



Envenomation & Environment SAQs

Emergency Medicine Fellowship Program

How to use this book:

1) Complete SAQs

- < 3 months until exam: Exam conditions – focus on clear answers ‘to time’
- 3-6 months until exam: Transition towards exam conditions
- > 6 months until exam: Open book is ok, ‘focus on good answers and developing knowledge acquisition

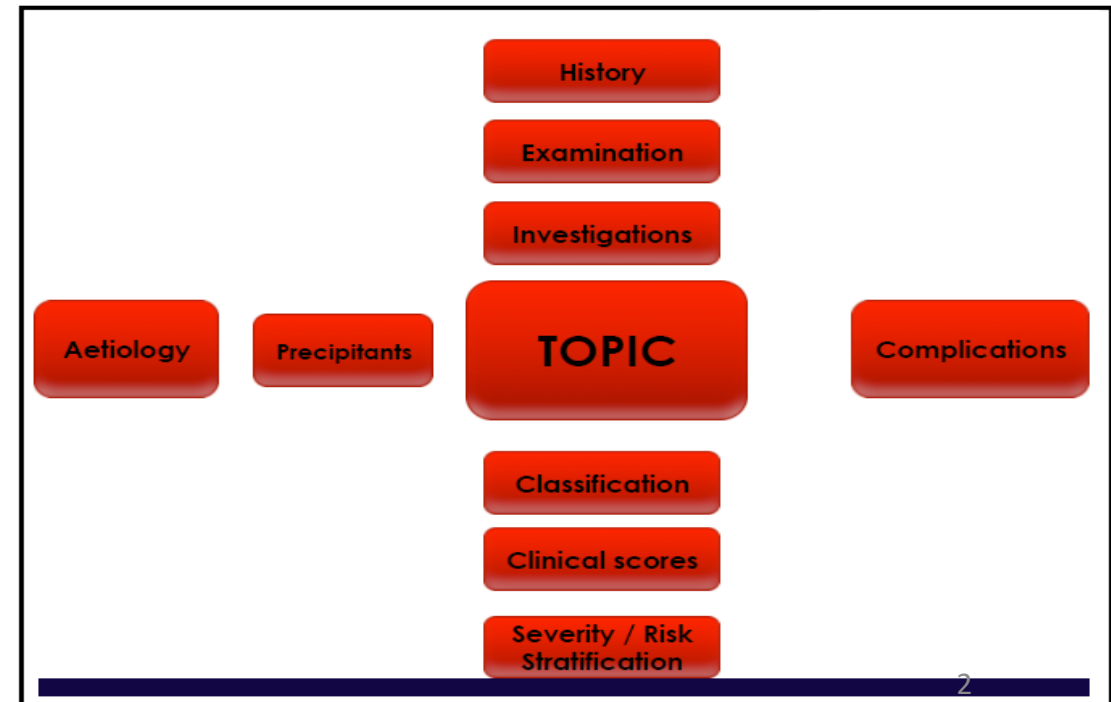
2) Read and study around SAQ

- Use each SAQ as motivation to study around the individual topic
- Think about the different ways the topic could come up in the SAQ exam (use the topic structure provided by APEM course)

3) Write SAQs to further develop this program

- Review syllabus of medical expertise
- Create SAQs relating to topics not covered in this book, please format to be in exam-format, include answers
- This will help further develop this program as well as help you think like an examiner
- Return to ben.shepherd86@gmail.com

ALL THE BEST!



8. ENVIRONMENTAL

8.1 Heat

- a) Heat stroke DIS Ex
- b) Heat stress/exhaustion DIS H
- c) Drug related hyperthermia DIS H

8.2 Cold

- a) Hypothermia DIS H
- b) Frostbite DIS G

8.3 Venomous bites and stings

- a) Snakes DIS Ex
- b) Spiders DIS Ex
- c) Hymenoptera – bees, wasps, ants DIS Ex
- d) Jellyfish DIS H
- e) Stinging fish DIS H
- f) Blue-ringed octopus DIS H
- g) Other DIS H

8.4 Aquatic

- a) Near drowning DIS H
- b) Decompression illness DIS H
- c) Barotrauma DIS H
- d) Toxic marine ingestions DIS H

8.5 Electricity

- a) Electric shock DIS H
- b) Lightning strike DIS H

8.6 Aviation

- a) Acute mountain sickness DIS H
- b) High altitude cerebral oedema DIS G
- c) High altitude pulmonary oedema DIS H

8.7 Exercise-associated illness DIS H

COLUMN "LO" – CATEGORIES OF LEARNING OBJECTIVES

DIS - Diseases/Injuries/Symptoms	D - Pharmacological & toxicological agents	Ex - Expert
E - Physical Examination	P - Procedures	H - High
I - Investigations	Eq - Equipment	G - General
M - Medical Interventions	T - Theories	3

COLUMN "LP" – LEVELS OF PRACTICE

Envenomation

A 25 year old man presents to your NSW Emergency Department after a suspected funnel web spider bite approximately 30 minutes ago.

- i. Complete the following table regarding features of envenomation from funnel web spiders. (15 marks)

Class	Symptoms
General (2 marks)	1
	2
Autonomic (5 marks)	1
	2
	3
	4
	5
Neurological (4 marks)	1
	2
	3
	4
Cardiovascular (3 marks)	1
	2
	3
Respiratory (1 mark)	1

- ii. List and justify two (2) investigations warranted in severe cases of envenomation. (4 marks)

	Investigation (2 marks)	Justification (2 marks)
1		
2		

- iii. State five (5) steps to your management of a patient with a symptomatic funnel web spider bite. Provide doses/routes as indicated. (5 marks)

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

A 22-year-old man presents with a 2-hour history of increasing R forearm pain after working in his garden. He tells you there are "lots of spiders around" and you suspect a red back spider bite.

a) List three (3) other symptoms or signs you would look for to confirm the diagnosis. (3 marks)

1. _____

2. _____

3. _____

b) List two (2) medications you would give as a priority, include dosage (2 marks)

1. _____

2. _____

c) What three (3) pieces of information, regarding red back antivenom use in this man, would you explain to the registrar who is looking after this patient? (3 marks)

1. _____

2. _____

3. _____

d) List the most important early complication of antivenom administration. (1 mark)

e) List the most important delayed complication of antivenom administration. (1 mark)

f) List two (2) symptoms of this delayed complication. (2 marks)

1. _____

2. _____

You are the duty consultant working in a metropolitan Victorian emergency department during the summer months.

A 4 year-old boy presents to triage with his parents. He sustained an injury while playing outside in the garden around 90 minutes ago. Apart from a sore foot, he has no other symptoms.

A photograph of his foot is reproduced and shown in PROPS booklet ; page 12 .

a) List two (2) key, initial management priorities? (2 marks)

1. _____

2. _____

b) List four (4) important features to look for on examination (4 marks)

1. _____

2. _____

3. _____

4. _____



c) List five (5) critical blood tests required for this patient and list one expected abnormality for each test (10 marks) ?

	Investigation	Expected Abnormality
1		
2		
3		
4		
5		

A 23 year old man presents 15 minutes after being bitten on the left ankle by a snake.

i. List five (5) features on examination which support the diagnosis of envenomation.

1. _____

2. _____

3. _____

4. _____

5. _____

____ / 5

ii. What five (5) actions are required for the specific treatment of a patient with a confirmed brown snake envenomation?

1. _____

2. _____

3. _____

4. _____

5. _____

iii. Briefly describe four (4) current controversies in snakebite envenomation management.

1. _____

2. _____

3. _____

4. _____

A 50 year old man has been bitten by a snake and presents to your ED 6 hours later. He has had no first aid. He is normally well, on no medications and has no pre-existing medical conditions. Initial blood tests demonstrate a marked coagulopathy and low fibrinogen.

i. Which Australian elapids cause coagulopathy (4 marks)

ii. Which of the pathological effects of envenomation are reversed by appropriate antivenom administration (4 marks)

iii. Detail how you will administer the antivenom (4 marks)

iv. Outline your actions in the event of an allergic reaction to the antivenom (5 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.

- Sequence your management steps (35%)
- What is the role for VDK in this man? (10%)
- What laboratory tests are appropriate to the management of this case? (30%)
- 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

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%)

A 10 year old boy collapses on the beach in Queensland after playing in a small rock pool. He had been handling a small sea creature. He is brought to your rural ED by paramedics who identified the creature as a blue ring octopus.

- i. Identify the type of toxin and its mechanism of action (2 marks)

- ii. Describe the clinical features you would expect this child to exhibit in early and late stages of the toxidrome (4 marks)

Stage of toxidrome	Clinical signs
Early signs – list 2	
Late signs – list 2	

- iii. Identify the definitive management step for the toxidrome from the blue ring octopus (1 mark)

- iv. List 2 other marine creatures which may cause collapse on an Australian beach and identify the mechanism of the collapse (4 marks)

Marine Creature	Mechanism of collapse

Environmental

You are a doctor at a well-equipped mobile clinic providing health services to a 5-day ultra-endurance competition in the West MacDonalld Ranges near Alice Springs. On the third day of competition a 30 year old female competitor is brought to your clinic having collapsed. She is confused, agitated and complaining of a headache.

- i. What are the key components of your initial assessment? List 3 features in each category (6 marks)

History	
Examination	

- ii. List 4 differential diagnoses for this presentation (4 marks)

- iii. The patient's GCS deteriorates and she has a prolonged generalised seizure. An iStat venous blood test is performed. The results are displayed. List two drugs you would use to urgently treat this problem now (6 marks)

pH 7.25
 pCO₂ 42
 pO₂ 25.2
 HCO₃ 18
 Hb 147 (120-160)
 K⁺ 5.2 (3.2-5.2)
 Na⁺ 114 (135-145)
 Glu 6.9 (3.9-5.8)
 Lac 6.2 (0.5-2.0)
 Cr 115 (45-90)

Drug	Dose	Route

- iv. The patient has a rectal temperature of 42⁰C. List 5 complications of exertional heat stroke (5 marks)

A 24 year old male presents with confusion after competing in a half marathon event.

His observations are as follows:

BP	95/60	mmHg
HR	118	/min
RR	24	/min
O ₂ saturations	98%	on room air
Temperature	40.8	°C
GCS	13	(V3, E4, M6)

1. What is the most likely diagnosis?

2. List four (4) important investigations for this diagnosis. Include a justification for each.

Investigation	Justification

2. List four (4) temperature control strategies.

3. List four (4) other immediate management priorities for this patient.

A 22 year old marathon runner is brought in to your Emergency Department. He has collapsed and has only had basic first aid.

On arrival is observations are as follows:

GCS	11	(E3, V4, M4)
Temp	41.5	°C
HR	140	bpm
BP	85/40	mmHg
SaO ₂	98%	on room air

i. List six (6) differential diagnoses.

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____

ii. Outline your four (4) initial treatment aims.

- 1 _____
- 2 _____
- 3 _____
- 4 _____

Some blood tests are performed and results given below:

Hb	180	g/L	(115 - 165)
WCC	23	x10 ⁹ /L	(3.5 - 11)
Plt	45	x10 ⁹ /L	(150 - 450)
Na	145	mmol/L	(135 - 145)
K	5.6	mmol/L	(3.5 - 5)
Urea	20	mmol/L	(2 - 7)
Creatinine	400	umol/L	(60 - 110)
CK	26,000	IU/L	(60 - 220)

iii. List three (3) abnormalities and explain their significance.

	Abnormalities	Significance
1		
2		
3		

iv. Describe your next three (3) management steps.

- 1 _____
- 2 _____
- 3 _____

A 62 year old man is brought to ED having been found asleep in the garden in the sun. He is agitated, combative, with no focal neurology or signs of trauma.

Vital signs Temp 41 deg Celsius
 P 118 bpm
 BP 90/40 mmHg
 RR 20 bpm
 SaO2 98% RA
 GCS 14 (E4V4M6)

i. List 4 possible diagnoses starting with the most likely (4 marks)

ii. List 3 separate heat related illnesses and their diagnostic criteria/main clinical findings (6 marks)

iii. List 3 potential ways of cooling this patient and 1 pro and con of each (6 marks)

iv. List 4 potential complications of this condition from separate organ systems (4 marks)

A 20 year old male is brought to your ED with confusion and hyperthermia following a marathon. You think he has exertion related heat stroke.

i. What are the management priorities in this situation (5 marks)

ii. What investigations would you perform and why (4 marks)

Heat illness affects some groups more than others and non-exertional heat stroke is more common during heat waves.

iii. Define heat wave (2 marks)

iv. List 4 risk factors for classic non-exertional heat stroke (4 marks)

v. List three drugs/medications from different classes that increase the risk of heat stroke and explain the pharmacological reason(s) for the effect for each (6 marks)

Medication	Explanation

A 68 year old man is found wandering the streets at 3am. He is confused and his vital signs are:

GCS 14

BP 124/70 mmHg

PR 50 regular

RR 20 /min

Temperature 31°C

An ECG is taken and shown in PROPS booklet, page 6 .

a) State four (4) features on this ECG consistent with hypothermia (4 marks)

1. _____

2. _____

3. _____

4. _____

b) List three (3) factors associated with a greater chance of survival in hypothermia In the event of cardiac arrest (3 marks)

1. _____

2. _____

3. _____

c) List five (5) parameters which may identify the non-salvageable patient in hypothermia (5 marks)

1. _____

2. _____

3. _____

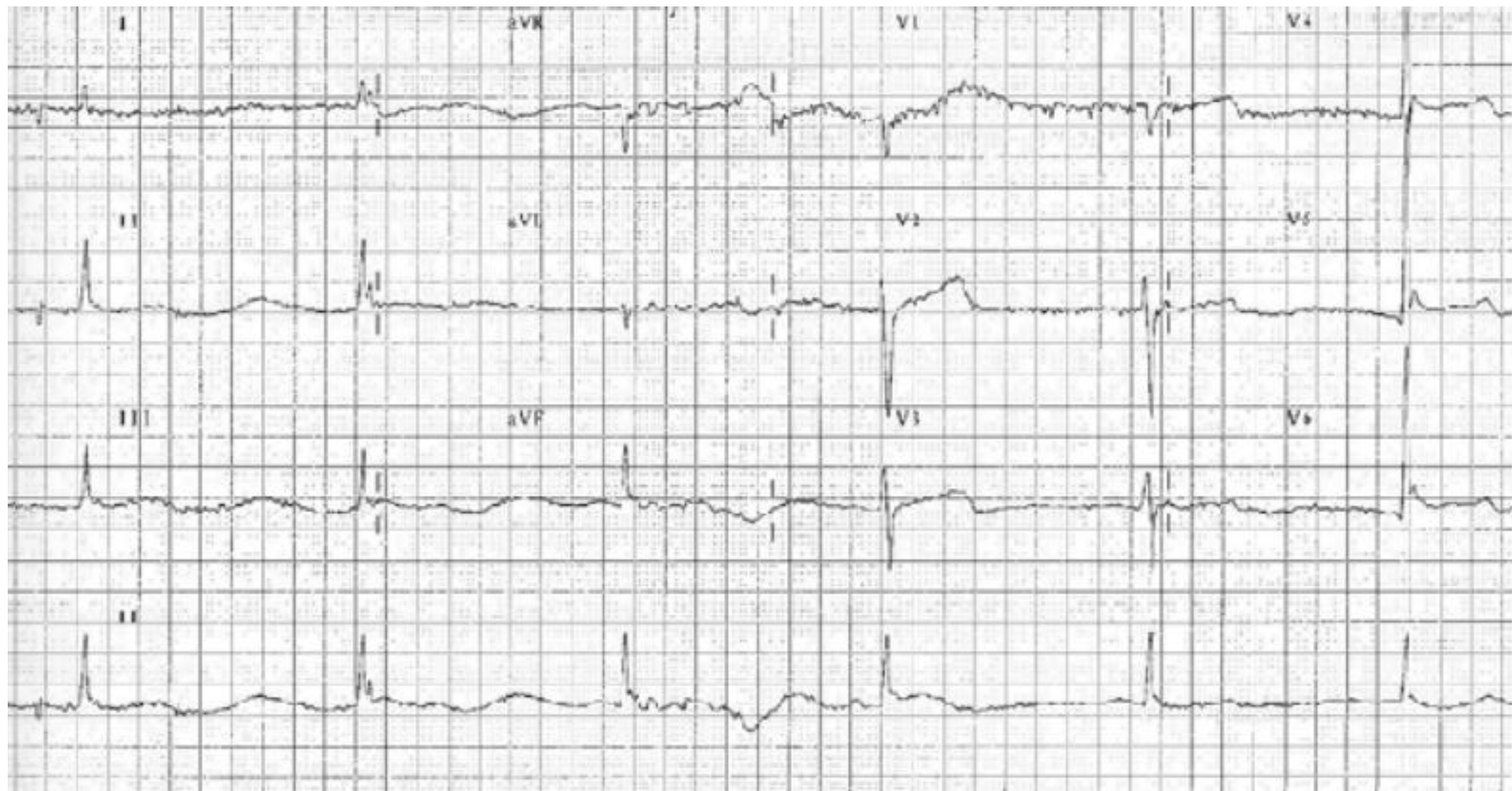
4. _____

5. _____

d) Complete the table below showing four (4) warming strategies in patients with hypothermia and the associated temperature rise / hour (°C) .(8 marks)

Endogenous rewarming has been completed for you as an example.

	Warming technique	Temperature rise °C / hour
	Endogenous rewarming	0.5-1
1		
2		
3		
4		



An elderly lady is brought to your ED by ambulance. She was found by a neighbour in her back yard.

Vital signs: GCS 9 (E3V3M3)
BP 90/50 mmHg
HR 45 bpm
SaO2 90% (8L/min Hudson)
Temp 27 deg celsius (oral and rectal)

i. List possible complications of her hypothermia on four organ systems (4 marks)

ii. After one hour, the patient remains GCS 9 and temp 29 degrees despite initial treatment. You decide to perform a CT brain. List 3 pros and 3 cons of intubating prior to CT (6 marks)

iii. The patient develops ventricular fibrillation. List five ways in which your approach to this resuscitation differs from standard ALS principles (5 marks)

An 72 year old lady is brought in by ambulance mid-winter having been found by a neighbour collapsed on the floor of her unheated unit. She was acutely confused in a pool of her urine and unable to get up.

Her vital signs on ambulance arrival:

BP	90/60	mmHg
HR	55	bpm
RR	10	bpm
O2 sat	95%	RA
Temp	29	deg Celcius

a) List four (4) ECG findings that you may expect for this patient.(4 marks)

1. _____

2. _____

3. _____

4. _____

b) List four (4) rewarming methods that you would use for this patient. (4 marks)

1. _____

2. _____

3. _____

4. _____

c) List four (4) complications to be aware of during rewarming of this patient. (4 marks)

1. _____

2. _____

3. _____

4. _____

A 31-year old male with a history of alcoholism and IVDU is found collapsed on the street during winter. He is brought to ED by ambulance.

His vital signs are:

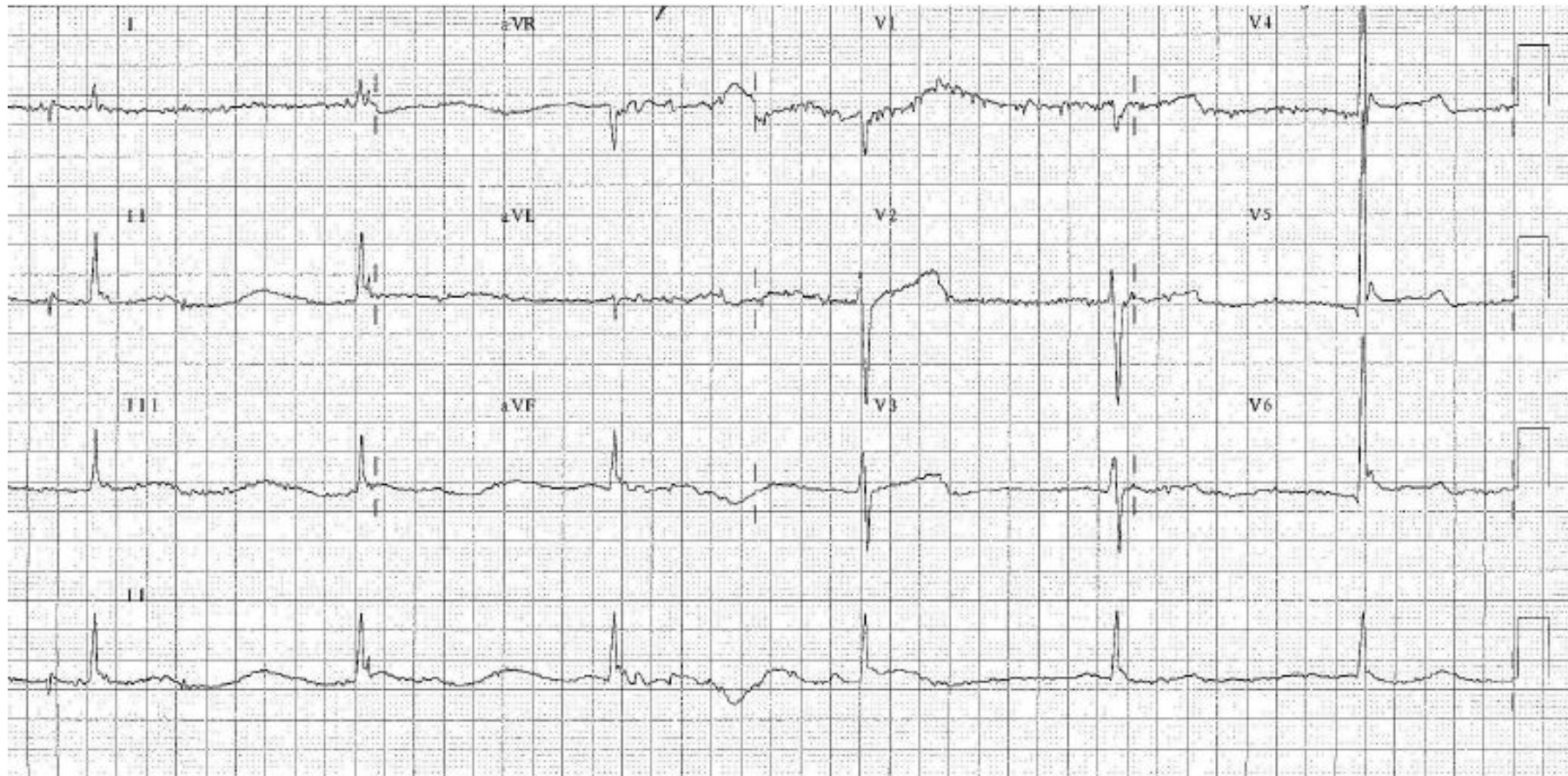
GCS 7

E2, V1, M4

BP 90/50mmHg

Temperature 29°C

His ECG is on the following page.



1. List 4 abnormal ECG findings that are consistent with a diagnosis of hypothermia (2 marks).

- i. _____
- ii. _____
- iii. _____
- iv. _____

2. List 4 methods of rewarming this patient (2 marks).

- i. _____
- ii. _____
- iii. _____
- iv. _____

3. List 3 elements of supportive care for this patient (3 marks).

- i. _____
- ii. _____
- iii. _____

The patient suffers a sudden VF arrest.

4. List 3 modifications to the standard *advanced life support* algorithm, with rationale for each modification (3 marks).

	Modification to ALS protocol	Rationale
1.		
2.		
3.		

A 40 year old man is brought to your ED after being swept into rough water whilst rock fishing in the middle of winter. On examination you notice a contusion to the right forehead.

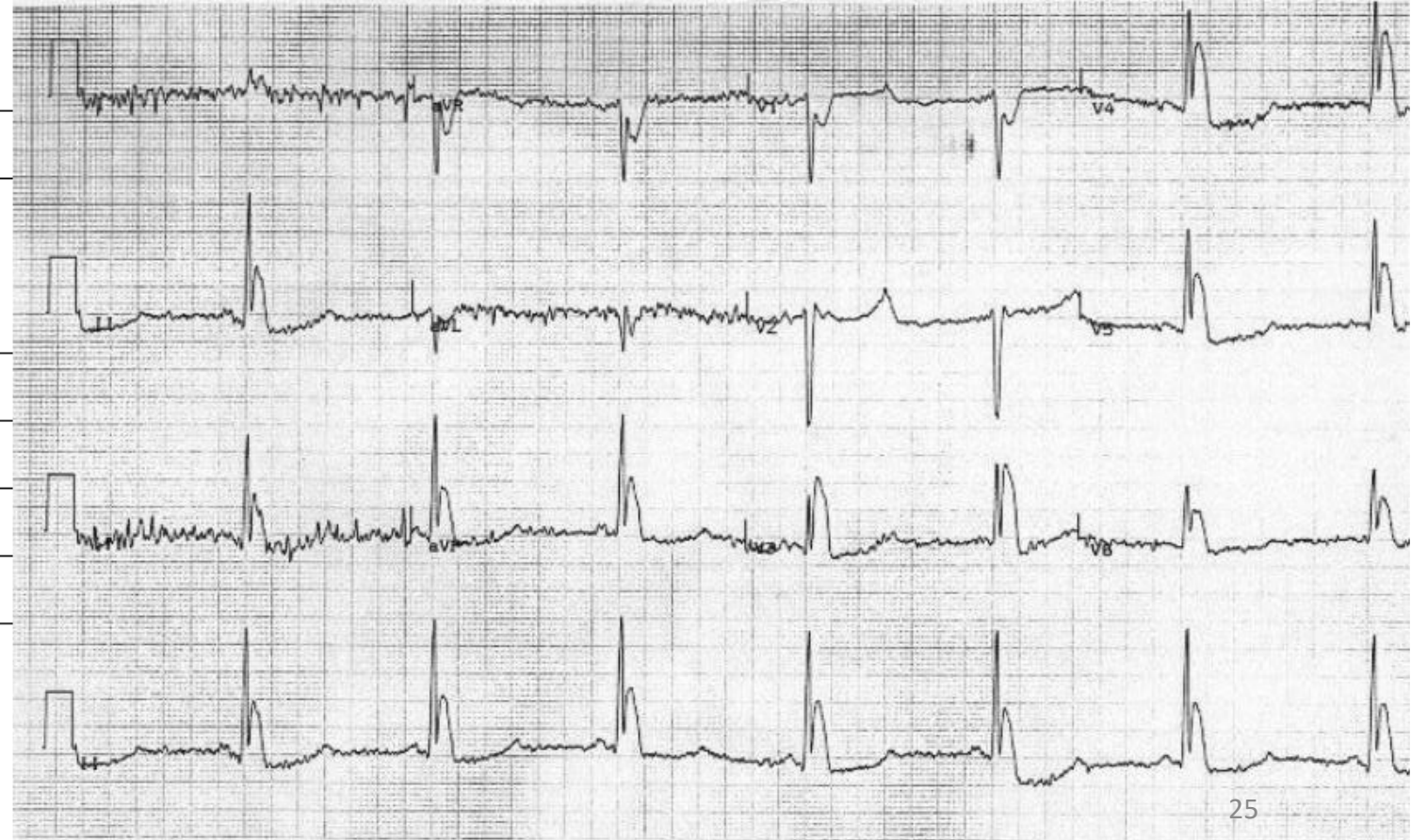
Vital signs GCS 5
 HR 48 bpm
 BP 105/70 mmHg
 RR 12 bpm
 SaO2 94% RA
 Temp 28 deg C

i. List the key features on the ECG (2 marks)

A 12 LEAD ECG IS SHOWN IN THE PROPS BOOKLET, PAGE 10

ii. List 5 important aspects to consider during the initial resuscitation (5 marks)

iii. Describe the methods you would employ to rewarm this patient noting specific triggers for any invasive measures (6 marks)



A 24 year old apprentice electrician has been brought to the Emergency Department having suffered an industrial electrocution, while working in the rain. He has burns to both his hands; and he complains of some dizziness, and severe pain in his arms.

a) List four (4) factors that may influence the severity of injury in this man. (4 marks)

1. _____
2. _____
3. _____
4. _____

b) Apart from his hand wounds, list the four (4) most likely tissues to be injured in this man, giving the type of injury for each. (8 marks)

	Tissue	Type of injury
1		
2		
3		
4		

A 42 year old man is brought by ambulance after completing a long distance bicycle race. Since the race his wife reports he has been acting strangely and fainted twice. She was told by his fellow cyclists that he had drunk plenty of water and had not fallen off his bike.

His vital signs are:

Temp: 39.5 degrees (per rectal)

HR: 122 regular

BP: 100/45

GCS: 14

i. List 5 potential causes for this man's symptoms and signs (5 marks)

ii. List 5 investigations that you think are the most important and their rationale (10 marks)

INVESTIGATION	RATIONALE

iii. The patient's temperature rises to 41 degrees (per rectal). Outline 4 actions in your initial management (4 marks)

iv. Despite resuscitative efforts the patient's temperature rises to 42 degrees and he has a generalised seizure. Outline 6 treatment priorities now. Provide doses and end points where appropriate (6 marks)

There has been a 3-day heat wave involving the south-eastern region (parts of NSW, Victoria and South Australia) with daytime temperatures 38-40 degrees Celsius and overnight minimum temperatures of 28-30 degrees Celsius.

- i. List 4 groups who are particularly at risk of developing non-exertional heat-related illness and include your reasoning (8 marks)

At-risk group	Explanation

- ii. What is the classic definition of heatstroke? (1 mark)

- iii. Provide 3 differential diagnoses of heatstroke in each of the 2 listed categories (6 marks)

Drug intoxication:

Infections:

- iv. Complete the table listing 3 cooling methods and 2 advantages and 2 disadvantages of each (9 marks)

Cooling method	Advantages	Disadvantages

You have agreed to be the expedition doctor for a trek to the Everest base camp. (altitude 5300m)

i. Outline the proposed pathophysiology of:

Acute Mountain Sickness (AMS)/High Altitude Cerebral Oedema (2 marks)

High Altitude Pulmonary Oedema (2 marks)

ii. List 2 risk factors for the development of High Altitude Pulmonary Oedema at any given altitude (2 marks)

iii. List 5 clinical features of AMS (5 marks)

iv. For severe High Altitude Pulmonary Oedema, list 4 treatment options (4 marks)

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High Altitude Pulmonary Oedema (2 marks)

ii. List 2 risk factors for the development of High Altitude Pulmonary Oedema at any given altitude (2 marks)

iii. List 5 clinical features of AMS (5 marks)

iv. For severe High Altitude Pulmonary Oedema, list 4 treatment options (4 marks)

You are on duty in a small urban district hospital. You attend to an 8 year-old boy who was rescued from the bottom of a saltwater backyard pool, unconscious. He was resuscitated by pre-hospital personnel and presents with the following vital signs:

HR 72 bpm, regular

BP 90/60 mmHg

RR 24 bpm

SaO₂ 100 % on high flow oxygen

i. Outline 5 key features in your examination of this child (5 marks)

ii. List 5 factors which determine this child's prognosis (5 marks)

iii. The child's GCS improves to 14. Despite high flow "non-rebreather" mask oxygen, he shows signs of respiratory distress from aspiration pneumonitis. Complete the table outlining 3 escalating modalities that could be used to improve his oxygenation. Describe initial settings and sizes as appropriate (6 marks)

Treatment/modality	Settings

iv. List 4 potential disadvantages of the use of non-invasive mask ventilation (CPAP or BiPAP) for this child in the aero-medical retrieval context (4 marks)

A 3 year old girl is en route by ambulance after drowning in a family pool.

- i. List 5 factors which indicate a poor prognosis for this patient (5 marks)

- ii. Outline your preparation for the patient's arrival (5 marks)

A 27 year old woman has been rescued from the surf by lifeguards at a nearby beach. Ambulance staff intubated her at the scene. Relevant vitals are:

O ₂ Saturation	92%	FiO ₂ 1.0
Temperature	32	°C
HR	120	beats/min
BP	90/56	mmHg

i. In the table provided, list four (4) factors at the scene that indicate a poorer prognosis and four (4) factors on arrival to the emergency department that indicate a poorer prognosis.

	Factors at the scene	Factors on arrival to emergency department
1		
2		
3		
4		

ii. List six (6) neuro protective strategies you will employ. For each strategy include rationale or target parameters.

	Neuro protective strategy	Rationale or target parameters
1		
2		
3		
4		
5		
6		

A 12 year old is brought to your tertiary emergency department unconscious, having been found by his parents unresponsive submersed in water at the local beach. He received basic life support at the beach, having been found in respiratory arrest. He was transported by ambulance to the ED, ventilated via BVM device with supplemental oxygen, having received a total of 400ml of crystalloid pre-hospital.

His vital signs are :

BP 100/50 mmHg
HR 125 bpm
Temperature 34.7 C
O2 saturation 88% on 15L O2 being ventilated via bag valve device
GCS 3

a) State three (3) important resuscitation steps (with prioritisation) you would perform in this case (3 marks).

1. _____

2. _____

3. _____

b) Other than death, list four (4) complications of near drowning that you might expect in this patient. (4 marks).

1. _____

2. _____

3. _____

4. _____

c) Complete the following table regarding the ideal ventilator settings for this patient post intubation (5 marks)

Parameter	Goal / Range
Oxygenation (paO2) or O2 Sat (%)	
Tidal Volume (ml/kg)	
PEEP (cmH2O)	
Plateau Pressure (mmHg)	
pH	

You are the in-charge consultant at an urban district hospital. You receive a batcall about a 2-year-old who has been dragged unconscious from a backyard pool. It is the middle of winter.

His vital signs en route are:

HR	70	GCS	Unresponsive
BP	70/40	Temp	30 degrees
O2 sats	90% (bag valve mask FiO2 1.0)		

1. List 4 predictors of poor outcome in drowning. (4 marks)

(1) _____

(2) _____

(3) _____

(4) _____

You intubate this child on arrival.

See his initial CXR on page 27 in separate book

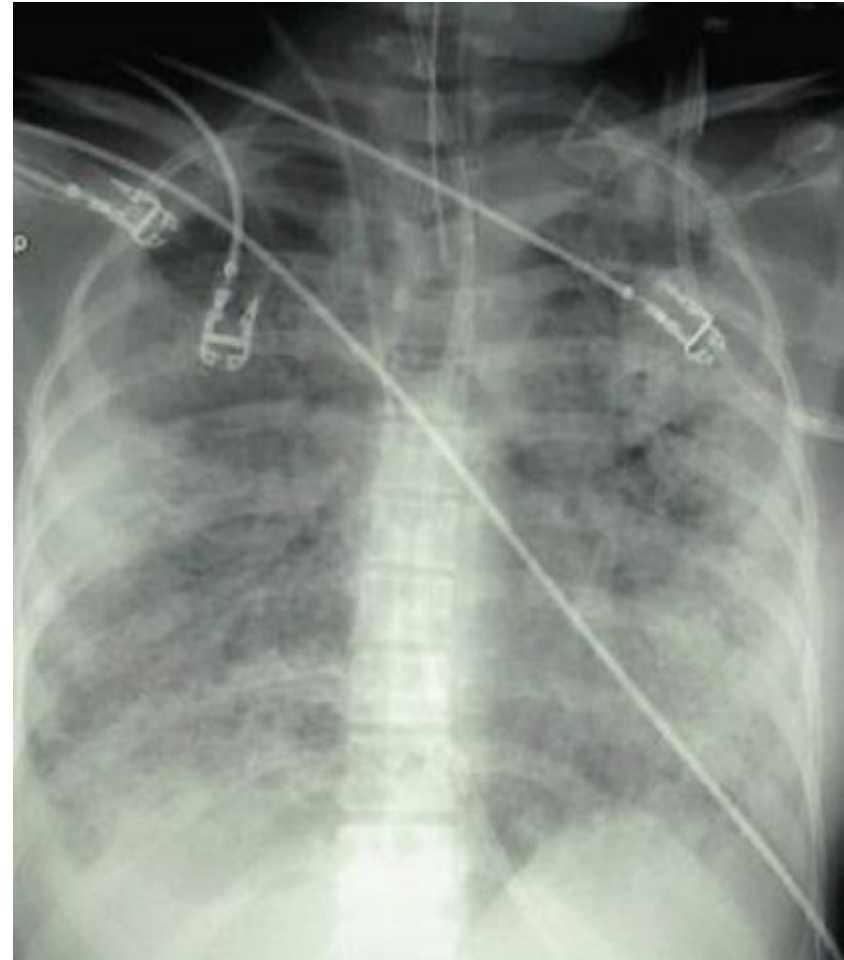
2. List 2 relevant features at this stage of the patient's management. (2 marks)

(1) _____

(2) _____

3. What ventilation strategies would you use? (2 marks)

4. What are your other initial management priorities? (3 marks)



A 27 year old man climbed over an electricity sub-station fence and sustained an electrical injury while grabbing a metal pole with his right hand. He arrives 30 minutes later complaining of tingling in his right arm and a numb left foot.

A CLINICAL PHOTOGRAPH IS SHOWN IN THE PROPS BOOKLET, PAGE 8

i. Describe the wound seen on the foot (1 mark)



ii. Complete the table outlining factors that determine the severity of an electrical injury (8 marks)

Category	Explanation
Voltage	
Current	
Resistance	
Type of current	

i. Complete the table comparing lightning vs high voltage injury (10 marks)

Factor	Lightning	High Voltage AC
Current duration		
Current characteristics		
Energy level		
Cardiac arrest initial rhythm		
Tissue damage		

ii. There are several different types of lightning strike. List 2 types and briefly describe them (4 marks)

Type of strike	Description

iii. Describe 2 clinical features which are considered pathognomonic for lightning strike (2 marks)

iv. List 3 other clinical features seen in lightning strike (3 marks)

- iii. For each of the three categories below, what specific injuries or problems may occur in the patient described in the stem? For each, describe the patho-physiological process (6 marks)

	Injury	Pathophysiology
Cardiac		
Nervous system		
Limb/soft tissue		

A 35 year old man presents to your emergency department after a high voltage electrical injury. A picture of the patient's hand is overleaf

a. Describe & interpret the clinical image ? (4 Marks)

b. List the potential complications following this injury (6 Marks)



A 55 year old man is brought to ED by ambulance after being found collapsed on a golf course. He received bystander CPR for 5-10 minutes at the scene. On arrival to ED, he is haemodynamically stable, spontaneously ventilating and alert but slightly confused.

Vital signs:

HR 120/min
 BP 190/100mmHg
 GCS 14
 E4, V4, M6
 RR 26/min

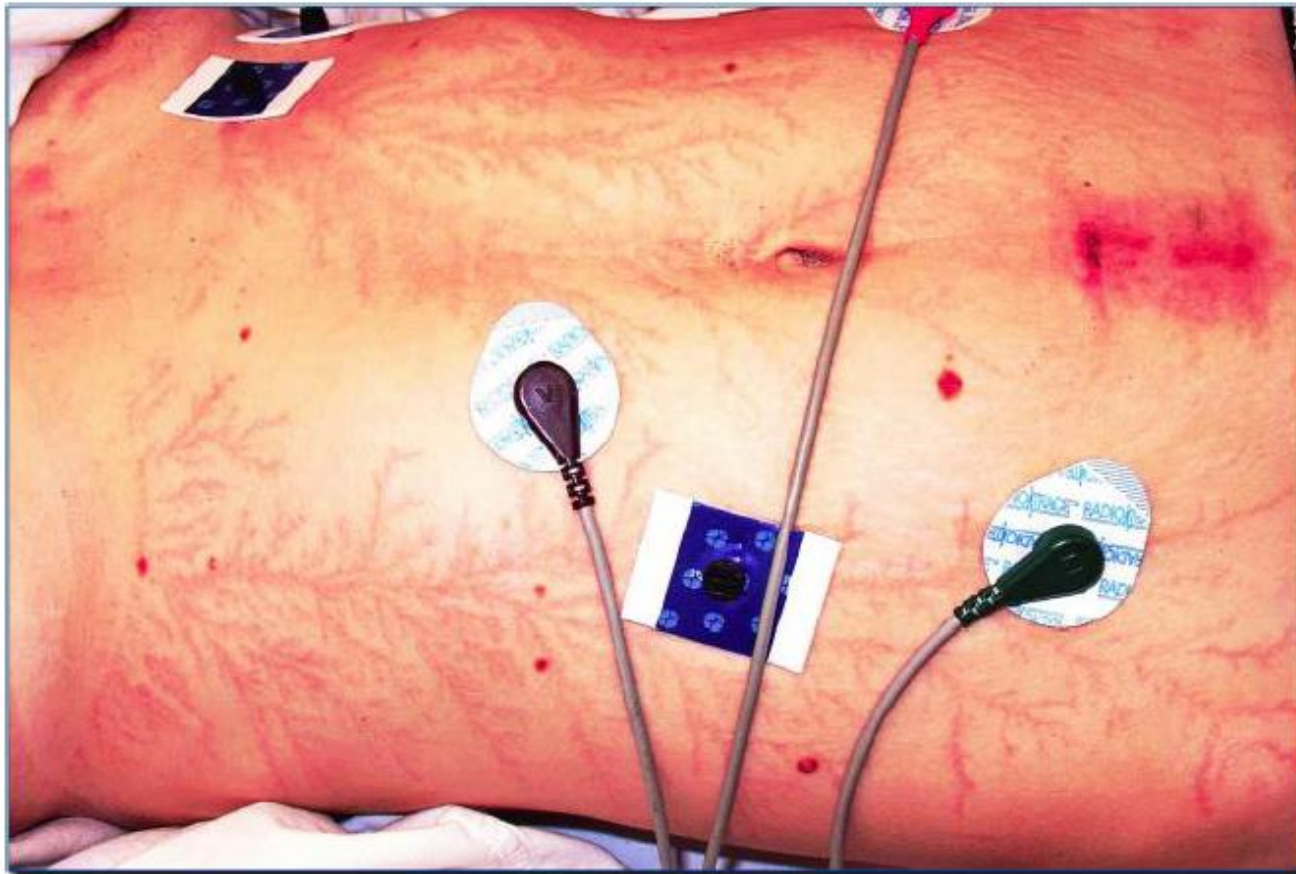


Figure 1: Image reproduced from Dunn's Emergency Medicine Manual (6th edition)

1. What is the most likely diagnosis? List 2 features from the photograph that support this diagnosis (2 marks).

Diagnosis: _____

Clinical Features:

i. _____

ii. _____

2. List 4 immediate complications that you would assess for (4 marks).

i. _____

ii. _____

iii. _____

iv. _____

3. List 1 important delayed complication requiring specialty follow-up (1 mark).

4. List and justify 3 investigations for this patient (3 marks).

	Investigation	Justification
1.		
2.		
3.		

A 25 year old man presents 6 hours after a SCUBA dive with possible decompression sickness (DCS).

i. List 6 questions specific to diving you should ask in your history (6 marks)

ii. Complete the table listing 3 symptoms or signs of DCS in each category (6 marks)

Category	Symptom/Sign
Neurological	
Other	

iii. Complete the table contrasting DCS and Arterial Gas Embolism (AGE) (4 marks)

	DCS	AGE
Pathophysiology		
Time of onset		

You are working in a tertiary referral centre that houses the local hyperbaric chamber. You are contacted by a GP working in a remote GP staffed medical centre located 150 km away. They have a 30 year old male diver with suspected decompression illness. The GP is requesting advice and your retrieval of this patient.

Current observations:

GCS 14 (V4)	Temperature 34.0 °C
HR 60 /min	O ₂ Sats 92 % 8L/min O ₂ via Hudson mask
BP 95/50 mmHg	RR 28 /min

a) Outline your instructions for patient management prior to retrieval team arrival (3 Marks)

b) Describe the important steps in the retrieval of this patient (7 Marks)

A 25 year old man presents 6 hours after a SCUBA dive with a possible decompression sickness (DCS)

i. List 6 questions specific to diving that you should ask in your history (6 marks)

ii. Complete the table listing 3 symptoms or signs of DCS in each category (6 marks)

Category	Symptom/Sign
Neurological	
Other	

iii. Complete the table contrasting DCS and Arterial Gas Embolism (AGE) (4 marks)

	DCS	AGE
Pathophysiology		
Time of onset		

A 30 year old male is brought by ambulance to your urban district ED from a local beach following a SCUBA dive. His dive buddy reports that the patient appeared to be behaving abnormally and possibly had brief seizure-type movements during their dive at a depth of 35 metres.

- i. List 3 diving-related causes of confusion or behaviour change at depth (3 marks)

Because of the problem at 35 metres, the buddy forced a rapid ascent and omitted a decompression stop at 10 metres. On the dive boat, the patient began to vomit and was very unsteady on his feet.

- ii. List 3 differential diagnoses for this presentation and outline historical or examination features that would support each differential (9 marks)

Differential Diagnosis	Supporting Findings

- iii. Complete the following table of changes in bubble size with change (altitude or depth) from sea level (4 marks)

Altitude	10,000 feet	
	2,000 feet	
	Sea Level	10 ml
Depth	10 metres	
	20 metres	

- iv. List 3 relative contraindications to helicopter retrieval in this patient (3 marks)

A 30-year old recreational diver is brought by ambulance to a small coastal ED. He collapsed shortly after emerging from the water and suffered a generalised seizure lasting 2-3 minutes. On examination, he is drowsy with a right-sided hemiparesis. The nearest tertiary hospital is 300km away by road.

Vital signs are as follows:

HR 110/min
BP 90/50mmHg
GCS 11
E4, V2, M5 (not moving right arm)
SaO2 89% room air

His chest x-ray:



1. List 2 diagnoses for this patient and a unifying aetiology (2 marks).

Diagnosis 1: _____

Diagnosis 2: _____

Unifying aetiology: _____

2. Outline your management of this patient (5 marks).

3. Complete the table below, listing 3 possible methods of retrieval for this patient. Give 1 advantage and 1 disadvantage of each method (3 marks).

Mode of transport	Advantage	Disadvantage
1.		
2.		
3.		

A 24 year old sub-mariner is brought to your emergency department after he made a rapid ascent from 30 meters during naval exercises off the coast. He is complaining of extreme vertigo and was dyspnoeic shortly after the rescue.

a) What are the possible aetiologies of his symptoms in this setting? (5 marks)

b) Outline the key points of assessment which would be most discriminatory in enabling you to distinguish between the aetiologies you are considering. (5 marks)

Important Topics Not Covered – Possible SAQs

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