# CHAPTER 21
# ONCOLOGIC EMERGENCIES

## 21.1 ONCOLOGICAL EMERGENCIES

Any acute, potentially morbid or life-threatening event directly or indirectly related to a patient's tumour or its treatment. Most oncological emergencies can be classified as metabolic, haematologic, structural, or side effects of chemotherapy agents or radiation therapy.

## 21.1.1 METABOLIC EMERGENCIES

### 21.1.1.1 HYPERCALCAEMIA OF MALIGNANCY

See section 8.9: Hypercalcaemia, including primary hyperparathyroidism

### 21.1.1.2 SYNDROME OF INAPPROPRIATE ANTIDIURETIC HORMONE (SIADH)

E22.2

#### DESCRIPTION

Patients present with: anorexia, nausea, vomiting, constipation, muscle weakness, myalgia, polyuria, polydipsia, neurologic symptoms (e.g. seizures, coma).

For management see section: 7.2.4:Hyponatraemia.

#### REFERRAL

Refer to Oncology Unit for management of underlying malignancy producing Antiduretic Hormone (ADH).

### 21.1.1.3 TUMOUR LYSIS SYNDROME

E88.3

#### DESCRIPTION

Rapid destruction of malignant cells can result in the release of cellular breakdown products and intracellular ions, causing potentially lethal metabolic derangements including acute renal failure.
Commonly seen in cancers with rapidly growing tumours and high tumour burdens, particularly acute leukaemias, chronic myeloid leukaemia and high-grade lymphoma, generally following chemotherapy.

**Presentation:** (Cairo-Bishop definition)

» azotaemia
» acidosis
» hyperphosphataemia >1.45 mmol/L
» hyperkalaemia >6.0 mmol/L
» hypocalcaemia <1.75 mmol/L

» uric acid >0.476 mmol/L

## GENERAL MEASURES

There is an increased risk of arrhythmias.
Monitor urine output.
Monitor urine and electrolytes, creatinine and uric acid levels.

## MEDICINE TREATMENT

**Fluid resuscitation:**

» IV hydration 2–3 L/m$^2$/day. The urine output needs to be monitored and maintained within 80–100 mL/m$^2$/hour.
» Diuretics are not indicated in patients with normal renal and cardiac function; and are contraindicated in patients with hypovolemia.

- Sodium chloride 0.9%, IV, 1000 mL 6–8 hourly.

If patient is hypernatraemic or fluid overloaded, consult a specialist.

*LoE:III*[i]

**For control of uric acid:**

- Allopurinol, oral, 100 mg 8 hourly.
  - Maximum dose: 300 mg 8 hourly.
  - Adjust dose to 50 mg 8 hourly, if eGFR <20 mL/minute.

*LoE:III*[ii]

**Correct electrolyte imbalances:**

» For hyperkalaemia, see section 7.2.1: Hyperkalaemia.
» For hypocalcaemia see section 8.10 Hypocalcaemia.

## REFERRAL

Transfer to oncology unit.

# 21.1.2 HAEMATOLOGIC EMERGENCIES

## 21.1.2.1 FEBRILE NEUTROPENIA

See section 2.2: Febrile neutropenia.

## 21.1.2.2 HYPERVISCOSITY AND LEUCOSTATIC SYNDROMES

D78.9

## DESCRIPTION

Hyperviscosity is seen in patients with Waldenström's macroglobulinemia and multiple myeloma, while leucostasis may be seen in patients with acute leukaemias and chronic myeloid leukaemia with high white cell counts. Sludging and decreased perfusion of the microvasculature and vascular stasis occur due to increased paraproteins or leucostasis.
Patients present with spontaneous bleeding, visual signs and symptoms, and

neurologic defects.

### GENERAL MEASURES
Perform investigations: FBC, peripheral blood smear, serum protein electrophoresis (SPEP) and erythrocyte sedimentation rate (ESR).
Monitor urine, electrolytes and creatinine.

### REFERRAL
Ensure adequate hydration and refer.

## 21.1.3 STRUCTURAL EMERGENCIES

## 21.1.3.1 EPIDURAL SPINAL CORD COMPRESSION
G95.2

### DESCRIPTION
Seen in breast, lung, and prostate cancers, as well as multiple myeloma.
Patients present with new back pain that worsens when lying down, late paraparesis, late incontinence, and loss of sensory function.

### GENERAL MEASURES
To evaluate level of neurologic function, perform a spinal x-ray or MRI if available.

### MEDICINE TREATMENT
- Dexamethasone, IV, 16 mg immediately as a single dose.
  - Followed by 4 mg 6 hourly, until transfer.

*LoE:III*[iii]

### REFERRAL
Urgent referral to tertiary services with oncology or neurosurgery services.

## 21.1.3.2 MALIGNANT PERICARDIAL EFFUSION
I31.3

### DESCRIPTION
Seen in metastatic lung and breast cancer, melanoma, leukaemia, and lymphoma.
Patients present with dyspnoea, fatigue, distended neck veins, distant heart sounds, tachycardia, orthopnoea, narrow pulse pressure, pulsus paradoxus, or water-bottle heart.

#### Investigation
Trans-thoracic echocardiography.

### GENERAL MEASURES
Management is dependent on the underlying aetiology and symptom progression.
Diagnostic and therapeutic pericardiocentesis:
» Immediate pericardiocentesis is mandatory for patients with tamponade.
» Send some of the fluid drained for microbiology and cytology.

### REFERRAL
All patients for definitive therapy.

## 21.1.3.3 SUPERIOR VENA CAVA SYNDROME
I87.1

### DESCRIPTION
Superior Vena Cava (SVC) obstruction may be seen in lung cancer, germ cell tumours, lymphomas, thyroid carcinomas, and metastatic mediastinal tumours. Indwelling central venous catheters may cause SVC syndrome due to venous thrombosis.
Patients present with: cough, dyspnea, dysphagia, facial oedema, or upper extremity swelling or discoloration, with development of collateral venous circulation.

### GENERAL MEASURES
Histological diagnosis is essential for definitive management.
Head elevation and supplementary oxygen.

### MEDICINE TREATMENT
Maintain normovolaemia.
- Sodium chloride 0.9%, IV, 1000 mL 8 hourly.
- Corticosteroids may be considered in consultation with a specialist.

### REFERRAL
Refer for histological diagnosis, and further management.

## 21.2 SIDE EFFECTS FROM ONCOLOGY TREATMENT AGENT

## 21.2.1 DIARRHOEA
Refer to section 1.3.3: Diarrhoea, acute non-inflammatory.

## 21.2.2 EXTRAVASATIONS

T80.8

### DESCRIPTION

Chemotherapeutic agents are classified as vesicants (can cause necrosis), non-vesicants, and irritants.
Patients present with pain and erythema at infusion site, swelling, necrosis, contractures.

### GENERAL MEASURES

Limb elevation.

### MEDICINE TREATMENT

**Long term**

Small localised area of erythema at the catheter insertion site will usually resolve without antibiotic therapy.

In patients with larger areas of erythema and tenderness extending beyond the insertion site, where secondary infection is suspected:

- Clindamycin, oral, 450 mg 8 hourly for 5 days. *LoE:III*[iv]

**Catheter related infections**

If patients with peripheral or central venous catheter infections are systemically unwell they should be treated as a venous catheter-related systemic blood infection.
Microbiologic specimen (for speciation and sensitivity).

### REFERRAL

All patients to oncological department where chemotherapy was administered.

## 21.2.3 CONSTIPATION

See section 24.1.2: Constipation.

## 21.3 SIDE EFFECTS FROM RADIATION AND CHEMOTHERAPY

## 21.3.1 RADIATION AND CHEMOTHERAPY RELATED MUCOSITIS

K12.3

### DESCRIPTION

An inflammatory reaction where shallow ulcerative lesions occur on mucosal surfaces.

### GENERAL MEASURES

Avoid irritants (e.g.: smoke, alcohol and hot spicy food).
Ensure adequate fluid intake e.g.: 2 L/day.
Modify diet to include soft or pureed foods.
Use lip care e.g. petroleum jelly, as required.
Keep dentures clean and snug fitting. If loose, refer to dentist.
Ensure adequate mouth care:

» Clean teeth with soft toothbrush or clean cloth.
» Avoid dental flossing.
» Rinse and gargle regularly, at a minimum after every meal.

Simple mouth rinse:

- ½ teaspoon salt
- 3 teaspoons sodium bicarbonate
- 1 L of filtered or previously boiled water.
  (Discard this mixture after 3 days).

*LoE:III$^{v}$*

### MEDICINE TREATMENT

Adequate pain control. See section 25.2: Analgesia for acute non-surgical pain.

## 21.3.2 WET DESQUAMATION OF SKIN

R23.4

### DESCRIPTION

Acute toxicity of skin that occurs during radiation treatment and up to 2-3 weeks after completion of the radiation.
Few or even no skin care products are effective to prevent or reduce acute radiotherapy skin reactions.

### GENERAL MEASURES

Keep skin clean and apply paraffin gauze dressings daily.
Avoid friction and trauma from clothes, weather, etc.
Prevent infection.
Encourage good nutrition.
Encourage smoking cessation.

### MEDICINE TREATMENT

Adequate pain control. See section 25.2: Analgesia for acute non-surgical pain.

## 21.3.3 RADIATION- OR CHEMOTHERAPY-INDUCED PNEUMONITIS

J70.0

### DESCRIPTION

Radiation pneumonitis is inflammation of the lung caused by radiation therapy to the chest. It mostly develops 1–6 months after treatment.
Chemotherapy-induced pneumonitis is inflammation of the lung caused by various chemotherapy agents. It mostly develops on treatment.
Symptoms include: fever, dry cough, chest congestion, shortness of breath, and chest pain.
The differential diagnosis includes infectious pneumonitis, pulmonary embolism, and tumor recurrence.

### GENERAL MEASURES

Symptoms generally resolve within 7–10 days following cessation of treatment.
Maintain hydration.

### MEDICINE TREATMENT

For symptomatic subacute pneumonitis:

- Corticosteroids (intermediate-acting) e.g.:
- Prednisone 1 mg/kg daily for 2–4 weeks at a maximum daily dose of 40–60 mg, and then taper slowly over 3–12 weeks. Refer to Appendix II for an example of a dose reduction regimen. *LoE:III*[M]

### REFERRAL

All patients with symptomatic pneumonitis.

## 21.3.4 RADIATION PROCTITIS

K62.7

### DESCRIPTION

An inflammatory process of the rectal mucosa that can present acutely (immediately after the initiation of radiation therapy or up to 3 months after) or chronically (8-12 months after completion of therapy). The acute process is usually self-limiting.

Symptoms include diarrhoea, nausea, cramps, tenesmus, urgency, mucus discharge, and minor bleeding.
Severe complications include bleeding, strictures, perforation, fistula, and bowel obstruction.

**Diagnosis**
Suspect radiation proctitis when there has been previous radiation to the pelvis.
On colonoscopy/sigmoidoscopy, pallor, friability, telangiectasia are seen localised to the area that was exposed to radiation. Do not biopsy.
Exclude other causes, e.g.: malignancy, infection, or inflammatory bowel disease.

### REFERRAL
All patients to a radiation oncology centre.

## 21.3.5 RADIATION- OR CHEMOTHERAPY-INDUCED CYSTITIS
N30.4

### DESCRIPTION
Symptoms include dysuria, frequency, nocturia, recurrent haematuria, and recurrent urinary tract infection.

### GENERAL MEASURES
Increase fluid intake.
Urine microscopy, culture and sensitivity to exclude/confirm an infection.
High dose cyclophosphamide and ifosfamide may cause severe cystitis due to excretion of acrolein into bladder.
Acute cystitis is usually self-limiting and resolves in one to two weeks after completing radiation therapy. If symptoms continue, cystoscopy with biopsy is indicated.

### REFERRAL
All patients.

# 21.4 SIDE EFFECT FROM CHRONIC PAIN MEDICATION

## 21.4.1 CONSTIPATION
See section 25.1.3: Treatment of adverse effects of chronic opioid use.

## 21.4.2 NAUSEA & VOMITING
See section 25.1.3: Treatment of adverse effects of chronic opioid use.

## 21.4.3 DEPRESSION
See section 24.2.3: Depression.

**References:**

[i] Sodium Chloride 0.9%, IV: Coiffier B, Altman A, Pui CH, Younes A, Cairo MS. Guidelines for the management of pediatric and adult tumor lysis syndrome: an evidence-based review. J Clin Oncol. 2008 Jun 1;26(16):2767-78. https://www.ncbi.nlm.nih.gov/pubmed/18509186

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Allopurinol, oral: National Department of Health: Affordable Medicines, EDP-Adult Hospital level. Medicine review: Allopurinol, oral for prevention of tumour lysis syndrome in adults, March 2019. http://www.health.gov.za/

[iii] Dexamethasone, IV: Kumar A, Weber MH, Gokaslan Z, Wolinsky JP, Schmidt M, Rhines L, Fehlings MG, Laufer I, Sciubba DM, Clarke MJ, Sundaresan N, Verlaan JJ, Sahgal A, Chou D, Fisher CG. Metastatic Spinal Cord Compression and Steroid Treatment: A Systematic Review. Clin Spine Surg. 2017 May;30(4):156-163. https://www.ncbi.nlm.nih.gov/pubmed/28437329

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Dexamethasone, IV (dosing): National Institute for Health and Care Excellence. Clinical Guidelines: Metastatic spinal cord compression in adults: risk assessment, diagnosis and management, November 2008. https://www.nice.org.uk/guidance/cg75

[iv] Clindamycin, oral: South African Antibiotic Stewardship Programme. A Pocket Guide to Antibiotic Prescribing for Adults in South Africa, 2015.http://www.fidssa.co.za/images/SAASP_Antibiotic_Gudidelines_2015.pdf

Clindamycin, oral: South African Medicines Formulary. 12th Edition. Division of Clinical Pharmacology. University of Cape Town, 2016.

Clindamycin, oral: Bouazza N, Pestre V, Jullien V, Curis E, Urien S, Salmon D, Tréluyer JM. Population pharmacokinetics of clindamycin orally and intravenously administered in patients with osteomyelitis. Br J ClinPharmacol. 2012 Dec;74(6):971-7.http://www.ncbi.nlm.nih.gov/pubmed/22486719

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[vi] Prednisone, oral: Small W Jr, Woloschak G. Radiation toxicity: a practical guide. Introduction. Cancer Treat Res. 2006;128:3-5. https://www.ncbi.nlm.nih.gov/pubmed/16335011

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**SOUTH AFRICAN ADULT HOSPITAL LEVEL ESSENTIAL MEDICINES LIST**
**CHAPTER 21: ONCOLOGIC EMERGENCIES**
**NEMLC RECOMMENDATIONS FOR MEDICINE AMENDMENTS (2017 -2019)**

**Background**

Previous editions of the Adult Hospital Level STGs and EML included a chapter for oncologic medicines to facilitate accessibility of bleomycin, hydroxyurea, tamoxifen and vincristine at secondary level of care. The rationale was that certain oncological conditions (e.g.: Kaposi sarcoma) may be managed at secondary level of care, in consultation with a specialist. The Standard Treatment Guideline further recommended that this does not restrict down-referral of oncology agents (according to Provincial guidelines) for continuation of care of patients who have been stabilised.

However, as each Province determines and authorises the oncology services to be provided at specific secondary or regional level institutions, the Adult Hospital Level Committee recommends that the objective of this chapter be amended. Furthermore, prevalence of Kaposi sarcoma is decreasing due to the roll out of antiretroviral therapy and severe cases are generally managed at tertiary level of care.

**General**

*Objective:* The chapter has been amended from a list of oncology medicines to management of oncologic emergencies and management of associated common side-effects.

*Access to oncologic agents at secondary/regional level:* Down referral mechanisms and Provincial Pharmaceutical and Therapeutics Committee are available mechanisms to ensure access of oncologic agents at sites approved by Provinces.

*Chapter layout:*

21.1 Oncological emergencies
- 21.1.1 Metabolic emergencies
  - 21.1.1.1 Hypercalcemia of malignancy
  - 21.1.1.2 Syndrome of inappropriate antidiuretic hormone (ADH)
  - 21.1.1.3 Tumor lysis syndrome
- 21.1.2 Haematologic emergencies
  - 21.1.2.1 Febrile neutropenia
  - 21.1.2.2 Hyperviscosity syndrome
- 21.1.3 Structural emergencies
  - 21.1.3.1 Epidural spinal cord compression
  - 21.1.3.2 Malignant pericardial effusion
  - 21.1.3.3 Superior vena cava syndrome

21.2 Side effects from oncologic treatment agent
- 21.2.1 Diarrhoea
- 21.2.2 Extravasations
- 21.2.3 Constipation

21.3 Side effects from radiation
- 21.3.1 Radiation mucositis
- 21.3.2 Wet desquamation of skin
- 21.3.3 Radiation and chemotherapy-induced pneumonitis
- 21.3.4 Radiation proctitis
- 21.3.5 Radiation cystitis

21.4 Side effect from chronic pain medication
- 21.4.1 Constipation
- 21.4.2 Nausea & vomiting
- 21.4.3 Depression

**Medicine recommendations, with supporting evidence and rationale are listed below. Kindly review the medicine amendments in the context of the chapter for oncologic emergencies**

| SECTION | MEDICINE | ADDED/DELETED/AMENDED |
|---|---|---|
| **21.1 ONCOLOGIC EMERGENCIES** | | |
| ***21.1.1 Metabolic emergencies*** | | |
| **21.1.1 Hypercalcemia of malignancy** | n/a | Cross referenced to section 8.9: Hypercalcaemia, including primary hyperparathyroidism |
| **21.1.1.2 Syndrome of inappropriate antidiuretic hormone (ADH)** | n/a | Cross referenced to section: 7.2.4 Hyponatraemia |
| **21.1.1.3 Tumour lysis syndrome** | Sodium chloride 0.9%, IV | Added |
| | Dextrose 5%, IV | Not added |
| | Sodium bicarbonate, IV | Not added |
| | Allopurinol, oral | Added |
| ***21.1.2 Haematologic emergencies*** | | |
| **21.1.2.1 Febrile neutropenia** | n/a | Cross referenced to section 2.8: Febrile neutropaenia |
| **21.1.2.2 Hyperviscosity syndrome** | n/a | n/a |
| ***21.1.3 Structural emergencies*** | | |
| **21.1.3.1 Epidural spinal cord compression** | Dexamethasone, IV | Added |
| **21.1.3.2 Malignant pericardial effusion** | Sodium chloride 0.9%, IV | Not added |
| | Dexamethasone, IV | Not added as a pre-referral dose (high dose) |
| **21.1.3.3 Superior vena cava syndrome** | Sodium chloride 0.9%, IV | Added |
| | Corticosteroids | Added (specialist consultation) |
| ***21.2 Side effects from oncology treatment agent*** | | |
| **21.2.1 Diarrhoea** | n/a | Cross referenced to section 1.3.3: Diarrhoea, acute non-inflammatory. |
| **21.2.2 Extravasations** | Clindamycin, oral | Added, where secondary infection is suspected |
| **21.2.3 Constipation** | n/a | Cross referenced to section 2.8: Constipation and Primary Health Care chapter: Medicines for palliative care; section 22.1.1: Constipation. |
| ***21.3 Side effects from radiation and chemotherapy*** | | |
| **21.3.1 Radiation mucositis** | Saline mouth rinse | Added |
| **21.3.2 Wet desquamation of skin** | n/a | n/a |
| **21.3.3 Radiation and chemotherapy induced pneumonitis** | Prednisone, oral | Added |
| **21.3.4 Radiation proctitis** | Topical steroids | Not added as pre-referral protocol |
| **21.3.5 Radiation cystitis** | Mist potassium citrate | Not added |
| ***21.4 Side effect from chronic pain medication*** | | |
| **21.4.1 Constipation** | n/a | Cross-referenced to section 25.1.3: Treatment of adverse effects of chronic opioid use. |
| **21.4.2 Nausea & vomiting** | n/a | Cross-referenced to section 25.1.3: Treatment of adverse effects of chronic opioid use. |
| **21.4.3 Depression** | n/a | Cross-referenced to Primary Health Care chapter: Medicines for palliative care; section 22.2.3: Depression. |

### 21.1.1.3 TUMOUR LYSIS SYNDROME

This Standard Treatment Guideline (STG) was developed, aligned with Clinical Practice Guideline[1], and assessed using the AGREE II instrument.

Sodium chloride 0.9%, IV: *added*
Dextrose 5%, IV: *not added*
Dextrose 5%, IV was not added to the STG as a resuscitation fluid, as sodium chloride 0.9% recommended consistent with the rest of the adult STGs. If patient is hypernatraemic or fluid overloaded, a specialist be consulted.

Sodium bicarbonate, IV**:** *not added*
Sodium bicarbonate, IV as a urinary alkaliniser not recommended as there was reported to be conflicting evidence for this intervention in tumour lysis syndrome.

Allopurinol, oral**:** *added*
Allopurinol has been standard of care prior to 1996 for prevention of tumour lysis syndrome, refer to the medicine review, allopurinol for tumour lysis (March 2019):

Allopurinol for Tumour Lysis Syndrc

http://www.health.gov.za/index.php/standard-treatment-guidelines-and-essential-medicines-list/category/286-hospital-level-adults

**Recommendation:** Based on this evidence review, the Adult Hospital Level Committee recommended oral allopurinol for prevention of tumour lysis syndrome.
*Rationale*: Standard practice and there is a paucity of high quality RCT evidence for allopurinol for the prevention of tumour lysis syndrome. Allopurinol is currently used as the standard of care/comparator in clinical intervention trials.
**Level of Evidence: III Case report[2], Standard of care as suggested by Guidelines [3][4]**

Guidelines (mentioned above) recommends allopurinol to prevent tumour lysis syndrome at a dose of 200–400 mg/m2/day in 1–3 divided doses for adults, up to a maximum of 800 mg daily, prior to starting chemotherapy. It is noted that allopurinol is available on the South African market as a "300 mg" tablet formulation. Maximum dose recommended as "900 mg" daily for pragmatic purposes. The STG recommends pre-referral dosing.
**Level of Evidence: III Guidelines, Expert opinion**

### 21.1.3.1 EPIDURAL SPINAL CORD COMPRESSION

Dexamethasone, IV: *added*
Corticosteroids has long-standing standard of care of care, prior to 1996 for preventing neurological decline due to metastatic spinal cord compression (MSCC); refer to medicine review (dexamethasone oral/IV for MSCC, November 2019):

[1] Coiffier B, Altman A, Pui CH, Younes A, Cairo MS. Guidelines for the management of pediatric and adult tumor lysis syndrome: an evidence-based review. J Clin Oncol. 2008 Jun 1;26(16):2767-78. https://www.ncbi.nlm.nih.gov/pubmed/18509186
[2] Krakoff IH. Use of allopurinol in preventing hyperuricemia in leukemia and lymphoma. Cancer. 1966 Nov;19(11):1489-96. https://www.ncbi.nlm.nih.gov/pubmed/5925255
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Steroids for Spinal Cord Compression_A

http://www.health.gov.za/index.php/standard-treatment-guidelines-and-essential-medicines-list/category/286-hospital-level-adults

**Recommendation**

Based on this evidence review, the Adult Hospital Level Committee recommends moderate dose corticosteroids to reduce inflammation, oedema and pain in metastatic spinal cord compression; either with/without surgery or radiation. NICE[5] and Canadian guidelines[6] recommend starting with a loading dose of at least 16 mg, followed by doses of 16 mg per day.

*Rationale:* Limited evidence of low quality suggests that moderate dose corticosetroids may be benificial in enhancing ambulation, long-term survival, reducing pain, improving urinary incontinence ; but there is uncertainty regarding the optimal dose. However, high doses of steroids are associated with a higher risk of adverse effects (such as perforated gastric ulcer, psychoses and deaths due to infection).

**Level of Evidence: III Systematic review of low quality RCTs**

External comment was received from a stakeholder, to recommend high dose dexamethasone as vasogenic oedema causes spinal cord damage due to limited space to expand. However, evidence suggests that there is no benefit of initial high dose vs conventional moderate dose corticosteroid (refer to medicine review, above).

**Level of Evidence: III Systematic review of low quality RCTs[7]**

### 21.1.3.2 MALIGNANT PERICARDIAL EFFUSION

Sodium chloride, IV: *not added*

Sodium chloride, IV was not recommended in this clinical setting, as patient with hypotension and tamponade should first be tapped to determine the underlying aetiology.

**Level of Evidence: III Expert opinion**

Dexamethasone, IV: *not added as a pre-referral dose (high dose)*

External comment received (without supporting evidence) that high dose dexamethasone may be of value as a pre-referral recommendation. However, the European Society of Cardiology recommends that systemic corticosteroid therapy be restricted to connective-tissue diseases, autoreactive pericarditis, or uraemic pericarditis[8]. The STG recommends that all patients should be referred for definitive therapy.

**Level of Evidence: III Guidelines, Expert opinion**

### 21.1.3.3 SUPERIOR VENA CAVA SYNDROME

Sodium chloride, IV: *added*

Sodium chloride, IV recommended as a resuscitation fluid.

[5] NICE. Metastatic spinal cord compression in adults, November 2008. https://www.nice.org.uk/guidance/cg75

[6] Loblaw DA, Mitera G, Ford M, Laperriere NJ. A 2011 updated systematic review and clinical practice guideline for the management of malignant extradural spinal cord compression. Int J Radiat Oncol Biol Phys. 2012 Oct 1;84(2):312-7. https://www.ncbi.nlm.nih.gov/pubmed/22420969

[7] George R, Jeba J, Ramkumar G, Chacko AG, Tharyan P. Interventions for the treatment of metastatic extradural spinal cord compression in adults. Cochrane Database Syst Rev. 2015 Sep 4;(9):CD006716. https://www.ncbi.nlm.nih.gov/pubmed/26337716

[8] Adler Y, Charron P, Imazio M, Badano L, Barón-Esquivias G, Bogaert J, Brucato A, Gueret P, Klingel K, Lionis C, Maisch B, Mayosi B, Pavie A, Ristic AD, Sabaté Tenas M, Seferovic P, Swedberg K, Tomkowski W; ESC Scientific Document Group . 2015 ESC Guidelines for the diagnosis and management of pericardial diseases: The Task Force for the Diagnosis and Management of Pericardial Diseases of the European Society of Cardiology (ESC)Endorsed by: The European Association for Cardio-Thoracic Surgery (EACTS). Eur Heart J. 2015 Nov 7;36(42):2921-2964. https://www.ncbi.nlm.nih.gov/pubmed/26320112

Corticosteroids: *added (specialist consultation)*
Despite patient referrals for directed management on histological diagnosis; delay in referral may occur and thus, corticosteroids may considered in consultation with a specialist
**Level of Evidence: III Expert opinion**

### 21.2.2 EXTRAVASATIONS

Clindamycin, oral: *added*
This was recommended for "*patients with larger areas of erythema and tenderness extending beyond the insertion site, where secondary infection is suspected*".
*Rationale:* The Adult Hospital Level Committee considered that the recommendation of clindamycin for extravasation due to oncologic treatment agents, where secondary infection is present, describes a favourable risk-benefit assessment of neutropaenic oncologic patients from an antibiotic stewardship perspective. This was aligned with section 9.1.1: Intravascular catheter infections.
**Level of Evidence: III Expert opinion, Guidelines[9] [10], pharmacokinetic study[11]**

### 21.3.1 RADIATION MUCOSITIS

Saline mouth rinse: *added*
A small randomised study[12] showed that radiation-induced oral mucositis symptoms were no different between patients receiving standard of care (education of mouthwashes with boiled water for 3-or 4-hr intervals and after meals vs the saline rinse education programme). However, the saline rinse and education programme promoted better physical and social-emotional QOL in oral cavity cancer patients receiving RT/CCRT. Despite the limited evidence of low quality, it was found reasonable to recommend saline mouth rinses which is standard practice.
**Level of Evidence: III Disease oriented study, Standard of care**

### 21.3.3 RADIATION AND CHEMOTHERAPY INDUCED PNEUMONITIS

Note that various chemotherapy agents may also cause chemotherapy-induced pneumonitis[13].

Prednisone, oral: *added*
Prednisone is long-standing standard of care prior to 1996 for radiation and chemotherapy-induced pneumonitis; refer to medicine review (Prednisone for pneumonitis, November 2019):

Prednisone for Pneumonitis_AdultR

http://www.health.gov.za/index.php/standard-treatment-guidelines-and-essential-medicines-list/category/286-hospital-level-adults

**Recommendation**: Based on this review, the Adult Hospital Level Committee recommended prednisone, oral for management of acute radiation pneumonitis.
*Rationale*: Limited evidence in the literature for preventing, mitigating and treating acute and late radiation induced lung injury. Mainstay of therapy and was found to be probably biologically plausible,

[9] South African Antibiotic Stewardship Programme. A Pocket Guide to Antibiotic Prescribing for Adults in South Africa, 2015.http://www.fidssa.co.za/images/SAASP_Antibiotic_Gudidelines_2015.pdf
[10] SAMF, 2016
[11] Bouazza N, Pestre V, Jullien V, Curis E, Urien S, Salmon D, Tréluyer JM. Population pharmacokinetics of clindamycin orally and intravenously administered in patients with osteomyelitis. Br J ClinPharmacol. 2012 Dec;74(6):971-7.http://www.ncbi.nlm.nih.gov/pubmed/22486719
[12] Huang BS, Wu SC, Lin CY, Fan KH, Chang JT, Chen SC. The effectiveness of a saline mouth rinse regimen and education programme on radiation-induced oral mucositis and quality of life in oral cavity cancer patients: A randomised controlled trial. Eur J Cancer Care (Engl). 2018 Mar;27(2):e12819. https://www.ncbi.nlm.nih.gov/pubmed/29315944
[13] McDonald S, Rubin P, Phillips TL, Marks LB. Injury to the lung from cancer therapy: clinical syndromes, measurable endpoints, and potential scoring systems. Int J Radiat Oncol Biol Phys. 1995 Mar 30;31(5):1187-203. https://www.ncbi.nlm.nih.gov/pubmed/7713782

as suggested in Guidelines and case reports.
**Level of Evidence: Standard of care as suggested by Guidelines[14], Case Reports[15] [16]**

External comment was received from stakeholder to increase the dose of prednisone. However, the current recommendation is aligned with Guidelines.
**Level of Evidence: III Guidelines[17], Standard of care**

### 21.3.4 RADIATION PROCTITIS

**Referral**
Topical steroids: *not added as pre-referral protocol*
External comment received indicating that topical steroids may be of value when the patient is referred to a radiation oncology centre. However, management would be determined at the referral centre.
**Level of Evidence: III Expert opinion**

### 21.3.5 RADIATION CYSTITIS

Mist potassium citrate, oral: *not added*
No available evidence for mist potassium citrate in the management of radiation cystitis could be retrieved.

*Report prepared by TD Leong: Secretariat to the Adult Hospital Level Committee (2017-2020)*
- ***Note**: Information was sourced from NEMLC ratified minutes and NEMLC-approved documents.*

[14] Small W Jr, Woloschak G. Radiation toxicity: a practical guide. Introduction. Cancer Treat Res. 2006;128:3-5. https://www.ncbi.nlm.nih.gov/pubmed/16335011
[15] Ta V, Aronowitz P. Radiation pneumonitis. J Gen Intern Med. 2011 Oct;26(10):1213-4. https://www.ncbi.nlm.nih.gov/pubmed/21538170
[16] Conway JL, Long K, Ploquin N, Olivotto IA. Unexpected Symptomatic Pneumonitis Following Breast Tangent Radiation: A Case Report. Cureus. 2015 Oct 22;7(10):e363. https://www.ncbi.nlm.nih.gov/pubmed/26623218
[17] Small W Jr, Woloschak G. Radiation toxicity: a practical guide. Introduction. Cancer Treat Res. 2006;128:3-5. https://www.ncbi.nlm.nih.gov/pubmed/16335011