

MH SAQ practice Toxicology/Environmental

An 84 year-old female attended your ED after allegedly taking 38 tablets of Paracetamol 16 hours ago (total 16 grams). Observations are stable and her GCS is 15.

1. What is the pathophysiology of paracetamol toxicity (1 mark)
2. List investigations you would perform and why (2 marks)
3. State 3 elements required to demonstrate competence (3 marks)
4. She refuses treatment and wants to discharge herself. Upon assessment, you find that she lacks capacity. List your important actions (5 marks)

An 18 month-old boy is brought by his worried mother to the ED with a rash and spots in his buccal cavity. He is also pyrexial (T 38.9°C).



1. What changes are shown and what is the diagnosis? (2 marks)

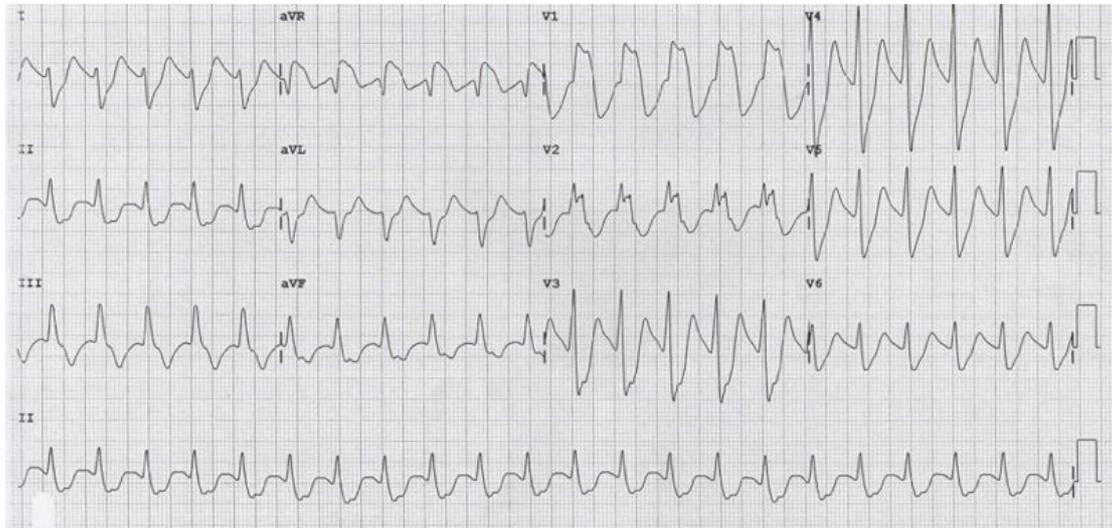
2. List 2 acute complications of this condition (2 marks)

NB encephalitis also reasonable

3. What laboratory findings would be expected with this diagnosis (3 marks)

3. In the ED, the child starts fitting. They are placed on their side with oxygen given by mask. An iv is placed. Outline your immediate management including drug doses (3 marks)

A 38 year-old female was brought to the ED by her husband. She was agitated but is now drowsy and her GCS is 13. Her husband reports that his wife had been under considerable stress at work recently. An ECG was performed.



1. You note a wide complex tachycardia. Describe the other important findings on ECG (2 marks)
2. What is the likely diagnosis (1 mark)?
3. Her GSC decreases to 10 and you decide to proceed with intubation.

HR 120
BP 95/70
Sats 98% on NRM
RR 30
Temp 36.8 degrees

NS 500mls bolus is started. What medications would you give during the next 5-10 minutes prior and during the intubation? (5 marks)
4. After intubation she has a generalised seizure. What medications would you give at this point (2 marks)?

NB failure to give bicarb is an entire question fail score 0

Giving phenytoin is an entire question fail as this is a Na blocker score 0

(Toxicology handbook 113-117 and 357-361.)

You are working at a rural ED located near an Australian ski field. You receive a 27 year old man who has fallen into a frozen lake while hiking. He has arrived to your resuscitation room 30 minutes after submersion. His core temperature is 27.4 °C

1. Define hypothermia and hypothermia severity? (2 marks)
2. What features of hypothermia are demonstrated on an ECG? (2 marks)
3. His rhythm on the monitor changes to VF. ACLS algorithm is started with breaths and compression, but no cessation of VF after 3 rounds of defibrillation and 1mg of adrenaline iv. How will you differ your resuscitation compared to the usual ACLS algorithm? (4 marks)
4. What are the 2 main types of warming and 2 give examples of how each can be achieved? (2 marks)
 - *Passive eg*
 - *Active eg*



A 19 year old girl is brought in by her friend after an episode of collapse. They had been taking ecstasy and dancing all night. She has a temperature of 39 degrees, HR 140bpm, BP 190/110. She appears dehydrated, agitated and has a resting tremor. She is catheterised with the above urine.

1. What is the likely diagnosis? (1 mark)

2. What is the most important electrolyte result you would want to know before starting treatment and why? (2 marks)

The laboratory ring you with an urgent Na result of 112mmol/l

3. Name four further steps in the ED management including drug doses and route where appropriate. (4 marks)

4. Name 3 clinical signs in this patient that would best correlate with serotonin toxicity (3 marks)

A 25 year old male presented to your ED after taking an overdose of 150 tablets of aspirin 300mg.

1. List three specific clinical features of salicylate toxicity that you might expect him to develop? (3 marks)

3. A VBG is performed. What would you expect? (3 marks)

4. What reasons would you consider haemodialysis? (4 marks)



A 2 year old boy weighing about 20 kg was brought to your regional ED by his mother having accidentally swallowed hydrochloric acid kept near a BBQ. The ingestion took place 20 minutes prior to arrival

1. What are 5 features would alert you to impending airway compromise? (5 marks)
2. How would you decontaminate this ingestion? (1 mark)
3. What are the indications for endoscopy within the first 24 hours? (4 marks)

The triage nurse rings you regarding a 32 year old with diabetes and bipolar disorder who is a frequent presenter to your ED. She often presents with disruptive behaviour but the nurse is concerned that today she appears disorientated, ataxic and complains of nausea and vomiting for the last two weeks.

Temp	37.4	°C
HR	110	/min
BP	90/60	mmHg
RR	22	/min
Sats	97	% on air

Her lithium level is 3 mmol/L.

- a. List 4 potential causes you would consider in this patient that may have resulted in lithium toxicity.

- b. A urine bHCG confirms pregnancy, and a UTI. List four antibiotics used to treat UTI and discuss why you would or would not use them in pregnancy.

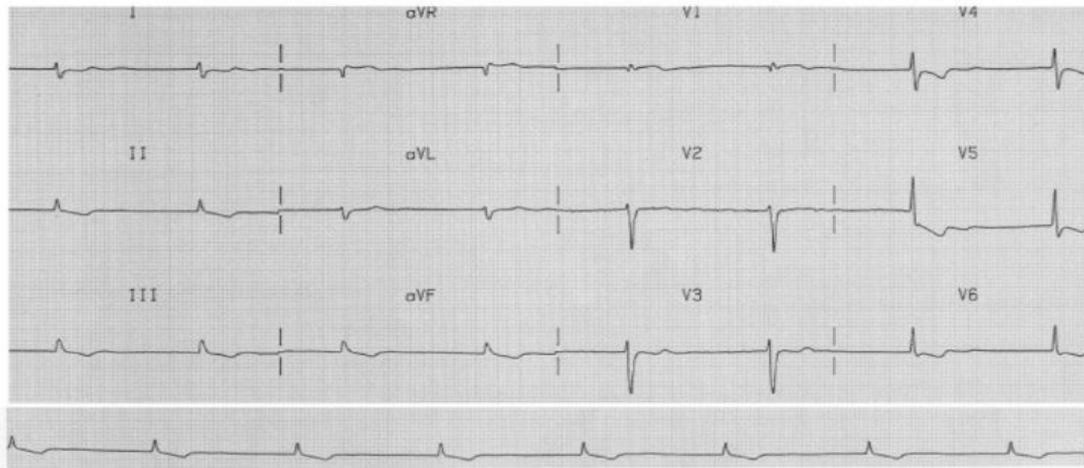
- c. Your 4th year student asks you about the role of charcoal in lithium overdose. You explain that charcoal does not bind lithium. Name 3 classes of drugs seen in overdose that are not bound by charcoal and give two examples of each.

- d. What alternative enhanced elimination technique may have a role in lithium toxicity?

- e. Name 3 toxicokinetic or toxicodynamic features of a drug that make it amenable or appropriate to this method of enhanced elimination, and 2 other drugs toxicities where the method plays a role.

- f. You find on questioning that it is likely she is 16/40 pregnant, homeless and with no regular medical care. List and expand briefly on 4 issues that should be discussed with this woman, including other services that may need to be involved.

A 65 year old man is in your ED with a known overdose of Digoxin. An ECG has been performed and is shown below.

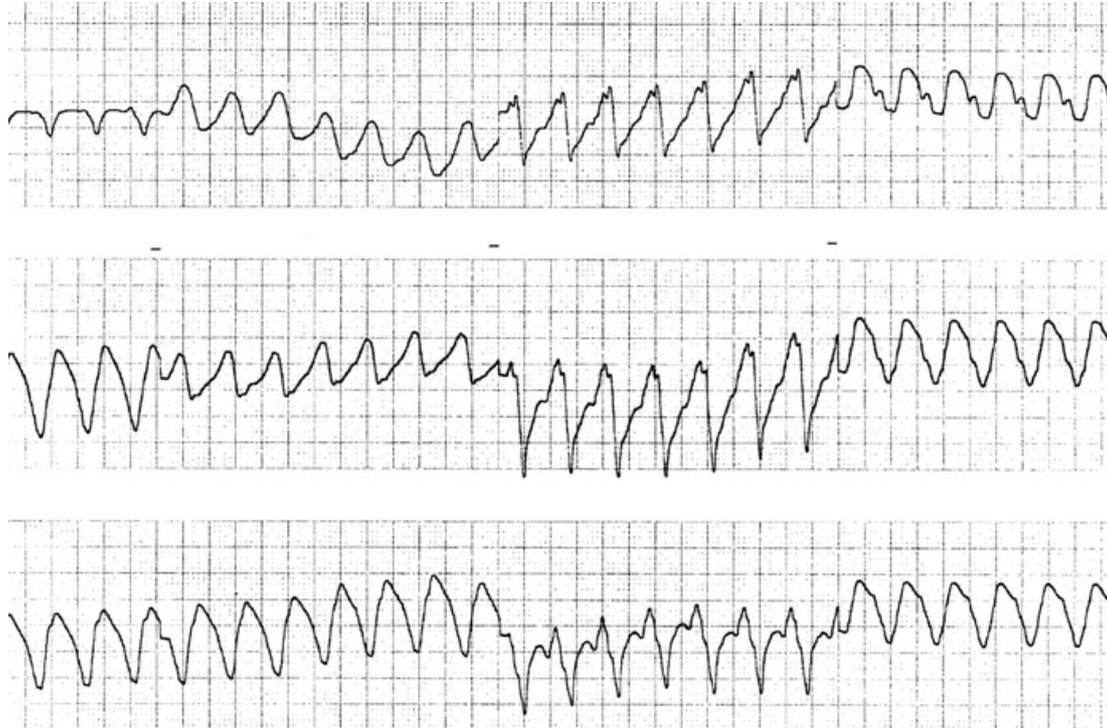


His U+E's are Na⁺ 142 mmol/L, K⁺ 6.7 mmol/L, U50.1, Cr 502.

- Describe 4 features of the ECG. (4 marks)
- Give 3 indications for digibind. (3 marks)
- List 3 other treatments for this patient and give reasons for using them. (3 marks)

A 30 year old female who works as an accountant and is known to have been depressed for some time is brought to the ED after having been found unresponsive.

An ECG has been taken on arrival and is shown below.



a. Describe the ECG and give the cardiac diagnosis. (2 marks)

As you are looking at the ECG the patient has a fit.

b. Given this event, what is the most likely diagnosis for the patient? (1 mark)

c. What drug would you give and what is its mode of action? (2 marks)

d. What aspects of the patient's condition would you monitor after giving this drug? (2 marks)

e. Give 4 other actions you would take to manage this patient's fitting. (4 marks)

A man staggers into your department and says that he and many other people have been on a train and were sprayed with a liquid. He then collapses.

a. Other than calling your ED consultant, give 4 actions you would take to manage the situation. (3 marks)

b. Give 4 muscarinic effects of organophosphate poisoning. (4 marks)

c. Give 3 drugs to treat organophosphate poisoning.

. A 40 year old female is brought to your ED following a 2.5g propranolol overdose taken 3 hours ago.

Vital signs:

Pulse	45	/min
BP	82/45	mmHg
RR	16	/min
Temp	36.8	°C
GCS	13	(E=3, V=4, M=6)
BSL	6.7	mmol/L

a. Outline a step-wise approach to the patient's bradycardia and hypotension? (4 marks)

b. Clinical toxicology have been consulted and advised you to commence HDI therapy. How is HDI administered? (4 marks)

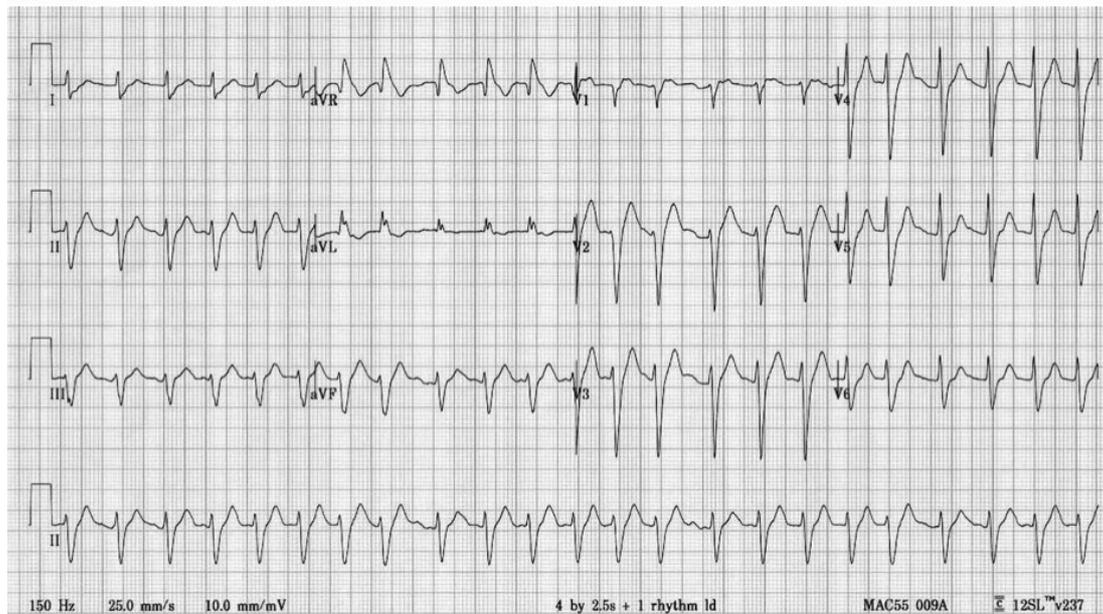
c. What are the potential complications associated with HDI therapy? (2 marks)

A 46 year old man is brought to your ED by ambulance following an overdose of unknown medications. He had a brief generalised seizure en route.

On arrival his observations are:

GCS	12	
BP	85/60	mmHg
Temp	37.0	°C
O ₂ Saturation	100	% on 8 L/min O ₂

His ECG is shown below.



a. Describe the ECG. (5 marks)

b. What are the first 5 things you would do to manage the patient?

A factory worker presents to your department with 3% body surface area burns to his hands and forearms from a 100% hydrofluoric acid solution.

- a. What percentage of body surface area burns would be expected to be associated with systemic toxicity from this acid and how does it cause toxicity?

- b. List 3 investigations that may be useful to help determine further management of this patient and describe the abnormality that may be detected.

- c. Name the antidote used to treat hydrofluoric acid toxicity.

- d. List 3 routes by which it may be administered and the dose typically used for each route.

A 3 year old child is brought into ED with a history of having ingested 'at least' 20 of her mother's iron tablets.

a. List 2 clinical features of significant iron toxicity that are likely to be seen within the first 6 hours after the ingestion.

b. List 2 investigations that may be helpful in confirming that a patient has ingested iron tablets and when the abnormality is likely to be detected.

c. List 2 methods of decontamination that may be useful in the management of iron toxicity and their indications for use.

d. Name the antidote used to treat iron toxicity and list 2 indications for its use.

A 32 year old female with a history of bipolar disorder is brought in by ambulance after having taken her weeks worth of lithium. She is alert and orientated and complains of no systemic symptoms at this time.

a. List two early signs or symptoms that suggest a significant amount of Lithium has been ingested acutely and the earliest and most frequent sign of neurological toxicity associated with Lithium ingestion.

b. List 2 tests that may have an influence on further management of a patient presenting after an acute overdose of lithium and explain why they may be relevant.

c. List two treatments that may be considered for a patient suffering from acute Lithium toxicity and one possible indication for each.

A 20 year old female presents saying she has taken an overdose of aspirin.

a. List 4 features of acute salicylate intoxication and the dose expected to cause severe toxicity.

b. What method of decontamination may be useful in the management of salicylate toxicity and for up to how long after the ingestion?

c. Name 2 methods of enhancing the elimination of salicylates and list 1 possible indication for each.

A 22 year old man presents having taken an overdose 2 hours ago. His family state he may have taken aspirin.

- a. What clinical features might the patient have? (4 marks) (any of)

- b. State 2 biochemical abnormalities that might be evident. (2 marks)

- c. What are the indications for urinary alkalinisation? (2 marks)

- d. What patients can be discharged? (2 marks)

A 23 year old man has been brought to your ED after having a seizure at a dance party. He has no

known medical history.

On arrival, his vital signs are:

GCS 8 E 2 V 2 M 4

Pulse 120 /min

BP 110/70 mmHg

Temp 41.0 degrees

O2 sats 100% 6L O2 via mask

1. List 3 possible non-toxicological causes of this presentation. (3 marks)

2. List 3 possible toxicological causes of this presentation. For each, give 3 cardinal examination features that would suggest the diagnosis. (12 marks)

Cause	Cardinal examination findings

3. List 4 methods of cooling appropriate for this patient. (4 marks)

A 45yo male is brought to Launceston ED by ambulance from a property near Launceston Tasmania. He reports that he has been bitten on the hand in the field “by a tiger snake” 20 minutes earlier. A pressure bandage and splint were applied in the field. He experienced a brief syncope within a few minutes of the bite and now complains of mild discomfort in the hand, visual blurring and feeling light headed.

- (a) Sequence your management steps (35%)
- (b) What is the role for VDK in this man? (10%)
- (c) What laboratory tests are appropriate to the management of this case? (30%)
- (d) Complete the table for the clinical presentation of Tiger snake envenomation in humans? (30%)

Symptom/sign/lab result	present/absent (cross out incorrect answer)
Severe pain at the bite site	present/absent
Defibrinating coagulopathy	present/absent
Anti-coagulant coagulopathy	present/absent
Myolysis (clinically significant)	present/absent
Presynaptic paralysis	present/absent
Postsynaptic paralysis	present/absent

Question 3:

Immediately upon commencing Tiger snake antivenom therapy a 45 yo male develops severe dyspnoea, throat “tightness” and light headedness.

- (a) Describe your immediate actions. (70%)

- (b) Describe the hypersensitivity reaction involved. (30%)

Question 12:

A 24yo female is BIBA with fever, mutism and increased muscle tone.

- (a) List 5 drug induced syndromes that have hyperthermia as a presenting sign. (10%)
- (b) What are the cardinal features of the history and clinical examination that define this as Neuroleptic Malignant Syndrome as distinct from Hyperserotonism? (40%)
- (c) What are the indications for intubation in this woman with NMS? (25%)
- (d) How would you manage her hyperthermia? (25%)

A 55 year old man collapses on emerging from the water after snorkelling on a Queensland beach. He is rapidly transported to the emergency department.

a) List six (6) differential diagnoses for his collapse

b) Give four (4) clinical features on assessment that would indicate marine envenomation

c) Name an organism for which marine antivenom exists AND give two (2) indications for its use
