APLS: Illness Scenario 7

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 4 year old boy is brought to Emergency Department by his parents. He has been unwell for 3 days with abdominal pain, and overnight he has had some bile-stained vomiting. His father tried to give him a drink but was unable to wake him.
Estimated weight 15 kg.

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

Unrousable. Pale child. Shallow breathing. Cold, mottled peripheries.

Additional History and Observations

RR 45, barely fogging the mask. HR 170 and CRT 7. Initial BP 61/42. O_2 sat 85% with poor trace. Moans to painful stimulus. The abdomen is rigid on palpation.

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

The child becomes unresponsive, apnoeic and pulseless (PEA). ROSC occurs after one dose of adrenaline and a fluid bolus.
Circulation improves after second fluid bolus.
VBG; pH 7.12, pCO_2 48 mmHg, pO_2 36 mmHg, HCO_3 16 mmol/L, Lactate 7.2 mmol/L
An urgent surgical opinion should be sought.

INSTRUCTORS INFORMATION

Key Treatment Points ☑

Airway	Establish airway patency High flow O_2 via face mask commenced early Titrate O_2 therapy to SpO_2 94-98% when stable Intubate or arrange intubation	
Breathing	BVM ventilation with 100% O_2	
Circulation	Uninterrupted BLS, PEA protocol IV/IO access Fluid bolus 10 ml/kg x2	
Specific Therapy	IV antibiotics Urgent surgical opinion ICU / Retrieval service consultation	

Diagnosis: Septic Shock secondary to perforated appendix, PEA Arrest

Learning objectives

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

- Apply the structured approach to management and diagnosis during cardiac arrest
- Perform BLS/ALS effectively and safely
- Recall and apply the ALS PEA algorithm in their own practice
- Recall and apply the acute management of severe sepsis in their own practice

Potential Issues to be Discussed

- PEA protocol, 4 Hs/Ts
- Septic shock management
- Sepsis assessment and management. Used with permission and endorsed by the Paediatric Improvement Collaborative

https://www.rch.org.au/clinicalguide/guideline_index/SEPSIS_assessment_and_management/

APLS: Illness Scenario 8

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 7 year old girl is brought into the Emergency Department by her mother who has noticed that she has become sleepy and has laboured breathing. 24 hours previously she had been seen at another hospital with abdominal pain. A diagnosis of constipation was made.
Estimated weight 25 kg.

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

Snoring respirations with a RR of 30 and deep, laboured breathing. O_2 sat 92%. HR 160 with poor volume, BP 80/50. CRT, 5. She responds to her mother's voice by briefly opening her eyes.

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

She is shocked and dehydrated.
BSL is 32 mmol/L
VBG; pH 7.03, PCO_2 30 mmhg, PO_2 40 mmhg, HCO_3 9.9, Na 132, K 6 mmol/L.

Pulse volume improves and capillary refill decreases after the first fluid bolus. She does not become fully alert but will respond to questioning after this treatment.

INSTRUCTORS INFORMATION

Key Treatment Points

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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 10 ml/kg*	
Specific Therapy	Assess dehydration* Calculate deficit* Begin normal saline replacement* 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 diabetic keto-acidosis (DKA)
- Recall and apply the principles of management of DKA in their own practice

Potential Issues to be Discussed/Instructor resources

- acute management of DKA
- 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 HCO_3<5) is usually associated with severe dehydration
- As a general guide a 20ml/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/