APLS: Cardiac Scenario 7

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

History {initial candidate briefing}

A 12-year-old male is admitted to the emergency department with a fractured femur after playing football.
He has no other injuries and is previously well.
To provide analgesia an initial dose of 1 microg/kg of I.V fentanyl is given, and a femoral nerve block is administered, using ropivacaine.
Shortly after performing the block the treating doctor is called urgently away. The child then has a brief grand mal convulsion and becomes apnoeic and pulseless. The nurse pushes the emergency bell and commences CPR. You are in ED and attend.
Estimated weight 40 kg.

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

Apnoeic and pulseless. Nurse performing CPR.

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

The child is in pulseless ventricular tachycardia (VT) which then changes to VF after the 1st shock. Following a 2nd shock, adrenaline and subsequent 2 minutes CPR, ROSC occurs with sinus rhythm 120/min and a palpable pulse. The child starts breathing and moving.

INSTRUCTORS INFORMATION

Key Treatment Points ☑

Airway & Breathing	Establish airway patency	
	BVM ventilation with 100% O_2	
	Consider LMA/intubation or arrange for intubation	
Circulation	Pulseless VT & VF protocol	
General Therapy	Uninterrupted BLS	
Specific therapy	Lipid rescue, Intralipid 20%, 1.5 mls/kg and infusion. Ideally mentioned but not required for ROSC in the simulation	

Diagnosis: Pulseless ventricular tachycardia, VF, Ropivacaine (LA) toxicity

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 VF/VT ALS algorithm in their own practice
- Recall and apply the 4 Hs/Ts in their own practice

Potential Issues to be Discussed

- Primary learning objectives are emphasis on VF/VT protocols
- Role of Lipid Rescue. If time for discussion. See RCH algorithm below

Extra equipment

- Algorithm available in Monash Paediatric Emergency Medication Book
- Intralipid 20% 500 mls (Laminated card)

Management of LA toxicity. RCH Guidelines

https://www.rch.org.au/clinicalguide/guideline_index/Local_anaesthetic_poisoning/
Modified for clarity. Algorithm available in Monash Paediatric Emergency Medication Book

BLS/ALS protocols if indicated
Immediately cease administration of the local anaesthetic. Call for help

Resuscitation

- Standard procedures and supportive care
- If there is evidence of cardiotoxicity, immediate BVM ventilation is necessary to prevent hypoxaemia, hypercarbia and acidosis. Prepare to intubate.
- Treat ventricular dysrhythmias with sodium bicarbonate (1–2 mmol/kg up to 100 mmol) IV; can use amiodarone; AVOID calcium channel blockers, beta blockers, local anaesthetics
- Treat seizures with benzodiazepines
- Treat hypotension with intravenous normal saline 10-20 mL/kg followed by inotropes if required; AVOID vasopressin
- Intravenous lipid emulsion (see below – antidotes)

Antidotes

1. Sodium bicarbonate for ventricular dysrhythmias secondary to sodium channel blockade (see above).
2. Intravenous lipid emulsion (intralipid 20%) in severe cardiovascular toxicity or cardiac arrest.

Precautions - hypersensitivity to egg yolk, soya or peanut protein

Administration of lipid emulsion therapy with 20% lipid emulsion

- Bolus 1.5 mL/kg IV over 1 minute
- Continuous infusion 0.25 mL/kg/minute. Wait 5 Minutes, then
  - Give a maximum of 2 repeat boluses for persistent cardiovascular collapse or deterioration (at least 5 minutes between boluses), AND
  - Double infusion to 0.5 mL/kg/minute
  - Continue infusion until stable and adequate circulation or maximum dose of lipid emulsion has been given (maximum cumulative dose is 12 mL/kg)

APLS: Cardiac 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}

You are called urgently to the resuscitation area in the Emergency department where a 6 year old has been brought in collapsed.
History of pyrexia and lethargy throughout the day.
Estimated weight 20 kg

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

Child is grey and floppy
As child is exposed a purpuric rash is evident on the limbs and trunk

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

The monitor shows a sinus rhythm, but the child is unresponsive, apnoeic and pulseless. The child remains in PEA until oxygenation is established, the 2nd dose of adrenaline given and fluid therapy is underway.

INSTRUCTORS INFORMATION

Key Treatment Points ☑

Airway & Breathing	Establish airway patency	
	BVM ventilation with 100% O_2	
	Consider LMA/intubation or arrange for intubation	
Circulation	PEA protocol	
	IV/IO access	
	Fluid bolus 10 mls/kg	
General Therapy	Uninterrupted BLS	

Diagnosis: Cardio-respiratory arrest – PEA. Circulatory collapse secondary to septic shock

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 4 Hs/Ts 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/