

APLS: SIMULATION CASE I-3

History *{initial candidate briefing prior to arrival of child}*

A 6 year old girl is carried into the Emergency Department by her parents. Over the last 2 days she has become increasingly lethargic and today they are very worried about her breathing.

Initial Impression *{to tell candidate as child arrives}*

Respiratory rate of 30/min and deep acidotic breathing. Pulse is 160/min with poor volume. Capillary refill is 5 seconds. Systolic BP 85. She responds to her mother's voice by opening her eyes. Guide weight 20 kg

Clinical Course *{to be given to candidate as he/she progresses through the assessment and treatment of the child}*

She is dehydrated and probably in some degree of shock. Blood glucose is 32 mmol/l, pH 7.03, PaO₂ 23.1 kPa on oxygen, PaCO₂ 2.5 kPa and potassium 5 mmol/l. After 2 boluses of 10ml/kg, she does not become fully alert but asks for her brother and pulse volume and rate improve a little.

INSTRUCTORS INFORMATION

Key Treatment Points

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Airway	Establish airway patency	
	Airway opening manoeuvres	
	Insert nasogastric tube and aspirate/drain	
Breathing	High flow oxygen by face mask	
Circulation	IV/IO access	
	Appropriate blood tests	
	Fluid boluses *	
Specific Therapy	Assess dehydration*	
	Calculate deficit*	
	Begin normal saline replacement*	
	Insulin infusion after 1 h*	
	Monitor for cerebral oedema and ECG T-waves	
	Contact diabetic team/HDU	

Diagnosis

Diabetes mellitus in ketoacidotic coma

POTENTIAL ISSUES THAT MAY BE RAISED

- mortality from cerebral oedema, hypokalaemia, aspiration
- risks for cerebral oedema – ensure slow reduction of glucose $<5\text{mmol/l/hour}$ and sodium rises and consider 0.05U/kg/h insulin

***Notes** Fluid boluses should be given slowly in 10ml/kg aliquots. It is rare to need more than 30ml/kg . Calculations should be done carefully in a quiet environment – resus boluses are included as part of total fluid needs (DKA only). Insulin should not be started until fluids have been running for 1 hour and therefore will probably commence after the child has been transferred. Normal saline replacement MUST contain KCl too. [Should not be needed during first hour of care]. Note: the rate for insulin is under debate. Guidelines suggest 0.1 units/kg/hr , but many paediatricians prefer 0.05u/kg/hour initially without a loading dose]