

**PAEDIATRIC HOSPITAL LEVEL ESSENTIAL MEDICINES LIST**  
**CHAPTER 18: POISONING**  
**NEMLC 30 JANUARY 2020**

**A: PREVIOUS RECOMMENDATIONS**

**PREVIOUSLY ACCEPTED MEDICINE AMENDMENTS**

SECTION	MEDICINE	ADDED/DELETED/NOT ADDED
<b>18.1 Poisoning</b>	Activated Charcoal	Dose amended
	Polyethylene glycol	Dose amended
<b>18.1.2 Anticoagulant poisoning</b>	Vitamin K <sub>1</sub>	Dosing recommendations amended
<b>18.1.3 Tricyclic antidepressant poisoning</b>	Sodium bicarbonate	Dosing recommendations amended
<b>18.1.4 Caustic or corrosive agents, ingestion</b>	Corticosteroid therapy	Removed
<b>18.1.6 Ethanol Poisoning</b>	Dextrose 10% IV	Indication amended
<b>18.1.7 Iron Poisoning</b>	Whole bowel irrigation	Recommendations for used amended
<b>18.1.9 Organophosphate poisoning</b>	Atropine	Dosing recommendations amended
	Glycopyrrolate	Added
<b>18.1.10 Opioid Poisoning</b>	Naloxone	IV infusion dose added
<b>18.1.11 Paracetamol Poisoning</b>	N-acetylcysteine, IV	Dosing regimen amended
<b>18.1.12 Petrochemical Poisoning</b>	Amoxicillin	Removed
<b>18.1.13 Salicylate Poisoning</b>	½ darrows/dextrose 5%	Removed
	5% dextrose/saline	Added
<b>18.1.14 Benzodiazepine Poisoning</b>	Activated charcoal	Removed
<b>18.1.18 Theophylline Poisoning</b>	Ondansetron	Added
<b>18.1.21 Carbon monoxide poisoning (for seizures)</b>	Benzodiazepine	Added
	Phenytoin	Not recommended
<b>18.2.3 Snakebites</b>	Paracetamol	Added
	Polyvalent antivenom	Indication guidance amended
	Monovalent antivenom	Indication guidance amended
	Polyvalent antivenom	Dosing recommendations amended
<b>18.2.5 Spider bites</b>	Paracetamol	Added

**B: AMENDMENTS FOLLOWING COMMENT**

The only external comment that was received was editorial. All editorial amendments were accepted, and the chapter was updated.

**PAEDIATRIC HOSPITAL LEVEL ESSENTIAL MEDICINES LIST**  
**CHAPTER 18: POISONING**  
**NEMLC 26 SEPTEMBER 2019**

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<b>18.2.5 Spider bites</b>	Paracetamol	Added

**Sections Added**

The following sections were added:

- ARV poisoning – common agents in household.
- Carbon monoxide poisoning – particularly due to use of fires in homes in informal settlements.
- Insect bites and stings

- Snake venom in the eye

The information in these chapters were aligned with those in the Adult Hospital Level Standard Treatment (STGs) and Essential Medicines List (EML)

## Helpline information

The contact information was expanded to include all contact information for all South African Poison centres and resources. Additionally operation hours or the information lines were added.

## 18.1 Poisoning

### Gastric lavage<sup>1</sup>

The gastric lavage section was amended to outline that this process is seldom needed and may cause more harm. Additionally the indications, contraindications and appropriate technique were added as follows:

#### 1. Gastric lavage

Gastric lavage is seldom indicated and may cause more harm than benefit. If indicated, it should only be performed by experienced staff and within 60 minutes of ingestion.

Indicated only if patient:

- has ingested a potentially life-threatening poison
- has a protected airway i.e. fully awake and cooperative or intubated with a depressed level of consciousness

Gastric lavage is contraindicated after ingestion of corrosive substances and volatile hydrocarbons such as paraffin.

#### Technique:

- Place patient in left lateral head down position
- Insert orogastric tube if possible, with largest bore and rounded tip.
- Insert 200ml warmed water or normal saline, and aspirate.

Continue until recovered solution is clear of particulate matter.

### Activated Charcoal<sup>2</sup>

The text was amended around the activated charcoal recommendations, with particular emphasis on only using in cases where the airway is protected. These recommendations were aligned to Adult STGs and EML, see adult 'Activated Charcoal medicine review'.

The dose in children less than 6 years was amended from a flat 10gs in all to 1g/kg.<sup>2</sup>

#### 2. Activated charcoal

May reduce systemic absorption of a variety of poisonous substances. The greatest benefit is achieved if activated charcoal is given within one hour after ingestion; however where gastric emptying is delayed by certain substances, there may be a longer period of time in which it is effective.

Activated charcoal must only be given in cases where the airway is protected. i.e. fully awake and cooperative patient or intubated with a depressed level of consciousness.

<sup>1</sup> Position paper update: gastric lavage for gastrointestinal decontamination. Clin Toxicol (Phila) 2013;51:140-146.  
DOI: 10.3109/15563650.2013.770154

<sup>2</sup> Chyka PA, Seger D, Krenzelok EP, Vale JA; American Academy of Clinical Toxicology; European Association of Poisons Centres and Clinical Toxicologists. Position paper: single-dose activated charcoal. Clin Toxicol (Phila) 2005;43(2):61-87.

Repeated doses of activated charcoal every 4 hours are effective in enhancing elimination of substances that undergo enterohepatic circulation, e.g. carbamazepine, dapsone, phenobarbitone, quinine or theophylline overdose.

- Activated charcoal, oral, given as a slurry:
  - If < 6 years of age: 1g/kg in 50–100 mL water.
  - If > 6 years of age: 20–50 g in 100–300 mL water.

### Whole bowel irrigation<sup>3</sup>

The text was amended to outline when whole bowel irrigation can be used.

The dose of polyethylene glycol (PEG) as follows:

#### 1. Whole bowel irrigation

Whole bowel irrigation can be done for potentially toxic ingestions of substances that are:

- » not absorbed by activated charcoal (e.g. iron and lithium)
- » sustained-release and enteric-coated products
- » or for removal of illicit drugs in body packers.

Patients must have a protected airway i.e. fully awake and cooperative or intubated with a depressed level of consciousness.

- Polyethylene glycol (PEG) balanced electrolyte solution, NGT,
  - 1500–2000 mL/hour.
  - Continue until rectal effluent is clear.

~~Use only for poisoning due to iron, lithium, or lead.~~

~~» Contraindications:~~

~~» In patient is unconscious and the airway is not protected.~~

- ~~• Polyethylene glycol balanced electrolyte solution, oral, 30mL/kg/hour.~~

~~○ Maximum dose: 1.8 L/hour~~

~~○ Continue until rectal effluent is clear~~

## **18.1.2 Anticoagulant Poisoning**

### Vitamin K<sub>1</sub>: Dosing recommendations amended

The previous text indicated that vitamin K should only be used if the INR was deranged. This was clarified as an INR > 2.5 IU. **LOE III Expert opinion**

The guidance around frequency and repeat dosing was confusing and was thus clarified as follows:

- Vitamin K<sub>1</sub>, IV/oral, 1–5 mg/dose administered slowly ~~6 hourly.~~
  - ~~repeat if large doses were administered~~

**Note:** Intravenous solution can be used orally.

Oral vitamin K<sub>1</sub> is usually preferred to intravenous vitamin K<sub>1</sub> unless more rapid reversal is required (e.g. the patient is bleeding). Intravenous vitamin K<sub>1</sub> may cause hypersensitivity reactions.

<sup>3</sup> Thanacoody R, Caravati EM, Troutman B, Hojer J, Benson B, Hoppu K et al. Position paper update: whole bowel irrigation for gastrointestinal decontamination of overdose patients. Clin Toxicol (Phila) 2015;53:5-12. DOI: 10.3109/15563650.2014.989326

Repeat vitamin K dosing and length of therapy is dependent on INR response to treatment and clinical response – contact poison centre for patient specific advice.

If significant bleeding present:

*ADD*

- Lyophilised plasma IV, 20 mL/kg.

*OR*

- Fresh frozen plasma, IV, 20 mL/kg.

Ingestion of super-warfarins may be refractory to large doses of vitamin K1 and therapy may be required for several weeks after ingestion.

### 18.1.3 Tricyclic Antidepressant Poisoning

Sodium bicarbonate: *dosing recommendations amended*

- Guidance on when serum alkalinisation should be done was added. This is now also in line with the Adult recommendations
- The sodium bicarbonate dosing<sup>4</sup> was updated as follows:

**Alkalinisation for metabolic acidosis**

Alkalinisation up to an arterial pH of 7.45:

3. Sodium bicarbonate 4.2%, IV, 2 mL/kg as a bolus.

1. May be repeated.

2. Follow with a continuous infusion in consultation with specialist.

**Serum alkalinisation for all patients with:**

- » ventricular dysrhythmias,
- » prolonged QRS >100 msec
- » hypotension unresponsive to fluids or
- » seizures.

- Sodium bicarbonate, bolus doses (1-2mEq/kg as an 8.4% solution), to achieve a pH of 7.45–7.55. (Specialist consultation).

- Monitor acid-base status, serum potassium and sodium

In severe cases, inotropic support and anti-arrhythmic agents may be required in addition to serum alkalinisation.

#### Seizure

- For seizures a note was added to avoid use of phenytoin. Phenytoin should not be used in tricyclic antidepressant poisoning due to the differing pathophysiology of toxin-induced seizures as opposed to epilepsy, phenytoin is probably not as effective as a second-line agent. In some instances phenytoin has even been found to be proconvulsive. In addition, the most common side effects of IV phenytoin are hypotension and arrhythmias, so it seems pharmacologically sensible not to advocate for its use in toxin-induced seizures where cardiotoxicity may be a concern.

<sup>4</sup> Brucoleri R and Burns M. A literature review of the use of sodium bicarbonate for the treatment of QRS widening. J Med Toxicol 2016;12:121-129.

Initially this was thought to be due to solvents, but similar side effects have been seen with fosphenytoin.<sup>5,6</sup>

#### 18.1.4 Caustic or corrosive agents, ingestion

Corticosteroid therapy recommendation: *removed*

Since all patients should be referred for endoscopic evaluation, steroid therapy should not be routinely recommended unless by initiation by a sub-specialist following endoscopy findings.

- » Prophylactic antibiotics are not indicated.
- » ~~Consider steroid therapy only if endoscopy has shown a 2<sup>nd</sup> or 3<sup>rd</sup> degree oesophageal injury to reduce oedema and fibrosis. In the setting of GIT bleeding or perforation, steroids are contraindicated~~
- » Empiric steroid therapy is not indicated, however, based on endoscopy findings may be appropriate (sub-specialist initiated).

#### 18.1.6 Ethanol poisoning

Dextrose 10% IV: *indication amended*

The previous recommendations indicated that dextrose 10% IV should be used in obtunded patients.

This was amended to outline that it is only recommended in obtunded patients with hypoglycaemia:

Obtunded patients with hypoglycaemia:

- Dextrose 10%, IV, 2 mL/kg followed by 10% dextrose maintenance infusion. Titrate until blood glucose is controlled.  
If patients respond to glucose administration, perform serial glucose levels to detect recurrent hypoglycaemia.

#### 18.1.6 Iron Poisoning

Whole bowel irrigation: recommendations for used amended.

The recommendations for which patients, whole bowel irrigation should be used for iron poisoning were outlined in line with the Position Paper on whole bowel irrigation<sup>3</sup>, as follows:

If no signs of gastrointestinal dysfunction e.g. perforation/haemorrhage:

- » Whole bowel irrigation is recommended if:
  - >60mg/kg elemental iron has been ingested
  - modified-release preparation are ingested
  - undissolved tablets are still visible on abdominal X-ray.

<sup>5</sup> Shah ASV, Eddleston M. Should phenytoin or barbiturates be used as second-line anticonvulsant therapy for toxicology seizures? Clinical Toxicology. 2010, 48: 800-805.

<sup>6</sup> Chen HY, Albertson TE, Olson KR. Treatment of drug-induced seizures. British Journal of Clinical Pharmacology. 2015, 81(3):412-419.

### 18.1.9 Organophosphate poisoning

Atropine: dosing recommendations amended

Glycopyrrolate: added

Atropine

Guidance on how to incrementally double doses was added

- Atropine bolus, IV, 0.05 mg/kg.
  - Reassess after 3 – 5 minutes for evidence of atropinisation as indicated by reduced bronchial secretions, dry mouth, increasing heart rate and blood pressure, and dilating pupils (note: pupils dilatation may be delayed)
- Give repeated atropine boluses incrementally doubling the dose until adequate clinical response achieved.
  - E.g. 10kg child: 0.5mg, 1mg, 2mg, 4mg, 8mg, (no maximum dose)
  - If no clinical response, give double the dose.
  - If some response, give the same or reduced dose.
- Follow with infusion. Calculate the total dose of atropine given as boluses (as described above). Give 10 – 20% of this dose per hour.
- Reassess frequently and adjust atropine infusion as follows:
  - Bronchial secretions, bronchospasm or bradycardia recur – increase dose.
  - Good control of bronchial secretions and signs of atropine overdose (tachycardia, dilated pupils, agitation, pyrexia, reduced bowel sounds and urinary retention): decrease dose.
  - No recurrence of bronchial secretions and no signs of atropine overdose: reduce dose slowly.

Glycopyrrolate<sup>7</sup>

Text was added to indicate that glycopyrrolate is not a substitute for atropine but may be considered in patients who are suffering from central cholinergic toxicity from atropine:

Glycopyrrolate is not a substitute for atropine. However, it does not penetrate the CNS and therefore may be useful in patients who are suffering from central cholinergic toxicity as a result of atropine but still require control of peripheral muscarinic symptoms.

- Dose: 0.025 mg/kg IV

### 18.1.10 Opioid Poisoning

Naloxone: *IV infusion dose added*

### 18.1.11 Paracetamol poisoning

N-acetylcysteine, IV: *dosing regimen amended*

<sup>7</sup> Eddleston M, Chowdhury FR. Pharmacological treatment of organophosphorus insecticide poisoning: The old and the (possible) new. Br J Clin Pharmacol 2015;81(3):462-470. <https://doi.org/10.1111%2Fbcp.12784>

A new 20-hour 2-bag N-acetylcysteine regimen (200mg/kg in first 4 hours, then 100mg/kg in 16 hours) has been shown to have less adverse reactions, less dosing errors, less bags for nurses to manage, and the same efficacy as the previously recommended regimens.<sup>8,9</sup>

#### **N-Acetylcysteine, IV.**

##### First 24-21 hours

- ~~Loading dose: 150 mg/kg, in diluted in of dextrose 5%, 5 mL/kg given over 1 hour.~~
- ~~50 mg/kg, diluted in of dextrose 5%, 5 mL/kg over the next 4 hours; then 100 mg/kg, diluted in of dextrose 5%, 10 mL/kg over 16 hours.~~

##### Second 24 hours Repeat infusions:

- ~~100 mg/kg, diluted in of dextrose 5%, 10 mL/kg over 24 hours.~~
- 20-hour regimen
- 200mg/kg in 7ml/kg of 5% dextrose over 4 hours
- Followed by 100mg/kg in 14ml/kg 5% dextrose over 16 hours
- Repeat infusions according to second dose.

### **18.1.12 Petrochemical poisoning**

Amoxicillin: *Removed*

The recommendation to used amoxicillin if infection develops was removed, and a referral to the Pneumonia section in the Respiratory chapter was added.

### **18.1.13 Salicylate Poisoning**

½ darrows/dextrose 5%: *removed*

5% dextrose/saline: *added*

In the previous iteration there was a move from ½ Darrows, dextrose 5% to an isotonic solution for rehydration in the Alimentary Chapter, due to the risk of hyponatraemia associated with this product.<sup>10</sup> The Committee proposed that this replacement be made for salicylate poisoning.

Note: A dextrose containing solution is required in salicylate poisoning.<sup>11</sup>

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<sup>8</sup> Bateman N, Dear J, Thomas S. New regimens for intravenous N-acetylcysteine. Where are we now? Clin Toxicol 2016;54(2):75-78.

<sup>9</sup> Wong A and Graudins A. Simplification of the standard three-bag intravenous acetylcysteine regimen for paracetamol poisoning results in a lower incidence of adverse drug reactions. Clin Toxicol (Phila) 2016;54(2):115-199.

<sup>10</sup> Foster BA, Tom D, Hill V. Hypotonic versus isotonic fluids in hospitalized children: a systematic review and meta-analysis. The Journal of Pediatrics 2014;165:163–9. 10.1016/j.jpeds.2014.01.040

<sup>11</sup> Yip L et al. Concepts and controversies in salicylate toxicity. Emerg Med Clinics of NA 1994;12(2):351-63

<sup>12</sup> McNab S, Ware RS, Neville KA, Choong K, Coulthard MG, Duke T, Davidson A, Dorofaeff T. Isotonic versus hypotonic solutions for maintenance intravenous fluid administration in children. Cochrane Database of Systematic Reviews 2014, Issue 12. Art. No.: CD009457. DOI: 10.1002/14651858.CD009457.pub2.

#### 18.1.14 Benzodiazepine Poisoning

Activated charcoal: *removed*

Benzodiazepines are rapidly absorbed and CNS depression is common, thus the risks of using activated charcoal outweigh the benefits.

#### 18.1.18 Theophylline poisoning

Ondansetron: *added*

It was reported by the Poisons Information Centre<sup>13</sup> that vomiting is common in theophylline poisoning, and thus an anti-emetic should be included. Ondansetron was recommended for inclusion, as it is already in the STGs for nausea and vomiting.<sup>14,15,16</sup>

#### 18.1.20 Antiretroviral agent poisoning

Section added as follows:

##### DESCRIPTION

Limited data is available regarding overdose of these medicines.  
Toxicological effects are generally extensions of adverse effects.

##### GENERAL MEASURES

Monitor FBC, serum electrolytes, renal and liver function.  
Monitor serum lipase in patients with abdominal pain.  
Lactic acid and serum pH should be monitored in acidotic patients.

##### TREATMENT

There are no specific antidotes.  
Treatment is symptomatic and supportive.

#### 18.1.21 Carbon monoxide poisoning

Benzodiazepines: *recommended*

Phenytoin: *not recommended*

Phenytoin should be avoided (due to potential cardiotoxicity), see section 18.1.3.<sup>5,6</sup>

<sup>13</sup> Goldfrank's Toxicologic Emergencies 10<sup>th</sup> edition p914.

<sup>14</sup> Roberts et al. Ondansetron quells drug-resistant emesis in theophylline poisoning. Am J Emerg Med 1993;11(6):609-10.

<sup>15</sup> Daly and Taylor. Ondansetron in theophylline overdose. Anaesthesia Intensive Care 1993;21(4):474-5.

<sup>16</sup> Sage et al. Ondansetron in the treatment of intractable nausea associated with theophylline toxicity. Ann Pharmacother 1993;27(5):584-5.

Section added as follows:

#### DESCRIPTION

Poisoning caused by accidental or intentional exposure to fires in poorly ventilated areas, combustion engines, faulty stoves and faulty heating systems.

Patients present with:

- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| » Dizziness                       | » high arterial                   |
| » Headache                        | carboxyhaemoglobin levels         |
| » seizures and other CNS symptoms | » impaired level of consciousness |
| » nausea and vomiting             | » retinal haemorrhages            |
| » chest pain                      | » respiratory alkalosis (mild)    |
| » tachycardia                     | » metabolic acidosis (severe)     |

**Note:** There may be a normal arterial PaO<sub>2</sub>, but low oxygen saturation on pulse oximetry. Neither are useful in assessing severity of carbon monoxide poisoning. Ideally, a blood gas sample should be sent for co-oximetry to specifically detect carboxyhaemoglobin levels.

#### GENERAL MEASURES

- » Remove patient from toxic environment.
- » Ventilation may be needed in deeply comatose patients.
- » Monitor ECG and neurological status.

#### MEDICINE TREATMENT

- » Give 100% oxygen via positive pressure facemask.
- » Evidence for the benefit of hyperbaric oxygen therapy is unclear, therefore it cannot be routinely advised.

For seizures:

- Benzodiazepines. See Chapter 13 The Nervous System, section 13.3: Status epilepticus.

**Note:** Phenytoin should be avoided (due to potential cardiotoxicity).

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Metabolic acidosis:

Metabolic acidosis shifts the oxygen-dissociation curve to the right and therefore aids in maintaining tissue oxygenation despite reduced haemoglobin carrying capacity. Metabolic acidosis should only be treated if profound and persistent, following standard treatment protocols.

Patients should be followed up after discharge for the persistence of neurocognitive symptoms.

In patients not responding to 100% oxygen, consider exposure to cyanide during fire and refer patient urgently.

### 18.2.1 Insect bites and stings

Section added as follows:

#### DESCRIPTION

Toxicity due to insect bites and stings usually results in local effects only and systemic effects are rare. Occasionally, hypersensitivity reactions are encountered, which may vary from minor local inflammation to acute anaphylaxis.

Multiple bee stings can result in toxicity and may require ICU care.

#### GENERAL MEASURES

- » Allergic reactions may be acutely life-threatening.

- » Patients with multiple stings may develop delayed systemic toxicity. Beware of premature discharge from the healthcare facility.

#### **MEDICINE TREATMENT**

For Anaphylaxis:

See Chapter 1, Section 1.1.3: Anaphylaxis/Anaphylactic Reactions.

For pain:

- Paracetamol, oral, 15mg/kg/dose 6 hourly as required.

### **18.2.2 Scorpion Stings**

Warning added:

#### **Caution**

Never administer antivenom without being prepared to manage acute anaphylaxis.

### **18.2.3 Snakebite**

Paracetamol: *added*

Polyvalent antivenom: *Indication guidance amended*

Monovalent antivenom: *Indication guidance amended*

Polyvalent antivenom: *Dosing recommendations amended*

#### Paracetamol

Analgesia recommendation were added, as these were not previously included. Paracetamol was added as first line management, as outlined in the Paediatric Pain Chapter. A caution to avoid nonsteroidal anti-inflammatories (NSAIDS) and aspirin due to concerns of coagulopathy was added, as well as a recommendation to use opioids cautiously in neurotoxic snakebites.

#### Antivenom

The polyvalent antivenom dosing was specified for cytotoxic and neurotoxic snake bites.<sup>17, 18</sup>

The text on indication and dosing was included as follows:

<sup>17</sup> Polyvalent antivenom (neurotoxic, cytotoxic or unidentified snakebites): Müller GJ, Modler H, Wium CA, Veale DJH, Marks CJ. Snake bite in southern Africa: diagnosis and management. CME Oct 2012; 30(10):362

82. <http://www.cmej.org.za/index.php/cmej/article/view/2546/2581>

<sup>18</sup> Polyvalent antivenom: South African Medicines Formulary. 12th Edition. Division of Clinical Pharmacology. University of Cape Town, 2016.

### **Antivenom therapy**

#### **Two types of snake antivenom are available:**

- Polyvalent antivenom: active against puff adder, gaboon adder, rinkhals, green mamba, black mamba, Jameson's mamba, Cape cobra, forest cobra, snouted cobra, Mozambique spitting cobra
  - Monovalent antivenom: for boomslang bites only
- » Obtainable from South African Vaccine Producers (tel: +2711 386-6063/2/78 or afterhours 0716809897 or 0828842971). See full details in the package insert.

#### **Indications:**

- » Consider antivenom in children who are persistently and severely affected even after the first day.
- » Polyvalent antivenom:
- Positively identified snake included in polyvalent antivenom AND evidence of severe cytotoxic envenomation
  - Unidentified snake and evidence of progressive severe cytotoxic envenomation:
    - Painful swelling of whole hand/foot within 1 hour
    - Swelling to the elbow/knee in less than 6 hours
    - Swelling of the whole limb in less than 12 hours
    - Swelling progression > 2.5cm per hour
    - A threatened airway due to swelling
    - Evidence of complication e.g. compartment syndrome
    - Systemic evidence of severe cytotoxicity
      - Shock
      - Haematological abnormalities: INR >1.5, Hb < 8g/dL, thrombocytopaenia (< 100 x 10<sup>9</sup>/L) or leukocytosis (>10 x 10<sup>9</sup>/L)
      - Arrhythmias (rare)
  - Any signs of neurotoxicity, i.e. weakness or paralysis
- » Monovalent antivenom
- Positively identified boomslang AND clinical or laboratory features of coagulopathy
  - Unidentified snakebite with evidence of coagulopathy AND no swelling at the bite site.

#### **Administration and antivenom dose:**

##### **Caution**

Never administer antivenom without being prepared to manage acute anaphylaxis.

- » In most cases patients do not need and should not be given antivenom.
- » Adverse reactions to antivenom are common and may be severe.
- » Pre-medication with adrenaline (epinephrine) may reduce the risk of severe adverse reactions to polyvalent snake antivenom.
- Adrenaline (epinephrine) 1:1000, SC, 0.01 mL/kg, to a maximum of 0.25 ml
- » The dose of antivenom is the same for adults and children.
- » Monitor for any deterioration in respiratory function as patients may need ventilation whether or not polyvalent antivenom has been given.
- » Antivenom should be given as soon as possible, however administration may be considered even as late as 48-72 hours after the bite, if there is continued clinical deterioration indicating ongoing venom activity.
- Polyvalent snake antivenom, IV.
    - 1 ampoule contains 10 mL antivenom.

<ul style="list-style-type: none"> <li>▪ Cytotoxic snakebite: give 50 mL</li> <li>▪ Neurotoxic snakebite: give 80–100 mL (and up to 200 mL in black mamba bites)</li> <li>○ Dilute in sodium chloride 0.9%, 50–100 mL</li> <li>○ Administer IV, over 30 minutes</li> </ul>	LoE:III
<ul style="list-style-type: none"> <li>• Boomslang monovalent antivenom: <ul style="list-style-type: none"> <li>○ Slow IV, 10 mL administered over 3–5 minutes.</li> </ul> </li> <li>OR</li> <li>○ IV infusion, 10–20 mL diluted in sodium chloride 0.9% or dextrose 5%, 50–100 mL administered over 5–10 minutes.</li> </ul> <p>Spontaneous systemic bleeding should stop within 15–30 minutes and blood coagulability be restored within 6 hours.</p> <ul style="list-style-type: none"> <li>» After administration of antivenom, observe patient for 24 hours.</li> <li>» Contact the Poisons Information Helpline for further advice.</li> <li>» Correct anaemia and bleeding tendency.</li> </ul>	

#### 18.2.4 Snake venom in the eye

Section added as follows:

##### DESCRIPTION

Direct or indirect snake venom exposure to the eye, particularly from various species of spitting cobras and rinkhals, can cause chemical injury with varying clinical presentations ranging from periocular swelling and mild conjunctival and corneal inflammation to frank corneal ulceration and perforation with eventual blindness.

##### GENERAL MEASURES

- » Instill local anaesthetic and promptly perform copious irrigation for 15–20 minutes to dilute or remove the toxin with sodium chloride 0.9%
- » Apply chloramphenicol ointment and cover the affected eye with an eye patch.

Note: Do not instil polyvalent antivenom in the eye or give systemically.

##### REFERRAL

Refer all patients to an ophthalmologist.

#### 18.2.5 Spider bites

Paracetamol: *added*

##### Paracetamol

Analgesia recommendation were added, as these were not previously included. Paracetamol was added as first line management, as outlined in the Paediatric Pain Chapter.