

Illness Scenario 4 Refresher Course

This is a Teaching Scenario. Some flexibility in how it progresses is possible according to individual learner needs

History {initial candidate briefing prior to arrival of child}

A 14 year old girl is brought into the Emergency Department by ambulance. Her friend had found her unconscious at a party and called the ambulance. She was worried about her as she thought she had been drinking vodka shots but not sure. Says she's been sick at home for the last 3 days with a "stomach bug", but felt better at the party
Estimated weight 42 kg.

Initial impression {provide information as candidate assesses child and applies monitoring}

Snoring respirations with a RR of 30 and deep, laboured breathing. O₂ sat 89%. HR 160 with poor volume, BP 80/50. CRT, 5 sec.

Clinical Course {to be given to candidate as they progress}

BP, pulse volume and capillary refill improve after the first fluid bolus. She does not become fully alert but will respond to questioning after this treatment. She maintains her own airway and oxygenation improves.

For a more challenging scenario with experienced learner – the girl remains unresponsive and has cerebral oedema which requires ongoing management including arranging for intubation and ventilation.

BSL is 32 mmol/L

VBG; pH 7.03, PCO₂ 34 mmhg, PO₂ 40 mmhg, HCO₃ 10, Na 132, K 6 mmol/L.

INSTRUCTORS INFORMATION

Key Treatment Points

Airway & Breathing	Establish airway patency Airway opening manoeuvres High flow O ₂ via face mask commenced early Titrate O ₂ therapy to SpO ₂ 94-98% when stable	
Circulation	IV/IO access Blood tests: BSL, VBG, biochemistry Fluid bolus*	
Specific Therapy	Assess dehydration* Calculate deficit* Begin normal saline replacement +/- KCL* Insulin infusion * Monitor for cerebral oedema	

Diagnosis: Diabetes mellitus in keto-acidotic coma

Learning objectives

At the end of this session participants should be able to:

- Apply the structured approach to assessment, management, and diagnosis of coma
- Recall and classify the potential causes of decreased conscious state
- Apply the structured approach to assessment, management and diagnosis of diabetic keto-acidosis (DKA)
- Recall and apply the principles of management of DKA in their own practice

Potential Issues to be Discussed/Instructor resources

- Diff dx of coma – systemic vs intra-cranial, potential causes include DKA coma, shock, cerebral oedema, OD – alcohol, etc
- acute management of DKA
- acute management of cerebral oedema
- potential morbidity: cerebral oedema, hypokalaemia, aspiration, hypoglycemia
- minimizing risk of cerebral oedema – ensure slow reduction of glucose <5mmol/hour, avoid sudden changes in serum sodium (especially falling sodium and hyponatremia), and consider 0.05 U/kg/h insulin

*Notes

- The degree of dehydration is difficult to determine clinically in DKA. This may be compounded by peripheral shutdown due to acidosis. Severe DKA (venous pH<7.1 or HCO₃<5) is usually associated with severe dehydration
- As a general guide a 10ml/kg bolus of Normal Saline should be given if signs of shock are present, followed by 10ml/kg boluses , up to 40ml/kg, until the circulation is restored (normal pulse volume, BP and improved perfusion).
- Consider giving 10ml/kg Normal saline “rehydration bolus” over 1 hour to any child needing IV fluids, followed by slower rehydration
- Local guidelines should direct the preferred fluid and rate of rehydration. Rehydration over 48 hrs is recommended. Recent evidence suggests the role of fluid therapy in the development of cerebral oedema seems not to be as great as was previously thought.
- The time to commence the insulin infusion and dose advised is likely to vary between regions in Australia so familiarity with local guidelines and early discussion with the local endocrine team is important. Some examples are: [RCH guidelines](#) and [SA Health guidelines](#).
- In moderate-severe DKA there is a total body Potassium deficit, as Potassium moves out of the cells in exchange with H⁺ ions, and is subsequently lost in the polyuria. Thus the addition of potassium to rehydration fluid, as soon as the patient is known to be making urine and does not have hyperkalemia, is important.
- <https://dontforgetthebubbles.com/diabetic-ketoacidosis/>