

**Reference: Western Australian, Advanced Course in Toxicological Emergencies, Aug 2017**

A 3 year old boy is brought in to your Emergency Department after being bitten by a snake.

a. Complete the following table. (16 marks)

	<b>Snakes that cause this</b>	<b>Examination Findings</b>	<b>Investigation Findings</b>
<b>Venom-induced consumptive coagulopathy (VICC)</b>	Brown, Tiger, Taipan	Bleeding eg from IV or bite site	Decreased Fibrinogen, Increased Ddimer & INR
<b>Anticoagulant coagulopathy</b>	Black snakes ie Mulga, King Brown, Red-bellied Black, Blue-bellied Black	Bleeding eg from IV or bite site (minimal risk of significant bleeding cf VICC)	Increased APTT,  without evidence of VICC ie fibrinogen, Ddimer less affected
<b>Neurotoxicity</b>	Tiger, Taipan, Death Adder	Descending symmetrical flaccid paralysis –Ocular (ptosis, diplopia, blurred vision) –Bulbar (dysphagia, dysarthria) –Respiratory muscles –Limb muscles	Reduced PEFR Respiratory Failure on VBGs
<b>Myotoxicity</b>	Tiger, Taipan, Black	myalgia or muscle weakness	Elevated CK Usually >1000U/L ARF – elevated creatinine cl.

Your assessment reveals that he has been envenomed by a Tiger snake.

b. What dose of antivenom would you administer? (1 mark)

One ampoule of monovalent antivenom. Children receive the same dose as adults

c. How would you administer the antivenom? (1 mark)

Always given IV – dilute 500mls NS over 20 mins.

NB Pre-treatment with adrenaline not recommended

d. What are the most important risks of antivenom administration and how commonly do these occur? (4 marks)

Allergy/Anaphylaxis- Immediate hypersensitivity reactions: 25% overall (5% severe)

Tiger, Death Adder and Polyvalent – 40%, Brown and Black – 10%

Serum Sickness- Delayed immune reaction 5-20 days post AV, Incidence: 29% overall

Tiger and Polyvalent – 40%, Brown – 17%

## Reference: Western Australian, Advanced Course in Toxicological Emergencies, Aug 2017

A 34 year old woman, suspected of taking a drug overdose, is brought in by ambulance after being found collapsed at a local concert.

a. List some 'emergency antidotes' that may be indicated in the initial resuscitation of a poisoned patient, prior to being able to formulate a risk assessment. (5 marks)

Glucose  
Naloxone  
NaHCO<sub>3</sub>  
Digoxin Fab  
Atropine

b. What 5 (five) factors that should be considered when making a risk assessment? (5 marks)

1. Agent(s)
2. Dose(s)
3. Time since ingestion
4. Clinical features and progress
5. Patient factors (e.g. weight, comorbidities)

c. What strategies do you have to obtain these details from this non-communicative patient? (4 marks)

Tablet counts  
Collateral history from family and friends  
Evidence brought to ED by ambulance personnel  
Correlation of clinical status with toxico-epidemiologic trends

d. What are the 2 (two) most important screening tests to perform on this patient? (2 marks)

Serum paracetamol level  
12-lead ECG

## Reference: Western Australian, Advanced Course in Toxicological Emergencies, Aug 2017

A 52 year old is en route to your rural emergency department, by ambulance, after being bitten by what he believes was a funnel web spider.

a. List 7 (seven) clinical features that are seen with systemic envenoming. (7 marks)

- Severe local pain, Fang marks may be visible
- Systemic envenoming
  - Rapid onset (within 2 hrs)
  - Autonomic excitation (sympathetic and parasympathetic)
    - Diaphoresis, hypersalivation, lacrimation, piloerection
    - Tachy-bradycardia
  - Paraesthesiae, muscle fasciculation and spasms
  - Hypertension, pulmonary oedema

b. The junior ambulance officer calls you for advice on what prehospital management they should commence. (2 marks)

PBI

Atropine for airway secretions

c. Outline the major aspects of your management, detailing doses as relevant. (4 marks)

Resuscitation eg Oxygen & CPAP for pulmonary odema

Supportive care eg analgesia for local pain and muscle spasms

Antivenom: 2 - 4 ampoules, IV undiluted push if life-threatening or cardiac arrest

Discharge after antivenom if clinically well for 12 hours OR if asymptomatic at 4 hours

**Reference: Toxicology Handbook, 3<sup>rd</sup> Edition, LMurray, MLittle, OPascu, KHoggett**

A 48yr old man presents after taking a drug overdose. Your junior registrar wants to administer activated charcoal.

a. Which groups of agents are poorly bound to activated charcoal? (3 marks)

**Hydrocarbons and alcohols** - ethanol, isopropyl alcohol, ethylene glycol, menthanol

**Metals** – Lithium, Iron, Potassium, Lead, Arsenic, Mercury

**Corrosives** – acids, alkalis

b. List 5 (five) contraindications to administration of activated charcoal, other than the agents that are poorly bound to activated charcoal. (5 marks)

Initial resuscitation incomplete

Non- toxic ingestion

Sub-toxic dose

Uncooperative pt (relative contraindication)

Risk assessment indicating good outcome with supportive care and antidote therapy alone

Decreased level of consciousness, delirium or poor cooperation (unless airway protected by ETT)

Risk assessment suggesting potential for imminent onset of seizures or decreased level of consciousness

After review of the patient, you decide that it is best not to administer activated charcoal. You decide to enhanced elimination instead.

c. Outline 3 (three) methods of enhanced elimination with 2 (two) examples of drugs that this could be used for (without repetition of examples). (9 marks)

**Multiple dose activated charcoal**

Carbamazepine, Theophylline, Phenobarbitone, Quinine, Dapsone, Amanita cyclopeptide mushroom poisoning

**Manipulation of urinary pH**

Salicylate, Phenobarbitone

**Haemodialysis**

Toxic alcohols, Salicylate, Theophylline, Valproic acid, Carbamazepine, Metformin-induced lactic acidosis, Potassium, Lithium

A 19yr old girl presents with a painful foot wound after fossicking in shallow tropical sea waters.

1. What are your four (4) most important differential diagnoses?

\_\_\_/4 marks

Box Jelly Fish Envenomation
Venomous Fish eg Stone fish / Cat fish / Weaver Fish Envenomation
Blue Bottle Jelly Fish Envenomation
Sting ray injury/envenomation
Starfish envenomation
Sea Urchin envenomation
Cone snail envenomation
Coral cut or similar

2. List your three (3) initial management priorities and give two (2) details of how you would accomplish each of them.

\_\_\_/9 marks

<b>Key Issue</b>	<b>Details of how to accomplish</b>
<b>Analgesia (Essential for pass)</b>	<b>Hot water immersion</b>

	<p><b>Oral or Intravenous analgesia eg paracetamol/ibuprofen morphine</b></p>
	<p><b>Local / region nerve blockage</b></p>
Haemorrhage Control	Direct pressure
	Tourniquet
	Wound closure
Ant venom, as indicated for ongoing / severe symptoms	Box Jellyfish ant venom
	Stone fish ant venom
Wound Care	Wound exploration
	Identify and remove foreign bodies eg tentacles/spines
	Irrigation / dress
Antibiotic	Doxycycline 200mg iv/po for Vibrio species
	+/- ceftriaxone 1g iv for severe infection
Tetanus Immunisation	Tetanus toxoid vaccination IM, if previously vaccinated > 5-10yrs ago

	Tetanus Immunoglobulin if not previously vaccinated
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3. List your two (2) most useful investigations and outline why.

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Investigation	Justification
Soft Tissue X ray	Foreign body identification
USS	Foreign body identification
Wound Swab	Infective agent identification

### Alternative Question 3

Identify two (2) important discharge counselling topics to address with this patient.

\_\_\_\_/2 marks

Wound Care
Monitoring for complications eg infection
Drug dosage/complication education eg analgesia/antibiotics
Follow up – GP
Future prophylaxis eg foot wear when fossicking



**Reference: Western Australian, Advanced Course in Toxicological Emergencies, Aug 2017**

An 18month old girl presents with concerns from the parents that she may have swallowed something toxic.

a. List 7 (seven) pills that are potentially lethal to a toddler with the ingestion of a single tablet. (7 marks)

**(ABC'S TOP TV)**

**A** – Amphetamines

**B** - Baclofen

**Cs**- Calcium channel blockers

Carbamazepine

Chloroquine

Clonidine

Clozapine

**S** – Sulphonylureas

**T**- Tricyclic antidepressants

**O** – Opioids (Dextropropoxyphene (*digesic, doloxene*), Diphenoxylate /atropine (*Lomotil*))

**P**- Propranolol

**T**- Theophylline

**V**-Venlafaxine

Review of the child reveals she is crying and distressed. Mum is concerned that she may have swallowed some oven cleaner.

b. List 4 (four) features you would look for when assessing this child. Give 2 (two) examination findings for each? (8 marks)

<b>Feature</b>	<b>Examination Findings</b>
Evidence of ingestion	oral/facial erythema/burns
Airway compromise	Stridor, drooling, voice change, throat pain, respiratory distress
Aspiration	Cough, wheeze, dyspnoea
Gastrointestinal injury	Vomiting, drooling, epigastric tenderness

c. List 5 (five) other non-pharmaceutical agents that are potentially lethal to a young child if ingested in a sip or mouthful. (5 marks)

Organophosphate and carbamate insecticides

Paraquat

Hydrocarbons Eucalyptus oil ('essential oils')

Camphor / Naphthalene

Lead foreign body Fishing sinkers

Button batteries

Dessicant pellets (in handbags and shoe boxes)

Dishwashing tablets

A 23yr old fisherman presents an hour after a seafood meal with facial numbness, abdominal pain and nausea.

1. What are your two (2) most important differential diagnoses? \_\_\_/2 marks

Puffer fish / Tetrodotoxin poisoning
Ciguatera poisoning
(Shell fish poisoning/allergy)

2. List five (5) important features you would like to gather in your history taking. \_\_\_\_\_/5 marks

Slurred speech
Paralysis / weakness / incoordination
Shortness of breath
Content of meal
Details of other consumers and their symptoms
Allergies
Past History, particularly neurological disorders, immuno - compromise

3. List two (2) key issues for your initial management in the Emergency Department. For each issue give two (2) details of how you would accomplish it \_\_\_\_\_/6 marks

Key Issue	Details of how to accomplish
Supportive	Intravenous fluids – replacement/maintenance
	Analgesia
Contact Tracing	Others with same meal
	Public Health notification
Specific Treatment if Tetrodoxin	Anticipate respiratory muscle paralysis, Prepare for intubation and ventilation
	HDU referral

4. List three (3) reasons to admit this patient \_\_\_\_\_/3 marks

Worsening symptoms
Failure to respond to treatment – hydration, analgesia
Respiratory Compromise
?Unclear Diagnosis

**Reference: Western Australian, Advanced Course in Toxicological Emergencies, Aug 2017**

A 48yr old man is brought in by ambulance after ingesting 50 tablets of amitriptyline. On arrival, she is alert and talking but uncooperative.

a. What are the toxic effects of amitriptyline? (5 marks)

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b. Which investigation is the most useful to predict toxicity? (1 mark)

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c. List 2 (two) abnormalities you would expect to find on this investigation, in the presence of major toxicity. (2 marks)

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The next day his wife raises concerns that he has also taken an overdose of paracetamol.

f. What 2 (two) investigations would you use to decide how you manage this situation. (2 marks)

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g. What findings would indicate that no further management is required for the potential paracetamol overdose. (1 mark)

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d. What timeframe would you expect toxicity to occur following an overdose? (1 mark)

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The patient becomes comatose.

e. Outline your initial management of this patient. (7 marks)

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