, SEPTIC

M00.90-99

DESCRIPTION

An acute infective condition involving one or more joints.

The joint is hot, swollen, and very painful, and movement is restricted.

Signs of systemic infection, including fever, are usually present. The infection is usually blood borne, but may follow trauma to the joint. The course may be acute or protracted. A wide spectrum of organisms is involved, including staphylococci and *N. gonorrhoea*.

Note: Haemophiliacs may present with an acute arthritis similar to septic arthritis. This is due to bleeding into a joint and not due to infection.

MEDICINE TREATMENT

» Infants ≤ 2 months of age, who fulfil the IMCI criteria for "POSSIBLE SERIOUS BACTERIAL INFECTION" should receive a first dose of ceftriaxone and other IMCI urgent care while arranging transfer.

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose. See dosing table: Chapter 23.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If SUSPECTING SERIOUS BACTERIAL INFECTION in neonate, give ceftriaxone, even if jaundiced.

» Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:
- If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
- If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
- Preferably administer IV fluids without calcium contents.

» Always include the dose and route of administration of ceftriaxone in the referral letter.

Children with suspected septic arthritis should be assessed for evidence of septicaemia and septicaemic shock, which should be treated accordingly while awaiting transfer.

REFERRAL

Urgent

All patients for confirmation of diagnosis and surgical drainage.

14.4 GOUT

14.4.1 GOUT, ACUTE

M10.00-09/M10.90-99

DESCRIPTION

A metabolic disease in which uric acid crystals are deposited in joints and other tissues. Characterised by recurrent attacks of an acute arthritis that often affects one joint which is very painful, tender, swollen, red and hot to the touch. The inflammation may extend beyond the joint.

In many patients the 1st metatarso-phalangeal joint is initially involved. The instep, ankle, heel, and knee are also commonly involved. Bursae (such as the olecranon) may be involved.

Gout commonly occurs in men > 40 years of age and in postmenopausal women.

INVESTIGATIONS

Increased serum uric acid level.

However, the serum uric acid level may be normal during acute attacks, and therefore best estimated after the acute symptoms have subsided.

GENERAL MEASURES

» Immobilise the affected joint during the acute painful attack.

» Increase (high) fluid intake.

» Avoid alcohol.
» Avoid aspirin.

MEDICINE TREATMENT

Initiate treatment as early as possible in an acute attack.

- NSAIDs, e.g.:
- Ibuprofen, oral, 400 mg,8 hourly with or after a meal for the duration of the attack.

CAUTION: NSAIDS

Concomitant use of more than one oral NSAID has no additional clinical benefit and only increases toxicity.
Chronic use of all NSAIDs is associated with increased risks of gastrointestinal bleeding, renal failure, and cardiovascular events (stroke and myocardial infarction).
NSAIDs should be used judiciously at the lowest effective dose for the shortest duration. Explore and manage exacerbating factors for pain. See chapter 20: Pain.
Do not use NSAID in pregnancy and breastfeeding.

LoE:III[7]

If NSAIDS are contraindicated, e.g. peptic ulceration, warfarin therapy and renal dysfunction, or heart failure:

- Corticosteroids (intermediate-acting) e.g.: *LoE:III*[8]
- Prednisone, oral, 40 mg daily for 5 days (Doctor prescribed). *LoE:II*[9]

REFERRAL

» No response to treatment.
» For confirmation of diagnosis, if in doubt.
» Patients with chronic kidney disease.
» Patients with suspected secondary gout (e.g. haematological malignancies).

Note:

» Gout may be secondary to other medical conditions, e.g. haematological malignancies.
» Gout may co-exist with hypertension, diabetes mellitus (as a risk factor for degenerative vascular disease) and chronic kidney disease. The pharmacological treatment of these conditions could precipitate gout.

14.4.2 GOUT, CHRONIC

M10.00-09/M10.90-99

DESCRIPTION

Gout with one or more of the following:

» uric acid deposits in and around the joints and cartilages of the extremities (tophi)
» tophi are most commonly found as hard nodules around the fingers and toes, at
» the tips of the elbows (olecranon bursae) or at the pinnae of the ears
» serum uric acid >0.5 mmol/L
» bone and cartilage destruction of the fingers and toes with joint swelling and deformity
» prolongation of attacks, often with reduction in pain severity
» incomplete resolution between attacks

GENERAL MEASURES

» If possible, avoid known precipitants and medicines that may increase uric acid, e.g. low dose aspirin, ethambutol, pyrazinamide and diuretics, especially hydrochlorothiazide. *LoE:III*
» Encourage weight loss, if overweight.
» Avoid alcohol.

MEDICINE TREATMENT

Uric acid lowering therapy is required in all of the following:

» ≥ 2 acute attacks per year
» chronic tophaceous gout
» urate renal stones
» urate nephropathy

When the acute attack has settled completely, i.e. usually after 3 weeks:

- Allopurinol, oral, 100 mg daily (Doctor initiated).
  - Increase monthly by 100 mg according to serum urate levels.
  - Titrate dose to reduce serum urate to <0.35 mmol/L.
  - Allopurinol dosage is dependent on severity of disease and serum urate concentration. Doses in excess of 300 mg should be administered in divided doses. *LoE:III[10]*
  - Average dose: 300 mg per day.
  - The elderly and patients with renal impairment require lower doses, start with 50 mg daily, or refer.

REFERRAL

» Suspected secondary gout.
» No response to treatment.
» Non-resolving tophaceous gout.
» Renal impairment.

14.5 OSTEOARTHROSIS (OSTEOARTHRITIS)

M13.00-19/M13.80-99/M15.0/M15.3/M15.8-9/M16.0-9/M18.0-5/M18.9/M19.00-09/M19.80-99

DESCRIPTION

A degenerative disorder typically affecting weight-bearing joints.
Signs and symptoms include:

» pain usually with movement
» limited range of movement often with crepitus
» post-rest stiffness
» joint may be swollen

GENERAL MEASURES

Non-pharmacological/general measures are as important as pharmacological management.
Educate patient and family on:

» weight reduction
» exercise
» rest during acute painful episodes.

Recommend use of a walking stick or crutch to alleviate stress on weight bearing joint.
Physiotherapy and/or occupational therapy.

MEDICINE TREATMENT

Pain:

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.
- Methyl salicylate ointment, topical, may provide some relief.

If patient responds to paracetamol reduce the dose to:

- Paracetamol, oral, 500 mg, 6–8 hourly when required.

If no response and inflammation is present:

ADD

- NSAID, e.g.:
- Ibuprofen, oral, 400 mg 8 hourly with or after a meal, as needed for 7 days.

As many of these patients, particularly the elderly, have concomitant medical conditions such as cardiovascular, gastrointestinal disease or renal function impairment, NSAIDs must be used with caution.

Patients on aspirin for cardiovascular risk reduction should take aspirin 30 minutes before the 1st dose of ibuprofen in the morning, as taking aspirin and ibuprofen at the same time may reduce aspirin's efficacy. *LoE:III*[11]

In high-risk patients: > 65 years of age; history of peptic ulcer disease; or on concomitant warfarin, aspirin, or corticosteroids:

ADD

- Proton pump inhibitor, e.g.:
- Lansoprazole, oral, 30 mg daily. *LoE:II*[12]

CAUTION: NSAIDS

Concomitant use of more than one oral NSAID has no additional clinical benefit and only increases toxicity.

Chronic use of all NSAIDs is associated with increased risks of gastrointestinal bleeding, renal failure, and cardiovascular events (stroke and myocardial infarction).

NSAIDs should be used judiciously at the lowest effective dose for the shortest duration. Explore and manage exacerbating factors for pain. See chapter 20: Pain.

Do not use NSAID in pregnancy and breastfeeding.

LoE:III[13]

REFERRAL

» All cases with:
  - uncertain diagnosis
  - intractable pain
  - recurrent episodes of pain with inflammation
  - suspected infection

» Consideration of joint replacement.

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PHC Chapter 15: Central nervous system conditions

15.1 STROKE

I61.0-6/I61.8-9/I63.0-6/I63.8-9/I64

DESCRIPTION

Stroke consists of rapidly developing clinical signs of focal (at times global) disturbance of cerebral function, lasting >24 hours or leading to death. Most strokes are ischaemic (embolism or thrombosis) whilst others may be caused by cerebral haemorrhage. A transient ischaemic attack (TIA) is defined as stroke symptoms and signs that resolve within 24 hours.

The diagnosis of stroke depends on the presentation of sudden onset of neurological loss, including:

» Weakness, numbness or paralysis of the face or limb/s.
» Sudden onset of blurred or decreased vision in one or both eyes; or double vision.
» Difficulty speaking or understanding.
» Dizziness, loss of balance or any unexplained fall or unsteady gait.
» Headache (severe, abrupt).

GENERAL MEASURES

Acute management

» Assess airway, breathing, circulation and disability.
» Measure blood glucose and treat hypoglycaemia if present. See Section 21.2.6: Hypoglycaemia and hypoglycaemic coma.
» BP is often elevated in acute stroke. Do not treat elevated BP at PHC but refer patient urgently.
» Patients should be given nil by mouth until swallowing is formally assessed.

Long term management

» Optimise treatment for existing medical conditions such as hypertension, diabetes mellitus, dyslipidaemia and cardiac conditions.
» Increase regular physical activity: aim for 30 minutes 5 times a week.
» Advise patient regarding appropriate weight loss, if weight exceeds ideal weight.
» Advise patient regarding smoking cessation.
» Refer for rehabilitative therapy including physiotherapy, occupational therapy and / or speech therapy if indicated.
» Initiate a palliative care approach if the patient's condition is deteriorating / in case of a massive stroke (see Chapter 22: Medicines used in palliative care).

LoE:IIb[1]

MEDICINE TREATMENT

Acute treatment

- Aspirin, oral, 300 mg, as a pre-referral dose. *LoE:Ia*[2]

Note: Do not give aspirin if the patient:
» is unconscious;
» cannot swallow;
» is on long-term anticoagulation therapy;
» has signs of a subarachnoid bleed: i.e. neck stiffness, headache;
» or will be transferred and treated with a thrombolytic within 3 hours. *LoE:Ia*[3]

Secondary prevention for adults (i.e. continuation of aftercare treatment initiated at higher level of care).

Antiplatelet therapy

All patients, if not contraindicated (e.g. haemorrhagic stroke, peptic ulcer, patients on anticoagulation therapy, etc.):
- Aspirin, oral, 150 mg daily. *LoE:Ia*[4]

Lipid-lowering therapy

See Section 4.1: Prevention of ischaemic heart disease and atherosclerosis.

Hypertensive therapy

For blood pressure management, see Section 4.7: Hypertension.

Diabetes mellitus and dietary management information

See Chapter 9: Endocrine conditions.

REFERRAL

Urgent

» Refer all acute stroke cases for further management (preferably within 3 hours).

15.2 DEMENTIA

A52.3/B23.8 + (F02.8)/E03.2-3/E03.8-9/E52/F03

DESCRIPTION

Progressive loss of cognitive function, usually of insidious onset. Initial presentation may be with mild personality or memory changes, before more pronounced deficits become evident.

Common reversible causes of dementia include:
» Metabolic:
  - Hypothyroidism.
  - Vitamin B12 deficiency.
  - Pellagra.
» Medications and drugs:
  - Long-term alcohol abuse.

  - Many medications have CNS side effects.
» Infections:
  - Neurosyphilis.
  - HIV dementia.
» Surgical:
  - Normal pressure hydrocephalus.
» Severe depression (pseudo-dementia).

GENERAL MEASURES

All patients must be seen by a doctor to confirm the diagnosis.
People with dementia are vulnerable to delirium and worsening confusion.
Manage conditions that may worsen symptoms, including:
» Electrolyte disturbances and dehydration.
» Infections, usually originating from the respiratory or urinary tract.
» Medication toxicity.
» For confirmed diagnosis of mild to moderate dementia, the following supportive measure may be taken:
  - Refer patients to occupational therapy, if available, for assessment of functioning and advice to the family on adaptive measures.
  - Disclose the diagnosis to family members/ primary care giver. *LoE:IIb*[5]
  - Explain that the condition is evolving, and future planning is necessary.
  - Advise driving cessation for the patient, if relevant.
  - Discuss home safety risks – e.g. potential for patient to leave stove on while cooking or wander if unattended.
  - Ensure that the patient has a caregiver that can supervise medication taking when the patient is unable to do so themselves.
  - Monitor functional problems and manage as they arise e.g. urinary incontinence.
  - Monitor nutritional status and intervene or refer if necessary.
  - Provide ongoing medical care.
» Initiate a palliative care approach as the patient's condition deteriorates. (See Chapter 22: Medicines Used in Palliative Care.)

REFERRAL

» Adults < 60 years of age, adolescents, and children, where common reversible causes of dementia could not be identified.
» When behavioural and/or psychological symptoms pose a risk to patient or carer.

15.3 PARKISONISM

G20/G21.0-4/G21.8-9/G22

DESCRIPTION

Parkinsonism is a syndrome that affects the nervous system and the parts of the body controlled by the nerves. It may be characterised by tremor, rigidity, stiffness, slow movements and postural disturbances. It may be primary, i.e. Parkinson's disease, or secondary, i.e. drug-induced, or due to uncommon disorders that may initially resemble Parkinson's disease.

Patients and caregivers may report:

» A tremor, or rhythmic shaking, which usually begins in a limb, often the hand or fingers.
» Slowed movement (bradykinesia), for example steps may become shorter as they walk and it may be difficult to get out of a chair.
» Decreased ability to perform unconscious movements, including blinking, smiling or swinging their arms while walking.
» Speech changes such as slurring or hesitation in speaking.
» Difficulty in writing.

The objective of treatment is to:

» minimise disabling symptoms;
» prevent complications and avoid serious drug-induced side effects.

GENERAL MEASURES

All patients demonstrating signs and symptoms of parkinsonism should be referred to a medical practitioner for assessment and treatment.

REFERRAL

» Patients suffering from motor difficulties should be referred for general supportive therapy and advice about lifestyle modification, and multidisciplinary rehabilitation to optimise their functioning. *LoE:IIIb*[6]

15.4 EPILEPTIC SEIZURES

G40.6-7; G41.0-2; G41.8-9; R56.8

DESCRIPTION

An epileptic seizure is a change in movement, attention or level of awareness that is sustained or repetitive and occurs because of abnormal and excessive neuronal discharge within the brain.

LoE:IVb[7]

Epileptic seizures should be differentiated from:
» Collapse, e.g. syncope, anoxic seizures, transient ischaemic attack, cardiac arrhythmias;
» Movement disorders, e.g., paroxysmal dyskinesias, tic disorders;
» Mental health conditions, e.g., functional/dissociative seizures (also called psychogenic non-epileptic seizures), rage reactions, panic attacks, daydreaming/ inattention;
» Sleep-related conditions, e.g., parasomnias, narcolepsy;
» Migraine associated disorders, e.g., migraine with visual aura.

See https://www.epilepsydiagnosis.org/epilepsy-imitators.html for a full list of conditions which may look like an epileptic seizure.

LoE:IVb[8]

Not all persons who have an epileptic seizure have epilepsy.
Specific criteria must be met to diagnose epilepsy (see Section 15.7: Epilepsy).

DIAGNOSIS

Epileptic seizures are diagnosed clinically, through eye-witness accounts, videos, careful observation by the healthcare professional, and a history from the patient of the symptoms, signs and behaviours experienced prior to and during the seizure. Epileptic seizures are classified by the International League Against Epilepsy (ILAE) into three types: focal, generalised, and unknown (see Figure 1). The evolution of the seizure (how it starts and progresses clinically) directs investigations to determine the cause of the seizure and related management.

LoE:IVb[9]

SEIZURE TYPES

Focal seizures:

The epileptic activity arises from a specific focus, or networks limited to one hemisphere of the brain.

Focal seizures may present with motor signs (e.g., rhythmic jerking of one limb; automatisms such as lip-smacking) or with non-motor signs (e.g., olfactory, tactile, or visual hallucinations, or intense emotions such as fear). This depends on the site of origin, which may be the frontal lobe, temporal lobe, parietal lobe or occipital lobe. A focal brain lesion should always be excluded in new focal seizures.

Focal seizures are classified according to the degree of impaired consciousness and whether there is progression to a tonic-clonic seizure. Consciousness is evaluated by assessing the levels of awareness (of themselves and their surroundings) and responsiveness (to other people or stimuli) of the person during

the seizure. Any impairment in consciousness means that the person's safety and the safety of others must be protected during the seizure.

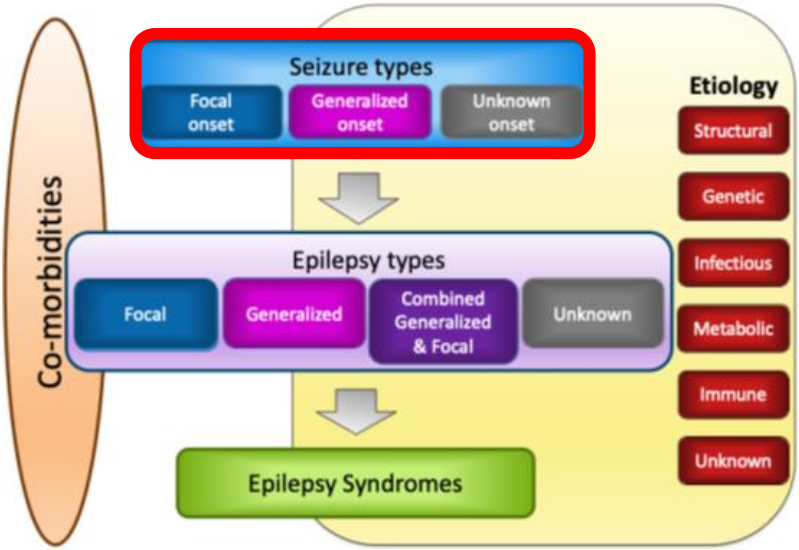


Figure 1. International League Against Epilepsy classification of seizure types *(Taken From: Scheffer IE, Berkovic S, Capovilla G, Connolly MB, French J, Guilhoto L. ILAE classification of epilepsies: Position paper of the ILAE Commission for Classification and Terminology. Epilepsia. 2017, 58 (4): 512-521).*

LoE:IVb[10]

» **Focal preserved consciousness seizures** (previously termed 'simple partial seizures'): the person is fully aware of themselves and their surroundings and fully responsive to others throughout the seizure.
» **Focal impaired consciousness seizures:** (previously termed 'complex partial seizures'), the person has impaired awareness or responsiveness at any time during the seizure.
» **Focal unknown state of consciousness seizures:** used when the state of consciousness is not known (e.g. unclear information).

» **Focal-to-bilateral tonic-clonic seizure:** the epileptic seizure progresses to both brain hemispheres. Bilateral tonic-clonic seizures are differentiated from generalised tonic-clonic seizures by a history of preceding focal signs (either sensory or motor) occurring before complete loss of consciousness and the development of tonic-clonic movements. The terms 'aura' or 'warning signs' may be used by people for the focal signs of the seizure.

Generalised seizures

The epileptic activity arises within and rapidly spreads to involve networks in both hemispheres of the brain. Generalised seizures are almost always associated with impaired or loss of consciousness.

Generalised seizures are classified as:

» **Generalised motor seizures**, which include:
  – **Generalised tonic-clonic seizures**, with loss of consciousness and bilateral tonic-clonic limb movements.
  – **Generalised seizures other than tonic-clonic**, including seizures with varying degrees of impaired consciousness and bilateral *tonic* movements (stiffening, sometimes with vibratory movements) of limbs or eyes, bilateral *atonic* movements (sudden loss of muscle tone) of head, trunk or limbs, bilateral jerks (brief shock-like muscle contractions), as in *myoclonic* seizures.

» **Absence seizures** (previously termed 'petit-mal seizures'), which usually occur in association with an epilepsy syndrome (see Section 15.7: Epilepsy). Absence seizures may be:
  – **'typical'** with abrupt loss of consciousness lasting 5-30 seconds and clonic movements of face and/or automatisms, or
  – **'atypical'** with a less abrupt onset of impaired consciousness, longer seizure duration and loss of muscle tone of head, trunk and limbs. Atypical absence seizures are rare and can be challenging to differentiate from focal sensory seizures.

LoE:IVb[11]

Unknown:

The category of 'unknown onset' is used when there is not enough information, or the clinical presentation is too unclear, to distinguish between focal or generalised seizures.

For more detail and educational videos on seizure types, see https://www.epilepsydiagnosis.org/seizure/seizure-classification-groupoverview.html

15.5 STATUS EPILEPTICUS

G41.0-2; G41.8-9

DESCRIPTION

In status epilepticus, the seizures do not stop, or they occur repeatedly in close succession with impaired consciousness between seizures. Status epilepticus may be 'convulsive' (associated with prominent motor symptoms) or 'non-convulsive' (i.e., without prominent motor symptoms).

Convulsive status epilepticus:

Convulsive status epilepticus is defined as ≥ 5 minutes of either:

- a continuous generalised or bilateral tonic-clonic seizure, or
- two or more discrete generalised, or bilateral tonic-clonic seizures with incomplete recovery of consciousness between the seizures.

Convulsive status epilepticus is a **medical emergency**. There are two critical time points:

- Time point 1: **5 minutes** from the onset of the initial epileptic seizure (i.e., at the point of diagnosis). Immediate treatment is needed to prevent ongoing epileptic seizure activity.
- Time point 2: **30 minutes** of epileptic seizure activity, timed from the onset of the seizure. After 30 minutes of seizure activity, irreversible brain damage related to hypoxia, acidosis, depletion of local energy stores, cerebral oedema and structural damage, is likely to occur.

Complications of convulsive status epilepticus include:

- hyperpyrexia
- respiratory depression
- cerebral oedema
- blood pressure disturbances
- inappropriate antidiuretic hormone (ADH) secretion
- hypoxic ischaemic damage to brain, myocardium and muscles.
- disturbances of blood glucose
- renal failure
- acidosis

Non-convulsive status epilepticus:

Non-convulsive status epilepticus refers to abnormally prolonged or rapidly recurring epileptic seizures with impaired consciousness but no major motor symptoms (e.g., focal seizures with autonomic, sensory or perceptual manifestations or absence seizures). The presentation is often subtle, and the seizures may not be recognised. Diagnosis is confirmed on EEG. Treat as for convulsive status epilepticus below; see Sections 15.5.1: Epileptic seizures

and status epilepticus in children <13 years and 15.5.2: Epileptic seizures and status epilepticus in adolescents (13 – 18 years) and adults. Ensure that underlying causes are identified and managed.

Causes of epileptic seizures and status epilepticus

With every epileptic seizure, the underlying cause of the seizure must be determined and treated, including in people with epilepsy.

Important causes of epileptic seizures that must be considered include:

» Infectious conditions e.g., meningitis or encephalitis.
» Encephalopathy e.g., hypertensive encephalopathy or cerebral hypoxia
» Metabolic conditions e.g., hypoglycaemia, hypo- or hypernatraemia, hypocalcaemia.
» Brain lesions e.g., brain tumours, stroke and post-stroke sequelae, trauma and post-traumatic sequelae.
» Substance withdrawal e.g., alcohol or benzodiazepines.
» Substance intoxication e.g., cocaine or amphetamines.
» Poisoning or toxin ingestion (accidental or intentional as in an overdose) e.g. isoniazid.
» Other neurological (e.g., cerebral palsy) or neurodegenerative (e.g., Alzheimer's dementia) conditions.
» Epilepsies e.g., breakthrough seizures, treatment non-adherence, recent changes to antiseizure medicine (ASM), antiseizure medication toxicity.

15.5.1 EPILEPTIC SEIZURES AND STATUS EPILEPTICUS IN CHILDREN < 13 YEARS OF AGE

DESCRIPTION

Central nervous system infections are a common cause of epileptic seizures in children < 13 years of age in South Africa. The most common seizures in children are febrile seizures (see Section 15.6: Febrile seizures) but the history, examination and investigations must aim at excluding the following conditions:

Perinatal conditions	Infections	Poisoning
» congenital infection » hypoxic-ischaemic damage » trauma » cerebral haemorrhage or thrombosis	» meningitis » encephalitis » brain abscess » neurocysticercosis	» medicine toxicity, e.g., isoniazid, antihistamines, antiseizure medicines » substance abuse, e.g., solvents, amphetamines

		» environmental and other toxins e.g., pesticides (organophosphates), essential oils » substance withdrawal, e.g. benzodiazepines.
Metabolic abnormalities	**Systemic disorders**	**Primary cerebral causes**
» hypoglycaemia » hypocalcaemia » hypomagnesaemia » hyponatraemia » hypernatraemia » inborn errors of metabolism	» vasculitis » hypertensive encephalopathy » uraemia (renal failure) » hyperammonaemia (liver failure)	» cerebral malformation » genetic/familial (syndromic) » tumour » idiopathic/ unknown

Special considerations by age group

Neonates:

Neonatal seizures are usually provoked, most commonly by hypoxic ischaemic encephalopathy (HIE). They rarely lead to a subsequent diagnosis of epilepsy. For management, refer to Section 19.6.2: Seizures, Neonatal.

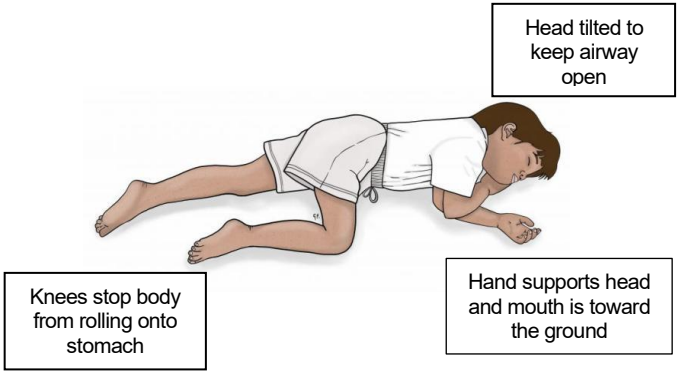
Infants and children up to 2 years of age:

» The most frequent cause of epileptic seizures that present in infancy are febrile seizures (see Section 15.6: Febrile seizures).
» Infants under 6 months of age cannot manifest generalised tonic-clonic seizures.
» Most provoked seizures presenting in this age group appear to be focal even when a generalised brain pathology is present.
» Infants and children under 2 years may not have typical signs of meningitis, i.e. neck stiffness or Kernig sign. Meningitis should be excluded in all children with a fever and seizure.
» Infants and children are at risk of metabolic derangement which may be from common triggers (e.g., dehydration) or rare causes (e.g., inborn errors of metabolism).
» Neuroimaging is often very useful, especially to exclude structural aetiologies (e.g., intracranial bleeds).

Children 2 to 12 years of age:
Older children are often able to present with clearer descriptions of seizure onset, i.e. a focal onset seizure is more likely to be specifically driven by an underlying focal cause (potentially a structural pathology):
» Ask for focality – point to the side of movement or change.
» Change in behaviour before convulsive seizure evident.
» Altered consciousness.
» Type of seizure is related to the underlying aetiology.

GENERAL MEASURES

On arrival/ while fitting:
» Ensure the environment is safe. Remove all sharp objects and hot liquids.
» Place the child in a recovery position to prevent aspiration of secretions or vomitus, on the floor if necessary.
» Do not place anything (spoon or spatula, etc.) in the patient's mouth.
» Ensure the airway is not obstructed.



Adapted from https://www.kidshealth.org.nz/emergencies/emergencies-cpr

LoE:IVb[12]

» Administer oxygen via face mask or nasal cannula to maintain $SaO_2 \geq 95\%$.

- » Obtain eyewitness account of when the seizure started and associated impaired consciousness: **If seizure duration is ≥ 5 minutes, commence urgent medicine treatment for convulsive status epilepticus** (refer to table below on medicine management and supportive care of status epilepticus in children < 13 years).
- » Examine for fever, dehydration, meningism, hypoglycaemia, evidence of toxin or poison ingestion, head, neck or other trauma, obvious focal neurology and other possible causes of the seizure.
- » Establish vascular (IV or IO) access, if possible. See Paediatric Hospital Level STGs and EML Chapter 1: Emergencies and Trauma, Section 1.1.10 Intra-Osseous Infusion in Emergencies.
- » Once threat of falling no longer present, move to bed (with cot sides up), if needed.
- » Monitor vital signs every 15 minutes.
- » Keep nil per mouth.
- » Ensure the family/caregiver/escort is attended to; social worker or auxiliary staff member should obtain all contact details and provide counselling as needed.

MEDICINE TREATMENT

The aim is to control the seizure within 30 minutes of its onset, prevent complications of status epilepticus with supportive care, and identify and correct underlying causes. Follow standard resuscitation protocols, such as the ABCDE approach.

Table 1: MEDICINE MANAGEMENT AND SUPPORTIVE CARE OF STATUS EPILEPTICUS IN CHILDREN < 13 YEARS OF AGE

PHASE	MEDICINE MANAGEMENT	SUPPORTIVE CARE
EARLY STATUS EPILEPTICUS **5-10 minutes after seizure onset**	**LEVEL 1 INTERVENTION:** (benzodiazepines, up to 2 doses). If vascular access is available: » Midazolam, IV, 0.25mg/kg over 60 secs, (max 10mg/dose) (Doctor prescribed). **OR** *LoE:IVba[13]* » Diazepam, IV, 0.25mg/kg IV over 60 secs (max 10mg/dose) (Doctor prescribed). *LoE:IIVb[14]* If vascular access is not available: » Midazolam, IM 0.1 mg/kg, **OR** buccal* 0.5 mg/kg (Doctor prescribed). *LoE:IIIa[15]* **OR** » Diazepam, rectal**, 0.5 mg/kg (max 10mg/dose) (Doctor prescribed). *LoE:IIIa[16]* Expect a response within 1–5 minutes. **If the seizure does not resolve within 5 minutes after first dose, give a repeat dose of benzodiazepine.** **CAUTION** Benzodiazepines can cause respiratory depression.	» Aim for seizure control within 30 minutes of onset. » Provide supplemental oxygen, maintain $SaO_2 \geq 95\%$. » Monitor cerebral perfusion pressure (CPP), heart rate, oxygen saturation. » Check glucose. If low, correct and start maintenance IV fluid with dextrose 5% in sodium chloride 0.9%. Do not overhydrate. » Blood gas analysis for electrolytes. Correct as required. Other biochemical disorders: Correct abnormalities, if present, e.g. glucose, calcium and sodium. Take blood for electrolytes, LFTs, FBC. If patient is a known epileptic, check therapeutic levels of ASMs. If meningitis cannot be excluded, give:

PHASE	MEDICINE MANAGEMENT	SUPPORTIVE CARE
	Monitor oxygen saturation and respiratory rate. If respiratory depression occurs, assist ventilation with bag-valve mask (1 breath every 3–5 seconds) and refer urgently/transfer to a high care setting.	» Ceftriaxone, W IM or IV, 100 mg/kg/dose stat
ESTABLISHED STATUS **10-30 minutes after seizure onset**	**LEVEL 2 INTERVENTION:** If no vascular access: • Phenobarbital, IM 20mg/kg (Doctor prescribed) ○ Slow IM Injection. **OR** if no IM formulation available: • Levetiracetam oral, crushed and given by nasogastric tube, 60 mg/kg as a single dose (maximum dose: 4500 mg). » **OR** *LoE:IIIb*[17] • Phenobarbital, oral, crushed and given by nasogastric tube, 20 mg/kg as a single dose. Note: if no response to phenobarbital IM or oral after 5-20 minutes, levetiracetam oral may be given via NG tube, but avoid repeating oral phenobarbital as it may take over an hour to achieve therapeutic concentrations and repeat doses increases the risk of respiratory depression. **Refer to higher level of care**	» Consult with higher level care, refer urgently. » Prepare for intubation and ventilation.
» Watch For complications of the prolonged seizure. » Check all possible underlining conditions. » Watch for adverse effects of administered ASM.		
Prescribing notes:		

PHASE	MEDICINE MANAGEMENT	SUPPORTIVE CARE

* Midazolam, buccal, 0.5 mg/kg/dose. See dosing table: Chapter 23.
- Use midazolam for injection 5 mg in 1 mL undiluted.
- Draw up the required volume in a 5 mL syringe.
- Remove needle then administer midazolam into the buccal cavity (between gum and cheeks).
- Note: Buccal midazolam should not be used in infants < 6 months of age.

LoE:IIIa[18]

**Diazepam, rectal, 0.5 mg/kg/dose as a single dose. See dosing table: Chapter 23.
- Use diazepam for injection 10 mg in 2 mL undiluted.
- Draw up the required volume in a 2 mL syringe.
- Remove needle then connect syringe to an NGT and gently insert into the rectum (or insert the whole barrel of the lubricated syringe if no NGT available) and inject the contents.
- Remove NGT / syringe and hold buttocks together to minimise leakage.

After The Seizure

Post-ictal phase

» Keep nil per mouth and haemodynamically stable until child has regained consciousness.
» Determine the seizure type (focal or generalised) and cause of the seizure. Further investigations are driven by clinical signs and seizure onset, e.g.:
  – History of toxin exposure.
  – Evidence of neuro-infection.
  – History of trauma.
  – Focal onset (e.g., a warning experience prior to generalised tonic-clonic movements) and/or focal neurology warrants neuroimaging.
» If meningitis cannot be excluded, commence antibiotic therapy within one hour of arrival. See Section 15.8.1: Acute meningitis.

Pre-discharge

» Consider whether the criteria for a diagnosis of epilepsy are met (see Section 15.7: Epilepsy). Initiate appropriate ASM for type of epilepsy and develop an emergency care plan for recurrent seizures.
» If not epilepsy, start weaning any ASMs.
» Counsel the caregiver on the current state of the child, the reason for the seizure, management given and likely sequelae of the seizure. Offer only as much information as the caregiver can receive at that time.
» Set up a follow up appointment to re-evaluate the diagnosis, educational and social needs, and to reinforce educational counselling about the child's condition.

Active follow-up

» Ensure underlying medical conditions are appropriately managed.
» Reduce and stop any residual ASMs if not epilepsy.
» Assess neurodevelopmental conditions, educational and social needs. Refer as necessary.
» If epilepsy is the cause of the seizure, check seizure control and if emergency care plan is understood.

Referral

» All children with status epilepticus.
» All children < 2 years.
» Children over ≥ 2 years, except for those with simple febrile seizures (see Section 15.6: Febrile seizures).

Follow up social worker or rehabilitation services required.

15.5.2. EPILEPTIC SEIZURES AND STATUS EPILEPTICUS IN ADOLESCENTS (13 – 18 YEARS) AND ADULTS

Additional causes of epileptic seizures to consider in adolescents and adults are categorised below:

Pregnancy related	Infections	Substances & poisoning
» eclampsia (see Adult Hospital STGs and EML, Section 6.4.2: Eclampsia) » electrolyte abnormalities (e.g. in hyperemesis gravidarum) » stroke » reduced blood levels of antiseizure medication	» meningitis » encephalitis » brain abscess » neurocysticercosis	» substance abuse (e.g. cocaine, amphetamines) » withdrawal syndromes (e.g., benzodiazepine, alcohol) » medicine toxicity and overdose (e.g., antiseizure medications, antidepressants, antipsychotics, isoniazid) » environmental toxins (e.g. pesticides)
Metabolic conditions	**Systemic disorders**	**Primary cerebral causes**
» hypoglycaemia » hypocalcaemia » hypomagnesaemia » hyponatraemia » hypernatraemia	» vasculitis » hypertensive encephalopathy » uraemia (renal failure) » hyperammonaemia (liver failure)	» tumour » trauma » neurodegenerative conditions » idiopathic/unknown

Special considerations

Adolescents and young adults:

» High risk for substance intoxication or withdrawal, and for traumatic brain injuries.

» Mental health conditions are common, and may present as 'epilepsy imitators' (see differentials of epileptic seizures above and https://www.epilepsydiagnosis.org/epilepsy-imitators.html).

» Idiopathic generalised epilepsies (including epilepsy with generalised tonic-clonic seizures, juvenile myoclonic epilepsy, juvenile absence epilepsy) may first present in this age group.

» High risk for poor adherence to ASMs and breakthrough seizures.

» Often require intensive individual and family counselling and support, with appropriate involvement of social welfare and education sectors.

Girls and women in child-bearing age group:

» Exclude pregnancy and pregnancy related complications.
» ASM concentrations may become sub-therapeutic in pregnant women with epilepsy, causing breakthrough seizures. An increase in ASM dose may be required during pregnancy (reduce dose after delivery). Where possible monitor.

CAUTION

Children born to women taking valproate are at significant risk of birth defects (11%) and persistent developmental disorders (40%).
Valproate is contra-indicated and should be avoided in pregnancy and in adolescents and women of child-bearing potential.

LoE:IIIb[19]

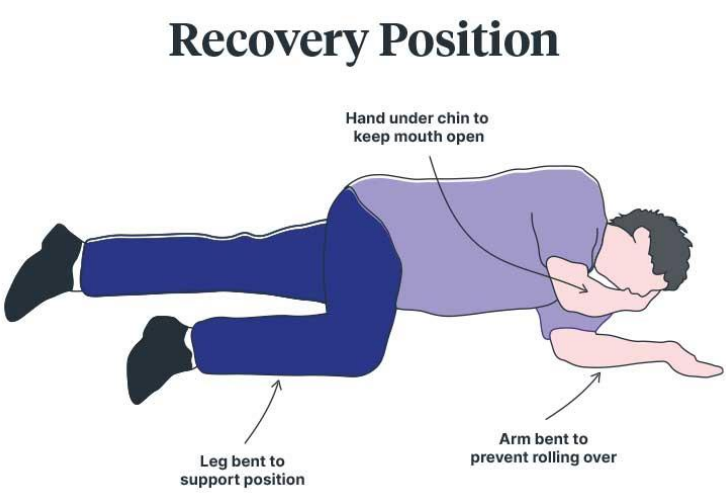
People > 65 years of age:

» Common reversible conditions include metabolic abnormalities, medications, alcohol withdrawal.
» The risk of developing epilepsy increases with age. Epilepsy in this age group is commonly caused by stroke, brain tumours and dementias. Continued ASM may be advisable after a single seizure in these patients.

GENERAL MEASURES

On arrival/ while fitting:

» Ensure the environment is safe. Remove all sharp objects and hot liquids.
» Place the patient in a lateral position to prevent aspiration of secretions or vomitus, on the floor if necessary.
» Do not place anything (spoon or spatula, etc.) in the patient's mouth.



Taken from Ausmed: Adult Basic Life Support

LoE:IVb[20]

» Obtain an eyewitness account of the seizure onset and any associated impaired consciousness. **If seizure duration is ≥ 5 minutes, commence urgent medicine treatment for convulsive status epilepticus** (refer to table below on medicine management and supportive care of status epilepticus in adolescents and adults).
» Ensure the airway is not obstructed and administer oxygen via face mask or nasal cannula to maintain $SaO_2 \geq 95\%$.
» Intubation should be performed if airway, ventilation, or oxygenation cannot be maintained, or if seizure is prolonged.
» Examine for fever; dehydration; meningism; hypoglycaemia; evidence of toxin or poison ingestion; head, neck or other trauma; obvious focal neurology; and other possible causes of the seizure.
» Secure intravenous access.
» Monitor vital signs every 15 minutes.
» Keep nil per mouth.
» Ensure the family/caregiver/escort is attended to. Social worker or auxiliary staff member should obtain all contact details and provide counselling as needed.

Convulsive status epilepticus:
If the seizure does not resolve within 5 minutes of onset, commence urgent medicine treatment.

MEDICINE TREATMENT

The aim is to control the seizure within 30 minutes of its onset, prevent complications of status epilepticus with supportive care, and identify and correct underlying causes. Follow standard resuscitation protocols, such as the ABCDE approach.

Table 2: MEDICINE MANAGEMENT AND SUPPORTIVE CARE OF STATUS EPILEPTICUS IN ADOLESCENTS AND ADULTS

PHASE	MANAGEMENT	SUPPORTIVE CARE
EARLY STATUS EPILEPTICUS (5 – 10 minutes)	**LEVEL 1 INTERVENTION:** (Benzodiazepines; See Caution below). <u>If IV access is available:</u> » Midazolam, IV, 10mg (Doctor prescribed). *LoE:IIb*[21] **OR** » Diazepam, IV, 10mg administered over at least 5 minutes (not faster than 2mg/min) (Doctor prescribed). *LoE:IIb*[22] <u>If IV access is not available:</u> • Midazolam, 10mg, IM or buccal, using the parenteral formulation, while continuing to establish IV access (Doctor prescribed). **OR** <u>If no midazolam available:</u> • Diazepam, rectal, 0.2–0.5 mg/kg as a single dose (maximum 20 mg/dose) (Doctor prescribed). *LoE:IVb*[23] If the seizure does not resolve 5 minutes after first dose of benzodiazepine, repeat the dose of benzodiazepine. If seizure aborts after 1 or 2 doses of benzodiazepines, but patient is at high risk of recurrent seizures (e.g., known with epilepsy and defaulted treatment), load with antiseizure medicine.	» Stabilize and support airway breathing and circulation. » Identify and treat the underlying cause of seizures such as: – Hypoglycaemia. – Electrolyte derangements (e.g. calcium, sodium, potassium, magnesium and urea). – Poisoning. – Intoxication/overdoses (e.g. isoniazid, theophylline, tricyclic antidepressants, cocaine, methamphetamine). – Withdrawal syndromes (e.g. alcohol, benzodiazepines). » If patient is known with epilepsy and on treatment, take blood for measurement of antiseizure medicine levels.

ESTABLISHED STATUS EPILEPTICUS (10 – 30 minutes)	**LEVEL 2 INTERVENTION:** (Antiseizure medicine) • Levetiracetam oral, crushed and given by nasogastric tube, 60 mg/kg as a single dose (Maximum dose: 4500 mg) *LoE:IIb*[24] **Refer all patients.**	» Prepare for intubation/ventilation. » Arrange referral to higher level of care.
CAUTION: Benzodiazepines can cause respiratory depression. Monitor closely for respiratory depression. If this occurs, assist ventilation with bag-valve mask (1 breath every 3–5 seconds) and refer urgently/transfer to a high-care setting.		

After The Seizure

Post Ictal Phase:

» Keep nil per mouth and haemodynamically stable until patient has regained consciousness and is aware of themself and their surroundings.
» If there is agitation or disturbed behaviour, consider post-ictal delirium and manage as for delirium – see Section 21.2.4: Delirium.
» Clarify the cause of the seizure and manage appropriately. Further investigations (e.g. lumber puncture and neuroimaging) are driven by clinical signs and seizure onset (e.g. focal onset).
  » If meningitis is suspected, commence antibiotic therapy urgently.
  » Counsel the patient and their family regarding the cause of the seizure, management given and likely sequelae of the seizure. Offer only as much information as the family or patient is able to receive at that time.
  » If reversible causes of the epileptic seizure have been addressed, wean and stop ASMs. Consider whether the person meets the criteria for a diagnosis of epilepsy that requires ongoing ASMs (see Section 15.7: Epilepsy).
» On discharge, set up a follow-up appointment to reinforce the counselling messages.

Active follow up:

» Wean any residual ASMs, unless ongoing maintenance treatment is indicated, or epilepsy has been diagnosed.

Referral

» All patients with status epilepticus must be referred to hospital for continued acute management and evaluation of the cause.
» New focal seizures for neuroimaging.
» Suspected meningitis.

Follow up social worker or rehabilitation services required.

15.6 FEBRILE SEIZURES

R56.0

DESCRIPTION

Febrile seizures occur between the ages of 6 months and 6 years of age in association with a significant fever (>38.5°C) in the absence of an intracranial infection and typically associated with viral upper respiratory tract infections. These are the most common type of seizures in children of this age. *LoE:IVb*[25]

However, the diagnosis requires the exclusion of other causes of seizures.
Febrile convulsions can be simple or complex.

Simple febrile seizures (SFS):

» are generalised,

- occur once per illness,
- are less than 15 minutes (typically 1–2 minutes),
- are not associated with any neurological deficit,
- are self-limiting,
- consist of only one seizure during the febrile illness which needs no specific treatment, and
- may be associated with a family history of simple febrile seizures.

Complex febrile seizures have *one or more* of the following characteristics:

- Seizure duration of 15 minutes or more;

OR

- are recurrent within the same febrile illness;

AND/OR

- have a focal onset.

AND/OR

- are associated with post-ictal, focal neurological abnormalities.

Children with febrile seizures have a good prognosis, and very rarely develop epilepsy. The overall risk for recurrence of simple febrile seizures is 30–40%. Factors which increase the risk for recurrent febrile seizures include:

- seizure disorder in a first-degree relative,
- onset before 12 months of age,
- initial complex seizures.

DIAGNOSTIC CRITERIA

Clinical

- Investigate for intracranial, extracranial, and biochemical causes of fever or seizure.
- Signs of meningism are unreliable in children under 18 months of age.
- If raised intracranial pressure or meningitis cannot be excluded, the diagnosis of febrile seizures cannot be made. Treat children empirically for meningitis if suspected.

Investigations

Lumbar puncture

- Lumbar puncture is indicated in:
  - All children with clinical features of meningitis.
- Lumbar puncture may be indicated in:
  - Children where meningitis cannot be excluded, e.g. under 18 months of age or those who have received antibiotics prior to the event.
- In children ≥ 18 months of age, where a focus of extracranial infection is present and intracranial infection such as meningitis has been excluded clinically, no further investigation is required.

Neuroimaging

» Children with complex febrile seizures and/or persistent lethargy may require neuroimaging, followed by a lumbar puncture if raised intracranial pressure can reliably be excluded based on clinical assessment. (See Paediatric Hospital Level STGs and EML, Section 13.2: Lumbar Puncture.)

» Based on clinical findings, investigate complex febrile seizures for possible underlying conditions such as meningitis, focal brain lesions and epilepsy.
Note: An EEG is of no value in simple febrile seizures but may be considered in recurrent complex febrile seizures.

GENERAL AND SUPPORTIVE MEASURES

» Reassure parents and caregivers.
» Educate parents and caregivers regarding the first aid management of seizures.
» Counsel against tepid sponging and fans as this increases the core temperature.
» Counsel that recurrent febrile seizures occur in 30-40% of patients.
» Look for a cause of the fever.
» **Always exclude meningitis** (see Section 15.8: Meningitis).

MEDICINE TREATMENT

For fever related symptoms (temperature > 38.5°C):

- Paracetamol, oral, 15 mg/kg/dose 6 hourly.
  - Note: Paracetamol has no effect on seizure prevention.

If convulsing for > 5 minutes:
See Section 15.5: Status epilepticus (convulsive).

Continuous antiseizure medication prophylactic therapy

» Routine daily antiseizure medication prophylaxis is not recommended for patients with simple febrile seizures.
» For children with recurrent complex febrile seizures, discuss the treatment options with a specialist.

REFERRAL

» All febrile seizures, except if:
> Previous episode of simple febrile seizures has been investigated,
AND
– the child regains full consciousness and function immediately after the seizure,
AND
– meningitis has been excluded (see Section 15.8: Meningitis).

» Complex convulsions:
  - All patients with recurrent complex febrile seizures without an obvious cause of the seizure and/or not responding to initial management should be discussed with a specialist.
  - Developmental delay/regression.

15.7 EPILEPSY
G40.0-9

DESCRIPTION
Epilepsy is a disease of the brain defined by any of the following conditions:
» At least two unprovoked (or reflex) seizures occurring >24 hours apart,
» One unprovoked (or reflex) seizure if there is a high risk (60% or more) of having recurrent seizures within the next 10 years (i.e., if the person is vulnerable to having another unprovoked seizure, e.g., because of structural damage such as from a stroke),
» Diagnosis of an epilepsy syndrome.

Note:
» An “unprovoked” epileptic seizure is a seizure which does not have evidence of an identifiable temporary or reversible factor acting on a healthy brain (e.g., hypoglycaemia, alcohol withdrawal, concussion).
» A “reflex” epileptic seizure is a seizure which occurs in response to a stimulus such as flashing lights. Such epileptic seizures indicate the person’s brain is predisposed to having seizures and therefore warrant a diagnosis of epilepsy.
» Epilepsy may be diagnosed after a single unprovoked seizure in people with an increased risk of recurrence for example in people with previous conditions such as TB meningitis, neurocysticercosis, stroke, brain tumour or traumatic brain injury. Note that the single unprovoked seizure is not caused by the immediate insult to the brain but occurs spontaneously (i.e., is unprovoked) because of the long-term sequelae of the initial insult. The damaged brain is thus at high risk of a recurrent unprovoked epileptic seizure.
» Epileptic syndromes confer a diagnosis of epilepsy, even if the risk of recurrent epileptic seizures is low for a particular individual.
» Epilepsy is considered to be resolved and no longer needing maintenance treatment in individuals who either:
  - had an age-dependent epilepsy syndrome, but are now past the applicable age, **OR**
  - have remained seizure-free for the last 10 years and weaned off ASM for at least the last 5 years.
» Epilepsy is associated with many psychological, social and legal problems, and cultural misperceptions which should be explored and addressed at the time of diagnosis and throughout the course of the illness.

Epilepsy types

As shown in Figure 2, epilepsies are classified by the International League Against Epilepsy (ILAE) according to:

» Type of seizures experienced, e.g.: focal, generalised, combined generalised and focal, or unknown.

AND

» Aetiology, which may be:
  – Structural (e.g., cerebral or vascular malformations, stroke, traumatic brain injury, brain tumours).
  – Genetic (the epilepsy is a direct result of chromosomal or gene abnormalities, e.g., Down syndrome, Fragile X syndrome, Dravet syndrome).
  – Infectious (e.g., post-infectious sequelae of TB meningitis).
  – Metabolic (e.g., inborn errors of metabolism).
  – Immune (rare conditions involving neuroreceptor antibodies).
  – Unknown.

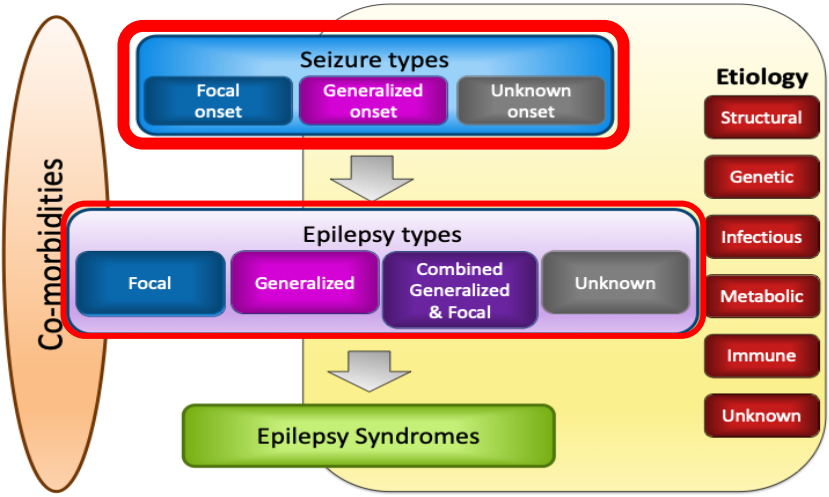


Figure 2. International League Against Epilepsy classification of seizure types *(Source: Scheffer IE, Berkovic S, Capovilla G, Connolly MB, French J, Guilhoto L. ILAE classification of epilepsies: Position paper of the ILAE Commission for Classification and Terminology. Epilepsia. 2017, 58 (4): 512-521).*

LoE:IVb[26]

Focal epilepsy

Characterised by unprovoked focal seizures, which may or may not evolve to bilateral tonic-clonic seizures. The diagnosis is made clinically and requires a

detailed description of how the seizure started. In people presenting with generalised tonic-clonic seizures, it is important to ask about any warning symptoms or 'aura' experienced by the person before losing consciousness. Typical interictal and/or ictal EEG findings may be present, and neuroimaging may reveal a focal brain lesion, supporting the diagnosis, but may also be normal.

Generalised epilepsy
Characterised by unprovoked generalized seizures, including tonic-clonic, tonic, myoclonic, and absence seizures. Typical interictal and/or ictal EEG findings may be present.

Combined generalised and focal epilepsy
Diagnosed in people with more than one type of seizure, e.g., unprovoked focal seizures and unprovoked generalised seizures. This may occur in people with Dravet syndrome or Lennox-Gastaut syndrome.

Unknown epilepsy
This classification is used when it is not possible to determine whether the epilepsy is focal, generalised, or combined generalised and focal epilepsy from the available history, clinical, and investigative findings.

For seizure types, see Section 15.4: Epileptic seizures.
For more information and educational videos on epilepsy types, see https://www.epilepsydiagnosis.org/epilepsy/epilepsy-classification-groupoverview.html.

Investigations:
- Neuroimaging (a CT Brain or MRI if available) should be conducted:
  - in new focal onset seizures to exclude a focal brain lesion,
  - if the epilepsy features change in an individual (i.e., new symptoms appear, noting that most people will experience the same march of symptoms with each seizure),
  - if epileptic seizures recur despite adherence to treatment and the diagnosis is unclear.
- EEG is indicated for recurrent or syndromic seizures where a diagnosis cannot be made on clinical grounds alone. Delay an EEG for at least one week after the convulsive episode.
- EEG is not indicated for simple febrile seizures.
- If the seizure presentation is atypical, a 12-lead ECG should be considered to identify prolonged QT interval syndromes. Syncope with exercise, syncope in response to loud noise, fright, or extreme emotional stress, syncope whilst supine, a family history of sudden death in a young person e.g., <40 years old, or sensorineural deafness are associated with some types of long QT syndrome.

15.7.1 EPILEPSY IN CHILDREN <13 YEARS OF AGE

A child may be diagnosed with focal, generalised, combined generalised and focal, or unknown epilepsy types.

Special considerations

Seizures in neonates

Seizures in the neonatal period seldom confer a diagnosis of epilepsy. For management of seizures, See Paediatric Hospital Level STGs and EML Chapter 19: Prematurity And Neonatal Conditions, Section 19.6.2: Seizures, Neonatal.

Underlying conditions and co-morbidities

The sequelae of neurocysticercosis and TB meningitis are a common cause of childhood epilepsy in South Africa. See Paediatric Hospital Level STGs and EML Chapter 13: The Nervous System, Section 13.7: Neurocysticercosis and Chapter 10: Tuberculosis, Section 10.4: Meningitis, Tuberculosis in Children.

Common co-morbidities with epilepsy which need to be managed in conjunction with treatment of the epilepsy include:

» Neurodevelopmental disorders, e.g., autism spectrum disorder, intellectual disability, attention deficit hyperactivity disorder, specific learning disorders.
» Behavioural and psychiatric disorders, e.g., anxiety disorder, depression, oppositional defiant disorder, conduct disorder, sleep disorders.
» Cognitive and academic difficulties.
» Developmental delays, particularly with epilepsies that have their onset in early childhood.

Infantile epileptic spasms (see syndromes below)

Infantile epileptic spasms (previously called infantile spasms) are a type of seizure that typically occur in infants between 3 and 12 months of age. They involve brief, repetitive stiffening of the body (for 1-2 seconds), typically recurring in clusters, and usually happen when the infant is waking up or falling asleep.

These spasms are often associated with a severe epilepsy syndrome called West syndrome or Infantile Epileptic Spasms Syndrome, which includes:

» Epileptic spasms.
» Developmental delay or regression.
» A specific abnormal EEG pattern called hypsarrhythmia.

Infantile spasms are a **medical emergency.** Early diagnosis and treatment are crucial to prevent long-term developmental problems. Discuss with a specialist and refer immediately.

Children on ART

Drug interactions between ASM and ARVs can arise from several mechanisms, including liver metabolism (increased or decreased) and competition for protein binding. There is a lack of strong evidence to guide clinicians at present.

The following points are important to remember when treating epilepsy in patients on ART:

» Carbamazepine, phenobarbital and phenytoin induce hepatic enzymes, which may lead to sub-therapeutic ARV plasma concentrations, especially of INSTIs, NNRTIs and PIs.
» If clinically indicated, monitor ASM levels in patients taking concurrent ART and ASM therapy.
» Consider lamotrigine, levetiracetam or valproate, and avoid prescribing carbamazepine, phenytoin or phenobarbital.

Girls likely to need treatment when of child-bearing potential/ after 10 years of age

» The potential for child-bearing must be considered in all girls requiring treatment for epilepsy.
» Choose the ASM with the least potential for harm in pregnancy (see Figure 3).
» Valproate should not be used if the child is likely to need epilepsy treatment as they grow older / develop child-bearing potential, unless other ASMs are not effective or intolerable. Annual acknowledgment of risk must be obtained if valproate is used.
» Girls over the age of 10 years should be counselled regarding sexual activity and contraception needs.
» Refer any girls who may be vulnerable to sexual abuse to a social worker.

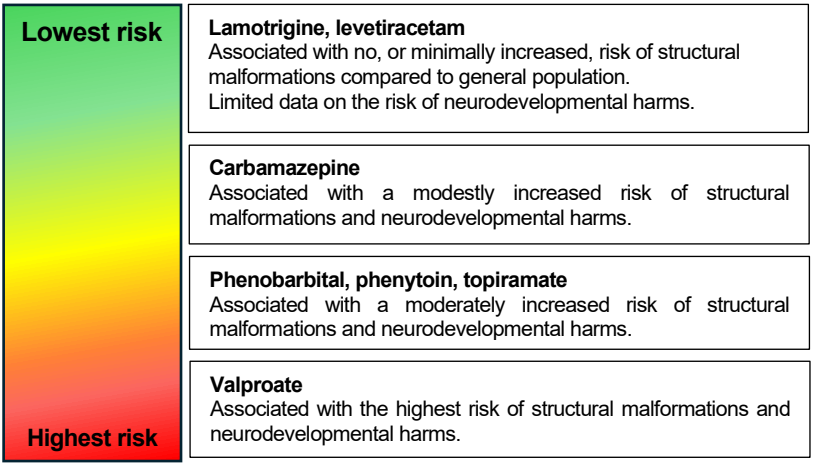


Figure 3. Risk of congenital structural malformations and neurodevelopment harms associated with various antiseizures medicines.
Increasing risk refers to increasing number of pregnancies or children affected. (Adapted from Pennell PB. *Neurotherapeutics*. 2016 and Medicines & Healthcare products Regulatory Agency safety leaflet).

LoE:IVb[27]

GENERAL AND SUPPORTIVE MEASURES

» Offer ongoing counselling to the patient and caregiver about epilepsy, its associated complications and comorbidities e.g. learning difficulties, ADHD, anxiety, and aggression.
» Encourage participation in activities of daily living and ensure that the patient is not precluded from school and lifestyle activities, unless valid safety concerns are evident.

MEDICINE TREATMENT

The goal of medicine treatment is to prevent recurrent seizures and optimise quality of life, balanced against potential adverse effects of ASM. Being seizure-free may not be achievable with all children and may require individualised treatment goals, e.g., severe to profound intellectual disability with intractable seizures that do not interfere with the care of that child. Cautious escalation of treatment should be done with consideration of potential adverse effects. In the settings of apparent drug-resistant epilepsy, revisit the diagnosis, check adherence, consider if the prescribed ASM and dose are correct, and refer to a specialist if treatment goals are not achieved.

Acute therapy

Manage acute seizure and status epilepticus as per seizures/status epilepticus, see Sections 15.4: Epileptic Seizures, and 15.5: Status epilepticus.

Maintenance therapy

Principles of management

» Monotherapy is preferred.
» Combination therapy, if necessary, should be specialist initiated in the form of add-on management.
» As a general rule, start with low doses according to the lower dose per kilogram for the child and titrate upwards slowly until seizures are controlled. This is often at the low-to-mid-therapeutic dose range.
» If seizures continue, titrate to high therapeutic doses, monitoring for unacceptable adverse effects.
» If the patient experiences unacceptable adverse effects, consult a doctor about cross-titrating to another ASM. Verify that the ASM is being given correctly and that the epilepsy type has been correctly identified.
» ASMs can interact with other drugs, affecting their effectiveness and safety. These interactions mainly occur through changes in drug metabolism (enzyme induction or inhibition) and protein binding.
» Monitoring of therapeutic ASM levels is only indicated when there is concern about toxicity or adherence. It is not recommended when titrating to establish the appropriate dose.

Continuation and cross-titration of treatment

» Cross-titration may be required when changing from one ASM to another if there is poor control or adverse effects. Add on the new medication, up-titrate to a therapeutic dose; when seizures are controlled, slowly reduce and stop the initial medication (doses should only be changed at 2 weekly intervals).

In most children, it is appropriate to continue effective ASM therapy as they grow older as indicated by the type of epilepsy. Exceptions are:

» **Valproate in girls approaching puberty and of child-bearing potential**.
Valproate should be deprescribed by cross-titration onto another suitable ASM in girls at approximately 10 years of age. **Lamotrigine and levetiracetam are the safest ASMs in pregnancy** and therefore the first choice in girls and women of child-bearing potential. As carbamazepine and topiramate are both teratogenic, they should be avoided.
» **Phenobarbital** may be initiated in infants under 6 months of age or for children with severe or profound intellectual disability, for whom the adverse effects will not interfere with their care or activities of daily living. In children who are controlled on phenobarbital, cross-titration onto another suitable ASM should be undertaken by 2 years of age.

Table 3: Epilepsy treatment in children 1 month to ≤ 12 years

Epilepsy type		Population	1st line	2nd line	Comments
Focal	With or without evolution to bilateral tonic-clonic seizures *LoE:IIIb*[28]	All	Lamotrigine	Carbamazepine **OR** Levetiracetam	Avoid carbamazepine in children on ART due to drug-drug interactions. Avoid carbamazepine in girls who are likely to require treatment when/ if of child-bearing potential.
Generalised epilepsy	Tonic-clonic, atonic, clonic, or tonic seizures	» Boys » Girls unlikely to need treatment after 10 years of age or develop child-bearing potential	Lamotrigine (low risk*) **OR** Levetiracetam (high-risk*)	Levetiracetam or lamotrigine (whichever not used as first line) **OR** Valproate	Valproate should not be used unless lamotrigine and levetiracetam are poorly tolerated or ineffective. If valproate used in girls 10 years and older - see note below on **acknowledgement of risk form.**
		Girls likely to need treatment after 10 years of age	Lamotrigine (low risk*) **OR** Levetiracetam (high-risk*)	Levetiracetam or lamotrigine (whichever not used as first line) **OR** Consider combination therapy with lamotrigine and levetiracetam	Valproate should not be used unless lamotrigine or levetiracetam, alone or in combination, are ineffective or poorly tolerated. **If valproate is used, see note below on "Acknowledgment of risk form"** and effective family planning.
	Absence	» Boys » Girls unlikely to need treatment after 10 years age of age or to develop child-bearing potential	Valproate	Lamotrigine	**If valproate is used, see note below on "Acknowledgment of risk form".** Girls aged 10 years or older that are on valproate should be cross-titrated to lamotrigine.

Epilepsy type	Population	1st line	2nd line	Comments
Absence (Continued)	Girls likely to continue treatment after 10 years of age	Lamotrigine	Levetiracetam	**If valproate is used, see note below on "Acknowledgment of risk form"** and effective family planning.
Myoclonic *Confirm diagnosis and discuss management with a specialist in all cases*	» Boys » Girls unlikely to need treatment after 10 years of age or to develop child-bearing potential	Valproate	Levetiracetam	Seizures may be aggravated by phenytoin or carbamazepine. Lamotrigine may be effective but may also exacerbate myoclonic seizures. **If valproate is used in girls, see note below on "Acknowledgment of risk form"** and effective family planning. Girls aged 10 years or older should be cross titrated to levetiracetam or lamotrigine.
	Girls likely to continue treatment after age of 10 years	Levetiracetam	Lamotrigine	These seizures may be aggravated by phenytoin or carbamazepine. Lamotrigine may be effective but may also exacerbate myoclonic seizures. **If valproate is used, see note below on "Acknowledgment of risk form"** and effective family planning.
Combined generalised and focal epilepsy OR Unknown/unclassified Discuss clinical presentation and management with a specialist in all cases.				

NOTE:

» Lamotrigine is the preferred first line treatment for all adult patients, including women of child-bearing potential, pregnant women, and people on ART.

» Lamotrigine requires slow dose up-titration and may not be suitable in people at high-risk of seizures.

» **If valproate is used in girls, an acknowledgment of risk form must be obtained annually, even if not of child-bearing potential. Girls aged 10 years and older should receive effective family planning and consider a long-acting form of contraception.**
https://www.sahpra.org.za/wp-content/uploads/2025/05/GLF-CEM-PV-S01_v2-Valproate-Annual-Risk-Acknowledgement-Form-ARF.pdf
*Assess level of risk (high vs low) based on clinical judgement and discuss with a specialist if unsure. In general, high-risk patients are those with frequent seizures, a previous history of hospitalization for seizures, or previous history of status epilepticus. Low-risk patients are those with infrequent seizures, no previous hospitalization for seizures, and no history of status epilepticus. *LoE:IVb*[29]

- Lamotrigine, oral
  Monotherapy:
  - Starting daily dose: 0.2 mg/kg/dose.
  - Increase slowly at 2 weekly intervals to 1–5 mg/kg/dose 12–24 hourly.
  - Rapid escalation associated with adverse effects (e.g., skin rash).

Table 4: Dosing regimens when lamotrigine is used as add-on therapy:

	Week 1 and 2	Week 3 and 4	Maintenance dose
Add on therapy where regimen **does not include valproate** or other inducers/inhibitors of lamotrigine glucuronidation	0.3 mg/kg in one or two divided doses.	0.6 mg/kg in one or two divided doses.	0.6 mg/kg increments every 1–2 weeks to achieve a maintenance dose of 1–10 mg/kg (once a day or two divided doses) to a maximum of 200 mg/day.
Add-on therapy where **regimen includes ASMs that induce lamotrigine glucuronidation** *(e.g. phenytoin, carbamazepine, phenobarbital, etc.)*	0.6 mg/kg in two divided doses.	1.2 mg/kg in two divided doses.	1.2 mg/kg increments every 1–2 weeks to achieve a maintenance dose of 5–15 mg/kg (once a day or two divided doses) to a maximum of 400 mg/day.
Add-on therapy where **regimen includes valproate** *(regardless of other concomitant medication)*	0.15 mg/kg daily.	0.3 mg/kg daily.	0.3 mg/kg increments every 1–2 weeks to achieve a maintenance dose of 1–5 mg/kg (once a day or two divided doses) to a maximum of 200 mg/day.

LoE:IVb[30]

CAUTION - LAMOTRIGINE
Lamotrigine may cause Stevens-Johnson Syndrome.

- Levetiracetam, oral,
  - Infants 1 to < 6 months:
    - Initial dose: 7 mg/kg/dose twice daily.
    - Increase dosage every 2 weeks by 7 mg/kg/dose twice daily based on response and tolerability to the recommended dose of 21 mg/kg/dose twice daily.

  - Infants ≥ 6 months and children < 4 years:
    - Initial dose: 10 mg/kg/dose twice daily.
    - Increase dosage every 2 weeks by 10 mg/kg/dose twice daily based on response and tolerability to the recommended dose of 25 mg/kg/dose twice daily.
  - Children ≥ 4 years to 12 years:
    - Initial dose: 10 mg/kg/dose twice daily.
    - Increase dosage every 2 weeks by 10 mg/kg/dose twice daily based on response and tolerability to the recommended dose of 30 mg/kg/dose twice daily.

- Carbamazepine, oral, 5 mg/kg/day (starting dose), 8–12 hourly.
  - Increase slowly by 2 mg/kg/day at 2 weekly intervals.
  - Usual maintenance total daily dose: 10–20 mg/kg/day.
  - Maximum total daily dose: 20 mg/kg/day.
  - Dosage intervals: syrup 8 hourly, tablets 12 hourly.
  - Exacerbates myoclonic seizures and absence seizures.

- Valproate, oral, 5 mg/kg/dose (starting dose), 8–12 hourly.
  - Increase by 5 mg/kg weekly to 15–20 mg/kg/day, given 8–12 hourly over 4 weeks.
  - Usual maintenance dose: 20-30 mg/kg/day.
  - Maximum total daily dose: 40 mg/kg/day.
  - Exclude liver dysfunction prior to initiating therapy (at least ALT), in children under 2 years or if clinical suspicion of liver dysfunction or metabolic disease.
  - Consider hepatotoxicity if clinical signs such as nausea, vomiting, malaise, jaundice or abdominal pain develop.

- Phenobarbital, oral, 3–5 mg/kg/dose as single dose at night.
  - May be used in children under six months of age.
  - Not recommended as maintenance therapy for children older than 2 years due to undesirable side-effects such as sedation, behaviour disturbances, hyperkinesia and dependence, except in situations where there is poor adherence to other drugs.
  - Exacerbates absence seizures.

REFERRAL

» Suspected but undiagnosed secondary cause for seizures (e.g., structural, metabolic, infectious, genetic causes).
» All myoclonic seizures and infantile epileptic spasms at presentation.
» Mixed seizure types in one patient.
» Focal seizures requiring neuroimaging (MRI preferred).
» Neuroregression (loss of previously acquired milestones or skills).

» Seizure-free patients on therapy for ≥ 5 years to assess whether treatment discontinuation is appropriate.

Information that should accompany each referral case.

» Number and frequency of seizures per month (or year).
» Date and time of most recent seizures.
» Detailed description of the seizures, including:
  – aura or warning sign ;
  – what happens during the seizure? (give a step-by-step account);
  – is the person conscious during the seizure?
  – how long do the seizures last on average?
  – what does the patient experience after the seizure e.g., weakness, loss of speech?
  – how long does this experience last?
» Is there a family history of seizures?
» What is the initial date of diagnosis?
» Is there evidence of alcohol use?
» Are there any comorbid conditions, e.g., diabetes, HIV and what medication is used?
» What is the name and dosage of the ASM used to date?
» Does the person return regularly for repeat of medication?

15.7.1.1 EPILEPSY SYNDROMES
G40.3-5

See Paediatric Hospital Level STGs and EML Chapter 13: the Nervous System, Section 13.4.1.1: Epilepsy Syndromes.

15.7.2 EPILEPSY IN ADOLESCENTS AND ADULTS
G40.0-9

DESCRIPTION
See Section 15.7: Epilepsy.

Diagnostic criteria
» The diagnosis of epilepsy is usually made clinically.
» Take an adequate history and get an accurate witness description of the seizures to define the type of epilepsy.
» Juvenile myoclonic epilepsy and absence seizures specifically should be considered and identified, as some first line medicines may be less efficacious or may even worsen seizure frequency or severity.
» Patients with new onset epilepsy should have a CT scan (this is essential in immunocompromised patients), and other investigations as clinically indicated.

Special considerations

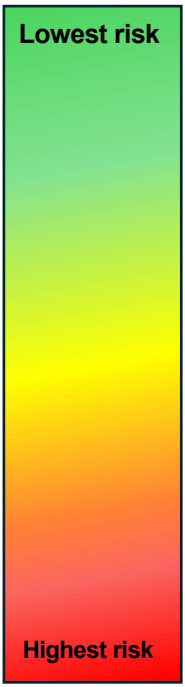
Women and girls of child-bearing potential and pregnancy

» Antiseizure medicines during pregnancy can cause structural or physical malformations and neurodevelopmental harms that may impact learning and education.
» The risk of antiseizure medicine to the unborn child needs to be balanced against the risk of uncontrolled seizures to both the mother and unborn child.
» The risk associated with each antiseizure medicine during pregnancy differs (see Figure 4).
» Women and girls of child-bearing potential with epilepsy should be counselled regarding contraception and the need to plan pregnancy.
  – NOTE: There are important drug-drug interactions between hormonal contraceptives (except DMPA) and several anticonvulsant medicines (e.g. carbamazepine, phenobarbital, phenytoin).
  – Progestin-only injectable contraceptives or IUCDs are the preferred contraceptive methods for women of child-bearing potential on ASM medication. See Chapter 7: Family planning.

It is crucial to treat epilepsy during pregnancy to prevent epileptic seizures, which pose significant risks to both the mother and the fetus/infant.

» In pregnant women, women of child-bearing potential (i.e. women < 55 years), and young girls who are likely to need to continue treatment into their child-bearing years, should initiate treatment with a lower risk antiseizure medication.
  – Lamotrigine and levetiracetam are safer antiseizure medicines to use.
  – Large amounts of data consistently show no increased risk of major congenital malformations associated with the use of lamotrigine or levetiracetam at usual doses.
  – Since lamotrigine requires slow dose titration, initiation of lamotrigine is best suited to low-risk patients.
  – Levetiracetam may be used if there is a poor response or adverse effects to lamotrigine, or in high-risk patients.
  – Seizure risk is based on clinical judgement (discuss with a specialist if unsure). In general, high-risk patients are those with frequent seizures, a previous history of hospitalisation for seizures, or previous history of status epilepticus. Low-risk patients are those with infrequent seizures, no previous hospitalisation for seizures, and no history of status epilepticus.

» Valproate **must not** be used in pregnant women, women of child-bearing potential and young girls who are likely to need continued treatment into their child-bearing years.
  – In women who take valproate while pregnant, around 1 in 9 babies (11%) will have a major birth defect and about 3–4 children in every 10 may have neurodevelopmental problems and these disorders can be seriously debilitating and permanent (e.g. delayed learning to walk and talk, lower intelligence, poor speech and language skills, memory problems, autism or autism spectrum disorders, attention deficit hyperactivity disorder).
  – In situations where valproate is deemed the only option in a female patient after all other treatment options have been ruled out, health professionals (prescribers and dispensers) are required to:
    ▪ Regularly review treatment.
    ▪ Provide counselling on the risks of valproate use in pregnancy.
    ▪ Ensure that the woman has completed and signed an acknowledgment of risk form annually: https://www.sahpra.org.za/wp-content/uploads/2025/05/GLF-CEM-PV-S01_v2-Valproate-Annual-Risk-Acknowledgement-Form-ARF.pdf
    ▪ Provide supplemental folic acid, oral, 5 mg daily.
» Women and girls with epilepsy who discover they are pregnant should not abruptly stop their ASM due to the risk of seizures.
  – Women and girls who become pregnant while on valproate should be transitioned off valproate and onto levetiracetam as early as possible during pregnancy to decrease the risk of neurodevelopmental harms, provided their seizures are not refractory to other antiseizure medications.
» During pregnancy, women may experience an increased number of seizures.
  – This may be due to sleep deprivation, increased emotional stress and changes in antiseizure medicine concentrations.
  – Antiseizure medication concentrations may decrease during pregnancy due to decreased absorption from nausea and vomiting, increased volume of distribution and increased clearance of antiseizure medicines.
  – There is increased hepatic metabolism of lamotrigine and increased renal clearance of levetiracetam in pregnancy, which returns to normal post-partum. Increase the dose if necessary, according to clinical response.



Lamotrigine, levetiracetam

Compared to the general population, lamotrigine and levetiracetam are associated with no increased risk or only a minimally increased risk of structural malformations. There is limited data on the risk of neurodevelopmental harms associated with levetiracetam and lamotrigine.

Carbamazepine

Carbamazepine is associated with a modestly increased risk of structural malformations and neurodevelopmental harms.

Phenobarbital, phenytoin, topiramate

Phenobarbital, phenytoin and topiramate are associated with a moderately increased risk of structural malformations and neurodevelopmental harms.

Valproate

Valproate is associated with the highest risk of structural malformations and neurodevelopmental harms.

Figure 4. Risk of congenital structural malformations and neurodevelopment harms associated with various antiseizures medicines. Increasing risk refers to increasing number of pregnancies or children affected. Adapted from Pennell PB. *Neurotherapeutics*. 2016 and Medicines & Healthcare products Regulatory Agency safety leaflet. *LoE:IVb*[31]

CAUTION – ASM and pregnancy

Children born to women taking valproate are at significant risk of birth defects (11%) and persistent developmental disorders (40%).

Valproate is contra-indicated and should be avoided in pregnancy and women or adolescents of child-bearing potential. *LoE:IIIb*[32]

Children and adolescents transitioning to adult care

» Children and adolescents whose seizures are controlled on levetiracetam should be continued on levetiracetam in adulthood.

Adults on ART

» Lamotrigine is the preferred ASM in people on ART because of fewer medicine interactions.
» Phenytoin, phenobarbital and carbamazepine are enzyme inducing ASM. Due to potential drug interactions with ARVs, switch these medicines to lamotrigine.
» Where concurrent use of dolutegravir and carbamazepine, phenytoin, or phenobarbital is unavoidable, double dolutegravir dose to 50 mg 12-hourly.
» The metabolism of lamotrigine is induced by lopinavir/ritonavir and atazanavir/ritonavir. The dose of lamotrigine may need to be increased if patients are switched to/initiated on lopinavir/ritonavir or atazanavir/ritonavir.

GENERAL AND SUPPORTIVE MEASURES

» Patients should record dates and, if possible, times of seizures in a seizure diary. Review seizure diary at each consultation for assessment of therapy.
» Patients with epilepsy should be issued a disease identification bracelet, necklace or card.
» Patients with uncontrolled seizures should avoid driving, swimming, working at heights and operating machinery until they have been seizure free for one year. Refer to an occupational therapist for rehabilitation and a workplace assessment. The patient should sign in the medical notes that they have received workplace and lifestyle advice.
» Provide counselling and advice on:
  – the adverse effect of alcohol on seizures,
  – sleep hygiene,
  – the effect of missing a dose of medication,
  – discontinuing the medication without advice of a doctor.

MEDICINE TREATMENT

Acute treatment

Manage acute seizure and status epilepticus as per seizures/status epilepticus, see Sections 15.4: Epileptic Seizures, and 15.5: Status epilepticus.

Maintenance Treatment

» Refer to the table below for guidance around the choice of medicine by seizure type.
» HIV status, child-bearing potential and pregnancy are important determinants of medicine choice.
» The antiseizure treatment strategy should also be individualised based on use of other medicines, comorbidities, as well as response to medication, and adverse effects.
» The goal of medicine treatment is to prevent recurrent seizures and optimise quality of life.
» As a general rule, a single ASM (monotherapy) is best. Progressively increase the dose of the ASM until the seizures are controlled or clinically important side effects occur.
» Recommended drug doses are general guides and will be effective in most patients. However, some patients may need much higher or lower doses. Doses should be increased at 2-weekly intervals only.
» If the initial ASM fails to achieve satisfactory control (no seizures) at optimal dosages, or causes unacceptable adverse effects, then a trial of a second ASM medicine may be commenced.
» Initiate second medicine, titrate to therapeutic dose, then gradually reduce and stop the first ASM over 6–8 weeks or longer if necessary. (See notes below for individual medicines).
» Failure of second-line monotherapy, after exclusion of alcohol use/misuse and poor adherence, may require add on therapy. Add on therapy may be initiated by a medical practitioner in consultation with a specialist.
» Therapeutic drug monitoring is not necessary in stable patients, but should be performed in the following situations:
  – To confirm ASM toxicity in a symptomatic patient,
  – In patients with poor seizure control,
  – To confirm suspected poor adherence despite self-reported good adherence.
» Phenytoin is not recommended in the table below; however, it may be continued in adults whose seizures are well-controlled on phenytoin. Therapeutic drug monitoring should be conducted in patients receiving higher than usual doses of phenytoin.
» Long term use of phenytoin and carbamazepine are associated with potential risks. Continued use of these ASM requires careful consideration of the balance between benefits and risks in individual patients.

MEDICINE INTERACTIONS *LoE:IVb*[33]

Phenytoin, phenobarbital and carbamazepine are potent enzyme inducing agents and should be used with caution with other medicines metabolised by the liver, especially warfarin, antiretrovirals, progestin subdermal implants and oral contraceptives

Table 5: Epilepsy treatment in adolescents and adults

Epilepsy type		Population	1st line	2nd line	Comments
Focal epilepsy	With and without evolution to bilateral tonic-clonic seizures	Adolescent boys, men and women not able to have children	Lamotrigine	Carbamazepine OR Levetiracetam	Avoid carbamazepine in people with HIV on ART due to drug-drug interactions
		Pregnant women and women of child-bearing potential	Lamotrigine	Levetiracetam	Avoid carbamazepine in people with HIV on ART due to drug-drug interactions
Generalised epilepsy	Tonic-clonic, atonic, clonic or tonic seizures	Adolescent boys, men and women not able to have children.	Lamotrigine (low-risk)* **OR** Levetiracetam (high-risk)*	Lamotrigine or levetiracetam (whichever not used as first line) **OR** Valproate	Valproate should not be used unless lamotrigine and levetiracetam are poorly tolerated or ineffective. If valproate used in girls 10 years and older - see note below on acknowledgement of risk form.
		Pregnant women and women of child-bearing potential	Lamotrigine (low risk)* **OR** Levetiracetam (high-risk)*	Levetiracetam or lamotrigine (whichever not used as first line) **OR** Consider combination therapy with lamotrigine and levetiracetam	Valproate should not be used unless lamotrigine or levetiracetam alone or in combination are ineffective or poorly tolerated. **If valproate is used,** see note below on "Acknowledgment of risk form" and effective family planning.
	Myoclonic *Confirm diagnosis and discuss management with a specialist*	Adolescent boys, men and women not able to have children	Valproate	Lamotrigine	These seizures may be aggravated by phenytoin or carbamazepine. Lamotrigine may be effective but may also exacerbate myoclonic seizures.

Epilepsy type	Population	1st line	2nd line	Comments
Myoclonic (continued)				If valproate used in girls 10 years and older - see note below on acknowledgement of risk form.
	Pregnant women and women of child-bearing potential	Lamotrigine	Levetiracetam	These seizures may be aggravated by phenytoin or carbamazepine. Lamotrigine may be effective but may also exacerbate myoclonic seizures.
Absence *e.g. Juvenile absence epilepsy or persistent childhood absence epilepsy*	Adolescent boys, men and women not able to have children	Valproate	Lamotrigine	These seizures may be aggravated by phenytoin or carbamazepine. If valproate used in girls 10 years and older - see note below on acknowledgement of risk form.
	Pregnant women and women of child-bearing potential	Lamotrigine	Levetiracetam	These seizures may be aggravated by phenytoin or carbamazepine. Valproate should not be used unless lamotrigine or levetiracetam, alone or in combination, are ineffective or poorly tolerated. **If valproate is used**, see note below on "Acknowledgment of risk form" and effective family planning.
Combined generalised and focal epilepsy OR Unknown/unclassified Discuss clinical presentation and management with a specialist in all cases.				

Epilepsy type	Population	1st line	2nd line	Comments
NOTE: » Lamotrigine is the preferred first line treatment for all adult patients, including women of child-bearing potential, pregnant women, and people living with HIV. » Lamotrigine requires slow dose up-titration and may not be suitable in people at high-risk of seizures. *High-risk patients are those with frequent seizures, a previous history of hospitalization for seizures, or previous history of status epilepticus. Low-risk patients are those with infrequent seizures, no previous hospitalization for seizures, and no history of status epilepticus. » **If valproate is used in girls, an acknowledgment of risk form must be obtained annually, even if not of child-bearing potential. Girls aged 10 years and older should receive effective family planning and consider a long-acting form of contraception**. https://www.sahpra.org.za/wp-content/uploads/2025/05/GLF-CEM-PV-S01_v2-Valproate-Annual-Risk-Acknowledgement-Form-ARF.pdf. *LoE:IVb*[34] *Assess level of risk (high vs low) based on clinical judgement and discuss with a specialist if unsure. In general, high-risk patients are those with frequent seizures, a previous history of hospitalization for seizures, or previous history of status epilepticus. Low-risk patients are those with infrequent seizures, no previous hospitalization for seizures, and no history of status epilepticus.				

MEDICINE TREATMENT

- Lamotrigine, oral (Doctor initiated).

Table 6: Dosing table for lamotrigine as monotherapy or add-on therapy
Dose-titrate as per table below:

	Week 1 and 2	Week 3 and 4	Maintenance dose
Monotherapy	25 mg daily	50 mg daily	100–200 mg (once a day or two divided doses). To achieve maintenance, doses may be increased by 50–100 mg every 1–2 weeks.
Add on therapy where **regimen does not include** valproate or other inducers/inhibitors of lamotrigine glucuronidation	25 mg daily	50 mg daily	100–200 mg (once a day or two divided doses). To achieve maintenance, doses may be increased by 50–100 mg every 1–2 weeks.
Add-on therapy where **regimen includes ASMs that induce glucuronidation** *(e.g. phenytoin, carbamazepine, phenobarbital, etc.)*	50 mg daily	100 mg in two divided doses	200–400 mg (two divided doses). To achieve maintenance, doses may be increased by 100 mg every 1–2 weeks.
Add-on therapy where **regimen contains valproate** *(regardless of other concomitant medication)*	25 mg on alternate days	25 mg daily	100–200 mg (once a day or two divided doses). To achieve maintenance, doses may be increased by 25–50 mg every 1–2 weeks.

Note:

» If therapy is interrupted for more than a week, restart the titration protocol.
» Metabolism of lamotrigine is induced by lopinavir/ritonavir and atazanavir/ritonavir. The dose of lamotrigine may need to be increased when people with HIV are switched to or initiate lopinavir/ritonavir or atazanavir/ritonavir.
» Metabolism of lamotrigine is induced during pregnancy. The dose of lamotrigine may need to be increased during pregnancy.

LoE:IVb[35]

CAUTION - LAMOTRIGINE
Lamotrigine may cause Stevens-Johnson Syndrome.

LoE:IVb[36]

- Carbamazepine, oral:
  - Start with 100 mg 12 hourly.
  - Increase by 100–200 mg/day at weekly intervals according to seizure control and adverse events.
  - Usual maximal dose: 600 mg 12 hourly. *LoE:IIIb*[37]

- Levetiracetam, oral Initially 250 mg 12 hourly, increasing to a therapeutic dose of 500 mg 12 hourly.
  - Dose can be adjusted upwards in increments of 500 mg 12 hourly every 2 to 4 weeks to a maximum of 1500 mg 12 hourly (3000 mg per day).

- Valproate, oral:
  - Usual starting dose: 200–300 mg 12 hourly.
  - Increase, as required, every 3 days to 2 weeks (depending on the seizure frequency) to a maximum dose of 1200 mg 12 hourly.

- Phenytoin, oral, 4.5–5 mg/kg (lean body mass) daily, at night.
  - Only consider continuing phenytoin in patients already well controlled on phenytoin, and in whom phenytoin is well tolerated.
  - Usual starting and maintenance dose in adults: 300 mg once daily.
  - Dose increases above 300 mg should be done in no more than 50 mg increments at intervals no shorter than 2 weeks.
  - Doses > 300 mg/day of phenytoin are potentially toxic and could lead to permanent cerebellar damage. Caution and frequent monitoring of drug levels are obligatory at doses > 300 mg daily.

LoE:IVb

Poorly controlled epilepsy

» Ensure diagnosis of epilepsy and seizure type is confirmed, and imitators of epileptic seizures excluded.

» Ask the patient, and if possible, a family member or primary care giver, about the following, as these factors can influence decisions regarding medicine therapy:
  – Has the patient been adherent in taking the medication regularly for at least 2 weeks or more before the seizure? Ask about medicine dosage and frequency.

- If non-adherence has been established, ask for reasons contributing to non-adherence and offer guidance.
- Has the patient recently used some other medicine and/or herbal remedy (i.e. look for drug interactions, substance use or traditional medicine use).
- Is there a chance that alcohol is involved?
- If ≥ 1 of the above are present, address the problem/s but leave ASM unchanged (unless dose adjustment is necessary because of a drug interaction). Reassess the patient within 2 weeks.

REFERRAL

» All patients with new onset epilepsy for further investigations such as neuroimaging.
» Patients with seizures other than generalised tonic-clonic seizures, including absence seizures.
» Patients with an increase in seizure frequency despite attempts to address adherence issues.
» Patients with a change in seizure type.
» Patients who have been seizure free on ASM for 2 years or more, to review medications and to consider cessation of treatment.
» Development of new neurological signs and symptoms.
» Adverse medicine reactions or suspected toxicity in children.
» If uncontrolled on monotherapy, and patient has been shown to be adherent, referral for initiation of a second agent can be made to a medical officer at primary care level and does not require hospital / specialist referral.

Information that should accompany each referral case:

» Number and frequency of seizures per month (or year).
» Date and time of most recent seizures.
» Detailed description of the seizures, including:
  - Presence of an aura or warning signs;
  - what happens during the seizure? (give a step-by-step account)
  - is the person conscious during the seizure?
  - how long do the seizures last on average?
  - what does the patient experience after the seizure?
  - how long does this experience last?
» Is there a family history of seizures?
» What is the initial date of diagnosis?
» Is there evidence of alcohol use?
» Is there another medical condition, e.g. diabetes, HIV and what medication is used?
» What is the name and dosage of the ASM used to date?
» Does the person return regularly for repeat of medication?

15.8 MENINGITIS

15.8.1 ACUTE MENINGITIS

A39.0+(G01*)/G00.0-3/G00.8-9/G01/G02.0-1/G02.8/G03.0/G03.8-9

DESCRIPTION

Infection of the membranes of the brain.

Clinical signs and symptoms include:

- » headache
- » neck stiffness
- » vomiting
- » fever
- » impaired level of consciousness
- » photophobia
- » bulging fontanelle in infants

Note:

- » During the early phase of TB meningitis, malaise, low-grade fever, headache and personality change rather than the above-mentioned symptoms may be present.
- » Duration of treatment for TB meningitis is 9 months.

Neck stiffness is rare in young children, especially in neonates, and may be absent in adults, especially debilitated patients and the elderly.

Young children with fever, vomiting and convulsions or an impaired level of consciousness must be assumed to have meningitis. Signs may be even more subtle in newborns.

EMERGENCY MEASURES

- » Stabilise before referral.
- » Treat for shock, if present.
- » If patient's level of consciousness is depressed:
  - maintain airway
  - give oxygen
- » Ensure hydration.
- » If convulsing, see Section 21.2.11: Seizures and status epilepticus.

MEDICINE TREATMENT

Initiate medicine treatment before transfer.

Children

- Ceftriaxone, IM/IV, 100 mg/kg/dose immediately as a single dose before referral. See dosing table: Chapter 23.
  - For IM administration, do not inject more than 1 g at one injection site.
  - Maximum pre-referral dose: 2 g IM/IV.
  - If referral is delayed, repeat dose after 12 hours.
  - Maximum daily dose of 4 g, given in divided doses 12 hourly.

LoE:IVb[38]

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If *SUSPECTING SERIOUS BACTERIAL INFECTION* in neonate, give ceftriaxone, even if jaundiced.

» Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:
- If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
- If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
- Preferably administer IV fluids without calcium contents.

» Always include the dose and route of administration of ceftriaxone in the referral letter.

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

AND/OR

- NSAID, e.g.:
- Ibuprofen, oral, 5–10 mg/kg/dose 8 hourly with or after a meal. See dosing table: Chapter 23.

Adults

- Ceftriaxone, W IM, 2 g immediately before referral.
  - Do not inject more than 1 g at one injection site.
  - If referral is delayed, repeat dose after 12 hours.

LoE:IVb[39]

- Paracetamol, oral, 500 mg–1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

AND/OR

- NSAID, e.g.:
- Ibuprofen, oral, 400 mg then 8 hourly with meals, if needed.

Severe pain:

- Tramadol, oral, 50–100 mg 4–6 hourly.
  - May be increased to a maximum daily dose of 400mg.

During a listeria outbreak, ADD as a pre-referral dose:

A32.1/A32.7-9

Children

- Ampicillin, A IM/IV 75 mg/kg/dose immediately before referral.
  - If referral is delayed by 6 hours or more, administer second dose.

Weight kg	**Dose** mg	**Injection** 500 mg/mL (500 mg diluted in 0.9 mL water for injection (WFI))	**Age** months/years
>3.5–5.5 kg	300 mg	0.6 mL	>1–3 months
>5–7 kg	450 mg	0.9 mL	>3–6 months
>7–9 kg	600 mg	1.2 mL	>6–12 months
>9–11 kg	750 mg	1.5 mL	>12–18 months
>11–17.5 kg	1000 mg	2 mL	>18 months–5 years
>17.5–25 kg	1500 mg	3 mL	>5–7 years
>25–35 kg	2000 mg	4 mL	>7–11 years
>35 kg	3000 mg	6 mL	>11 years

Adults

- Ampicillin, A IM/IV, 3 g immediately before referral.
  - If referral is delayed by 6 hours or more, administer second dose.

Severe penicillin allergy:

Z88.0

Children

- Cotrimoxazole, A oral, immediately before referral. See dosing table: Chapter 23.
  - If referral delayed by 12 hours or more, administer second dose.

Adults

- Cotrimoxazole, A oral, 80/400 mg immediately before referral. *LoE:IVb*[40]
  - If referral delayed by 12 hours or more, administer second dose.

REFERRAL

All patients with meningitis, or suspected meningitis or suspected listeria meningitis.

15.8.2 MENINGOCOCCAL MENINGITIS, PROPHYLAXIS

Z20.8+Z29.2

In cases of meningococcal infection, the following close contacts should receive prophylaxis:

» household members,
» child-care centre contacts, and

» anyone directly exposed to the patient's oral secretions, e.g. kissing, mouth-to-mouth resuscitation, endotracheal intubation, or endotracheal tube management.

Chemoprophylaxis is only effective for the current exposure.

MEDICINE TREATMENT

Prophylaxis

Children < 6 years of age

- Ceftriaxone, (W) IM, 125 mg, as a single dose.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If *SUSPECTING SERIOUS BACTERIAL INFECTION* in neonate, give ceftriaxone, even if jaundiced.

» Always include the dose and route of administration of ceftriaxone in the referral letter.

Children 6–12 years of age

- Ciprofloxacin, (W) oral, 250 mg, as a single dose.

Children > 12 years of age and adults

- Ciprofloxacin, (W) oral, 500 mg, as a single dose.

LoE:IIIb[41]

Pregnant women

- Ceftriaxone, (W) IM, 250 mg, as a single dose.

15.8.3 CRYPTOCOCCAL MENINGITIS

See Section 11.3.4: Cryptococcosis.

15.9 HEADACHE, MILD, NON-SPECIFIC

R51

DESCRIPTION

Headache can be benign or serious.

Headache can have serious underlying causes including:

» encephalitis
» meningitis
» mastoiditis
» benign intracranial hypertension
» hypertensive emergencies
» venous sinus thrombosis
» stroke
» brain tumour

Headache due to a serious disease will often be associated with neurological symptoms and signs including:

» vomiting
» fever
» mood change
» cranial nerve fall-out
» convulsions
» confusion
» impaired consciousness
» pupillary changes and difference in size
» focal paralysis
» visual disturbances
» neck stiffness

Tension headache due to muscle spasm:
» May be worse in the afternoon but often present all day.
» Is normally felt in the neck and the back of the head but may be felt over the entire head.
» Is often associated with dizziness and/or blurring of vision.
» Is often described as a tight band around the head or pressure on the top of the head.
» Does not progress through stages like a migraine (no nausea, no visual symptoms).

GENERAL MEASURES
» Teach relaxation techniques where appropriate.
» Reassurance, where applicable.
» Exclude analgesia overuse headache.

MEDICINE TREATMENT
Children
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing tables: Chapter 23.

Adults
- Paracetamol, oral, 500 mg–1 g, 4–6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

REFERRAL
» Refer patients with suspected meningitis immediately after initial treatment. See Section 15.8: Meningitis.
» Headache in children lasting for 3 days.
» Recent headache of increasing severity.
» Headache with neurological manifestations.
» Analgesia overuse headache.
» Newly developed headache persisting for >1 week in an adult.
» Chronic recurrent headaches in an otherwise healthy patient: refer if no improvement after 1 month of treatment.
» Tension headache due to muscle spasm: refer if no improvement after 1 month of treatment.

15.10 NEUROPATHY
DESCRIPTION
Defective functioning of nerves, which may involve peripheral nerves (peripheral neuropathy) and/or cranial nerves.
Clinical features may be predominantly of a sensory, sensorimotor or motor nature.

15.10.1 POST-HERPES ZOSTER NEUROPATHY (POST HERPETIC NEURALGIA)

See Section 10.13: Shingles (Herpes zoster).

15.10.2 BELL'S PALSY

G51.0

DESCRIPTION

Unilateral paralysis of all the muscles of facial expression (the corner of the mouth drops, the forehead is unfurrowed, and the eyelid will not close).

Taste sensation may be lost unilaterally and hyperacusis (painful sensitivity to loud sounds) may be present.

Most patients recover within a few weeks or months.

GENERAL MEASURES

» HIV testing.
» Referral for facial muscle massage and exercises
» Eye patch for protection of the eye during sleep.

MEDICINE TREATMENT

Adults — *LoE:IVb*[42]

- Corticosteroids (intermediate-acting) e.g.:
- Prednisone, oral, 60 mg daily for 7 days started within 72 hours, preferably within 48 hours of onset (Doctor prescribed). — *LoE:Ia*[43]

Children

- Corticosteroids (intermediate-acting) e.g.: — *LoE:IVb*[44]
- Prednisone, oral, 2 mg/kg daily for 7 days within 3 days of onset (Doctor prescribed).

Weight (kg)	Dose (mg)	Tablet (5 mg)	Age (Months/years)
>17.5–25 kg	40 mg	8 tablets	>5–7 years
>25–40 kg	55 mg	11 tablets	>7–12 years

REFERRAL

» If diagnosis uncertain.
» All cases for physiotherapy, if available.
» Eye irritation requiring lubrication.

15.10.3 PERIPHERAL NEUROPATHY

E10.4/E11.4/G60.9/G62.0-1/G62.9

DESCRIPTION

Initially sensory symptoms consisting of tingling, prickling, burning in the balls of the feet or tips of the toes or in a general distribution over the soles. The symptoms are symmetrical and with progression spread proximally.

Later sensory loss over both feet and weakness of dorsiflexion of the toes may be present. Patients may experience difficulty in walking on their heels and foot drop becomes apparent.

Common causes include HIV, diabetes mellitus, isoniazid, antiretrovirals, vitamin B12 deficiency and alcohol.

GENERAL MEASURES

» HIV testing.
» Screen for diabetes mellitus, syphilis and vitamin B12 deficiency
» Avoid alcohol.
» A balanced diet to prevent nutritional deficiency.

MEDICINE TREATMENT

» Stop the offending medicine or give suitable substitute.
» Patients on isoniazid (TB treatment or prophylaxis): increase pyridoxine to 25–50 mg 8 hourly for 3 weeks, followed by 25–50 mg daily.
- Amitriptyline, oral, 25 mg at night (Doctor prescribed).
  - Titrate at two weekly intervals to a maximum of 75 mg at night.

REFERRAL

» All children.
» All patients to rehabilitation to improve postural control and gait as well as education for prevention of complications.
» Difficulty in walking or foot drop.
» Any limb weakness present.
» Unsteady/ataxic gait.
» Severe sensory loss. *LoE:IIIb*[45]

15.11 CEREBRAL PALSY

G80.0-4/G80.8-9

DESCRIPTION

Cerebral palsy (CP) is a neurodevelopmental disorder resulting from an injury to the developing brain.

The most common type of CP is hypertonia/spasticity (85%), followed by dyskinesia (7%), ataxia (4%), and hypotonia (3%). The distribution of motor impairment may be bilateral (as in diplegia, quadriplegia, or triplegia) or unilateral (as in hemiplegia).

The primary impairments associated with CP include reduced muscle strength, impaired sensation, abnormal muscle tone and reduced cardiorespiratory fitness, resulting in difficulties performing selfcare activities and mobility. Some children with CP experience hearing loss, which may affect posture and balance.

Poor communication from speech and language impairment may also occur.

GENERAL MEASURES

» Children with CP require regular screening of their general health and wellbeing e.g. for evidence of neglect or abuse, infections, constipation, and malnutrition.
» Refer to rehabilitation services to optimise function, training on assistive devices, assessment, and management of hearing and communication problems, as well as caregiver training and support.

LoE:IIIb[46]

15.12 SPINAL CORD INJURIES

DESCRIPTION

Multiple symptoms may manifest in these patients, requiring accompanying medications and rehabilitative therapy at different levels of care.

Patients with spinal cord injuries may initially be managed at hospital level before referral to primary care level for long-term management. After referral, patients should be assisted with access of items prescribed at hospital level to ensure continuity of care.

GENERAL MEASURES

LoE:IIb[47]

Refer patients with cervical spinal cord injury for multidisciplinary rehabilitation to optimise cardiorespiratory and functional (including mental health) performance.

MEDICINE TREATMENT

Neurogenic bowel dysfunction

For constipation, see Section 2.8: Constipation.

Neuropathic and nociceptive pain

See Section 20.3: Chronic non-cancer pain.

Depression

See Section 16.4.1: Depressive disorders.

Anxiety

See Section 16.3: Anxiety disorders.

Infections

See Chapter 10: Infections and related conditions.

Pressure sores

See Section 5.19: Pressure ulcers/sores.

REFERRAL

» All patients for initial multidisciplinary assessment and management.
» Patients who require treatment for chronic conditions not covered above, such as spasticity, neurogenic bladder, DVT (prophylaxis or treatment), and osteoporosis.

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PHC Chapter 16: Mental Health Conditions

Nurses with authorisation as provided by Section 56(6) of the Nursing Act 33 of 2005 may initiate and/or maintain treatment with medicines as per the STGs and in accordance with their scope of practice.

Precepts of the Mental Health Care Act (MHCA) No. 17 of 2002 include:

» All people with mental illness and/or intellectually disability must be managed under the Act and its regulations as either Voluntary, Assisted or Involuntary Mental Health Care Users.
» All registered medical practitioners, professional nurses, psychologists, occupational therapists (OTs), social workers, and registered counsellors whose training includes mental health are designated Mental Health Care Practitioners.
» At the PHC level, familiarity with MHCA Forms 01, 02, 04, 05, 07, 11, 13A, 22, and 48. An understanding of the related processes is required by all mental health practitioners.
» Specific obligations of the South African Police Service (SAPS) to protect, apprehend, and assist with transfer, people with mental illness.
» For children that present with mental health conditions at a primary care setting:
» Identify and manage sensory impairments and underlying medical conditions.
  - Consider developmental delay and refer for educational interventions.
» Ask about family/psychosocial stressors and/or potential abuse, and refer to social worker.

Meaning of selected terminology used in this chapter:

» **Psychoeducation** (psychological education) involves informing a patient and their family or support system about their illness and providing problem solving, communication, and assertiveness skills training. The goals are to enable understanding, self-care, crisis management, suicide prevention, and relapse prevention. Information on aetiological factors, signs and symptoms, early signs of relapse, treatment options, need for adherence to treatment, and long-term course and outcome should be provided with consideration of the individual and their family's culture, beliefs, and coping mechanisms. Myths and misconceptions regarding the illness and its treatment are identified and managed in a person-centred manner. Advice on managing difficult behaviour and emergency situations is provided, and stigma should be dispelled.

  Psychoeducation may require several individual, family, or group sessions, depending on the complexity of the illness, understanding of the problem by the individual, and their family/support system. Involvement of a registered counsellor, occupational therapist, and/or social worker is advised.

  LoE:IVb[1]

» **Risk assessment** refers to a clinical judgement of the patient's potential for:
  - suicide or self-harm,
  - aggression or violence towards others,
  - being assaulted by others,
  - high risk impulsive or addictive behaviour for e.g. high-risk sexual intercourse,
  - severe self-neglect,

- being exploited,
- reputational damage,
- non-adherence to treatment,
- causing damage to property,
- poor physical health.

A risk assessment is performed by collecting information from the patient and relevant stakeholders, which may include the person's family/support system, healthcare providers (including community health workers, or social workers who have knowledge of the person's home), as well as past clinical and forensic history.

Close attention must be given to women in the perinatal period, people who care for others (e.g., parents, grandparents, teachers, and health and social care providers), and those with previous high-risk behaviour.

While the clinical judgement may not always be accurate, it should be justified by the available information. The clinical judgement serves to inform precautionary interventions, e.g., close clinical follow-up after hospital discharge with increased attention by the Ward-Based Outreach Teams (WBOT), referral to social welfare/statutory services, advice regarding a protection order, and/or further psychoeducation.

A useful clinical guideline on how to conduct a risk assessment is available at: https://www.seslhd.health.nsw.gov.au/sites/default/files/documents/SESLHDGL%20082%20-%20%20Clinical%20Risk%20Assessment%20and%20Management%20-%20Mental%20Health1.pdf

LoE:IVb[2]

16.1 AGGRESSIVE DISRUPTIVE BEHAVIOUR

16.1.1 ACUTE CONFUSION - DELIRIUM

See Section 21.2.4: Delirium.

16.1.2 AGGRESSIVE DISRUPTIVE BEHAVIOUR IN ADULTS

R45.1/R45.4-6

DESCRIPTION

Agitation may escalate to overt aggression and often manifests with restlessness, pacing, and loud or demanding speech. Aggressive behaviour includes verbally abusive language, specific verbal threats, intimidating physical behaviour, and/or actual physical violence to self, others, or property. All agitation and aggression must be considered an emergency, and violence should be prevented or minimised wherever possible.

Causes for aggressive, disruptive behaviour include:

» **Physical:** acute medical illness, delirium and its causes (see Section 21.2.4: Delirium), epilepsy (pre-, intra-, and post-ictal), intracerebral lesions, traumatic brain injury.
» **Psychiatric:** psychosis, mania, agitated depression, neurocognitive disorders (e.g. dementias, traumatic brain injury), developmental disorders (e.g. intellectual disability and autistic spectrum disorder – See Section 16.8.1: Intellectual disability), severe anxiety.
» **Substance misuse:** alcohol, cannabis, methaqualone (mandrax) intoxication or withdrawal, stimulant (cocaine, methamphetamine [tik], methcaninone [cat]) intoxication, benzodiazepine withdrawal.
» **Psychological factors:** high levels of impulsivity and antagonism, hypersensitivity to rejection or insult, poor frustration tolerance, and maladaptive coping skills may contribute to aggression and rage.

CAUTION

» Psychiatric and intellectually disabled patients often have medical conditions, trauma, and substance misuse.
» **Do not assume aggressive behaviour is due to mental illness or psychological factors**

GENERAL MEASURES

» Be prepared:
» Be aware of high-risk patients e.g. those known with previous violence, substance misuse, State patients.
» Have a step-wise protocol available to ensure safety of the patient and all in the clinic.
  - Establish clear roles for all staff members.
  - Have a triage plan for early signs of aggression.
  - Have available backup – security, SAPS, and Emergency Medical Service (EMS).
  - Prepare a designated calming area – suitable for regular monitoring.
» De-escalate and contain:
  - Be calm, confident, kind and reassuring. Listen to the patient.
  - Maintain a submissive posture with open hands; do NOT turn your back.
» Do NOT argue, confront delusions, or attempt to touch the patient.
» Be vigilant for delirium, medical, and other causes while calming the patient.
» Manual restraint:
» Manual restraint refers to interventions done with hands or bodies without the use of any device, to limit a user's movement of body or limb. It is sometimes called “holding”.

» May be necessary to administer medication – must be respectful, controlled, kept to a minimum, and should preferably be applied by personnel of the same sex as the patient. *LoE:IVb*[3]
  - Report any injuries or death associated with the restraint to the Mental Health Review Board and health facility quality assurance department.
» Mechanical restraint:

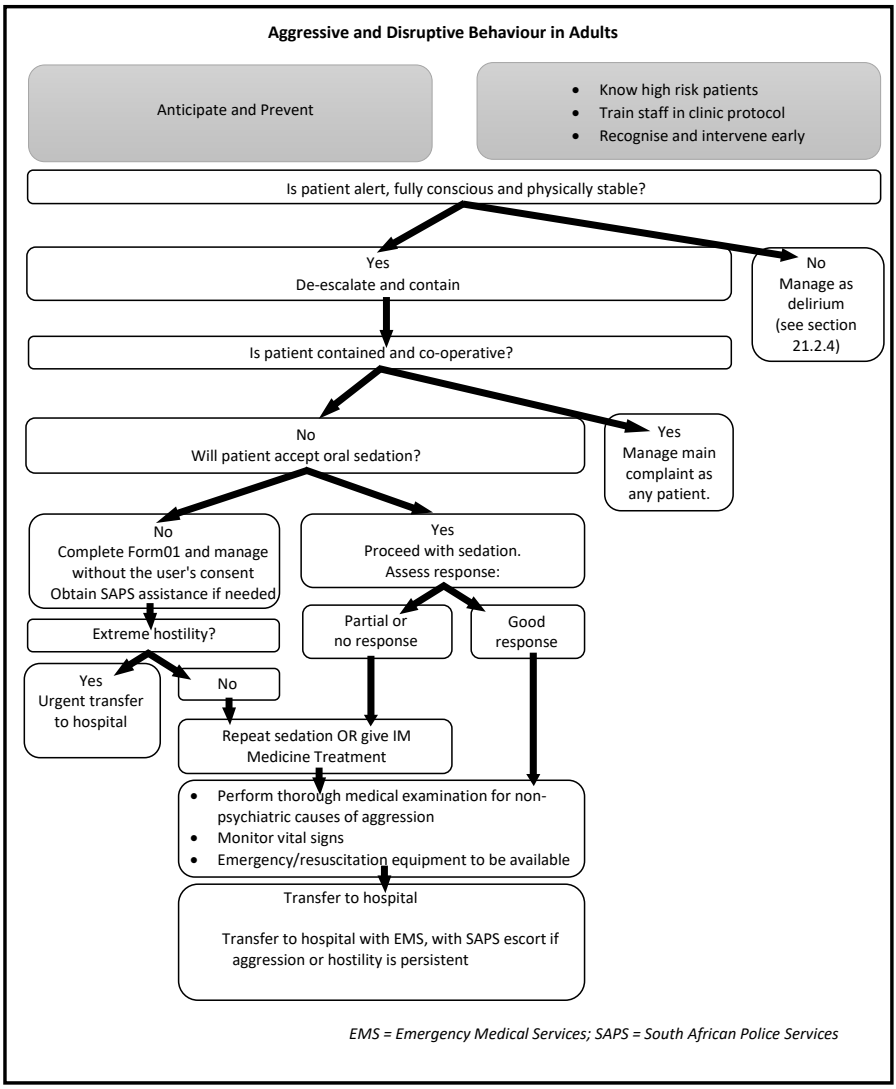
» Only use when absolutely necessary to protect the patient and others in an acute setting for as short a period of time as possible and as prescribed by a doctor. See national policy guidelines: https://knowledgehub.health.gov.za/elibrary/policy-guidelines-seclusion-and-restraint-mental-health-care-users-2012

LoE:IVb[4]

- Record type, sites, and duration of any restraints used, with 15-minute monitoring of vital signs, mental state, restraint sites, and reasons for use.
- For people managed under the MHCA, complete and submit MHCA Form 48, along with reports of any injuries or death incurred, to the Mental Health Review Board and health facility quality assurance department.

» Pregnant women:
- Never leave unattended.
- Use restraint sparingly and with care, with mother in a supported, semi-seated position (not supine or prone).

» Counsel the family/friend/patient escort regarding:
» Possible causes for the behaviour.
- Reasons for restraints if used.
- Importance of their continued support of the patient after hospital discharge.



MEDICINE TREATMENT

Oral treatment:

- Benzodiazepines, e.g.: (Doctor prescribed)
- Diazepam, oral, 5 mg immediately.

OR

- Midazolam, buccal, 7.5–15 mg immediately, using the parenteral formulation.

If response to oral benzodiazepine (after 30–60 minutes) is inadequate, or oral treatment refused, administer parenteral or orodispersible olanzapine:

- Olanzapine, orodispersible tablet or IM, 5 to 10 mg immediately (Doctor prescribed).
  - Repeat after 30–60 minutes if needed.

LoE:IVb[5]

Note:

» Use lower doses of olanzapine (2.5 to 5mg) in elderly, frail, or medically unwell patients.
» Repeated doses may result in excessive sedation.

If previous intolerability to olanzapine (e.g., previous neuro-malignant syndrome), administer parenteral benzodiazepine:

- Short-acting benzodiazepines, e.g.: (Doctor prescribed)
- Midazolam, IM, 7.5 to 15 mg immediately.
  - Repeat after 30 to 60 minutes if needed.

Note:

» To avoid inappropriate repeat dosing allow at least 30 minutes for the medication to take effect.

LoE:IIIb[6]

» Do not administer IM olanzapine and IM benzodiazepines at the same time.
» Midazolam IM has a rapid onset of action (10 to 20 minutes) and very short duration of sedation (approximately 1 hour and 20 minutes).

Note: Long-acting injectable antipsychotics e.g., flupenthixol decanoate and zuclopenthixol decanoate have no role in rapid tranquillisation.

CAUTION

» Rapid tranquillisation may cause cardiovascular collapse, respiratory depression, neuroleptic malignant syndrome, and acute dystonic reactions.
» The elderly, children, intellectually disabled and those with comorbid medical conditions and substance users are at highest risk.
» **An emergency trolley, airway, bag, oxygen, and intravenous line equipment must be available**.

If alcohol use is suspected:

ADD

- Thiamine, oral, 300 mg immediately and daily for 14 days.

Note:

» Always monitor vital signs of sedated patient:

» Vital signs: pulse, respiratory rate, blood pressure, temperature, level of consciousness and hydration.
» Monitor particularly for respiratory depression: if respiratory rate drops to <12 breaths/minute, call doctor urgently and ventilate with bag-valve mask (1 breath/3-5 seconds) attached to oxygen at 15 L/minute.

REFERRAL

» All cases.

16.1.3 AGGRESSIVE DISRUPTIVE BEHAVIOUR IN CHILDREN AND ADOLESCENTS

R45.1/R45.4-6

As with adults, agitation among children and adolescents may escalate to overt aggression and violence. However, aggression may also occur suddenly, without warning signs, particularly in children with neurodevelopmental conditions such as intellectual disability and autism spectrum disorder. All children and adolescents should be treated respectfully and calmly, especially if seen in a busy, noisy clinic environment.

Possible causes for aggressive, disruptive behaviour include:

» **Physical:** epilepsy (pre-, intra-, and post-ictal), acute medical (e.g. encephalopathy, infection, metabolic disease, medication adverse effects) or surgical conditions, injuries (including traumatic brain injury).
» **Neuropsychiatric:** severe anxiety, distress, and/or acute or chronic traumatic stress, especially in children with neurodevelopmental disorders (which may be mild and missed clinically; see Section 16.8.1: Intellectual disability).
» **Substance use:** alcohol, cannabis, methaqualone (mandrax) intoxication or withdrawal, stimulant (cocaine, methamphetamine [tik], methcaninone [cat]) intoxication or withdrawal.
» **Psychological factors:** high levels of impulsivity and antagonism, hypersensitivity to rejection or insult, and poor frustration tolerance may contribute to aggression and rage.

CAUTION

» **An unsafe home, school, or community environment must always be considered**
» Children who have been abused, and/or have a neurodevelopmental or other psychiatric condition may also have medical conditions, trauma, and substance misuse.
» **Do not assume that aggressive behaviour is due to abuse, mental illness or psychological factors**

GENERAL MEASURES

» Be prepared – have in place:
» a step-wise protocol to ensure safety and protection of the child or adolescent aligned with the Children's Act No. 38 of 2005 and the national Policy Guidelines on Child and Adolescent Mental Health (available from https://www.gov.za/documents/policy-guidelines-child-and-adolescent-mental-health).
  - clear roles for all staff members.
» a triage plan for children and adolescents at high risk of aggression.
  - a designated calming area – suitable for regular monitoring.
» De-escalate and contain:
  - Be calm, confident, kind and reassuring.
  - Maintain a submissive posture with open hands; do NOT turn your back.
  - Limit the number of the people attending the child, limit noise levels.
» Do NOT attempt to touch the patient unnecessarily.
  - Do NOT confront, argue, or smother with kindness.
» Try and discern the child's/adolescent's wishes and attend to them immediately.
» Examine for delirium, medical, and other causes while calming the patient.
» Mechanical restraint:
» Only use when absolutely necessary to protect the patient and others in an acute setting for as short a period of time as possible.
  - Beware of using excessive force, especially if the child/adolescent fights back.
  - Type, sites, and duration of any restraints used must be documented, with 15-minute monitoring of vital signs, mental state, restraint sites, and reasons for use.
  - For people managed under the MHCA, complete and submit MHCA Form 48, along with reports of any injuries or death incurred, to the Mental Health Review Board and health facility quality assurance department.

MEDICINE TREATMENT

For children <6 years of age:
Sedation with psychotropic agents should only be considered in extreme cases and only after consultation with a specialist.

For children ≥6 years of age and adolescents:

- Benzodiazepines, e.g.: (Doctor prescribed)
- Midazolam, IM, 0.1 to 0.15 mg/kg/dose immediately as a single dose.
  - Onset of action: within 5 minutes.

If sedation with benzodiazepines is inadequate: See Hospital Paediatric STGs and EML Chapter 14.1: Sedation of an acutely disturbed child or adolescent for further medicine management.

CAUTION

» Always consult with a doctor, preferably a psychiatrist where possible, when prescribing antipsychotic medication to children and adolescents.

» Rapid tranquillisation may cause cardiovascular collapse, respiratory depression, neuroleptic malignant syndrome (see Section 16.2.2: Neuroleptic malignant syndrome), and acute dystonic reactions (see Section: 16.2.1: Extra-pyramidal side effects).

» The elderly, children, intellectually disabled, and those with comorbid medical conditions and substance use are at highest risk.

» **An emergency trolley, airway, bag, oxygen and intravenous line equipment must be available.**

16.2 ANTIPSYCHOTIC ADVERSE DRUG REACTIONS

16.2.1 EXTRA-PYRAMIDAL SIDE EFFECTS

G21.1/G24.0/G25.8-9/Y11/Y13/Y88.0 + (T43.0-6/T43.8-9)

DESCRIPTION

Extra-pyramidal side effects (EPSE) may occur with any antipsychotic, but are most commonly due to haloperidol, risperidone, and flupenthixol and zuclopenthixol injections.

» At-risk groups include those with underlying medical conditions such as epilepsy, intellectual disability, dementia, and late onset psychosis (more often associated with a medical condition than psychosis in youth).
» People with bipolar disorder are more susceptible to EPSE than those with schizophrenia.

EPSEs may present as a variety of clinical syndromes:

Early appearing:

» Acute dystonic reaction (sustained muscle contraction that causes twisting and repetitive movements, abnormal posture or abnormal eye position, or laryngospasm within a few minutes to days after receiving an antipsychotic tablet or injection.
» Parkinsonism (slow, shuffling gait, delayed responses, masked facies, and a pill rolling tremor).
» Akathisia (a subjective and observed motor restlessness e.g.: pacing, rocking, marching, crossing and uncrossing legs).

Late appearing:

» Tardive dyskinesia (choreoathetoid involuntary movements that particularly involve the face, lips, and tongue (e.g.: lip smacking or chewing, tongue protrusion ("catching flies"), but occasionally also arms, legs or trunk. More common in older women, depression, bipolar disorder, people with cognitive impairment. Only about 50% of cases are reversible.

MEDICINE TREATMENT

Acute dystonic reaction

Children

- Anticholinergic, e.g.:
- Biperiden, IM/slow IV, 0.05–0.1 mg/kg to a maximum of:
  - 1 to 6 years: 1–2 mg immediately
  - 7 to 10 years: 3 mg immediately
  - >10 years: 5 mg immediately

LoE:IVb[7]

OR

- Promethazine, IM, 0.125–0.5 mg/kg to a maximum of:
  - 5 to 10 years: 12.5 mg immediately
  - 10 to 16 years: 25 mg immediately

LoE:Ivb[8]

Adults

- Anticholinergic, e.g.:
- Biperiden, IM, 2.5 mg immediately.
  - May be repeated every 30 minutes.
  - Maximum of 3 doses within 24 hours.

LoE:Ivb[9]

OR

- Promethazine, IM, 50 mg immediately.

Drug-induced parkinsonism

- Anticholinergic, e.g.:
- Orphenadrine, oral, 50 mg 8 hourly, whilst awaiting review.

LoE:Ivb[10]

REFERRAL

» Refer all children urgently.
» All patients for review of psychotropic medication.

16.2.2 NEUROLEPTIC MALIGNANT SYNDROME

G21.0 + (T43.0-6/T43.8-9)

DESCRIPTION

» Neuroleptic malignant syndrome (NMS) is a rare but potentially fatal syndrome characterised by a tetrad of fever, muscle rigidity, altered mental state, and autonomic dysfunction.
» An altered mental state with confusion, delirium, or stupor may precede other clinical signs of NMS.
» Suspect if there is a history of exposure to an antipsychotic, fever and sweating, muscle rigidity, and elevated or fluctuating blood pressure.
» Most common after initiation or increase in dose of haloperidol, risperidone, or injectable antipsychotic, but may occur with any antipsychotic at any dose.

LoE:IVb[11]

» Combinations of antipsychotics with SSRIs or lithium may increase the risk.
» Agitation, dehydration, exhaustion, and iron deficiency increase the risk of NMS.
» Other causes of fever must be investigated and treated.

GENERAL MEASURES
Stop all antipsychotics.
Cool patient and hydrate adequately.

REFERRAL
» All patients for urgent medical admission and psychiatric review

16.3 ANXIETY DISORDERS
F40.0-2/F40.8-9/F41.0-3/F41.8-9/F42.0-2 + (F10.0-F19.9/R42/R45.0-8/Z65.0-5/Z65.8-9/Z81.0-4/Z81.8)

DESCRIPTION
Anxiety is an emotional response to an apparent stress. It is diagnosed as a disorder when it is excessive or persistent and impacts daily functioning.
Anxiety disorders are associated with an increase in cigarette smoking, alcohol use, and various medical illnesses.
Anxiety may present in various forms:
» **Physical symptoms:** anxiety may present with medically unexplained symptoms like muscle tension, headache, abdominal cramps, nausea, palpitations, sweating, a choking feeling, shortness of breath, chest pain (non-cardiac), dizziness, numbness, and tingling of the hands and feet.
  - *Panic attacks* are abrupt surges of intense anxiety with prominent physical symptoms. They may occur in anxiety, mood, psychotic, or substance use disorders, and are a marker of increased severity.
» **Psychological symptoms**: panicky feelings, excessive worry, mood changes, irritability, tearfulness, distress, and difficulty concentrating.
  - *Phobias* are diagnosed when the anxiety is caused by a specific situation or object, e.g. social phobia is the fear of social interactions. Thoughts are of negative evaluation by others and usually start in adolescence. Self-medication with alcohol or other substances before and during a social event is common. Substance misuse may be the presenting feature.
» *Obsessive thoughts and/or compulsive behaviours* are a core feature of Obsessive-Compulsive Disorder but may also occur in other anxiety, mood, developmental, and psychotic disorders.
  - *In people with intellectual disability*, anxiety may present with aggression, agitation, and demanding behaviour.

GENERAL MEASURES
» Assess severity of the condition.
» Maintain an empathic and concerned attitude.
» Exclude underlying medical conditions and optimise treatment for comorbid medical conditions (e.g. heart disease, hypertension, COPD, asthma, GORD, inflammatory bowel disease, thyroid disease, epilepsy).
» Screen for, and manage, underlying or co-morbid substance use, e.g. nicotine, alcohol, over the counter analgesics, benzodiazepines.

» Psychoeducate the patient and their family regarding the nature of anxiety, importance of managing the condition, and early signs of recurrence.
» Explore and address psychosocial factors:
  - Stress management/coping skills – refer to registered counsellor or non-governmental organization (NGO) counselling services, e.g. SA Depression and Anxiety Group (https://www.sadag.org/).
  - Social support systems, relationship, and family issues – refer to social worker, registered counsellor, or NGO counselling, e.g., Family and Marriage Society of South Africa (https://famsa.org.za).
  - Abuse – refer to a social worker, social welfare, and/or People Opposing Women Abuse (https://www.powa.co.za/POWA/).

MEDICINE TREATMENT

» Offer a choice of psychotherapy (if available) or medication.
» Review every 2 to 4 weeks for 3 months, then 3 to 6 monthly.
» If response to psychotherapy is sub-optimal, medication may be prescribed together with continued psychotherapy (if available).
» If medication is effective, continue for at least 12 months to prevent relapse.
» Patients with severe anxiety should be assessed by a doctor.

- Fluoxetine, oral (Doctor prescribed).
  - Initiate at 20 mg on alternate days for 2-4 weeks.
  - Increase to 20 mg daily after 2–4 weeks.
  - Delay dosage increase if increased agitation or panic symptoms occur.

LoE:Ib[12]

<u>If fluoxetine is poorly tolerated:</u>

- Alternative SSRI, e.g.: (Doctor prescribed).
- Citalopram, oral.
  - Initiate at 10 mg daily for the 1st week.
  - Then increase to 20 mg daily.

LoE:Ib[13]

CAUTION

SSRIs (e.g. fluoxetine, citalopram) may cause agitation initially. This typically resolves within 2 to 4 weeks. *LoE:Ivb*[14]

Ask about suicidal ideation in all patients, particularly adolescents and young adults. (See Section 16.7: Suicide risk assessment).

If suicidal ideation is present, refer before initiating SSRI.

Once started, monitor closely for clinical worsening, suicidality, or unusual changes in behaviour.

Advise families and caregivers of the need for close observation, and refer as required.

Note: If there is a good response to SSRI, continue treatment for a minimum of 12 months after remission of symptoms. Consider stopping after 12 months only if patient has had

no/minimal symptoms and has optimal functioning. Reduce dose gradually over 4 weeks. Prolong treatment if:

» Previous episode/s of anxiety (extend treatment to at least 3 years).
» Any of: severe anxiety, suicidal attempt, sudden onset of symptoms, or family history of bipolar disorder (extend treatment to at least 3 years).
» ≥ 3 episodes of anxiety (advise lifelong treatment). *LoE:Ib*[15]

For severe panic attacks:

- Benzodiazepines, e.g.: (Doctor prescribed).
- Diazepam, oral. *LoE:IIIb*[16]
  - 2.5–5 mg immediately.
  - Continue with 2.5 to 5 mg at night, for a maximum of 10 days for relief of severe anxiety.
  - Start definitive treatment with psychotherapy/SSRI. *LoE:Ia*[17]

CAUTION - BENZODIAZEPINES

» Associated with cognitive impairment – reversible with short-term use and potentially irreversible with long-term use.
» Elderly are at risk of over-sedation, falls and hip fractures.
» Dependence may occur after only a few weeks of treatment.
» Prescribe for as short a period of time as possible.
» Warn patient not to drive or operate machinery when used short-term.
» Avoid use in people at high risk of addiction: e.g. personality disorders and those with previous or other substance misuse. *LoE:IVb*[18]

REFERRAL

» Any risk of harm to self or others.
» Comorbid severe mental or physical conditions.
» Poor response to treatment.
» Repeated panic attacks.
» Children and adolescents.

16.4 MOOD DISORDERS

DESCRIPTION

The person's thoughts and behaviour are driven by their mood, which may be depressed, sad, angry, happy, elated, manic, or any of these in combination.

Mood disorders may be:

» Due to another medical condition, e.g. HIV, TB, anaemia of any cause, malignancy, hypothyroidism, and chronic pain conditions.
» Comorbid with other medical conditions e.g. epilepsy, diabetes, and cardiovascular disease.
» Due to substance use, e.g. alcohol, cannabis, benzodiazepines.
» Comorbid with substance use.

16.4.1 DEPRESSIVE DISORDERS

F32.0-3/F32.8-9/F33.0-4/F33.8-9/F34.1/F34.8-9/F38.0-1/F38.8/F39 + (F10.0-F19.9/R45.0-8/Z65.0-5/Z65.8-9/Z81.0-4/ Z81.8)

DESCRIPTION

» Depressive disorders cause significant impairment in social and occupational functioning, and may result in unemployment, poor self-care, neglect of dependent children, and suicide.
» Depression impacts negatively on other medical conditions, with increased pain, disability, and poorer treatment outcomes.
» Depression is characterised by a low mood and/or a reduced capacity to enjoy life. Depressive episodes may also occur as part of bipolar disorder, which requires a different treatment strategy to unipolar depressive disorders.
» Depression is often not recognised by the sufferer or clinicians. It may be regarded as a normal emotional state or it may be unacceptable to the sufferer due to stigma. Thus, associated symptoms may be the presenting complaint rather than the low mood. In general, insomnia and loss of energy are the most common presenting complaints. In African cultures, somatic symptoms (bodily aches and pains) may predominate. Symptoms may also be masked in the interview setting. It is important to have a high degree of suspicion and to elicit symptoms, degree of impaired function, and suicide risk with care.

Depression may present with:

» **Mood symptoms:** may manifest as depressed, sad, hopeless, discouraged, feeling empty, having no feelings, irritability, increased anger or frustration, bodily aches and pains.
» **Loss of interest or pleasure (anhedonia):** 'not caring any more', boredom, social withdrawal, apathy, reduced sexual interest or desire.
» **Neuro-vegetative symptoms:** loss of appetite or an increase in appetite, sometimes with food cravings; weight loss or gain if appetite changes are severe; increased or decreased sleep (usually mid- or terminal-insomnia, i.e. waking during the night or early hours of the morning); psychomotor agitation (pacing, hand-wringing, rubbing of skin or clothing) or psychomotor retardation (slowed thoughts, speech and/or movements); tiredness and fatigue – daily living tasks, e.g. getting dressed, are exhausting.
» **Psychological symptoms:** feelings of worthlessness; unrealistic, negative self-evaluation; self-blame; and guilt – may be over minor failings or may be of delusional proportions.
» **Cognitive symptoms:** diminished ability to think, concentrate or make minor decisions; may appear to be easily distracted; memory may be impaired (as in pseudodementia); preoccupation with thoughts of death of loved ones, others, or self (from vague wishes to suicidal ideation or plans).

The presence of mood, psychological, and cognitive symptoms help to differentiate between depression and normal sadness/grief following a loss, or between depression and the loss of appetite and energy associated with a medical condition.

GENERAL MEASURES

» Assess severity of the condition.
» Maintain an empathic and concerned attitude.
» Exclude underlying medical conditions and optimise treatment for comorbid conditions (e.g. hypothyroidism, anaemia, HIV/AIDS, TB, cancers, diabetes).
» Screen for, and manage, underlying or co-morbid substance use, e.g. nicotine, alcohol, over the counter analgesics, benzodiazepines.
» Psychoeducate the patient and their family regarding the nature of depression, importance of managing the condition, and early signs of recurrence.
» Explore and address psychosocial stressors:
  - Stress management / coping skills – refer to social worker or NGO counselling services, e.g. SA Depression and Anxiety Group (https://www.sadag.org/).
» Social support systems, relationship and family issues – refer to social worker or NGO counselling, e.g., Family and Marriage Society of South Africa (https://famsa.org.za/).
  - Abuse - refer to a social worker, social welfare, and/or People Opposing Women Abuse (https://www.powa.co.za/POWA/).
  -

MEDICINE TREATMENT

Offer choice of psychotherapy (if available) or medication.

Adults

- Fluoxetine, oral (Doctor prescribed).
  - Initiate at 20 mg on alternate days for 2 weeks.
  - Increase to 20 mg daily after 2 to 4 weeks.
  - Delay dosage increase if increased agitation or panic symptoms occur.
  - Reassess response after 4 weeks on daily fluoxetine. Symptoms may take up to 2-4 weeks to resolve. If only a partial or no response after 8 weeks of treatment refer to doctor.

OR *LoE:Ib*[19]

If fluoxetine is poorly tolerated:

- Alternative SSRI e.g.: (Doctor prescribed).
- Citalopram, oral.
  - Initiate at 10 mg daily for the 1st week.
  - Then increase to 20 mg daily. *LoE:Ib*[20]

Note: See recommendation for treatment duration of SSRI therapy below.

CAUTION

SSRIs (e.g. fluoxetine, citalopram) may cause agitation during the first 2 to 4 weeks. Ask about suicidal ideation in all patients, particularly adolescents and young adults. (See Section 16.7: Suicide risk assessment.)
If suicidal ideation is present, refer before initiating SSRI.
Once started, monitor closely for clinical worsening, suicidality, or unusual changes in behaviour. Advise families and caregivers of the need for close observation and refer as required.

If a sedating antidepressant is required:

- Tricyclic antidepressants, e.g.: (Doctor prescribed).

- Amitriptyline, oral, at bedtime.
  - Initial dose: 25 mg per day.
  - Increase by 25 mg per day at 3- to 5-day intervals.
  - Maximum dose: 150 mg per day.

CAUTION

» Tricyclic antidepressants can be fatal in overdose.
» Prescription requires a risk assessment of the patient and others in their household, especially adolescents.
» Avoid tricyclic antidepressants in the elderly and patients with heart disease, urinary retention, glaucoma, and epilepsy.

Treatment duration for SSRI therapy:
If the patient responds well to antidepressant, continue for a minimum of 9 months after remission of symptoms. Consider stopping after 9 months only if patient has had no/minimal symptoms and has optimal functioning. Reduce dose gradually over 4 weeks. Prolong treatment if any of the following are present:
» Concomitant generalised anxiety disorder (extend treatment to at least 1 year).
» Previous episode/s of depression (extend treatment to at least 3 years).
» Any of: severe depression, suicidal attempt, sudden onset of symptoms, family history of bipolar disorder (extend treatment to at least 3 years).
» ≥3 episodes of depression (advise lifelong treatment). *LoE:IIb*[21]

CAUTION

» Do not prescribe antidepressants to a patient with bipolar disorder without consultation, as antidepressants may precipitate a manic episode.
» Be careful of interactions between antidepressants and any other agents that the patient might be taking (e.g. St John's Wort or traditional African medicine).

REFERRAL

» Suicidal ideation.
» Major depression with psychotic features.
» Bipolar disorder.
» Failure to respond to antidepressants.
» Pregnancy and lactation.
» Children and adolescents.

16.4.2 BIPOLAR DISORDER

F30.0-F30.2/F30.8-F30.9/F31.0-9/F38.0-1/F38.8/F39 + (F10.0-F19.9/R45.0-8/Z65.0-5/Z65.8-9/Z81.0-4/Z81.8)

DESCRIPTION

A lifelong illness which may have an episodic, variable course with the presenting episode being manic, hypomanic, mixed, or depressive (according to accepted diagnostic criteria).

An episode of mania is typically characterised by an elevated mood where a patient may experience extreme happiness, lasting days to weeks, which might also be associated with an underlying irritability. Such mood is associated with increased energy/activity, talkativeness, and a reduction in the need for sleep, and features may be accompanied by grandiose and/or religious delusions.

The diagnosis of bipolar disorder should be confirmed by a specialist. It may present with any mood state, e.g. with treatment resistant depression. The diagnosis requires either a current or previous episode of mania (bipolar I disorder) or hypomania (bipolar II disorder), but this history is not always clear, in which case a trial of treatment may be indicated.

Comorbid substance use is common. It may confuse the clinical presentation and may cause poor adherence to medication. The 'dual diagnosis' of bipolar disorder and an addiction requires referral to a specialist and ongoing monitoring after discharge.

GENERAL MEASURES

» Provide reassurance and support of the patient and family.
» Psychoeducate regarding the nature of bipolar disorder, the importance of treatment adherence, and early signs of recurrent episodes.

MEDICINE TREATMENT

For manic, agitated, and acutely disturbed patients:

» Stop antidepressants if prescribed.
» Manage as for the aggressive or disruptive patient. See Sections 16.1.2: Aggressive disruptive behaviour in adults and 16.1.3 Aggressive disruptive behaviour in children and adolescents.

For stable patients:

» Support treatment adherence and manage comorbid medical conditions, see Section 16.6: Psychiatric patients - general monitoring and care.

REFERRAL

» All patients.

16.5 PSYCHOSIS

DESCRIPTION

Psychosis is characterised by a loss of contact with reality, and may present with:

» Delusions: Fixed, unshakeable, false beliefs which are not in keeping with a person's society, culture, or religion. Beliefs may be persecutory, referential, grandiose, religiose, erotic, or bizarre in nature.
» Hallucinations: Perceptual disturbances, e.g. auditory hallucinations, which are heard as voices distinct from the patient's thoughts.
» Disorganised thinking: Manifests as disordered flow of speech, such that the person does not make sense.
» Grossly disorganised or abnormal motor behaviour (including catatonia).
» Negative symptoms: reduced emotional expression, apathy, avolition, lack of speech, lack of social interaction.

Psychosis occurs in psychotic disorders (which may be acute, transient, or chronic), other psychiatric conditions such as bipolar disorder or depression, medical conditions (e.g. certain types of epilepsy), or substance use (intoxication or withdrawal).

Psychosis is often accompanied by a lack of insight into the symptoms and poor judgement. The risk to self and others must always be assessed. It may be necessary to treat as an Assisted or Involuntary User under the MHCA.

16.5.1 ACUTE AND TRANSIENT PSYCHOTIC DISORDERS

F23.0-F23.9/F24/F28/F29 + (F10.0-F19.9/R45.0-8/Z65.0-5/Z65.8-9/Z81.0-4/Z81.8)

DESCRIPTION

Sudden onset of ≥1 psychotic symptoms (usually delusions, hallucinations, or disorganised thinking) which resolves spontaneously, usually within 1 month, with a full return to premorbid social or occupational functioning. Stressful events may precede the psychotic episode. Within 3 years, 40-50% will have a recurrent episode or develop schizophrenia or bipolar disorder.

LoE:IIb[22]

GENERAL MEASURES

» Refer all new onset psychosis to hospital for a medical, substance use, and mental health evaluation (see Adult Hospital STG and EML Section 15.5.1: Acute and transient psychotic disorders).
» For agitated and acutely disturbed patients, manage as for the aggressive or disruptive patient. See Section 16.1.2: Aggressive disruptive behaviour in adults and 16.1.3: Aggressive disruptive behaviour in children and adolescents.
» Ensure the safety of the patient and those caring for them.
» Minimise stress and stimulation.
» Do not challenge what appear to be false statements or delusions.

<u>After hospital discharge/ on return to PHC:</u>

» Provide active follow-up with 6-monthly visits for three years with mental health and substance use screening and general health promotion.
» Psychoeducate the patient and their family regarding the condition and red flags to watch for if the psychosis worsens or recurs.
» Address psycho-social stressors – refer to social worker, counselling services.

<u>Women of child-bearing potential:</u>

» Ensure family planning
» If the patient is a parent/guardian – refer to social worker to assess home functioning and childcare.

MEDICINE TREATMENT

» See Sections 16.1.2: Aggressive disruptive behaviour in adults and 16.1.3: Aggressive disruptive behaviour in children and adolescents.

REFERRAL

» All patients with active psychosis.

16.5.2 SCHIZOPHRENIA SPECTRUM DISORDERS (SCHIZOPHRENIA)

F20-F20.9/F21/F22.0-22.9; F25.0-25.9 + (F10.0-F19.9/R45.0-8/Z65.0-5/Z65.8-9/Z81.0-4/ Z81.8)

DESCRIPTION

Schizophrenia is the most common, chronic psychotic disorder and is characterised by recurrent, severe, psychotic episodes which are accompanied by a marked deterioration in personal, social, and occupational functioning.

Onset is usually in adolescence or young adulthood. Prognosis is worsened with delay in initial treatment, repeated episodes, and comorbid substance use. Comorbid substance use and medical conditions (e.g., metabolic syndrome) are common.

The diagnosis of schizophrenia should be confirmed by a specialist. In stable patients with good insight and support, primary care facilities may continue treatment and social support.

GENERAL MEASURES

» See Section 16.6: Psychiatric patients - general monitoring and care.
» Supportive intervention includes:
» Psychoeducation of the patient and their family regarding the nature of schizophrenia, the importance of treatment adherence, and early signs of recurrent episodes.
  - Supportive group therapy for patients with schizophrenia.
» Rehabilitation may be enhanced by:
  - Assertive community programs.
  - Occupational therapy.
  - Work assessment, and bridging programmes.
  - Appropriate placement and supported employment.
» Assessment of risk to self and others, and early signs of relapse should be performed at every review.

MEDICINE TREATMENT

Adults

- Haloperidol, oral. (Doctor prescribed.)
  - Initial dose: 1.5 mg daily, increasing to 5 mg daily, if initial treatment tolerated and according to clinical response.
  - Once stabilised, administer as a single dose at bedtime.

Elderly

- Haloperidol, oral. (Doctor prescribed.) *LoE:IVb*
  - Initial dose: 0.75 mg twice daily.

- Increase dose more gradually until symptoms are controlled or until a maximum of 5 mg daily, if tolerated, is reached.
- Once stabilised, administer as a single dose at bedtime.

See Section 16.8.2: Special considerations: Older patients (≥45 years).

If there is a good response / tolerability to haloperidol, or patient's preference:

- Flupenthixol decanoate, IM, 10 to 40 mg every 4 weeks. (Doctor prescribed.)
  - Initial dose: 10 mg.

OR

- Zuclopenthixol decanoate, IM, 100 to 400 mg every 4 weeks. (Doctor prescribed.)
  - Initial dose: 100 mg.

Note:

» Patients should initially be stabilised on an oral antipsychotic agent before changing to a depot preparation.
» Administer an initial test dose of the depot antipsychotic and observe the patient for 1 week before administering higher doses.
» Reduce the oral antipsychotic formulation, stopping once patient is stabilised on the long-term depot therapy.
» Long-acting injectable antipsychotics are particularly useful in patients unable to adhere to their oral medication regimens, but need to be accompanied by a track and trace programme to be effective for adherence
» Long-term therapy should always be in consultation with a doctor or, if available, with a psychiatrist. Patients should be re-assessed every 6 months.

<u>For breakthrough episodes on an injectable antipsychotic, consider additional short-term therapy of:</u>

- Risperidone, oral 2 mg daily. (Doctor prescribed.)

<u>If good response to IM antipsychotic but patient has extrapyramidal side effects (EPSEs), add:</u>

- Anticholinergic, e.g.:
- Orphenadrine, oral, 50 mg 8 hourly, and refer for review of medication. *LoE:IVb*[23]

Note:

» Anticholinergic medicines (e.g. orphenadrine) should not be used routinely as prophylaxis to prevent EPSEs to antipsychotic medication.
» For management of extra-pyramidal adverse drug reactions and acute dystonic reactions: see Section 16.2.1: Extra-pyramidal side effects.

<u>If poor response, to IM antipsychotic or poor EPSE response to anticholinergic switch to risperidone:</u>

- Risperidone, oral, 2 mg daily. (Doctor prescribed.)
  - Increase to 4 mg daily if there is a poor response after 4 weeks.

<u>If patient is already stabilised on chlorpromazine:</u>

- Chlorpromazine, oral. (Doctor prescribed.)

- Maintenance dose: 75 to 300 mg at night, but may be as high as 800 mg.

REFERRAL

» Poor social support.
» High suicidal risk or risk of harm to others.
» Children and adolescents.
» The elderly.
» Pregnant and lactating women.
» No response or intolerance to medicine treatment.
» Concurrent medical or other psychiatric illness.
» Epilepsy with psychosis.
» Early sign of relapse.

16.6 PSYCHIATRIC PATIENTS - GENERAL MONITORING AND CARE

DESCRIPTION

Nursing staff are required to monitor users with serious mental illness between medical or psychiatric doctor visits.
Regular monitoring with documented nursing notes in the file should occur monthly to 6-monthly depending on the severity of the illness and the risk of relapse, aggression, absconding or poor adherence, with referral as required.
Monitoring includes:

» A mental state enquiry and examination.
» A brief psychosocial assessment.
» A risk assessment for harm to self or others with referral if deemed high risk.
» Adherence support.
» Women: family planning, pregnancy counselling, supportive home visits in childcare.
» General health: screen at baseline and annually - weight and body mass index, blood pressure (see Section 4.7: Hypertension), finger-prick blood glucose test for diabetes (see Section: 9.2.2: Type 2 Diabetes mellitus, adults), HIV (See chapter 11: HIV and AIDS), and tuberculosis (see Section 17.4: Pulmonary tuberculosis (TB)).
» Lifestyle advice for obesity, smoking, alcohol, other substances, and high-risk sexual behaviour or victim of abuse. *LoE:IVb*[24]

Recommendations for specific medicines include:

» Antipsychotic medicines:
» Examples: haloperidol, risperidone, flupenthixol decanoate, zuclopenthixol decanoate.
  - If metabolic effects (e.g., weight gain, hyperglycaemia, hyperlipidaemia) occur, refer to a dietician and encourage regular exercise. If needed, manage dyslipidaemia. (See Section: 4.1: Prevention of ischaemic heart disease and atherosclerosis.) *LoE:IVb*[25]
» Lithium:

- The therapeutic range is 0.8 to 1.0 mmol/L in acute mania, 0.6 to 0.8 mmol/l for prevention of mania and 0.4 to 0.8 mmol/l for prevention of depressive relapse.
- Monitor lithium concentration and eGFR every 6 months (3-monthly in elderly or those with medical comorbidity).
- Monitor TSH and calcium concentrations annually.

» Women of child-bearing potential must be on family planning; refer all pregnant women on lithium immediately (See caution on lithium in Adult Hospital Level STGs and EML, Chapter 15: Mental Health Conditions and Substance Misuse - Section 15.3.2: Bipolar And Related Disorders).
» Valproate and carbamazepine: Avoid in women of child-bearing potential.
» If alternate treatment cannot be recommended and these agents are required, give:
• Folic acid, oral, 5 mg daily; and ensure reliable contraception. *LoE:IVb*[26]

CAUTION

Valproate is teratogenic, and children born to women taking valporic acid during pregnancy are at significant risk of birth defects (10%) and persistent developmental disorders (40%). Valproate is contra-indicated during pregnancy and in women of child-bearing potential and should be avoided. If no alternative, acknowledgment of risk must be signed: *LoE:IIIb*[27]
https://www.sahpra.org.za/wp-content/uploads/2025/05/GLF-CEM-PV-S01_v2-Valproate-Annual-Risk-Acknowledgement-Form-ARF.pdf

16.7 SUICIDE RISK ASSESSMENT

R45.8/X60-X84/Z91.5 + (Z81.8)

DESCRIPTION

Suicide is the act of deliberately killing oneself. Self-harm refers to intentionally self-inflicting injury or poisoning, which may or may not have a fatal intent or outcome. Suicide risk assessment is a process of estimating the probability for a person to commit suicide. There are 5 important components when assessing suicide: ideation (thoughts), intent, plan, access to lethal means, and history of past suicide attempts.
Key risk factors for suicide include previous suicide attempt, current suicidal plan or ideation, and history of mental illness and/or substance abuse, access to lethal means, history of childhood sexual/physical abuse, family history of suicide and suicidality in males, adolescents, elderly patients, and patients with alternative sexual orientations - lesbian, gay, bisexual, and transgender (LGBT) patients. (see Section 16.8.3: Special considerations: Sexual health and sexuality).

WARNING

Suicide risk assessment tools and guidelines should not replace clinical judgment.

GENERAL MEASURES

Any of the following factors may indicate a high risk of suicide:

» Extreme hopelessness and despair.
» Current thoughts/plan/act of self-harm/suicide.
» History of self-harm/suicide.

» Mental health condition: depression, bipolar disorder, substance use disorders, psychoses, dementia.
» Chronic condition: chronic pain, disability.
» Extreme emotional distress.
» Key population groups (LGBTQIA+) and adolescents.

1. **Reduce immediate risk**

» Manage the patient who has attempted a medically serious act of self-harm: See Section 21.3: Trauma and injuries.
» If medically stable, assess for imminent risk of self-harm/suicide: imminent risk of suicide is likely in a patient who is extremely agitated, violent, distressed or has difficulty communicating and has any of the following:
  - Current thoughts or plan of self-harm/suicide.
  - History of thoughts or plan of self-harm in the past month.
  - Act of self-harm.

2. **Manage underlying factors:**

» Ensure optimal treatment and support of other conditions like chronic pain and mental health conditions (depression, mood disorders, substance use disorders, psychosis, dementia).
» Identify psychosocial stressors like bereavement, intimate partner violence, financial or relationship problems, bullying, divorce, or separation.

3. **Monitoring and follow-up:**

For all cases of medically serious acts of self-harm/suicide, or where there is an imminent risk of self-harm/suicide:

» Remove access to means of self-harm/suicide (bleach, pesticides, firearms, medications) and medicines known to be toxic in overdose, including paracetamol, amitriptyline, theophylline.
» Maintain regular contact if possible – suggested weekly contact for the first 2 months. Follow-up for as long as the risk of self-harm/suicide persists. At every contact, re-assess for suicidal thoughts and plans.

» Educate patient and family:
  - To seek help from a trusted family member, friend, or health worker if they have any thoughts of self-harm/suicide.
  - That family/carers may also need psychosocial support – provide patient with resources (e.g., brochures if available, SA Depression and Anxiety Group details https://www.sadag.org/).

» Educate family/friend/carer:
  - Talking about suicide does not trigger the act of suicide and may lower the risk of following through on suicidal ideation.
  - Where they may get support for their own mental health and to better support the patient.

» Refer to social worker, registered counsellor, mental health services if available, or to community resources such as NGO or faith-based organisation crisis centres or support groups.

REFERRAL

» All patients who have attempted a medically serious act of self-harm/suicide.
» All patients where there is an imminent risk of self-harm/suicide.
» All patients where there is a high index of suspicion for self-harm/suicide.

16.8 SPECIAL CONSIDERATIONS

16.8.1 INTELLECTUAL DISABILITY

F70.0-1/F70.8-9/F71.0-1/F71.8-9/F72.0-1/F72.8-9/F73.0-1/F73.8-9/F78.0-1/F78.8-9/F79.0-1/F79.8-9/F84.1/F84.4 + (Z13.3/Z81.0/Z81.8)

» Difficulty with verbal communication in the patient may result in over diagnosis of psychiatric conditions.
» More time is needed in the consultation and to obtain adequate history from family members.
» High risk of being victims of sexual and physical violence by family, neighbours, or strangers – maintain high index of suspicion for abuse.
» Physical discomfort, e.g., pain or constipation, may present as emotional distress.
» Emotional distress, fear, anxiety, or depression may cause aggression or odd behaviour.
» A supportive, caring, and secure environment is essential for well-being and contained behaviour.
» Manage together with social workers, occupational therapists, counsellors, and non-health departments, e.g. social development and education.
» Consider anxiety, depression, and epilepsy before psychosis.
» Use lowest possible doses of medication to achieve desired effect.
» Placement in a residential facility may be necessary. Requires referral to a social worker and may require completion of one MHCA Form 04 and two Form 05s depending on the mental health status of the user.

16.8.2 OLDER PATIENTS (≥ 45 YEARS)

» New psychiatric diagnoses are uncommon in the older patient.
» Actively exclude medical causes, e.g. anaemia, pain, constipation, dementia, chronic kidney disease, COPD, malignancy.
» Older patients are very sensitive to the side effects of psychiatric medications. Use lowest possible dose to achieve desired effect.
» Consult with family/carers: educate about the condition and provide support by explaining how to manage behaviour at home.
» Refer family/carers to social worker or counsellor for further support.

16.8.3 SEXUAL HEALTH AND SEXUALITY

F52.0-9

Sexual problems may be more frequent amongst people with mental illness or neuropsychiatric conditions:

» Low sex drive, anorgasmia (unable to achieve an orgasm), or impotence may occur as part of the mental illness, as a result of medication side effects (e.g. fluoxetine), and/or substance use.
» Hyper-sexuality may occur in people with intellectual disability, in manic or psychotic states, emotional dysregulation, or substance use disorders.
» Specific sexual disorders, e.g. vaginismus (spasm of vagina) or other sexual dysfunction require specialist treatment.
» Refer for assessment and appropriate treatment.

Mental illness is more common amongst people with alternative sexual orientations or who are transgender.

» Stigma, discrimination, and victimisation increase the prevalence of mental illness amongst this group of people.
» Response to treatment will be poor if underlying issues are not expressed and managed.
» Disclosure to staff depends on a non-judgemental, accepting environment.
» Refer to counsellor/social worker.
» Counsel family members and caregivers.
» Refer to psychiatrist depending on clinical presentation/need.

16.8.4 MATERNAL MENTAL HEALTH

Details regarding maternal mental healthcare are provided in:

- Primary Health Care STGs Chapter 6: Obstetrics, Section 6.9: Maternal mental health.
- Adult Hospital STGs Chapter 15: Mental health conditions and substance misuse.

16.9 SUBSTANCE MISUSE

16.9.1 SUBSTANCE USE DISORDERS

F10.0-F19.9 + (R40-R46/Z65.0-5/Z65.8-9/Z81.0-4/Z81.8)

Consult National Policy guidelines on detoxification of psychoactive substances.

DESCRIPTION

Substance use disorder consists of mental and physical symptoms caused by the use of one or more substances, despite significant substance-related problems (including abuse and dependence). Substance-induced disorders include intoxication, withdrawal, and other substance/medication-induced mental disorders.

Alcohol withdrawal

See Section 16.9.4: Alcohol withdrawal (uncomplicated).

Methamphetamines (tik), cocaine (crack), methaqualone (mandrax), cannabis

These patients usually do not require hospitalisation unless signs of severe withdrawal are present, e.g. seizures or severe irritability/agitation resulting in aggressive behaviour.

GENERAL MEASURES

Reassure and support the patient and family.

MEDICINE TREATMENT

For severe anxiety, irritability, and insomnia:

- Benzodiazepine, e.g.: (Doctor prescribed.)
- Diazepam, oral, 5 to 10 mg as a single dose or 12 hourly for 3 to 5 days.

For seizure control and /or sedation:

- Diazepam, slow IV, 10 mg. (Doctor prescribed.) *LoE:IVb*[28]

REFERRAL

» Severe alcohol dependence.
» Past history of withdrawal seizures or a history of epilepsy.
» Past history of delirium tremens.
» Younger (< 12 years of age) or older age (> 60 years of age).
» Pregnancy.
» Significant polydrug use.
» Cognitive impairment.
» Lack of support at home or homelessness.
» Previous failed community detoxification attempts.
» Opioid substance use disorder.

16.9.2 SUBSTANCE-INDUCED MOOD DISORDERS

F10.0-F19.9 + (R40-R46/Z65.0-5/Z65.8-9/Z81.0-4/Z81.8)

DESCRIPTION

Mood disorder secondary to substance use or withdrawal such as abuse of alcohol, drugs, e.g. cannabis and methamphetamines.

GENERAL MEASURES

» Generally treated by removal of the causative substance.
» Requires acute detoxification, followed by maintenance treatment.
» If symptoms of mood disorder persist after 2 weeks, consider treating the mood disorder. See Section 16.4: Mood disorders.

16.9.3 SUBSTANCE-INDUCED PSYCHOSIS

F10.0-F19.9 + (R40-R46/Z65.0-5/Z65.8-9/Z81.0-4/Z81.8)

DESCRIPTION

Psychosis secondary to a substance use or withdrawal such as abuse of alcohol, drugs, e.g. cannabis and methamphetamines.

GENERAL MEASURES

» Most patients with substance-induced psychosis can be managed without medication.
» Ensure the safety of the patient and those caring for them.
» Minimise stress and stimulation (do not argue with psychotic thinking).
» Avoid confrontation or criticism, unless it is necessary to prevent harmful or disruptive behaviour.

MEDICINE TREATMENT

» See sections 16.1.2: Aggressive disruptive behaviour in adults and 16.1.3: Aggressive disruptive behaviour in children and adolescents.

REFERRAL

» All patients to hospital for inpatient management of psychosis.
» All patients to social worker for referral to substance rehabilitation centres.

16.9.4 ALCOHOL WITHDRAWAL (UNCOMPLICATED)

F10.3

DESCRIPTION

» A syndrome characterised by central nervous system hyperactivity that occurs when an alcohol dependent individual abruptly stops, or significantly reduces, alcohol consumption.
» The symptoms of complicated alcohol withdrawal syndrome, requiring referral, include:
» **Autonomic:** sweating, tachycardia, hypertension, tremors, tonic-clonic seizures, and low-grade fever.

- **Gastrointestinal:** anorexia, nausea, vomiting, dyspepsia, and diarrhoea.
- **Cognitive and perceptual disturbances**: poor concentration, anxiety, psychomotor agitation, disturbed sleep with vivid dreams, visual hallucinations, and disorientation.

» Typical delirium occurs 2–3 days following cessation of prolonged alcohol intake, but some withdrawal symptoms such as the typical tremor, may start within 12 hours.

GENERAL MEASURES

Assess for comorbid infections.

MEDICINE TREATMENT

- Thiamine, oral, 300 mg daily for 14 days.

AND *LoE:IIIb*[29]

- Diazepam, oral, 10 mg immediately. (Doctor prescribed.)
  - Then 5 mg 6 hourly for 3 days.
  - Then 5 mg 12 hourly for 2 days.
  - Then 5 mg daily for 2 days. *LoE:IVb*[30]
  - Then stop.

REFERRAL

» See referral criteria of Section 16.9.1: Substance use disorders.

» Complicated alcohol withdrawal, including persistent seizures despite oral benzodiazepine therapy.

References:

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PHC Chapter 17: Respiratory conditions

17.1 CONDITIONS WITH PREDOMINANT WHEEZE

17.1.1 ACUTE ASTHMA & ACUTE EXACERBATION OF COPD, ADULTS

J46/J45.0-1/J45.8-9

DESCRIPTION

This is an emergency situation recognised by various combinations of:

- » wheeze
- » tightness of the chest
- » chest indrawing
- » breathlessness
- » respiratory distress
- » cough

In adults, bronchospasm is usually associated with asthma (where the bronchospasm is usually completely reversible) or chronic obstructive pulmonary disease (COPD) (where the bronchospasm is partially reversible).

The clinical picture of pulmonary oedema due to left ventricular heart failure may be similar to that of asthma. If patients >50 years of age present with asthma for the first time, consider pulmonary oedema due to left ventricular heart failure.

All PHC facilities must have peak expiratory flow rate (PEFR) meters, as asthma cannot be correctly managed without measuring PEFR.

ASTHMA

Recognition and assessment of severity of asthma attacks in adults

	Mild-Moderate	Severe	Life threatening
Oxygen saturation	>90%	<90%	<90%
Talks in	phrases	words	unable to speak
Alertness	normal	Usually agitated	agitated, drowsy or confused
Respiratory rate	20–30 breaths/minute	often >30 breaths/minute	often >30 breaths/minute OR feeble effort
Wheeze	present	present	absent
Heart rate	100–120 beats/minute	>120 beats/minute	bradycardia
PEFR	>60% of predicted	<60% of predicted	<33% of expected or unable to blow

Note: PEFR is expressed as a percentage of the predicted normal value for the individual, or of the patient's personal best value obtained previously when on optimal treatment (see nomogram in Appendix I: Asthma monitoring, to predict PEFR).

LoE:IVb[1]

COPD

Recognition and assessment of severity of COPD attacks in adults

	Moderate	Severe
Talks in	phrases	words
Alertness	usually agitated	agitated, drowsy or confused
Respiratory rate	20–30 breaths/minute	often >30 breaths/minute
Wheeze	loud	loud or absent
Heart rate	100–120 beats/minute	>120 beats/minute
PEFR after initial nebulisation	±50–75%	<50%; may be too short of breath to blow in PEF meter

Note: PEFR is expressed as a percentage of the predicted normal value for the individual, or of the patient's personal best value obtained previously when on optimal treatment (see nomogram in Appendix I: Asthma monitoring, to predict PEFR).

MEDICINE TREATMENT

See Appendix II: Devices for Respiratory Conditions for guidance on inhaler, spacer and nebuliser device techniques.

Mild to moderate attacks

- Salbutamol 100 mcg metered-dose inhaler (MDI), *LoE:IVb*[2]
  - Salbutamol inhaler 400 to 1000 mcg (4 to 10 puffs) using a spacer if required and available. *LoE:IVb*[3]
  - Shake the inhaler between each puff.
  - If no relief, repeat every 20 to 30 minutes in the first hour.
  - Thereafter, repeat every 2 to 4 hours if needed.

  Note: Administering salbutamol via a spacer is as effective as, and cheaper than, using a nebuliser.

OR

- Salbutamol 0.5% (5 mg/mL), solution,
  - 1 mL (5 mg) salbutamol 0.5% solution made up to 4 mL with sodium chloride 0.9%, preferably delivered at a flow rate of 8 L/min with oxygen.
  - If no relief, repeat every 20 to 30 minutes in the first hour.
  - Thereafter, repeat every 2 to 4 hours if needed. *LoE:IVb*[4]

PLUS

- Corticosteroids (intermediate-acting), e.g.: *LoE:IVb*[5]
- Prednisone, oral, 40 mg immediately if patient known to have asthma/COPD.
  - Follow with prednisone, oral, 40 mg daily for 7 days.

Severe attacks (while awaiting referral)

- Oxygen to keep oxygen saturation 93-95%.

Note: For adults with COPD:

Give oxygen with care (preferably by 24% or 28% facemask, if available). Observe patients closely, as a small number of patients' condition may deteriorate.

AND

- Salbutamol 0.5% (5 mg/mL) nebuliser solution,
  - 1 mL (5 mg) salbutamol 0.5% solution, made up to 4 mL with sodium chloride 0.9%, preferably delivered at a flow rate of 8 L/min with oxygen.
  - If no relief, repeat every 20 to 30 minutes until PEFR >60% of predicted.
  - Once PEFR >60% of predicted, repeat every 2 to 4 hours if needed. *LoE:IVb[6]*

OR

- Salbutamol, inhalation using a MDI, *LoE:IVb[7]*
  - Salbutamol 400–1000 mcg (4 to 10 puffs), up to 20 puffs, using a spacer.
  - Inhale 1 puff at a time. Allow for 6 breaths through the spacer between puffs.
  - If no relief, repeat every 20 to 30 minutes until PEF >60% of predicted.
  - Once PEF >60% of predicted, repeat every 2 to 4 hours if needed.

Note: Administering salbutamol via a spacer is as effective as, and cheaper than, using a nebuliser. *LoE:IVb[8]*

If poor response after first salbutamol nebulisation/inhalation:

- Continue salbutamol nebulisation as described in management above and

ADD

- Ipratropium bromide 0.5 mg/2ml; nebuliser solution
  - Ipratroprium bromide, 2 mL (0.5 mg) added to salbutamol 1 mL (5 mg) solution and made up to 4 mL with sodium chloride 0.9%. *LoE:IIb[9]*
  - Administer every 20 to 30 minutes up to a maximum of 3 doses depending on clinical response.

OR

- Ipratroprium bromide, MDI, 80 to 160 mcg (2 to 4 puffs), using a spacer every 20 to 30 minutes as needed for up to 3 hours. *LoE:IIb[10]*

AND

- Corticosteroids (intermediate-acting), e.g.: *LoE:IVb[11]*
- Prednisone, oral, 40 mg immediately.
  - Follow with prednisone, oral, 40 mg daily for 7 days.

OR

If oral prednisone cannot be taken: *LoE:IVb[12]*

- Hydrocortisone IM/slow IV, 100 mg as a single dose.

Followed with:

- Prednisone, oral, 40 mg daily for 7 days.

CAUTION
Avoid sedation of any kind.

Note: If poor response to treatment, consider alternate diagnosis and refer urgently.

Life- threatening attacks

- Oxygen, to keep oxygen saturation 93 to 95%.

Note: For adults with COPD:

  - Give oxygen with care (preferably by 24% or 28% facemask, if available). Observe patients closely, as a small number of patients' condition may deteriorate.

AND

- Salbutamol 0.5% (5 mg/mL) with ipratropium bromide 0.5 mg/2mL nebuliser solution.
  - Salbutamol 0.5%, 2 mL (10 mg) plus ipratroprium bromide, 2 mL (0.5 mg) every 20–30 minutes depending on clinical response for 4 doses over 2 hours.
  - Delivered at a flow rate of 8 L/min with oxygen.
  - If no relief, repeat every 20 to 30 minutes until asthma severity category moves from life-threatening to severe.

AND

- Parenteral corticosteroids (intermediate-acting) e.g.:
- Hydrocortisone IM/slow IV, 100 mg as a single dose.

LoE:IVb[13]

Followed with:

- Oral corticosteroids (intermediate-acting) e.g.:
- Prednisone, oral, 40 mg daily for 7 days.

CAUTION
Avoid sedation of any kind.

Note: If response to treatment is adequate and severity improves to become severe but not life threatening, treat as per severe asthma exacerbation above.

Assessment of response in adults

	Response	No response
PEFR (if possible)	improvement by >20%	improvement by <20%
Respiratory rate	<20 breaths/ minute	>20 breaths/ minute
Speech	normal	impaired

Patients responding to treatment:

» Routine prescription of antibiotics is not indicated for acute asthma.
» Review current treatment and possible factors causing acute attack, including poor adherence and poor inhaler technique.
» Advise patient/caregiver on further care at home, danger signs and that follow up is required.
» Caution patient on the high chance of further wheezing in the week following an acute attack.
» Patients with a first attack should be fully assessed for maintenance treatment.
» Ask about smoking: if yes, urge patient to stop.

Note: Patients needing repeated courses of oral corticosteroids (more than twice over 6 months) should be assessed by a doctor for maintenance therapy. (See Section 17.1.3: Chronic asthma.)

REFERRAL

Urgent (after commencing treatment):

» All patients with severe attack.
» Poor response to initial treatment.
» PEFR <75% of the predicted normal or of personal best value 15 to 30 minutes after nebulisation.
» A lower threshold for admission is appropriate in patients when:
  - seen in the afternoon or evening, rather than earlier in the day.
  - recent onset of nocturnal symptoms or aggravation of symptoms.
  - previous severe attacks, especially if the onset was rapid.

17.1.2 ACUTE ASTHMA, CHILDREN

J46/J45.0-1/J45.8-9

DESCRIPTION

Bronchospasm in children is usually associated with asthma or with infections such as bronchiolitis or bronchopneumonia. Consider foreign bodies or obstruction of airways due to tuberculous nodes or congenital malformation, especially if the wheeze is unilateral.

Recognition and assessment of severity of attacks in children

	Mild/Moderate	Severe	Life-threatening
Oxygen saturation	>90%	<90%	<90%
Respiratory rate	<40 breaths/minute	>40 breaths/minute	>60 breaths/minute
Chest indrawing/recession	present	present	present
PEF (if >5 years of age)	>60% of predicted	<60% of predicted	<33% of expected or unable to blow
Speech	normal	difficult	unable to speak
Feeding	normal	difficulty with feeding	unable to feed
Wheeze	present	present	absent
Consciousness	normal	normal	impaired

MEDICINE TREATMENT

See Appendix II: Devices for Respiratory Conditions for guidance on inhaler, spacer and nebuliser device techniques.

Mild to moderate attacks:

- Salbutamol 100 mcg metered-dose inhaler (MDI).

Children ≥5 years:

- Salbutamol inhaler 400 to 1000 mcg (4 to 10 puffs) using a spacer.
  - Shake the inhaler between each puff.
  - If no relief, repeat every 20 to 30 minutes in the first hour.
  - Thereafter, repeat every 2 to 4 hours if needed.

LoE:IVb[14]

Children <5 years:

- Salbutamol inhaler 200–600 mcg (2-6 puffs) using a spacer.
  - For children ≥ 3 years, use a spacer with a mouthpiece.
  - If child <3 years of age, use a mask attached to the spacer. Apply the mask to the face to create a seal so that the child breathes through the spacer.
  - Inhale one puff at a time. Use a single breath inhalation technique. If single inhalation technique not possible, allow for 6 breaths through the spacer between puffs.
  - If no relief, repeat every 20 to 30 minutes in the first hour.
  - Thereafter, repeat every 2 to 4 hours if needed.

LoE:IVb[15]

Note: Administering salbutamol via a spacer is as effective as, and cheaper than, using a nebuliser.

OR

- Salbutamol 0.5% (5 mg/mL), solution,
  - 0.5–1 mL (2.5 to 5 mg) salbutamol 0.5% solution, made up to 4 mL with sodium chloride 0.9%, preferably delivered at a flow rate of 8 L/min with oxygen.
  - If no relief, repeat every 20 to 30 minutes in the first hour.
  - Thereafter, repeat every 2 to 4 hours if needed.

LoE:IVb[16]

PLUS

- Corticosteroids (intermediate-acting) e.g.:

LoE:IVb[17]

- Prednisone, oral, 1 to 2 mg/kg immediately and follow with same dose for 7 days:

Weight (kg)	**Dose** (mg)	**Tablet** (5 mg)	**Age** (years)
>11–14 kg	20 mg	4 tablets	>2–3 years
>14–17.5 kg	30 mg	6 tablets	>3–5 years
>17.5 kg	40 mg	8 tablets	>5 years

Severe attacks (while awaiting referral)

- Oxygen to keep oxygen saturation 93 to 95%.

AND

- Salbutamol 0.5% (5mg/mL) nebuliser solution,
  - 0.5–1 mL (2.5 to 5 mg) salbutamol 0.5% solution, made up to 4 mL with sodium chloride 0.9%, preferably delivered at a flow rate of 8 L/min with oxygen.
  - If no relief, repeat every 20 to 30 minutes depending on clinical response.

OR

- Salbutamol, inhalation using an MDI,
  - Salbutamol, 400 to 1000 mcg (4 to 10 puffs), using a spacer.
  - For children ≥3 years, use a spacer with a mouthpiece.
  - If child <3 years of age, use a mask attached to the spacer. Apply the mask to the face to create a seal so that the child breathes through the spacer.
  - Inhale one puff at a time. Use a single breath inhalation technique. If single inhalation technique not possible, allow for 6 breaths through the spacer between puffs.
  - If no relief, repeat every 20 to 30 minutes depending on clinical response.

Note: Administering salbutamol via a spacer is as effective as, and cheaper than, using a nebuliser.

If poor response after first salbutamol nebulisation/inhalation:

ADD

LoE:IIb[18]

- Ipratropium bromide 0.25 mg/2ml; nebuliser solution.
  - Ipratropium bromide, 2 mL (0.25 mg) solution, nebulised with salbutamol 0.5 mL (2.5 mg) and made up to 4 mL with sodium chloride 0.9%.
  - Administer every 20 to 30 minutes depending on clinical response for 4 doses over 2 hours.

OR

- Ipratroprium bromide, MDI, 80 to 160 mcg (2 to 4 puffs), using a spacer every 20–30 minutes as needed for up to 3 hours.

AND

- Corticosteroids (intermediate-acting), e.g.:

LoE:IVb[19]

- Prednisone, oral, 1 to 2 mg/kg immediately and follow with same dose for 7 days:

Weight (kg)	Dose (mg)	Tablet (5 mg)	Age (years)
>11–14 kg	20 mg	4 tablets	>2–3 years
>14–17.5 kg	30 mg	6 tablets	>3–5 years
>17.5 kg	40 mg	8 tablets	>5 years and adult

OR

If oral prednisone cannot be taken:

- Hydrocortisone IM/slow IV, 4 mg/kg (maximum 100 mg) immediately. See dosing table: Chapter 23.

Followed with:

- Prednisone 1 to 2 mg/kg daily for 7 days as per dosing table above.

CAUTION
Avoid sedation of any kind.

Note: If poor response to treatment, consider alternate diagnosis and refer urgently.

Life- threatening attacks

- Oxygen, to keep oxygen saturation 93 to 95%.

AND

- Salbutamol 0.5% (5 mg/mL) with ipratropium bromide 0.5 mg/2mL nebuliser solution:
  - Salbutamol 0.5%, 2 mL (10 mg) plus ipratroprium bromide, 2 mL (0.5 mg) every 20–30 minutes depending on clinical response for 4 doses over 2 hours.
  - Delivered at a flow rate of 8 L/min with oxygen.
  - If no relief, repeat every 20 to 30 minutes until asthma severity category moves from life-threatening to severe.

AND

- Parenteral corticosteroids (intermediate-acting) e.g.:

LoE:IVb[20]

- Hydrocortisone IM/slow IV, 4 mg/kg (maximum 100 mg) immediately. See dosing table: Chapter 23.

Followed with:

- Oral corticosteroids (intermediate-acting) e.g.:
- Prednisone 1 to 2 mg/kg daily for 7 days.

CAUTION
Avoid sedation of any kind.

Note: If response to treatment is adequate and severity improves to become severe but not life threatening, treat as per severe asthma exacerbation above.

Assessment of response in children

	Response	**No response**
PEFR (if possible)	improvement by >20%	improvement by <20%
Respiratory rate	<40 breaths/minute	>40 breaths/minute
Chest indrawing or recession	absent	present
Speech	normal	impaired
Feeding	normal	impaired

Patients responding to treatment:

» Routine prescription of antibiotics is not indicated for acute asthma.
» Review current treatment and possible factors causing acute attack including poor adherence and poor inhaler technique.
» Advise patient/caregiver on further care at home, danger signs and that follow up is required.
» Caution patient/carer on the high chance of further wheezing in the week following an acute attack.
» Patients with a first attack should be fully assessed for maintenance treatment.

Note: Patients needing repeated courses of oral corticosteroids (more than twice over 6 months) should be assessed by a doctor for maintenance therapy. (See Section 17.1.3: Chronic asthma.)

REFERRAL

Urgent (after commencing treatment):

» All patients with severe attack.
» Poor response to initial treatment.
» PEFR <75% of the predicted normal or of personal best value 15 to 30 minutes after nebulisation.
» A lower threshold to admission is appropriate in patients when:
  - seen in the afternoon or evening, rather than earlier in the day.
  - recent onset of nocturnal symptoms or aggravation of symptoms.
  - previous severe attacks, especially if the onset was rapid.

17.1.3 CHRONIC ASTHMA

J45.0-1/J45.8-9

DESCRIPTION

A chronic inflammatory disorder with reversible airway obstruction. In susceptible patients, exposure to various environmental triggers, allergens or viral infections results in inflammatory changes, bronchospasm, increased bronchial secretions, mucus plug formation and, if not controlled, eventual bronchial muscle hypertrophy of the smooth muscle in the airways. All these factors contribute to airway obstruction.

Asthma varies in intensity and is characterised by recurrent attacks of:
» wheezing,
» dyspnoea or shortness of breath,
» cough, especially nocturnal, and
» periods of no airway obstruction between attacks.

Acute attacks may be caused by:
» exposure to allergens,
» respiratory viral infections,
» non-specific irritating substances, and
» exercise.

Asthma must be distinguished from COPD, which is often mistaken for asthma. (See Section 17.1.5: Chronic obstructive pulmonary disease (COPD)). The history is valuable in assessing treatment response.

Asthma	COPD
» Young age onset, usually <20 years. » History of hay fever, eczema and/or allergies. » Family history of asthma. » Symptoms are intermittent with periods of normal breathing in between. » Symptoms are usually worse at night or in the early hours of the morning, during an upper respiratory tract infection, when the weather changes, or when upset. » Marked improvement with $ß_2$-agonist.	» Older age onset, usually >40 years. » Symptoms slowly worsen over a long period of time. » Long history of daily or frequent cough before the onset of shortness of breath. » Symptoms are persistent rather than only at night or during the early morning. » History of heavy smoking (>20 cigarettes/day for ≥15 years), heavy cannabis use, or previous TB. » Little improvement with $ß_2$-agonist.

Asthma cannot be cured, but it can be controlled with regular treatment.
If symptoms suggest TB (e.g. weight loss, night sweats, etc.), investigate and manage accordingly.
Note: The diagnosis of asthma can be difficult in children <6 years of age.
Refer the patient if the diagnosis of asthma is uncertain.

ASTHMA DIAGNOSIS AND SEVERITY

Peak Expiratory Flow Rate (PEFR)
See PEFR charts in Appendix I: Asthma monitoring.
The PEFR may provide additional information for diagnosis and assessing response to therapy.
» PEFR is best assessed in the morning and evening.
  - Instruct the patient to blow forcibly into the device after a deep inspiratory effort.

- The patient must perform three blows at each testing point.
- Take the highest value as the true value.

» The PEFR can be helpful in confirming a diagnosis of asthma in primary care.
- An improvement of 60 L/min or ≥20% of the pre-bronchodilator PEFR, 10 to 20 minutes after inhalation of a beta$_2$-agonist e.g. salbutamol, inhalation, 200 mcg, confirms a diagnosis of asthma.
- A normal PEFR excludes the possibility of moderate and severe COPD.

» PEFR may be useful in assessing response to therapy.
- Any value >80% of the personal best before the use of a bronchodilator is regarded as confirmation of adequate control. Ensure that pre-bronchodilator values are measured at follow-up visits.

Note: Initiating and optimising inhalation corticosteroid therapy for step 1 to 3 asthma therapy should always be done with the use of a peak flow meter to assess asthma control and treatment response of asthma.

Starting asthma treatment in children aged 6-11, adolescent >12 years of age and in adults

STEP 1	STEP 2	STEP 3
Initial asthma treatment in patients with symptoms less than twice a month, and with no exacerbations within the last 12 months.	Asthma symptoms or need for reliever twice a month or more or any exacerbations within the last 12 months.	Troublesome asthma symptoms most days, or waking up from asthma once a week or more.

Figure 17.1 Guidance for assessing asthma treatment in children and adolescents (adapted from the GINA 2023

LoE:IIb[21]

GENERAL MEASURES

» Avoid irritant triggers and relevant allergic triggers.
» Advise patient to stop smoking, and to avoid smoke exposure from others.
» Avoid exposure to known allergens if avoidance measures are feasible and sensitisation has been proven.
» Educate patient and caregiver on:
- early recognition and management of acute attacks,
- emphasise the diagnosis and explain the nature and natural course of the condition,
- use a spacer for all children and all adults with step 3 therapy and above,
- teach and monitor inhaler technique, and
- reassure parents and patients of the safety and efficacy of continuous regular controller therapy.

MEDICINE TREATMENT

Medicine treatment is based on severity and control of the asthma and consists of therapy to prevent the inflammation leading to bronchospasm (controller) and to relieve bronchospasm (reliever).

Reliever medicines in asthma:

- Short acting beta$_2$-agonists (SABAs), e.g.:
- Salbutamol:
  - Indicated for the immediate relief of the symptoms of acute attacks, i.e. cough, wheeze and shortness of breath.
  - Can be used as needed.
  - Increasing need for reliever medicine indicates poor asthma control.

Controller medicines in asthma:

- Inhaled corticosteroids, e.g.:
- Beclomethasone.
  - Must be used twice daily every day, even when the patient feels well.

Inhalation therapy:

Inhaled therapy is preferable to oral therapy.
See Appendix II: Devices for Respiratory Conditions for guidance on inhaler and spacer device technques

STEP 1

Adults and children >6 years

LoE:IIb[22]

As reliever/rescue therapy:

- Short acting beta$_2$-agonists, e.g.:
- Salbutamol, MDI, 200 mcg, as needed.

AND

- Inhaled corticosteroids, e.g.:
- Budesonide, inhalation, 200 mcg whenever salbutamol is taken.

Note: Beclomethasone is the preferred ICS in patients on protease inhibitors due to drug interactions between protease inhibitors and budesonide:

- Beclomethasone, inhalation, 200 mcg whenever salbutamol taken.

STEP 2

Children <6yrs (wheeze ≥3 times a year):

- Inhaled corticosteroids e.g.:
- Beclomethasone, inhalation, 100 mcg 12 hourly.

AND

- Short acting beta$_2$-agonists agonist e.g.:
- Salbutamol, inhalation, 100 to 200 mcg (1 to 2 puffs), 6 to 8 hourly as needed (until symptoms are controlled).

Adults and children ≥ 6yrs

As controller therapy:

- Inhaled corticosteroids, low dose, e.g.:
- Budesonide, inhalation, 200 mcg 12 hourly. *LoE:IIIb*[23]
  - Well and stable after 6 months: can attempt to reduce budesonide dose to 200 mcg daily.
  - Dose adjustments may be required at change of seasons.

Note: Beclomethasone is the preferred ICS in patients on protease inhibitors due to drug interactions between protease inhibitors and budesonide.

- Beclomethasone, inhalation, 200 mcg 12 hourly for 6 months; reduced to 200 mcg daily once well and stable.

AND

As reliever/rescue therapy:

- Short acting beta$_2$-agonists, e.g.:
- Salbutamol, MDI, 200 mcg, 6 hourly as necessary.

Review treatment every 3 months. Adequate control is defined as:

» ≤ 2 episodes of daytime cough and/or wheeze per week.
» No night-time cough and/or wheeze. *LoE:IIIb*[24]
» No recent (within the last year) admission to hospital for asthma.
» PEFR ≥ 80% predicted between attacks.

If control is inadequate:

» Check adherence and inhaler technique, and
» Exclude ongoing exposure to irritants and allergens.

After excluding those causes, refer to a doctor to confirm the diagnosis of asthma, to exclude other diagnoses.

Once the diagnosis is confirmed, **step-up** treatment to STEP 3 as below:

STEP 3

Children

- Inhaled corticosteroids, e.g.:
- Beclomethasone, inhalation, 200 mcg 12 hourly.

Adults

- Inhaled corticosteroids, e.g.:
- Budesonide, inhalation, 400 mcg 12 hourly

Note: Beclomethasone is the preferred ICS in patients on protease inhibitors due to drug interactions between protease inhibitors and budesonide:

- Beclomethasone, inhalation, 400 mcg 12 hourly.

If control is still inadequate in adults, re-evaluate inhaler technique (See Appendix II: Devices for Respiratory Conditions for guidance on inhaler and spacer device technques**) and consider treatment with combination of corticosteroid and long-acting beta agonist (LABA):**

Stop corticosteroid inhaler (e.g. budesonide) and replace controller therapy with:
- Inhaled long-acting beta agonist (LABA)/corticosteroid combination, e.g.:
- Salmeterol/fluticasone, inhalation, 50/250 mcg (1 puff) 12 hourly. (Doctor initiated.) *LoE:IVb[25]*

AND

As reliever/rescue therapy:
- Short acting beta$_2$-agonists, e.g.:
- Salbutamol, MDI, 200 mcg, 6 hourly as necessary.

Note: Fluticasone interacts with protease inhibitors. Refer all patients on protease inhibitors requiring inhaled fluticasone for further management. *LoE:IIIb[26]*

Stepping down treatment:
Attempt a reduction in therapy if the patient has not had any acute exacerbation of asthma in the preceding 6 months, and day-time and night-time symptoms are well controlled.
Gradually reduce the dose of inhaled corticosteroid therapy.
If the symptoms are seasonal, corticosteroids may be stopped until the next season.
If symptoms re-appear, increase therapy to the level at which the patient was previously controlled.

REFERRAL TO DOCTOR
» All children <6 years of age for assessment and confirmation of diagnosis.
» Any patient who has received >2 courses of oral prednisone within 6 months.
» Brittle asthma (very sudden, very severe attacks).
» All patients without adequate control on step 2 or 3 of treatment.
» Patients on protease inhibitors, requiring inhaled fluticasone.

REFERRAL TO HOSPITAL
Uncontrolled asthma.
Note: In patients with new onset of exercise-related symptoms, consider other diagnoses, particularly if no response to pre-treatment with SABA is noted.

17.1.4 ACUTE BRONCHIOLITIS IN CHILDREN
J20.0-9/J21.0-1/J21.8-9

DESCRIPTION
Acute bronchiolitis is a common cause of wheezing and cough in the first two years of life. It is caused by viral infections and presents with lower airway obstruction due to inflammation and plugging of the small airways. Recurrent episodes can occur, usually during winter.
It can be difficult to distinguish between bronchiolitis and asthma. Bronchiolitis does not respond to salbutamol. If there is a good response to a single dose of salbutamol, asthma is the likely diagnosis. See Section 17.1.2: Acute asthma, children.
Bronchiolitis is extremely rare in children >2 years of age. Consider other causes of wheeze in children >2 years of age. See Section 17.1.2: Acute asthma, children; and Section 17.3.4.1: Pneumonia in children.

Child presents with:
» rapid breathing
» decreased breath sounds

» chest indrawing
» an audible wheeze or crackles

Risk factors for severe bronchiolitis:
» Infants <3 months of age
» Ex-premature babies
» Chronic lung disease
» Congenital heart disease

Signs of severe disease:
» Increased respiratory effort: tachypnoea, nasal flaring, severe lower chest wall indrawing, accessory muscle use, grunting.
» Central cyanosis or hypoxia (oxygen saturation <90% in room air).
» Apnoea.
» Inability to feed.
» Lethargy or decreased level of consciousness.

DIAGNOSTIC CRITERIA
» Prodrome of viral infection: irritability and rhinorrhoea.
» A wheeze that is slowly responsive or non-responsive to bronchodilators.
» Tachypnoea: age dependent:

Age	Respiratory rate
Birth to 2 months	≥60 breaths/minute
2o to 12 months	≥50 breaths/minute
1 to 5 years	≥40 breaths/minute

GENERAL MEASURES
» Minimise contact with other children.
» Avoid routine use of antibiotics and corticosteroids.
» Do not sedate child.

MEDICINE TREATMENT
Mild cases, without risk factors may be managed as an outpatient.

Refer severe bronchiolitis or those with risk factors:

- Oxygen, humidified, using nasal prongs or nasal cannula, at 1 to 2 L/minute.

REFERRAL
» Signs of severe bronchiolitis (respiratory distress, hypoxia, apnoea, inability to feed, lethargy/decreased level of consciousness).
» Bronchiolitis with risk factors for severe disease.
» Previous admission for same problem.

17.1.5 CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

J43.0-2/J43.8-9/J44.0-1/J44.8-9

DESCRIPTION

Also referred to as chronic obstructive airways disease (COAD), and comprises chronic bronchitis and emphysema which are characterised by:

» chronic cough with/without sputum production on most days of ≥3 months for ≥2 consecutive years;
» dyspnoea or shortness of breath; and
» wheezing.

The onset is very gradual with progressively worsening symptoms. Due to the large reserve capacity of the lungs, patients often present when there is considerable permanent damage to the lungs. In addition to the symptoms listed above, patients may present with symptoms or signs of right heart failure. The airways obstruction is not fully reversible (in contrast to asthma).

The main causes of COPD are chronic irritation of the airways caused by smoking, air pollution, previous TB, and previous cannabis (dagga) smoking, although there are many other causes.

If symptoms suggest TB (e.g. weight loss, night sweats, etc.), investigate and manage accordingly. (See Section 17.4: Pulmonary Tuberculosis (TB).)

GENERAL MEASURES

» Smoking cessation, including cannabis (dagga), is the mainstay of therapy.
» Chest physiotherapy where available.
» Exercise.

MEDICINE TREATMENT

See Appendix II: Devices for Respiratory Conditions for guidance on inhaler, spacer and nebuliser device techniques.

Acute lower airways obstruction:

Treat as for acute asthma but in addition, add antibiotics if patients have increased sputum purulence AND either increased sputum volume or increased dyspnoea.

- Amoxicillin, oral, 500 mg 8 hourly for 5 days. A — *LoE:IIb*[27]

Severe penicillin allergy:

Z88.0

Azithromycin, oral, 500 mg daily for 3 days. W

Chronic management:

» In a stable patient, check PEFR.
» Then give a test dose of salbutamol, i.e. 2 puffs.
» Repeat PEFR 15 minutes later.
» If there is ≥20% improvement in peak flow, diagnose asthma and manage patient accordingly. See Section 17.1.3: Chronic asthma.
» Perform spirometry if available. Diagnose COPD if post-bronchodilator FEV_1/FVC <70%.

▪ Short acting $beta_2$ agonist, e.g.:

- Salbutamol, inhalation, 100 to 200 mcg (1 to 2 puffs), 3 to 4 times daily via a spacer as needed for relief of wheeze.

If not controlled on SABA alone and diagnosis was confirmed by spirometry (with <2 exacerbations per year):

- Long-acting beta$_2$ agonist (LABA), e.g.:
- Formoterol, inhaled 12 mcg (1 puff) 12 hourly. (Doctor initiated.) *LoE:IVb*[28]

If not controlled on SABA alone and spirometry not available:

- Inhaled LABA/corticosteroid combination e.g.:
- Salmeterol/fluticasone, inhalation, 50/250 mcg (1 puff) 12 hourly. (Doctor initiated.)

If not controlled on a LABA alone or frequent exacerbations (≥2 per year):

Measure blood eosinophil levels.

If eosinophils >0.1 x10^9 cells/L, replace with:

- Inhaled LABA/corticosteroid combination e.g.:
- Salmeterol/fluticasone, inhalation, 50/250 mcg (1 puff) 12 hourly. (Doctor initiated.) *LoE:IVb*[29]

Note:

» Fluticasone and budesonide interact with protease inhibitors. Refer all patients on protease inhibitors requiring inhaled corticosteroids for further management. *LoE:IIIb*[30]

» Oral corticosteroids may be required for acute exacerbations, but these have severe long-term complications and should only be used long-term if advised by a specialist.

» Do not measure blood eosinophil levels while taking oral corticosteroids, as this may temporarily lower the eosinophil count.

Prophylaxis against respiratory tract infections:

Z25.1

- Influenza vaccination, annually.

REFERRAL

» Poor response to above therapy, for further investigations and adjustment of treatment.

» Patients on protease inhibitors, requiring inhaled corticosteroids.

17.2 STRIDOR (UPPER AIRWAYS OBSTRUCTION)

17.2.1 CROUP (LARYNGOTRACHEO BRONCHITIS) IN CHILDREN

J05.0-1

DESCRIPTION

Croup is a common cause of potentially life-threatening airway obstruction in childhood. It is characterised by inflammation of the larynx, trachea and bronchi. Most common causative pathogens are viruses, including measles.

A clinical diagnosis of viral croup can be made if a previously healthy child develops progressive, inspiratory airway obstruction with stridor and a barking cough, 1 to 2 days after the onset of an upper respiratory tract infection. A mild fever may be present.
Suspect foreign body aspiration if there is a sudden onset of stridor in an otherwise healthy child.
Suspect epiglottitis if the following are present in addition to stridor:

» very ill child
» high fever
» sitting upright with head held erect
» drooling saliva
» unable to swallow

Assessment of the severity of airway obstruction and management in croup

Grade 1 Inspiratory stridor only	▪ Corticosteroids (intermediate-acting) e.g.: ▪ Prednisone, oral, 1 to 2 mg/kg, single dose. o Do not give if measles or herpes infection present. » Refer. *LoE:III*[31]
Grade 2 Inspiratory and expiratory stridor	▪ Corticosteroids (intermediate-acting) e.g.: ▪ Prednisone, oral, 1 to 2 mg/kg, immediately as a single dose. *LoE:III*[32] ▪ Adrenaline (epinephrine), 1:1000 diluted in sodium chloride 0.9%, nebulised, immediately. o Dilute 1 mL of 1:1000 adrenaline with 1 mL sodium chloride 0.9%. o Repeat every 15 to 30 minutes until expiratory stridor disappears. » Refer.
Grade 3 Inspiratory and expiratory stridor with active expiration, using abdominal muscles	» Treat as above. » If no improvement within one hour, refer **urgently** (intubate before referral if possible).
Grade 4 Cyanosis, apathy, marked retractions, impending apnoea	» Intubate (if not possible give treatment as above). » Refer **urgently**.

GENERAL MEASURES

» Keep child comfortable.
» Continue oral fluids provided that patient is able to swallow.
» Encourage parent or caregiver to remain with the child.

MEDICINE TREATMENT

- Paracetamol, oral, 10 to 15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Children grade 2 or more stridor- while awaiting transfer:

▪ Corticosteroids (intermediate-acting) e.g.: *LoE:IVb*[33]

- Prednisone, oral, 1 to 2 mg/kg immediately as a single dose.
- Adrenaline (epinephrine), 1:1000, nebulised, immediately using a nebuliser.
  - o If there is no improvement, repeat every 15 minutes until the child is transferred.
  - o Dilute 2 mL of 1:1000 adrenaline with 2 mL sodium chloride 0.9%.
  - o Nebulise the entire volume with oxygen at a flow rate of 6 to 8 L/minute.

Weight-based prednisone dosing for children <18 kg:

Weight (kg)	Dose (mg)	Tablet (5 mg)	Age (years)
>11–14 kg	20 mg	4 tablets	>2–3 years
>14–17.5 kg	30 mg	6 tablets	>3–5 years

If epiglottitis suspected:

- Ceftriaxone, IM,80 mg/kg/dose immediately as a single dose and refer. W See dosing table: Chapter 23.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If *SUSPECTING SERIOUS BACTERIAL INFECTION* in neonate, give ceftriaxone, even if jaundiced.
» Always include the dose and route of administration of ceftriaxone in the referral letter.

Management during transfer:

» Give the child oxygen to keep oxygen saturation levels at 93 to 95%.
» Continue nebulisations with adrenaline (epinephrine).
» If grade 2 to 3, contact ambulance or nearest doctor.
» If grade 4, intubate and transfer.

REFERRAL

Urgent

» Children with:
  - Grade 2-4 stridor,
  - chest indrawing,
  - rapid breathing,
  - altered consciousness,
  - inability to drink or feed.
» For confirmation of diagnosis.
» Suspected foreign body.
» Suspected epiglottitis.

Non Urgent

» All children with grade 1 stridor.

17.3 RESPIRATORY INFECTIONS

17.3.1 INFLUENZA

J09/J10.0-1/J10.8/J11.0-1/J11.8

DESCRIPTION

Influenza is a self-limiting viral condition that presents with headache, muscular pain and fever. It usually begins to clear within 7 days but may last up to 14 days. Malnourished children, the elderly and debilitated patients are at greater risk of developing complications.

CAUTION

Malaria, measles, and HIV seroconversion may present with flu-like symptoms.

Complications:
Secondary bacterial infections, including:
» pneumonia secondary to influenza
» sinusitis
» otitis media

GENERAL MEASURES
» Bed rest, if feverish.
» Ensure adequate hydration.
» Advise patient to return to clinic if earache, tenderness or pain over sinuses develops and/or cough or fever persists for longer than a week.

MEDICINE TREATMENT
Note: Antibiotics are of no value in the treatment of influenza.

Infants
- Sodium chloride 0.9%, instilled into each nostril as required.

Pain and fever with distress:

Children
- Paracetamol, oral, 10 to 15 mg/kg/dose 4 to 6 hourly when required. See dosing table: Chapter 23.

Adults
- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

17.1.4REFERRAL
Severe complications.

17.3.2 ACUTE BRONCHITIS IN ADULTS OR ADOLESCENTS
J20.0-9

DESCRIPTION
Acute airway infections, mostly of viral origin, accompanied by cough, sputum production, and sometimes a burning retrosternal chest pain in patients with otherwise healthy lungs.
Clinical features:
» initially: non-productive cough.
» later: productive cough with yellow or greenish sputum.

Viral bronchitis is usually part of an upper respiratory viral infection. It may be accompanied by other manifestations of viral infections. It is important to exclude underlying bronchiectasis or an acute exacerbation of chronic bronchitis in adults.

Antibiotics are not indicated in acute bronchitis in the absence of underlying COPD.

17.3.3 ACUTE EXACERBATION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

See Sections 17.1.1: Acute asthma and acute exacerbation of COPD, adults, and 17.1.5: Chronic Obstructive Pulmonary Disease.

17.3.4 PNEUMONIA

DESCRIPTION

Acute infection of the lung parenchyma, usually caused by bacteria, especially *Streptococcus pneumonia* (pneumococcus).

Management is guided by:
- » age
- » co-morbidity
- » severity of the pneumonia

Manifestations include:
- » malaise;
- » fever, often with sudden onset and with rigors;
- » cough, which becomes productive of rusty brown or yellow-green sputum;
- » pleuritic type chest pain;
- » shortness of breath;
- » and in severe cases, shock and respiratory failure.

On examination there is:
- » fever
- » tachypnoea
- » crackles or crepitations
- » bronchial breath sounds

A pleural rubbing sound, or signs of a pleural effusion may be present.

Predisposing conditions include:
- » very young or old age
- » malnutrition
- » other concomitant diseases
- » HIV infection

Pneumococcal pneumonia often occurs in previously healthy adults.
Adults with mild to moderately severe pneumonia may be managed at PHC level, depending on the response to initial treatment (see below).

17.3.4.1 PNEUMONIA IN CHILDREN

J18.0-2/J18.8-9

DESCRIPTION

Pneumonia should be distinguished from viral upper respiratory infections. With viral URTIs' the respiratory rate will be normal. A raised respiratory rate indicates an alternate diagnosis such as bronchiolitis or pneumonia.

Assess the child for the severity of the pneumonia

Classify children according to the severity of the illness:

» Pneumonia: fever, cough and rapid breathing, but no chest indrawing (of the lower chest wall) and no flaring of nostrils.

» Severe pneumonia: fever, cough, rapid breathing, chest indrawing and flaring nostrils, or grunting.

Note: Children <2 months of age with rapid breathing should be classified as having severe pneumonia.

Rapid breathing is defined according to age:

Age	Respiratory rate
Birth – 2 months	≥ 60 breaths/minute
2–12 months	≥ 50 breaths/minute
1–5 years	≥ 40 breaths/minute

Danger signs indicating urgent and immediate referral include:

» oxygen saturation of <90% in room air
» inability to drink
» impaired consciousness
» cyanosis
» <2 months of age
» grunting

GENERAL MEASURES

» Ensure adequate hydration.
» Continue feeding.

MEDICINE TREATMENT

Pneumonia (non-severe):

- Amoxicillin, oral, 45 mg/kg/dose, 12 hourly for 5 days. A

LoE:IVb[34]

Weight (kg)	Dose mg	Use one of the following: Syrup (mg/5mL)		Capsule (mg)		Age (Months/years)
		125	250	250	500	
>3.5–5 kg	175 mg	7 mL	3.5 mL	–	–	>1–3 months
>5–7 kg	250 mg	10 mL	5 mL	–	–	>3–6 months
>7–11 kg	375 mg	15 mL	7.5 mL	–	–	>6–18 months
>11–14 kg	500 mg	–	10 mL	2	1	>18 months–3 years
>14–17.5 kg	750 mg	–	15 mL	3	–	>3–5 years
>17.5–25 kg	1000 mg	–	20 mL*	4	2	>5–7 years
>25–30 kg	1250 mg	–	25 mL*	5	–	>7–10 years
>30 kg	1500 mg	–	–	6	3	>10 years

*capsule/tablet preferred

Severe penicillin allergy:

Z88.0

Children

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg/dose daily for 3 days. W See dosing table:Chapter 23.

Severe pneumonia:

- Oxygen, using nasal cannula at 1–2 L/minute before and during transfer.

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose. W See dosing table: Chapter 23.
  - Do not inject more than 1 g per injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If SUSPECTING SERIOUS BACTERIAL INFECTION in neonate, give ceftriaxone, even if jaundiced.
» Always include the dose and route of administration of ceftriaxone in the referral letter.

REFERRAL

Urgent

» All children with severe pneumonia, i.e. chest indrawing (of the lower chest wall), flaring nostrils or cyanosis.
» All children <2 months of age.

Non urgent

» Inadequate response to treatment.
» Children coughing for >3 weeks to exclude other causes such as TB, foreign body aspiration or pertussis.

17.3.4.2 PNEUMONIA IN ADULTS

17.3.4.2.1 UNCOMPLICATED PNEUMONIA

J18.0-2/J18.8-9

DIAGNOSIS

A chest X-ray should ideally be taken in all patients to confirm the diagnosis. Send one sputum specimen for TB DNA PCR (Xpert® MTB/RIF) to exclude pulmonary tuberculosis.

MEDICINE TREATMENT

If not severely ill (see referral criteria below):

- Amoxicillin, oral, 1 g 8 hourly for 5 days.

Severe Penicillin allergy:

Z88.0

- Moxifloxacin, oral, 400 mg daily for 5 days.

A follow-up chest X-ray should ideally be taken to ensure resolution of the pneumonia in patients >50 years of age. *LoE:IIIb*[35]

REFERRAL

Any of the following:

» Confusion or decreased level of consciousness.
» Cyanosis.
» Respiratory rate of ≥30 breaths/minute.
» Systolic BP <90 mmHg.
» Diastolic BP <60 mmHg.
» Deterioration at any point.
» No response to treatment after 48 hours.
» Patients with pneumonia:

- from a poor socio-economic background,
- who are unlikely to comply with treatment,
- who live a considerable distance from health centres,
- who have no access to immediate transport.

17.3.4.2.2 PNEUMONIA IN ADULTS WITH UNDERLYING MEDICAL CONDITIONS OR >65 YEARS OF AGE

J18.0-2/J18.8-9

A chest X-ray should ideally be taken in all patients to confirm the diagnosis. Send one sputum specimen for TB DNA PCR (Xpert® MTB/RIF) to exclude pulmonary tuberculosis.

Common underlying conditions include:

» Diabetes mellitus.
» HIV infection.
» Cardiac failure.
» COPD.
» Alcoholism.
» Chronic liver disease.
» Chronic kidney disease.

Most of these patients will require referral to a doctor.

MEDICINE TREATMENT

Mild pneumonia:

- Amoxicillin/clavulanic acid 875/125 mg, oral, 12 hourly for 5 days. A

Severe Penicillin allergy:

Z88.0

LoE:IIIb[36]

- Moxifloxacin, oral, 400 mg daily for 5 days. W

A follow-up chest X-ray should ideally be taken to ensure resolution of the pneumonia in patients >50 years of age.

17.3.4.2.3 SEVERE PNEUMONIA

J18.0-2/J18.8-9

DESCRIPTION

Severe pneumonia is defined as ≥ 2 of the following:

» confusion/ decreased level of consciousness
» respiratory rate of ≥ 30 breaths/minute
» >65 years of age
» systolic BP <90 mmHg
» diastolic BP <60 mmHg

MEDICINE TREATMENT

While awaiting transfer:

- Oxygen, to achieve a saturation of 92%.
- Ceftriaxone, IV/IM, 1 g, as a single dose before referral.

CAUTION

Do not administer calcium containing intravenous fluids, e.g. Ringer Lactate, concurrently with IV ceftriaxone.

REFERRAL

Urgent

All patients.

17.3.4.2.4 PNEUMOCYSTIS PNEUMONIA

B20.6

DESCRIPTION

Interstitial pneumonia occurring with advanced HIV infection due to *Pneumocystis jiroveci* (formerly *carinii*). Patients usually present with shortness of breath or dry cough. Chest X-ray may be normal in the early stages, but typically shows bilateral interstitial or ground glass pattern.

GENERAL MEASURES

Ensure adequate hydration.

MEDICINE TREATMENT

Adults

- Cotrimoxazole, oral, 6 hourly for 3 weeks. A

Approx. weight kg	Use one of the following tablet formulations	
	80/400 mg	160/800 mg
<40 kg	2 tablets	1 tablet
>40–56 kg	3 tablets	1½ tablets
>56 kg	4 tablets	2 tablets

For secondary prophylaxis

- Cotrimoxazole, oral, daily. A

Use one of the following tablet formulations	
80/400 mg	160/800 mg
2 tablets	1 tablet

Note: Discontinue cotrimoxazole prophylaxis once the CD4 count increases on ART to >200 cells/mm^3 for at least 6 months.

REFERRAL

» All children.
» Breathing rate >24 breaths/minute.
» Shortness of breath with mild effort.
» Cyanosed patients.

17.4 PULMONARY TUBERCULOSIS (TB)

Note: TB is a notifiable disease.

TB guidelines are updated regularly.
Consult the most recent National Tuberculosis Control Programme Guidelines.

DESCRIPTION

Tuberculosis is an infection caused by *Mycobacterium tuberculosis*. The risk of developing TB disease is higher among people living with HIV.

17.4.1 PULMONARY TUBERCULOSIS (TB) IN ADULTS

A15.0-3/A15.7-8/A16.0-2/A16.4/A16.7-9 + (B20.0)

DIAGNOSIS

Pulmonary TB is diagnosed on sputum by TB nucleic acid amplification tests (TB-NAAT) such as Xpert® MTB/RIF Ultra, sputum smear, or culture.

» Send 1 sputum specimen for TB-NAAT.
- If TB-NAAT is unsuccessful: collect another sample and repeat TB-NAAT.
- If TB-NAAT is trace (only applies to Xpert® MTB/RIFUltra): If the clinical presentation and chest X-ray are suggestive of TB, treat for drug-sensitive TB (DS-TB), and collect sputum specimen for TB culture and drug sensitivity testing (DST). If the patient is asymptomatic, with no abnormalities on chest X-ray, continue routine care with close follow-up for features of TB.
- If TB-NAAT is positive and susceptible to rifampicin: treat for DS-TB and send a sputum specimen for baseline smear microscopy (the smear is used for reporting, not for diagnosis).
- If TB-NAAT is positive, susceptible to rifampicin and resistant to isoniazid: treat for isoniazid monoresistant TB (See Section 17.4.4.1: Isoniazid mono-resistant tuberculosis in adults). Collect sputum sample for reflex testing of fluoroquinolone susceptibility.
- If TB-NAAT is positive and rifampicin unsuccessful: start DS-TB treatment and collect another sputum sample for smear, culture and drug sensitivity testing (DST). Follow-up culture and DST results.
- If TB-NAAT is positive and resistant to rifampicin (with or without isoniazid resistance): treat for rifampicin resistant TB and send sputum sample for further reflex testing and DST.
- If TB-NAAT is negative and patient is living with HIV: send sputum for TB culture and perform chest X-ray. If CD4 <200 within the last 6 months and they have signs and symptoms of TB (pulmonary or extrapulmonary), the patient has advanced HIV disease or the patient is currently seriously ill and requiring hospitalization, perform urine LAM (U-LAM) test. *LoE:I*[37]
- If TB-NAAT is negative and patient is HIV negative: treat with antibiotics and consider further investigation only if symptoms persist.

Note: Patients with a history of TB can remain TB-NAAT positive for several years after completion of appropriate anti-TB treatment. To diagnose a new episode of TB in previously treated patients, send sputum for smear microscopy and culture instead.

GENERAL MEASURES

» Counsel patients about the disease and infection control in the home. Explain the importance of completing treatment.
» Advise against the use of tobacco and excessive alcohol.
» If more than two doses of treatment are missed, extra effort should be made to identify and manage any problems the patient might have.

MEDICINE TREATMENT

Administer total daily amount of each medicine in one dose and not as divided doses.

Important medicine interactions

Rifampicin may reduce the efficacy of low dose combined oral contraceptives and progestin-only implants, resulting in possible unplanned pregnancies. (See Chapter 7: Family planning.)

» Use of alternative contraceptive methods, such as IUD or DMPA, should be advised.
OR
» Women choosing to use a progestin-only subdermal implant should be advised to use additional contraception for the duration of TB therapy. See Section 11.1: Antiretroviral therapy, adults and adolescents.

CAUTION
Antiretroviral medicines frequently interact with TB medicines.
Consult the National Department of Health antiretroviral treatment guidelines.

Dose adjustment in renal impairment (eGFR <30 mL/min).

- Ethambutol 15 – 25mg/kg three times weekly.
- Pyrazinamide 20 – 30 mg/kg three times weekly.
- Rifampicin and isoniazid do not require dose adjustment.

Intensive phase of treatment:

- Alternate day dosing of RH and RHZE.
  - Administer standard weight-based dosing of RH on Tuesday, Thursday, Saturday, Sunday.

  AND
  - Administer standard weight-based dosing with RHZE on Monday, Wednesday, Friday.

Continuation phase of treatment:

LoE:IVb

- Rifampicin and isoniazid
  - Do not require dose adjustment. Continue daily weight-based dosing of RH.

Adverse effects of TB medicines include:

» Nausea:
  - Taking medicines with meals can minimise nausea.
  - Hepatitis must be excluded, if there is new onset nausea. Request serum alanine aminotransferase test urgently in these patients.
» Hepatitis (drug induced liver injury):

- Rifampicin, isoniazid and pyrazinamide may cause hepatitis. Cotrimoxazole and antiretrovirals (efavirenz, nevirapine, lopinavir + ritonavir) can also cause hepatitis.
- Patient may present with jaundice and/or complaining of hepatitis symptoms (e.g. nausea, malaise, abdominal pain).
- Refer to hospital for urgent (same day) ALT and further management.
- If jaundiced, stop TB treatment and medicines known to cause hepatitis before referring. See Section: 11.1: Antiretroviral therapy, adults and adolescents (Rifampicin-based TB treatment).

» New onset skin rash:
- Refer if suspected drug rash.

» Neuropathy:
- Can be prevented by taking pyridoxine.

» Arthralgia:
- Exclude gout, and treat symptomatically.

17.4.1.1 TB CHEMOPROPHYLAXIS/ISONIAZID PREVENTIVE THERAPY (IPT) IN ADULTS

See Section 11.2.2: Tuberculosis preventive therapy (TPT).

17.4.1.2 TB CONTROL PROGRAMME: MEDICINE REGIMENS IN ADULTS

A15.0-3/A15.7-8/A16.0-2/ A16.4/A16.7-8 + (B20.0)

Treatment should be given once daily, **seven days per week**, in both the intensive and continuation phases.

R – Rifampicin
H – Isoniazid
Z or PZA– Pyrazinamide
E or EMB – Ethambutol

Pre-treatment body weight kg	**Two months initial phase**	**Four months continuation phase**	
	RHZE (150/75/400/275)	RH (150/75)	RH (300/150)
30–37 kg	2 tablets	2 tablets	
38–54 kg	3 tablets	3 tablets	
55–70 kg	4 tablets		2 tablets
≥71kg	5 tablets		2 tablets

» Adhere to the correct dose and the duration of treatment.
» Weigh patient frequently and adjust the dose according to current weight.

17.4.2 PULMONARY TUBERCULOSIS (TB) IN CHILDREN

A15.0-3/A15.7-8/A16.0-2/A16.4/A16.7-8 + B20.0

Most children acquire tuberculosis from infected adults by inhalation. Malnourished, immunosuppressed (HIV and AIDS) children, and children <5 years of age, are at increased risk for pulmonary tuberculosis.

DIAGNOSIS

Any child presenting with symptoms and signs suggestive of pulmonary TB is regarded as a case of TB if there is:

» A chest X-ray suggestive of TB,

AND/OR

» History of exposure to an infectious TB case and/or positive tuberculin skin test (TST) e.g. Mantoux.

A positive TB-NAAT and/or smear microscopy and/or culture, on early morning gastric aspirate or induced sputum, confirms TB disease.

Signs and symptoms include:

» unexplained weight loss or failure to thrive,
» unexplained fever for ≥ 2 weeks,
» chronic unremitting cough for >14 days,
» lymphadenopathy (especially cervical, often matted),
» hepatosplenomegaly,
» consolidation and pleural effusion.

Tuberculin skin test (TST), e.g. Mantoux:

» A positive test: TST induration ≥10 mm.
» A TST may be falsely negative in the presence of:
  - malnutrition,
  - immunodeficiency, e.g. HIV and AIDS,
  - immunosuppression, e.g. steroid therapy, cancer chemotherapy,
  - following overwhelming viral infection, e.g. measles or post vaccination.

  In these circumstances a TST induration ≥5 mm may be regarded as positive. Frequently, the TST will be non-reactive in these cases. TB treatment should be considered, despite a negative TST.

The following may be evident on chest X-ray:

» Direct or indirect evidence of hilar or mediastinal adenopathy, with or without parenchymal opacification, and/or bronchopneumonia.

GENERAL MEASURES

» Identify and treat the source case.
» Screen all contacts for TB infection.
» Monitor the nutritional status of the child to assess response to treatment.

17.4.2.1 TB CHEMOPROPHYLAXIS/ISONIAZID PREVENTIVE THERAPY (IPT) IN CHILDREN

Z20.1

Consider TB chemoprophylaxis/isoniazid preventive therapy (IPT) in all children younger than 5 years, or who are living with HIV, and exposed to a pulmonary TB contact.

Exclude active TB (i.e. no signs or symptoms suggestive of TB):

» Refer to Section 17.4.2: Pulmonary tuberculosis (TB) in children.
» If any signs or symptoms of pulmonary TB are present, refer for chest X-ray.

» Never give TPT to children with active TB.

TB chemoprophylaxis/ IPT is only used in:

» Children <5 years of age.

OR

» Children of any age, who are living with HIV.

WITH EITHER

- Close contact with an infectious pulmonary TB case. If child is re-exposed to a close contact, TB chemoprophylaxis must be repeated (Previous IPT does not protect the child against subsequent TB exposure/ infection).
- Positive TST (only applicable on the first occasion of a positive TST).

MEDICINE TREATMENT

Preventive therapy in case of drug-sensitive TB contact:

- Isoniazid, oral, 10 mg/kg daily for 6 months.
  - Maximum dose: 300 mg daily.

Weight kg	Daily isoniazid (INH) 100 mg tablet
>2–3.4 kg	¼ tablet
>3.5–6.9 kg	½ tablet
>7–9.9 kg	1 tablet
>10–14.9 kg	1½ tablets
>15–19.9 kg	2 tablets
>20–24.9 kg	2½ tablets
>25 kg	3 tablets

Note: For adults and adolescents initiating a DTG-containing ART regimen, isoniazid daily for 12 months is the preferred regimen. For patients who are already virally suppressed on a DTG-based regimen, a weekly combination of isoniazid (900mg if weight >30 kg) plus rifapentine (900mg if weight >30 kg) for three months may be preferred. Do not use rifapentine-containing TPT in patients on protease inhibitor-based ART, or in women on hormonal contraceptives. *[See the therapeutic interchange database for details regarding the rifapentine-containing TPT regimen].*

LoE:IIb[38]

Preventive therapy in case of drug-resistant TB contact:

Isoniazid mono-resistant contact:

- Rifampicin, oral, 15 mg/kg daily for 4 months.

LoE:IVb[39]

Rifampicin mono-resistant contact:

- Isoniazid, oral, 10 mg/kg daily for 6 months (see table above).

LoE:IVb[40]

Children living with HIV or malnutrition or existing neuropathy taking isoniazid:

ADD

- Pyridoxine, oral, daily for duration of prophylaxis:
  - Child <5 years old: 12.5 mg.
  - Child ≥ 5 years old: 25 mg.

LoE:IVb[41]

REFERRAL

Children with drug resistant TB contacts for expert advice.

17.4.2.2 TB CONTROL PROGRAMME: MEDICINE REGIMENS IN CHILDREN

A15.0-3/A15.7-8/A16.0-2/ A16.4/A16.7-8 + (B20.0)

The employment of directly observed therapy (DOT) with short-course, fixed medicine combinations are recommended. Treatment should be given daily in both the intensive (initial) and continuation phases.

Recommended dose ranges		
	Daily (mg/kg)	**Maximum daily dose**
H	10–15	300 mg
R	10–20	600 mg
Z/ PZA	30–40	2 g
E/EMB	15–25	1 200 mg

UNCOMPLICATED PULMONARY TB

Includes smear negative pulmonary TB with no more than mild to moderate lymph node enlargement and/or lung field opacification, or simple pleural effusion on chest x-ray.

Children ≤ 8 years of age or <25 kg):

	2 months intensive phase given daily			**4 months continuation phase given daily**
Weight (kg)	**RH**	**PZA**		**RH**
	60/60 mg	150 mg* **OR** 150 mg/3 mL	500 mg	60/60 mg
2–2.9 kg	½ tablet	1.5 mL	expert advice on dose	½ tablet
3–3.9 kg	¾ tablet	2.5 mL	¼ tablet	¾ tablet
4–5.9 kg	1 tablet	3 mL	¼ tablet	1 tablet
6–7.9 kg	1½ tablets		½ tablet	1½ tablets
8–11.9 kg	2 tablets		½ tablet	2 tablets
12–14.9 kg	3 tablets		1 tablet	3 tablets
15–19.9 kg	3½ tablets		1 tablet	3½ tablets
20–24.9 kg	4½ tablets		1½ tablet	4½ tablets
25–29.9 kg	5 tablets		2 tablets	5 tablets

* For each dose, dissolve 150 mg dispersible (1 tablet) in 3 mL of water to prepare a concentration of 50 mg/mL (150 mg/3 mL)

Note: Give PZA 150 mg **or** 500 mg, and not both.

LoE:IVb[42]

Dosing recommendations for dispersible fixed dose combinations tablets:

Weight kg	2 months intensive phase given daily	4 months continuation phase given daily
	RHZ (75/50/150 mg)	**RH** (75/50 mg)
4–7.9 kg	1 tablet	1 tablet
8–11.9 kg	2 tablets	2 tablets
12–15.9 kg	3 tablets	3 tablets
16–24.9 kg	4 tablets	4 tablets
≥25 kg	Adult dosages recommended	

ADD

- Pyridoxine, oral, daily for 6 months if living with HIV, malnourished, or has existing neuropathy:
  - Child <5 years old: 12.5 mg.
  - Child ≥5 years old: 25 mg.

LoE:IVb[43]

Children ≥ 8 years and adolescents (and ≥25 kg)

Pre-treatment body weight kg	2 months intensive phase given daily	4 months continuation phase given daily	
	RHZE (150/75/400/275)	**RH (150/75)**	**RH (300/150)**
25–37.9 kg	2 tablets	2 tablets	
38–54.9 kg	3 tablets	3 tablets	
55–70 kg	4 tablets		2 tablets
>71 kg	5 tablets		2 tablets

AND

If living with HIV, malnourished or has existing neuropathy:

LoE:IVb[44]

- Pyridoxine, oral, daily for 6 months.
  - Child ≥ 5 years old: 25 mg.

» Adjust treatment dosages to current body weight.

» If calculating dosages, rather give ½ tablet more than ½ tablet less.

COMPLICATED PULMONARY TB

» Includes all other forms of pulmonary TB, such as smear positive TB, cavitating pulmonary TB, bronchopneumonic TB, large lesion pulmonary TB, and tuberculous empyema.

» Refer all cases of miliary TB for exclusion of TB meningitis.

Children ≤8 years of age (or <25 kg):

» Intensive phase: Standard dose 4-drug therapy daily (RHZE) for 2 months.

THEN

» Continuation phase: Standard dose 2-drug therapy daily for 4 to 7 months.

	Intensive phase: 2 months				Continuation phase:4–7 months***
Weight kg	**RH**	**PZA**		**EMB**	**RH**
	60/60	150 mg* **OR** 150 mg/3 mL	500 mg	400 mg tablet **OR** 400 mg/8 mL** solution	60/60

2–2.9 kg	½ tablet	1.5 mL	Expert advice on dose	1 mL	½ tablet
3–3.9 kg	¾ tablet	2.5 mL	¼ tablet	1.5 mL	¾ tablet
4–5.9 kg	1 tablet	3 mL	¼ tablet	2 mL	1 tablet
6–7.9 kg	1½ tablet		½ tablet	3 mL	1½ tablets
8–11.9 kg	2 tablets		½ tablet	½ tablet	2 tablets
12–14.9 kg	3 tablets		1 tablet	¾ tablet	3 tablets
15–19.9 kg	3½ tablets		1 tablet	1 tablet	3½ tablets
20–24.9 kg	4½ tablets		1½ tablet	1 tablet	4½ tablets
25–29.9 kg	5 tablets		2 tablets	1½ tablets	5 tablets

* PZA: For each dose, dissolve 150 mg dispersible (1 tablet) in 3 mL of water to prepare a concentration of 50 mg/mL (150 mg/3mL).
** EMB: For each dose, crush 400 mg (1 tablet) to a fine powder and dissolve in 8 mL of water to prepare a concentration of 400mg/8mL. Discard unused solution.
Note: Give PZA 150 mg or 500 mg, and not both.
*** Continuation phase may be prolonged to 7 months in slow responders and children with HIV.

AND

If living with HIV, malnourished or has existing neuropathy:

- Pyridoxine, oral, daily for 6–9 months. *LoE:IVb*[45]
  - Child <5 years old: 12.5 mg.
  - Child ≥5 years old: 25 mg.

Children ≥ 8 years and adolescents (and >25 kg)

	2 months intensive phase given daily	4 months continuation phase given daily	
Weight kg	**RHZE (150/75/400/275)** mg	**RH (150/75)** mg	**RH (300/150)** mg
25–37.9 kg	2 tablets	2 tablets	
38–54.9 kg	3 tablets	3 tablets	
55–70 kg	4 tablets		2 tablets
>71 kg	5 tablets		2 tablets

AND

If living with HIV, malnourished, or has existing neuropathy:

- Pyridoxine, oral, daily for 6 to 9 months. *LoE:IVb*[46]
  - Child ≥5 years old: 25 mg.

» Weigh at each visit and adjust treatment dosages to body weight. If calculating dosages, rather give ½ tablet more than ½ tablet less.

» Ensure that the correct dose and duration of treatment are adhered to.

REFERRAL

Disseminated forms of TB.
All patients who cannot be managed on an ambulatory basis.
Children <12 years of age for a chest X-ray for diagnostic purposes.
Children with previously treated TB requiring re-treatment.
Children who are contacts of patients with drug resistant TB.

17.4.3 TB, HIV AND AIDS

B20.0

People living with HIV (PLHIV) with suspected TB should have one negative sputum TB-NAAT test or two negative sputum smears, before sputum is sent for culture.

Advise PLHIV to present to a clinic if they develop common TB symptoms:

» active cough (any duration)
» fever
» night sweats
» loss of weight

PLHIV with concomitant TB should be treated according to the standard TB treatment protocol.

Medicine interactions may occur with ART. (See Sections 11.1: Antiretroviral therapy, adults and adolescents; 11.8: Opportunistic infections, treatment in children.)

17.4.4 DRUG-RESISTANT TUBERCULOSIS (MDR TB)

Drug-resistant TB (DR-TB) guidelines are updated regularly.
Consult the most recent National DR-TB Programme Guidelines.

DESCRIPTION

Isoniazid monoresistant TB is TB disease caused by *M. tuberculosis* that is resistant to isoniazid, but susceptible to rifampicin.

Rifampicin resistant tuberculosis (RR-TB) is TB disease caused by *M. tuberculosis* that is resistant to rifampicin, with or without resistance to other anti-TB drugs.

Pre-XDR TB is TB disease caused by a strain of *M. tuberculosis* that is resistant to rifampicin and at least one fluoroquinolone (either levofloxacin or moxifloxacin).

Extensively drug-resistant TB (XDR-TB) is TB disease caused by a strain of *M. tuberculosis* that is resistant to rifampicin AND at least one fluoroquinolone (levofloxacin or moxifloxacin) AND either bedaquiline or linezolid. *LoE:IVb*[47]

17.4.4.1 ISONIAZID MONO-RESISTANT TUBERCULOSIS IN ADULTS

A15.0-3/A15.7-8/A16.0-2/A16.4/A16.7-9 + (U50.00-01+U50.10-11) + (B20.0)

MEDICINE TREATMENT

Confirmed isoniazid mono-resistant TB:

- RHZE at standard doses. (See Section 17.4.1: Pulmonary Tuberculosis (TB) in adults.)

AND

- Levofloxacin, oral, daily
  - 30–45 kg: 750 mg.
  - ≥46 kg: 1 000 mg.

Confirmed isoniazid monoresistant TB AND contraindication to isoniazid:

- Rifampicin, oral, 10 mg/kg daily.

AND

- Ethambutol, oral, 15 mg/kg daily.

AND

- Pyrazinamide, oral, 25 mg/kg daily.

AND

- Levofloxacin, oral, daily.
  - 30 to 45 kg: 750 mg
  - >46 kg: 1 000 mg

LoE:IIb[48]

Treatment should be given for at least 6 months.

REFERRAL

All drug resistant TB patients to medical officer at primary care level for initiation of therapy.

17.4.4.2 RIFAMPICIN-RESISTANT TUBERCULOSIS (RR TB), IN ADULTS

A15.0-3/A15.7-8/A16.0-2/A16.7-8 + (U50.00-01+U50.20-21) + (B20.0)

Never treat for drug resistant TB without laboratory confirmation, either by molecular or phenotypic (culture and sensitivity) results.

GENERAL MEASURES

Counsel and educate patients about the disease and its treatment, including treatment duration.

Screen all close contacts for signs and symptoms of drug-resistant TB and by sputum sampling to detect early disease.

Infection control and cough etiquette is important to limit spread.

MEDICINE TREATMENT

Drug resistant TB prophylaxis

The effectiveness of preventive therapy in adults exposed to drug resistant TB bacteria is not currently known. Consult a specialist for management.

RR-TB and Pre-XDR TB treatment

Consult the most recent national drug resistant TB programme guidelines.
Treatment for 6–18 months is required.

Management of drug resistant TB should be conducted in dedicated drug resistant TB clinics and hospitals with appropriate infection control measures.

XDR-TB treatment

Patients with XDR-TB should be discussed with the National Clinical Advisory Committee (NCAC - NCAC@witshealth.co.za) and referred to a TB hospital for an individualised regimen of at least 4 effective medicines, based on susceptibility tests

and treatment history. Infection control to prevent airborne transmission is essential to prevent nosocomial transmission.

REFERRAL

All drug resistant TB patients to medical officer at primary care level for initiation of therapy.

17.4.4.3 RIFAMPICIN-RESISTANT (RR), PRE-XDR AND XDR TUBERCULOSIS, IN CHILDREN

A15.0-3/A15.7-8/A16.0-2/A16.7-8 + (U50.00-01+U50.20-21) + (B20.0)

Never treat for drug resistant TB without laboratory confirmation, either by molecular or phenotypic (culture and sensitivity) results.
All cases should be discussed with a designated specialist drug resistant TB centre.

GENERAL MEASURES

Suspect drug-resistant TB when any of the features listed below is present:

» A known source case (or contact) with drug resistant TB or high-risk source case, e.g. on TB therapy who was recently released from prison.
» A patient with confirmed treatment adherence that remains smear positive after 2 months of 1st line TB treatment.
» Any severely ill child with TB who failed to improve, or got worse on TB treatment.
» Patients who defaulted TB treatment (>2 months).
» History of treatment interruption (<1 month) or relapse at some point during their TB therapy.
» With recurrent TB disease after completion of TB treatment (re-treatment case).

Management of drug resistant TB should be conducted in dedicated drug resistant TB clinics and hospitals with appropriate infection control measures. Initiate treatment in consultation with a designated expert. An uninterrupted medicine supply, direct supervision with proper education and counselling is necessary.

REFERRAL

All children with suspected drug resistant TB to a medical officer at primary care level for initiation of therapy.

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PHC Chapter 18: Eye conditions

For many eye conditions early specialist consultation and advice is required. To mitigate delays in referral it is recommended that electronic consultation methods are utilised with transmission of appropriate images so that appropiate treament can be initiated before referral.

18.1 CONJUNCTIVITIS

An inflammatory condition of the conjunctiva, possibly caused by:

» allergies,
» bacterial or viral (pink eye) infections.

Likely cause	Conjunctival	Itching	Discharge	Lymphadenopathy	Fever & sore throat
Viral (adenoviral, HSV, VZV)	Follicular***	Minimal	Watery	Common	Common
Bacterial	Papillary**	Minimal	Purulent*	Uncommon	Occasionally
Chlamydial	Follicular***	Minimal	Purulent*	Common	No
Allergic	Papillary with chemosis (blister-like swelling of the conjunctiva)	Severe	Watery Mucoid	None	No

*Mucopurulent for nongonococcal and chlamydial infections and hyperpurulent for gonococcal infections.
**PAPILLARY CONJUNCTIVITIS: Papillae are elevations of the conjunctival tissue so there is usually a red central vascular core to the lesions which appear as distinct, well separated bumps.
***FOLLICULAR CONJUNCTIVITIS: Follicles have a larger appearance than papillae and have a white central core which is indicative of a local immune reaction i.e. accumulation of inflammatory agents (e.g. lymphocytes, macrophages) at a cellular level.

Adapted from Yeu E et al. A review of the differential diagnosis of acute conjunctivitis: implications for treatment and management. Clinical Ophthalmology 2020

Table 1: Clinical features of suspected acute conjunctivitis

LoE:IVb[1]

18.1.1 CONJUNCTIVITIS, ALLERGIC

H10.1

DESCRIPTION

An inflammatory condition of the conjunctivae caused by allergy to pollen, grass, animal fur, medication, cosmetics, etc. Often associated with allergic rhinitis or hay fever. Common features include:

» Itching, watery eyes and photophobia.
» Slightly red or normal conjunctiva.
» Conjunctival swelling in severe cases.
» Normal cornea, iris and pupil.
» Normal visual acuity.

In cases of vernal keratoconjunctivitis (VKC), there may be brown discolouration of the conjunctivae or cobblestone elevations of the upper tarsal conjunctivae.

GENERAL MEASURES

Relieve symptoms with cold compresses, i.e. a clean moistened cloth over the eyes for 10 minutes.

MEDICINE TREATMENT

Adults and children >6 years of age

- Oxymetazoline 0.025%, eye drops, instil 1 drop 6 hourly for a maximum of 7 days.

If no response within 7 days or history of recurrent (seasonal)/chronic allergic conjunctivitis, change to:

- Anti-allergic eye drops, e.g.:
- Sodium cromoglycate, 2 % eye drops, instil 1 drop 6 hourly. (Doctor initiated.)
  - Use may be seasonal (1 to 3 months) or long-term. *LoE:II²*

If symptoms not controlled, add cetirizine/chlorphenamine:

- Cetirizine, oral, 10 mg once daily.
  - Use may be seasonal (1 to 3 months) or long-term.

Children: 2–6 years of age

- Chlorphenamine, oral, 0.1 mg/kg/dose 6 to 8 hourly. See dosing table:Chapter 23.

If no response within 7 days or history of recurrent (seasonal)/chronic allergic conjunctivitis, change to:

- Anti-allergic eye drops, e.g.:
- Sodium cromoglycate, 2 % eye drops, instil 1 drop 6 hourly. (Doctor initiated.)
  - Use may be seasonal (1 to 3 months) or long-term. *LoE:II³*

If symptoms not controlled, add cetirizine:

- Cetirizine, oral, 5 mg once daily. See dosing table:Chapter 23.
  - Use may be seasonal (1 to 3 months) or long-term.

REFERRAL

» No response to treatment.
» Persons wearing contact lenses.
» Children <2 years of age.

18.1.2 CONJUNCTIVITIS, BACTERIAL (EXCLUDING CONJUNCTIVITIS OF THE NEWBORN)

H10.0

DESCRIPTION

An inflammatory purulent condition of the conjunctivae caused by bacterial infection and characterised by:

» Sore, gritty or scratchy eyes and swollen lids.
» Mucopurulent discharge from one or both eyes.
» Redness especially of conjunctival angles (fornices).

GENERAL MEASURES

» Educate patient on personal hygiene to avoid spread e.g. do not use the same face-cloth or towels as others.
» Do not use contaminated cosmetics.
» Practise good contact lens hygiene.
» Avoid chronic use topical medications.

» Educate patient on correct application of ophthalmic ointment.
» Advise patient:
  - to wash hands thoroughly before and after applying ophthalmic ointment.
  - not to share ophthalmic ointments or drops.
  - not to rub eyes.
  - never to use urine or milk to wash the eyes.

MEDICINE TREATMENT

- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly for 7 days.

Pain:

Children

- Paracetamol, oral, 10 to 15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults

- Paracetamol, oral, 500 mg to 1 g 4 to 6 hourly when required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

Gonococcal conjunctivitis:

Hyperacute bacterial conjunctivitis involves rapid onset and progression of conjunctivitis with a hyperpurulent discharge, and is often caused by *N. gonorrhoeae*. Gonococcal conjunctivitis requires immediate treatment and referral to an ophthalmologist to prevent corneal involvement and potential perforation.

Neonates

Refer to Section 18.1.3 Conjunctivitis of the newborn

Children 1 month to 11 years:

- Ceftriaxone, IM, W
  - <45 kg: 125 mg, IM, as a single dose.
  - ≥45 kg: 250 mg, IM, as a single dose.

Adults and children 12 years and older:

- Ceftriaxone, IM, 250 mg as a single dose. W
  - For ceftriaxone IM injection: Dissolve ceftriaxone 250 mg in 0.9 mL lidocaine 1% without adrenaline (epinephrine).

AND

- Azithromycin, oral, 1 g as a single dose. W
  Refer to Section 12.3 Sexually transmitted infections for further detail.

REFERRAL

» No response after 5 days.
» All cases of unilateral conjunctivitis, as this may be caused by a foreign body.
» Loss of vision.
» Irregularity of pupil.
» Haziness of the cornea.
» Persistent painful eye.

» Suspected or confirmed gonococcal conjunctivitis.

18.1.3 CONJUNCTIVITIS OF THE NEWBORN

P39.1

DESCRIPTION

Inflammation of the conjunctivae in the neonatal period, presenting with a picture that may range from mildly sticky eyes to an abundant purulent discharge and eyelid oedema.

Common infectious agents include *N. gonorrhoeae*, *S. aureus*, and *Chlamydia*.

Generally, conjunctivitis of the newborn is either mild (small amount of sticky exudates) or severe (profuse pus and swollen eyelids).
The latter is often *N. gonorrhoeae* and threatens damage to the cornea, while the former is often *S. aureus* or undefined.

CAUTION
Treat conjunctivitis with abundant pus immediately to prevent damage to the cornea that may lead to blindness.
Treat parents of a neonate with purulent discharge appropriately.

GENERAL MEASURES

» Cleanse or wipe eyes of all newborn babies with a clean cloth, cotton wool or swab, taking care not to touch or injure the eye.

MEDICINE TREATMENT

Prevention

Routine administration for every newborn baby:

- Chloramphenicol 1%, ophthalmic ointment, applied as soon as possible after birth.

Treatment

Sticky eye(s) without purulent discharge**:**

- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly for 7 days.

Purulent discharge:
i.e. mild discharge without swollen eyelids and no corneal haziness

- Sodium chloride 0.9%, eye washes, immediately then 2 to 3 hourly, until discharge clears.

AND

- Ceftriaxone, IM, 50 mg/kg immediately as a single dose. W

Weight kg	**Dose** mg	**Use one of the following injections mixed with water for injection (WFI):**		**Age** Months/years
		250 mg/2 mL (250 mg diluted in 2 mL WFI)	500 mg/2 mL (500 mg diluted in 2 mL WFI)	
>2–2.5 kg	100 mg	0.8 mL	0.4 mL	>34–36 weeks
>2.5–3.5 kg	150 mg	1.2 mL	0.6 mL	>36 weeks–1 month
>3.5–5.5 kg	200 mg	1.6 mL	0.8 mL	>1–3 months

Follow up in one day.

Abundant purulent discharge and/or swollen eyelids and/or corneal haziness:

- Sodium chloride 0.9%, eye washes, immediately then hourly until referral.

AND

- Ceftriaxone, IM, 50 mg/kg immediately as a single dose, and refer. W

Weight kg	Dose mg	Use one of the following injections mixed with water for injection (WFI):		Age Months/years
		250 mg/2 mL (250 mg diluted in 2 mL WFI)	500 mg/2 mL (500 mg diluted in 2 mL WFI)	
>2–2.5 kg	100 mg	0.8 mL	0.4 mL	>34–36 weeks
>2.5–3.5 kg	150 mg	1.2 mL	0.6 mL	>36 weeks–1 month
>3.5–5.5 kg	200 mg	1.6 mL	0.8 mL	>1–3 months

CAUTION
USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If *SUSPECTING SERIOUS BACTERIAL INFECTION* in neonate, give ceftriaxone, even if jaundiced.
» Always include dose and route of administration of ceftriaxone in the referral letter.

Treat both parents of newborn babies who develop purulent conjunctivitis after 24 hours of birth for *N. gonorrhoeae* and Chlamydia.

Parents:

- Ceftriaxone, IM, 250 mg as a single dose. W
  - For ceftriaxone IM injection: Dissolve ceftriaxone 250 mg in 0.9 mL lidocaine 1% without adrenaline (epinephrine).

AND

- Azithromycin, oral, 1 g as a single dose. W

REFERRAL

Urgent

» All neonates with abundant purulent discharge and/ or swollen eyelids and/or corneal haziness.
» Neonate unresponsive to treatment within 2 days.

18.1.4 CONJUNCTIVITIS, VIRAL (PINK EYE)

B30.1/B30.9 + (H13.1)

DESCRIPTION

A highly contagious, viral infection, which is spread by contact with:

» hands
» face cloths
» towels

It may start in one eye, spreading to the other. More commonly both eyes are infected. Viral conjunctivitis may be associated with an upper respiratory tract infection.

Common symptoms include:
- » A burning, itching, sandy, or gritty feeling in the eyes, often described as being painful.
- » Photophobia.
- » Watery discharge (a yellow discharge indicates a secondary bacterial infection).
- » Diffuse pink or red conjunctivae, which may become haemorrhagic.
- » Enlarged pre-auricular lymph node.

The cornea, iris and pupil are completely normal with normal visual acuity.

The condition is self-limiting but eye irritation and discharge may get worse for the first week depending on the specific virus. Duration varies from 3 to 5 days to 2 to 3 weeks before resolution.

GENERAL MEASURES
- » Advise on correct cleansing or rinsing of eyes with clean water.
- » Cold compresses for symptomatic relief.

MEDICINE TREATMENT
Children >6 years of age and adults
- Oxymetazoline 0.025%, eye drops, instil 1 drop 6 hourly for a maximum of 7 days to reduce redness of eyes.

Pain:

Children
- Paracetamol, oral, 10 to 15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults
- Paracetamol, oral, 500 mg to 1 g 4 to 6 hourly when required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

REFERRAL
- » No response after 5 days.
- » A unilateral red eye for more than one day.
- » Suspected herpes conjunctivitis.
- » Loss of vision.
- » Irregularity of pupil.
- » Haziness of the cornea.
- » Persistent painful eye.

18.2 CORNEAL ULCER
H16.0

DESCRIPTION
Corneal ulcers may be caused by an infection, a foreign body, abrasions on the eye surface, severely dry eye or wearing contact lenses that are left in overnight.
Presents with:

» Blurring of vision.
» Photophobia.
» Very painful and watery eye.
» White patch/es on the cornea.
» Inflamed conjunctiva.

Herpes virus causes a branching (dendritic) ulcer which can recur and relapse over the lifetime of an individual.

GENERAL MEASURES

» Establish the cause, to determine likelihood of a foreign body.
» Remove any foreign body if visible on sclera or conjunctivae with cotton bud.
» Stain with fluorescein to reveal corneal foreign body or conditions such as abrasion or dendritic ulcer.
» Cover injured eye with eye pad, provided there is no pressure on the eye.

MEDICINE TREATMENT

If referral is deferred and a culture cannot be done within 12 hours:

- Chloramphenicol 1%, ophthalmic ointment applied 6 hourly. *LoE:III[4]*

REFERRAL

Urgent within 12 hours

All patients.

18.3 EYE INJURIES

18.3.1 EYE INJURY, CHEMICAL BURN

T26.9 + (X49.99)

This is a medical emergency.

DESCRIPTION

Damage to one or both eyes caused by contact with irritating chemical substances e.g. alkali or acid.

Presents with:

» pain
» inability to open eye
» blurred vision
» excessive teary and watery eye

GENERAL MEASURES

» Irrigate or wash the eye immediately and continuously with sterile water or sodium chloride 0.9% for at least 30 minutes (1 to 3 L of fluid) and until pH of the ocular surface has returned to approximately 7.4. A urine dipstick can be used to measure this when gently placed at the lateral canthus of the eye. Recheck the pH 5 minutes after completing irrigation to ensure it remains normal. Continue irrigation if the pH becomes abnormal again. If repeatedly abnormal after cessation of irrigation, check for retained debris and remove gently with a cotton bud.
» In severe alkaline burn cases, irrigation should be prolonged further.
» Ensure that eye is irrigated so that the fluid runs away from the unaffected side (ie. nasal to lateral).

LoE:III[5]

MEDICINE TREATMENT

Local anaesthetic if needed:

- Tetracaine 1% eye drops, instil 1 drop in the affected eye(s). Can be repeated if needed.
  - Repeat irrigation of the eye.
  - Evert upper eyelid and remove debris with cotton bud.
  - Never give anaesthetic drops to the patient to take home as they can cause blindness if used too often.
- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly.

Pain:

Children

- Paracetamol, oral, 10 to 15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults

- Paracetamol, oral, 500 mg to 1 g 4 to 6 hourly when required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

REFERRAL

All cases within 12 hours.

18.3.2 EYE INJURY, FOREIGN BODIES

S05.9+(Y34.99)

Many foreign objects that enter the conjunctiva are the result of mishaps that occur during everyday activities e.g. eyelashes, dust, dirt, sand.

Foreign objects that enter the eye at high rate of speed pose the highest risk of injury and may embed in the eye especially the cornea, or may penetrate into the eyeball. This often follows welding, grinding or hammering metal without wearing a protective eye visor or spectacles.

DESCRIPTION

» Disturbance of vision.
» Complaints of foreign body in the eye that may not be visible.
» Pain and lacrimation.
» Metallic foreign body embedded in the cornea appears as a cloudy spot with a dark speck (the metal splinter) in the centre.

GENERAL MEASURES

» If the foreign body is not embedded, irrigate eye with sterile water or sodium chloride 0.9%.
» Remove any foreign body if visible on sclera or conjunctivae with moist cotton bud.
» Stain with fluorescein to reveal corneal foreign body if it is not obvious.
» Consider X-ray of orbit (with frontal and lateral views) to exclude intra-ocular metallic foreign body if the mechanism is projectile in nature.

MEDICINE TREATMENT

Local anaesthetic if needed:

- Tetracaine 1% eye drops, instil 1 drop in the affected eye(s), before removal of the foreign body.
  - Apply an eye shield until the anaesthetic effect wears off.
  - Never give anaesthetic drops to the patient to take home.

LoE:III

Prophylactic antibiotics:

- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly for 5 days.

LoE:III[6]

REFERRAL

» Any embedded or penetrating foreign body.
» Failure to remove a visible foreign body.
» Suspected intraocular foreign body.

18.3.3 EYE INJURY, BLUNT OR PENETRATING

S05.9+(Y34.99)

DESCRIPTION

Eye injuries can be caused by high speed flying objects e.g. pieces of wood, glass, stone and other materials or by blunt trauma e.g. sporting balls, blow from a fist, facial trauma in a MVA. Injuries include conjunctival/corneal lacerations, haematoma, orbital fracture and penetrating open-globe injuries with prolapse of eye contents.

Check for:

» Visual loss, hyphema, lacerations.
» Perforation e.g. teardrop-shaped pupil indicating uveal prolapse.
» Muscular entrapment associated with a fracture of the orbital bones limiting vision in one direction.

GENERAL MEASURES

» Apply an eye shield only. Avoid using pressure patching which increases the risk of intraocular infection.

MEDICINE TREATMENT

Deep corneal or scleral injuries:

Cover with an eye shield and refer immediately.

If immediate referral is not possible, while awaiting transfer:

- Atropine, 1%, drops, instilled immediately.
- Chloramphenicol 1%, ophthalmic ointment applied immediately.

Pain:

Children

- Paracetamol, oral, 10 to 15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults

- Paracetamol, oral, 500 mg to 1 g 4 to 6 hourly when required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

CAUTION
Review the problem daily.
Do not use an eye pad if there is ecchymosis, lid oedema or bleeding.

REFERRAL

Immediately:

» If the foreign body cannot be removed or an intraocular foreign body is suspected.
» Laceration, perforation or diffuse damage to the cornea or sclera.
» Damage to other structures of the eye, including the eyelid edge.
» Visual abnormalities or limitation of movement of the eye.

18.4 GLAUCOMA, ACUTE AND CLOSED ANGLE

H40.0-6/H40.8-9

DESCRIPTION

Acute closed angle glaucoma is damage to the optic nerve caused by raised intra-ocular pressure. This may result in loss of vision usually in one eye.
Clinical features:

» pupil is moderately dilated and may be oval in shape,
» corneal haziness,
» pericorneal conjunctival inflammation,
» sudden onset of extremely severe, bursting pain and eye redness,
» a unilateral, temporal headache, after being exposed to a period of darkness, e.g. in a cinema,
» coloured haloes around lights (bright rings),
» eye feels hard, compared to the other eye, when measured with finger palpation (this is not an accurate test),
» severe pain in eye (acute),
» nausea and vomiting in severe cases.

Note: The more common chronic open angle glaucoma is usually without symptoms.

Emergency medicine treatment before referral (Doctor prescribed)

- Acetazolamide, oral, 500 mg, immediately, followed by 250 mg 6 hourly until referred.

REFERRAL

Urgent
All patients to an ophthalmologist within 12 hours.

18.5 PAINFUL RED EYE

H57.1

DESCRIPTION

Pain and redness in one eye only, indicates inflammation of the anterior structures of the eye.

Exclude bacterial or viral conjunctivitis (often bilateral and associated with irritation, rather than pain).

Consider acute closed angle glaucoma and manage appropriately. See Section 18.4: Glaucoma, acute and closed angle.

REFERRAL

Urgent within 12 to 24 hours:

- All patients (excluding those with conjunctivitis):
  - Single painful red eye.
  - Corneal ulceration including herpes infection.
  - Sudden loss or change in vision, including blurred or reduced vision.
  - Sudden onset of visual problems, associated with dizziness, weakness on either one or both sides, difficulty speaking or swallowing (possible stroke; see Section 15.1: Stroke).
  - Foreign body associated with welding or grinding.
  - Chemical burn (see Section 18.3.1: Eye injury, chemical burn).
  - Whole eyelid swollen, red and painful (consider orbital cellulitis).
  - Coloured haloes around light, dilated oval pupil, headache, nausea, vomiting (possible glaucoma; see Section 18.4: Glaucoma, acute and closed angle).

18.6 STRUCTURAL ABNORMALITIES OF THE EYE

H02.0-1/H02.4/Q10.0-2

These include:

- eyelashes rubbing on the cornea (trichiasis),
- eyelids bent into the eye (entropion),
- eyelids bent out too much (ectropion),
- ptosis (drooping eyelid).

REFERRAL

All patients.

18.7 VISUAL PROBLEMS

H53.0-6/H53.8-9/H54.0-7/H54.9

DESCRIPTION

Visual problems may be due to refractive errors, or damage to the eye or optic nerve. This may be an indication of underlying disease such as diabetes or hypertension.

Assessment

Look for abnormalities of the eye.

Determine visual acuity accurately in both eyes by using the Snellen chart.

If vision is diminished (less than 6/12) perform the following tests:

» Pin hole test
  - Make a hole of about 1 mm wide in a piece of dark/black paper– you can push a hole in paper or card with a pen tip.
  - Ask the patient to look through this hole at the Snellen chart.
  - If vision improves, this means that the patient has a refractive error.

» Red reflex test

The patient looks past the examiner's head focussing on a distant target.
  - With the ophthalmoscope at 0 (zero) the examiner keeps it close to his eye and then focuses the beam of light so that it falls on the pupillary area of the cornea.
  - The examiner stands about 60 cm away from the patient.
  - In normal individuals, the examiner should be able to see a red or pink colour (reflex) through the pupil which comes from the retina.

Significance of an absent red reflex.

If there is a history of trauma or diabetes the absence of a red reflex is probably due to:

» retinal detachment,
» a vitreous or internal haemorrhage,
» mature cataract.

If there are cataracts one usually sees:

» black shadows against the red reflex in immature cataracts, or
» absence of red reflex in mature cataracts.

In a patient >50 years of age with no history of trauma, diabetes or previous eye disease, an absent red reflex is often due to cataract formation, especially with decreased visual acuity.

Note: Associated diabetes or hypertension should be adequately managed with referral, as surgery can only be considered with appropriately managed disease.

REFERRAL

Urgent: within 12–24 hours

» Sudden visual loss in one or both eyes.
» Pain or redness in one eye only especially with visual and pupil abnormalities.
» Recent proptosis of one or both eyes or enlargement of the eye (buphthalmos/glaucoma) in children.
» Hazy cornea in children.
» Unilateral watery eye.

Within days

» Squint of recent onset.
» Suspected or previously diagnosed glaucoma.
» Double vision following recent injury might indicate orbital fracture.
» Leucokoria (white reflex from the pupil).
» Squint at any age if not previously investigated by ophthalmologist.
» Visual loss in patients with systemic disease such as diabetes.

Non-urgent referral

» Cataracts.
» Refractive errors.
» Long-standing blindness – first visit to health facility.

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PHC Chapter 19: Ear, nose and throat conditions

19.1 ALLERGIC RHINITIS

J30.0-4

DESCRIPTION

Inflammation of the mucous membranes of the nose and paranasal sinuses in response to an allergen e.g. pollen, house dust, grasses, and animal hair.

Allergic rhinitis is characterised by recurrent episodes of:

» blocked stuffy nose
» watery nasal discharge
» frequent sneezing, often accompanied by nasal itching and irritation
» conjunctival itching and watering
» oedematous pale nasal mucosa
» mouth breathing
» snoring at night

Exclude other causes, such as infections, vasomotor rhinitis, overuse of decongestant drops, and side effects of antihypertensives and antidepressants.

GENERAL MEASURES

Avoid allergens and irritants.

MEDICINE TREATMENT

Adults and children > 6 years of age

- Corticosteroid, e.g.: *LoE:III*[1]
- Fluticasone, aqueous nasal solution, 1 spray of 100 mcg in each nostril 12 hourly.
  - Aim the nozzle laterally and upwards (aim for the eye) and not to the back of the throat.
  - Do not sniff vigorously.
  - Review 3 monthly. *LoE:I*[2]

Note: Fluticasone and budesonide interacts with protease inhibitors. Refer all patients on protease inhibitors requiring corticosteroids for further management. *LoE:III*[3]

For short term symptomatic use:

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table: Chapter 23.

Adults

- Chlorphenamine, oral, 4 mg, 6–8 hourly.

For relief of nocturnal nasal blockage:

Topical nasal decongestant e.g.:

- Oxymetazoline 0.05%, intranasal, administered at night for a maximum of 5 days.

Long-term antihistamines should only be used after an adequate trial of intranasal corticosteroids and should be added to steroid therapy, if necessary.

For long-term use in adults and school going children:

Children: 2–6 years of age

- Cetirizine, oral, 5 mg once daily. See dosing table: Chapter 23.

Children > 6 years of age and adults
- Non-sedating antihistamine, oral e.g.:
- Cetirizine, oral, 10 mg daily. *LoE:I*[4]

CAUTION
Do not give an antihistamine to children < 2 years of age.

REFERRAL
» Chronic persistent symptoms.
» Severe symptoms.
» Patients on protease inhibitors, requiring nasal corticosteroids.

19.2 COMMON COLD (VIRAL RHINITIS)
J00

DESCRIPTION
Colds are self-limiting viral conditions that may last up to 14 days. Colds begin to clear within 3 days. Colds present with nasal stuffiness and throat irritation.
Malnourished children, the elderly and debilitated patients are at greater risk of developing complications.

Complications
Secondary bacterial infections, including:
» pneumonia
» otitis media
» sinusitis

GENERAL MEASURES
» Limit strenuous activity.
» Ensure adequate hydration.
» Advise patient to return to clinic if earache, tenderness or pain over sinuses develops or symptoms persist for > 14 days.

MEDICINE TREATMENT
Antibiotics are of no value for the treatment of the common cold.

Infants
- Sodium chloride 0.9%, 1–3 drops, instilled into each nostril as required. *LoE:III*[5]

Symptomatic relief of pain and fever with discomfort:

Children
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23. *LoE:III*[6]

REFERRAL
Severe complications.

19.3 EPISTAXIS
See Section 21.2.7: Nose bleeds (epistaxis).

19.4 OTITIS

19.4.1 OTITIS EXTERNA

H60.0/H60.5/H60.9

DESCRIPTION

Inflammation of the external ear may be one of the following:

» Diffuse: An infection of the ear canal, often due to Gram negative bacilli (especially P. aeruginosa). Pain is increased when chewing and the lining of the canal may be either inflamed or swollen with dry or moist debris or even a white or clear discharge.
» Furuncular: Usually caused by Staphylococcus aureus. A painful localised swelling present at the entrance to the ear canal. May be precipitated by trauma caused by scratching, e.g. matchsticks, earbuds.

GENERAL MEASURES

» Exclude any underlying suppurative otitis media. If suppurative otitis media is
» diagnosed, see Section: 19.4.3 Otitis media, chronic, suppurative.
» Most cases recover after thorough cleansing and drying of the ear.
» Keep the ear clean and dry (dry mopping).
» Do not leave pieces of cotton wool, etc. in the ear.
» Do not instil anything into the ear unless prescribed.

MEDICINE TREATMENT

Diffuse

» Does not usually require an antibiotic
» Make a wick where possible, using ribbon gauze or other suitable absorbent cloth, e.g. paper towel to clean and dry the ear.
- Acetic acid 2% in alcohol, topical, instilled into the ear every 6 hours for 5 days.
  - Instil 3–4 drops after cleaning and drying the ear.

Furuncular

Children

- Cefalexin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table: Chapter 23.

OR

- Flucloxacillin, oral, 12–25 mg/kg/dose 6 hourly for 5 days. See dosing table: Chapter 23.

Children > 7 years of age and adults

- Cefalexin, oral, 500 mg 6 hourly for 5 days.

OR

- Flucloxacillin, oral, 500 mg 6 hourly for 5 days.

Severe penicillin allergy:

Z88.0

Children

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg daily for 3 days. See dosing table: Chapter 23.

Children > 35 kg and adults
- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

REFERRAL
No response to treatment.

19.4.2 OTITIS MEDIA, ACUTE
H66.9

DESCRIPTION
Inflammation of the middle ear characterised by:
» pain
» loss of hearing
» red bulging eardrum
» drum perforation
» fever in about half of the cases
» loss of the normal light reflex of the eardrum

Mild redness of the eardrum and rubbing the ear are not reliable signs.

GENERAL MEASURES
» Do not instil anything into the ear.
» Avoid getting the inside of the ear wet.
» Dry mop ear if discharge is present.
» Do not plug the ear with cotton wool, etc.
» Exclude HIV infection as a contributing factor for recurrent ear infection.

MEDICINE TREATMENT
Children
- Amoxicillin, oral, 45 mg/kg/dose 12 hourly for 5 days.

Weight kg	Dose mg	Use one of the following: Syrup mg/ 5mL		Capsule mg		Age Months/years
		125	250	250	500	
>3.5–5 kg	175 mg	7 mL	3.5 mL	–	–	>1–3 months
>5–7 kg	250 mg	10 mL	5 mL	–	–	>3–6 months
>7–11 kg	375 mg	15 mL	7.5 mL	–	–	>6–18 months
>11–14 kg	500 mg	–	10 mL	2	1	>18 months–3 years
>14–17.5 kg	750 mg	–	15 mL	3	–	>3–5 years
>17.5–25 kg	1000 mg	–	20 mL*	4	2	>5–7 years
>25–30 kg	1250 mg	–	25 mL*	5	–	>7–10 years
>30 kg	1500 mg	–	–	6	3	>10 years

  - Review response after 5 days. *LoE:III*[7]
  - If pain or discharge persists, consider alternative diagnosis and continue antibiotics for a further 5 days. *LoE:III*[8]

Adults
- Amoxicillin, oral, 1500 mg 12 hourly for 5 days. *LoE:III*[9]

Antibiotic treatment for those who have taken amoxicillin in the previous 30 days; or poor response to 10-day course of amoxicillin:

Children

- Amoxicillin/clavulanic acid oral, 15–25 mg/kg/dose of amoxicillin component, 8 hourly for 5-10 days.

Weight kg	Dose mg (amoxicillin component)	Use one of the following			Age months/years
		Susp 125/31.5 mg/5 mL	Susp 250/62.5 mg/5 mL	Tablet 500/125 mg/tab	
>3.5–5kg	75 mg	3 mL	1.5 mL	–	>1–3 months
>5–7 kg	100 mg	4 mL	2mL	–	>3–6 months
>7–9 kg	150 mg	6 mL	3 mL	–	>6–12 months
>9–11 kg	200 mg	8 mL	4 mL	–	>12–18 months
>11–14 kg	250 mg	10 mL	5 mL	–	>18 months–3 years
>14–17.5 kg	300 mg	12 mL	6 mL	–	>3–5 years
>17.5–25	375 mg	15 mL	7.5 mL	–	>5–7 years
>25–35 kg	500 mg	20 mL	10 mL	1 tablet	>7–11 years

Children > 35 kg and adults

Amoxicillin/clavulanic acid, oral, 875/125 mg 12 hourly for 5 to 10 days. *LoE:III*[10]

Severe penicillin allergy: *LoE:III*[11]

Z88.0

Children

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg daily for 3 days. See dosing table: Chapter 23.

Children > 35 kg and adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23. *LoE:II*[12]

Adults

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

For patients with upper respiratory tract congestion, secondary to allergy: (T78.4)

- Non-sedating antihistamine, oral, e.g.:
- Cetirizine, oral, 10 mg daily for 10 days. *LoE:II*[13]

For management of allergic rhinitis, see section 19.1: Allergic rhinitis.

REFERRAL

» Severe pain, fever or vomiting, not responding to treatment after 72 hours (if otoscopy confirmed) or after 24 hours (if otoscopy unconfirmed).
» Recurrent otitis media.

» Painful swelling behind the ear or tenderness on percussion of the mastoid.
» Suspected meningitis.

19.4.3 OTITIS MEDIA, CHRONIC, SUPPURATIVE

H66.1-3

DESCRIPTION

A purulent discharge from the ear with perforation for > 2 weeks. If the eardrum has been ruptured for ≥ 2 weeks, a secondary infection with multiple organisms usually occurs. Oral antibiotic treatment is generally ineffective.

TB may present with a chronically discharging ear. Consider the diagnosis of TB if other clinical features suggestive of TB are present (e.g. cough, weight loss, failure to thrive, etc.). See Section 17.4: Pulmonary tuberculosis (TB). *LoE:III*[14]

GENERAL MEASURES

» Do not send pus swabs collected from the external ear canal for routine bacterial and fungal MC+S (microscopy, culture and sensitivity) or for microscopy and culture for tuberculosis.
» Explain to patients and caregivers that a chronically draining ear can only heal if it is dry.
» Dry mopping is the most important part of the treatment. It should be demonstrated to the child's caregiver or patient if old enough. Roll a piece of clean absorbent cloth into a wick.
  - Carefully insert the wick into the ear with twisting action.
  - Remove the wick and replace with a clean dry wick.
  - Repeat this until the wick is dry when removed.
» Do not leave anything in the ear.
» Do not instil anything else in the ear.
» Avoid getting the inside of the ear wet while swimming and bathing.
» Check HIV status if unknown.

REFERRAL

» All sick children, vomiting, drowsy, etc.
» Painful swelling behind the ear.
» Ear discharge still present for ≥ 4 weeks, despite dry mopping.
  Note: These referrals do not all require referral to an ENT. They may be referred to a hospital outpatient department for consideration of a topical antibiotic eardrops.
» Any attic perforation.
» Any perforation not progressively improving after 3 months or closed by 6 months, even if dry.
» Moderate or severe hearing loss.

19.5 SINUSITIS, ACUTE, BACTERIAL

J01.0-4/J01.8-9

DESCRIPTION

Bacterial infection of one or more paranasal sinuses that occurs most often after a viral nasal infection or allergic rhinitis.

Bacterial sinusitis is characterised by:

» Deterioration of a common cold after 5–7 days.
» Headache.
» Purulent nasal discharge, especially if unilateral.
» Pain and tenderness over one or more sinuses.
» Nasal obstruction.
» Fever.

Note: Sinusitis is uncommon in children < 5 years of age, as sinuses are not fully developed.

GENERAL MEASURES

Consider HIV in recurrent sinusitis.

MEDICINE TREATMENT

Children ≤ 3 years of age

- Amoxicillin, oral, 45 mg/kg/dose 12 hourly for 5 days.

Weight kg	**Dose** mg	**Use one of the following:**				**Age** Months/years
		Syrup mg/ 5mL		**Capsule** mg		
		125	250	250	500	
>2–2.5 kg	100	4 mL	2 mL	–	–	34–36 weeks
>2.5–3.5 kg	125	5 mL	2.5 mL	–	–	Birth–1 month
>3.5–5 kg	175	7 mL	3.5 mL	–	–	>1–3 months
>5–7 kg	250	10 mL	5 mL	–	–	>3–6 months
>7–11 kg	375	15 mL	7.5 mL	–	–	>6–18 months
>11–14 kg	500	–	10 mL	2	1	>18 months–3 years

Children > 3 years of age

- Amoxicillin, oral, 500 mg 8 hourly for 5 days.

Adults

- Amoxicillin, oral, 500 mg 8 hourly for 5 days.

Severe penicillin allergy:
Z88.0

Children

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg daily for 3 days. See dosing table: Chapter 23.

Children > 35 kg and adults

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

AND

- Oxymetazoline, nose drops, 2 drops in each nostril 6–8 hourly for not more than 5 days continuously.

- Children > 5 years of age: 0.025%
- Adults: 0.05%

LoE:III[15]

AND/OR

- Sodium chloride 0.9%, nose drops, use frequently and in fairly large volumes.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

REFERRAL

» Fever lasting > 48 hours.
» Poor response > 5 days.
» Complications, e.g. periorbital cellulitis with periorbital swelling.
» Oedema over a sinus.
» Recurrent sinusitis.
» Meningeal irritation.

19.6 TONSILLITIS AND PHARYNGITIS

J03.0/J03.8-9/J35.0/J02.0/J02.8-9/J31.1-2

DESCRIPTION

A painful red throat and/or enlarged inflamed tonsils. White pus exudates, either spots or patches, may be present. Tender anterior cervical lymphadenopathy may be present.
Viruses cause the majority of cases. Group A beta haemolytic streptococcus causes 20% of pharyngitis/tonsillitis, and may result in rheumatic fever (which can cause serious heart disease) as well as local suppurative complications.
Other clinical features that might suggest streptococcal infection may include palatal petechiae, inflamed tongue mucosal papillae (strawberry tongue), a scarlitiniform (i.e.: rough, diffuse, fine papular) rash.

GENERAL MEASURES

» Homemade salt mouthwash, gargle for 1 minute twice daily:
  - 2.5 mL (½ medicine measure) of table salt in 200 mL lukewarm water.
  - Do not give to children unable to gargle.
» Advise adequate hydration.
» Avoid irritants e.g. vaporubs inserted into nostrils.
» For children < 6 years of age: Soothe the throat with, breastmilk. If not exclusively breastfed, give warm water or weak tea: add sugar or honey and lemon if available.

MEDICINE TREATMENT

Antibiotics are not required for all patients with a sore throat.

Antibiotics to eradicate streptococci must be given to patients presenting with a sore throat who are at risk for rheumatic fever (3–21 years of age) if they have:

» Enlarged tonsils;
PLUS at least one of the following criteria:
- Exudates on their tonsils
- No cough
- No runny nose

LoE:I[16]

- Benzathine benzylpenicillin, IM, single dose.
  - Children < 30 kg: 600 000 IU.
  - Children ≥ 30 kg and adults: 1.2 MU.
  - Dissolve benzathine benzylpenicillin 1.2 MU in 3.2 mL lidocaine 1% without adrenaline (epinephrine) or 3 mL water for injection.

OR

Children

- Amoxicillin, oral, 50 mg/kg daily for 10 days.

Weight kg	Dose mg	Use one of the following				Age Months/years
		Susp		Capsule		
		125 mg/5mL	250 mg/5mL	250 mg	500 mg	
>2–2.5 kg	100 mg	4 mL	2 mL	–	–	>34–36 weeks
>2.5–3.5 kg	150 mg	6 mL	3 mL	–	–	>36 weeks–1 month
>3.5–5 kg	200 mg	8 mL	4 mL	–	–	>1–3 months
>5–7 kg	275 mg	11 mL	5.5 mL	–	–	>3–6 months
>7–11 kg	400 mg	–	8 mL	–	–	>6–18 months
>11–17.5 kg	575 mg	–	11.5 mL	–	–	>18 months–5 years
>17.5–25 kg	750 mg	–	15 mL	3	–	>5–7 years
>25–35 kg	1000 mg	–	20 mL	4	2	>7–11 years
>35kg	2000 mg	–	–		4	>11 years

LoE:I[17]

Adults

- Amoxicillin, oral, 1 000 mg 12 hourly for 10 days.

LoE:III[18]

OR

Children: 18 months–11 years of age

- Phenoxymethylpenicillin, oral, 250 mg 12 hourly for 10 days.

Children > 11 years of age and adults

- Phenoxymethylpenicillin, oral, 500 mg 12 hourly for 10 days.

Severe Penicillin allergy:
Z88.0

Children > 3 years of age
- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg daily for 3 days. See dosing table: Chapter 23.

Children > 35 kg and adults
- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days.

Pain:

Children
- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults
- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

REFERRAL

» Any suppurative complications, e.g. retropharyngeal or peritonsillar abscess.
» Tonsillitis accompanied by difficulty in opening the mouth (trismus).
» Recurrent tonsillitis (≥ 6 documented episodes/year) for possible tonsillectomy.
» Suspected acute rheumatic fever.
» Suspected acute glomerulonephritis.
» Heart murmurs not previously diagnosed.

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PHC Chapter 20: Pain

20.1 PAIN CONTROL

R52.0/R52.9

DESCRIPTION

Pain is “an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage”.

It is subjective. It is affected by the patient's mood, morale, and the meaning the pain has for the patient. Verbal description is only one of several behaviours to express pain; inability to communicate does not negate the possibility that the patient is experiencing pain. *LoE:IVb*[1]

GENERAL MEASURES

- » Enquire about pain at all patient consults.
- » General medical history is an important part of a pain history, as it reveals co-morbidities affecting the complexity of the pain condition.
- » Culture, gender and language play an essential role in how a patient reports pain. *LoE:IVb*[2]
- » Active pain assessment and self-report is the key to effective pain management.
- » Different pain assessment scales should be used for different ages and intellectual categories of patients.

Choice of pain assessment tool:

- » The gold standard of pain assessment is self-report. Consider using self-report tools from >5 years (e.g. revised faces pain scale, visual analogue scales below).
- » If the child is unable to self-report, use the revised Face, Legs, Activity, Cry, and Consolability (R-FLACC) scale. *LoE:IIIb*[3]
- » In non-verbal patients or patients with cognitive impairment, specific tools, e.g. the Abbey pain scale, may be used to assess pain: https://www.mdcalc.com/calc/3627/abbey-pain-scale-dementia-patients *LoE:IVb*[4]

Revised FLACC tool (R-FLACC)

Infants and children (2 months to 18 years old) - Behavioural pain assessment tool:

This tool can be used in children aged 2 months to 18 years and includes descriptors for cognitively impaired children. The clinician assigns a score to each parameter, and tallies a score out of 10. The final score is used to diagnose 1 to 3 (mild discomfort), 4 to 6 (moderate), or 7 to 10 (severe pain), which must be treated accordingly.

LoE:IIIb[5]

Revised FLACC Tool (R-FLACC)			
	0	**1**	**2**
Face	No particular expression/ smile.	Occasional grimace/frown; withdrawn or disinterested. Appears sad/worried.	Constant grimace/frown, quivering chin, clenched jaw. Looks distressed, expression of fright/panic.
Legs	Normal position or relaxed.	Uneasy, restless, tense. Occasional tremors.	Kicking or legs drawn up, spasticity, constant tremors, jerking.
Activity	Lying quietly, normal position, moves easily.	Squirming, shifting back and forth, tense, mildly agitated. Shallow, splinting respirations, intermittent sighs.	Arched, rigid, jerking. Severe agitation. Breath-holding, gasping, sharp intake of breath. Severe splinting.
Crying	No cry (awake/ asleep).	Moans or whimpers, occasional complaint, verbal outburst/grunt.	Crying steadily, screams, sobs. Frequent complaints/ outbursts, constant grunting.
Consolability	Content, relaxed.	Reassured by occasional touching, 'talking to', hugging. Distractible.	Difficult to console/comfort. Pushing away caregiver or comfort measures.

Table 20.1: Revised FLACC tool for assessment of pain severity (R-FLACC)

Revised faces pain scale:
» Use in children >4 years of age.
» Ask them to point to the face that best depicts their level of pain.

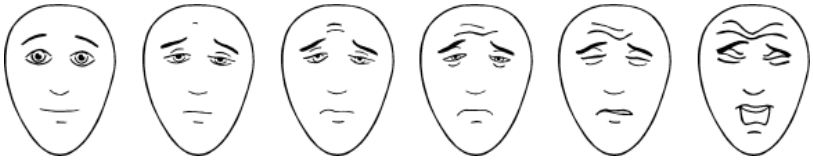


Figure 20.1: Revised faces pain scale

LoE:IIIb[6]

Visual analogue scale:
» Use in children over 7 and adults who can communicate.
» Ask: "on a scale of 0 to 10, '0' being no pain and '10' being the worst pain, what number are you feeling right now?"

Pain should be assessed by:
» Duration,
» severity, e.g. does the patient wake up because of the pain?
» site,
» character, e.g. stabbing, throbbing, crushing, cramp like,
» persistent or intermittent,
» relieving or aggravating factors,
» accompanying symptoms e.g. nausea and vomiting, visual disturbances,
» distribution of pain,
» referred pain.

20.2 ACUTE PAIN

R52.0/R52.9

DESCRIPTION

Acute pain happens suddenly, starts out sharp or intense, and serves as a warning sign of disease or threat to the body. It is caused by injury, surgery, illness, trauma, or painful medical procedures and generally lasts from a few minutes to less than six months. Acute pain usually disappears whenever the underlying cause is treated or healed.

LoE:IVb[7]

GENERAL MEASURES

» Patient counselling.
» Lifestyle adjustment.

MEDICINE TREATMENT

Mild pain:

Non-opioid treatment.

Non-inflammatory or post trauma:

Children

- Paracetamol, oral, 15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

LoE:IVb[8]

Pain associated with inflammation:

Adults

- NSAIDs, e.g.:
- Ibuprofen, oral, 400 mg 8 hourly with or after a meal.

Combine paracetamol and ibuprofen at the above dosages if there is no relief after 2 or 3 doses.

LoE:IVb[9]

Moderate pain:

If no relief to paracetamol,
ADD:

Children

- NSAIDs, e.g.:
- Ibuprofen, oral, 5 to 10 mg/kg/dose 8 hourly with or after a meal. See dosing table: Chapter 23.
  - Discontinue if not effective after 2 to 3 days.

LoE:IVb[10]

Refer if there is no response to paracetamol and ibuprofen.

Adults

- NSAIDs, e.g.:
- Ibuprofen, oral, 400 mg 8 hourly with or after a meal.
  - Discontinue if not effective after 2 to 3 days.

LoE:IVb[11]

If response to paracetamol and ibuprofen is still inadequate:
ADD

- Tramadol, oral, 50 to 100 mg, 6 hourly as a starting dose. (Doctor prescribed.)
  - May be increased to a maximum daily dose of 400 mg.

LoE:IVb[12]

Acute severe pain:

Note: All children with severe pain should be referred. Ensure patient is comfortable prior to referral.

Children

- Morphine solution, oral. (Doctor prescribed.)
  - Starting dose:
    - 0–1 month of age: 0.05 mg/kg/dose 6 hourly.
    - ≥ 1–11 months of age: 0.1 mg/kg/dose 4-6 hourly.
    - ≥ 12 months of age: 0.2–0.4 mg/kg/dose 4-6 hourly.

See dosing table:Chapter 23. (Doctor prescribed.)

CAUTION

Morphine can cause respiratory depression, monitor carefully.

Adults

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

AND *LoE:IVb[13]*

- Tramadol, oral, 50 to 100 mg, 6 hourly as a starting dose. (Doctor prescribed.)
  - May be increased to a maximum daily dose of 400 mg.

If no response to paracetamol and tramadol: **REPLACE** tramadol with morphine:

- Morphine solution, oral. (Doctor prescribed.)
  - Starting dose: 5 mg (maximum 0.2 mg/kg) 4 hourly.
  - Elderly or frail patients: 2.5 to 5 mg (maximum 0.1 mg/kg) 4 hourly.
  - Adjust morphine doses for patients with renal impairment:
    - GFR 10 to 50 mL/min, 75% of dose,
    - GFR <10 mL/min, 50% of dose.

LoE:IVb[14]

OR

- Morphine, IM, 5 to 10 mg, 4 to 6 hourly when required. (Doctor prescribed.) *LoE:IVb[15]*

OR

- Morphine, IV, to a total maximum dose of 10 mg. (Doctor prescribed.)
  - Dilute 10 mg up to 10 mL with sodium chloride, 0.9%.
  - Administer morphine, IV, 3 to 5 mg as a single dose, then further boluses of 1 to 2 mg/minute and monitor closely.

- Total maximum dose: 10 mg.
- Repeat after 4 hours if necessary.
- Monitor response to pain and effects on respiration and BP.

LoE:IVb[16]

Patients that require morphine for acute pain of unknown cause or have pain that does not respond with one dose, must be referred for definitive treatment.

If no response while awaiting transfer a repeat dose of IV morphine may be given after the initial bolus dose of 3 to 5 mg.

Precautions and special comments on the use of morphine:

» Morphine may cause respiratory depression. This can be reversed with naloxone. (See Section 21.3.3: Exposure to poisonous substances.)
  Do not administer morphine in patients with:
  - severe head injury,
  - acute asthma,
  - uncontrolled hypothyroidism.
» Morphine can be used for acute abdominal pain without leading to surgical misdiagnosis.
» Use morphine with extreme care in the following:
  - recent or concurrent alcohol intake or other CNS depressants,
  - advanced chronic obstructive pulmonary disease, or other respiratory,
  - disease with imminent respiratory failure,
  - hypovolaemia or shock,
  - advanced liver disease,
  - the elderly.
» Use morphine with extreme care in these circumstances, and monitor response to pain and effects on respiration and BP.

If morphine has been administered, document the time and dose of administration on the referral letter as this may alter some of the clinical features of acute abdomen or head injury.

REFERRAL

» All children with acute severe pain.
» No response to oral pain control and unable to initiate opioid therapy.
» Uncertain diagnosis.
» Management of serious underlying conditions.

20.3 CHRONIC NON-CANCER PAIN

R52.1/R52.2/R52.9

DESCRIPTION

Pain is defined as chronic when it is present for more than 3 months.

LoE:IVb[17]

» It can arise from:
  - tissue damage (nociceptive pain), e.g. arthritis, lower back pain, pleuritic pain;
  - injury to nerves (neuropathic pain) e.g. post herpetic neuralgia (pain following shingles), trigeminal neuralgia, diabetic neuropathy, HIV related peripheral neuropathy, drug induced peripheral neuropathy, or phantom limb pain;
  - Pain experienced in the absence of tissue damage, inflammation and nerve damage (central pain), e.g. fibromyalgia, irritable bowel syndrome.

GENERAL MEASURES

» Assess pain severity, functional status, medication use including self-medication, co-morbid illnesses, etc.
» Actively look for concomitant depression and anxiety/somatoform pain disorders.
» Counsel on lifestyle adjustments.
» Refer for occupational therapy and physiotherapy as appropriate.
» Address psycho-social problems e.g. stress, anxiety, sleep disturbances.

MEDICINE TREATMENT

» The principles are the same as with cancer pain relief. Analgesics should be given by mouth, regularly, in a stepwise manner to ensure adequate relief. Neuropathic and central pain are best treated with analgesics in addition to tricyclic antidepressants.
» It is useful to combine different classes of analgesics for the additive effects, depending on pain severity.

Mild pain:

To manage chronic non-cancer conditions such as genetic conditions, nerve damage pain, chronic musculoskeletal pain, and chronic abdominal pain.

Children:

- Paracetamol, oral, 15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

LoE:IVb[18]

Adults:

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

LoE:IVb[19]

Pain associated with inflammation:

Children

See the Paediatric Hospital STGs and EML, section 20.1.1.1: Acute Pain.

Adults

- NSAIDs, e.g.:
- Ibuprofen, oral, 400 mg 8 hourly with or after a meal. *LoE:IIb*[20]

OR

Combine paracetamol and ibuprofen at the above dosages.

Moderate pain:

Adults

If still no relief to simple analgesics (paracetamol and/or ibuprofen), as above

ADD

- Tramadol, oral, 50 to 100mg, 6 hourly as a starting dose. (Doctor prescribed.)
  - May be increased to a maximum daily dose of 400 mg.

Adjuvant therapy:

Adults

In addition to analgesia as above:

- Amitriptyline, oral, 10 mg at night. (Doctor initiated.).
  - Titrate up to a maximum of 75 mg at night. *LoE:IVb*[21]

Under-recognition of pain and under-dosing of analgesics is common in chronic pain.
Analgesics should be given regularly rather than only when required in patients with ongoing pain.

REFERRAL

» Pain requiring strong opioids.
» Pain requiring definitive treatment for the underlying disease.
» Conditions difficult to treat e.g. Complex Regional Pain Syndrome (CRPS) and post-herpetic neuralgia.
» All children.

20.4 CHRONIC CANCER PAIN

R52.1/R52.2/R52.9

DESCRIPTION

Cancer pain is usually persistent and progressive. Pain assessment requires training in:

» psycho-social assessment,
» assessment of need of type and dose of analgesics,
» pain severity assessment.

Under-recognition of pain and under-dosing with analgesics is common in chronic cancer pain.
Analgesics should be given regularly rather than only when required in patients with ongoing pain.

GENERAL MEASURES

» The need for treatment is determined by pain severity rather than the presence of pain.
» Do not withhold pharmacological treatment for pain.
» Pain is what the patient says it is.
» Arrange counselling/hospice care.
» Occupational therapy may be required.
» Manage contributing psycho-social factors.

Note:

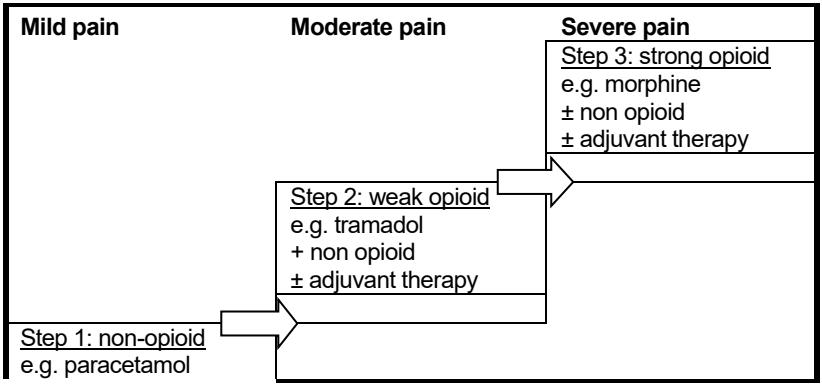
» Appropriate care should be provided from the time of diagnosis.
» Home palliative care is provided by the family or caregiver with the support of health care professionals. See Chapter 22: Medicines used in palliative care.

MEDICINE TREATMENT

» Pain should be controlled as rapidly as possible.
» If pain is not adequately controlled within 2 days, proceed to the next step.
» Cancer pain in children is managed by the same principles but using lower doses of morphine than adults.

STEPWISE APPROACH IN MANAGEMENT OF CANCER PAIN

Adults



and/or ibuprofen where anti-inflammatory effect is required.	

Step 1: Non-opioid

- Paracetamol, oral, 500 mg to 1 g, 4 to 6 hourly as required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

AND/OR *LoE:IIb*[22]

- NSAIDs, e.g.:
- Ibuprofen, oral, 400 mg 8 hourly with or after a meal.

LoE:IIb[23]

Step 2: Add weak opioid to Step 1

- Tramadol, oral, 50 to 100 mg, 6 hourly as a starting dose. (Doctor prescribed.)
  - May be increased to a maximum daily dose of 400 mg.

CAUTION
Use with caution when administered with antidepressants e.g. amitryptyline to avoid over sedation.

LoE:IIb[24]

Step 3: Replace weak opioid with strong opioid, i.e. morphine, and add to paracetamol and/or ibuprofen

- Morphine, oral, 4 hourly. (Doctor prescribed.)
  - Start with 5 to 10 mg.
  - Titrate the dose and dose frequency against the effect on pain.

<u>If dosage is established and patient is able to swallow:</u>

- Morphine, long-acting, oral, 12 hourly. (Doctor prescribed.)
  - Start with 10 to 20 mg/dose.
  - Titrate the dose and dose frequency against the effect on pain. *LoE:IIb*[25]

<u>If breakthrough pain occurs:</u> See Section 20.5: Breakthrough Pain.

<u>Elderly adults or severe liver impairment:</u>

- Morphine solution, oral, 4 hourly. (Doctor prescribed.)
  - Start with 2.5 to 5 mg.
  - Titrate the dose and dose frequency against the effect on pain.

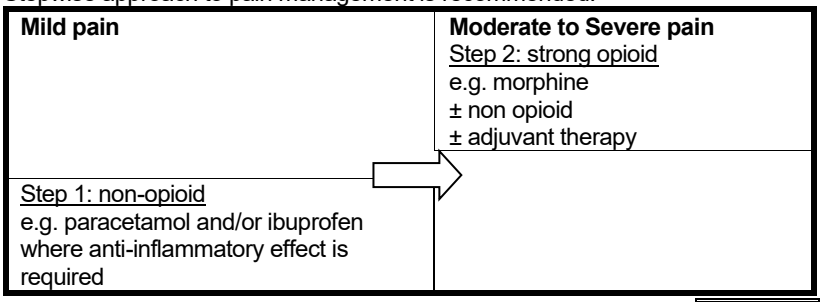
Note:

» There is no maximum dose for morphine – titrate the dose against the effect on pain.

» For the management of morphine overdose, see Section 21.3.3: Exposure to poisonous substances.

Children

Stepwise approach to pain management is recommended:



LoE:IVb[26]

Step 1: Non-opioid

- Paracetamol, oral, 10 to 15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.
- NSAIDs, e.g.:
- Ibuprofen, oral, 5 to 10 mg/kg/dose 8 hourly with or after a meal. See dosing table: Chapter 23. Where anti-inflammatory effect is required.
  - Can be used in combination with paracetamol and/or opioids.
  - Discontinue if not effective after 2 to 3 days.

LoE:IIb[27]

Step 2: Add opioid to paracetamol and/or ibuprofen

- Morphine, oral, 0.2 to 0.4 mg/kg/dose 4 to 6 hourly according to severity of the pain. See dosing table: Chapter 23. (Doctor prescribed.)

LoE:IIb[28]

Adjuvant therapy:

Children

See the Paediatric Hospital STGs and EML, chapter 20: Pain control.

Adults

In addition to analgesia as above:

- Amitriptyline, oral, 10 mg at night. (Doctor initiated.)
  - Titrate up to a maximum of 75 mg at night.

LoE:IVb[29]

Significant nausea and vomiting:

Adults

- Metoclopramide oral, 10 mg, 8 hourly as needed.
  - Maximum daily dose: 0.5 mg/kg

Children

For treatment of nausea and vomiting in the palliative care setting, see section: 22.1.3 Nausea and vomiting.

Constipation:
A common problem due to long-term use of opioids, which can be prevented and should always be treated.
For management of constipation in palliative care, see Section: 22.1.1.

Children
- Lactulose, oral, 0.5 mL/kg/dose once daily. See dosing table: Chapter 23.
  - If poor response, increase frequency to 12 hourly.

Adult
- Lactulose, oral, 10–20 mL once daily.
  - If poor response, increase frequency to 12 hourly.

Pruritus:

Children
- Chlorphenamine, oral, 0.1 mg/kg/dose 6 to 8 hourly. See dosing table: Chapter 23.

Adults
- Chlorphenamine, oral, 4 mg, 6 to 8 hourly.

CAUTION
Do not give an antihistamine to children <2 years of age.

Anxiety related to pain:

Children
- Diazepam, oral, 0.04 mg/kg/dose 8 to 12 hourly. (Doctor prescribed.)

Weight kg	**Dose** mg	**Tablet** 2 mg	**Age** months/years
>9–17.5 kg	0.5 mg	¼ tablet	>12 months–3 years
>17.5–25 kg	1 mg	½ tablet	>5–7 years
>25–35 kg	1.5 mg	¾ tablet	>7–11 years
>35 kg	2 mg	1 tablet	>11 years

  - May be increased up to 0.2 mg/kg/dose 8 to 12 hourly.
  - Beware of respiratory depression if given with morphine.

If an increase in dosage is required follow the weight band dosing guidance of 0.2 mg/kg/dose (see table below) .

Diazepam, oral, 0.2 mg/kg/dose 8 to 12 hourly. (Doctor prescribed.)

- Beware of respiratory depression if given with morphine.

Weight kg	Dose mg	Use one of the following tablets:		Age months/years
		2 mg	5 mg	
>9–11 kg	2 mg	1 tablet	–	>12–18 months
>11–14 kg	2.5 mg	–	½ tablet	>18 months–3 years
>14–17.5 kg	3 mg	1½tablets	–	>5–7 years
>17.5–25 kg	4 mg	2 tablets	–	>5–7 years
>25 kg	5 mg	–	1 tablet	>7 years

Adults

Diazepam, oral, 2 to 5 mg every 12 hours for a maximum of two weeks. (Doctor prescribed.)

20.5 BREAKTHROUGH PAIN

R52.9

DESCRIPTION

Breakthrough pain is a transient exacerbation of pain which either occurs spontaneously or in relation to a specific trigger, despite relatively stable and adequately controlled background pain. It may or may not be at the same location as the background (controlled) pain.

MEDICINE TREATMENT

» Treat breakthrough pain by giving an extra dose of immediate-release morphine equal to the regular 4 hour dose (i.e. one sixth of the total daily dose).

» The next regular dose of morphine must still be given at the prescribed time, and not be delayed because of the additional dose. *LoE:IVb*[30]

» The regular 4-hourly dosage should be titrated upward against the effect on pain in the following way:
- Add up the amount of “breakthrough morphine” used in the previous 24 hours.
- Divide this amount by 6 (the number of 4 hourly doses in 24 hours).
- Increase maintenance dose on the following day by that amount.

Example:

» Patient receives 10 mg morphine every four hours.

» The patient has 3 episodes of breakthrough pain over 24 hours and is given an additional 10 mg during each episode:
- Total breakthrough pain dosage: 3 x 10 mg = 30 mg.
- Dose to add to maintenance dose the following day: 30 mg ÷ 6 = 5 mg.

» The day following the breakthrough pain, the regular 4 hourly dose of 10 mg will be increased by 5 mg, i.e. 10 mg + 5 mg = 15 mg.

» The new morphine dose will be 15 mg 4 hourly.

CAUTION
Morphine can cause respiratory depression, monitor carefully.

REFERRAL

» Uncontrolled pain.
» Pain uncontrolled by step 1 of the stepwise management approach where no doctor is available.
» Severe emotional, or other distress, which may aggravate the perception of pain.
» Nausea and vomiting associated with pain in children.

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PHC Chapter 21: Emergencies and injuries

The conditions described in this chapter are emergencies and must be treated as such. Medicines used for treatment must be properly secured and recorded (time, dosage, route of administration) on the patient's notes and on the referral letter.

Determine the priority of patients' treatments based on the severity of their condition, using a triage system appropriate to your level of care, available resources and staff at your facility.

21.1 CARDIAC ARREST

21.1.1 CARDIAC ARREST, ADULTS

I46.0/I46.9

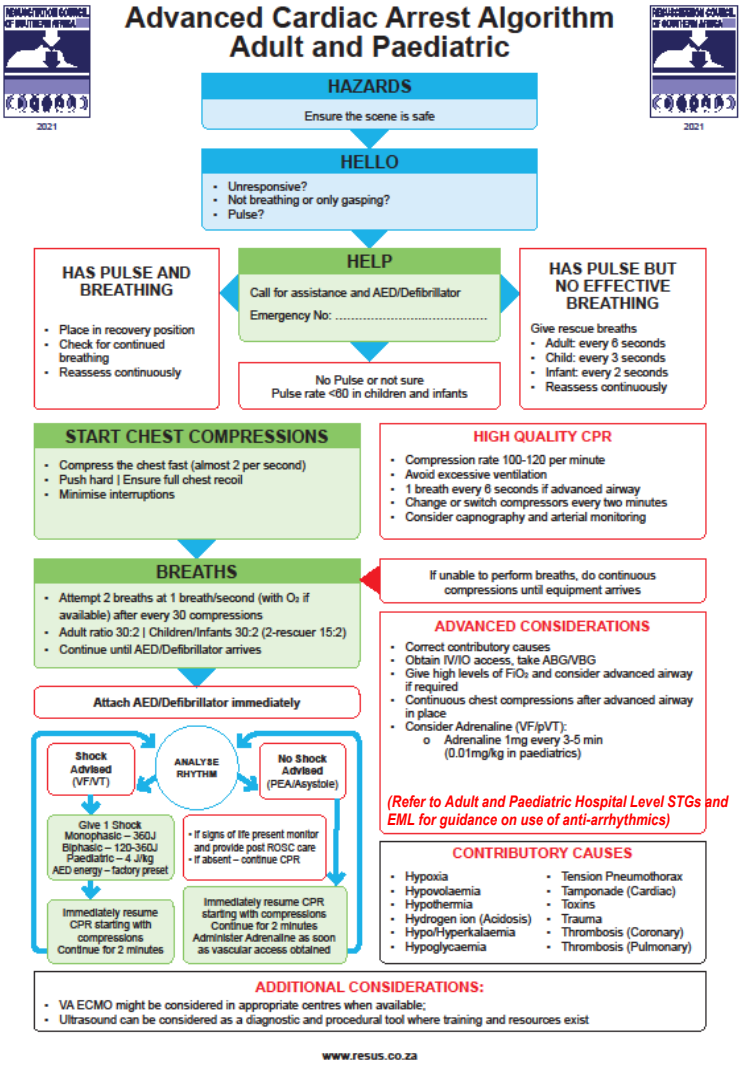


Figure 21.1: Advanced cardiac arrest algorithm *(adapted with permission from the Resuscitation Council of South Africa)*

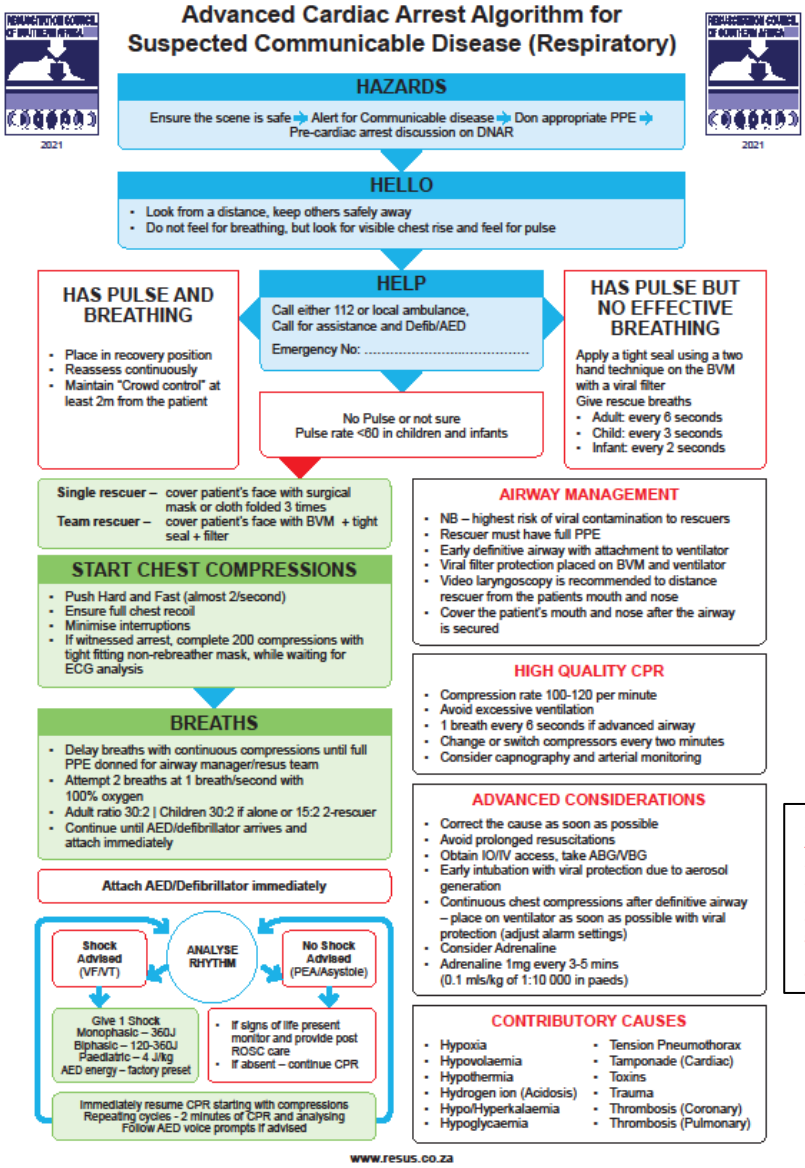


Figure 21.2: Advanced cardiac arrest algorithm - suspected respiratory communicable disease *(adapted with permission from the Resuscitation Council of South Africa)*

DESCRIPTION

Defined as the loss of a heart beat and loss of a palpable pulse, irrespective of the electrical activity captured on ECG tracing.
Irreversible brain damage can occur within 2 to 4 minutes.
Clinical features include:

» sudden loss of consciousness,
» absent carotid pulse, and
» loss of spontaneous respiration.

LoE: IVb[1]

COVID-19 CONSIDERATIONS

» The infection risk that CPR poses to providers due to aerosolization of coronavirus particles is not negligible.
» This potential risk should be weighed against the probability of achieving spontaneous return of circulation to inform the decision to initiate or stop CPR.
» For in hospital cardiac arrest in patients with suspected COVID-19, CPR has been shown to not be beneficial unless an immediate reversible cause is suspected, e.g., dislodgement of ET tube, etc. and is therefore not recommended.
» For out of hospital cardiac arrest in patients with suspected COVID-19, it is recommended to not start conventional CPR in unwitnessed cardiac arrest as it will likely not be beneficial.
» Appropriate PPE should be worn by all staff before initiating CPR: FFP3 mask, visor, gloves and gown.

LoE: IIIb[2]

GENERAL MEASURES

» Diagnose cardiac arrest rapidly.
» Make a note of the time of starting resuscitation.
» Document medication given and progress after the resuscitation.
» Follow instructions as per the appropriate algorithm (Fig 21.1 or 21.2) and below.

EMERGENCY TREATMENT

Hazards, Hello, Help

» Assess for any hazards and remove. Make use of personal protective equipment i.e. gloves, masks.
» Speak to the patient. If they respond, turn into recovery position and continue management as directed by findings.
» If no response, check for carotid pulse and breathing. Take no longer than 10 seconds.
» Call for skilled help and an automated external defibrillator (AED) or defibrillator.

Cardiopulmonary resuscitation (CPR)

» Place the patient on a firm flat surface and commence resuscitation immediately.
» Initiate CAB (Circulation Airway Breathing) sequence of CPR.
» Check the rhythm as soon as defibrillator or AED is available and defibrillate if a shockable rhythm is identified.

Circulation

» If there is no pulse or you are not sure, start with 30 chest compressions at a rate of 100-120 compressions per minute, and a depth of +/-5 cm.
» Allow full chest recoil between compressions.
» Minimise interruptions during compressions.

Airway and **B**reathing

» To open the airway, lift the chin forward with the fingers of the one hand and tilt the head backwards with other hand on the forehead. Do not do this where a neck injury is suspected (see below).
» If there is no normal breathing, give 2 breaths with bag-valve-mask resuscitator and face mask.
» The administered breaths must cause visible chest rise.
» If not able to perform breaths, continue compressions (reposition head and insert correctly sized oropharyngeal airway and try again after 30 compressions).
» If advanced airway is placed, administer 1 breath every 6 seconds without interrupting chest compressions. Avoid excessive ventilation.
» Oxygenate with 100% oxygen.
» Repeat the cycle of 30 compressions followed by 2 breaths (30:2) until the AED or defibrillator arrives.

Where neck injury is suspected:

» Do not perform a chin lift or head tilt manoeuvre if a neck injury is suspected.
» To open the airway, use a jaw thrust:
  - place your fingers behind the jaw on each side,
» lift the jaw upwards while opening the mouth with your thumbs "Jaw thrust".
» Ideally use a 3rd person to provide in-line manual stabilisation of the neck.

Initiate fluids, IV/IO access

- Sodium chloride 0.9%, IV, 1000 mL. *LoE: IIb*[3]

AED/Defibrillator

Attach leads and analyse rhythm as soon as the defibrillator arrives:

If pulseless with shockable rhythm (ventricular fibrillation/tachycardia)

» Defibrillate, as indicated per algorithm (1 shock).
» Immediately resume CPR. Starting with chest compressions.
» Continue CPR cycles of 30:2 for 2 minutes, then reassess for a pulse.
» Administer adrenaline (epinephrine) as per algorithm and medicine treatment below.
» Seek reversible cause of arrest.
» Continue CPR until spontaneous breathing and/or pulse returns.

If pulseless and no respirations with non-shockable rhythm

» Immediately resume CPR. Starting with chest compressions.
» Continue CPR cycles of 30:2 for 2 minutes then reassess for a pulse.
» Administer adrenaline (epinephrine) as per algorithm.
» Seek reversible cause of arrest.

» Continue CPR until spontaneous breathing and/or pulse returns.

IMMEDIATE EMERGENCY MEDICINE TREATMENT:

Adrenaline (epinephrine) is the mainstay of treatment. Give immediately, IV, IO, or endotracheal, when there is no response to initial resuscitation or defibrillation.

- Adrenaline (epinephrine 1 mg), 1:1 000, 1 mL , IV immediately as a single dose.
  - Flush with 5–10 mL of sterile water or sodium chloride 0.9%.
  - Repeat every 3–5 minutes during resuscitation.

OR

- Adrenaline (epinephrine 1 mg), intra-osseous (IO), 1:1 000, 1 mL, via IO line.

LoE: IVb[4]

ADDITIONAL GUIDANCE

Connect bag-valve-mask resuscitator to 100% oxygen at 10-15L/min flow.
Check glucose and treat hypoglycaemia.
Continue CPR until spontaneous breathing and/or heart beat returns.
Assess continuously (every 2 minutes) until the patient shows signs of recovery.

Termination of resuscitation:

» The decision to stop CPR attempts depends on the specifics of the individual patient and should be based on clinical judgement.

» Consider stopping resuscitation attempts and pronouncing death if there is incurable underlying disease, or if asystole > 20 minutes or in the absence of the factors for prolonging resuscitation as listed below.

LoE: IIIb[5]

Consider carrying on for longer especially with:

» hypothermia and drowning,

» poisoning or medicine overdose,

» neurotoxic envenomation (e.g. black and green mamba or Cape cobra snakebite) – see Section 21.3.1.4: Snakebites.

This decision should take into consideration the potential risk that CPR poses to the rescuer e.g. infectious diseases.

REFERRAL

All patients: transfer with supportive care and accompanying skilled worker until care is taken over by doctor at receiving institution.

21.1.2 CARDIOPULMONARY ARREST, CHILDREN

I46.0/I46.9

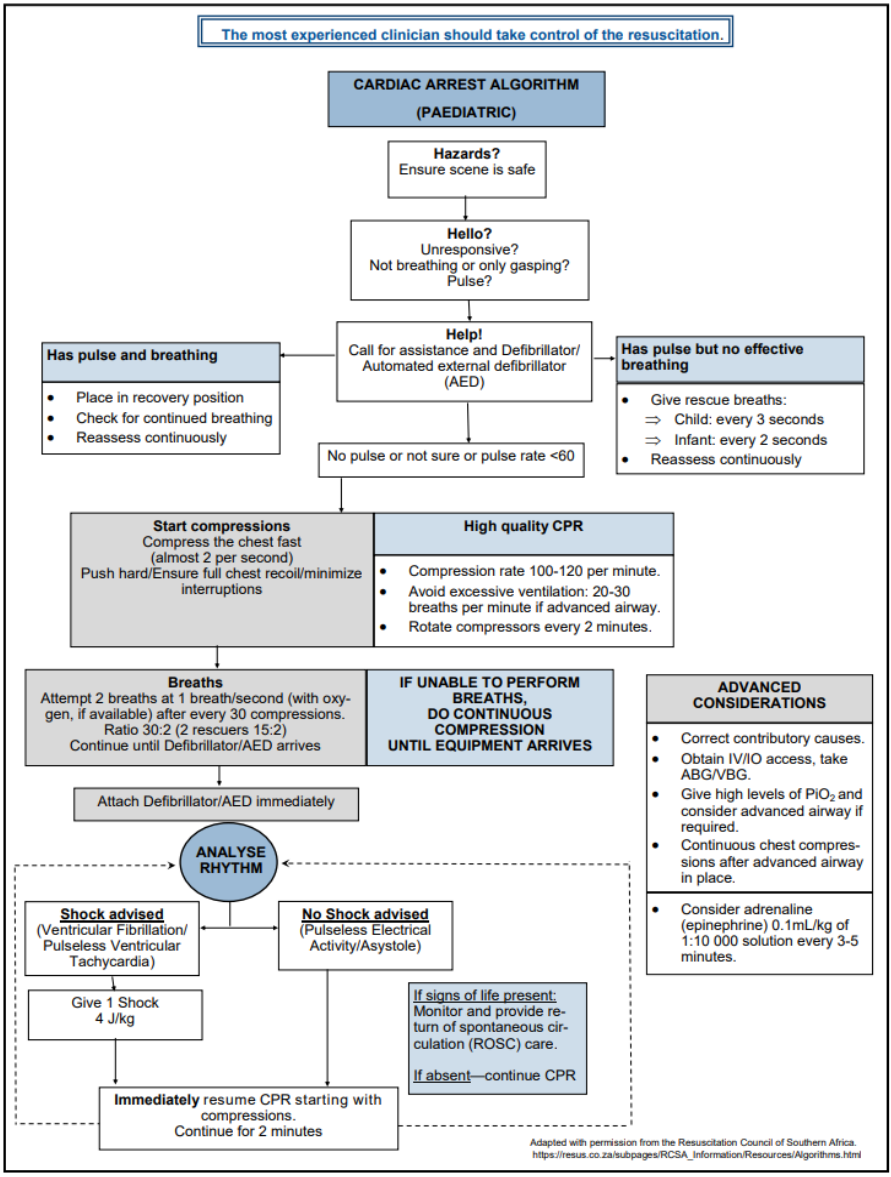


Figure 21.3 Advanced cardiac arrest algorithm for children

DESCRIPTION

Cardiopulmonary arrest is the cessation of respiration or cardiac function and in children is usually a pre-terminal event as a result of a critical illness.

The most effective treatment of cardiorespiratory arrest in children is the prevention of the arrest by early recognition and management of severe disease.
Bradycardia in children is a pre-terminal event and needs to be treated with resuscitation.

Cardiorespiratory arrest in children usually follows poor respiration, poor circulation or poor respiratory effort (e.g. prolonged seizures, poisoning, neuromuscular weakness etc.).
The following table outlines signs of serious disease/impending cardiorespiratory failure in a child. These are an indication that urgent effective management is needed.

	Neurological	Respiratory	Circulatory
Signs of impending cardio-respiratory failure/ severe disease	Decreased level of consciousness or extreme weakness	Increased respiratory rate: >60 breaths/minute	Increased heart rate: >160 beats/min in infants >120 beats/min in children
	Abnormal posture	Marked chest indrawing	Decreased pulse volume
	Pupils – unequal or abnormal size	Grunting	Capillary refill time >3 seconds
	Presence of convulsions	Flaring nostrils, gasping, shallow/irregular breathing	Poor colour: bluish, grey or marked pallor

GENERAL MEASURES

» Diagnose the need for resuscitation rapidly.
» Make a note of the time of starting.
» Place the patient on a firm flat surface and commence resuscitation immediately.
» Document timings of interventions, medication and any response to these. (Ideally, during resuscitation, one staff member should act as a 'scribe'.)
» Collect all ampoules used and total them at the end.

EMERGENCY TREATMENT

Hazards, Hello, Help

» Assess for any hazards and remove. Make use of personal protective equipment i.e. gloves, masks.
» Call for skilled help and an automated external defibrillator (AED) or defibrillator.

Cardiopulmonary resuscitation (CPR)

Circulation

» Check for signs of life and presence of central pulse for 5 to 10 seconds. In younger children (infants) check brachial or femoral pulse, in older children use femoral or carotid pulse.
» If there is no pulse (or pulse <60 beats/minute) with no signs of life, give 30 chest compressions at a rate of 100 to 120 compressions/minute.
» Compress over lower half of sternum and compress chest by approximately 1/3 of the anteroposterior diameter of the chest.

» Allow chest to fully recoil before next compression.
» Minimise interruptions in compressions.

Airway

» Manually remove obvious visible obstruction from the mouth.

CAUTION
Do not use blind finger sweeps of the mouth or posterior pharynx as this can impact any obstruction further down the airway.

» In neonates and infants: position the head in neutral position. In children: position in the sniffing position.
» Lift the chin forward with the fingers under the bony tip of the jaw.

Breathing

» If there is no breathing, give breaths:
  - preferably with bag-valve-mask resuscitator.

  or
  - mouth-to-nose (covering child's mouth AND nose with your mouth).

  or
  - mouth-to-mouth (occluding nose by pinching child's nostrils).
» Give 2 effective breaths at one breath/second.
» Breaths must produce visible chest rise.

Then

» If 2 rescuers are present, carry out cycles of 15 chest compressions followed by 2 breaths (15:2).
» If only 1 rescuer present, carry out cycles of 30 compressions to 2 breaths (30:2).
» Review after 2 minutes or 5 cycles - if pulse is not palpable continue CPR sequence until help arrives.
• Oxygenate with 100% oxygen, if available.

Keep patient covered and warm while resuscitating (although the patient should be fully exposed for short periods during examination).

IMMEDIATE EMERGENCY MEDICINE TREATMENT:

» Estimate the weight of the child by using a paediatric resuscitation tape (PAWPER tape or Broselow tape). If not available, use the following calculation: *LoE: IIIb*[6]

Weight *[kg]* = (Age *[yrs]* + 4) X 2

» If still no pulse or signs of life after cardiac compressions and ventilations:
• Adrenaline (epinephrine), IV, 0.1 mL/kg of 1:10 000 solution.
  - To make an 1:10 000 adrenaline (epinephrine) solution, dilute 1 mL ampoule of adrenaline (epinephrine) (1:1000) with 9 mL of sodium chloride 0.9% to give 10 mL of 1:10 000 solution.
  - Administer dose according to table below.
  - If no IV line is available, the same dose may be given IO.

Weight kg	**Dose** mg	**Volume of diluted solution** (1: 10 000 solution)	**Age** months/years
>2.5–7 kg	0.05 mg	0.5 mL	Birth–6 months
>7–11 kg	0.1 mg	1 mL	>6–18 months
>11–17.5 kg	0.15 mg	1.5 mL	>18 months–5 years
>17.5–25 kg	0.2 mg	2 mL	>5–7 years
>25–35 kg	0.3 mg	3 mL	>7–11 years
>35–55 kg	0.5 mg	5 mL	>11–15 years

Treat hypoglycaemia if present

- Dextrose 10%, solution, IV, 2–5 mL/kg.
  - To make 20 mL of 10% dextrose solution: draw 4 mL of 50% dextrose using 20 mL syringe and add 16 mL of sodium chloride 0.9% or water for injection.
  - After dextrose bolus, commence dextrose 5–10% infusion, 3–5 mL/kg/hour to prevent blood glucose dropping again.
  - Re-check the blood glucose after 15 minutes: if blood sugar is still low: give further bolus of dextrose 10%, IV, 2 mL/kg and continue dextrose infusion.
  - Assess continuously until the patient shows signs of recovery.

ADDITIONAL GUIDANCE

Consider stopping resuscitation attempts and pronouncing death if:

» No signs of life are present after 30 minutes of active resuscitation or in the absence of the factors for prolonging resuscitation as listed below. A doctor must be called before resuscitation is stopped. If no doctor on site, telephonic consultation should take place.

Consider carrying on for longer especially with

» hypothermia and drowning,
» poisoning or medicine overdose,
» neurotoxic envenomation (e.g.black and green mamba or Cape cobra snakebite) – see Section 21.3.1.4: Snakebites.

This decision should take into consideration the potential risk that CPR poses to the rescuer e.g. infectious diseases.

REFERRAL

All patients: transfer with supportive care and accompanying skilled worker until care is taken over by doctor at receiving institution.
For guidance on neonatal resuscitation, see Section 6.6.2: Neonatal resuscitation.

21.1.3 BRADYCARDIA

R00.1

Refer to Adult Hospital Level and Paediatric Hospital Level STGs and EML for relevant guidance.

DESCRIPTION

In adults, bradycardia refers to a pulse rate <50 beats/minute.

In children, bradycardia refers to a pulse rate <60 beats/minute despite effective oxygenation and ventilation.

GENERAL MEASURES

» Assess ABC:
  - Airway: ensure airway is open and clear.
  - Breathing: give oxygen to target pulse oximeter saturation of 94–98%.
  - Circulation: assess peripheral perfusion, measure pulse and blood pressure.
» Attach ECG monitor, pulse oximeter and blood pressure cuff.
» Establish IV access.
» Print rhythm strip to confirm bradycardia; if possible, do 12 lead ECG.
» Assess for signs of instability:
  - Hypotension
  - Altered mental status
  - Chest pain
  - Acute heart failure
  - Signs of shock: cold clammy peripheries and weak pulses

MEDICINE TREATMENT:

Adults

If unstable:

- Atropine, IV, 0.5 mg as a bolus.
  - Repeat every 3–5 minutes, if no response.
  - Maximum dose: 3 mg.

» Look for and treat contributory causes for bradycardia (see table below).
» If no response to atropine, discuss with referral centre or refer to Adult Hospital Level STGs and EML for guidance.

If stable:

Look for and treat contributory causes for bradycardia (see table below):

Contributory causes for bradycardia and treatment	
Hypoxia	Give supplemental oxygen or ventilate.
Hypothermia	Warm the patient.
Head injury	Give oxygen, elevate head of bed.
Heart block	Look for cause of heart block.
Hydrogen ion (acidosis)	Look for cause of acidosis.
Hypotension	If no signs of heart failure: • Sodium chloride 0.9%, IV, 200 mL.
Toxins and therapeutic agents	Treat as for specific overdose.

Table 21.1: Causes and treatment of bradycardia

Children

If unstable:

» Start CPR:
  - 30 compressions: 2 breaths (1 rescuer), or
  - 15 compressions: 2 breaths (2 rescuers).

- Adrenaline (epinephrine), IV, 0.1 mL/kg of 1:10 000 solution. (Doctor prescribed.)
  - To make 1:10 000 adrenaline (epinephrine) solution: dilute 1 mL ampoule of adrenaline (epinephrine) (1:1000) with 9 mL of sodium chloride 0.9% to give 10 mL of 1:10 000 solution.

- Administer dose every 3–5 minutes, according to table below.

Weight kg	**Dose** mg	**Volume of diluted solution** (1: 10 000 solution)	**Age** months/years
>2.5–7 kg	0.05 mg	0.5 mL	Birth–6 months
>7–11 kg	0.1 mg	1 mL	>6–18 months
>11–17.5 kg	0.15 mg	1.5 mL	>18 months–5 years
>17.5–25 kg	0.2 mg	2 mL	>5–7 years
>25–35 kg	0.3 mg	3 mL	>7–11 years
>35–55 kg	0.5 mg	5 mL	>11–15 years

LoE: IVb[7]

If heart block or increased vagal tone suspected:

- Atropine, IV, 0.02 mg/kg/dose as a single dose. (Doctor prescribed.)
  - Maximum single dose: 0.5 mg.
  - Repeat dose, if no response.

LoE: IVb[8]

If stable:

» Look for and treat contributory causes for bradycardia (see Table 21.1 above).
» Close monitoring required.
» Ensure adequate oxygenation and ventilation if necessary.

REFERRAL

Urgent

All patients: transfer with supportive care and accompanying skilled worker until care is taken over by doctor at receiving institution.

21.1.4 TACHYDYSRHYTHMIAS

R00.0

Refer to Adult and Paediatric Hospital Level STGs and EML for relevant guidance.

DESCRIPTION

Adults: tachydysrhythmias refers to a pulse rate >150 beats/minute.
Children: tachydysrhythmias refers to a pulse rate >normal range for age (see table 21.2 below).

EMERGENCY TREATMENT

Assess ABC:

» Airway: ensure airway is open and clear.
» Breathing: give oxygen to target pulse oximeter saturation of 94-98%.
» Circulation: assess peripheral perfusion, measure pulse and blood pressure.

Child heart rate ranges for age	
Age	**Normal heart rate range** (beats/minute)
Newborn to 3 months	85–205
3 months to 2 years	100–190
2 years to 10 years	60–140
>10 years	60–100

Table 21.2: Child heart rate ranges

» Supraventricular tachycardia is suspected when the pulse rate >180 beats/minute in a child and >220 beats/minute in an infant.
» Attach ECG monitor, pulse oximeter and blood pressure cuff.
» Establish IV access.
» Print rhythm strip to confirm tachycardia, if possible do 12 lead ECG.
» Assess for signs of instability:
  - Hypotension
  - Altered mental status
  - Chest pain
  - Acute heart failure
  - Signs of shock: cold clammy peripheries and weak pulses

Adults

If unstable:

» Synchronised cardioversion at 100 J.
» Consider analgesia and sedation if time permits.

If stable:

Assess QRS length on rhythm strip or 12 lead ECG:

» If QRS <0.12 = Narrow complex tachycardia (supraventricular tachycardia):
» Attempt vagal stimulation: Modified valsalva manoeuvre.
  Ice water applied to face.
  Cough, breath holding.
  Carotid sinus massage (not in elderly or those with cardiac disease).
» If QRS > 0.12 = Wide complex tachycardia (ventricular tachycardia):
  - Correct electrolyte disturbances.
  - Consider toxins, overdoses.

Children

If unstable:

» Synchronised cardioversion at 0.5-1 J/kg initially (max 4 J/kg).
» Consider analgesia and sedation if time permits.

If stable:

Assess QRS length on rhythm strip or 12 lead ECG:

» If QRS <0.08 = Narrow complex tachycardia (supraventricular tachycardia):
  - Attempt vagal stimulation: Ice water applied to face.
» If QRS >0.08 = Wide complex tachycardia (ventricular tachycardia):
  - Correct electrolyte disturbances.
  - Consider toxins, overdoses.

REFERRAL

Urgent

All patients: transfer with supportive care and accompanying skilled worker until care is taken over by doctor at receiving institution.

21.1.5 MANAGEMENT OF SUSPECTED CHOKING/FOREIGN BODY ASPIRATION IN CHILDREN

T17.2-5/T17.8-9/ T18.0-1

If the child is **able to talk and breathe**	Encourage the child to cough repeatedly while arranging transfer to hospital urgently with supervision.
If the child is **conscious but with no effective cough or breathing**	Give up to 5 abdominal thrusts and if ineffective up to 5 back slaps, followed by re-assessment of breathing. Repeat as a cycle until recovery or child becomes unconscious. See technique below and figure 21.4 for differences between infants and children.
If the child is **unconscious with no effective breathing**	Call for assistance. Open airway and check for any visible foreign body and remove. Start CPR: compressions and breaths (30:2) (check airway for foreign body each time before giving breaths).

(Infant: <1 year of age; Child: >1 year of age until puberty).
Table 21.3: Managing suspected choking/foreign body aspiration in children

Techniques for back blows and chest/abdominal thrusts:

Infants

» Place the baby along one of the rescuer's arms in a head down position with baby face down.
» Rescuer to rest his/her arm along own thigh and deliver 5 back slaps to the child.
» If this is ineffective turn the baby over (face up) and lay on the rescuer's thigh in the head down position.
» Apply 5 chest thrusts – use the lower ½ of the sternum – compress at least 1/3 of the anteroposterior diameter of the chest. If baby too large to carry out on the thigh this can be done across the lap.

Children

» In older children, rather lie child across rescuer's lap to deliver back blows. Use abdominal thrusts (Heimlich manoeuvre) in place of chest thrust.
» For abdominal thrust in the standing, sitting, or kneeling position, rescuer to move behind the child and pass his/her arms around the child's body. Then, form a fist with one hand, and place against the child's abdomen above the umbilicus and below the xiphisternum. Then place the other hand over the fist and thrust both hands sharply upwards into the abdomen towards the chest.
» In the lying (supine) position, the rescuer to kneel astride the victim and do the same manoeuvre except use the heel of one hand rather than a fist.

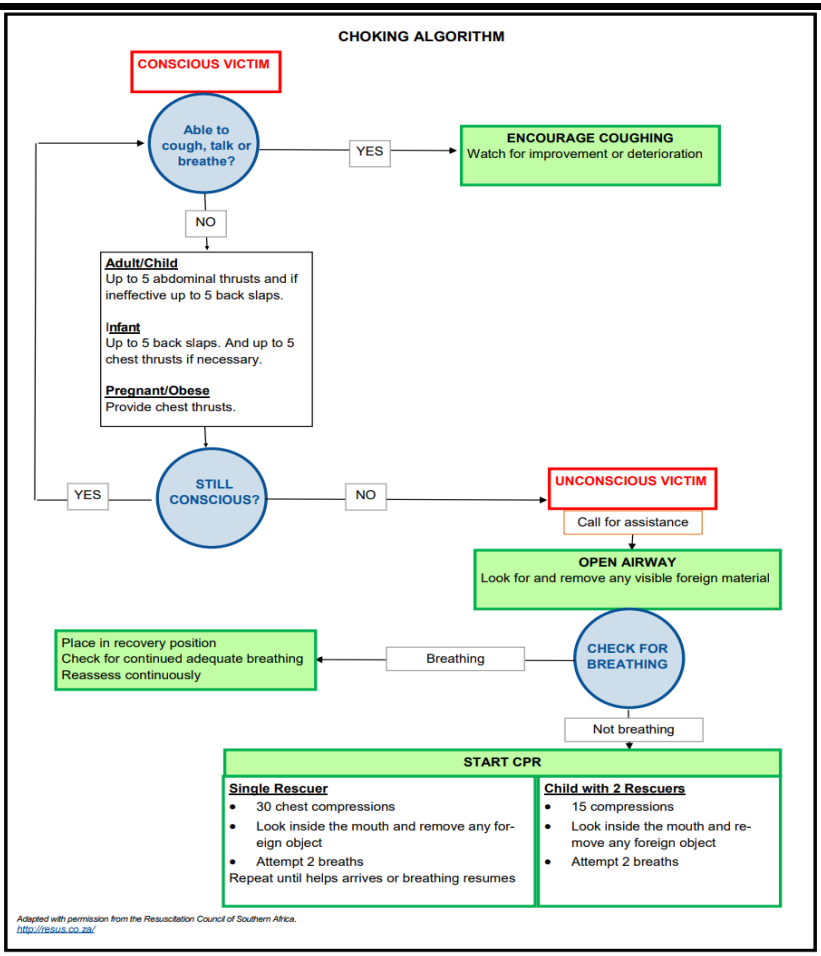


Figure 21.4 Choking algorithm

21.2 MEDICAL EMERGENCIES

21.2.1 PAEDIATRIC EMERGENCIES

Certain emergencies of the airway, breathing, circulation and neurological system are dealt with in the respiratory, cardiac, and nervous system chapters. All doctors should ensure that they have received appropriate training in at least providing basic (and preferably advanced) life support to children.

21.2.1.1 RAPID TRIAGE OF CHILDREN PRESENTING WITH ACUTE CONDITIONS IN CLINICS AND CHCS

TRIAGE OF ALL SICK CHILDREN

Triage is the process of rapidly examining all sick children when they first arrive at clinic.

- It involves the rapid examination of all sick children when they first arrive at the clinic to priotiise their care.
- They should be reassessed regularly while awaiting definitive care.
- Early recognition of life-threatening emergencies and rapid provision of appropriate care can prevent childhood deaths and reduce associated morbidity.

CATEGORIES

1. **EMERGENCIES:** Conditions that cannot wait and require immediate treatment.
2. **PRIORITY SIGNS:** Place ahead of the normal queue.
3. **NON-URGENT**: Join the queue.

1. ASSESS & TREAT AS EMERGENCIES

Conditions that cannot wait and require immediate treatment.

A&B — AIRWAY AND BREATHING
- Not breathing, ***or***
- Obstructed breathing, ***or***
- Central cyanosis, ***or***
- Severe respiratory distress

→ ANY SIGN POSITIVE

C — CIRCULATION
- Cold hands, ***and***
- Capillary refill 3 secs or more, ***and***
- Weak and fast pulse

→ ALL SIGNS POSITIVE

C — COMA/CONVULSING
- Coma, ***or***
- Convulsing (at the time of evaluation)

→ IF COMA OR CONVULSING

D — SEVERE DEHYDRATION

(only in child with diarrhea)

Diarrhoea ***plus any two*** of the following:
- Lethargy
- Sunken eyes
- Very slow skin pinch (fold visible for >2 sec)

→ DIARRHOEA *plus* 2 SIGNS +ve

If any emergency sign is present, give emergency treatment (s), call for help and draw blood for emergency laboratory investigations as needed.

Refer to relevant chapters of the EML for management guidance.

2. ASSESS FOR PRIORITY SIGNS

Place ahead of the normal queue.
These children need prompt assessment and treatment.

- Tiny baby (< 3 months)
- Temperature very high (>38 ^{0}C) or very low (<36.4 ^{0}C)
- Trauma or other urgent surgical condition
- Severe pallor
- History of poisoning
- Severe pain
- Respiratory distress
- Restless, continuously irritable or lethargic
- Referred for urgent attention
- Malnutrition
- Oedema of both feet
- Burns (major)

Note:
If a child has trauma or other surgical problems, get surgical help or follow surgical guidelines.

3. NON-URGENT (queue)

No emergency or priority signs.

Proceed with assessment and further treatment according to the child's priority.

Adapted from Pocketbook of Hospital Care for Children. Management of Common Childhood Illnesses. National Department of Health, South Africa, 2016. www.health.gov.za/ and the Integrated Management of Childhood Illness 2022: NDoH.

Figure 21.5: Triage of sick children

The Emergency Triage Assessment and Treatment (ETAT) triage process, presented above, should be a minimum standard of triage in community health centres.

For management guidance, refer to relevant sections of the EML as listed below:

» For foreign body aspiration see Section 21.1.5: Management of suspected choking/foreign body aspiration in children.
» For acute asthma see Section 17.1.2: Acute asthma, children.
» For acute bronchiolitis see Section 17.1.4: Acute bronchiolitis in children.
» For croup see Section 17.2.1: Croup (laryngotracheobronchitis) in children.
» For shock see Section 21.2.9: Shock.
» For hypoglycaemia and hypoglycaemic coma see Section 21.2.6: Hypoglycaemia and hypoglycaemic coma.
» For acute diarrhoea see Section 2.9.1: Diarrhoea, acute in children.

21.2.2 ANGINA PECTORIS, UNSTABLE

See Section 4.3: Angina pectoris, unstable/ Non-ST elevation myocardial infarction (NSTEMI).

21.2.3 MYOCARDIAL INFARCTION, ACUTE (AMI)

See Section 4.4: Myocardial infarction, Acute (AMI)/ ST Elevation Myocardial Infarction (STEMI).

21.2.4 DELIRIUM

F05.0-1/F05.8-9/F44.8/R45.1/R45.4-6

DESCRIPTION

Delirium is a medical emergency.

Delirium is a disturbance in attention, awareness (reduced orientation to the environment), and cognition (e.g. deficits in memory, language, visuospatial ability, or perception). It is acute, developing within hours to days, and fluctuates during the day, worsening in the evenings. It may be hyperactive, with increased mood lability, agitation, and/or uncooperative behaviour, or hypoactive, with poor responsiveness and stupor.

Delirium should not be mistaken for psychiatric disorders like schizophrenia or a manic phase of a bipolar disorder. It is a physiological consequence of another medical condition, substance intoxication or withdrawal (including prescription or over the counter medications and recreational substances), exposure to a toxin, or multiple aetiologies.

There are many possible causes including extracranial causes. Organic or physical illness should also be considered as possible causes.

The elderly are particularly prone to delirium caused by medication, infections, electrolyte and other metabolic disturbances.

Main clinical features are:

» acute onset (usually hours to days)
» impaired awareness
» a fluctuating course and disturbances of the sleep-wake cycle
» confusion
» disorientation

Other symptoms may also be present:
» restlessness and agitation,
» hallucinations,
» autonomic symptoms such as sweating, tachycardia and flushing,
» hypo-activity, with reduced responsiveness to the environment,
» aggressiveness,
» violent behaviour alone occurs in exceptional cases only.

Risk factors for delirium include:
» > 65 years of age
» history of stroke, neurological disorder, falls, previous delirium
» HIV infection
» polypharmacy
» psychoactive substance intoxication and withdrawal
» dementia
» medicines such as anticholinergics and hypnotics
» multiple comorbidities
» severe illness

GENERAL MEASURES

» Perform investigations to exclude or diagnose an underlying medical problem, the treatment of which is the primary management (e.g. hypoglycaemia, hypoxia, pain etc).

Checklist for diagnosis:
D Drugs (Intoxication and withdrawal. Consider Wernicke's encephalopathy).
I Infections, e.g. sepsis, pneumonia, urinary tract infections, peritonitis, meningitis.
M Metabolic, e.g. hypoglycaemia, electrolyte abnormalities (e.g. hyponatraemia); organ failure (e.g. liver failure, renal dysfunction), CO2 narcosis.
T Trauma, e.g. chronic subdural haematoma.
O Oxygen deficit (including hypoxia, carbon monoxide poisoning).
P Psychiatric or physical conditions, e.g. severe stress or pain.

» Nurse in a calm, predictable and safe environment, avoid changes of staff or rooms/ wards.
» Maintain circadian rhythm: in the day mobilise, provide sensory stimulation/ spectacles/ hearing aids; at night avoid noise, light and procedures
» Ensure effective communication: introduce self with each patient contact, be aware of patient's non-verbal cues, listen attentively, reassure frequently.
» Re-orientate verbally, with a clock, and signage
» Assess for and address dehydration, constipation, hypoxia, infections, pain, and discomfort.
» Avoid abrupt substance withdrawal (see Section 16.9: Substance misuse).

CAUTION – physical restraint:

» Worsens the outcomes of delirious patients: this is a last resort when all else has failed and is a short-term measure until chemical restraint and other measures have been achieved.
» Manual restraint: respectful, controlled, applied by personnel of the same sex as the patient.
» Mechanical restraint: only if absolutely necessary to protect the patient and others for as short a time as possible. Document the type, sites and duration of any restraints used. 15-minute monitoring of vital signs, the mental state, restraint sites, and reasons for use.

MEDICINE TREATMENT

» Manage the underlying medical or surgical condition.
» The aim is to contain the person while awaiting transfer to hospital and to enable initial care of the underlying condition.
» Keep antipsychotic or benzodiazepine use to a minimum.
» Use small doses regularly rather than large doses less frequently.
» Adjust doses according to clinical circumstances, e.g., lower doses in the elderly, debilitated.

Acute management

For severe aggression and disruptive behaviour, see Section 16.1.2: Aggressive, disruptive behaviour in adults or Section 16.1.3 Aggressive, disruptive behaviour in children and adolescents.

If the delirium is caused by seizures or substance withdrawal, or if communication is difficult

- Midazolam, IM, 7.5 to 15 mg immediately.
  - Repeat after 30 to 60 minutes if needed.

OR

- Diazepam, slow IV, 10 mg no faster than 5 mg/minute for immediate sedative or hypnotic action.
  - If no response, give a 2nd dose after 30 to 60 minutes.

Switch to oral administration, once containment is achieved.

» Secure airway.
» Exclude hypoglycaemia.
» Monitor for respiratory depression.

CAUTION - Benzodiazepines

» Benzodiazepines, especially diazepam IV, can cause respiratory depression.
» Monitor vital signs closely during and after administration. In the frail and elderly patient or where respiratory depression is a concern, reduce the dose by half.

» The safest route of administration is oral followed by IM with the IV route having the highest risk of respiratory depression and arrest. Use the safest route wherever possible.
» In patients with respiratory insufficiency: use oral haloperidol or olanzapine oro-dispersible tablets, IM, or oral instead of IM or IV benzodiazepines.
» Do NOT use IM olanzapine with IM/IV benzodiazepines.
» In the short-term, benzodiazepines can aggravate delirium.
» Allow at least 15–30 minutes for the medication to take effect. Repeated IM doses of benzodiazepines may result in toxicity owing to accumulation.

LoE:IVb[9]

If the most likely cause of delirium is a medical disorder and if very restless or agitated:

- Haloperidol, oral, 0.75 to 1.5 mg, repeated in 30 to 60 minutes, if required.

OR

If unable to swallow or oral medication declined:

- Haloperidol, IM, 0.5 to 1mg.

OR

If haloperidol, IM is not available:

- Olanzapine, oral dispersible tablet or IM, 2.5 to 5 mg.
  - Use lowest dose with caution in the elderly.
  - May be repeated in 30 to 60 minutes, if required.
  - Monitor vital signs and beware of oversedation, neuroleptic malignant syndrome, and acute dystonia.

If alcohol withdrawal/ Wernicke's encephalopathy suspected:

- Thiamine, IM, 200 mg immediately. *LoE:IVb*[10]

See Section 16.9.4: Alcohol withdrawal (uncomplicated).

CAUTION

Thiamine should preferably be administered prior to intravenous glucose to prevent permanent neurological damage.
Do not delay the dextrose administration in a hypoglycaemic patient.

REFERRAL

Urgent

All cases.

21.2.5 HYPERGLYCAEMIA AND KETOACIDOSIS

See Section 9.3.2: Severe hyperglycaemia (Diabetic ketoacidosis (DKA) & hyperosmolar hyperglycaemic state (HHS)).

21.2.6 HYPOGLYCAEMIA AND HYPOGLYCAEMIC COMA

E10.0/ /E11.0//E12.0/E13.0/ /E14.0//E16.0/E16.1/E16.2

DESCRIPTION

Hypoglycaemia is a blood glucose concentration <3 mmol/L (<2.6 mmol/L in neonate) and may rapidly cause irreversible brain damage and/or death.

Clinical features include:

» tremor
» sweating
» tachycardia
» dizziness
» hunger
» headache
» impaired concentration
» confusion
» delirium
» coma
» convulsions
» transient aphasia or speech disorders
» irritability

There may be few or no symptoms in the following situations:

» chronically low blood glucose
» patients with impaired autonomic nervous system response, e.g.
  - the elderly
  - malnourished
  - treatment with beta-blockers
» very ill
  - those with long-standing diabetes mellitus

People at risk of hypoglycaemia:

» neonates with low birth weight or ill or not feeding well,
» malnourished or sick children,
» shocked, unconscious or convulsing patients,
» alcohol binge,
» liver disease,
» diabetics on treatment,

Hypoglycaemia may be a marker of deteriorating renal function.

EMERGENCY TREATMENT

» Obtain blood for glucose determination immediately.
» Establish blood glucose level with glucometers or testing strip.

Conscious patient, able to eat

Adults

- Sweets, sugar, glucose or milk by mouth.
  or
- Oral sugar solution.
  - Dissolve 3 teaspoons of sugar (15 g) in 200 mL cup of water.

Breastfeeding child

- Administer breast milk.

Older children

- A formula feed of 5 mL/kg.
  or
- Oral sugar solution.
  - Dissolve 3 teaspoons of sugar (15 g) in 200 mL cup of water; administer 5 mL/kg.
  or

- Sweets, sugar, glucose by mouth.

Conscious patient, not able to feed without danger of aspiration

Administer via nasogastric tube:

- Dextrose 10%, 5 mL/kg.
  (add 1 part 50% dextrose water to 4 parts water to make 10% solution)
  or
- Milk.
  or
- Sugar solution.
  - Dissolve 3 teaspoons of sugar (15 g) in 200 mL cup of water – administer 5 mL/kg.

Unconscious patient

Children

- Dextrose 10%, IV, 2 to 5 mL/kg.
  - 10% solution, e.g.: 1 part 50% dextrose water to 4 parts water for injection to make 10% solution.
  - After dextrose bolus, commence dextrose 5 to 10% infusion, 3 to 5 mL/kg/hour to prevent blood glucose dropping again.
  - Re-check blood glucose after 15 minutes: if still low: give further bolus of dextrose 10%, IV, 2 mL/kg and continue dextrose infusion.
  - Feed the child as soon as conscious.
  - Investigate underlying cause e.g. infection.

Adults

- Dextrose 10%, IV, 5 mL/kg immediately and reassess.
  - 10% solution, e.g.: 1 part 50% dextrose water to 4 parts water for injection to make 10% solution.
  - Generally, an immediate clinical response can be expected.
  - Maintain with 5% dextrose solution infusion until blood glucose is stabilised within the normal range.
  - Investigate underlying cause e.g. infection. *LoE:IIIb*[11]

Alcoholics/ malnourished (adults) *LoE:IIIb*[12]

- Thiamine, IV/IM, 200 mg immediately.

CAUTION

Thiamine should preferably be administered prior to intravenous glucose to prevent permanent neurological damage.
Do not delay the dextrose administration in a hypoglycaemic patient.

Although potentially serious allergic adverse reactions may rarely occur during, or shortly after, parenteral administration, it is recommended that:
- This should not preclude the use of parenteral thiamine in patients where this route of administration is required, particularly in patients at risk of Wernicke-Korsakoff syndrome where treatment with thiamine is essential;
- Intravenous administration should be by infusion over 30 minutes;

- Facilities for treating anaphylaxis (including resuscitation facilities) should be available when parenteral thiamine is administered.

LoE:IVb[13]

REFERRAL

Urgent

» All hypoglycaemic patients on oral hypoglycaemic agents.
» Hypoglycaemic patients who do not recover completely after treatment.
» All children who have had documented hypoglycaemia (unless the cause is clearly identified and safe management instituted to prevent recurrence).

21.2.7 NOSE BLEED (EPISTAXIS)

R04.0

DESCRIPTION

Nose bleed may be caused by local or systemic diseases, or local trauma, especially nose picking, and occurs from an area anterior and inferior to the nasal septum. Consider other conditions associated with nosebleeds, especially if recurrent, e.g. hypertension and bleeding tendency.

MANAGEMENT

Acute episode

Control bleeding by pinching the nasal wings (alae) together for 5–10 minutes.
If this fails, insert nasal tampons or BIPP stripping into bleeding nostril(s), if available.
Identify underlying cause.

REFERRAL

» Recurrent nose bleeds.
» Failure to stop the bleeding.

21.2.8 PULMONARY OEDEMA, ACUTE

J81

DESCRIPTION

A life-threatening condition with abnormal accumulation of fluid in the lungs.
Common causes include acute heart failure and acute renal failure (e.g. acute nephritis).
Persons with pulmonary oedema may present similarly to acute bronchospasm.
It is important to distinguish this condition from an acute attack of asthma.

EMERGENCY TREATMENT

Place the patient in a sitting or semi-Fowlers position.

Children

- Oxygen, using a 40% face mask or nasal cannula at 2 to 3 L/minute.
- Furosemide, IV, 1 mg/kg immediately administered slowly over 5 minutes. See dosing table: Chapter 23.
  - Do not put up a drip or run in any IV fluids.

Adults

- Oxygen, using face mask to deliver 40% oxygen at a rate of 6 to 8 L/minute.

AND

- Furosemide, slow IV, 40 mg.
  If response is adequate follow with:
  - Furosemide, IV, 40 mg in 2 to 4 hours.

  If no response within 20–30 minutes:
  - Furosemide, IV, 80 mg.

AND

- Isosorbide dinitrate, sublingual, 5 mg immediately.
  - If needed, repeat every 5 to 10 minutes. *LoE:IVb*
  - Do not administer if hypotensive. Monitor BP.

CAUTION

Do not use morphine for pulmonary oedema, as there is observational data providing a signal of harm.

LoE:IIIb[14]

Pulmonary oedema due to a hypertensive crisis:

To treat hypertension:

I10

ADD

- ACE-inhibitor, e.g.
- Enalapril 10 mg, oral, as a single dose and refer.

REFERRAL

Urgent

All cases.

(Continue oxygen during transfer).

21.2.9 SHOCK

R57.0-2/R57.8-9/ /T79.4/T78.2/Y57.9

DESCRIPTION

Shock is a life-threatening condition characterised by any evidence of inadequate organ perfusion.

Signs and symptoms of shock in adults

» Low blood pressure (systolic BP <80 mmHg) is the key sign of shock.
» Weak and rapid pulse
» Rapid shallow breathing.
» Low urine output
» Restlessness and altered mental state
» Weakness

Signs and symptoms of shock in children

Shock must be recognised while still in the compensated state to avoid irreversible deterioration. Therefore, the following are primarily assessed in children:

» Prolonged capillary filling (>3 seconds).
» Decreased pulse volume (weak thready pulse).
» Increased heart rate (>160 beats/minute in infants, >120 beats/minute in children).
» Decreased level of consciousness (poor eye contact).
» Rapid breathing.
» The signs mentioned above are more sensitive in detecting shock before it is irreversible. Decreased blood pressure and decreased urine output are late signs of shock and can be monitored.

	Age of child (years)				
	<1	**1-2**	**2-5**	**5-12**	**>12**
Respiratory rate (breaths/min)	30–40	25–35	25–30	20–25	15–20
Heart rate (beats/min)	110–160	100–150	95–140	80–120	60–100
Systolic BP (mmHg)	80–90	85–95	85–100	90–110	100–120

Source: The Hands-on Guide to Practical Paediatrics, First Edition. Rebecca Hewitson and Caroline Fertleman. © 2014 John Wiley & Sons, Ltd. Published 2014 by John Wiley & Sons, Ltd. Companion Website: www.wileyhandsonguides.com/paediatrics
Table 21.4: Normal ranges in children:

Types of shock:
» *Hypovolaemic shock:* Most common type of shock. Primary cause is loss of fluid from circulation due to haemorrhage, burns, diarrhoea, etc.
» *Cardiogenic shock:* Caused by the failure of heart to pump effectively e.g. in myocardial infarction, cardiac failure, etc.
» *Septic shock:* Caused by an overwhelming infection, leading to vasodilation.
» *Anaphylactic shock*: Caused by severe allergic reaction to an allergen, or medicine.

EMERGENCY TREATMENT

» Maintain open airway.
• Administer face mask oxygen, if saturation < 94%. *LoE:IIb*[15]
» Consider the need for intubation and seek advice from referral centre.
» Check for and manage hypoglycaemia.
» If anaphylactic shock suspected, see Section 21.2.10: Anaphylaxis.

Intravenous fluid therapy is important in the treatment of all types of shock, except for cardiogenic shock and septic shock (as fluid-overloaded patients do not need fluid replacement) – these patients should receive a fluid challenge as detailed below. Prompt diagnosis of the underlying cause is essential to ensure optimal treatment.

Fluid replacement (avoid in cardiogenic and septic shock):

Adults
• Sodium chloride 0.9%, IV, 1 L as a rapid bolus.
  o Repeat bolus until haemodynamic status is improved.
  o Once stable, maintain IV fluids with careful monitoring of haemodynamic status; adjust infusion rate as needed to maintain stability pending transfer.

Children
• Sodium chloride 0.9% or ringers lactate, IV, 10 mL/kg as over 20 minutes.
  o Repeat bolus until haemodynamic status is improved.

- Once stable, maintain IV fluids with careful monitoring of haemodynamic status; adjust infusion rate as needed to maintain stability pending transfer.

Note: If patient develops respiratory distress, recheck airway and breathing and discontinue fluids.

In adults with suspected cardiogenic or septic shock: give a fluid challenge:

- Sodium chloride 0.9%, IV, 500 mL over 30 minutes.
  - Assess blood pressure and pulse rate response. Response is defined by improvements in blood pressure, pulse rate and mental status (adequate cerebral perfusion) in addition to a good urine output, rather than an absolute blood pressure value.
  - If response is positive, then continue with intravenous fluid. Monitor the patient and stop fluids if patient is breathless. Avoid over hydrating as this could exacerbate hypoxia associated with adult respiratory distress syndrome.
  - If no adequate response to fluid challenge (as described above), suspect septic shock and repeat fluid challenge.

Septicaemia in children:

All children with shock, which is not obviously due to trauma or simple watery diarrhoea, should in addition to fluid resuscitation, receive antibiotic cover for probable septicaemia.

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a **single dose**. W See dosing table: Chapter 23.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If *SUSPECTING SERIOUS BACTERIAL INFECTION* in neonate, give ceftriaxone, even if jaundiced.

» Avoid giving calcium-containing IV fluids (e.g. Ringer's Lactate) together with ceftriaxone:
- If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
- If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
- Preferably administer IV fluids without calcium contents.

» Always include the dose and route of administration of ceftriaxone in the referral letter.

REFERRAL

Urgent

All patients, after resuscitation.

21.2.10 ANAPHYLAXIS

T78.2/Y57.9

DESCRIPTION

A very severe allergic reaction that usually occurs within seconds or minutes after exposure to an allergen, but may be delayed for up to 1 hour. The reaction can be short-lived, protracted or biphasic, i.e. acute with recurrence several hours later. Immediate reactions are usually the most severe and/or life-threatening.

Clinical features include:

» Acute onset of signs and symptoms.
» Urticaria (hives) or angioedema.
» Bronchospasm, wheezing, dyspnoea, chest tightness.
» Laryngeal oedema with upper airway obstruction or stridor.
» Gastrointestinal symptoms such as nausea, vomiting, diarrhoea.
» Hypotension and/or shock.
» Dizziness, paraesthesia, syncope, sweating, flushing, dysrhythmias.

GENERAL MEASURES

Anaphylaxis associated with vaccinations:

» Always keep a fully equipped emergency tray at the vaccination point.
» It is advisable to observe clients for 15 minutes after a vaccination. If a client is known with severe allergies, an observation period of 30 minutes is advised.
» Clients who develop symptoms should be assessed for possible vaccination associated anaphylaxis by considering the following:
  - If signs and symptoms are generalised – involving more than 2 body systems, manage as anaphylaxis.
  - If signs and symptoms are serious or life-threatening, even if only one body system is involved (including hypotension, respiratory distress, significant swelling of lips or tongue), treat as anaphylaxis.
  - If isolated rash in an otherwise well client, monitor for 30 minutes.
» Collapse following vaccination might be due to anaphylaxis or other causes such as a vasovagal episode:
  - Call for help and put patient on his/her back and raise legs.
  - Check if responsive – if unresponsive, commence CPR (See Section 21.1: Cardiac arrest)
  - A vasovagal episode is usually associated with a transient loss of consciousness (<1 minute), relieved by raising the legs when supine, transient low BP and low HR.
  - Collapsing after vaccination usually occurs 5 to 10 minutes post-vaccination, but can occur up to an hour afterwards.
  - Treat as anaphylaxis if loss of consciousness is not brief and not relieved by raising the legs, or if any of the signs or symptoms of anaphylaxis occur.

	ANAPHYLAXIS	ACUTE STRESS RESPONSE	
		GENERAL	VASOVAGAL REACTION WITH SYNCOPE
Onset	Usually 5 min after immunization but may be delayed up to 60 min	Sudden, occurs before, during or shortly after (< 5 min) immunization	Sudden, occurs before, during or shortly after (< 5 min) immunization. May present after 5 min if the individual stands suddenly.
System			
Skin	Generalized urticaria (hives) or generalized erythema, angioedema, localized or generalized, generalized pruritus with or without skin rash, generalized prickle sensation, localized injection site urticaria, red and itchy eyes	Pale, sweaty, cold, clammy	Pale, sweaty, cold, clammy
Respiratory	Persistent cough, noisy breathing and airway constriction: wheeze, stridor. If very severe, respiratory arrest.	Hyperventilation (rapid, deep breathing)	Normal to deep breaths
Cardiovascular	↑ heart rate, ↓ blood pressure, circulatory arrest	↑heart rate, normal or ↑systolic blood pressure	↓ heart rate with or without transient ↓in blood pressure
Gastrointestinal	Nausea, vomiting, abdominal cramps	Nausea	Nausea, vomiting
Neurological and other symptoms	Uneasiness, restlessness, agitation, loss of consciousness, little response when supine or lying flat	Fearfulness, light-headedness dizziness, numbness, weakness, tingling around the lips, spasms in hands, feet	Transient loss of consciousness, good response once supine or lying flat, with or without tonic–clonic seizure

Table 21.5: Differences between anaphylaxis, general acute stress response and vasovagal reaction with syncope
Source: Immunization stress-related response. A manual for program managers and health professionals to prevent, identify and respond to stress related responses following immunization. Geneva: World Health Organization; 2019. https://apps.who.int/iris/handle/10665/330277

EMERGENCY TREATMENT

» Resuscitate (CAB) immediately (see Section 21.1: Cardiopulmonary arrest–cardiopulmonary resuscitation).
» Place hypotensive or shocked patient in horizontal position. Do NOT sit the patient up.
» Severe anaphylaxis: administer oxygen by facemask at high flow rate of 15 L/min.
» Remove the trigger if possible.

MEDICINE TREATMENT

First line priority:

Adrenaline (epinephrine) is the mainstay of treatment and should be given immediately.

- Adrenaline (epinephrine), 1:1000, IM, 0.01 mL/kg as a single dose.
  - Children: 1:1000, IM, 0.01 mL/kg as a single dose. See dosing table: Chapter 23.
  - Adults: 1:1000, IM, 0.5 mg (0.5 mL) as a single dose, into the lateral thigh.
  - Repeat in 5 minutes if no improvement.

Second line priority:

- Oxygen, 8-10 L/minute via facemask or up to 100% oxygen, as needed.

LoE:IVb[16]

AND

If hypotension not responding promptly to adrenaline (epinephrine), also give:

- Sodium chloride 0.9%, IV:
  - Children: 20 mL/kg, over 5 to 10 minutes. Repeat as needed.
  - Adults: 1–2 L, at the most rapid flow rate possible in the first minutes of treatment. Repeat as needed.

LoE:IVb[17]

CAUTION
Monitor continuously for clinical response and fluid overload.

AND

If wheeze:

- Salbutamol 0.5%, (5 mg/mL) solution, nebulised, with high flow oxygen.
  - Children: 0.5 to 1 mL (2.5 to 5 mg) salbutamol 0.5% solution,
  - Adults: 1 mL (5 mg) salbutamol 0.5% solution,

LoE:IVb[18]

AND

- Ipratropium bromide, solution, added to salbutamol solution.
  - Children: Ipratropium bromide 0.25 mg/2ml; nebuliser solution: 2 mL (0.25 mg) nebulised with salbutamol and made up to a total volume of 4 mL with sodium chloride 0.9%.
  - Adults: Ipratropium bromide 0.5 mg/2ml; nebuliser solution, 2 mL (0.5 mg) nebulised with salbutamol and made up to a total volume of 4mL with sodium chloride 0.9%.

LoE:IVb[19]

AND

- Hydrocortisone IM/slow IV, immediately.
  - Children: 5 mg/kg immediately. See dosing table: Chapter 23.
  - Adults: 200 mg immediately.

LoE:IVb[20]
LoE:IVb[21]

AND

- Promethazine IM/slow IV.
  - Children >2 years: 0.25 mg/kg. See dosing table: Chapter 23.
  - Adults: 25 to 50 mg.

LoE::IVb[22]

REFERRAL

All patients.

Note: Adrenaline (epinephrine) administration may have to be repeated due to its short duration of action. Observe closely during transport.

21.2.11 SEIZURES AND STATUS EPILEPTICUS

G41.0-2/G41.8-9

For description and general measures of seizures, see Section 15.3: Seizures.

DESCRIPTION

This is a medical emergency and has the potential for causing high mortality.

Status epilepticus is a series of seizures following one another lasting >30 minutes with no intervening periods of recovery of consciousness. The seizure may be generalised or partial, convulsive or non-convulsive.

Do not wait for established status epilepticus to terminate convulsions. Convulsions lasting > 5 minutes should be terminated.

GENERAL MEASURES

» Place the patient in a lateral (recovery) position.
» **Do not** place anything (spoon or spatula, etc.) in the patient's mouth.
» Do not try to open the patient's mouth.
» Maintain airway.
» Assist respiration and give high flow oxygen.
» Prepare for intubation if sufficiently skilled in the procedure and relevant rescue devices are available.
» Check blood glucose (exclude hypoglycaemia).
» Monitor vital signs every 15 minutes.
» Establish an IV line.

MEDICINE TREATMENT

Children < 12 years of age

- Midazolam, buccal, 0.5 mg/kg/dose. See dosing table: Chapter 23.
  - Use midazolam for injection 5 mg in 1 mL undiluted.
  - Draw up the required volume in a 5 mL syringe.
  - Remove needle then administer midazolam into the buccal cavity (between gum and cheeks).
  - If seizures persist for >5 minutes, repeat the dose and refer urgently.
  - Note: Buccal midazolam should not be used in infants <6 months of age.

OR *LoE:IIIa*[23]

- Midazolam, IM:
  - Child >13 kg: midazolam, IM, 5 mg, repeat once after 5 to 10 minutes if still fitting.

OR *LoE:IIa*[24]

- Diazepam, rectal, 0.5 mg/kg/dose as a single dose. See dosing table: Chapter 23.
  - Use diazepam for injection 10 mg in 2 mL undiluted.
  - Draw up the required volume in a 2 mL syringe.
  - Remove needle then insert the whole barrel of the lubricated syringe into the rectum and inject the contents.
  - Remove syringe and hold buttocks together to minimise leakage.
  - Maximum dose: 10 mg in 1 hour.
  - May be repeated after 10 minutes if convulsions continue.
  - Expect a response within 1 to 5 minutes.

CAUTION
Benzodiazepines, can cause respiratory depression.
Monitor closely for respiratory depression. If this occurs, assist ventilation with bag-valve mask (1 breath every 3 to 5 seconds) and refer urgently.

If no response after two consecutive doses of either midazolam or diazepam, and if the convulsion has lasted more than 20 minutes:

ADD

- Phenobarbital, oral, crushed and given by nasogastric tube, 20 mg/kg as a single dose. See dosing table: Chapter 23. *LoE: IIIb*[25]

Adults

- Midazolam, IM, 10 mg, immediately.
  - Repeat once after 5 to 10 minutes if still fitting. *LoE: IIb*[26]

OR

- Midazolam, buccal, 10 mg using the parenteral formulation.
  - Repeat once after 5 to 10 minutes if still fitting. *LoE: IVb*

OR

- Diazepam, slow IV, 10 mg.
  - Administer at a rate not exceeding 5mg/minute.
  - Repeat within 5 minutes if needed.
  - Maximum dose: 20 mg within 1 hour.
  - Expect a response within 1 to 5 minutes. *LoE: IIIa*[27]

CAUTION
Benzodiazepines can cause respiratory depression.
Monitor closely for respiratory depression. If this occurs, assist ventilation with bag-valve mask (1 breath every 3 to 5 seconds) and refer urgently.
Avoid diazepam IM since absorption is slow and erratic.
Do not mix diazepam with other medicines in same syringe.

REFERRAL

Urgent
Seizures that cannot be controlled.

Non-urgent
All patients once stabilised.

Note: Clinical notes describing medication administered, time, dose, and route of administration should accompany patients.

21.3 TRAUMA AND INJURIES

21.3.1 BITES AND STINGS

21.3.1.1 ANIMAL BITES

S01.0-9/S11.0-2/S11.7-9/S21.0-2/S21.7-9/S31.0-5/S31.7-8/S41.0-1/S41.7-8/S51.0/S51.7-9/S61.0-1/S61.7-9/S71.0-1/S71.7-8/S81.0/S81.7-9/S91.0-3/S91.7/T01.0-3/T01.6/T01.8-9/T09.1/T11.1/T13.1/T14.0-1/A82.0-1/A82.9/Z24.2/Z20.3 + External Cause Code (W,X,Y,Z)

Note: Rabies and tetanus are notifiable medical conditions.

DESCRIPTION

Animal bites may be caused by:

» Domestic animals e.g. horses, cows, dogs, cats.
» Wild animals e.g. jackals, mongooses (including meerkats), bats.

Animal bites may result in:

» Wound infection, often due to mixed aerobic and anaerobic infection.
» Puncture wounds.
» Tissue necrosis.
» Transmission of diseases, e.g. tetanus, rabies.

NICD hotline for rabies advice: 0828839920

Suspected rabid bite

Any mammal bite can transmit rabies. Rabies incubation period is at least 9–90 days, but could be much longer. In suspected rabies exposure of a person by a domestic animal, attempt to trace the source animal to determine likelihood of rabies. Observe the suspected rabid animal for abnormal behaviour for 10 days. If the animal remains healthy for 10 days, rabies is unlikely.

Note: If the animal has to be put down, care should be taken to preserve the brain, as the brain is required by the state veterinarian for confirmation of diagnosis. The animal must not be killed by shooting it in the head, as this will damage the brain.

PATIENT WITH ANIMAL EXPOSURE			
Severity of exposure	**No direct contact** with animal (for example, being in the presence of a rabid animal or petting an animal)	Direct contact with animal but **no breach of skin, no bleeding** (for example bruising or superficial scratch)	Direct contact with animal with **breach of skin, any amount of bleeding, contact with mucosal membranes** (for example lick on/in eyes or nose)**, contact with broken skin** (for example licks on existing scratches), **any contact with a bat.**
Management based on severity of the exposure	Washing of exposed skin surfaces	Wound management ***AND*** Full course of rabies vaccine (Rabies immunoglobulin, only if severely immuno-compromised)	Wound management ***AND*** Rabies immunoglobulin ***AND*** Full course of rabies vaccine

Table 21.6: Algorithm for rabies post exposure prophylaxis (PEP)

MEDICINE TREATMENT

Wound management:

Wash wound thoroughly with soap under running water for 15 minutes. *LoE: IVb*[28]

- Chlorhexidine 0.05%, aqueous solution.

Apply disinfectant if available:

- Povidone-iodine 10%, solution.

CAUTION

Primary suturing of wounds should be avoided unless for urgent haemostasis.

Clean wound thoroughly, dress (avoid compressive dressings), and review after 48 hours for secondary closure at that time.

The following treatment may be commenced in facilities designated by Provincial/Regional Pharmaceutical Therapeutics Committees. If access to rabies vaccine and/or immunoglobulin is not immediately available refer urgently.

Immunocompromised individuals:

Individuals with documented immunodeficiency, such as symptomatic HIV infection, patients with cancer on chemotherapy/radiotherapy, and patients on long-term corticosteroids dosed at 20 mg/day for ≥2 weeks, should be evaluated on a case-by-case basis and receive a complete course of PEP including RIG and 4 doses of rabies vaccine in all exposures with direct animal contact.

Note: HIV-infected individuals receiving ART who are clinically monitored and well managed are not considered immunocompromised. Such patients have been shown to respond normally to rabies vaccines.

Rabies immunoglobulin (RIG) – doctor prescribed: *LoE: IVb*[29]

» Only indicated for:
  - Direct animal contact with breach of skin/ bleeding/ mucosal contact, immunocompetent patients.
  - Any direct animal contact, immunocompromised patients.
  - All bat exposures.

» Patients who have received PEP or PrEP do not require RIG. Only wound treatment is required.

» Available from the nearest district hospital.

» If not immediately available, source and give as soon as possible.

» When 7 days have lapsed since the initial rabies vaccination, RIG is no longer indicated as the vaccine induced immune response will be effective at that time.

» Infiltrate as much as possible in and around the wound.

» It is **no longer** recommended to inject the remainder of the calculated RIG dose at a site distant to the wound.

» In the case of smaller wounds/areas where it is not possible to infiltrate the entire calculated dose, infiltrate as much as is anatomically feasible in and around the wound site/s without causing compartment syndrome.

» In case of large and multiple wounds, RIG can be diluted with sodium chloride 0.9% solution if necessary to ensure infiltration of all wounds.

» Follow with a complete course of vaccine.

- Human-derived rabies immunoglobulin (HRIG), IM 20 IU/kg (doctor prescribed). Infiltrate as much as possible in and around the wound.

LoE:IVb[30]

OR

- Equine-derived rabies Immunoglobulin (ERIG), IM 40 IU/kg (doctor prescribed). Infiltrate as much as possible in and around the wound.
  - Administer ERIG only in facilities where anaphylaxis or adverse reactions can be managed. (Refer to Section 21.2.10.)

LoE:IVb[31]

Product name	Max. dose	Description	Site of administration	Schedule
HRIG			Infiltrate up to the maximum calculated dose in and around the wound site/s. For smaller wounds where it is not possible to infiltrate all of the calculated dose, infiltrate as much as is anatomically feasible in and around the wound site/s.	On day 0 (when patient presents for first time)/ as soon as possible after exposure to be effective to neutralise virus. When RIG is not available it should be sourced as a matter of urgency. When 7 days have lapsed since initial rabies vaccination, RIG is no longer indicated.
Rabigam®	20 IU/kg	150 IU/mL (supplied in 2 mL vial)		
KamRAB®	20 IU/kg	150 IU/mL (supplied in 2, 5 and 10 mL vials).		
ERIG				
Equirab®	40 IU/kg	200 IU/mL (supplied in 5 mL vial).		

Table 21.7: Summary of regimen for HRIG and ERIG
Source: NICD updated human rabies prophylaxis guideline. www.nicd.ac.za

LoE: IVb[32]

Rabies vaccination – doctor initiated:

» Only indicated for direct animal contact.
» Patients who have previously been fully immunised or who received PEP more than 3 months ago need only two doses: on Day 0 and Day 3.
» Patients who have received previous PEP or PrEP within the previous 3 months do not require vaccination against rabies. Only wound treatment is required.
» Available from the nearest district hospital.

Children

- Rabies vaccine, 1 amp, IM anterolateral thigh (doctor initiated).
  - Day 0 – single dose
  - Day 3 – single dose
  - Day 7 – single dose
  - Between day 14-28 – single dose

Adults

- Rabies vaccine, 1 amp, IM deltoid (doctor initiated).
  - Day 0 – single dose
  - Day 3 – single dose
  - Day 7 – single dose
  - Between day 14-28 – single dose

CAUTION
Do not administer rabies vaccine into buttocks (gluteus maximus).

Tetanus prophylaxis if not previously immunised within the last 5 years:
Z23.5

- Tetanus toxoid vaccine (TT), IM, 0.5 mL.

Note: In a fully immunised person, tetanus toxoid vaccine or tetanus immunoglobulin may produce an unpleasant reaction, e.g. redness, itching, swelling or fever, but in the case of a severe injury the administration is justified.

Antibiotic treatment (only for direct animal contact with broken skin, hand wounds):

Adults and Children >35 kg

- Amoxicillin/clavulanic acid, oral, 875/125 mg 12 hourly for 5 days. A

Children ≤35 kg

- Amoxicillin/clavulanic acid, oral, 15–25 mg/kg/dose of amoxicillin component, 8 hourly for 5 days. A

Weight kg	Dose mg (amoxicillin component)	Use one of the following			Age months/years
		Susp 125/31.5 mg/5 mL	Susp 250/62.5 mg/5 mL	Tablet 500/125 mg/tab	
>3.5–5kg	75 mg	3 mL	1.5 mL	–	>1–3 months
>5–7 kg	100 mg	4 mL	2mL	–	>3–6 months
>7–9 kg	150 mg	6 mL	3 mL	–	>6–12 months
>9–11 kg	200 mg	8 mL	4 mL	–	>12–18 months
>11–14 kg	250 mg	10 mL	5 mL	–	>18 months–3 years
>14–17.5 kg	300 mg	12 mL	6 mL	–	>3–5 years
>17.5–25	375 mg	15 mL	7.5 mL	–	>5–7 years
>25–35 kg	500 mg	20 mL	10 mL	1 tablet	>7–11 years

Severe penicillin allergy:
Z88.0

Adults and Children >35 kg

- Macrolide, e.g.:
- Azithromycin, oral, 500 mg daily for 3 days. W

Children

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg daily for 3 days. W See dosing table: Chapter 23.

AND

Adults

- Metronidazole, oral, 400 mg, 8 hourly for 5 days. A

Children

- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days. A See dosing table: Chapter 23.

PREVENTION

» Regular vaccination of domestic cats and dogs.
» Pre-exposure vaccine may be given to those at risk, e.g. occupation, endemic areas, laboratories.

REFERRAL

» Deep and large wounds requiring suturing.
» Shock and bleeding.
» Possible rabies exposure (for immunoglobulin and vaccination).
» Severe infected wounds or infected wounds not responding to oral antibiotics.
» Hand bites.

21.3.1.2 HUMAN BITES

S01.0-9/S11.0-2/S11.7-9/S21.0-2/S21.7-9/S31.0-5/S31.7-8/S41.0-1/S41.7-8/S51.0/S51.7-9/S61.0-1/S61.7-9/S71.0-1/S71.7-8/S81.0/S81.7-9/S91.0-3/S91.7/T01.0-3/T01.6/T01.8-9/T09.1/T11.1/T13.1/T14.0-1 + External Cause Code (W,X,Y,Z)

DESCRIPTION

Human bites may be accidental or intentional (form of assault).
Human bites may result in:
» Wound infection, often due to mixed aerobic and anaerobic infection.
» Puncture wounds.
» Tissue necrosis.
» Transmission of diseases, e.g. HIV, hepatitis.

MEDICINE TREATMENT

Wound management:

Wash wound thoroughly with soap under running water for 5 to 10 minutes.

- Chlorhexidine 0.05%, aqueous solution.

Apply disinfectant if available:

- Povidone-iodine 10%, solution.

CAUTION

Do not suture bite wounds unless on the head/face. Clean thoroughly, dress (avoid compressive dressings). Review after 48 hours for secondary closure at that time.

Tetanus prophylaxis:

Z23.5

If not previously immunised within the last 5 years:

- Tetanus toxoid (TT), IM, 0.5 mL. *LoE: IIIa*[33]

Antibiotic treatment:

Adults and Children >35 kg

- Amoxicillin/clavulanic acid, oral, 875/125 mg 12 hourly for 5 days. A

Children ≤35 kg

- Amoxicillin/clavulanic acid oral, 15–25 mg/kg/dose of amoxicillin component, 8 hourly for 5 days. A

Weight kg	Dose mg (amoxicillin component)	Use one of the following			Age months/years
		Susp 125/31.5 mg/5 mL	Susp 250/62.5 mg/5 mL	Tablet 500/125 mg/tab	
>3.5–5kg	75 mg	3 mL	1.5 mL	–	>1–3 months
>5–7 kg	100 mg	4 mL	2mL	–	>3–6 months
>7–9 kg	150 mg	6 mL	3 mL	–	>6–12 months
>9–11 kg	200 mg	8 mL	4 mL	–	>12–18 months
>11–14 kg	250 mg	10 mL	5 mL	–	>18 months–3 years
>14–17.5 kg	300 mg	12 mL	6 mL	–	>3–5 years
>17.5–25	375 mg	15 mL	7.5 mL	–	>5–7 years
>25–35 kg	500 mg	20 mL	10 mL	1 tablet	>7–11 years

Severe penicillin allergy:

Z88.0

Adults and Children > 35 kg

- Macrolide, e.g.:

Azithromycin, oral, 500 mg daily for 3 days. W

Children

- Macrolide, e.g.:
- Azithromycin, oral, 10 mg/kg daily for 3 days. W See dosing table: Chapter 23.

AND

Adults

- Metronidazole, oral, 400 mg, 8 hourly for 5 days. A

Children

- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days. A See dosing table: Chapter 23.

Hepatitis B prophylaxis (if bite is severe enough to cause bleeding):

Z29.8

See Section 21.3.6.3: Post exposure prophylaxis, inadvertent (non-occupational).

HIV prophylaxis

The risk of HIV transmission through biting is negligible. Post-exposure prophylaxis is not indicated after a bite. *LoE: IIIb*[34]

REFERRAL

» Deep and large wounds requiring suturing.
» Shock and bleeding.
» Severe infected wounds or infected wounds not responding to oral antibiotics.
» Hand bites.

21.3.1.3 INSECT STINGS, SCORPION STINGS AND SPIDER BITES

T63.2-4 + External Cause Code (V,W,X,Y)

Poisons Information Helpline:0861555777
See Section 21.3.3: Exposure to poisonous substances.

DESCRIPTION

Spider bites and stings by bees, wasps, scorpions and other insects.
Symptoms are usually localised such as pain, redness, swelling and itching.

Bees and wasps

» Venom is usually mild but may provoke severe allergic reactions (see Section 21.2.10: Anaphylaxis).

Spiders and scorpions

» Most are non-venomous or mildly venomous, but some may be extremely venomous resulting in neurotoxicity and constitute a medical emergency.

MEDICINE TREATMENT

Emergency treatment:
Treat anaphylaxis (bee/wasp stings). See Section 21.2.10: Anaphylaxis.

Local symptoms:

- Calamine lotion, apply when needed.

If severe itch:

Children

- Chlorphenamine, oral, 0.1 mg/kg/dose 6 to 8 hourly. See dosing table: Chapter 23.

Adults

- Chlorphenamine, oral, 4 mg, 6–8 hourly.

AND
If there is a wide local response to insect bite with inflamed lesion, see Section 5.10.4: Papular urticaria.

Pain:

Children

- Paracetamol, oral, 10 to 15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults

- Paracetamol, oral, 500 mg to 1 g 4 to 6 hourly when required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

Very painful scorpion stings:

- Lidocaine 2%, 2 mL injected around the bite as a local anaesthetic.

Local application of ice, if tolerated.

Cytotoxic lesions:
Avoid giving prophylactic antibiotics for bites and stings.
If secondary skin infection (site red, swollen, hot, tender, pus may be present), manage as cellulitis. See Section 5.4.3: Cellulitis.

Spider bites and scorpion stings:
Tetanus prophylaxis:
Z23.5

If not immunised within the last 5 years:
- Tetanus toxoid vaccine (TT), IM, 0.5 mL.

LoE:IVb[35]

REFERRAL
» For possible antivenom (neurotoxic spider bites or scorpion stings), if applicable, and intensive care, if necessary.
» Presence of systemic manifestations:
- weakness
- drooping eyelids
- hypersalivation
- sweating
- difficulty in swallowing and speaking
- double vision
- muscle cramps
- paraesthesia
- difficulty in breathing
- agitation/restlessness in children

Note: Send the spider or scorpion with the patient, if available.
» Secondary infection of bite/sting that is not responding to 1st line antibiotics.

For guidance on the identification and clinical management of snake/spider/scorpion bites, contact:
Poisons Information Helpline: 0861 555 777

For procurement of snake/spider/scorpion antivenom, contact:
South African Vaccine Producers (SAVP):
Telephone (011) 386 6062/ 6063/ 6078 (0ffice hours only) or
Email: Benita.mouton@nhls.ac.za
In the rare event that antivenom needs to be released/procured afterhours:
Tel. 071 680 9897

21.3.1.4 SNAKEBITES
T63.0 + (X20.99/W59.99)

DESCRIPTION
Of all the snake species found in South Africa less than 10% are potentially harmful to humans. However, all snakebites should be considered dangerous until proven otherwise. In the majority of snakebite incidents, the offending snake is not identified.
South African poisonous snakes can be broadly divided into 3 groups according to the action of their venom, although there may be overlap of toxic effects from some snake venoms.

1. **Cytotoxic venoms:**
» Venom causes local tissue damage and destruction around the area of bite, including swelling, discolouration of the skin, and blister formation.
» Bite is painful and symptoms usually start within 10 to 30 minutes.
» Examples include: puff adder, Gaboon adder, Mozambique spitting cobra, other smaller adders and spitting cobras, stiletto snake, rinkhals (cytotoxic as well as neurotoxic).
2. **Neurotoxic venoms:**
» Neurotoxic venom causes weakness, ptosis, drooling, dysphagia, pins and needles, sweating, blurred vision, hypotension, paralysis of skeletal muscles and respiratory compromise.
» Bite is not as painful as cytotoxic venom bites.
» Symptoms usually start in 15 to 30 minutes.
» Examples include: black and green mamba, non-spitting cobras (Cape, forest, snouted), berg adder (neurotoxic as well as cytotoxic), rinkhals (cytotoxic as well as neurotoxic).
3. **Haemotoxic venoms:**
» Venom affects the clotting of blood causing bleeding tendency that may present within hours or up to a few days after the bite.
» Examples include: boomslang, vine snake

Symptoms and signs of snakebite envenomation include:

Local
» Bite marks with or without pain.
» Swelling around the bite, which may be severe with discolouration of skin and/or blister formation.
» Bleeding or oozing from bite site.

Note: the absence of bite marks does not exclude envenomation.

Systemic
» Nausea, vomiting.
» Sweating, hypersalivation and hypotension.
» Pins and needles.
» Skeletal muscle weakness (descending paralysis), which may cause:
- drooping eyelids
- double vision
- difficulty in swallowing
- difficulty in breathing

» Shock.
» Rarely bleeding (epistaxis, haematuria, haematemesis or haemoptysis).

CAUTION
Do not apply a tourniquet.
Do not apply a restrictive bandage to the head, neck or trunk.
Do not squeeze or incise the wound.
Do not attempt to suck the venom out.

GENERAL MEASURES

» Remove clothing from site of the bite and jewellery e.g. rings if an extremity bite.
» Clean the wound thoroughly with chlorhexidine 0.05%, aqueous solution.
» Immobilise the affected limb with a splint or sling.
» Be prepared to support ventilation in neurotoxic bites as this can be life-saving.
» For neurotoxic bites only:
  - Immediately apply a wide crepe bandage firmly from just below the bite site up to 10 to 15 cm proximal to the bite site. Apply no tighter than for a sprained ankle.
» Obtain an accurate history e.g. time of the bite, type of snake.
» If the snake is unidentified, observe for 24 hours with repeated examinations. Absence of symptoms and signs for 6–8 hours usually indicates a harmless bite.

MEDICINE TREATMENT

Venom in the eyes:

S05.9 + (X20.99)

Irrigate the eye thoroughly for 15 to 20 minutes with water or sodium chloride, 0.9%.

- Local anaesthetic ophthalmic drops, e.g.:
- Tetracaine 1%, drops (if available), instil 1 drop into the affected eye(s) before irrigation. *LoE:IIIb*[36]

Refer the patient.

Pain:

- Non-opioid analgesics according to severity. See Section 20.3: Chronic non-cancer pain.

Note: The use of NSAIDs is not recommended due to the antiplatelet effect and the potential danger of renal failure in a hypotensive patient. *LoE:IVb*[37]

Shock:

Treat if present. See Section 21.2.9: Shock.

Tetanus prophylaxis:

Z23.5

If not previously immunised within the last 5 years:

- Tetanus toxoid (TT), IM, 0.5 mL.

Note:

» **The majority of patients do not need and should not be given antivenom.**
» Adverse reactions to antivenom (including anaphylaxis) are common and may be severe.
» The dose of antivenom is the same for adults and children.
» Polyvalent antivenom does NOT include antivenom for berg adders or stiletto snakes. Management for these snakebites is symptomatic and supportive only.
» Antibiotics are seldom needed, except for secondary infection.

LoE:IVb[38]

Criteria for antivenom administration

» Signs of neurotoxicity.
» Positively identified puff adder, Gaboon adder, Mozambique spitting cobra or rinkhals bites AND evidence of severe progressive cytotoxicity.
» Unidentified snakebites and evidence of severe progressive cytotoxicity envenomation, i.e.:
  - swelling of whole hand or foot within 1 hour,
  - swelling to the knee or elbow in <6 hours,
  - swelling of the whole limb in <12 hours,
  - swelling progression >2.5 cm per hour,
  - a threatened airway due to swelling,
  - evidence of complication, e.g. compartment syndrome.

LoE:IVb[39]

REFERRAL

» All patients with bites or likely bites even if puncture marks are not seen. If possible, take the dead snake to the referral centre for identification. Referral centre will determine if antivenom is indicated.
» If patient presents at the clinic with their own antivenom, contact the secondary level hospital for advice (antivenom should be given as soon as possible, however administration may be considered even as late as 48 to 72 hours after the bite, if there is continued clinical deterioration indicating ongoing venom activity).

For guidance on the identification and clinical management of snake/spider/scorpion bites, contact:
Poisons Information Helpline: 0861 555 777

For procurement of snake/spider/scorpion antivenom, contact:
South African Vaccine Producers (SAVP):
Telephone (011) 386 6062/ 6063/ 6078 (0ffice hours only) or
Email: Benita.mouton@nhls.ac.za
In the rare event that antivenom needs to be released/procured afterhours:
Tel. 071 680 9897

21.3.2 BURNS

T30.0-3/T31.0-9 + (Y34.99)

DESCRIPTION

Burns lead to skin and soft tissue injury and may be caused by:

» heat, e.g. open flame, hot liquids, hot steam,
» chemical compounds,
» physical agents, e.g. electrical/lightning) or
» radiation.

The extent and depth may vary from superficial (epidermis) to full-thickness burns of the skin and underlying tissues.
Initially, burns are usually sterile.

Depth of burn wound	Surface /colour	Pain sensation/healing
Superficial or epidermal	Dry, minor blisters, erythema	» Painful » Heals within 7 days
Partial thickness superficial or superficial dermal	Blisters, moist	» Painful » Heals within 10 to 14 days
Partial thickness deep or deep dermal	Moist white or yellow slough, red mottled	» Less painful » Heals within a month or more » Generally needs surgical debridement and skin graft
Full thickness (complete loss of skin)	Dry, charred whitish, brown or black	» Painless, firm to touch » Healing by contraction of the margins » Generally needs surgical debridement and skin graft

Table 21.8: Assessment of burns

EMERGENCY TREATMENT

Follow the 7C's:

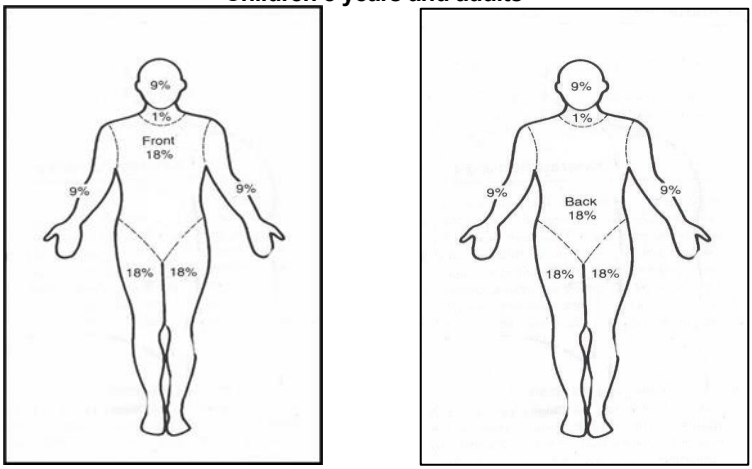
» Clothing: remove non-sticking clothing especially if hot or smouldering or constrictive (e.g. rings).
» Cool: with tap water for 30 minutes.
» Clean: with chlorhexidine.
» Cover: with a non-adherent dressing.
» Comfort: provide pain relief.
» Carbon dioxide poisoning: consider if enclosed fire, decreased LOC, disorientation.
» Consider inhalation injury if: carbonaceous (black-coloured) sputum, shortness of breath, perioral burns, hoarse voice, stridor. Discuss with referral centre as early intubation may be needed.

Child and adult percentages					
Age years	**Head + neck Front + back**	**Torso Front**	**Torso Back**	**Leg + foot Front + back**	**Arm+ hand Front+ back**
<1	18%	18%	18%	14%	9%
1-<2	17%	18%	18%	14.5%	9%
2-<3	16%	18%	18%	15%	9%
3-<4	15%	18%	18%	15.5%	9%
4-<5	14%	18%	18%	16%	9%
5-<6	13%	18%	18%	16.5%	9%
6-<7	12%	18%	18%	17%	9%
7-<8	11%	18%	18%	17.5%	9%
≥ 8	10%	18%	18%	18%	9%

Table 21.9: Estimated body surface area (BSA) percentages

The figures below are used to calculate body surface area %*.
These diagrams indicate percentages for the whole leg/arm/head (and neck in adults) not just the front or back.
In children the palm of the hand, including the fingers, is 1%.

Children 8 years and adults



Children < 8 years of age

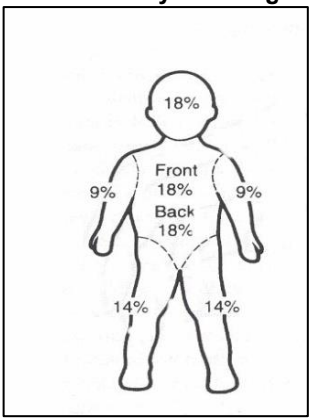


Figure 21.6: Calculating body surface area for management of burns
* Source: Karpelowsky JS, Wallis L, Madaree A, Rode H; South African Burn Society..South African Burn Society burn stabilisation protocol. S Afr Med J. 2007. Aug;97(8):574-7. https://www.ncbi.nlm.nih.gov/pubmed/17966146

MEDICINE TREATMENT

Fluid replacement

Burns ≤ 10% Total Body Surface Area (TBSA):
Oral fluids.

Burns > 10% of TBSA:

- IV fluid for resuscitation, replacement, and maintenance.

Note: IV fluid replacement is very important in large burns. However, if unable to obtain IV access, give fluids orally or via NGT and transfer urgently.

Calculation of fluid replacement

Fluids in adults:

If shocked, see Section 21.2.9: Shock.
First 24 hours:

- Sodium chloride 0.9%, IV.
  - Calculate total fluid requirement in 24 hours:
    Total % burn x weight (kg) x 4 mL.
  - Give half this volume in the first 8 hours.
  - Administer remaining fluid volume in next 16 hours.

Note: If urine output is not adequate, increase fluids for the next hour by 50%. Continue at a higher rate until urine output is adequate, then resume normal calculated rate.

Fluids in children:

Note: Avoid circumferential taping when securing infusion lines, as oedema under the eschar may decrease the venous return.

» **First 8 hours of fluid replacement in children**

Weight **kg**	Fluid volume (mL per hour) for the 1st 8 hours in burns of > 10% in PHC clinics while awaiting transfer: • **0.9% Sodium chloride with 100 mL of 50% dextrose added to each litre or 10 mL of 50% dextrose added to each 100 mL.**			
	Burns percentage of total body area			
	10–20%	>20–30%	>30–40%	>40%
>2–2.5 kg	15	19	23	28
>2.5–3.5 kg	20	25	31	36
>3.5–5 kg	28	36	44	51
>5–7 kg	40	50	62	73
>7–9 kg	53	70	84	100
>9–11 kg	67	85	105	120
>11–14 kg	82	105	125	150
>14–17.5 kg	95	125	155	185
>17.5–25 kg	115	155	190	235
>25–35 kg	147	200	250	310

» **Next 16 hours of fluid replacement in chidlren**				
Weight **kg**	Fluid volume (mL per hour) for the next 16 hours in burns of > 10% in PHC clinics if transfer has not been accomplished in the 1st 8 hours: • **0.9% Sodium chloride with 100 mL of 50% dextrose added to each litre or 10 mL of 50% dextrose added to each 100 mL.**			
	Burns percentage of total body area			
	10–20%	>20–30%	>30–40%	>40%
>2–2.5 kg	12	14	17	19
>2.5–3.5 kg	16	19	22	25
>3.5–5 kg	23	27	31	35
>5–7 kg	33	38	44	49
>7–9 kg	43	50	58	65
>9–11 kg	54	64	72	82
>11–14 kg	64	76	86	97
>14–17.5 kg	75	91	104	118
>17.5–25 kg	91	110	129	148
>25–35 kg	110	138	165	190

Table 21.10: Replacement fluids for burns >10% BSA in children

Pain:

Children

- Paracetamol, oral, 10 to 15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults

- Paracetamol, oral, 500 mg to 1 g 4 to 6 hourly when required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

Severe pain:

See Section 20.3: Chronic non-cancer pain.

Wound cleansing:

Clean the burn wound gently.
Sodium chloride 0.9% or clean water.

Burn dressing:

Keep the wound clean and dress with sterile dressings.

For patients requiring referral

» If within 12 hours, transfer patient wrapped in clean dry sheet and blankets.
» If delayed by >12 hours, paraffin gauze dressing and dry gauze on top.
» For full thickness and extensive burns cover with a paraffin gauze occlusive dressing. Cover the dressing with plastic wrap (e.g. cling film). *LoE:IVb*

For patients not requiring transfer (burns that can be treated at home)

» Paraffin gauze dressing.

If infected burn

- Povidone-iodine 5%, cream, applied daily. *LoE:IIIb*[40]

Tetanus prophylaxis:

Z23.5

If not vaccinated within the last 5 years

- Tetanus toxoid (TT), IM, 0.5 mL.

See Section 21.3.1.1: Animal bites or 21.3.1.2: Human bites, for detailed indications and management principles.

REFERRAL

» All children <1 year of age.
» All burns >5% in children 1–2 years of age.
» Full thickness burns of any size in any age group.
» Partial thickness burns >10% TBSA.
» Burns of special areas – face, hands, feet, genitalia, perineum and major joints.
» Electrical burns, including lightning injury.
» Severe chemical burns.
» Inhalation injury – fire or scald injury.
» Circumferential burns of the limbs or chest.
» Burn injury in a patient with pre-existing medical disorders which could complicate management, prolong recovery or affect mortality.
» Any patient with burns and concomitant trauma.
» Suspected child abuse.
» Burns exceeding the capabilities of the referring centre.
» Septic burn wounds.
» Consider rehabilitation services for reducing the risk of contractures and disfigurement.

21.3.3 EXPOSURE TO POISONOUS SUBSTANCES

T36.0-9/T37.0-5/T37.8-9/T38.0-9/T39.0-4/T39.8-9/T40.0-9/T41-0-5/T42.0-8/T43.0-6/T43.8-9/T45.0-9/T46.0-9/T47.0-9/T48-0-7/T49.0-9/T50.0-9/T51.0-3/T51.8-9/T52.0-4/T52.8-9/T53.0-9/T54.0-3/T54.9/T55/T56.0-9/T57.0-3/T57.8-9/T58/T59.0-9/T60.0-4/T60.8-9/T65.0-6/T65.8-9+ (X44.99/X49.99/X64.99/X69.99/Y14.99/Y19.99) 4.0-

Note: Poisoning from all pesticides (i.e. agricultural stock remedies) is a notifiable medical condition. Please visit www.nicd.ac.za for further information.

POISON INFORMATION CENTRES		
Poisons Information Helpline (national service)	24 hours/day	0861 555 777
Red Cross War Memorial Children's Hospital Poisons Information Centre Email: poisonsinformation@uct.ac.za http://www.paediatrics.uct.ac.za/poisons-information-centre		
Tygerberg Poisons Information Centre Email: toxicology@sun.ac.za www.sun.ac.za/poisoncentre		
University of the Free State Poison Control and Medicine Information Centre	24 hours/day	082 491 0160
Telephone numbers tested June 2025		

Table 21.11: Poison information centre(s)

The Afritox database is available free of charge to public hospitals in South Africa: see www.afritox.co.za for information on how to access the database. If the above centres cannot be contacted, enquire at the nearest trauma and emergency unit.

DESCRIPTION

Acute poisoning is a common medical emergency. Poisoning may occur by ingestion, inhalation, or absorption through skin or mucus membranes. Frequently encountered poisons include:

» analgesics
» anti-epileptic agents
» antidepressants and sedatives
» anti-infectives
» vitamins and minerals, especially iron in children
» pesticides
» volatile hydrocarbons, e.g. paraffin
» household cleaning agents
» antihypertensive and anti-diabetic agents

Signs and symptoms vary according to the nature of poisoning.

GENERAL MEASURES

» Establish and maintain the airway.
» Ensure adequate ventilation and oxygenation.
» Treat shock. See Section 21.1: Cardiac arrest.
» Take an accurate history.
» Obtain collateral information, especially in patients with impaired consciousness.
» A special effort should be made to obtain tablets, packets, containers, etc. to identify poisons involved.
» Document, and respond to, abnormalities of:
  - pulse rate
  - blood pressure
  - respiratory rate
  - level of consciousness
  - pupillary size and reaction
  - oxygenation

Remove the patient from the source of poison:

» *Topical exposure*:
  - If skin contact has occurred, especially pesticides, wash the skin with soap and water, ensuring carer has protective measures, e.g., gloves, gowns, masks, etc.
  - Remove contaminated clothes in organophosphate poisoning.
» Remove eye contaminants, especially alkalis, acids, and other irritants, by continuous irrigation of the eye with sterile water or normal saline for 15 to 20 minutes. Analgesic eye drops may be required to perform this adequately.
» *Inhalation of poisonous gases*: move the patient to fresh air.

Contact the Poisons Information Helpline or nearest hospital for advice.

MEDICINE TREATMENT

Ingested poisons

- Activated charcoal.
  - Administer only when the airway is protected (i.e. patient is fully awake and cooperative, or intubated with a depressed level of consciousness).
  - Administer within 1 hour of ingestion of toxin, unless poison is a substance that delays gastric emptying.

Charcoal may be useful if these poisons are taken in toxic dose	Poisons where charcoal is ineffective and should not be given
» carbamazepine, barbiturates, phenytoin » dapsone, quinine » theophylline » salicylates » mushroom poisoning (Amanita phalloides) » slow release preparations » digoxin » beta-blockers » NSAIDs	» ethanol, methanol, ethylene glycol » brake fluid » petroleum products (e.g. petrol or paraffin) » iron salts » lead, mercury, arsenic » lithium » strong acids or alkalis » other corrosive agents (e.g. household detergents)

LoE:IIIb[41]

Table 21.12: Activated charcoal for poisoning(s)

Children:

Activated charcoal, oral, 1 g/kg mixed as a slurry with water. See dosing table: Chapter 23.

Adults:

- Activated charcoal, oral, 50 g (36 level medicine measures) diluted in 100 mL water.
  - When mixing, add a small amount of water to charcoal in a container.
  - Cap and shake container to make a slurry and then dilute further.

Specific poisons and antidotes:

Carbon monoxide poisoning

T58 + (X49.99/X69.99/Y19.99)

For hypoxia:

- Oxygen, 100% by non-rebreather mask.

Organophosphate and carbamate poisoning

T60.0 + (X48.99/X68.99/Y18.99)

» **Note**: Healthcare workers should wear personal protective equipment and all caregivers should avoid having skin contact with the poison or the patient's bodily fluids e.g. vomitus, faeces. If staff come into contact with body fluids, wash off immediately.

» Decontamination procedures for the patient should only be done once the patient is fully resuscitated. Remove patient's clothes and wash the body with soap and water. Place clothes in bags and seal.

» Signs and symptoms of poisoning include:
  - diarrhoea and vomiting
  - hypotension
  - bradycardia
  - muscle twitching
  - coma
  - hypersecretions (hypersalivation, sweating, lacrimation, rhinorrhoea)
  - weakness
  - pinpoint pupils
  - confusion
  - convulsions

» bronchospasm and bronchorrhoea

» Protect airway if GCS <8.

» Suction secretions frequently.

» Intubate and ventilate if hypoxia, hypercarbia, or decreased respiratory effort.

» Start atropine antidote immediately.

For bronchorrhoea, bronchospasm or bradycardia:
Children:

- Atropine bolus, IV,0.05 mg/kg/dose. See dosing table: Chapter 23. *LoE:IVb*[42]

Adults:

- Atropine bolus, IV, 2 mg.

LoE:IIIa[43]

In both adults and children:

- Reassess after 3 to 5 minutes for evidence of atropinisation as indicated by reduced bronchial secretions, improvement of oxygenation, and decreased oxygen requirements.
- Give repeated atropine boluses incrementally doubling the dose until adequate clinical response achieved, e.g. 2 mg, 4 mg, 8 mg, 16 mg etc.
  - If no clinical response, give double the dose.
  - If some response, give the same or reduced dose.
- Continue to reassess frequently as additional doses may be required.

Note: Refer all patients urgently but only when stable.

Poisoning from all pesticides (i.e. agricultural stock remedies) is a notifiable medical condition. Please visit www.nicd.ac.za for further information.

Opioid overdose

T40.0-9 + (X42.99/X62.99/Y12.99)

» Respiratory support is the mainstay of treatment. Give naloxone for severe poisoning only (i.e. patients requiring ventilatory support) or as a single test dose for uncertain diagnosis.
» If respiration adequate, observe the patient in a monitored setting and reassess frequently.
» If patient is apnoeic or has slow/shallow respirations, assist ventilation with bag-valve mask attached to supplemental oxygen, whilst administering naloxone as described below. If GCS< 8, protect airway and consider intubation if persistent respiratory depression.

- Naloxone, IV (preferable) or IM

	Initial dose (IV/IM)	**Repeat dose:** Reassess every 2 minutes. If breathing still inadequate, give further naloxone every 2 to 3 minutes.
Children	• 0.1 mg/kg immediately	*LoE:IIIb*[44] Repeat 0.1 mg/kg (maximum 2 mg/dose), up to total dose of 10 mg.
Adults	• 0.4 mg immediately	Double the dose each time (e.g.: 0.8 mg, 2 mg, 4 mg), up to total dose of 10 mg. *LoE:IVb*[45]

- Naloxone has a short duration of action (45 minutes) - continue to monitor closely as further doses of naloxone may be needed while awaiting and during transport.
- In patients addicted to opioids, naloxone may precipitate an acute withdrawal syndrome after several hours. This must not prevent the use of naloxone.
- Refer all patients.

Paracetamol poisoning

T39.1 + (X40.99/X60.99/Y10.99)

All symptomatic patients or those with a history of significant single ingestion (≥200 mg/kg or 10 g, whichever is less) should be referred urgently for paracetamol blood level (taken at least 4 hours post-ingestion) and consideration of N-acetylcysteine.

Where referral is delayed:

- N-acetylcysteine, oral, 140 mg/kg immediately. *LoE:IIIb*[46]
  - Followed by 70 mg/kg 4 hourly, for seventeen doses.

Note: *LoE:IIIb*[47]

» Avoid giving oral N-acetylcysteine together with activated charcoal, as systemic absorption and effect of N-acetylcysteine is reduced.

» Anaphylactoid reactions to N-acetylcysteine do occur and the loading dose should preferably be administered in a monitored area. *LoE:IIIb*[48]

Toxic alcohols (ethylene glycol and methanol poisoning)

» Refer all cases.

» See Adult Hospital Level STG and EML Section 19.17.2: Ethylene glycol poisoning.

REFERRAL

» All intentional overdoses.

» All symptomatic patients.

» All children in whom toxicity can be expected, e.g. ingestion with:

- paracetamol ≥200 mg/kg or 10 g (whichever is less), *LoE:IVb*[49]
- anti-epileptics,
- warfarin,
- anticholinergics,
- antihypertensives,
- tricyclic antidepressants,
- sulphonylureas (antidiabetic agents),
- paraffin (unless patient has a normal respiratory rate after 6 hours),
- iron tablets,
- pesticides.

If in doubt, consult the referral hospital or Poisons Information Helpline.

Note: Send the following to hospital with the patient:

» detailed referral letter with all appropriate clinical details. Ensure to include time of ingestion and treatment received.

» a sample of the poison or the empty poison container

21.3.4 EYE, CHEMICAL BURNS

(See Chapter 18: Eye conditions.)

21.3.5 EYE INJURY, FOREIGN BODY

(See Chapter 18: Eye conditions.)

21.3.6 POST EXPOSURE PROPHYLAXIS

21.3.6.1 POST EXPOSURE PROPHYLAXIS, OCCUPATIONAL

Z20.6 + Z20.5 + (Z57.8+X58.92+Z29.8)

DESCRIPTION

Post exposure prophylaxis may prevent the risk of acquiring HIV and hepatitis B following a significant occupational exposure to infectious material from a patient (includes blood, CSF, semen, vaginal secretions and synovial/pleural/ pericardial/ peritoneal/ amniotic fluid).

The risk of acquiring HIV following occupational exposure is estimated at 0.3%.

There is a higher risk when:

» the injury is deep or,
» involves a hollow needle, or
» if the source patient is more infectious, e.g.: WHO stage 4 defining illness or known to have a high HIV viral load, i.e. >100 000 copies/mL, seroconversion illness.

GENERAL MEASURES

» Where the source patient is on ARVs or has been on ARVs, initiate prophylaxis and seek expert opinion. An extra blood sample (unclotted, EDTA) of the source patient should be stored in case of need for further resistance testing.
» Other blood borne infections that can be transmitted include hepatitis C and syphilis. Test all source patients (see monitoring table).
» Offer comprehensive and confidential pre-test HIV counselling.
» Advise HCW about the need to take precautions, e.g. condom use (for 4 months), to prevent HIV and HBV transmission to sexual partners.
» Document occupational exposures adequately for possible subsequent compensation.

INVESTIGATIONS

LoE:IVb[50]

	Source patient	Exposed health care worker			
	Baseline	Baseline	2 weeks	6 weeks	4 months
HIV	Rapid test PLUS ELISA	Rapid test PLUS ELISA		ELISA	ELISA
Hepatitis B	Surface antigen	Surface antibody**			Surface antigen and surface antibody**
Hepatitis C	HCV antibody	HCV antibody*		HCV PCR*	
Syphilis	RPR/ TP antibody	RPR/TP antibody*			RPR/TP antibody*
Creatinine		If TDF part of PEP	If TDF part of PEP		
FBC		If AZT part of PEP	If AZT part of PEP		

*Only if source patient was positive (in the case of syphilis, source patient must be RPR positive)
**Only if source patient was positive AND health care worker unvaccinated or HBsAb <10 units/mL
Table 21.13: Investigations and monitoring in occupational exposures

MEDICINE TREATMENT

1. Prevent HIV:

Z20.6 + (Z57.8+X58.92+Z29.8)

» Initiate HIV PEP immediately after the injury - within 72 hours. Do not wait for the confirmatory test results on the source patient and health care worker.
» If higher risk exposure (defined above) consider initiation of treatment beyond 72 hours, as the risks of prophylaxis in this setting may outweigh the benefits. Avoid initiating PEP beyond 7 days after exposure.

Note: HIV PEP is **not** indicated if:
» HCW exposed to body fluids which carry no risk of infection, e.g. vomitus, urine, faeces or saliva.
» HCW is HIV-infected. Stop PEP if HIV test of the health care worker is positive at the time of the injury.
» The source is HIV sero-negative unless there are features suggesting sero-conversion illness.
» Continue prophylaxis until the results of additional tests are available.
- These cases should be discussed with virologists.

Exposure	HIV Status of source patient	
	Negative	Unknown or Positive
Intact skin	no PEP	no PEP
Mucosal splash or non-intact skin or percutaneous injury	no PEP	PEP: • TDF+3TC+DTG **OR** • 3-drug regimen

Table 21.14: PEP for healthcare worker following occupational HIV exposure.

When PEP is indicated (administered preferably as a fixed-dose combination):
- Tenofovir (TDF), oral, 300 mg daily for 4 weeks (provided baseline eGFR is >50 mL/minute).

AND
- Lamivudine (3TC), oral, 300 mg daily for 4 weeks.

AND
- Dolutegravir (DTG), oral 50 mg once daily for 4 weeks. *LoE:IIIa*[51]

If DTG is not tolerated:
- Tenofovir (TDF), oral, 300 mg daily for 4 weeks (provided baseline eGFR is >50 mL/minute).

AND
- Emtricitabine (FTC), oral, 200 mg daily for 4 weeks.

AND *LoE:IIIb*[52]
- Atazanavir/ritonavir 300/100 mg daily for 4 weeks.

OR
- Lopinavir/ritonavir (LPV/r) 200/50 mg, oral, 2 tablets 12 hourly for 4 weeks.

If tenofovir is contraindicated or if source patient is known to be on a failing tenofovir based regimen, replace tenofovir and emtricitabine with:

- Zidovudine (AZT), oral, 300 mg 12 hourly for 4 weeks.

AND

- Lamivudine (3TC), oral, 150 mg 12 hourly for 4 weeks.

Note: Adverse effects of PEP:

» PEP is generally not well tolerated. Adverse effects occur in about half of cases and therapy is discontinued in about a third. Efavirenz is not recommended as it is very poorly tolerated in PEP.

» TDF is contra-indicated in renal disease or with concomitant use of nephrotoxic medicines, e.g. aminoglycosides (check baseline creatinine clearance). Where TDF is contraindicated, switch to AZT. If AZT is not tolerated, consult or refer for further management.

» Zidovudine often causes nausea and headache and so should only be given if TDF is contraindicated.

» If dolutegravir is not tolerated, give ATV/r as the first choice protease inhibitor as LPV/r frequently causes gastrointestinal side effects. ATV/r may commonly cause jaundice (i.e. unconjugated hyperbilirubinaemia without hepatitis) which is harmless.

» If the source patient is known to be on a failing ART regimen, modification of the PEP regimen may be required. Consultation with a virologist or infectious diseases physician is recommended for advice on which antiretroviral medicines to use for PEP

» If the patient is on AZT or stavudine then TDF should be used.

» Patients on a failing second line ART regimen almost always have no resistance to protease inhibitors, so ATV/r or LPV/r should still be effective.

2. Prevent hepatitis B

Decide on what treatment to give the exposed person according to the vaccination status (and antibody response) of the exposed person, as well as the HBsAg results of the source patient, if known.

LoE:IVb[53]

LoE:IVb[54]

PEP following hepatitis B exposure:

Z20.5 + (Z57.8+X58.92+Z29.8)

Vaccination status and antibody response status of HCW	Source patient status & treatment		
	HBsAg positive	**HBsAg negative**	**HBsAg unknown**
Unvaccinated **OR** vaccination incomplete	• HBIG, IM, 500 units* • Hep B vaccine (3 doses at monthly intervals)	• Initiate Hep B vaccination (month 0, 1 and 6)	• HBIG, IM, 500 units* • Hep B vaccine (3 doses at monthly intervals)
Vaccinated **AND** HBsAb ≥10 units/mL#	No treatment	No treatment	No treatment
Vaccinated **AND** HBsAb <10 units/mL	• HBIG, IM, 500 units* • Repeat Hep B vaccine (3 doses at monthly intervals)	• Initiate Hep B vaccination (month 0, 1 and 6)	• HBIG, IM, 500 units* • Repeat Hep B vaccine (3 doses at monthly intervals)

Table 21.15: PEP for healthcare workers following hepatitis B exposure
* HBIG and first dose of vaccine to be given simultaneously, but at different sites.
# If the delay in obtaining HBsAb results is more than 7 days initiate treatment as for vaccinated AND HBsAb <10 units/mL.
After vaccination ensure the health care worker has a HBsAb ≥10 units/mL 1 to 2 months after the last vaccine dose.

REFERRAL

Note: Refer if there are inadequate resources with regard to:
» counselling,
» laboratory for testing,
» medico-legal examination,
» medicine treatment.

21.3.6.2 POST EXPOSURE PROPHYLAXIS, RAPE AND SEXUAL ASSAULT

Z29.8 + Z20.5 + Z20.2 + Z20.6

DESCRIPTION

Sexual offences are of grave concern and in particular to the most vulnerable persons including women, children and disabled persons. Sexual offences are physically and psychologically damaging to victims.
The definitions of sexual offences are within the Criminal Law (Sexual Offences and Related Matters) Amendment Act, No 32 of 2007. The ability to consent to a sexual act depends on the competence of the person to give consent and be knowledgeable of the consequences of that act - including the risk of contracting sexually transmitted diseases such as HIV.

GENERAL MEASURES

» Sexual offence victims must be regarded as emergencies but do not displace life-threatening management of other cases.
» Ensure appropriate management is in place for every case. So called “cold cases” (>72 hours after the incident) may be managed medically and given an appointment for medico-legal investigation.
» If the victim wants to open a case, the Family Violence, Child Protection and Sexual Offences Unit (FCS) must be phoned and requested to come to the hospital.
» Cases must be opened in all cases of suspected or alleged rape/sexual abuse in children.

Offer 1st dose of antiretroviral PEP in all cases of suspected rape - the following matters can be resolved in due course:

HIV test
» Determine the patient’s HIV status before initiating PEP.
  - Prophylaxis given to a previously infected HIV person will have no clinical benefit and may lead to the development of viral resistance. Provide counselling and manage accordingly.
» Obtain informed consent from the patient and written consent from the parent in case of minors before HIV testing and giving the full course of treatment.
» Consent for HIV testing in children can be given by:

  - Children who are competent to give consent and are:
    (i) ≥ 12 years of age; or
    (ii) < 12 years of age and of sufficient maturity to understand the benefits, risks and social implications of such a test.
» Parents or caregivers of children who are not competent to sign consent (but the child should have this explained to them so they understand what is happening, appropriate to their age and development).
  - The clinical head of the institution, where a competent person is not available to give consent for HIV testing and PEP (alleged rape in children is a medical emergency).
» Opting for immediate HIV testing remains the patient's choice.
» If the patient declines, give a 3–day starter pack of PEP and encourage the patient to reconsider testing within those 3 days.
  - **No further PEP should be given in the case of continued refusal of HIV testing in adults, in children where the parent unreasonably refuses PEP this may be taken further.**
  - If in doubt about the indications for HIV PEP, give PEP.
» A patient presenting after 72 hours since the alleged incident should not be given PEP, but should be counselled about the possible risk of transmission.
  - HIV testing should still be offered at the time of presentation and 4 months later.
» If the HIV Elisa/Rapid test is positive in sexually abused children <18 months of age, perform HIV PCR to confirm if HIV infection is truly present.
» If HIV-uninfected or if the child has no access to immediate HIV PCR results, they should receive prophylaxis (until the HIV PCR result is obtained).

Pregnancy test

» Perform a pregnancy test in adult and pubertal girls to exclude pregnancy before initiating post exposure contraception and STI prophylaxis.
  - Pregnant rape patients should be referred.

Initial counselling

Counsel all victims of sexual offences and their caregivers in the case of children

» Explain the side effects of ARVs, e.g. tiredness, nausea and flu-like symptoms.
» Use condoms for 4 months.
» Avoid blood or tissue donation for 6 months.
» Emphasise the importance of compliance with ARV PEP.
» Provide psychosocial support pertaining to:
  - Restoring control of the victim by avoiding secondary traumatisation, and give choices and participation in treatment decisions.
  - Medical risks, e.g. transmission of sexually transmitted infections including HIV, syphilis, hepatitis B and C.
  - Risk of pregnancy.
  - Psycho-emotional-social effects of the sexual assault according to their level of understanding and maturity.

Follow-up support

» Discuss issues relating to stress management at subsequent visits.

» Inform the patient of the signs and symptoms of post-traumatic stress syndrome (PTSD), that may eventually cause exhaustion and illness. These include:
  - general irritability
  - trembling
  - pain in neck and/or lower back
  - change in appetite
  - change in sleep pattern

Medico-legal assessment of injuries

» Complete appropriate required forms and registers.

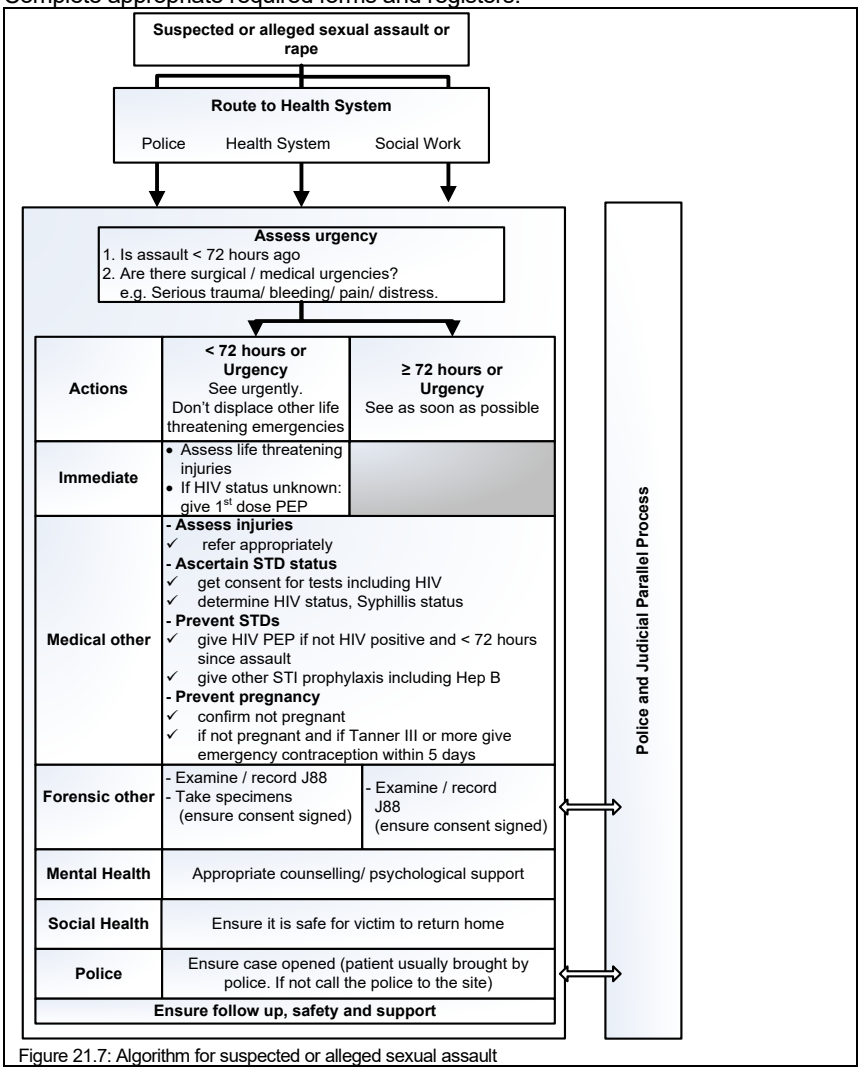


Figure 21.7: Algorithm for suspected or alleged sexual assault

INVESTIGATIONS

» Voluntary rapid HIV testing should be made available and should be done on all opting for PEP.
» Further baseline and follow-up investigations are the same as for occupational HIV exposure, with the addition of pregnancy testing in all women and female adolescents prior to post exposure contraception. See Section 21.3.6.1: Post-exposure prophylaxis, occupational.

MEDICINE TREATMENT

Prevent the following:
1. HIV – PEP.
2. HIV – PrEP.
3. Hepatitis B.
4. Pregnancy.
5. STIs.

Note:
» Obtain consent for HIV testing from all patients before initiating PEP.
» Offer PEP if the patient presents within 72 hours of being raped and is HIV-uninfected or HIV status is unknown.
» Initiate therapy as early as possible after the exposure to maximize the chance of effective prophylaxis.
» It is important to manage the medical condition before medico-legal examination. Most of these will require referral.
» If, for practical reasons, a person cannot return for the 3-day follow up, a 28-day course of ART should be provided.

1. HIV PEP

» Therapy may be given up to 72 hours after exposure.
» In children <18 months of age: initiate antiretroviral PEP while awaiting transfer and HIV PCR results.

Children <10 years and <30kg

- Zidovudine (AZT), oral, 12 hourly for 28 days.
  - Paediatric dose: 180 to 240 mg/m2. See Chapter 23: Standard Paediatric dosing tables.
  - Maximum: 300 mg/dose.

AND

- Lamivudine (3TC), oral, 4 mg/kg 12 hourly or 8 mg/kg daily for 28 days.
  - Maximum: 150 mg/dose if given 12 hourly or 300 mg/dose if given daily. See Chapter 23: Standard Paediatric dosing tables.

AND

- Dolutegravir (DTG), oral, for 28 days.
  - For dosing guidance, see Chapter 23: Standard Paediatric dosing tables.

Dosages may vary by±1 mg/kg/dose, to allow a convenient volume of medication.
Use the adult dosage regimen if children require more than the maximum dose.
Follow-up visits should be at 2 weeks, 6 weeks, and 4 months after the rape.

Adults and children ≥10 years and ≥30 kg

Management for HIV prevention is the same as for occupational HIV exposure. See Section 21.3.6.1 Post-exposure prophylaxis, occupational. *LoE:IVb*[55]

2. HIV PrEP (see Section 11.11: Pre-exposure prophylaxis (PrEP))

If patient is at ongoing high risk of HIV acquisition, commence PrEP after PEP has been completed.

Perfom HIV test 4-weeks after initiating PrEP.

3. Hepatitis B prevention

Management for Hepatitis B prevention is the same as for occupational hepatitis B exposure. See Section 21.3.6.1: Post-exposure prophylaxis, occupational.

4. Emergency contraception (after pregnancy is excluded)

Do a pregnancy test in all women and female adolescents.

Children must be tested and given emergency contraception from Breast Tanner Stage III. If unsure of staging, give emergency contraception when you detect any breast development (DO NOT REGARD MENARCHE AS AN INDICATION). Refer all pregnant rape victims.

- Copper IUCD, e.g.:
- Cu T380A, inserted as soon as possible after unprotected intercourse /sexual assault and not later than 5 days. *LoE:IIIb*[56]

OR

- Levonorgestrel 1.5 mg, oral, as a single dose as soon as possible after unprotected intercourse/sexual assault, and not later than 5 days. *LoE:Ia*[57]
  - If the woman vomits within 2 hours, repeat the dose.

Advise women that their period should be on time; very rarely it is delayed but it should not be more than 7 days late. If this occurs, they should come back for a pregnancy test.

CAUTION

Emergency contraceptive tablets must be taken as soon as possible, preferably within 72 hours of unprotected intercourse, and not later than 5 days.

Enzyme inducers (including efavirenz and carbamazepine) cause a significant reduction in levonorgestrel concentrations.

Women on these medicines should preferably have copper IUCD inserted or alternatively double the dose of levonorgestrel.

Women > 80 kg or BMI ≥ 30 should also preferably have copper IUCD inserted or alternatively double the dose of levonorgestrel.

LoE:IIIb[58]

An anti-emetic:

- Metoclopramide oral, 10 mg 8 hourly as needed.

5. STI prophylaxis

LoE:IIIb[59]

Adults

- Ceftriaxone, IM, 250 mg as a single dose. W
  - For ceftriaxone IM injection: Dissolve ceftriaxone 250 mg in 0.9 mL lidocaine 1% without adrenaline (epinephrine).

AND

- Azithromycin, oral, 1 g, as a single dose. W

AND

- Metronidazole, oral, 2 g immediately as a single dose. A

Children

Prior to hospital referral, administer:

Children < 45 kg

- Macrolide, e.g.:
- Azithromycin, oral, 20 mg/kg/dose, as a single dose, and refer. W

Weight kg	Dose mg	Use one of the following: Susp 200 mg/5mL	Tablet 250 mg	Tablet 500 mg	Age Months/years
>7–9 kg	160 mg	4 mL			>6-12 months
>9–11 kg	200 mg	5 mL	–	–	>12–18 months
>11–14 kg	240 mg	6 mL	–	–	>18 months–3 years
>14–18 kg	320 mg	8 mL	–	–	>3–5 years
>18-25	400 mg	10 mL	–	–	>5-7 years
>25–35 kg	500 mg	–	2 tablets	1 tablet	>7–11 years
>35–45 kg	750mg	–	3 tablets	–	>11–13 years
> 45 kg	1000 mg	–	–	2 tablets	>13 years

Children ≥45 kg

- Macrolide, e.g.:
- Azithromycin, oral, 1g, as a single dose, and refer. W

AND

- Metronidazole, oral, as a single dose, and refer. A
  - 1–3 years: 500 mg
  - 3–7 years: 600–800 mg
  - 7–10 years 1 g
  - > 10 years 2 g

AND

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose. W See dosing table: Chapter 23.
  - Do not inject more than 1 g at one injection site.

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If *SUSPECTING SERIOUS BACTERIAL INFECTION* in neonate, give ceftriaxone, even if jaundiced.

» Avoid giving calcium-containing IV fluids (e.g. Ringer's Lactate) together with ceftriaxone:

- If ≤28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.
- If >28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.
- Preferably administer IV fluids without calcium contents.

» Always include the dose and route of administration of ceftriaxone in the referral letter.

LoE:IIIb[60]

REFERRAL

» All patients with severe physical or psychological injuries.
- All children for medico legal and general care assessment after initiation of PEP as outlined above at PHC.
- If uncertain, phone Childline 0800055555
- Pregnant rape victims.
- Adults with:
  - » Active bleeding
  - » Abdominal pain
  - » Multiple injuries
  - » History of the use of a foreign object

Note: Refer if there are inadequate resources with regards to:
- counselling
- laboratory for testing
- medico-legal examination
- medicine treatment
-

21.3.6.3 POST EXPOSURE PROPHYLAXIS, INADVERTENT (NON-OCCUPATIONAL)

Z29.8 + Z20.5 + Z20.2 + Z20.6

DESCRIPTION

Inadvertent (non-occupational) exposure to infectious material from HIV and hepatitis B sero-positive persons often requires clinical judgement and includes:
» human bites (requires hepatitis B, but not HIV prophylaxis),
» sharing of needles during recreational drug use,
» consensual sexual exposure, burst condoms,
» contact sports with blood exposure.

Management of inadvertent (non-occupational) HIV and hepatitis B exposure is the same as for occupational exposure. See Section: 21.3.6.1: Post exposure prophylaxis, occupational.

LoE:IIIa[61]

For exposures of a sexual nature (e.g. consensual sex with a burst condom), consider emergency contraception and STI prophylaxis on a case-by-case basis – see Section 21.3.6.2: Post exposure prophylaxis, rape and sexual assault.

21.3.7 SOFT TISSUE INJURIES

T14.0-1/T14.9

DESCRIPTION

Injuries may be minor, moderate or major:

Major injuries: it is important to recognise potentially life-threatening injuries. Indicators of such injuries are:

» Mechanism of injury: motor vehicle collision at speed exceeding 60 km/hour, ejection from the car, death of other occupant in the same car compartment, roll-over, pedestrian thrown out of his/her shoes, fall from height of more than 2 stories (more than thrice the patient's height in a child), multiple gunshot wounds.
» Physiological status: unable to maintain airway, tachycardia, hypoxia, hypotension on arrival (even if corrected with crystalloid infusion), tachycardia (especially in a child) or decreased level of consciousness.
» Anatomical distribution: (suspicion of) injuries to more than one body region (face, intracranial, chest, abdominal cavity, spine).
» Age: children < 2 years of age require admission.

Moderate injuries (list is not exhaustive):

» Head injuries: moderate head injuries (i.e. any GCS 11-14), facial fractures (airway maintained).
» Neck injuries: stable patient with a stabbed neck, tenderness over C-spine.
» Chest injuries: pneumothorax, haemothorax, rib fractures (2 or less).
» Abdominal injuries: any suspicion of an intra-abdominal injury in a haemodynamically stable patient: e.g. abdominal bruising (including seat belt sign in children), tenderness, distension, loss of bowel sounds, vomiting, haematemesis or haematuria.
» Extremity injuries: major open wounds, degloving injuries (boggy feel under intact skin), fractures, dislocations (in children: point tenderness around a major joint), crush injuries, multiple soft tissue injuries, enlarging or pulsating swelling.
» Suspicion of abuse (child abuse, intimate partner abuse, elderly abuse).

Minor injuries are injuries that can be managed as an outpatient and include bruises, small lacerations, sprains, concussions etc.

» Human bites (see Sections 21.3.1.2: Human bites) and animal bites (see Section 21.3.1.1: Animal bites).
» Sprains or strains (see Section 21.3.8: Sprains and strains).
» Exclude fractures.

EMERGENCY MANAGEMENT

All trauma patients, except for those who only have minor injuries, should undergo these surveys:

A = **Airway:** check and maintain airway. If airway obstructed, first perform a jaw thrust manoeuver, then if able, insert an endotracheal tube. Patients with maxillofacial fractures may require a tracheostomy.

B = **Breathing:** assess respiratory rate, use of accessory muscles, symmetry, oxygen saturation. If needed, support breathing using a Bag-Valve-Mask device ('AMBU bag'). Look for signs of pneumothorax (affected site is hyperinflated, hypertympanic and has

decreased breath sounds). If tension pneumothorax (distended neck veins, deviated trachea, hypoxia and hypotension): perform a needle thoracostomy.

C = **Circulation:** look for tachycardia and hypotension. Put up two large bore peripheral lines, a femoral line or an intraosseous line in the tibia (if no abdominal injury) or the proximal humerus. In adults: if SBP if < 90 mmHg, infuse 2 L of sodium chloride 0.9% until SBP ≥ 90 mmHg. If actively bleeding, it is permissible to maintain SBP≥ 80 mmHg (or a palpable radial pulse if you do not have access to a BP machine). In children the SBP should not fall below (70 + [2 x age]) mmHg.

D = **Disability:** perform a brief neurologic assessment and classify according to the Glasgow Coma Scale:

Glasgow Coma Scale: Add scores to give a single score out of 15:		
Best motor response:	Obeys commands	6
	Localises to pain	5
	Withdraws from pain	4
	Abnormal flexion to pain	3
	Extends to pain	2
	None	1
Best verbal response:	Orientated	5
	Confused	4
	Inappropriate words	3
	Incomprehensible sounds	2
	None	1
Eye opening	Spontaneous	4
	To voice	3
	To pain	2
	None	1
Total		

Table 21.16: Primary survey of trauma patients

E = **Exposure/environment:** expose the patient. If any suspicion of spinal cord injury (multi-trauma, decreased level of consciousness, neurological deficit, tenderness over the spine, severe mechanism of injury, anatomic deformity of the spine or any of the following: intoxication, inability to communicate or a distracting injury) cut the patient's clothes off, so as to minimise movement of the spine, and immobilise neck using a long back board. Use a hard collar and strapping to the trolley in other patients Prevent hypothermia by covering the patient with warm blankets, and infusing warm fluids.

When major physiological derangements are identified and patient is stabilised using the ABCDEs of the primary survey, perform an AMPLE history and secondary survey:

AMPLE history:

A = allergies

M = the patient's regular medication (including contraceptives and OTC medication)

P = past medical history

L = time of last meal (important is the time between the last meal and the accident)

E = events leading up to the incident

Secondary survey

The secondary survey is a head-to-toe examination of the patient to identify any injuries that may have been missed during the primary survey. The secondary survey is only performed in a stable patient.

First examine patient from the front, then log-roll the patient and examine the back (include a rectal examination).
All fracture sites must be immobilised by external splints.
Any additional investigations should be ordered according to availability of resources:
» Bloods may include FBC, clotting profile, cross-match and U & Es.
» Consider whether the patient requires transfer for X-rays.

MANAGEMENT OF WOUNDS AND LACERATIONS

» Assess wound: if significant devitalised tissue, especially if due to a crush injury or a bite, dress with povidone-iodine and refer for surgical debridement.
» Assess surrounding tissues and test function: look for associated fractures, ligament/tendon damage and nerve or vascular injuries. Document.
» If needed, anaesthetise wound. Remove foreign bodies and irrigate the wound with sodium chloride 0.9%. If needed, remove any devitalised tissue with a scalpel.
» Wounds may be glued with tissue adhesives if wound <4 cm, clean and uncomplicated, especially in children and elderly patients. Avoid in the following cases: lacerations in areas under tension (hands, feet, joints), oral mucosa, wounds in moist or hairy areas (axillae/perineum), if needing high level of precision (hairline or vermilion border of lip), or wounds at increased risk of infection (bite wounds, puncture wounds, wounds with contaminated tissue). Wounds on the scalp can be glued but surrounding hair needs to be trimmed.

Tissue adhesive (glue):
- Clean wound thoroughly with chlorhexidine 0.05% aqueous solution.
- Ensure good haemostasis before applying glue.
- Appose wound edges (bring wound edges together). Ensure patient is positioned appropriately so that when applied, any excess glue does not run down into areas not meant to be glued. If this happens, quickly wipe away with dry gauze.
- Crush tissues adhesive vial and invert.
- Gently brush adhesive over laceration (avoid contact with gloves/ instruments and avoid pushing adhesive into wound).
- Apply three layers of adhesive (maximum bonding strength is achieved within 2.5 minutes of application).
- Do not put on any covering or dressings.
- Advise patients that they may shower but not soak in bath and to pat area dry.
- The bonded adhesives spontaneously slough off within 5 to 10 days.

MEDICINE TREATMENT

If fluid replacement needed, see Section 21.2.9: Shock.

Adults
- Sodium chloride 0.9%, IV, 1L as a rapid bolus.
  - Repeat bolus until blood pressure is improved.

Children
- Sodium chloride 0.9%, IV, 20 mL/kg as a rapid bolus.
  - Repeat bolus if no adequate response.

Note: If patient develops respiratory distress, discontinue fluids.

Tetanus prophylaxis:
Z23.5
If not previously immunised within the last 5 years.
- Tetanus toxoid (TT), IM, 0.5 mL.

If sutures needed:
- Lidocaine without adrenaline (epinephrine), injection. *LoE:IVb*[62]
  - Infiltrate around the wound as local anaesthetic.
  - Maximum dose: 3 mg/kg.
  - See dosing table below.

Weight kg	Maximum dose, mg	Vial 1%, 10 mg/mL	Vial 2%, 20 mg/mL	Age months/years
>2.5–3.5 kg	7 mg	0.7 mL	0.35 mL	Birth–1 month
>3.5–5 kg	10 mg	1 mL	0.5 mL	>1–3 months
>5–7 kg	15 mg	1.5 mL	0.75 mL	>3–6 months
>7–9 kg	20 mg	2 mL	1 mL	>6–12 months
>9–11 kg	25 mg	2.5 mL	1.25 mL	>12–18 months
>11–14 kg	30 mg	3 mL	1.5 mL	>18 months–3 years
>14–17.5 kg	40 mg	4 mL	2 mL	>3–5 years
>17.5–35 kg	50 mg	5 mL	2.5 mL	>5–11 years
>35–55 kg	100 mg	10 mL	5 mL	>11–15 years

For children >55 kg and adults:
- Lidocaine without adrenaline (epinephrine), injection.
  - Infiltrate around the wound as local anaesthetic.
  - Maximum dose: 3 mg/kg.

Pain:
Children
- Paracetamol, oral, 10 to 15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults
- Paracetamol, oral, 500 mg to 1 g 4 to 6 hourly when required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

For more severe pain, give analgesia as appropriate. See Section 20.1: Pain control.

Infected wound management:
Manage as for cellulitis. See Section 5.4.3: Cellulitis.

REFERRAL

Urgent
» All major and moderate injuries once stabilised.
» Infected wounds.

Note:
» If uncertain how to stabilise patient, phone for guidance from referral hospital.

» Before transport leaves, ensure endotracheal tube is securely strapped, all lines are secured, all drips are running well and patient is well covered to prevent hypothermia.
» If transport is delayed, ensure patient does not deteriorate while waiting: repeat ABCD survey at least hourly.

21.3.8 SPRAINS AND STRAINS

S03.4-5/S13.4-6/S23.3-5/S33.5-7/S43.4-7/S53.4/S63.5-7/S73.1/S83.4-6/S93.4-6/T11.2/T13.2/T14.3

DESCRIPTION

Clinical features include:

» pain, especially on movement
» tenderness on touch
» limited movement
» history of trauma

May be caused by:

» sport injuries
» slips and twists
» overuse of muscles
» abnormal posture

Note: In children always bear non-accidental injuries (assault) in mind.

EMERGENCY TREATMENT

Immobilise with firm bandage and/or temporary splinting.

Children

- Paracetamol, oral, 10 to 15 mg/kg/dose 6 hourly when required. See dosing table: Chapter 23.

Adults

- Paracetamol, oral, 500 mg to 1 g 4 to 6 hourly when required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

AND

Children >12 years of age and adults

- NSAID, e.g.:
- Ibuprofen, oral, 200 to 400 mg 8 hourly with or after a meal.

REFERRAL

» Severe progressive pain.
» Progressive swelling.
» Extensive bruising.
» Deformity.
» Joint tenderness on bone.
» No response to treatment.
» Severe limitation of movement.
» Suspected serious injury.
» Recurrence.
» Previous history of bleeding disorder.
» Consider rehabilitation services for sprains, strains, and overuse injuries to improve joint stability and assist with pain management.

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PHC Chapter 22: Medicines used in palliative care

INTRODUCTION

Palliative care improves the quality of life of patients facing life-threatening illnesses and their family members, regardless of whether or not they also receive life-prolonging treatment. It requires a multidisciplinary approach, and aims to address physical, psychological, spiritual and social problems.

General principles of palliative care include:

» Treat the underlying causes of symptoms;
» Minimise medicine side effects; and
» Ensure that the patient and caregivers are informed of the nature of the disease, treatment, side-effects, and likely outcomes.

Palliative care patients who are down-referred from higher levels of care with a care plan should be managed according to that plan. Palliative care patients should be assessed by community-based palliative care teams where available.

The SPICT™-SA is a generic tool (https://www.spict.org.uk/the-spict/spict-sa/), designed for the South African setting, to help identify adults with advanced life-limiting illnesses when the best available and appropriate treatment has been given and their condition continues to deteriorate.

LoE:IVb[1]

Always refer to the latest National Department of Health Guidelines on Palliative Care.

Note: Please be advised that the recommendations in this chapter are directed at treating common symptoms alongside disease directed care and symptoms associated with end-of-life care.

22.1 GASTROINTESTINAL CONDITIONS

22.1.1 CONSTIPATION

K59.0 + (Z51.5)

See section 2.8: Constipation.

DESCRIPTION

The underlying cause of constipation in palliative care patients may be functional, disease, or treatment related. Developmental disorders with or without cognitive deficits, mood and situational circumstances can impact bowel habits in chronically ill children.

GENERAL MEASURES

Ensure privacy and comfort to allow a patient to defecate normally.
Increase fluid intake within the patient's limits.
Encourage activity and increased mobility within the patient's limits.
Anticipate the constipating effects of pharmacological agents, such as opioids, and provide laxatives prophylactically.

MEDICINE TREATMENT

Adults and children >15 years of age

- Sennosides A and B, oral, 13.5 mg, 1 tablet at night.
  - In resistant cases increase to 2 tablets. LoE:IIb[2]

AND/OR

- Lactulose, oral, 10 to 30 mL 12 to 24 hourly. LoE:IIb[3]

Children

- Lactulose, oral, 2.5 to 10 mL 12 hourly.
  - If poor response, increase frequency to 12 hourly. LoE:IIb[4]

Note: Manual removal should only be undertaken if the patient has received adequate pain relief and, if necessary, sedation as well.

For management of opioid-induced constipation:
See adjuvant therapy in Section 20.4: Chronic cancer pain.

REFERRAL

» All patients with suspected bowel obstruction.
» Patients with severe constipation, not relieved with oral treatment, or who are unable to swallow.

22.1.2 DIARRHOEA

A09.0

See Section 2.9: Diarrhoea.

DESCRIPTION

The commonest cause of diarrhoea in palliative care is laxative use. Other causes include partial intestinal obstruction, HIV-associated diarrhoea, pancreatic insufficiency, *Clostridium difficile* infection, chemotherapeutics, and radiation enteritis.
Severe constipation and faecal impaction can also cause diarrhoea as backed-up, liquefied stool may be all that the patient can pass ("overflow diarrhoea").

GENERAL MEASURES

Refer to a dietician.
Consider faecal impaction and perform rectal examination if indicated.

MEDICINE TREATMENT

Rehydrate the patient as appropriate if necessary. See Sections 2.9.1: Diarrhoea, acute in children and Section 2.9.3: Diarrhoea, acute, without blood, in adults.

Adults:

- Loperamide, oral, 4 mg immediately and 2 mg as required after each loose stool up to 6 hourly.
  - Not more than 16 mg daily
  - Contraindicated in antibiotic-induced diarrhoea and overflow diarrhoea.

REFERRAL

Persistent diarrhoea (>2 weeks) in children.

22.1.3 NAUSEA AND VOMITING

R11 + (Z51.5)

See Section 2.4: Nausea and vomiting, non-specific.

DESCRIPTION

Nausea and vomiting may have many causes in palliative care patients e.g. medication, constipation, anxiety, infection, and raised intracranial pressure.

GENERAL MEASURES

Refer to a dietician if available.
Identify and manage reversible causes, which include medication, hypercalcemia, constipation, uraemia, gastritis, gastroenteritis, coughing, and infections.
Manage odours e.g. cooking smells and fungating wounds.

MEDICINE TREATMENT

Treat the underlying cause and rehydrate the patient if necessary.
Deliver medicines via an appropriate route and regularly.

Adults:

- Metoclopramide, oral, 10 mg, 8 hourly as needed.
  - In renal impairment start with a dose of 5 mg, 8 hourly. *LoE:IVb*[5]
  - Increase according to clinical response using alternate 5 mg and 10 mg doses if required. *LoE:IVb*[6]

Children:

- Metoclopramide, oral, 0.1 mg/kg/dose, 8 to 12 hourly.

Weight kg	**Dose** mg	**Syrup** 5 mg/5 mL	**Age** months/years
> 9–11 kg	1 mg	1 mL	> 12–18 months
> 11–14 kg	1.2 mg	1.2 mL	> 2–3 years
> 14–17.5 kg	1.6 mg	1.6 mL	>3–5 years
> 17.5–25 kg	2 mg	2 mL	>5–7 years
> 25–35 kg	3 mg	3 mL	>7–11 years
> 35–55 kg	4.5 mg	4.5 mL	>11–15 years

Use with caution as extrapyramidal side effects may occur (especially at higher doses).

LoE:IVb[7]

REFERRAL

» All patients with a diagnosed or suspected underlying cause that requires treatment at a higher level of care.
» Consult a palliative care trained doctor if nausea and vomiting persist despite treatment.

22.2 NEUROPSYCHIATRIC CONDITIONS

22.2.1 ANXIETY

F41.0-3/F41.8-9/ + (Z51.5)

See Section 16.3: Anxiety disorders.

DESCRIPTION

Some symptoms of anxiety in palliative care patients may be expected, given the concerns of living with a serious illness. However, if the symptoms are debilitating, they require treatment.

GENERAL MEASURES

Address any contributing factors such as pain and dyspnoea.
Consider other underlying conditions that may mimic anxiety e.g. electrolyte imbalance, hyperthyroidism, hypoxia, arrhythmias and many adverse drug reactions.
Assess for depression.
Offer referral for psychotherapy if available.

MEDICINE TREATMENT

Adult:

- Fluoxetine, oral.
  - Initiate at 20 mg alternate days for 2 weeks.
  - Increase to 20 mg daily after 2 to 4 weeks.
  - Delay dosage increase if increased agitation/panicky feelings occur.

LoE:IIb[8]

CAUTION FLUOXETINE
Fluoxetine is contraindicated if eGFR <10 mL/min

OR

LoE:IVb[9]

If fluoxetine is poorly tolerated:

- Alternative SSRI e.g.:
- Citalopram, oral.
  - Initiate at 10 mg daily for 2 weeks.
  - Then increase to 20 mg daily.

LoE:IIb[10]

Note: Effects of SSRIs are only apparent after 2 to 3 weeks of treatment, so they should be reserved for patients where end-of-life is not imminent.

For acute anxiety reactions:

- Benzodiazepine, e.g.:
- Diazepam, oral, 2.5 to 5 mg.
  - For a maximum of 10 days.

LoE:IIb[11]

Note: Benzodiazepines might cause sedation and confusion. Use with caution.

CAUTION - BENZODIAZEPINES

» Associated with cognitive impairment – reversible with short-term use and irreversible with long-term use.
» Elderly are at risk of over-sedation, falls and hip fractures.
» Dependence may occur after only a few weeks of treatment.
» Prescribe for as short a period of time as possible.
» Warn patient not to drive or operate machinery when used short-term.
» Avoid use in people at high risk of addiction – personality disorders and those with previous or other substance misuse. *LoE:IIIb*[12]

REFERRAL
All children.

22.2.2 DELIRIUM
F05.0-1/F05.8-9/R45.1/ + (Z51.5)
See Section 21.2.4: Delirium.

DESCRIPTION
Delirium (confusion) is common in the terminal stages of advanced disease, but is rarely seen in children. Supportive measures such as frequent re-orientation may be useful.

GENERAL MEASURES
Assess for underlying causes e.g. infection, electrolyte imbalance.
Remove factors that can agitate patient (full bladders, thirst, pain, constipation).
Reduce polypharmacy.
Monitor for sensory deficits e.g. hearing impairment.

MEDICINE TREATMENT

CAUTION

» Rapid tranquillisation may cause cardiovascular collapse, respiratory depression, neuroleptic malignant syndrome and acute dystonic reactions.
» The elderly, children, intellectually disabled and those with comorbid medical conditions and substance users are at highest risk.
» **An emergency trolley, airway, bag, oxygen and intravenous line must be available.**

Adults:

For hyperactive delirium and severe agitation:

- Benzodiazepine, e.g.:
- Diazepam, IV, 2.5 to 5 mg as a single dose *LoE:IIIb*[13]
  - If no response, give a second dose.
  - Do not administer at a rate over 5 mg/minute.

OR

- Midazolam, IM, 1 to 5 mg immediately.

- Repeat after 30 to 60 minutes if needed.
- Lower doses are indicated for patients with liver failure. LoE:IVb[14]

Switch to oral benzodiazepine if possible.

CAUTION - BENZODIAZEPINES

» Associated with cognitive impairment – reversible with short-term use and irreversible with long-term use.
» Elderly are at risk of over-sedation, falls and hip fractures.
» Dependence may occur after only a few weeks of treatment.
» Prescribe for as short a period of time as possible.
» Warn patient not to drive or operate machinery when used short-term.
» Avoid use in people at high risk of addiction – personality disorders and those with previous or other substance misuse. LoE:IIIb[15]

REFERRAL
All children.

22.2.3 DEPRESSION
F32.0-3/F32.8-9/F33.0-3/F33.8-9/F34.1 + (Z51.5)

See section 16.4.1: Depressive disorders.

DESCRIPTION
Depression might be difficult to diagnose in palliative care patients as some symptoms of depression are similar to disease manifestations such as anorexia and insomnia. The key indicators of depression in palliative care patients are persistent feelings of hopelessness and worthlessness and/or suicidal ideation. Young children may present with somatic complaints e.g. abdominal pain or headaches, or may have restlessness.

GENERAL MEASURES
Refer to a social worker to assist with concerns of future care of patient, family, and finances.

MEDICINE TREATMENT
Adults

- Fluoxetine, oral.
  - Initiate at 20 mg alternate days for 2 weeks.
  - Increase to 20 mg daily after 2 to 4 weeks.
  - Delay dosage increase if increased agitation/panicky feelings occur. LoE:IIb[16]

CAUTION FLUOXETINE

Fluoxetine is contraindicated if eGFR <10 mL/min

OR

If fluoxetine is poorly tolerated:

- Alternative SSRI e.g.:
- Citalopram, oral.
  - Initiate at 10 mg daily for 2 weeks.
  - Then increase to 20 mg daily. *LoE:Ib*[17]

OR

If a sedating antidepressant is required:

- Tricyclic antidepressants (Doctor prescribed), e.g.:
- Amitriptyline, oral, at bedtime.
  - Initial dose: 25 mg per day.
  - Increase by 25 mg per day at 3- to 5-day intervals.
  - Maximum dose: 150 mg per day.

Note: Tricyclic antidepressants may cause dry mouth, constipation, urinary retention, and confusion, which might be especially problematic in palliative care patients. Use the lowest dose possible, and titrate slowly. *LoE:IVb*[18]

Note: Effects of SSRIs are only apparent after 2 to 3 weeks of treatment, so they should be reserved for patients where end-of-life is not imminent.

REFERRAL

» All children and adolescents.
» All patients to a psychologist and social worker if available.

22.3 PAIN

See chapter 20: Pain.

22.3.1 CHRONIC CANCER PAIN

See Section 20.4: Chronic cancer pain.

22.4 RESPIRATORY CONDITIONS

For Coronavirus Disease-19. See Section 10.19.1: COVID-19.

22.4.1 DYSPNOEA

R06.0 + (Z51.5)

DESCRIPTION

Dyspnoea is the subjective, unpleasant sensation of being unable to breathe adequately (breathlessness). Dyspnoea is a complex symptom which can be caused or exacerbated by physical, psychological, and emotional factors. The intensity of dyspnoea is not related to the oxygen saturation. In the palliative care patient fluid overload is a potential cause of dyspnoea.

LoE:IIIb[19]

The aim should always be to address the underlying cause. However, in end stage disease it may not be possible to resolve dyspnoea. Therefore, symptomatic treatment is indicated in addition to treating the cause.
In children dyspnoea is often evidenced by difficulty talking or feeding, or restlessness.

GENERAL MEASURES

If available refer to a physiotherapist and occupational therapist for pulmonary rehabilitation, and to teach patients pursed lip breathing, pacing of activities, relaxation techniques and positioning.
A fan might reduce the sensation of dyspnoea.
Where possible treat the underlying cause e.g. antibiotics for underlying respiratory infection.

MEDICINE TREATMENT

Adults

LoE:IIIb[20]

- Morphine solution, oral. (Doctor prescribed.)
  - Starting dose: 2.5 to 5 mg, as required 4 hourly, titrating up slowly.
  - In renal failure: start at 1 to 2 mg and observe patient closely before titrating up as required.

LoE:IVb[21]

Children

- Morphine solution, oral. (Doctor prescribed.)
  - Starting dose:
    - 0–1 month of age: 0.05 mg/kg 6 hourly.
    - ≥ 1–12 months of age: 0.1 mg/kg/dose 4-6 hourly.
    - ≥ 12 months of age: 0.2–0.4 mg/kg/dose 4-6 hourly.

LoE:IVb[22]

REFERRAL

Dyspnoea associated with hypoxia for consideration of home-based oxygen.

22.5 PRESSURE ULCERS/SORES

See Section 5.19: Pressure ulcers/sores.

22.6 END OF LIFE CARE

Z51.5

The management of a patient who is imminently terminal (death suspected to occur within a few days or weeks), should include:

» Communicating honest, direct, compassionate, and culturally sensitive information regarding the prognosis, and symptoms that might develop.
» Relieving physical, spiritual and emotional distress in the patient and family.
» Treating easily manageable complications that cause suffering.
» Stopping all unnecessary medicines.

» Limiting hospital admissions, if possible.
» Ensuring that parents/caregivers are adequately counselled.
» Decision making as to the preferred place of death (home, hospice, hospital) and referral to community-based services where available (hospice, palliative, and home-based care services).

Indications for referral for in-patient hospital or hospice care:
» Hypoxia and respiratory distress where oxygen therapy provides relief. IV/ nasogastric fluid requirements or medication administration needed to relieve suffering.
» Carer/s unable to cope at home.

Feeds and fluids at the end of life:
» Anorexia and refusal of feeds/fluids in dying patients is a normal phenomenon.
» Encourage the family to feed for comfort only and reassure them that the dying patient is not hungry.

Investigations at the end of life:
» Investigations should be kept to a minimum and only done if it might contribute to the patient's comfort.

Antibiotics at the end of life:
» Oral antibiotic therapy might not be indicated. Refer to the patient's palliative care plan if available, or consult a palliative care trained doctor.

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PHC Chapter 23: Standard paediatric dosing tables

Different conditions require different dosaging of medication. In children most conditions can use standardised doses. The weight-band dosing tables below are standardised doses of a medicine **for children** for specific conditions (indicated above each table). Where a specific condition is not indicated below, see the main text of the book for the dosing specific to that condition.

ABACAVIR

1.6 Management of HIV-infected children

- Abacavir, oral, 8 mg/kg 12 hourly or 16 mg/kg daily. (*see Annexure A*)

ACICLOVIR

1.4 Herpes simplex infections of the mouth and lips; 5.13 Herpes simplex.

- Aciclovir, oral, 250 mg/m^2/dose, 8 hourly for 7 days.

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/years
		Susp 200 mg/5mL	**Tablet**		
			200 mg	400 mg	
>3.5–5 kg	50 mg	1.25 mL	–	–	>1–3 months
>5–7 kg	80 mg	2 mL	–	–	>3–6 months
>7–11 kg	100 mg	2.5 mL	½ tablet	–	>6–18 months
>11–14 kg	120 mg	3 mL	–	–	>18 months–3 years
>14–25 kg	160 mg	4 mL	–		>3–7 years
>25–35 kg	200 mg	5 mL	1 tablet	½ tablet	>7–11 years
>35 kg–55 kg	300 mg	7.5 mL	1½ tablets	–	>11–15 years
>55 kg	400 mg	–	–	1 tablet	>15 years

ACTIVATED CHARCOAL

21.3.3 Exposure to poisonous substances.

- Activated charcoal, 1 g/kg mixed as a slurry with water.

Weight kg	**Dose** g	**Age** Months/years
>3.5–7 kg	5 g	>1–6 months
>7–11 kg	10 g	>6–18 months
>11–17.5 kg	15 g	>18 months–5 years
>17.5–35 kg	25 g	>5–11 years
>35–55 kg	50 g	>11–15 years
>55 kg	50–100 g	>15 years

AMOXICILLIN A

3.2.1.1 Complicated severe acute malnutrition (SAM)-use as a single dose; 10.8 Measles (initial dose for measles with pneumonia, then refer); 17.3.4.1: Pneumonia in children; 19.4.2: Otitis media, acute.

- Amoxicillin, oral, 45 mg/ kg/ dose, 12 hourly for 5 days.

Weight kg	**Dose** mg	**Use one of the following:**				**Age** Months/years
		Syrup mg/ 5mL		**Capsule** mg		
		125	250	250	500	
>3.5–5 kg	175 mg	7 mL	3.5 mL	–	–	>1–3 months
>5–7 kg	250 mg	10 mL	5 mL	–	–	>3–6 months
>7–11 kg	375 mg	15 mL	7.5 mL	–	–	>6–18 months
>11–14 kg	500 mg	–	10 mL	2	1	>18 months–3 years
>14–17.5 kg	750 mg	–	15 mL	3	–	>3–5 years
>17.5–25 kg	1000 mg	–	20 mL*	4	2	>5–7 years
>25–30 kg	1250 mg	–	25 mL*	5	–	>7–10 years
>30 kg	1500 mg	–	–	6	3	>10 years

ATROPINE

21.1.3 Bradycardia; 21.3.3 Exposure to poisonous substances.

- Atropine, IV, 0.05 mg/kg/dose.

Weight kg	**Dose** mg	**Use one of the following injections** (intravenously)		**Age** months/years
		0.5 mg/mL	1 mg/mL	
>3.5–5kg	0.2 mg	0.4 mL	0.2 mL	>1–3 months
>5–7 kg	0.3 mg	0.6 mL	0.3 mL	>3–6 months
>7–9 kg	0.4 mg	0.8 mL	0.4 mL	>6–12 months
>9–11 kg	0.5 mg	1 mL	0.5 mL	>12–18 months
>11–14 kg	0.6 mg	1.2 mL	0.6 mL	>18 months–3 years
>14–17.5 kg	0.8 mg	1.6 mL	0.8 mL	>3–5 years
>17.5 kg	1 mg	2 mL	1 mL	>5 years

AZITHROMYCIN W

1.1.1 Dental abscess; 4.9 Rheumatic fever, acute; 5.4.1 Boil, abscess; 5.4.2 Impetigo; 5.4.3 Cellulitis; 5.8.2 Eczema, acute, moist or weeping; 10.8 Measles (children with otitis media); 10.14 Tick bite fever; 17.3.4.1 Pneumonia in children; 19.4.1 Otitis, externa; 19.4.2 Otitis, media, acute; 19.5 Sinusitis, acute, bacterial; 19.6 Tonsillitis and pharyngitis; 21.3.1.1 Animal bites; 21.3.1.2 Human bites.

- Azithromycin, oral, 10 mg/kg/dose, daily for 3 days.

Weight kg	**Dose** mg	**Use one of the following:**			**Age** Months/years
		Susp 200 mg/5mL	**Tablet**		
			250 mg	500 mg	
>3.5–5 kg	40 mg	1 ml	–	–	>1–3 months
>5–7 kg	60 mg	1.5 ml	–	–	>3–6 months
>7–9 kg	80 mg	2 mL			>6-12 months
>9–11 kg	100 mg	2.5 mL	–	–	>12–18 months
>11–14 kg	120 mg	3 mL	–	–	>18 months–3 years
>14–18 kg	160 mg	4 mL	–	–	>3–5 years
>18-25 kg	200 mg	5 mL	–	–	>5-7 years
>25–35 kg	250 mg	–	1 tablet	–	>7–11 years
>35 kg	500 mg	–	–	1 tablet	>11 years

CEFTRIAXONE W

3.2.1.1 Complicated severe acute malnutrition (SAM); 8.4 Urinary tract infection (UTI); 10.5 Fever; 10.18 Viral haemorrhagic fever; 14.3 Arthritis, septic; 17.2.1 Croup (laryngotracheobronchitis) in children;17.3.4.1 Pneumonia in children; 21.2.9 Shock (septicaemia); 21.3.6.2 Post exposure prophylaxis, rape and sexual assault.

- Ceftriaxone, IM, 80 mg/kg/dose immediately as a single dose.

Weight kg	**Dose** mg	**Use one of the following injections mixed with water for injection (WFI):**			**Age** Months/years
		250 mg/2 mL (250 mg diluted in 2 mL WFI)	500 mg/2 mL (500 mg diluted in 2 mL WFI)	1 000 mg/3.5 mL (1 000 mg diluted in 3.5 mL WFI)	
>2–2.5 kg	190 mg	1.5 mL	0.75 mL	–	>34–36 weeks
>2.5–3.5 kg	225 mg	1.8 mL	0.9 mL	–	>36 weeks–1 month
>3.5–5.5 kg	310 mg	–	1.25 mL	–	>1–3 months
>5.5–7 kg	440 mg	–	1.75 mL	–	>3–6 months
>7–9 kg	625 mg	–	2.5 mL	–	>6–12 months
>9–11 kg	750 mg	–	3 mL	–	>12–18 months
>11–14 kg	810 mg	–	3.25 mL	–	>18 months–3 years
>14–17.5 kg	1 000 mg	–	4 mL	3.5 mL	>3–5 years
>17.5 kg	1 500 mg		-	5.5 mL	>5 years

2.9.1 Diarrhoea, acute in children; 2.10.1 Dysentery, bacillary; 15.4.1 Meningitis, acute; Ceftriaxone IM/IV, 100 mg/kg/dose (immediately as a single dose)

Weight kg	**Dose** mg	**Use one of the following injections mixed with water for injection (WFI):**			**Age** Months/years
		250 mg/2 mL (250 mg diluted in 2 mL WFI)	500 mg/2 mL (500 mg diluted in 2 mL WFI)	1 000 mg/3.5 mL (1 000 mg diluted in 3.5 mL WFI)	
>2–2.5 kg	238 mg	1.9 mL	0.9 mL	–	>34–36 weeks
>2.5–3.5 kg	280 mg	-	1.1 mL	–	>36 weeks–1 month
>3.5–5.5 kg	388 mg	–	1.6 mL	–	>1–3 months
>5.5–7 kg	550 mg	–	2.2 mL	-	>3–6 months
>7–9 kg	782 mg	–	3.1 mL	-	>6–12 months
>9–11 kg	938 mg	–	3.75 mL	-	>12–18 months
>11–14 kg	1013 mg	–	4.0 mL	3.5 mL	>18 months–3 years
>14–17.5 kg	1 250 mg	–	-	4.6 mL	>3–5 years
>17.5 kg	1 875 mg		-	6.9 mL	>5 years

CEPHALEXIN A

5.4.1 Boil, abscess; 5.4.2 Impetigo;5.4.3 Cellulitis; 5.8.1 Eczema, atopic;5.8.2 Eczema, acute, moist or weeping; 19.4.1 Otitis, externa, (furuncular).

- Cephalexin, oral, 25 mg/kg/dose 12 hourly for 5 days.

Weight kg	**Dose** mg	**Syrup** 125 mg/ 5mL	**Syrup** 250 mg/ 5mL	**Capsule** 250 mg	**Capsule 500mg**	**Age** Months/years
>2.5–3.4 kg	75 mg	3 mL	1.5 mL	–	-	Birth–3 months
3.5–5.0 kg	100 mg	4 mL	2 mL	-	-	>3–18 months
5.1-7.4 kg	150 mg	6 mL	3 mL	-	-	>3–6 months
7.5-10 kg	200 mg	8mL	4 mL	-	-	>12–18 months
10.1-14.kg	250 mg	10 mL	5 mL	1	-	>18 months–3 years
14.1-18 kg	350 mg	-	7 mL	-	-	>3–5 years
18.1-25 kg	500 mg	-	10 mL	2	1	>5-7 years
>25 kg	625 mg	–	12.5 mL	-	-	>7 years

CETIRIZINE

5.2 Itching (pruritus); 5.8.1 Eczema, atopic; 5.8.2 Eczema, acute, moist or weeping; 5.10.1 Urticaria; 5.10.4 Papular urticaria; 5.11 Pityriasis rosea; 18.1.1 Conjunctivitis, allergic; 19.1 Allergic rhinitis.

- Cetirizine, oral, 5 mg once daily

Weight kg	**Dose** mg	**Use one of the following:**		**Age** years
		Syrup 1 mg/ mL	**Tablet** 10 mg	
>12–21 kg	5 mg	5 mL	–	2–6 years
>21 kg	10 mg	10 mL	1 tablet	>6 years

CHLORPHENAMINE

5.2 Itching (pruritus); 5.7.3 Sandworm; 5.8.1 Eczema, atopic; 5.8.2 Eczema, acute, moist or weeping; 5.10.1 Urticaria; 5.10.4 Papular urticaria; 5.11 Pityriasis rosea; 10.2 Chicken pox; 18.1.1 Conjunctivitis, allergic; 19.1 Allergic rhinitis; 20.4 Chronic cancer pain (pruritis); 21.3.1.3 Insect stings, scorpion stings and spider bites.

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly.

Weight Kg	**Dose** mg	**Use one of the following:**		**Age** years
		Syrup 2 mg/5mL	**Tablet** 4 mg	
>12–14 kg	1.2 mg	3 mL	–	>2–3 years
>14–17.5 kg	1.6 mg	4 mL	–	>3–5 years
>17.5–25 kg	2 mg	5 mL	–	>5–7 years
>25–35 kg	3 mg	7.5 mL	–	>7–11 years
>35 kg	4 mg	–	1 tablet	>11 years

CIPROFLOXACIN W

2.10.1 Dysentery, bacillary.

- Ciprofloxacin, oral, 15 mg/kg/dose 12 hourly for 3 days.

Weight kg	Dose mg	Use one of the following:			Age Months/years
		Susp	Tablet		
		250 mg/5 mL	250 mg	500 mg	
>9–11 kg	150mg	3 mL	–	–	>12–18 months
>11–14 kg	200 mg	4 mL	–	–	>18 months–3 years
>14–17.5 kg	250 mg	5 mL	1	–	>3–5 years
>17.5–25 kg	300 mg	6 mL	–	–	>5–7 years
>25 kg	500 mg	10 mL	2	1	>7 years

CLARITHROMYCIN W

1.1.1 Dental abscess; 4.9 Rheumatic fever, acute; 5.4.1 Boil, abscess; 5.4.2 Impetigo; 5.4.3 Cellulitis; 5.8.2 Eczema, acute, moist or weeping; 10.8 Measles (children with otitis media); 10.14 tick bite fever; 17.3.4.1 Pneumonia in children; 19.4.1 Otitis, externa; 19.4.2 Otitis, media, acute; 19.5 Sinusitis, acute, bacterial; 19.6 Tonsillitis and pharyngitis; 21.3.1.1 Animal bites; 21.3.1.2 Human bites.

- Clarithromycin, oral, 7.5 mg/kg/dose, 12 hourly for 5 days.

Weight kg	Dose mg	Use one of the following:			Age Months/years
		Susp		Tablet	
		125mg/5mL	250mg/5mL	250 mg	
>3.5–5 kg	30 mg	1.2	–	–	>1–3 months
>5–7 kg	45 mg	1.8	–	–	>3–6 months
>7–9 kg	62.5 mg	2.5	–	–	>6–12 months
>9–11 kg	75 mg	3	–	–	>12–18 months
>11–14 kg	100 mg	4	–	–	>18 months–3 years
>14–17.5kg	125 mg	5	2.5	–	>3–5 years
>17.5-25kg	150 mg	6	3	–	>5–7 years
>25–35 kg	187.5 mg	7.5	3.75	–	>7–11 years
>35–55 kg	250 mg	–	5	1 tablet	>11–15 years

COTRIMOXAZOLE (PROPHYLAXIS) A

11.5 The HIV-exposed infant; 11.6 Management of HIV infected children; 11.7 Opportunistic infections, prophylaxis in children; 15.4.1 Meningitis, acute – or suspected meningitis or suspected listeria meningitis (pre-referral dose only).

- Cotrimoxazole (sulfamethoxazole/trimethoprim), oral, once daily

Recommended daily dosage by weight band	Dose of sulfamethoxazole/ trimethoprim	Suspension (200/40 mg per 5 mL)	Single strength tablet (400/80 mg)	Double strength tablet (800/160 mg)
3 to 5.9 kg	100/20 mg	2.5 mL	¼ tablet	-
6 to 13.9 kg	200/40 mg	5 mL	½ tablet	-
14 to 24.9 kg	400/80 mg	10 mL	1 tablet	½ tablet
25 kg	800/160 mg	-	2 tablets	1 tablet

DIAZEPAM

15.3.3 Febrile convulsions; 21.2.11 Seizures and status epilepticus.

- Diazepam, rectal, 0.5 mg/kg/dose for convulsions as a single dose.

Weight kg	Dose mg	Ampoule 10 mg/2 mL	Age Months/years
>3–6 kg	2 mg	0.4 mL	<6 months
>6–10 kg	2.5 mg	0.5 mL	>6 months–1 year
>10–18 kg	5 mg	1 mL	>1–5 years
>18–25 kg	7.5 mg	1.5 mL	>5–7 years
>25–40 kg	10 mg	2 mL	>7–12 years

EFAVIRENZ

11.6 Management of HIV-infected children.

- Efavirenz, oral, at night. (see Annexure A)

EPINEPHRINE (ADRENALINE)

5.10.2 Angioedema , 21.2.10 Anaphylaxis.

- Epinephrine (adrenaline), 1:1000, IM, 0.01 mL/kg as a single dose.

Weight kg	Dose mg	Injection 1 mg/mL (1:1 000)	Age years
9–12 kg	0.1 mg	0.1 mL	1–2 years
>12–17.5 kg	0.2 mg	0.2 mL	>2–5 years
>17.5–40 kg	0.3 mg	0.3 mL	>5–12 years
>40 kg	0.5 mg	0.5 mL	>12 years

FLUCLOXACILLIN A

5.4.1 Boil, abscess; 5.4.2 Impetigo; 5.4.3 Cellulitis; 5.8.2 Eczema, acute, moist or weeping; 19.4.1 Otitis, externa (furuncular)

- Flucloxacillin, oral, 12–25mg/kg/dose 6 hourly for 5 days.

Weight Kg	Dose mg	Syrup 125 mg/ 5mL	Capsule 250 mg	Age Months/years
>2.5–5 kg	62.5 mg	2.5 mL	–	Birth–3 months
>5–11 kg	125 mg	5 mL	–	>3–18 months
>11–25 kg	250 mg	10 mL	1 capsule	>18 months–7 years
>25 kg	500 mg	–	2 capsules	>7 years

FLUCONAZOLE

5.5.2.3 Scalp infections – tinea capitis (for 28 days); 11.8.2 Candidiasis, oesophageal (for 21 days).

- Fluconazole, oral, 6 mg/kg once daily.

Weight Kg	Dose mg	Use one of the following:			Age Months/years
		Susp 50 mg/5 mL	Capsule 50 mg	Capsule 200 mg	
>3.5–5 kg	25 mg	2.5 mL	–	–	>1–3 months
>5–7 kg	30 mg	3 mL	–	–	>3–6 months
>7–9 kg	50 mg	5 mL	1 capsule	–	>6–12 months
>9–11 kg	60 mg	6 mL			>12–18 months
>11–14 kg	70 mg	7mL	–	–	>18 months–3 years
>14–17.5 kg	100 mg	10 mL	2 capsules	–	>3–5 years
>17.5–25 kg	125 mg	12.5 mL	–	–	>5–7 years
>25–35 kg	150 mg	15 mL	3 capsules	–	>7–11 years
>35 kg	200 mg	–	–	1 capsule	>11 years

FUROSEMIDE

4.6.2 Cardiac failure, Congestive (CCF); 8.1 Chronic kidney disease (CKD); 8.2 Acute kidney injury; 21.2.8 Pulmonary oedema, acute.

- Furosemide, IV, 1 mg/kg, over 5 minutes.

Weight Kg	Dose mg	Injection 10 mg/mL	Age Months/years
>3.5–5 kg	4 mg	0.4 mL	>1–3 months
>5–7 kg	6 mg	0.6 mL	>3–6 months
>7–9 kg	8 mg	0.8 mL	>6–12 months
>9–11 kg	10 mg	1 mL	>12–18 months
>11–14 kg	12 mg	1.2 mL	>18 months–3 years
>14–17.5 kg	15 mg	1.5 mL	>3–5 years
>17.5–25 kg	20 mg	2 mL	>5–7 years
>25–35 kg	30 mg	3 mL	>7–11 years
>35 kg	40 mg	4 mL	>11 years

HYDROCORTISONE

21.2.10 Anaphylaxis.

- Hydrocortisone IM/ slow IV, 5 mg/kg immediately.

Weight kg	Dose mg	Injection 100 mg/2 mL	Age Months/years
<11 kg	25 mg	0.5 mL	1 month-2 years
>11–14 kg	50 mg	1 mL	>2–3 years
>14–17.5 kg	75 mg	1.5 mL	>3–5 years
>17.5 kg	100 mg	2 mL	>5 years

17.1.2 Acute asthma , children

- Hydrocortisone IM /slow IV, 4mg/kg (maximum 100 mg) immediately.

Weight kg	Dose mg	Injection 100 mg/2 mL	Age Months/years
<11 kg	25 mg	0.5 mL	1-18 months
>11–14 kg	40 mg	0.8 mL	>18 months–3 years
>14–17.5 kg	50 mg	1 mL	>3–5 years
>17.5–25 kg	60 mg	1.2 mL	>5–7 years
>25–40 kg	80 mg	1.6 mL	>7–12 years
>40 kg	100 mg	2 mL	>12 years

IBUPROFEN

20.2 Acute pain; 20.3 Chronic non-cancer pain; 20.4 Chronic cancer pain.

- Ibuprofen, oral, 5–10 mg/kg/dose 8 hourly with or after a meal.

Weight kg	Dose mg	Use one of the following:		Age Months/years
		Syrup 100 mg/5mL	Tablet 200 mg	
>9–11 kg	80 mg	4 mL	–	>12–18 months
>11–14 kg	100 mg	5 mL	–	>18 months–3 years
>14–17.5 kg	120 mg	6 mL	–	>3–5 years
>17.5–25 kg	150 mg	7.5 mL	–	>5–7 years
>25–40 kg	200 mg	10 mL	1 tablet	>7–12 years
>40 kg	400 mg	–	2 tablets	>12 years

LACTULOSE

2.5.1 Anal fissures; 2.8 Constipation; 20.4 Chronic cancer pain (constipation); 22.1.1 Constipation (medicines used in palliative care).

- Lactulose, oral, 0.5 mL/kg/dose once daily.
  - If poor response, increase frequency to 12 hourly.

Weight kg	Syrup 3.3 g/5 mL	Age Months/years
>5–7 kg	3 mL	>3–6 months
>7–9 kg	4 mL	>6–12 months
>9–11 kg	5 mL	>12–18 months
>11–14 kg	6 mL	>18 months–3 years
>14–17.5 kg	7.5 mL	>3–5 years
>17.5–35 kg	10 mL	>5–11 years
>35 kg	15 mL	>11 years

LAMIVUDINE

11.6 Management of HIV-infected children; 21.3.6.2 Post exposure prophylaxis, rape and sexual assault.

- Lamivudine, oral, 4 mg/kg 12 hourly or 8 mg/kg daily. (see Annexure A)

LOPINAVIR/RITONAVIR

11.6 Management of HIV-infected children

- Lopinavir/ritonavir, oral 300/75mg/m^2 – administered 12 hourly. (see Annexure A)

METRONIDAZOLE A

1.1.1 Abscess, dental; 1.3.3 Necrotising periodontitis; 21.3.1.1 Animal bites; 21.3.1.2 Human bites.

- Metronidazole, oral, 7.5 mg/kg/dose 8 hourly for 5 days.

Weight kg	Dose mg	Use one of the following:			Age Months/years
		Suspension 200 mg/5mL	Tabs 200mg	Tabs 400mg	
> 9–11 kg	80 mg	2 mL	–	–	>12–18 months
>11–14 kg	100 mg	2.5 mL	½ tablet	–	>18 months–3 years
>14–17.5 kg	120 mg	3 mL	–	–	>3–5 years
>17.5–25 kg	160 mg	4 mL	–	–	>5–7 years
>25–35 kg	200 mg	5 mL	1 tablet	½ tablet	>7–11 years
>35–55 kg	300 mg	7.5mL	1½ tablets	–	>11–15 years
>55 kg	400 mg	–	–	2 tablets	>15 years

MIDAZOLAM

15.3.3 Febrile convulsions; 21.2.11 Seizures and status epilepticus.

- Midazolam, buccal, 0.5 mg/kg/dose.

Weight kg	**Dose** mg	**Injection formulation (buccal administration)** 5 mg/mL	**Age** Months/years
>7–9 kg	4 mg	0.8 mL	>6–12 months
>9–11 kg	5 mg	1 mL	>12–18 months
>11–14 kg	6 mg	1.2 mL	>18 months–3 years
>14–17.5 kg	7.5 mg	1.5 mL	>3–5 years
>17.5 kg	10 mg	2 mL	>5 years

MORPHINE

20.2 Acute severe pain (*pre-referral dose*), 22.4.1 Dyspnoea (*pre-referral dose*),

The dosing table is based on the following doses according to age:

- Morphine , oral, 0.05 mg/kg/dose 6 hourly in children aged 0-1 month.
- Morphine, oral, 0.1 mg/kg/dose 4-6 hourly in children 1-11 months.
- Morphine, oral, 0.2–0.4 mg/kg/dose 4–6 hourly in children > 12 months.

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months/years
		Syrup 1 mg/mL	**Tablet** 10 mg	
<4.4 kg	0.2 mg	0.2 mL	-	0–1 month
>5–9 kg	0.7 mg	0.7 mL		>1–11 months
>9–11 kg	2.5 mg	2.5 mL	–	>12–18 months
>11–14 kg	4 mg	4 mL	–	>18 months–3 years
>14–17.5 kg	5 mg	5 mL	–	>3–5 years
>17.5–25 kg	6 mg	6 mL	–	>5–7 years
>25 kg	10 mg	10 mL	1 tablet	>7 years

PARACETAMOL

1.1.1 Dental abscess; 1.3.3 Necrotising periodontitis; 1.4 Herpes simplex infections of the mouth and lips; 1.5 Apthous ulcer; 10.2 Chickenpox; 10.5 Fever; 10.7.1 Malaria, uncomplicated (fever in children < 5 years of age); 10.8 Measles; 10.10 Mumps; 10.11 Rubella (German measles); 10.14 Tick bite fever; 14.1 Arthralgia; 15.3.3 Febrile convulsions; 15.4.1 Meningitis, acute; 15.5 Headache, mild, non-specific; 17.2.1 Croup (laryngotracheobronchitis) in children; 17.3.1 Influenza; 18.1.2 Conjunctivitis, bacterial (excluding conjunctivitis of the newborn); 18.1.4 Conjunctivitis, viral (pink eye); 18.3.1 Eye injury, chemical burn; 18.3.3 Eye injury (blunt or penetrating); 19.2 Viral rhinitis (common cold); 19.4.2 Otitis, media, acute; 19.5 Sinusitis, acute, bacterial; 19.6 Tonsillitis and pharyngitis; 20.2 Acute pain; 20.3 Chronic non-cancer pain; 20.4 Chronic cancer pain; 21.3.1.3 Insect stings, scorpion stings and spider bites; 21.3.2 Burns; 21.14 Injuries; 21.3.8 Sprains; 21.3.7 Soft tissue injuries.

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required.

Weight kg	**Dose** mg	**Use one of the following:**		**Age** Months/years
		Syrup 120 mg/5mL	**Tablet** 500 mg	
>3.5–5 kg	48 mg	2 mL	–	>1–3 months
>5–7 kg	72 mg	3 mL	–	>3–6 months
>7–9 kg	96 mg	4 mL	–	>6–12 months
>9–11 kg	120 mg	5 mL	–	>12–18 months
>11–14 kg	144 mg	6 mL		>18 months–3 years
>14–17.5 kg	180 mg	7.5 mL		>3–5 years
>17.5–25 kg	240 mg	10 mL	½ tablet	>5–7 years
>25–35 kg	360 mg	15 mL		>7–11 years
>35–55 kg	500 mg	–	1 tablet	>11–15 years
>55 kg	1 000 mg		2 tablets	>15 years

PHENOBARBITAL

21.2.11 Seizures and status epilepticus.

- Phenobarbital, oral, crushed and given by nasogastric tube, 20 mg/kg as a single dose.

Weight kg	**Dose** mg	**Tablet** 30 mg	**Age** Months/ years
>2.5–3.5 kg	60 mg	2 tablets	Birth–1 month
>3.5–5 kg	75 mg	2½ tablets	>1–3 months
>5–7 kg	120 mg	4 tablets	>3–6 months
>7–11 kg	180 mg	6 tablets	>6–12 months
>11–14 kg	210 mg	7 tablets	>18 months–3 years

>14 kg	240 mg	8 tablets	>3 years

PRAZIQUANTEL

10.12 Schistosomiasis.

- Praziquantel, oral, 40 mg/kg as a single dose.

Weight kg	**Dose** mg	**Tablet** 600 mg	**Age** years
>12–17.5 kg	600 mg	1tablet	>2–5 years
>17.5–25 kg	900 mg	1½ tablet	>5–7 years
>25–35 kg	1 200 mg	2 tablets	>7–11 years
>35 kg	1 800 mg	3 tablets	>11 years

PROMETHAZINE

21.2.10 Anaphylaxis.

- Promethazine IM/slow IV.
  - Children > 2 years: 0.25 mg/kg.

Weight	**Dose**	**Use one of the following injections:**		**Age**
kg	mg	25 mg/mL	50 mg/2 mL	Months/years
>12–17.5 kg	2.5 mg	0.1 mL	0.1 mL	2–5 years
>17.5–25 kg	5 mg	0.2 mL	0.2 mL	>5–7 years
>25–35 kg	7.5 mg	0.3 mL	0.3 mL	>7–11 years
>35–55 kg	15 mg	0.6 mL	0.6 mL	>11–15 years
>55 kg	25 mg	1 mL	1 mL	>15 years

RITONAVIR

11.6 Management of HIV-infected children; 11.8.7 Tuberculosis (concomitant ARVs).

- Ritonavir, oral, 12 hourly (ONLY as booster for lopinavir/ritonavir, when on rifampicin) (see Annexure A)

ZIDOVUDINE

21.3.6.2 Post exposure prophylaxis, rape and sexual assault.

- Zidovudine, oral, 180-240 mg/m2 12 hourly. (*see antiretroviral drug dosing chart for children below*)

ANNEXURE A: ANTIRETROVIRAL DRUG DOSING CHART FOR CHILDREN

	Abacavir (ABC)	**Lamivudine (3TC)**	**Abacavir + Lamivudine (ABC + 3TC)**	**Dolutegravir (DTG)**	**Dolutegravir when on rifampicin**
Target dose	8 mg/kg **TWICE daily** **OR** If ≥ 10 kg: 16 mg/kg **ONCE daily**	4 mg/kg **TWICE daily** **OR** If ≥ 10 kg: 8 mg/kg **ONCE daily**	As for individual medications **ONCE daily**	By weight band **ONCE daily**	By weight band **TWICE daily**
Available formulations	Sol. 20 mg/mL Tabs 60 mg (scored, dispersible), 300 mg (not scored)	Sol. 10 mg/mL, Tabs 150 mg (scored)	Dispersible tablets (FDC): ABC/3TC 120/60 mg Tablet FDC: ABC/3TC 600/300 mg ABC/3TC/DTG 600/300/50 mg	Dispersible tabs (DT) 10 mg, film coated (FC) tabs 50 mg, FDC: TLD 300/300/50 mg **OR** ABC/3TC/DTG 600/300/50 mg **DT AND FC TABLETS ARE NOT BIOEQUIVALENT**	Dispersible tabs (DT) 10 mg, film coated (FC) tabs 50 mg, FDC: TLD 300/300/50 mg **OR** ABC/3TC/DTG 600/300/50 mg **DT AND FC TABLETS ARE NOT BIOEQUIVALENT**
Weight (kg)	Consult with a clinician experienced in paediatric ARV prescribing for neonates (< 28 days of age) and infants weighing < 3 kg.				
3–5.9	3 mL 12 hourly **OR** 1 x 60 mg tab 12 hourly	3 mL 12 hourly	1 x 120/60 mg tab daily	0.5 x 10 mg DT daily	0.5 x 10 mg DT 12 hourly
6-9.9	4 mL 12 hourly **OR** 1.5 x 60 mg tabs 12 hourly	4 mL 12 hourly	1.5 x 120/60 mg tabs daily	1.5 x 10 mg DT daily	1.5 x 10 mg DT 12 hourly
10–13.9	4 x 60 mg tabs daily **OR** 12 mL daily	12 mL daily	2 x 120/60 mg tabs daily	2 x 10 mg DT daily	2 x 10 mg DT 12 hourly

<table>
<tr><th></th><th>Abacavir
(ABC)</th><th>Lamivudine
(3TC)</th><th>Abacavir +
Lamivudine
(ABC + 3TC)</th><th>Dolutegravir
(DTG)</th><th>Dolutegravir when on rifampicin</th></tr>
<tr><td>14–19.9</td><td>5 x 60 mg tabs daily
OR
1 x 300 mg tab daily</td><td>1 x 150 mg tab daily</td><td>2.5 x 120/60 mg tabs daily</td><td>2.5 x 10 mg DT daily</td><td>2.5 x 10 mg DT
12 hourly</td></tr>
<tr><td>20–24.9</td><td>1 x 300 mg tab
PLUS
1 x 60 mg tab daily
OR
6 x 60 mg tabs daily</td><td rowspan="4">2 x 150 mg tabs daily</td><td rowspan="4">1 x ABC/3TC 600/300 mg tab daily
OR
ABC/3TC/DTG FDC (600/300/50 mg) if eligible, daily</td><td>3 x 10 mg DT daily
OR
1 x 50 mg FC tab daily</td><td>3 x 10 mg DT 12 hourly
OR
1 x 50 mg FC tab
12 hourly</td></tr>
<tr><td>25–29.9</td><td rowspan="3">2 x 300 mg tabs daily</td><td>1 x 50 mg tab daily
OR
FDC: ABC/3TC/DTG 600/300/50 mg tab daily</td><td>1 x 50 mg tab 12 hourly
OR
FDC: ABC/3TC/DTG 600/300/50 mg tab
12 hourly</td></tr>
<tr><td>30–39.9</td><td rowspan="2">1 x 50 mg FC tab daily
OR
FDC: TLD if eligible daily
OR
FDC: ABC/3TC/DTG if eligible daily</td><td rowspan="2">1 x 50 mg FC tab
12 hourly
OR
FDC: TLD if eligible daily + 50 mg DTG FC tab 12 hours later
OR
FDC: ABC/3TC/DTG if eligible daily + 50 mg DTG FC tab 12 hours later</td></tr>
<tr><td>≥ 40</td></tr>
</table>

	Lopinavir/ritonavir (LPV/RTV)	**Abacavir + Lamivudine + Lopinavir/ ritonavir**	**Lopinavir/ritonavir when on rifampicin (and for 2 weeks after stopping rifampicin)** ***Choose one of the 2 options below as appropriate***		**#Atazanavir (ATV) + ritonavir (RTV)**	**Efavirenz (EFV)**	**Zidovudine (AZT)**
Target dose	300/75 mg/m^2/dose LPV/RTV **TWICE daily**	By weight band **TWICE daily**	LPV/RTV std dose + super-boosting with ritonavir (RTV) powder **TWICE daily** (≥ 0.75 x LPV dose 12 hourly)	Double-dose LPV/RTV tabs ONLY if able to swallow whole LPV/RTV tabs **TWICE daily**	By weight band **ONCE daily**	By weight band **ONCE daily**	180–240 mg/m^2/dose **TWICE daily**
Available formulations	Sol. 80/20 mg/mL Adult tabs 200/50 mg, Paed tabs 100/25 mg **TABLETS MUST BE SWALLOWED WHOLE** Pellets 40/10 mg per capsule **ONLY FOR USE IF NOT TOLERATING LPV/RTV SOLUTION. CAPSULES ARE NOT RECOMMENDED < 6 MONTHS OF AGE**	Caps 30/15/ 40/10 mg **IF PATIENT IS ON RIFAMPICIN TB TREATMENT, ADD RTV POWDER** (next column)	Oral powder 100 mg per packet	Adult tabs 200/50 mg, Paed tabs 100/25 mg	ATV caps 150, 200 mg: RTV tabs 100 mg; FDC: ATV/RTV 300/100 mg; **RTV TABLETS AND ATV/R FDC TABLETS MUST BE SWALLOWED WHOLE**	Caps/tabs 50, 200, 600 mg; FDC: TEE 300/200/600 mg; **TABLETS MUST BE SWALLOWED WHOLE**	Sol. 10 mg/mL Tabs 100 mg, 300 mg (not scored), AZT/3TC 300/150 mg
Weight (kg)	Consult with a clinician experienced in paediatric ARV prescribing for neonates (< 28 days of age) and infants weighing < 3 kg.						

<table>
<tr><th></th><th>Lopinavir/ritonavir (LPV/RTV)</th><th>Abacavir + Lamivudine + Lopinavir/ ritonavir</th><th colspan="2">Lopinavir/ritonavir when on rifampicin (and for 2 weeks after stopping rifampicin)
Choose one of the 2 options below as appropriate</th><th>#Atazanavir (ATV) + ritonavir (RTV)</th><th>Efavirenz (EFV)</th><th>Zidovudine (AZT)</th></tr>
<tr><td>3–5.9</td><td>*1 mL 12 hourly
OR
2 capsules 12 hourly</td><td>2 capsules
12 hourly</td><td rowspan="2">LPV/RTV std dose
PLUS
oral RTV powder 100 mg (1 packet) 12 hourly</td><td rowspan="2">Do not use double-dose LPV/RTV tabs</td><td rowspan="2">Not recommended</td><td rowspan="2">Not recommended</td><td>6 mL 12 hourly</td></tr>
<tr><td>6–9.9</td><td>*1.5 mL 12 hourly
OR
3 capsules 12 hourly</td><td>3 capsules
12 hourly</td><td>9 mL 12 hourly</td></tr>
<tr><td>10–13.9</td><td>2 mL 12 hourly
OR
4 capsules 12 hourly
OR
2 x 100/25 mg paed tabs in morning PLUS
1 x 100/25 mg paed tab at night</td><td>4 capsules
12 hourly</td><td rowspan="2">LPV/RTV std dose
PLUS
oral RTV powder 200 mg (2 packets) 12 hourly</td><td>3 x 100/25 mg tabs 12 hourly</td><td rowspan="2">ATV 1 x 200 mg cap daily
PLUS
RTV 1 x 100 mg tab or 100 mg oral powder (1 packet) daily</td><td>1 x 200 mg cap/tab at night</td><td>12 mL 12 hourly
OR
1 x 100 mg tab 12 hourly</td></tr>
<tr><td>14–19.9</td><td>2.5 mL 12 hourly
OR
5 capsules 12 hourly
OR
2 x 100/25 mg paed tabs 12 hourly
OR
1 x 200/50 mg adult tab 12 hourly</td><td>5 capsules
12 hourly</td><td>4 x 100/25 mg paed tabs 12 hourly
OR
2 x 200/50 mg adult tabs 12 hourly</td><td>1 x 200 mg cap/tab + 2 x 50 mg caps/tabs at night</td><td>2 x 100 mg tab in morning
PLUS
1 x 100 mg tab at night
OR
15 mL 12 hourly</td></tr>
</table>

<table>
<tr><th></th><th>Lopinavir/ritonavir (LPV/RTV)</th><th>Abacavir + Lamivudine + Lopinavir/ ritonavir</th><th colspan="2">Lopinavir/ritonavir when on rifampicin (and for 2 weeks after stopping rifampicin)
Choose one of the 2 options below as appropriate</th><th>#Atazanavir (ATV) + ritonavir (RTV)</th><th>Efavirenz (EFV)</th><th>Zidovudine (AZT)</th></tr>
<tr><td>20–24.9</td><td>3 mL 12 hourly
OR
6 capsules 12 hourly
OR
2 x 100/25 mg paed tabs 12 hourly
OR
1 x 200/50 mg adult tab 12 hourly</td><td>6 capsules 12 hourly</td><td></td><td></td><td></td><td></td><td>2 x 100 mg tabs 12 hourly
OR
20 mL 12 hourly</td></tr>
<tr><td>25–29.9</td><td>3.5 mL 12 hourly
OR
7 capsules 12 hourly
OR
3 x 100/25 mg paed tabs 12 hourly
OR
1 x 200/50 mg adult tab 12 hourly PLUS 1 x 100/25 mg paed tab 12 hourly</td><td rowspan="3">Not recommended</td><td rowspan="3">LPV/RTV std dose
PLUS
oral RTV powder 300 mg (3 packets) 12 hourly</td><td>6 x 100/25 mg paed tabs 12 hourly
OR
3 x 200/50 mg adult tabs 12 hourly</td><td rowspan="3">1 x ATV/RTV 300/100 mg FDC daily
OR
ATV 2 x 150 mg caps daily
PLUS
RTV 1 x 100 mg tab or 100 mg oral powder (1 packet) daily</td><td rowspan="2">2 x 200 mg caps/tabs at night</td><td rowspan="3">1 x 300 mg tab 12 hourly
OR
1 x AZT/3TC 300/150 mg tab 12 hourly</td></tr>
<tr><td>30–39.9</td><td rowspan="2">5 mL 12 hourly
OR
10 capsules 12 hourly
OR
4 x 100/25 mg paed tabs 12 hourly
OR</td><td rowspan="2">8 x 100/25 mg paed tabs 12 hourly
OR</td></tr>
<tr><td>≥ 40</td><td>2 x 200 mg caps/tabs at night
OR
FDC: TEE if eligible, daily</td></tr>
</table>

	Lopinavir/ritonavir (LPV/RTV)	**Abacavir + Lamivudine + Lopinavir/ ritonavir**	**Lopinavir/ritonavir when on rifampicin (and for 2 weeks after stopping rifampicin)** ***Choose one of the 2 options below as appropriate***		**#Atazanavir (ATV) + ritonavir (RTV)**	**Efavirenz (EFV)**	**Zidovudine (AZT)**
	2 x 200/50 mg adult tabs 12 hourly			4 x 200/50 mg adult tabs 12 hourly			

Source: Child and Adolescent Committee of the SA HIV Clinicians Society in collaboration with the Department of Health: Antiretroviral drug dosing chart for children, 2022: https://sahivsoc.org/Files/PaedDosingChart_2022.pdf

GUIDELINES FOR THE MOTIVATION OF A NEW MEDICINE ON THE NATIONAL ESSENTIAL MEDICINES LIST

Section 1: Medication details

» Generic name
A fundamental principle of the Essential Drug Programme is that of generic prescribing. Most clinical trails are conducted using the generic name.

» Proposed indication
There will usually be many registered indications for the medication. However, this section should be limited to the main indication which is supported by the evidence provided in section 2.

» Prevalence of the condition in South Africa
This information is not always readily available. However, it is an important consideration in the review of a proposed essential medicine.

» Prescriber level
Here the proposed prescriber level should be included. If more than one level is proposed each relevant box should be ticked.

Section 2: Evidence and motivation

» Estimated benefit
- Effect measure: this is the clinical outcome that was reported in the clinical trial such as BP, FEV, CD_4, VL etc.
- Risk benefit: this should reported in the clinical trial and, in most cases, includes the 95% confidence level (95% CI). Absolute risk reduction, also termed risk difference, is the difference between the absolute risk of an event in the intervention group and the absolute risk in the control group.
- Number Need to Treat (NNT): gives the number of patients who need to be treated for a certain period of time to prevent one event. It is the reciprocal of the absolute risk or can be calculated using the formula on page xxxv.

Calculations

	Bad outcome	Good outcome	Total patients
Intervention group	*a*	*c*	*a + c*
Control group	*b*	*d*	*b + d*

Measure	Equation
Absolute risk:	[b/(b+d)] – [a/(a+c)]
Number needed to treat	$\frac{1}{[b/(b+d)] - [a/(a+c)]}$
Relative risk	[a/(a+c)] ÷ [b/(b+d)]
Odds ratio	$\frac{[a/(a+c)] \div [c/(a+c)]}{[b/(b+d)] \div [d/(b+d)]} = (a/c) \div (b/d)$

Reference - Aust Prescr 2008;31:12–16)

» Motivating information (**Level of evidence based on the SORT system**)
  – The National Essential Medicines List Committee has endorsed the adoption of the SORT system for categorising levels of evidence. This system[1] contains only three levels:

Level I	Good quality evidence	Systematic review of RCTs with consistent findings High quality individual RCT
Level II	Limited quality patient oriented evidence	Systematic review of lower quality studies or studies with inconsistent findings Low quality clinical trial Cohort studies Case-control studies
Level III	Other	Consensus guidelines, extrapolations from bench research, usual practice, opinion, disease-oriented evidence (intermediate or physiologic outcomes only), or case series

A: Newer product: for most newer products, level I evidence such as high quality systematic reviews or peer-reviewed high quality randomised controlled trials should be identified and referenced in the space provided.

B: Older products: many of these products were developed prior to the wide use of randomised controlled trials. However, there may be level I evidence where the product was used as the control arm for a newer product. If no level I

[1] Ebell MH, Siwek J, Weiss BD, et al. Strength of recommendation taxonomy (SORT): a patient-centered approach to grading evidence in the medical literature. Am Fam Physician. 2004;69:550-6.

evidence can be identified, then level II data from poorer quality controlled trials or high quality observational studies should be referenced in the space provided.

» Cost considerations
  - Where a published reference supporting the review of cost is available comments should be made regarding its applicability to the South African public sector environment.
  - Possible unpublished information that can be included:
    - Cost per daily dose or course of therapy – for long term or chronic therapy such as hypertension the usual daily dose should be calculated (Dose x number of times a day) and converted into the number of dosing units e.g. tablets. This is then used to calculate the cost per day. For medications used in a course of therapy such as antibiotics this is then multiplied by the number of days in the course of therapy.
    - Cost minimisation is used where there is evidence to support equivalence and aims to identify the least costly treatment by identifying all the relevant costs associated with the treatment.
    - Cost-effectiveness analysis is used to compare treatment alternatives that differ in the degree of success in terms of the therapeutic or clinical outcome. By calculating a summary measurement of efficiency (a cost-effectiveness ratio), alternatives with different costs, efficacy rates, and safety rates can be fairly compared along a level playing field.

Where any of these have been performed tick the relevant block and send as an attachment with all the calculations. If possible, the spread sheet should be supplied electronically.

Section 3: Motivator's Details

The receipt of all submission will be acknowledged. In addition, all decisions with supporting arguments will be communicated where appropriate. This section therefore forms a vital link between the motivator and the decision making process.

Note: The evidence for decisions informing the selection of a medicine is cited in the STGs, with the respective level of evidence. For example, the following abbreviation is used to describe good quality RCT evidence: '*LoE: I'*.
Where possible, hyperlinks are provided for cited evidence.
The rationale for decision-making may be sourced from the relevant medicine reviews, costing analysis reports or NEMLC reports which are accessible from the National Department of Health website at: https://www.health.gov.za/nhi-edp-stgs-eml/

DEPARTMENT OF HEALTH
Republic of South Africa

Motivation form for the inclusion of a new medication on the National Essential Medicines List

Section 1: Medication details			
Generic name (or International Non-proprietary Name):			
Proposed indication:			
Prevalence of condition (based on epidemiological data, if any):			
Prescriber level			
Primary Health Care 1	Medical Officer 2	Specialist 3	Designated Specialist 4

Section 2: Evidence and motivation			
2.1 Estimated benefit			
Effect measure			
Risk difference (95% CI)			
NNT			
2.2: Motivating information (Level of evidence based on the SORT system)			
A. Newer product: High quality systematic reviews or peer-reviewed high quality randomised controlled trials (Level I)			
Author	Title		Journal ref
B. Older product with weaker evidence base: Poorer quality controlled trials or high quality observational studies (Level II)			
Author	Title		Journal ref
2.3: Cost-considerations			
Have you worked up the cost?	YES		NO
	Daily cost	Cost minimisation	Cost-effectiveness analysis
Other relevant cost information if available:			
Author	Title		Journal ref
2.4: Additional motivating comments.			

Section 3: Motivator's Details	
Name:	**Date submitted:**
Qualification:	**Registration number:**
PTC motivation: Y/N	**PTC Details:**
PTC Chair:	**PTC Chair signature:**

GUIDELINES FOR ADVERSE DRUG REACTION REPORTING

National Pharmacovigilance Programme

The South African Health Products Regulatory Authority (SAHPRA) has a responsibility to ensure the safety, efficacy and quality of all medicines used by the South African public. The National Pharmacovigilance Programme is coordinated by the SAHPRA and has a dedicated Unit, Pharmacovigilance, at the SAHPRA head office, in Pretoria, which monitors the safety of all registered medicines in South Africa.

What is Pharmacovigilance?

Pharmacovigilance is defined as the science and activities concerned with the detection, assessment, understanding and prevention of adverse reactions to medicines (i.e. adverse drug reactions or ADRs). The ultimate goal of this activity is to improve the safe and rational use of medicines, thereby improving patient care and public health.

What is an Adverse Drug Reaction (ADR)?

SAHPRA defines an Adverse Drug Reaction (ADR) as a response to a medicine which is noxious and unintended, including lack of efficacy, and which occurs at any dosage and can also result from overdose, misuse or abuse of a medicine.

Who should report Adverse Drug Reactions?

All health care workers, including doctors, dentists, pharmacists, nurses and other health professionals are encouraged to report all suspected adverse reactions to medicines (including vaccines, X-ray contrast media, traditional and herbal remedies), especially when the reaction is not in the package insert, potentially serious or clinically significant.

According to Regulation 40 of the Medicines and Related Substances Act, 1965 (Act 101 of 1965) as

amended: A healthcare professional /provider, veterinarian or any other person should inform the SAHPRA, in the manner as determined by the Authority, of any:

- suspected ADRs/AEFIs; or
- new or existing safety, quality or effectiveness concerns, occurring as a result of the use of any medicine or scheduled substance

What happens to a report?

All ADR reports are entered into a national ADR database. Each report is evaluated to assess the causal relationship between the event and the medicine. A well-completed adverse drug reaction/product quality form submitted could result in any of the following:

» additional investigations into the use of the medicine in South Africa;
» educational initiatives to improve the safe use of the medicine;
» appropriate package insert changes to include the potential for the reaction, and
» changes in the scheduling or manufacture of the medicine to make it safer.

The purpose of ADR reporting is to reduce the risks associated with the use of medicines and to ultimately improve patient care.

Will reporting have any negative consequences on the health worker or the patient?

An adverse drug reaction report does not constitute an admission of liability or that the health professional contributed to the event in any way. The outcome of a report, together with any important or relevant information relating to the reaction, will be sent back to the reporter as appropriate. The details of a report are stored in a confidential database. The names of the reporter or any other health professionals named on a report and that of the patient will be removed before any details about a specific adverse drug reaction are used or communicated to others. The information is only meant to improve the understanding of the medicines used in the country.

Is the event possibly an ADR?

The following factors should be considered when an adverse drug reaction is suspected:

1. What exactly is the nature of the reaction? (*Describe the reaction as clearly as possible and where possible provide an accurate diagnosis.*)
2. Did the reaction occur within a reasonable time relationship to starting treatment with the suspected medicine? *(Some reactions occur immediately after administration of a medicine while others take time to develop.)*
3. Is the reaction known to occur with the particular medicine as stated in the package insert or other reference? *(If the reaction is not documented in the package insert, it does not mean that the reaction cannot occur with that particular medicine.)*
4. Did the patient recover when the suspected medicine was stopped? *(Some reactions can cause permanent damage, but most reactions are reversible if the medication is stopped.)*
5. Did the patient take the medicine again after the reaction abated (i.e. rechallenge). If so, did the same reaction occur again? *(In most situations it is not possible or ethical to rechallenge the patient with the same medicine. If such information is available or if such a rechallenge is necessary, recurrence of the event is a strong indicator that the medicine may be responsible.)*
6. Can this reaction be explained by other causes (e.g. underlying disease/s; other medicine/s; toxins or foods)? *(It is essential that the patient is thoroughly investigated to decide what the actual cause of any new medical problem is. A medicine-related cause should be considered, when other causes do not explain the patient's condition.)*

What types of reactions should be reported?

The following adverse drug reactions should be reported:

- All ADRs to newly marketed drugs or new medicines added to the EML.
- All serious reactions and interactions
- ADRs that are not clearly stated in the package insert.
- All adverse reactions or poisonings to traditional or herbal remedies

Report even if you are not certain that the medicine caused the event.

What Product Quality Problems should be reported?

The following product quality problems should be reported:

- suspected contamination;
- questionable stability;
- defective components;
- poor packaging or labeling;
- therapeutic failures.

How can ADRs be prevented from occurring?

Some ADRs are unavoidable and cannot be prevented. However, most ADRs can be prevented by following the basic principles of rational use of medicines.

How are adverse drug reactions reported?

An Adverse Drug Reaction/Product Quality Report Form is enclosed in this book and should be completed in as much detail as possible before returning it by fax or post to any of the addresses provided below. Additional forms can be obtained by contacting the SAHPRA at these addresses. Reporting forms may also be accessed via the SAHPRA website: https://www.sahpra.org.za/

1. The CEO OF SAHPRA

South African Health Products Regulatory Authority (SAHPRA), Private Bag X828
Pretoria, 0001
Tel: (012) 5010311; E-mail: adr@sahpra.org.za

2. South African Health Products Regulatory Authority (SAHPRA)

Head Office
Building A, Loftus Park, 402 Kirkness Street
Arcadia, Pretoria, 0001
Tel: (012) 501 0300

Doc Number: GLF-CEM-PV-06A *[Old Doc no. 6.04]*	**ADVERSE DRUG REACTION (ADR)/ PRODUCT QUALITY PROBLEM REPORT FORM** **(PUBLIC AND PRIVATE SECTOR) (Including Herbal Products)**	SAHPRA South African Health Products Regulatory Authority
Revision: 3.0		Effective date: 11 October 2023

See Page 2 for CONSENT CLAUSE, more information regarding reporting of PRODUCT QUALITY PROBLEMS and ADVERSE EVENTS FOR VACCINES

Reporting Health Care Facility/Practice

Building A, Loftus Park **402 Kirkness Street, Arcadia,** **Pretoria** **Tel: (012) 501 0311** **E-mail: adr@sahpra.org.za**	Facility/Practice			
	District		Tel	
	Province		Fax	

Patient Details

Patient Initials		File/Reference Number				Date of Birth/Age			
Sex	☐M ☐F ☐Unk	Race		Weight (kg)		Height (cm)		Pregnant?	☐N ☐Y
Allergies		☐ **Follow up report** **Reference number:** _____						Estimated gestational age at time of reaction	

Suspect Medicine(s) [Medicines suspected to have caused the ADR], Concomitant [Other medicines taken together with the suspect medicine(s)] OR Interacting [Other medicines taken together with the suspect medicine(s)] [Including over the counter and herbal products].

Trade Name [Active Ingredient if Trade Name is unknown]	Medicine role (Please tick the applicable box)	Route	Dose (mg) and Interval	Date Started/ Given	Date Stopped	Reason for use	Batch Number	Expiry Date
	☐ Suspect ☐ Concomitant ☐ Interacting							
	☐ Suspect ☐ Concomitant ☐ Interacting							
	☐ Suspect ☐ Concomitant ☐ Interacting							
	☐ Suspect ☐ Concomitant ☐ Interacting							
	☐ Suspect ☐ Concomitant ☐ Interacting							

Adverse Drug Reaction/Product Quality Problem

Date and time of onset of reaction		Date reaction resolved	

Please describe Adverse Event/Product Quality Problem: (kindly add as much clinical information as possible)

Intervention (Tick all that apply)	**Patient Outcomes** (Tick all that apply)	**ADR seriousness criteria** (Tick all that apply)
☐ No intervention. ☐ Intervention unknown. ☐ Patient counselled/non-medical treatment. ☐ Discontinued suspect drug; **Replaced with**: _____ ☐ Decreased suspect drug dosage; **New Dose**: _____ ☐ Treated ADR – with: _____ ☐ Referred to hospital: **Hospital name**_____ ☐ Other intervention (e.g., dialysis): _____	☐ ADR recovered/resolved. ☐ Recovering/resolving. ☐ Not recovered/not resolved. ☐ Recovered with sequelae. ☐ ADR resolved after suspect medicine was stopped: ☐N ☐Y. ☐ ADR reappeared after restarting suspect drug/similar drug (rechallenge): ☐N ☐Y ☐ Not done ☐ Unknown	☐ Resulted in death. Date of death: _____ ☐ Patient hospitalised or hospitalisation prolonged. ☐ Life threatening. ☐ Impairment/disability. ☐ Congenital anomaly/ birth defect. ☐ Other medically important condition.

Laboratory Results			**Additional Laboratory Results**		
Lab Test	**Test Result**	**Test Date**	**Lab Test**	**Test Result**	**Test Date**

Co-morbidities/Other Medical Condition(s)

Reported by				
Name		E-mail		
Designation	☐Nurse ☐Pharmacist ☐Doctor ☐Other:		Telephone	
Date reported:			Signature	

THIS ADR REPORT IS NOT A CONFIRMATION THAT THE REPORTER OR THE SUSPECT MEDICINE(S) CAUSED THE ADR

ADVICE ABOUT VOLUNTARY REPORTING

Report adverse experiences with:

- medications (medicines and biologicals),
- complementary / alternative medicines (including traditional, herbal remedies, etc).

Please report especially:

- adverse drug reactions to newly marketed products,
- serious reactions and interactions with all products,
- adverse drug reactions which are not clearly reflected in the package insert.

Report Product Quality Problems such as:

- suspected contamination,
- questionable stability,
- defective components,
- poor packaging or labelling,
- therapeutic failures.

Report even if:

- you're not certain the product caused the event,
- you don't have all the details.

Report adverse events experiences with Medical Device via:

- phone: 012 501 0476
- mdvigilance@sahpra.org.za

Report Adverse Events Following Immunisation (AEFI) experienced with vaccines on:

- the dedicated Case Reporting Form accessed from SAHPRA portal: https://www.sahpra.org.za/health-products-vigilance/
- forward the dedicated form to AEFI@health.gov.za
- phone: 0800 02 9999.

Report Product Quality Problems via:

- phone: 0800 204 307

SAHPRA portal: https://www.sahpra.org.za/complaints-relating-to-medicine-and-medical-devices/

Other reporting tools available at SAHPRA include:

Med Safety Application

The Med Safety Application is a mobile application designed for the public and healthcare professionals to report suspected ADRs/adverse event following immunisations (AEFIs). It is the preferred reporting tool by SAHPRA and allows for a seamless electronic submission of ADR/AEFI reports directly from the source into SAHPRA's reporting systems. The app can be downloaded onto a smart mobile phone directly from the SAHPRA website, https://medsafety.sahpra.org.za.
For more reporting channels please visit SAHPRA website, https://www.sahpra.org.za

CONSENT CLAUSE

By the signature above, the reporter hereby provides consent to the processing of personal information provided for the purpose of reporting a suspected adverse reaction. The reporter acknowledges that this information may be used a) to access all medical and clinical records for the purpose of gathering additional information for a clinical meaningful data, when required; b) in the generation of statistics; and c) to make policy decisions relating to safe use of medicines.

SAHPRA's Vigilance unit undertakes to collate the personal information contained in this form and collected during the process of reporting of suspected adverse drug reaction in a manner that adheres to the Protection of Personal Information Act, so that your personal data is processed fairly, lawfully and transparently, adequate, relevant, and limited to what is necessary, processed for specific and legitimate purposes, accurate and kept up to date where necessary, kept in an identifiable form no longer than necessary for the purpose and processed securely . SAHPRA has placed appropriate technical and organisational measures to safeguard your information. The information will not be stored for any longer than is necessary to achieve the purpose for which it was collected, unless the unit has a lawful basis to do so. If the reporter wishes to access and/or rectify their personal information, they may do so by contacting SAHPRA's Vigilance unit at 012 501 0311 or via email: adr@sahpra.org.za.

Confidentiality:

Identities of the reporter and patient will remain strictly confidential.

Your support of the South African Health Products Regulatory Authority's adverse drug reaction monitoring programme is much appreciated. Information supplied by you will contribute to the improvement of medicine safety and therapy in South Africa.

DISEASE NOTIFICATION PROCEDURES

The International Health Regulations, 2005 (IHR) and the National Health Act, 61 0f 2003 in South Africa require the rapid detection of notifiable medical conditions (NMC), as well as the prompt risk assessment, notification, verification and implementation of timely interventions.

NMCs are diseases that are of public health importance because they pose significant public health risks that can result in disease outbreaks or epidemics with high case fatality rates both nationally and internationally.

Identification of diseased persons and implementation of necessary public health actions to ensure that the disease is not spread to other people can control spread of infectious diseases within the population. Real-time surveillance and reporting NMCs provides an early warning signal and a window of opportunity to interrupt the disease transmission cycle.

Who should notify

The first health care professional to come into contact with a patient presenting with one of the prescribed NMCs is required by law to notify. This may include clinic personnel, infection control nurses, other hospital staff or private medical practitioners. Any member of the community aware of or who reasonably suspects that a person in the community is a case or carrier must immediately report this to the nearest medical health establishment for reporting of the NMC.

Which diseases to notify

Notifiable medical conditions have been sub-divided into two categories according to type of disease:

Category 1 NMC: Requires to be reported immediately using the most rapid means upon clinical or laboratory diagnosis followed by a written or electronic notification within 24 hours of diagnosis.

Category 2 NMC: Requires to be reported through a written or electronic notification, within 7 days of of clinical or laboratory diagnosis but preferably as soon as possible following diagnosis.

Reporting a Notifiable Disease during an outbreak

During an outbreak of a notifiable disease, report all cases electronically or by phone, email or fax. Daily reporting by health facilities should be maintained through an Outbreak Case Line Listing Form as well through the notification form (GW17/5) to the local health authority that must report to the provincial health officials and the National Department of Health.

How to notify
Electronically:
- Electronic reporting via the NMC mobile or web-based APP: https://www.nicd.ac.za/nmc-overview/notification-process/

Paper-based:
- Complete the case-based form (*GW 17/5*)
- Send the NMC Case Notification Form to NMCsurveillanceReport@nicd.ac.za or fax to 086 639 1638 or NMC hotline 072 621 3805. Form(s) can be sent via sms, whatsapp, email, fax.
- Send a copy to the NMC focal person at Sub-District/District

Any person contracting a notifiable disease and then dies from the disease should be notified twice: first as a **"CASE"** and then later as a **"DEATH".** This will ensure that when estimating the **"Case Fatality Rate"** (CFR%), all deaths in the numerator are also included in the denominator.

National NMC contact details:
Helpline: 072 621 3805
Fax no: 086 639 1638
Sms/whatsup line (for copy/photograph submissions): 072 621 3805
Email address: NMCsurveillanceReport@nicd.ac.za

List of Notifiable Medical Conditions

Category 1: *Immediate notification (within 24 hours) of diagnosis*
Acute flaccid paralysis
Acute rheumatic fever
Anthrax
Botulism
Cholera
Coronavirus disease-2019 (COVID-19)
Diphtheria
Enteric fever (typhoid or paratyphoid fever)
Food borne disease outbreak
Haemolytic uraemic syndrome (HUS)
Listeriosis
Malaria
Measles
Meningococcal disease
Multisystem inflammatory syndrome (MIS-C)
Pertussis
Plague
Poliomyelitis
Rabies (human)
Respiratory disease caused by a novel respiratory pathogen

Rift valley fever (human)
Smallpox
Viral haemorrhagic fever diseases
Yellow fever

Category 2: *Notification within seven days of diagnosis*
Agricultural or stock remedy poisoning
Bilharzia (schistosomiasis)
Brucellosis
Congenital rubella syndrome
Congenital syphilis
Haemophilus influenzae type B
Hepatitis A
Hepatitis B
Hepatitis C
Hepatitis E
Lead poisoning
Legionellosis
Leprosy
Maternal death (pregnancy, childbirth and puerperium)
Mercury poisoning
Soil transmitted helminths
Tetanus
Tuberculosis: pulmonary
Tuberculosis: extra-pulmonary
Tuberculosis: multidrug-resistant (MDR-TB)
Tuberculosis: extensively drug-resistant (XDR-TB)

USING THE ROAD TO HEALTH BOOKLET

Check and update the Road to Health booklet at each consultation and on each admission and discharge.

The South African Road to Health Booklet is an extremely important document for the child and family,
It is designed to support and integrate the various child health strategies such as IMCI, EPI, TB and HIV care and the Integrated Nutrition Programme. It reminds health care workers to look for, respond to, and record important events and care given to the child.

OWNERSHIP OF THE BOOKLET
The Road to Health Booklet is the exclusive property of the parent (primary caregiver) and the child. This is important as the booklet contains information on the child's health including HIV status, and if the booklet is used for other purposes, mothers may hide the booklet or refuse to allow important information to be recorded in it. This can result in the child receiving less than optimal care

USE OF THE ROAD TO HEALTH BOOKLET
Issuing the Road to Health Booklet
At birth all children should be issued with a Road to Health Booklet – in which all vital information is recorded including:

- » Name and date of birth
- » Details of child and family
- » Neonatal information
- » Immunisations at birth
- » PMTCT/HIV information

Use at health service contacts
On the cover the booklet states:

"IMPORTANT: always bring this booklet when you visit any health clinic, doctor or hospital"

To use the booklet effectively the attending nurse or doctor should ask, at each attendance, to see the Road to Health booklet both due to its intrinsic value as part of a child health consultation and to emphasise the importance of the booklet and its use to the mother.

On each visit complete/record appropriately

» Well child visit routine care (incl. growth, TB status, PMTCT HIV status, feeding etc.).
» Immunisations given.
» Information on the HIV status of the mother and child (if HIV-exposed).
» Vitamin A and deworming.
» Weight for age, length/height for age and weight for length/height charting.
» Any clinical notes (ideally using IMCI classification, treatment and follow up should be made in the clinical notes).
» Any hospital admissions should be recorded.

During the health visit certain care given will depend on whether this is a scheduled well child visit, a follow-up visit, or a first attendance for a new illness.

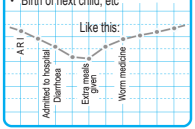
<table>
<tr><th>Well child visit</th><th>Sick child consultation</th><th>Follow up consultation</th></tr>
<tr><td colspan="3">Greet mother and child</td></tr>
<tr><td>Ask why she has come and whether she has any concerns.</td><td>Ask why she has come and what her concerns are.</td><td>Ask how the child is and whether any further concerns have arisen.</td></tr>
<tr><td colspan="3">Ask for Road to Health Booklet and use it.</td></tr>
<tr><td>If the child has an illness, proceed to sick child consultation (IMCI) in addition to the well child consultation.</td><td>Proceed to sick child consultation (IMCI).
Ensure that promotive aspects of IMCI (nutrition, immunisations, HIV and TB status) are covered.</td><td>Carry out the follow-up process from IMCI, but also check the well child consultation.</td></tr>
<tr><td colspan="3">Check and record all due visit items – see above.</td></tr>
<tr><td>Carry out and record the well child visit.
Note and respond to any other problems identified.</td><td colspan="2">Manage the child according to IMCI classification.
Follow up as required.
Carry out and record the well child visit.
Note and respond to any other problems identified.</td></tr>
<tr><td colspan="3">Tell mother what has been done, what was found and what this means.
Ensure the mother knows when to follow up for the next well child visit, and when to come if the child is ill or for other scheduled follow up.</td></tr>
</table>

Boy's Weight-for-Age Chart

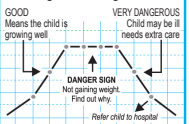
Write on the chart

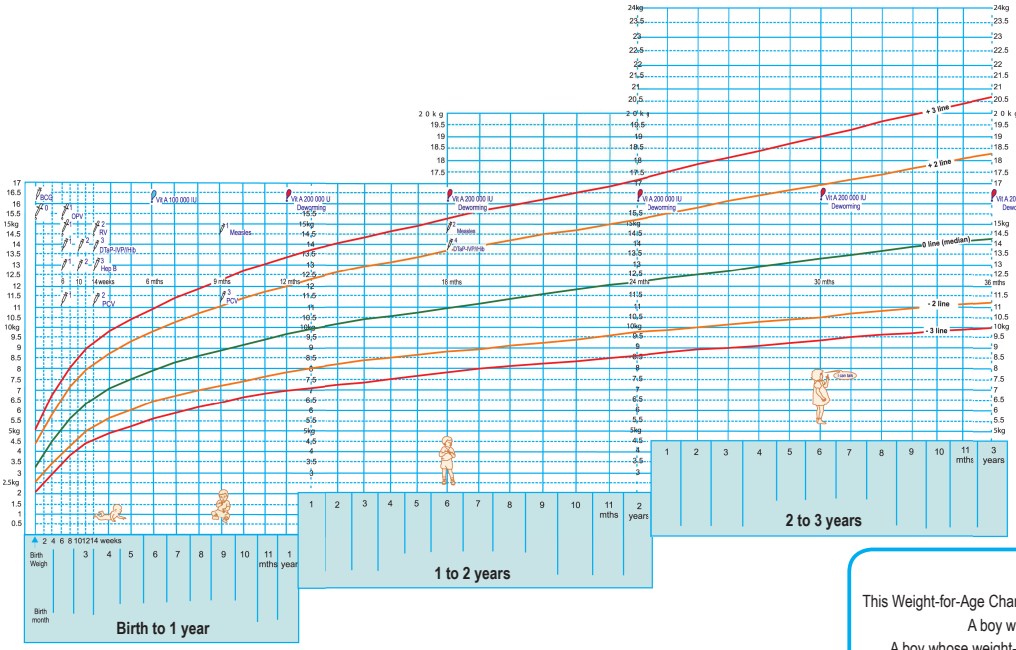
- Any illness e.g. diarrhoea, ARI etc.
- Admission to hospital
- Solids introduced
- Breastfeeding stopped
- Birth of next child, etc

Like this:



Watch the direction of the curve showing the child's growth:





Interpretation of lines:

This Weight-for-Age Chart shows body-weight relative to age in comparison to the Median (0-line).

A boy whose weight-for-age is below the -2 line, is underweight.

A boy whose weight-for-age is below the -3 line, is severely underweight. Clinical signs of Marasmus or Kwashiokor may be observed.

If his line crosses a z-score line and the shift is away from the median, this may indicate a problem or risk of a problem.

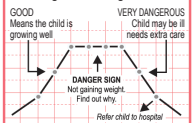
If his line stays close to the median, occasionally crossing above or below it, this is fine.

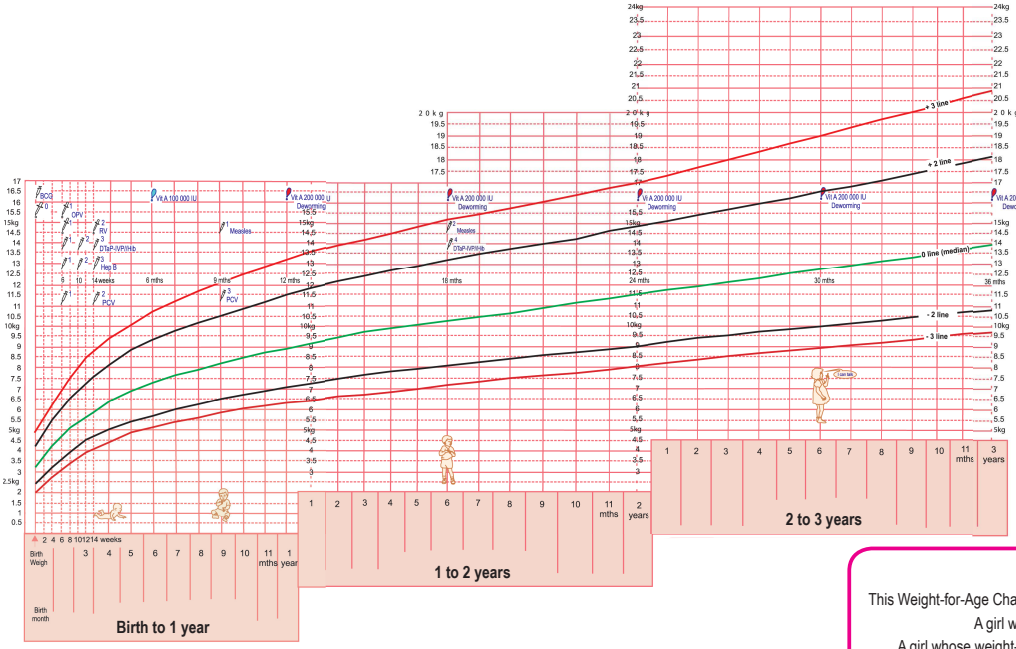
Girl's Weight-for-Age Chart

Write on the chart

- Any illness e.g. diarrhoea, ARI etc.
- Admission to hospital
- Solids introduced
- Breastfeeding stopped
- Birth of next child, etc

Watch the direction of the curve showing the child's growth:





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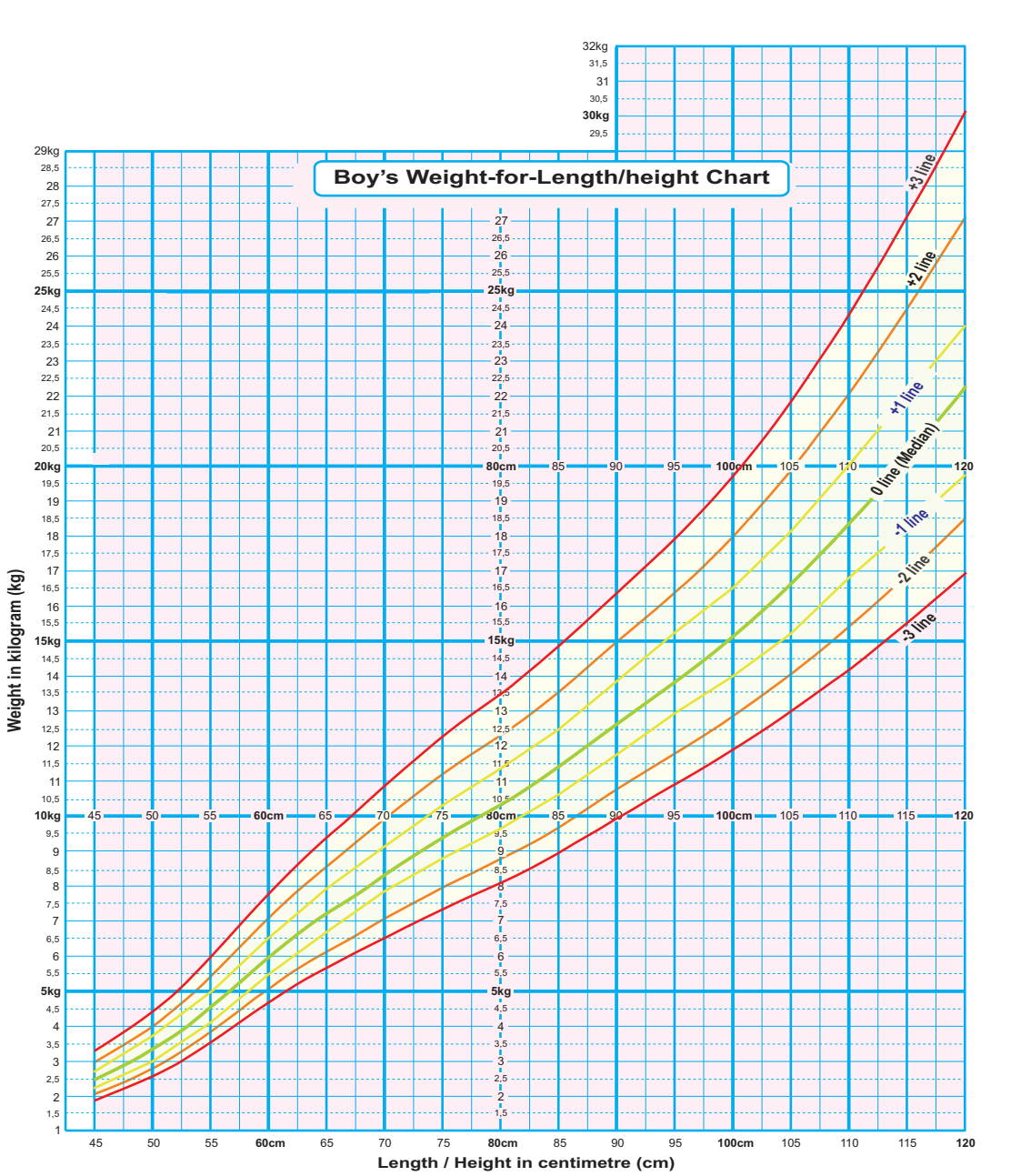
If her line stays close to the median, occasionally crossing above or below it, this is fine.



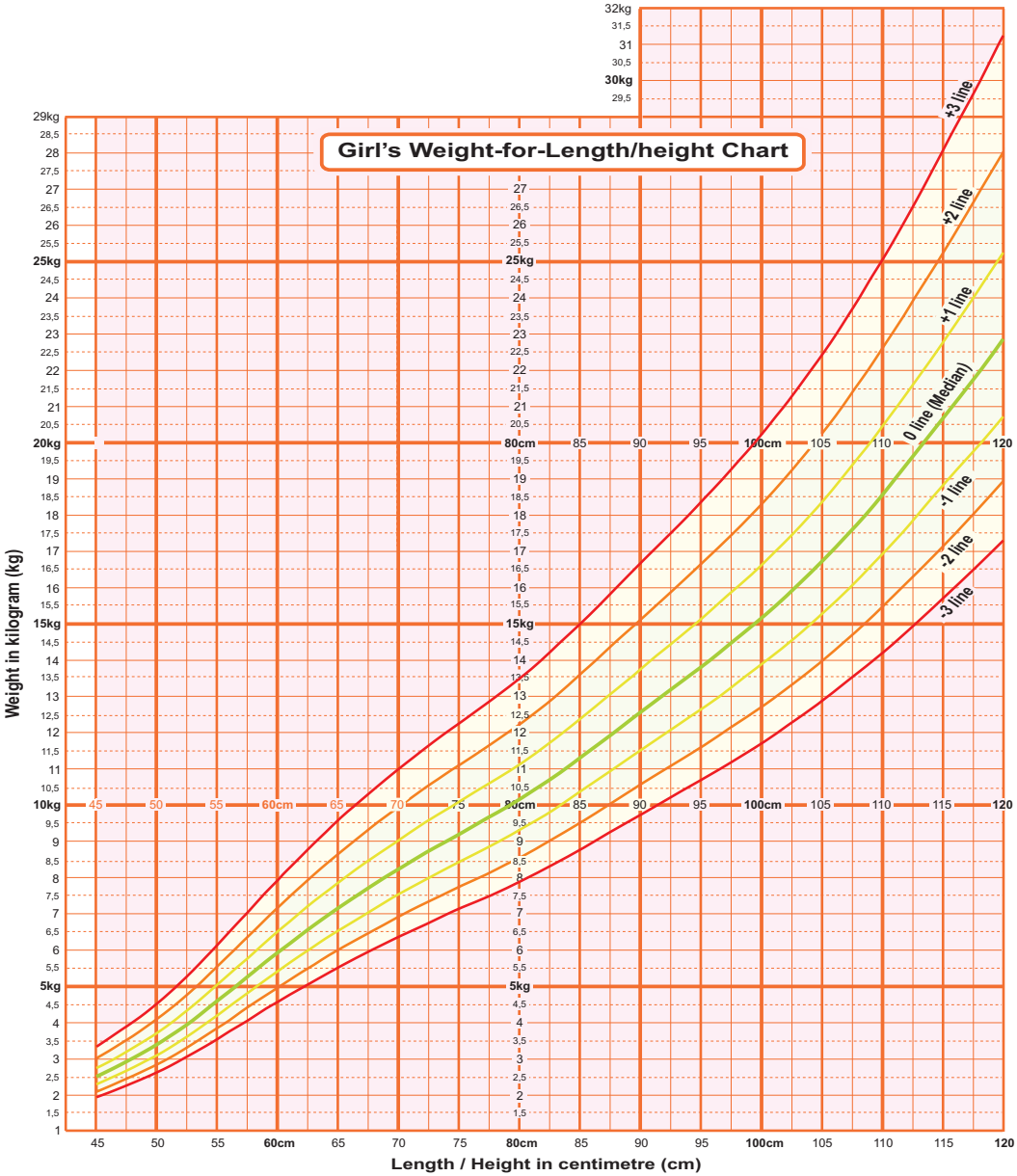
This **Weight-for-Length/height Chart** shows body-weight relative to length/height in comparison to the Median (the 0 z-score line).

A boy whose weight-for-length/height is above the +3 line, is **obese.**

A boy whose weight-for-length/height is above the +2 line, is **overweight.**

A boy whose weight-for-length/height is below the -2 line, is **wasted.**

A boy whose weight-for-length/height is below the -3 line, is **severely wasted. Refer for urgent specialised care.**



This **Weight-for-Length/height Chart** shows body-weight relative to length/height in comparison to the Median (the 0 z-score line).

A girl whose weight-for-length/height is above the +3 line, is **obese.**

A girl whose weight-for-length/height is above the +2 line, is **overweight.**

A girl whose weight-for-length/height is above the +1 line, shows possible risk of **overweight.**

A girl whose weight-for-length/height is below the -2 line, is **wasted.**

A girl whose weight-for-length/height is below the -3 line, is **severely wasted. Refer for urgent specialised care.**

PEAK EXPIRATORY FLOW RATES

Suggested reference peak expiratory flow (PEF) values for children:

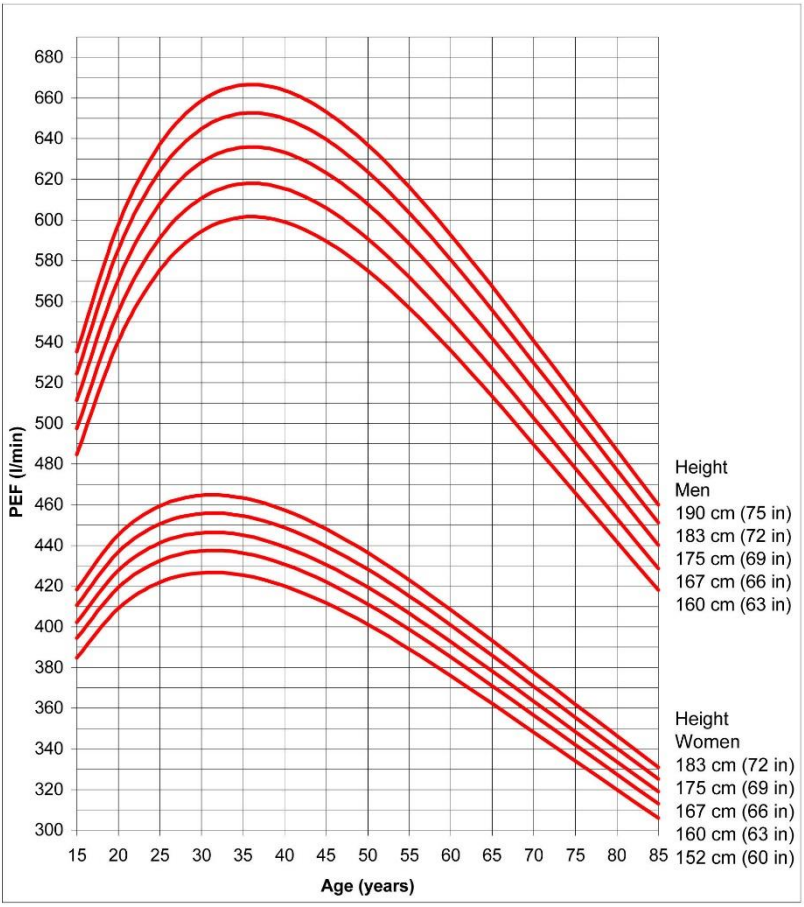
Height (cm)	PEF		PEF	
	Caucasian		African*	
	Male	Female	Male	Female
100	127	142	120	126
101	131	145	124	130
102	135	149	128	133
103	138	152	131	137
104	142	156	135	140
105	146	159	139	144
106	150	163	143	148
107	154	166	147	151
108	158	170	151	155
109	162	174	155	159
110	166	178	159	163
111	170	182	163	167
112	175	185	168	171
113	179	189	172	175
114	184	193	176	179
115	188	197	181	184
116	193	202	186	188
117	197	206	190	192
118	202	210	195	197
119	207	214	200	201
120	212	218	205	206
121	217	223	210	210
122	222	227	215	215
123	227	232	220	220
124	232	236	226	225
125	237	241	231	230
126	243	245	236	235
127	248	250	242	240
128	254	255	248	245
129	259	259	253	250
130	265	264	259	255
131	271	269	265	260
132	276	274	271	266
133	282	279	277	271
134	288	284	283	277
135	294	289	289	282
136	300	294	295	288
137	307	299	302	293
138	313	304	308	299
139	319	309	315	305
140	326	315	322	311
141	332	320	328	317

Height (cm)	PEF		PEF	
	Caucasian		African*	
	Male	Female	Male	Female
142	339	325	335	323
143	345	331	342	329
144	352	336	349	335
145	359	342	356	342
146	366	348	363	348
147	373	353	371	354
148	380	354	378	361
149	387	365	386	368
150	395	371	392	374
151	402	377	401	381
152	410	382	409	388
153	417	388	417	395
154	425	394	425	402
155	433	401	433	409
156	440	409	441	416
157	448	413	442	423
158	456	419	458	430
159	464	426	466	437
160	473	432	475	445
161	481	438	484	452
162	489	445	492	460
163	498	451	501	468
164	506	458	510	475
165	515	465	520	483
166	524	471	529	491
167	533	478	538	499
168	542	485	548	507
169	551	492	557	515
170	560	499	567	523
171	569	506	577	532
172	578	513	587	540
173	588	520	597	548
174	597	527	607	557
175	607	534	617	566
176	617	541	627	574
177	626	549	638	583
178	636	556	648	592
179	646	563	659	601
180	657	571	670	610

** Based on African American data.*

For optimal control, 80% of the predicted peak flow is required.

Peak expiratory flow in normal adult subjects



Adapted with permission from Nunn AJ Gregg I, Br Med J 1989:298;1068-70 and Clement Clarke International.

CALCULATING % PREDICTED PEAK FLOW RATE

- Take the best of 3 of the patient's observed peak flow rates (l/min): e.g. 200, 180, 190 performed – so take 200.
- Find the patient's sex, age and height predicted value from the nomogram. e.g. 440 l/min for a woman of age 25 years and height 167 cm
- Divide patient's observed peak flow rate over their predicted peak flow rate: e.g. 200/440 = 0.45
- Multiply by 100: e.g. 0.45 X 100 = 45%

So, in this example, the patient's observed peak flow rate is 45% of their predicted.

CALCULATING BRONCHODILATOR RESPONSIVENESS USING PEAK FLOW IN ADULTS

Perform peak flow testing and select the best of the 3 values to use as the pre-bronchodilator peak flow.

- Administer salbutamol 400 µg using a metered dose inhaler and spacer without a mask.
- Wait 15 minutes before repeating peak flow
- Repeat peak flow testing to obtain a post-bronchodilator peak flow.
- Subtract the pre-bronchodilator reading from the post-bronchodilator reading.
- Divide the difference by the pre-bronchodilator reading.
- Multiply by 100.

For example, a patient with readings that improve from 300 to 400, has reversibility of 33%. Measurements that improve by >20% strongly suggest a diagnosis of asthma. (See Sections 16.1: Asthma, acute and 16.2: Asthma, chronic persistent).

CALCULATING PEAK FLOW VARIABILITY IN CHILDREN AND ADULTS

- Perform peak flow measurements 4 times per day spread over the course of the day.
- Subtract the lowest reading of each day from the highest reading.
- Calculate the mean/average reading by adding all 4 readings from that day and dividing total by 4.
- Calculate PEF variability:

$$\text{PEF variability} = \frac{(\text{Highest PEF} - \text{Lowest PEF})}{\text{Mean PEF}} \times 100.$$

Determine this value on each day over two weeks, and average the results. Excessive diurnal PEF variability defined as >10% in adults and >12% in children strongly supports a diagnosis of asthma.

ASTHMA CONTROL TEST™

This is a validated measure of clinical asthma control that can be completed by the patient (after initial instruction) at each visit to the clinic prior to consultation. A value of ≥19 suggests adequate asthma control.

Online version of the test is accessible at: https://www.asthmacontroltest.com/

Reference: Nathan RA, Sorkness CA, Kosinski M, Schatz M, Li JT, Marcus P, Murray JJ, Pendergraft TB. Development of the asthma control test: a survey for assessing asthma control. J Allergy Clin Immunol. 2004 Jan;113(1):59-65. http://www.ncbi.nlm.nih.gov/pubmed/14713908

INHALER DEVICES

SPACER DEVICES

» Spacers are vital for an adequate therapeutic effect of inhaled therapy.
» Spacer devices should be used for all inhaled medications in all age groups to improve efficacy of medicine delivery and limit adverse effects.
» Use a spacer that is appropriate for the patient's age.

	Spacer volume	Valve	Delivery	Technique
Infants <3 years	150–250 mL	Required	Face mask	Deep tidal breathing
Children 3 to 6 years	500 mL	Required	Mouthpiece	Deep tidal breathing
Children >7 and adults	500 mL	Optional	Mouthpiece	Single inhalation and breath-hold

» Inhalation spacer devices enable optimal aerosol delivery.
» Children < 3 years of age should have a spacer with a face mask, while older children and adults should use the spacer with a mouth piece directly.
» Demonstrate the relevant inhaler technique more than once to ensure the correct procedure (see below). *LoE:IVb*[1]

Patient and caregiver education on inhaler and spacer techniques:
» If patients are switched between different types of devices (e.g. from MDI to DPI), patients need to be re-educated on inhaler technique.
» If changing from a DPI to MDI, consider if a spacer is required, and the optimal technique for inhalation.
» Doses may not be equivalent between different inhaler devices – ensure that patients are prescribed the correct dose when switching between devices.

METERED DOSE INHALERS (MDIs)

» A mask attachment must be used with the spacer for children < 3 years of age and be removed as soon as the child is able to use the mouthpiece.

A. Inhalation therapy without a spacer in adults: Single breath inhalation technique

1. Remove the cap from the mouthpiece.
2. Shake the inhaler well.
3. While standing or sitting upright, breathe out as much air as possible.
4. Immediately place the mouth piece of the inhaler between the lips and gently close the lips around it.
5. Start breathing in slowly.

6. Immediately press down the canister of the metered dose inhaler once to release one puff while simultaneously breathing in as deeply as possible.
7. Hold breath for 5 to 10 seconds, if possible.
8. Breathe out slowly through the nose and rest for a few breaths (30–60 seconds).
9. Repeat steps 2–8 for each puff prescribed.
10. Rinse mouth after inhalation of corticosteroids.

LoE:IVb[2]

B. Inhalation therapy with a spacer in adults and older children: Single breath inhalation technique

1. Remove the caps from the inhaler and the spacer.
2. Shake the inhaler well.
3. Insert the mouthpiece of the metered dose inhaler into the back of the spacer.
4. Insert the mouthpiece of the spacer into the mouth and close the lips around the mouthpiece.
5. Exhale fully into the spacer.
6. Start inhalation and immediately press down the canister of the metered dose inhaler once to release one puff into the spacer.
7. Breathe in slowly to full inhalation and hold the breath for 5 to 10 seconds.
8. Breathe out through the nose.
9. Repeat steps 2–8 for each puff prescribed, waiting at least 30 seconds between puffs.
10. Rinse mouth after inhalation of corticosteroids.

C. Inhalation therapy with the spacer alone in younger children or in adolescent and adults unable to do single inhalation: Deep tidal breathing technique

1. Remove the caps from the inhaler and the spacer.
2. Shake the inhaler well.
3. Insert the mouthpiece of the spacer into the mouth and close the lips around the mouthpiece.
4. Press down the canister of the metered dose inhaler once to release one puff into the spacer.
5. Breathe slowly and deeply in and out of the spacer continuously for at least 6 breaths
6. If breathing through the nose as well as the mouth, pinch the nose gently while breathing from the spacer.

D. Inhalation therapy with a spacer and mask for infants and children < 3 years:

1. Remove the caps from the inhaler and the spacer.
2. Infants may be preferably placed on the caregiver's lap or alternatively laid on a bed while administering the medication.
3. Shake the inhaler well.
4. Apply the mask to the face, ensuring that the mouth and nose are well covered.

5. With the mask held firmly onto the face, press down the canister of the metered dose inhaler once to release one puff into the spacer.
6. Keep the mask in place for at least six breaths, then remove.
7. Repeat steps 3–6 for each puff prescribed, waiting at least 30 seconds between puffs.

DRY POWDER INHALERS (DPIs)

E. Inhalation therapy with a dry powder inhaler (DPI) for adults and children over 6 years of age:

1. There is no need to shake a DPI.
2. Open, twist or click the device to load the medication dose.
3. Stand or sit up straight and breathe out completely (away from the device, not into the mouthpiece).
4. Immediately place the mouthpiece into the mouth, close lips tightly around it and breathe in quickly and forcefully to full inhalation.
5. Remove the DPI from the mouth, hold breath for 5-10 seconds, then exhale slowly.
6. Optimise positioning and repeat steps 2–5 for each puff prescribed, waiting at least 30 seconds between puffs.
7. Rinse mouth with water after inhalation of corticosteroids.

NEBULISERS

The guidance below is tailored to the use of jet nebulisers which are primarily used in the public sector.

1. Ensure the nebuliser cup is filled sufficiently to allow effective nebulisation (approx. 4L minimum volume). Volume must be more than the equipment dead space to be sufficient. The dead space in a nebuliser refers to the volume of the nebulizer chamber and tubing that remains filled with medication after treatment. This volume is not delivered to the patient and can vary depending on the nebulizer design. Typical dead space volumes in jet nebulizers is 2-3 mL.
2. Hold the nebuliser upright.
3. Select a flow rate of oxygen of 6 to 8 L/min for jet nebulisers.
4. Use a mouthpiece rather than a facemask in adults and in any child able to hold a mouthpiece between their lips and breathe via their mouths.
   Better medication delivery: The T-piece allows for more direct delivery of medication to the lungs, reduced medication loss, improved patient comfort, enhanced cooperation, reduced risk of skin irritation and easier observation of the patient's mouth and nose.
5. Place the mouthpiece in the patient’s mouth. Advise the patient to keep their lips firmly around the mouthpiece. If using a facemask, place it over the mouth and nose.

6. Ensure patient is calm and relaxed.
7. Advise patient to breathe slowly and deeply through the mouth as far in and as far out as possible until all the medication is used.

The following should be avoided when using nebulisers:

» Rapid or forceful inhalation (including crying)
» Nebulising whilst sleeping
» Using a facemask when a mouthpiece is possible
» A loose-fitting facemask or placing the nebuliser near a child's nose and mouth rather than securing a facemask

LoE:IVb[3]

[1] Spacers: Vincken W, Levy ML, Scullion J, Usmani OS, Dekhuijzen PNR, Corrigan CJ. Spacer devices for inhaled therapy: why use them, and how? ERJ Open Res. 2018 Jun 18;4(2):00065-2018. doi: 10.1183/23120541.00065-2018. PMID: 29928649; PMCID: PMC6004521.
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[2] Optimal aerosol delivery: Levin ME. Optimal aerosol delivery. Current Allergy & Clinical Immunology. 2011; 24(1):27-30
Rubin BK Fink JB. Optimizing aerosol delivery by pressurized metered-dose inhalers. Respir Care 2005; 50 (9): 1191-1200.
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Everard ML, Clark AR, Milner AD. Drug delivery from holding chambers with attached facemask. Archives of Disease in Childhood. 1992 May;67(5):580-585. DOI: 10.1136/adc.67.5.580. PMID: 1599292; PMCID: PMC1793709.
Vincken W, Levy ML, Scullion J, Usmani OS, Dekhuijzen PNR, Corrigan CJ. Spacer devices for inhaled therapy: why use them, and how? ERJ Open Res. 2018 Jun 18;4(2):00065-2018. doi: 10.1183/23120541.00065-2018. PMID: 29928649; PMCID: PMC6004521.
Esposito-Festen JE, Ates B, van Vliet FJ, Verbraak AF, de Jongste JC, Tiddens HA. Effect of a facemask leak on aerosol delivery from a pMDI-spacer system. J Aerosol Med. 2004 Spring;17(1):1-6. doi: 10.1089/089426804322994406. PMID: 15120007.
[3] Optimal aerosol delivery: Levin ME. Optimal aerosol delivery. Current Allergy & Clinical Immunology. 2011; 24(1):27-30

ABBREVIATIONS

3TC	lamivudine
ABC	abacavir
ACE-inhibitor	angiotensin-converting-enzyme inhibitor
ACR	albumin/creatinine ratio
ADRs	Adverse Drug Reactions
AED	automated external defibrillator
AEFI	adverse events following immunisation
AIDS	Acquired Immune Deficiency Syndrome
AKI	Acute Kidney Injury
Al^{3+}	Aluminium salts
ALT	alanine transaminase
AMI	acute myocardial infarction
ANC	Antenatal Care
ARB	angiotensin II receptor blockers
ARDS	Acute respiratory distress syndrome
ART	antiretroviral therapy
ARV	antiretroviral medicine
AST	aspartate aminotransferase
ATV/r	atazanavir/ritonavir
AZT	zidovudine
BAL	balanitis/balanoposthitis
BCG vaccine	Bacillus Calmette–Guérin vaccine
BD	Bipolar Disorder
BIPP	Bismuth Iodoform Paraffin Paste
BMI	body mass index
bOPV	Polio vaccine
BP	blood pressure
BPC	British Pharmaceutical Codex
BPH	benign prostatic hyperplasia
°C	degree(s) Celsius
Ca^{2+}	calcium salts
CAB	circulation airways breathing
cap(s)	capsule(s)
CCF	congestive cardiac failure
CD4	cluster of differentiation 4
CHC	community health centres
CHD	Coronary Heart Disease
CHW	Community health worker
CKD	chronic kidney disease
CKD-EPI	Chronic Kidney Disease Epidemiology Collaboration
cm	centimetre
CMV	cytomegalovirus
CNS	central nervous system
CO_2	carbon dioxide
COAD	Chronic obstructive airways disease
COC	combined oral contraceptive
COPD	chronic obstructive pulmonary disease
COVID-19	Coronavirus Infectious Disease 2019
CPAP	Continuous positive airway pressure
CPR	cardiopulmonary resuscitation
CPT	Cotrimoxazole prophylaxis
CrAg	cryptococcal antigen
CRPS	Complex Regional Pain Syndrome
CS	Caesarean section
CSF	cerebrospinal fluid
CTOP	Choice termination of pregnancy
CVA	cerebral vascular accident
CVD	cardiovascular disease
CVS	cardiovascular system
CXR	Chest radiograph
DBP	Diastolic Blood pressure
DC	Dispensing cycle
DKA	hyperglycaemia diabetic ketoacidosis
dL	decilitre
DMARDs	Disease Modifying Anti-rheumatic Drugs
DNA	deoxyribonucleic acid
KDIGO	Kidney Disease: Improving Global Outcomes
L	litre
LABA	long-acting beta$_2$ agonist
LAM	Lipoarabinomannan
LAP	lower abdominal pain
LDL	low-density lipoprotein
LFT	liver function test(s)
LGBT	lesbian, gay, bisexual, transgender
LGE	lineal gingival erythema
LIP	lymphoid interstitial pneumonitis
LNG-IUD	Levonorgestrel intra-uterine device
LoE	level of evidence
LOC	Level of consciousness
LP	lumbar puncture
LPC	liquor picis carbonis (coal tar)
LPV/r	lopinavir/ritonavir
LS	Lifestyle modification
LV	left ventricular
LVH	left ventricular hypertrophy
m^2	square metre
MAM	moderate acute malnutrition
MC	molluscum contagiosum
mcg	microgram
MC&S	microscopy, culture and sensitivity
MCV	mean corpuscular volume
MDI	metered dose inhaler
MDR TB	multi drug-resistant tuberculosis
MEC	Medical eligibility criteria
MERS-CoV	Middle East respiratory syndrome
mEq	milliequivalent
mg	milligram
Mg^{2+}	Magnesium salts
MHCA	Mental Health Care Act
min	minute
MIS-A	Multisystem inflammatory syndrome in adults
MIS-C	Multisystem inflammatory syndrome in children
mL	millilitre
mm	millimetre
mmHg	millimetre(s) of mercury
mmoL	millimole
MMD	Multi-month dispensing
MTB	*Mycobacterium tuberculosis*
MTCT	mother to child transmission
MU	million units
MUAC	mid upper arm circumference
MUS	male urethritis syndrome
MVA	manual vacuum aspiration
NAGI	National Advisory Group on Immunisation
NCAC	National Clinical Advisory Committee
NCD	non-communicable disease
NDoH	National Department of Health
NET-EN	Norethisterone enanthate
NEMLC	National Essential Medicines List Committee
NG	Nasogastric
NGO	non-governmental organisation
NHLS	National Health Laboratory Service
NICD	National institute for communicable diseases
NIMART principles	Nurse Initiated Management of Antiretroviral Therapy principles
NISEC	National Immunisation Safety Expert
NMC	Notifiable medical condition
NMS	neuroleptic malignant syndrome
NNRTI	non-nucleoside reverse transcriptase inhibitor (RTI)
NRTI	nucleoside RTI
NSAID	non-steroidal anti-inflammatory drug
NSTEMI	non-ST elevation myocardial infarction
NTD	Neural Tube Defects

DoH	Department of Health
DEET	di-ethyl 3-methylbenzamid
DHIS	District health information system
DKA	hyperglycaemia diabetic ketoacidosis
dL	decilitre
DMARDs	Disease Modifying Anti-rheumatic Drugs
DMPA	Depot medroxyprogesterone acetate
DNA	deoxyribonucleic acid
DoH	Department of Health
DOT	Directly observed therapy
DRESS	drug reaction with eosinophilia and systemic symptoms
DR-TB	drug resistant tuberculosis
DRV/r	darunavir/ritonavir
DS-TB	Drug susceptible tuberculosis
DST	Drug sensitivity testing
DT	Dispersible tablet
DTaP	diphtheria, tetanus, acellular pertussis
DTG	Dolutegravir
E or EMB	ethambutol
EAC	Enhanced adherence counselling
e.g.	example
ECG	electrocardiogram
ECMO	Extracorporeal membrane oxygenation
EDP	Essential Drugs Programme
EDTA	Ethylenediaminetetraacetic acid
EFV	efavirenz
eGFR	estimated glomerular filtration rate
ELISA	enzyme-linked immunosorbent assay
EML	essential medicine list
EMS	emergency medical services
ENT	Ear, Nose and Throat
EPI	expanded programme on immunisation
EPSE	extra-pyramidal side effects
ERIG	Equine derived rabies Immunoglobulin
ETAT tool	Emergency Triage Assessment and Treatment tool
ET	endotracheal tube
ETT	endotracheal tube
EX-PUP	External pick-up point
F-75	Formula-75 (therapeutic milk)
FAC-PUP	Facility pick up point
FAMSA	Families South Africa
FBC	full blood count
FBG	Fasting blood glucose
FC	Film coated tablet
FDC	fixed-dose combination
Fe^{2+}	Iron salts
FEV1	Forced expiratory volume
FFP	Filtering facepiece
FTC	emtricitabine
FiO_2	fraction of inspired oxygen
FLACC scale	face, legs, activity, cry, consolability scale
FTA	fluorescent treponemal antibody
FTA-ABS	fluorescent treponemal antibody assay
FTC	emtricitabine
FVC	Forced Vital Capacity
g	gram
GCS	Glasgow coma scale
GI	gastro-intestinal
GN	glomerular disease
GOR	gastro-oesophageal reflux
GORD	gastro-oesophageal reflux disease
GUS	genital ulcer syndrome
GW	Genital warts
H or INH	isoniazid
NVP	Nevirapine
OPV	Oral polio vaccine
ORS	Oral rehydration solution
OT	occupational therapist
PCR	protein/creatinine ratio
PCV	pneumococcal conjugated vaccine
PEF	peak expiratory flow
PEFR	peak expiratory flow rate
PEP	post exposure prophylaxis
pg	page
PGL	persistent generalised lymphadenopathy
PHC	primary healthcare
PI	protease inhibitor
PID	pelvic inflammatory disease
PL	pubic lice
PLHIV	People living with HIV
PML	progressive multifocal leukoencephalopathy
PMTCT	prevention of mother to child transmission
PND	Paroxysmal nocturnal dyspnoea
POWA	People opposing women abuse
PPE	Personal protective equipment
PPG	post-prandial blood glucose
PPH	post-partum haemorrhage
PPIP	Perinatal problem identification programme
PPROM	preterm prelabour rupture of membranes
PrEP	pre-exposure prophylaxis
PROM	prelabour rupture of membranes at term
PTL	preterm labour
PTSD	post-traumatic stress syndrome
PV	Vaginal route (of administration)
PZA or Z	pyrazinamide
R	rifampicin
R-FLACC tool	revised Face, Legs, Activity, Cry and Consoloability scale
RIG	Rabies Immunoglobulin
RfH	Results for Action
Rh	Rhesus
RH	Rifampicin and Isoniazid
RHZE	Rifampicin, Isoniazid, Pyrazinamide and Ethambutol
RIF	Resistance to rifampicin
RNA	ribonucleic acid
RPCs	Repeat Prescription Collection Strategies
RPR	Rapid Plasmin Reagin
RR-TB	Rifampicin resistant tuberculosis
RTI	respiratory tract infection
RTUF	ready to use food
RTV	Ritonavir
RV	rotavirus
SABA	short-acting $beta_2$ agonist
SADAG	South African Depression and Anxiety Group
SAHPRA	South African Health Products Regulatory Authority
SAM	severe acute malnutrition
SAMF	South African Medicines Formulary
SBP	systolic blood pressure
SAPS	South African Police Services
SARS	Severe acute respiratory syndrome
SC	subcutaneously
SGA	Small for gestational age
SJS	Stevens-Johnson syndrome
SLE	Systemic Lupus Erythematosus
sol	solution
SPICT tool	Supportive and Palliative Care Indicators tool
SPF	sun protection factor
SPO2	Blood oxygen level
SSRI	selective serotonin re-uptake inhibitor

Hb	haemoglobin
HB	hepatitis B
HbA1c	glycosylated haemoglobin
HBeAg	hepatitis B e-antigen
HBsAb	hepatitis B surface antibody
HBsAg	hepatitis B surface antigen
HBIG	hepatitis B immune globulin
HBV	hepatitis B virus
Hep B	hepatitis B vaccine
HCP	Healthcare professional
HCT	HIV counselling and testing
HCTZ	hydrochlorothiazide
HCV	Hepatitis C virus
HCW	healthcare worker(s)
HDL	high-density lipoprotein
HELLP syndrome	Haemolysis, elevated liver enzymes and low platelet count
HHS	hyperosmolar hyperglycaemic state
Hib	*Haemophilus influenzae* type b
HIV	human immunodeficiency virus
HIV PCR	HIV polymerase chain reaction (test)
HMGCoA	3-hydroxy-3-methylglutaryl–coenzyme A
HMOD	Hypertension-mediated organ damage
HPV	human papillomavirus
HR	heart rate
HRP2	Histidine-rich Protein 2
HRIG	Human derived rabies immunoglobulin
HSV	herpes simplex virus
HT	hormone therapy
HTS	HIV testing services
IBD	Irritable bowel disease
IBS	irritable bowel syndrome
ICD10 codes	International Classification of Diseases 10th Revision codes
IDDM	insulin-dependent diabetes mellitus
IM	intramuscular
IMCI	Integrated management of childhood illnesses
InSTI	integrase strand transfer inhibitor
IPC	Infection Prevention and Control
ICS	Inhaled corticosteroids
IO	intra-osseus
IPT	isoniazid preventive therapy
IPV	inactivated polio vaccine
IRIS	immune reconstitution inflammatory syndrome
IU	international unit
IUCD	intrauterine contraceptive device
IV	intravenous
kg	kilogram
SSS	sugar and salt solution
SSW	scrotal swelling
STEMI	ST elevation myocardial infarction
STG	standard treatment guideline
STI	sexually transmitted infection
susp	suspension
SSW	scrotal swelling
T4	thyroxine
tab(s)	tablet(s)
TAF	Tenofovir alafenamide
TB	tuberculosis
TB-NAAT	TB Nucleic Acid Amplification Test
TBSA	total body surface area
Td	tetanus and diphtheria
Tdap	Tetanus, diphtheria, pertussis
TDF	tenofovir disoproxil
TEN	toxic epidermal necrolysis
TG	triglycerides
TIA	transient ischaemic attack
TOP	termination of pregnancy
TPAb	rapid treponemal antibody test
TPHA	*Treponema pallidum* haemagglutination
TPPA	*Treponema pallidum* particle haemagglutination
TPT	Tuberculosis preventive therapy
TSH	thyroid-stimulating hormone
TST	tuberculin skin test
TT	tetanus toxoid vaccine
U&E	urea & electrolytes
UE	ung emulsificans/emulsifying ointment
UEA	ung emulisificans aqueosum (aqueous cream)
UTI	urinary tract infection
UV	ultraviolet
UVA	ultraviolet A
UVB	ultraviolet B
VDS	vaginal discharge syndrome
VF	Ventricular Fibrillation
VHF	viral haemorrhagic fever
VKC	Vernal keratoconjunctivitis
VL	viral load
VTP	Vertical Transmission Prevention
VVM	vaccine vial monitor
VT	Ventricular tachycardia
WBOT	Ward-Based Outreach Teams
WFI	water for injection
WHO	World Health Organization
WHZ	weight-for-height Z-score
WLHIV	Women Living With HIV/AIDS
XDR TB	extensively drug-resistant TB
Zn^{2+}	zinc salts

DECLARATION OF INTERESTS

Selection of medicines for the essential medicines list requires measures to ensure that the best possible assessment of scientific evidence is achieved in an independent environment, free of either direct or indirect pressures. Thus, to assure the credibility of the process, it is necessary to avoid situations in which financial or other interests may unduly influence decision-making.

All members of the NEMLC, combined Primary Healthcare/Adult Hospital Level Technical Expert Review Committee and Secretariat were required to make formal declarations of interest on application and at the start of each meeting. Guidance for declaring, assessing and handling conflicts of interests is outlined in the NEMLC conflict of interest policy, accessible at: https://www.health.gov.za/nhi-edp-stgs-eml/.The following specific declarations were noted and managed during the development of the 8th Edition of the Primary Healthcare Level STGs and EML:

Combined PHC/Adult Hospital Level Expert Review Committee (2020-2024)	
Dr H Dawood (Vice-Chairperson: 2020-2023)	NICD influenza guidelines: annual. Abbott - TB LAM presentation at SA TB conference 2022
Prof M Blockman	Various pharmaceutical companies provide research sponsorship to the University of Cape Town (nil to member).
Ms SM McGee	Employed by Ophthalmology Society of South Africa (OSSA) which has direct interest in the activities of the PHC/AHL ERC from the point of view of access to and availability of medicines for eye conditions. society receives sponsorships and support from various pharmaceutical and medical device companies.
Dr JS Nel	Public lectures on HIV & COVID topics for Cipla, Abbvie, Novo Nordisk and HIV Clinicians Society. Funding for RECOVERY and InterCOV trials (PI for the trials, but no personal fee taken) - Wellcome Trust, Bill & Melinda Gates Foundation.
Prof L Robertson (Vice- Chairperson from 2023-2024)	Contracted as a technical advisor to the mental health and disability Ghana Somubi Dwumadie Programme funded by UK FCDO. Contracted from 5 June 2024 – 30 September 2024 to conduct phase 4 of work on access to psychotropic medicines in Ghana. Honorarium from Foundation for Professional Development (FPD) to assist FPD and the Knowledge Translation Unit with drafting an application to SAHPRA for rescheduling of fluoxetine.
Prof M Levin	Serves on the executive committee of the Allergy Society of South Africa and is the CEO of the Allergy Foundation of South Africa. He is registered for RWOEE in his role as CEO of AFSA, providing training of doctors for AFSA. He also serves on advisory boards for Sanofi and Takeda and within the last 5 years has also lectured for Organon, Cipla, Abbvie, Glenmark and Pharmadynamics and Bayer. The Allergy Foundation of SA produces and markets low cost spacers for the management of children and adults with asthma.
Dr N Tsabedze	Servier Laboratories SA (Pty) Ltd: Consultancy (New Hypertension Guideline Management); Novartis SA (Pty) Ltd: Consultancy to develop a Heart Failure Tool box; Boehringer–Ingelheim, Novonordisk, Eli-Lilly, AstraZeneca and Adcock Ingram: Speaker Fees for Webinars & Advisory Board Services; Wits University/ NovoNordisk: SELECT Phase III Trial; Wits University/TAKEDA: Research Grant - Fabry's Disease in South Africa; HEFSSA/NPC: Heart Failure Guidelines Committee Member (SAMJ).

Dr M Reddy	2022: IQVIA Health – Project regarding Analysis and summary of the reimbursement landscape for HIV – retrospective analysis on ARV reimbursement.

National Essential Medicines List Committee (2020-2024)	
Prof M Blockman	See above
Dr H Dawood	See above
Dr T Kredo	SA- Medical Research Council: Receipt of grants.
Dr M McCaul	International research grants
Prof J Miot	Chair of the Clinical Advisory Board of HQA. HQA is currently investigating outcomes measurement through the setting up of a clinical registry (probably in oncology) which may result in data to inform clinical guidelines in the future.
Mrs B Molongoana	Technical advisor for Market Access Africa/JPIEHGO
Prof L Robertson	See above
Prof P Ruff	Wits University Health Consortium: Clinical trial funding and honoraria from various pharmaceutical companies involved in oncology trials and funds are directed to Wits Health Consortium.
Mr R Wiseman	Employed by Liberty Health

USEFUL NUMBERS AND URL LINKS

POISONS INFORMATION CENTRES

Poisons Information Helpline	0861 555 777 https://www.afritox.co.za/
Red Cross War Memorial Children's Hospital Poisons Information Service	021 658 5308 http://www.paediatrics.uct.ac.za/poisons-information-centre Email: poisonsinformation@uct.ac.za
Tygerberg Poison Information Centre	0861 555 777 www.sun.ac.za/poisoncentre
University of the Free State Poison Control and Medicine Information Centre	082 491 0160

COMMUNICABLE DISEASES

NICD COVID-19 hotline	0800 029 999 https://www.nicd.ac.za/diseases-a-z-index/disease-index-covid-19/covid-19-contact-resources/
NICD hotline (e.g. Rabies, Viral Haemmorhagic Fever outbreak, emerging respiratory pathogens)	062 204 6411
South African Vaccine Producers	011 386 6063/2/00
National notifiable medical conditions surveillance	Helpline/ sms/ whatsapp line: 072 621 3805 Fax: 086 639 1638 Email: NMCSurveillanceReport@nicd.ac.za

MEDICINE INFORMATION CENTRES

Medicine Information Centre (Cape Town)	021 406 6829 0861 100 531 Email: http://www.mic.uct.ac.za/
Amayeza Info Centre	011 475 2994
National HIV Healthcare Worker Hotline	0800 212 506 021 406 6782

DEPARTMENT OF HEALTH

National Department Health website	www.health.gov.za
Essential Drugs Programme	https://www.health.gov.za/nhi-hpp-edp/ Email:SAEDP@health.gov.za
Third line ART applications	Email: TLART@health.gov.za
Medicine stock availability reporting	Email: stockalert@health.gov.za
Adverse Drug Reactions: South African Health Products Regulatory Authority (SAHPRA)	adr@sahpra.org.za 012 501 0311 https://primaryreporting.who-umc.org/Reporting/Reporter?OrganizationID=ZA
Central Chronic Medicine Dispensing and Distribution (CCMDD)	https://www.health.gov.za/ccmdd/

OTHER NUMBERS

Women abuse helpline	0800 150 150
Child line	116
South African Police Services: Emergency	10111
National Human Trafficking Helpline	0800 222 777
Suicide helpline	0800 567 567

MISCELLANEOUS

Antiretroviral pregnancy registry	http://www.APRegistry.com/
Antiretroviral therapy: drug-drug interactions	https://www.hiv-druginteractionslite.org/checker
Asthma control test™	https://www.asthmacontroltest.com/
BMI-based CVD risk tool	https://www.framinghamheartstudy.org/fhs-riskfunctions/cardiovascular-disease-10-year-risk/#
eGFR calculator	https://www.kidney.org/professionals/KDOQI/gfr_calculator
Ideal weight calculator	https://www.mdcalc.com/ideal-body-weight-adjusted-body-weight
Mental health conditions: support groups	www.SADAG.org www.SAFMH.org.za
Centre for Healthcare-Associated Infections, Antimicrobial Resistance and Mycoses (CHARM)	011 386 6430
Renal impairment: Medicines requiring dose adjustment in renal impairment	http://www.globalrph.com/index_renal.htm
Valproate: acknowledgement of risk form	https://www.sahpra.org.za/wp-content/uploads/2025/05/GLF-CEM-PV-S01_v2-Valproate-Annual-Risk-Acknowledgement-Form-ARF.pdf