

FINAL SIMULATION 5

Simulation focus (Thromboembolism progressing to Cardiac Arrest)

Expected outcomes

Team Leader - to perform initial A to E assessment, direct team and lead care – taking over skills as and when appropriate. Recognise respiratory compromise sinus tachycardia and provide supportive treatment.

Team/More experienced candidate - Recognise the pulseless electrical activity cardiac arrest and manage according to non-shockable cardiac arrest algorithm. Recognise risk of thromboembolism and need for specialist management advice

For the candidate who needs a reassessment

This can be an uncomplicated cardiac arrest simulation used to reassess a candidate. In this case if a structured ABCDE assessment and KTP met, then get ROSC and sinus tachycardia after 2 min of CPR and BMV. The candidate should recognise potential for septic shock or cardiac pathology. 4Hs and 4Ts can be discussed.

History

Emergency staff:

Robyn is a 15-year-old with Down Syndrome who has recently completed induction chemotherapy for Acute Myeloid Leukaemia. Robyn is brought into ED by parents because of sudden onset breathlessness and chest pain.

Ward staff:

You are asked to see Robyn is a 15-year-old with Down Syndrome who has recently completed induction chemotherapy for Acute Myeloid Leukaemia. Robyn is complaining of breathlessness and chest pain which has come on suddenly.

Immediately apparent

Please ensure that the card with global overview is placed on the manikin for the start of the sim.

As you approach the child you notice she looks uncomfortable and is breathing fast.

Clinical course (to be given as the simulation progresses)

Assess	Features	Action	Key treatment points
A	Patent	Assess, give oxygen	
B	RR 35 SpO₂ 90% in air	Assess including auscultation and SpO ₂	High flow oxygen via face mask
C	HR 150, CRT 4, BP 95/70 Weak radial pulses are palpable. Sinus tachycardia. Pale with cool peripheries	Assess and recognise tachycardia Apply ECG/cardiac monitors	IV access Fluid bolus 250ml and reassess (Balanced crystalloid)
D	Alert, GCS 15 (E4V5M6). BM 4 , Pupils 5mm, reflexes brisk	Blood sugar	Blood sugar
E	Central venous catheter <i>in situ</i> left chest. Appears clammy & sweaty Appears in pain If assessed right calf is swollen, warm and tender	Request assessment of CVC site Give analgesia	Consider line sepsis IV antibiotics as per local protocol

Reassessment or weaker candidate or group Use the guidance in blue box below

Strong confident group or candidate Use the guidance in yellow box below

Reassessment candidate

This can be an uncomplicated cardiac scenario where the candidate is expected to direct an ABCDE primary survey, identify cardiorespiratory compromise and manage with supportive therapy. The candidate should recognise potential for septic shock or cardiac pathology.

The patient will progress to PEA cardiac arrest after primary survey with ROSC and sinus tachycardia after 2 min of CPR and BMV.

Team learning scenario

The wider team will be involved to manage cardiac arrest. During 4H4T thromboembolism should clearly be identified as cause of PEA with appropriate management. Team to work through 4H4T and discuss risks of fluid overload, anticoagulation, and thrombolysis for PE. Identify need for specialist advice in addition to critical care.

Diagnosis: pulmonary embolism secondary to DVT in child with multiple risk factors.

Reassessment (Team learning scenario KTPs in italics)

As candidate starts their reassessment the child becomes unresponsive.

Assess	Features	Action	Key treatment points
A	Patent only with airway opening manoeuvres	Assess, airway opening manoeuvres/OPA	<i>Open airway</i>
B	Apnoeic Unrecordable SpO₂	Assess including auscultation and SpO ₂ Monitor for signs of fluid overload	<i>BMV ventilation with oxygen</i>
C	Cardiac arrest Unrecordable BP	Assess. Monitor for signs of fluid overload (worsening tachycardia or shock)	<i>Uninterrupted CPR</i> <i>Call for arrest team</i> <i>Manage PEA arrest</i>
D	Unresponsive GCS 3. BM 4 Pupils 5mm, reflexes brisk	Assess Blood sugar	
E	Central venous catheter in situ left chest. Temp 36 Appears clammy and sweaty Appears in pain If assessed right calf is swollen, warm and tender	Seek specialist advice (cardiologist, haematologist and oncologist)	<i>Recognise possible thromboembolism</i> <i>Seek specialist advice</i>

Debrief

Using the learning conversation, discuss the technical and non-technical elements of the simulation.

- Discuss the value of working through 4H and 4T, recognising rare but possible risk factors in paediatric medicine.
- Discuss specialist advice for management of unusual conditions.

Assessment

This station makes up part of the continuous assessment process, therefore candidates need to know whether they are meeting the standard.

At the end give the opportunity for candidates to ask questions, answer these and then summarise the key points.

Final 5 - Global overview (to be placed on SIM manikin)

The child looks uncomfortable.

She is breathing fast.

Final 5 - Results Information

pH	7.34
pO ₂	9.0
pCO ₂	4.0
HCO ₃	16
BE	-4.0
Lactate	3.5

BM 8.4

A-a gradient (if requested) is normal: 8mmHg

ECG if requested is sinus tachycardia but otherwise normal.

Faculty helper information – Final 5

When candidate requests information regarding observations please give the following in “real-time” (e.g., wait for blood pressure to cycle, saturation trace to be achieved). If key treatment points are not undertaken, consider a “prompt” that would be visible in a child.

Assess	Observation	Example prompt
A	Patent	
B	RR 35 SpO₂ 90% in air	If no oxygen applied prompt that “sats trace is alarming and child looks pale”
C	HR 150, CRT 4, BP 95/70 Weak radial pulses are palpable. Sinus tachycardia. Pale with cool peripheries	If IO is requested state you have “not performed before/are unsure” If “bloods” prompt and ask “which ones” Emphasise patient complaining of chest pain if possible cardiovascular pathology not recognised.
D	Alert, GCS 15 (E4V5M6) . BM 4 , Pupils 5mm, reflexes brisk	
E	Central venous catheter <i>in situ</i> left chest. Appears clammy & sweaty Appears in pain If assessed right calf is swollen, warm and tender	Ensure candidate aware of central vascular line. Do not emphasise infection – “Site looks clean. I’m not worried it is infected” “Should we give something for the pain?”

Reassessment – Final 5

Assess	Observation	Example prompt
A	Patent only with airway opening manouevres	
B	Apnoeic Unrecordable SpO₂	As reassessment begins vocalise that patient does not appear to be breathing and isn’t talking any more. “Should we reassess?” “From the top?”
C	Cardiac arrest Unrecordable BP	If not done by team leader by 2 nd cycle, prompt for 4H4Ts: “What do you think has caused them to arrest?” “Are we treating everything we can?”
D	Unresponsive GCS 3. BM 4 Pupils 5mm, reflexes brisk	“They’re not making any sounds anymore”
E	Central venous catheter <i>in situ</i> left chest. Temp 36 Appears clammy and sweaty Appears in pain If assessed right calf is swollen, warm and tender	If not already noted, highlight possible DVT in calf. “I was getting ready for an IO and I’ve noticed that this right leg looks swollen and red”

Algorithms:

Cardiac arrest expanded
PEA/Asystole