

1. Lead examiner

Candidate Number:

2. Co-examiner.....

Final Mark:

SCENARIO

A 65 year-old man is brought to your urban district ED from a burning factory. Firefighters found him unconscious within the building. His observations are as follows

- Pulse 110 beats / min
- BP 104/58 mmHg
- Resp Rate 10 / min
- O₂ saturations 99% on a non re-breathing mask
- GCS 6 (E1, V1, M 4)

Arterial blood gases on 15 l of oxygen.

pH	7.2	7.35 - 7.45	HCO ₃	20	mmol/L	22 - 28
paCO ₂	55	mmHg 35 - 45	Base Excess	-8		-3 - +3
paO ₂	144	mmHg 80 - 95				

Question 1: List possible causes for his reduced conscious state.

Expected Response	Details & Comments	
Factors may be in combination, or contributory to / exacerbating each other		
Toxic Inhalation	hypoxia CO poisoning CN poisoning other	
Trauma	Head injury-from falling debris or attempts to flee fire / smoke	
+ one other	Other injury causing CNS hypoxia / hypoperfusion (note tachycardia and mild hypoT)	
Metabolic	Airway burns causing hypoxia	
Incidental - preceding event, or exacerbated by it	Hypercarbia, from low resp rate	
	Stroke	
	Hypoglycaemia	
	Cardio-respiratory arrest	
	OD	

Question 2: Describe and interpret the ABG results.

Expected Response	Details & Comments	
Moderate acidaemia	Mixed acidosis: • Metabolic: tissue hypoxia • Respiratory: altered conscious state	
Oxygenation	High arterial O ₂ tension reflects high FiO ₂ with non-rebreathing mask– however, concerns re tissue hypoxia, given high COHb Probable impairment in O ₂ exchange in setting of acute lung injury – ie Aa grad likely high Normal O ₂ sats do not reflect high level of COHb and therefore cannot predict tissue oxygenation in this setting	
Interpretation	Significant mixed metabolic and respiratory acidosis with CO poisoning. Needs oxygen therapy. Consider CN poisoning as well.	

Question 3: What features in the assessment of this patient would support a diagnosis of CO poisoning ?

Expected Response	Details & Comments	
History	Breathing car exhaust fumes- engine running with pipe connecting exhaust into car	
Setting in which found	Fires – especially in large fires in closed spaces Indoor exposure to combustible gases /combustion engines / stoves / heaters/fireplaces	

Symptoms- neuro or cardiac	Altered sensorium	
		3/4
Investigations	High CO level	
	Unexplained metabolic acidosis and respiratory acidosis	

Question 4: Outline the key issues in the airway management of this patient.

Expected Response	Details & Comments	
Key Issues	Needs ETT urgently! Difficult airway – potential airway burns and oedema Possible difficult to ventilate Low respiratory reserve, with toxic inhalation Low cardiac reserve, with tissue hypoxia and other potential injuries – high risk of hypotension with induction ? C spine injury – may need in-line immobilization 4/5	
Preparation	Lead team. Most experienced airway practitioner to intubate. Pre-oxygenation In-line C spine immobilisation if suspect C spine injury.	
Rapid Sequence Induction	Preload with IV fluids Fentanyl as drug of choice Suxamethonium – hyper K potential caveat	
Post procedure	ETT position confirmation: ETCO ₂ , CXR Ongoing sedation and paralysis Ventilate with 100% oxygen Needs IA line	

Question 5: The patient is safely intubated. COHb = 15% Discuss the role of hyperbaric oxygen therapy in this setting.

Expected Response	Details & Comments	
Considerations	Indications – potential benefit Risks – probably needs transfer Availability Evidence – conflicting in literature: Weaver vs Scheincastle	
Indications	In this case: coma, hypotension, acidaemia	
Risks / Cons	HBO service likely not available at urban district hospital, so needs transfer High resource consumption!	
Availability	Likely limited, as restricted also by ICU access	
Evidence	Indications less ambiguous in this setting, as tissue hypoxia is evident	
	Longer term neurological and other end-organ function are key outcomes	
Decision	Despite the above, decision for HBO therapy rests with accepting service rather than ED	

Comments: (if you fail the candidate, please state why)

.....

.....

If the candidate fails the exam overall, what feedback would you suggest CIC provide for this SCE?

.....

.....

SCENARIO

SCENARIO

A 65 year-old man is brought to your urban district ED from a burning factory. Firefighters found him unconscious within the building. His observations are as follows

- Pulse 110 beats / min
- BP 104/58 mmHg
- Resp Rate 10 / min
- O₂ saturations 99% on a non re-breathing mask
- GCS 6 (E1, V1, M 4)

Arterial blood gases on 15 l of oxygen.

pH	7.2	7.35 - 7.45	HCO ₃	20	mmol/L	22 - 28
paCO ₂	55 mmHg	35 - 45	Base Excess	-8		-3 - +3
paO ₂	144 mmHg	80 - 95				