TOXICOLOGICAL EMERGENCIES

PRACTICE GUIDELINE ©

DOCUMENT SUMMARY/KEY POINTS

- This document summarises the assessment and management of common poisoning & envenoming scenarios likely to be encountered in the Emergency Department. It is intended for use by medical and nursing staff.
- For information and advice regarding the management of poisoned & envenomed patients call the **Poisons Information Centre** (24/7) on 13 11 26.

CHANGE SUMMARY

- This document is a SCHN guideline primarily for use by CHW and SCH Emergency Departments.
- Previous SEATS contacts for SCH ED are no longer in service.
- For Paracetamol overdose, please refer to the "Paracetamol Overdose - Assessment and Management" SCHN guideline.
- For Organophosphate/Carbamate exposure, please refer to the "Organophosphate/Carbamate Exposure – Management" SCHN Guideline

Approved by:	SCHN Policy, Procedure and Guideline Committee	
Date Effective:	1st April 2023	**Review Period**: 3 years
Team Leader:	Staff Specialist	**Area/Dept**: Emergency Department

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READ ACKNOWLEDGEMENT

- This document is intended for use by doctors and nurses working with poisoned & envenomed patients at SCHN; this will primarily be those in the Emergency Department.
- There is no training requirement attached to this document, however, staff in the ED should be aware of its existence.

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

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Information and Help

When to call for HELP?

You can call for help regarding any patient presenting to the ED where poisoning is known or suspected.

Local expertise

- Senior ED staff (e.g. Emergency Physician)
- Prince of Wales Toxicology Service – provides consultation service to SCH when required - contact via PIC
- Westmead-Blacktown Toxicology Service – may provide bedside consultation to CHW in selected cases – contact via PIC

NSW Poisons Information Centre (PIC) 13 11 26

- 24-hour hotline for advice on the management of the poisoned patient
- Staffed by experienced Pharmacists and Consultant Toxicologists

Websites

- Toxicology and Toxinology: eTG complete [digital] Melbourne Therapeutic Guidelines: Ltd. 2020. (via CIAP)
- PIC fact sheets: https://www.poisonsinfo.nsw.gov.au/Factsheets.aspx

Textbooks

- Olson. Poisoning and Drug Overdose, 8th Ed, McGraw-Hill, 2022 (via CIAP)
- Armstrong, Pascu. The Toxicology Handbook, 4th Ed, Elsevier, 2022
- Goldfrank's Toxicological Emergencies, 11th Ed. McGraw-Hill, 2019.

List of Abbreviations

ABC: Airway, Breathing, Circulation

ACEM: Australasian College of Emergency Medicine

ARDS: Acute respiratory distress syndrome

ASCIA: Australasian Society of Clinical Immunology and Allergy

AV: antivenom

bHCG: beta Human Chorionic gonadotrophin

CIAP: Clinical Information Access Portal

CK: Creatine kinase

CXR: Chest Xray

DSP: Deliberate self poisoning

ECG: electrocardiogram

eTG: electronic Therapeutic Guidelines

FBC: Full blood count

FWS: funnel web spider

GCS: Glasgow Coma Scale

HDU: High Dependency Unit

ICU: Intensive care Unit

MAOI: Monoamine oxidase inhibitor

MDMA: Methylenedioxymethamphetamine (Ecstasy)

OD: overdose

PIB: pressure immobilisation bandage

PIC: Poisons Information Centre

RBS: red back spider

SSRI: selective serotonin reuptake inhibitor

TCA: Tricyclic antidepressant

UEC: Urea, Electrolytes and Creatinine

1 General Principles

What is poisoning?

- Poisoning is the exposure to a toxic chemical or substance with the potential to cause physical harm to that person. The exposure may be through a variety of routes including:
  - Oral
  - Inhalational
  - Dermal/subcutaneous
  - Ocular
  - Mucosal
  - Intravenous
- **Reasons for the exposure may be:**
  - Accidental
  - Deliberate self-poisoning (DSP)
  - Therapeutic misadventure, e.g., excess paracetamol for toothache
  - Recreational, e.g., drug misuse
  - Industrial/occupational
  - Disaster/terrorist activity
  - Envenomation, e.g., spider bite, snake bite
  - Iatrogenic, i.e., during the course of medical treatment
- Whatever the reason for the toxicologic presentation, DSP is a symptom of the underlying social, psychological or medical stressor.

Triage of the poisoned patient

- Patients who present with a history of poisoning should be triaged as per the Australasian Triage Scale (ACEM G24 2016).
- An assessment needs to be made according to type of drug ingestion or poison exposure, time since exposure, clinical appearance of patient and vital signs (HR, BP, RR, temperature, saturation). Consider triaging poisoned patients as Category 3 or higher. This means that they should be seen by a senior ED doctor within 30 minutes of presentation.

Paediatric Poisoning

- Poisoning in children is usually accidental, particularly under the age of 6 years old.
- Deliberate self-poisoning (DSP) may become apparent as they mature into teenage years.
- Non-accidental poisoning (either deliberate or due to neglect) should be considered and excluded. There should be a low threshold of suspicion to refer a poisoned child to the Child Protection Unit or Community Services.
- Poisoning in children manifests clinically in a similar manner to adults. The management of poisoning in children is also similar.

2 Assessment of the poisoned patient

Poisoned patients should be assessed by a standard process which includes history, examination and appropriate investigations. The following outlines a typical assessment of a poisoned patient; there are situations where additional history, examination or investigations are appropriate.

Taking a history

- Background medical problems (particularly in teenagers).
  - Previous psychiatric history or contact.
  - Known depression.
  - Previous overdose or deliberate self-harm episodes.
- Medications (including all drugs which the patient has access to at home). Also consider non-medicines, such as chemicals or other household products, they have access to.
- Allergies & adverse drug reactions.
- Drug use – over-the-counter, herbal, recreational and illicit.
- Social history – home situation including stressors.
- History of the poisoning:
  - What did they get exposed to?
  - In which form (powder, liquid etc.)?
  - Through which route (oral, intravenous, etc.)?
  - How much?
  - When?
  - Was it all in one go or staggered over a period of time?
  - Where and from whom did they get access to this substance?
  - Where did the exposure happen (home, office, park etc.)?
  - Why (accidental, recreational, DSP, etc.)?
  - Did they vomit after the exposure? Were there any tablets/capsules present in the vomitus?
  - Do they have any pain or other symptoms since the exposure?

Examination

As in any patient presenting to the ED, the priorities in poisoned patients begin with ABC.

- **1° survey**
  - Assess patency of airway
  - Assess adequacy of ventilation
  - Assess circulation

- Check vital signs
- Assess GCS and neurological exam (including pupils, tone, reflexes, clonus)
- Check BSL in all patients with altered level of consciousness

- 2° survey
  - Full head-to-toe examination
  - Look for external signs of trauma
  - Does the patient have an odour? (e.g. ethanol, hydrocarbon solvent)
  - Important systems to examine include the cardiovascular, respiratory, gastrointestinal, haematological and neurological systems
  - Look for pressure areas, bleeding/ petechiae /ecchymoses, track marks, bite sites.

Investigations

Laboratory, imaging and other specific investigations are often not required in suspected paediatric exposures. Discuss the need for investigations with the NSW PIC.

Certain cases of poisoning in children may warrant investigations as follows:

- Bedside tests:
  - Blood sugar level
  - Blood gas: in moderate or severe poisoning, or when the cause is unknown
  - Urine drug screen: unknown ingestions or forensic matters. Discuss with a toxicologist regarding the preferred test.
  - ECG: cardiac toxins or haemodynamically unstable patients
- Laboratory:
  - Paracetamol concentration: in paracetamol overdose, in any DSP, or as a screening test
  - bHCG: in DSP in female adolescents
  - Salicylate levels: known aspirin or salicylate overdose. Salicylate levels should NOT be performed as a screening test in drug overdose. Discuss ordering this test with a Toxicologist
- Imaging:
  - Chest/abdomen X-ray: with history of ingestion of radio-opaque tablets (e.g. iron or potassium) or foreign bodies (eg. button batteries or lead sinkers), or to assess severe poisoning with cardiorespiratory effects

3 Toxidromes

Toxidromes are syndromes consisting of a cluster of symptoms and signs which characterise a particular type of poisoning. The main toxidromes to recognise are shown in Table 1 (below):

Toxidrome	Mechanism	Agents	Clinical features
Sympathomimetic	Adrenergic receptor stimulation	▪ Amphetamines ▪ MDMA (Ecstasy) ▪ Cocaine ▪ Ephedra alkaloids ▪ Synthetic cathinones	▪ Tachycardia ▪ Hypertension ▪ Mydriasis ▪ Sweating ▪ Agitation ▪ Delirium ▪ Fever
Anticholinergic	Muscarinic receptor blockade	▪ Atropine ▪ Hyoscine ▪ Tricyclic anti-depressants ▪ Phenothiazines ▪ Antihistamines ▪ Plants: Datura spp., Brugmansia spp. ▪ Atypical antipsychotics	▪ Tachycardia ▪ Mydriasis ▪ Loss of visual accommodation ▪ Flushed skin ▪ Dry skin/mouth/eyes ▪ Fever ▪ Delirium
Opiate	Opiate (μ receptor) stimulation	▪ Morphine ▪ Codeine ▪ Methadone ▪ Fentanyl ▪ Heroin ▪ Oxycodone ▪ Tramadol	▪ Sedation ▪ Bradypnoea ▪ Hypotension ▪ Miosis
Cholinergic	Acetylcholinesterase enzyme blockade	▪ Organophosphates ▪ Carbamates ▪ Nerve agents ▪ Nicotine (nicotine receptor stimulation) ▪ Neostigmine/pyridostigmine	▪ Delirium ▪ Coma ▪ Seizures ▪ Excess secretions (DUMBELS) ▪ bradycardia or tachycardia ▪ Weakness ▪ Fasciculations

Serotonergic	Serotonin (5-HT_2 receptor) stimulation	▪ SSRIs
		▪ SNRIs
		▪ MAOIs
		▪ Some opiates, e.g. tramadol, pethidine, tapentadol
		▪ Lithium
		▪ MDMA (Ecstasy)
		▪ Amphetamines
		▪ Lamotrigine
			▪ CNS:
			  ○ Agitation
			▪ Neuromuscular:
			  ○ Hypertonia
			  ○ Hyperreflexia
			  ○ Tremor
			  ○ Clonus (ocular, spontaneous or inducible)
			▪ Autonomic:
			  ○ Diaphoresis (sweating)
			  ○ Fever
			  ○ Hypertension and tachycardia

Neuroleptic	Dopamine transmission blockade	▪ Anti-psychotics
		  ○ Phenothiazines
		  ○ Haloperidol
		  ○ Risperidone
		  ○ Clozapine
		  ○ Olanzapine
			▪ Extrapyramidal effects
			▪ Fever
			▪ Rigidity
			▪ Rhabdomyolysis
			▪ Leukocytosis
			▪ Delirium

		○ Quetiapine ○ Levodopa with benserazide ○ Carbidopa, bromocriptine ▪ Anti-emetics ○ Domperidone ○ Droperidol ○ Metoclopramide ○ Promethazine	

In any individual patient, toxidromes may not fully manifest with the classic symptoms and signs. The likely diagnosis is made on available history and signs elicited.

4 Principles of Management

General management of poisoned patients should follow these principles. Discuss with PIC regarding which treatments are required for a specific exposure:

1. **Resuscitation**
   - Ensure patent airway and oxygenate patient (may require intubation)
   - Support ventilation
   - Obtain intravenous access and support circulation
   - Maintain normothermia & euglycaemia
2. **Decontamination**, for example:
   - Remove patient from the source of toxicity into a well-ventilated area
   - Remove contaminated clothing and discard; irrigate skin/eyes/mucosa
   - Activated charcoal
   - Whole bowel irrigation
   - Note that inducing emesis (such as with Ipecac) is NOT recommended in most situations because of low efficacy and a risk of aspiration and oesophageal trauma
3. **Antidotes**
   - There are many specific antidotes for treating toxicity from particular poisonings, please consult the PIC to assist in deciding the need of an antidote. (e.g. acetylcysteine for paracetamol poisoning, bicarbonate for tricyclic antidepressant poisoning)
4. **Supportive treatment**, including:
   - IV rehydration
   - Correction of electrolyte abnormalities
   - Analgesia and anti-emetics
   - Anticoagulation for comatosed patients
   - Blood products

- Thiamine (eg for concomitant alcohol use disorder or feeding disorders)
- Treat complications such as seizures, aspiration, ARDS, arrhythmias, delirium

5. **Enhance elimination** – methods include:
   - Multidose activated charcoal
   - Urinary alkalinisation
   - Extracorporeal treatments, such as haemodialysis
6. **Consultation** – may need to consult with:
   - Toxicologist/Poisons Centre Specialist
   - Mental Health team
   - Child Protection Unit
   - Intensive Care
   - Others (e.g. Dentist: paracetamol OD for toothache)

Disposition

- Admission or discharge (with appropriate follow-up)
- If admitted, select level of care required in-hospital – e.g. ICU, HDU, general ward, special nurse

Each poison has its own specific management and set of tailored interventions. However, many poisonings are managed with supportive measures and no specific interventions exist. Advice on individual cases is best sought from PIC.

5 Activated Charcoal

Activated charcoal is a preparation containing charcoal particles in suspension. It is not commonly indicated in paediatric poisoning. This is a time-critical treatment that should be given as soon as possible, when indicated.

- Available as 50 g/250 mL (sorbitol-free) suspension (Carbosorb X PI).

Dose:

- Single dose 0-18 years: 1 g/kg orally or via gastric tube (max dose: 50 g) [1] [2] [3]
- Multi dose: 0-18 years: Initial dose as above, Subsequent dose : 0.5 g/kg/dose 4 hourly (Max Dose: 50 g)
- Infants and children (1 month to 11 years): Repeat doses should be administered only when necessary and must be accompanied by monitoring of fluid and essential electrolytes

Indications:

- Drug ingested has significant potential for toxicity, **AND**
- Ingested drug is adsorbed by charcoal, **AND**
- Charcoal can be administered within 2 hour of ingestion, (refer to eTG for more details about timing and dosage) **AND**
- Patient is alert enough to drink charcoal (or via gastric tube in intubated patients).

Contraindications:

- Absent bowel sounds
- Bowel obstruction or ileus
- Unprotected airway
- Charcoal does not adsorb the following poisons and should **NOT** be used for:
  - Metals (e.g. lithium, iron, lead)
  - Corrosives (acids & alkalis)
  - Alcohols (e.g. ethanol, methanol, ethylene glycol)
  - Hydrocarbons (e.g. petrol, kerosene)
- Charcoal is **NOT** recommended for pure benzodiazepine ingestions

Adverse effects: [1]

- Black stools
- Bowel obstruction (very rare)
- Vomiting
- Potential for aspiration and pneumonitis

Important notes:

- DO NOT insert a gastric tube in patients with reduced level of consciousness (unless intubated) for charcoal administration
- Always check for the presence of bowel sounds prior to administering charcoal
- For oral administration, charcoal can be sweetened with ice-cream or ice-cream toppings to make it more palatable if necessary. [2]
- If giving charcoal via a gastric tube, ensure proper position with a chest X-ray and dilute with water. [1]
- Charcoal administration beyond the 2-hour threshold may be justified in cases, e.g. where the drugs delay gastric emptying or are modified-release preparations or enteric coated substances; consult with PIC before instituting. (refer to eTG)
- Multi-dose activated charcoal may be warranted in a limited number of cases; consult with PIC before instituting.
- Do not use charcoal tablets or capsules for acute poisoning as they are ineffective. [1]

6 Paracetamol

For guidelines on management of paracetamol poisoning in children please refer to the SCHN Practice Guideline on "Paracetamol Overdose – Assessment and Management (intranet)".

7 Benzodiazepines

The sequelae of sedative drug overdose include hypopnoea, coma, aspiration, hypothermia and rhabdomyolysis (from prolonged lying and local myonecrosis). Mortality can be prevented in these poisonings by the provision of supportive care.

Management of benzodiazepine poisoning:

1. **Resuscitation**
   - Monitor oxygen and if supplementation is required, perform blood gas to assess for ventilatory function
   - Airway and ventilatory support
   - Prevent aspiration in obtunded patients
   - IV access and circulatory support
   - Prevent hypothermia and maintain euglycaemia
   - DON'T EVER FORGET GLUCOSE in any patient with altered level of consciousness
2. **Antidote**

   Flumazenil: may be indicated in pure benzodiazepine overdose with hypoventilation, **but rarely**. Discuss with PIC
   - Available as: 0.1 mg/mL injection, 5mL (Anexate®)
   - Indications include diagnostic evaluation of the sedated child or to avoid intubation
   - Dose:
     - IV Bolus: 5 microgram/kg, repeated every 60 seconds to a total of 40 microgram/kg or a total dose of 2 mg (1 mg in a child). (1) (2)
     - IV Infusion*: this is rarely indicated and should be discussed with a Toxicologist. (1) (2)
   - Do not titrate to GCS alone – see precautions in note below.
3. **Inadequate response:**
   - If inadequate response, dose may be repeated every 60 seconds to a cumulative total of 40 micrograms/kg up to max dose of 1 mg for children up to 12 years old. For older children, up to 2 mg).
   - Titrate to respiratory rate and effort; Do not titrate to GCS alone – see precautions in note below.

4. **Decontamination**
    - Activated charcoal for pure benzodiazepine ingestion is NOT recommended.
5. **Supportive treatment**
    - Hourly neurological observations in patients with reduced levels of consciousness until GCS 15.
6. **Consultation** (e.g. Toxicologist via PIC if considering flumazenil, Child Protection Unit).
7. **Disposition**
    - Admit non-alert patients to a monitored bed. ICU if requiring a flumazenil infusion
    - Alert and asymptomatic patients who have been observed for > 4hours may be toxicologically cleared. Do not discharge children overnight.

Note: Some benzodiazepines are long-acting while the half-life of flumazenil is approximately 45 to 60 minutes. Sedation can recur when flumazenil wears off and patients may need to be observed for longer periods. The use of **flumazenil** in any overdose (including benzodiazepines) is not routinely recommended and **advice from a PIC Toxicologist should be sought**. **Unmasking of any proconvulsant co-ingestants may lead to seizures after flumazenil administration**.

8 Opioids

Drugs such as heroin, morphine, methadone and oxycodone produce the opioid toxidrome (as described above in Table 1) causing primarily reduced level of consciousness and respiratory failure.

Opioid poisoning can be rapidly reversed by naloxone administration (usually intramuscular, intravenous, or intranasal). Complications of opioid poisoning include hypoxia, coma, aspiration, and non-cardiogenic pulmonary oedema.

Management of opioid poisoning:

1. **Resuscitation**
    - Monitor oxygenation and if supplementation is required, perform blood gas to assess ventilatory function
    - Airway and ventilatory support
    - Prevent aspiration in obtunded patients (by intubation)
    - IV access and circulatory support
    - Prevent hypothermia and maintain euglycaemia
    - DON'T EVER FORGET GLUCOSE in any patient with altered level of consciousness
    - Remove any patches that may be applied

2. Antidote

Naloxone (1) (2) (3)

- Available as: 400 micrograms/1 mL injection
- Route: IV/IM/ET/IO/SC: (IV route is preferred where possible.)
- Indications include diagnostic evaluation of the sedated child or to avoid intubation
- Dose:
  - Bolus: 10 microgram/kg/dose. (Max: 200micrograms)
    - If no response, subsequent doses of 10 microgram/kg/dose (to a maximum of 2 mg) may be given. If there is no response, consider other causes and consult PIC. (1)
    - Do NOT titrate to GCS or pupil size. Titrate dosing to respiratory rate and effort. (2)
    - If repeated doses are required, consider switching to, an IV infusion. Patients who ingest long-acting or sustained-release opioids (e.g. methadone, MS Contin) may require a naloxone IV infusion (consult Toxicologist via PIC).
  - IV infusion: this is rarely required, discuss with Toxicologist via PIC; if required, use naloxone 4 mg in sodium chloride 0.9% 100 mL by intravenous infusion. Start the infusion at an hourly rate of approximately two-thirds of the total effective bolus dose, then titrate the infusion rate to clinical effect.
- Caution: (3)
  - Do NOT use in infants born to mothers suspected or known to be dependent on opioids as acute withdrawal syndrome may be precipitated.
  - Infants on prolonged opioid infusion may develop acute withdrawal following naloxone

3. Decontamination

- Consider charcoal if there is ingestion of
  - Massive quantity of immediate-release preparations
  - Opioids with a long half-life (e.g., methadone)
  - Sustained-release preparations (e.g., morphine, oxycodone).
- For opioid poisoning, offer activated charcoal to alert and cooperative patients who are able to protect their airway and present within:
  - 2 hours after ingesting an immediate-release preparation
  - 6 hours after ingesting a sustained-release preparation.
- If the patient is intubated, activated charcoal can be given any time after ingestion via a nasogastric or orogastric tube—confirm correct placement of the nasogastric or orogastric tube beforehand.
- (See contraindications in 'Charcoal' section above)

4. **Supportive treatment**
    - Anti-emetics
    - Hourly neurological observations in patients with reduced levels of consciousness
    - CXR to look for non-cardiogenic pulmonary oedema
5. **Consultation** (e.g. Toxicology via PIC, Child Protection Unit)
6. **Disposition**
    - Admit non-alert patients to a monitored bed. ICU if requiring a naloxone infusion
    - Alert and asymptomatic patients who have been observed for at least 4 hours post-ingestion of an immediate release opiate may be toxicologically cleared. Patients who required naloxone or ingested methadone, tramadol or sustained-release preparations should be observed for at least 8 hours. Do not discharge children overnight.
    - NSW Health clinicians are mandated by legal and policy requirements to complete a Reportable Incident Brief (RIB) via the incident management system if methadone or buprenorphine is associated, or suspected, with a child's presentation or admission to hospital regardless of the outcome.
        - Contact the Medication Safety Pharmacist or Patient Safety Team within Clinical Governance for support relating to this.
        - Further details available via https://www.health.nsw.gov.au/aod/Publications/nsw-clinical-guidelines-opioid.pdf

9 Snake Bite

Australian elapid snakes are amongst the most venomous in the world. The primary effects of toxins in snake venom include: (eTG)

- **Local effects** – pain, redness, bleeding, swelling
- **Systemic effects** – headache, nausea, vomiting, abdominal pain, regional pain, lymphadenopathy
- **Neurotoxicity** – ptosis, cranial nerve palsy, diplopia, limb weakness, respiratory paralysis
- **Myotoxicity** – myalgia, rhabdomyolysis
- **Coagulopathy** – both anticoagulant and consumptive forms are seen

Important questions to ask:

- When and where was the bite?
- Was it a pet snake? If so, what type of snake was it?

- Was pressure-immobilisation bandage applied? How soon after the bite? How effective is it (adequate pressure)?
- How were they transported to hospital?
- Any bleeding sites (bite site, haematuria, haematemesis)?
- Any symptoms (local or systemic) or collapse?

9.1 Management of snake bite (eTG)

Contact the NSW Poisons Information Centre about all children with suspected snake bite.

1. **Resuscitation** (ABC) – manage all snake bite patients in an acute monitored area
2. **First aid** (2)
   - If the patient presents within 4hrs of the bite, **apply a pressure immobilisation bandage** (PIB) – if it has already been applied, check that it has been correctly done and if not reinforce with a new PIB.
   - Apply a firm crepe (or similar, non-elastic) bandage over bite site and then over the entire limb.
   - Immobilise limb with rigid splint.
   - Do NOT remove PIB until antivenom availability has been confirmed and close by.
3. **Further examination**
   - Examine bite site & regional lymph nodes.
   - Look for evidence of bleeding (skin, mucosa, urine) and muscle tenderness.
   - Examine neurological system (in particular cranial nerves) looking for weakness.
4. **Investigations**
   - BSL, Urinalysis.
   - Pathology: FBC, EUC, LFTs, Coagulation studies, D-Dimer, fibrinogen, CK. These are repeated at certain times depending on the time of the bite, time of PIB removal, and if envenomed.
   - Spirometry and peak flow measurements of respiratory function in neurotoxicity.
   - Radiology sometimes may be important (such as CXR or CT brain).
   - Urinary myoglobin can be done to confirm rhabdomyolysis, but there is limited availability or clinical indications.
5. **Consultation**
   - In any patient with clinical or laboratory signs of systemic envenomation, call PIC and speak with the Toxicologist on call.
6. **Antidotes** (4)
   - Check available stock of antivenom (AV) in ED & Pharmacy. Consult PIC for stock location if required.

- Appropriate antivenom should be administered when signs of systemic envenomation are present.
- Choice of antivenom would be determined by Toxicologist via PIC
- Although antivenoms may cause anaphylaxis, pre-medication (with steroids & adrenaline) is not routinely recommended. Patients should be monitored during and after administration and treated when reactions occur (AMH). If adverse reaction occurs the full dose of antivenom is still required, treat as per below and then contact the toxicologist via PIC for advice if required.
- Children require the same doses of antivenom as adults, as the dose required depends on the amount of venom to be neutralised and not the weight of the patient. (AMH)
- Antivenom should be diluted before IV infusion (usual dilution 1:10) (2) as this reduces anaphylaxis risk. (2) (4) In life threatening cases (e.g. cardiac arrest) consider IV bolus without dilution. (4)
- Start IV infusion slowly. If no adverse reactions, increase the rate so that the whole infusion can be given over 20 minutes. (1) (4)

7. Supportive treatment

- Analgesia.
- Check tetanus status.
- IV rehydration.
- Monitor for and treat any anaphylactic reactions to antivenom (e.g. rash, wheeze, hypotension) as usual with steroids, adrenaline. (ASCIA guidelines)
- If there is an acute allergic or anaphylactic reaction temporarily stop the infusion and treat accordingly then recommence the infusion at a slower rate.
- PIB is removed after either (1) envenomation is not observed based on initial bloods and clinical assessment, or (2) after antivenom has been administered. Advice is available via PIC.

8. Disposition

- Admit all patients with suspected snake bite for at least 12 hours (or overnight).
- Admit all patients with confirmed snake bite for at least 24 h. Discharge criteria are in eTG or from Toxicology via PIC
- Inform all patients who have received AV regarding the potential for serum sickness in 4-14 days. If symptoms develop, they should re-present to their GP or ED.
- Do not discharge children with snake bite overnight.

10 Spider Bite

The medically important spider bites in Australia are those of the funnel-web spider (FWS) and red-back spider (RBS). Clinical features and management of these two types of spider bite are very different.

10.1 Funnel-web spider bite (FWS) (Atrax and Hadronyche species)

All deaths due to FWS have been attributed to the male Atrax species prior to the availability of FWS antivenom; cause of death is due to pulmonary oedema or cardiovascular collapse. The FWS is a **"big black spider"** and there are other non-venomous spiders that look similar to the FWS.

Contact the NSW Poisons Information Centre about all children bitten by a "big black spider".

Clinical features of FWS envenomation (eTG)

- Local pain
- Perioral tingling, piloerection, fasciculations
- Muscle spasm (potential for laryngospasm)
- Nausea, vomiting, abdominal pain
- Tachycardia, hypertension
- Dyspnoea
- Increased secretions (giving it an appearance similar to organophosphate poisoning)

Management

- Manage all big black spider bite patients in a resuscitation environment: support ABCs, oxygenate, monitor, IV access
- Remove spider with care if still attached
- **Apply pressure immobilisation bandage** (as for snake bite) – do NOT remove bandage until adequate antivenom supply is available. Be aware that reconstitution of antivenom vial may take up to 10 minutes. [4]
- Consult with Toxicologist through PIC for FWS bites with signs of envenomation

FUNNEL WEB SPIDER ANTIVENOM (PI)

- Availability: Each Vial contains 125 units of funnel web spider antivenom
- Reconstitute the vial with 10 mL of water for injections. Swirl gently until completely dissolved, it may take up to 10 minutes. The solution is slightly opalescent to colourless.
- **Dose**: 2 Vials of FWS antivenom.

- **Administration**: If there are significant signs of systemic envenomation. Administer 2 vials of FWS antivenom (diluted in 10 mL/kg up to 100 mL sodium chloride 0.9% or Compound sodium lactate) by slow IV infusion over 20 minutes (4)
- Pre-medication (with steroids & adrenaline) is not recommended.

  Children require the same doses as adults. (4)
- Monitor for and treat any anaphylactoid reactions to antivenom (e.g. rash, wheeze, hypotension) as usual with steroids, adrenaline. (ASCIA guidelines)
- If there is an acute allergic or anaphylactic reaction temporarily stop the infusion and treat accordingly then recommence the infusion at a slower rate.
- Administer analgesia and antiemetics as required
- Check and optimise tetanus status
- Observe all patients with suspected FWS bite for at least 4 hours (or overnight)
- Admit all patients who have been treated with funnel-web spider antivenom. Monitor them for 12 to 24 hours until the effects of envenoming have resolved.
- Inform all patients/carers who have received AV regarding the potential for serum sickness in 4-14 days. If symptoms develop, they should re-present to their GP or ED.

10.2 Red-back spider bite (Latrodectus hasselti)

Red back spider (RBS) envenomation (known as latrodectism) is the commonest envenomation syndrome to present to hospital in Australia.

Clinical features of RBS envenomation (eTG)

- Local pain is the dominant feature.
- Young children and infants may present with undifferentiated pain, irritation and distress.
- Local sweating, piloerection, fasciculations.
- Tachycardia, hypertension.
- Diaphoresis.
- Regional pain (e.g. pain over the entire limb).
- Chest and abdominal pain, headache.

Management

- Support ABCs, apply oxygen & monitoring, IV access.
- Ice or heat packs over bite site may improve symptoms.
- Do NOT apply compressive bandages or tourniquets.
- Treat pain with analgesia such as paracetamol, ibuprofen and/or opiates.
- Administer anti-emetics as required.
- Use of RBS antivenom is controversial and unproven – discuss with toxicologist through PIC.

REDBACK SPIDER ANTIVENOM: (PI)

- rarely indicated, if ever– discuss with toxicologist through PIC.
- Availability: Vial contains 500 units of redback spider antivenom in 1–1.5 mL
- Route: IV route is preferred [4]
- **Dose**: 2 vials of RBS antivenom
- **Administration**: [4] If antivenom is indicated: Administer 2 vials of RBS antivenom (diluted in 10 mL/kg up to 100 mL sodium chloride 0.9% or Hartmann's) and infuse slowly over 20 minutes. [5]
- Pre-medication (with steroids or adrenaline) is not required. Monitor for and treat any anaphylactic reactions to antivenom (e.g. rash, wheeze, hypotension) as usual with steroids, adrenaline. (ASCIA guidelines)
- If there is an acute allergic or anaphylactic reaction temporarily stop the infusion and treat accordingly then recommence the infusion at a slower rate.
- Check and optimise tetanus status.
- If no improvement in symptoms in 1 hour, reconsider the diagnosis or contact the PIC.
- If you have any concerns with management, consult with Toxicologist through PIC.
- Observe patients until they are asymptomatic, or their pain is adequately controlled by oral analgesia. Ensure adequate oral analgesia supply on discharge as pain can last up to 5 days.
- Inform all patients/carers who have received AV regarding the potential for serum sickness in 4-14 days. If symptoms develop, they should re-present to their GP or ED.

11 References

1. Australian Medicines Handbook, Children's dosing companion. [Online] https://childrens.amh.net.au.acs.hcn.com.au/.
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3. Meds4Kids (NSW Health Intranet). [Intranet] https://webapps.schn.health.nsw.gov.au/meds4kids/.
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