

1. Lead examiner

Candidate Number:

2. Co-examiner

Total Mark:

SCENARIO

A 30 year old woman with known type I diabetes presents with vomiting and abdominal pain for two days. Her vital signs are HR 138/ minute, BP 112/69, Afebrile, GCS 14, RR 24/ minute.

Question 1: Describe and interpret her ABG

pH	6.95	(7.35-7.45)	Glucose	32 mmol/L	(3.0-7.7 mmol/L)
PaO ₂	165 mmHg	(80-100 mmHg)	Na	132 mmol/L	(135-145 mmol/L)
PaCO ₂	10 mmHg	(35-45 mmHg)	K	5.8 mmol/L	(3.5-5 mmol/L)
HCO ₃	2	(22-28 mmol/L)			
Base Excess	-30 mEq/L	(-2 - +2 mEq/L)	O ₂ Saturation	100%	(95-100%)

(1 minute)

Expected Response	Details & Comments	
Profound metabolic acidosis with partial respiratory compensation	HCO ₃ of 2 suggests course over several days	
Marked hyperglycaemia		
Normal corrected sodium (prompt if needed)	Corrected Na = Na + (Gluc-10)/3= 139	
Mild hyperkalaemia	Care with K ⁺ replacement	
c/w Severe DKA		

Question 2: Describe the key features in your assessment of this patient

(2 minutes)

Expected Response	Details & Comments	
Concurrent Assessment and Management	Initiate resuscitation whilst gaining further Hx/Ex/Ix	
History	History of her Diabetes Usual insulin regime/ other meds/ compliance Previous episodes DKA- ?usual precipitants, other complications- hypos- Usual endocrinologist Usual BSLs, HbA _{1c} , Frequency of monitoring Other known complications IDDM - retinopathy, renal disease, PVD This illness?: Possible precipitant, sepsis, non compliance, History of vomiting, abdo pain, oral intake, other Sx, previous Surgery, pregnancy? allergies	Focus on acute precipitant of severe presentation
Examination	Focused Exam- vital signs Hydration status Look for site of infection - chest, skin, renal tract, CNS, abdomen	
Investigations	Bedside- BSL (already have) Urine- ketones, U/A and microscopy, bHCG ECG- ?ischaemia BG (already have most)- lactate ?sepsis, hypoperfusion FBC- WCC- sepsis, stress, Hb- likely haemoconcentration EUC- K ⁺ , renal function Ca Mg PO ₄ Lipase, LFTs- ?cause abdo pain CXR- ?pneumonia	Reasonable, structured approach

Question 3: Outline your specific management in the first 2 hours in the ED

(2.5 minutes)

Expected Response	Details & Comments	
Triage to resus area	Comprehensive monitoring, team approach IV access X 2	
Fluid resuscitation	0.9% N/Saline 1L stat, 2 nd litre over 1 hr, 3 rd litre over 2 hrs Further boluses if hypotension, Aim HR<100, BP>100	
Insulin therapy Prompt at end if required The BSL is now 12, how does this alter your management.	Actrapid Insulin 50Units in 50ml N/saline @ 0.1units/kg/hr (infusion without bolus preferred but not essential) ONCE fluid resuscitation commenced. Check BSL hourly When BSL <15 change to 5% dextrose as fluid (maybe in addition to N/Saline) to maintain serum glucose whilst continuing insulin infusion When BSL < 15 may reduce actrapid infusion to 0.05 U/kg/hr (Do NOT stop infusion as need to treat ketogenesis)	Reasonable infusion rate Reasonable end points
Initiate potassium replacement Will have large total body potassium deficit. (prompt for detail if not given)	Current K ⁺ 5.8- do not commence replacement until repeat EUC in 1 hour-check on VBG for rapid result Potassium will shift into cells with treatment K ⁺ <3.3 replace at 20mmol/hr K ⁺ 3.4-5- replace at 10mmol/hr K ⁺ 5.1-5.5 replace at 5-10mmol/hr Aim for serum K ⁺ 4-5 mmol/L, max rate K ⁺ peripherally ~ 20mmol/hr, centrally 30mmol/hr	Anticipate large fall in K ⁺ as treatment commenced Monitor and adjust regime
Treat underlying precipitant	Eg Antibiotics if site of sepsis identified- probably assume sepsis unless other obvious cause	
Consider HCO ₃	As pH <7 may consider administration of 50mmol sodium bicarbonate 8.4%- probably will resolve without bicarb	
On-going monitoring	Hourly BSLs Second hourly EUC- K ⁺ VBG 2 nd hourly Blood capillary ketones	
Invasive monitoring	Consider arterial line- for ease of repeat sampling IDC- hourly U/O	
Consultation / disposition	ICU/ Endocrine team	

Question 4:

After 2 hours in the ED she wants to discharge herself. Outline your approach.

(1.5 minutes)

If / when requested last BSL is 12 and her most recent VBG has a pH 7.1
Her vital signs are HR 110/ min, BP 120/ 85

Expected Response	Details & Comments	
Difficult situation	Needs to stay for ongoing medical management Duty of care to ensure that the patient is fully informed of risk of leaving ?capacity to decide-significant physiological derangement. Outline how competence would be determined Negotiate/arrange further treatment and follow up if the patient leaves.	Assessment of capacity for informed consent
Elucidate why she wishes to leave	Enlist family /friends Endocrine team may have relationship with pt	Enlist support as available
Explain need to remain for treatment	If patient deemed competent then she cannot be kept against her will, but if deemed incompetent due to serious medical condition can be treated "in good faith" in the best interest of the patient	

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

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

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pCO ₂	10 mmHg	Potassium	5.8 mmol/L	(3.5-5.0)
HCO ₃	2 mmol/L	Hb	143g/L	(130-170)
BE	-30			
Sats	98%			