

CARDIAC SIMULATION 2

Simulation focus - Asystole following choking (BLS child - skill)

Expected outcomes

Team Leader - Perform initial ABCDE assessment, direct team and lead care – taking over skills as and when appropriate. Identify the child is in asystole, initiate BLS and appropriate initial therapies (adrenaline and identify/treat reversible causes). Identify need for and summon cardiac arrest team.

Team/More experienced candidate - Recognise the presence of tension pneumothorax and the need for decompression. Discuss with team or in the debrief. (If no candidate familiar with this then management to be undertaken as group discussion in the debrief).

Assessment

This simulation allows for practise and assessment of child BLS.

History

Emergency staff

Pre-alert from the paramedics:
Anaya is a 3-year-old girl who was eating a grape and started choking and collapsed. The grape came out after back slaps from parent, but she is not breathing.

Ward staff

Anaya is a 3-year-old girl who was admitted to hospital for elective surgery to her foot. She was eating a grape in bed, started choking and collapsed. Her parent slapped her back and the grape came out, but she is not breathing.

Immediately apparent

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

As you approach the child you notice she looks pale, grey, cyanosed and lifeless.

Clinical course (to be given as the simulation progresses)

ROSC occurs once tension pneumothorax is recognised and treated, with at least one full cycle of ALS.

Assess	Features	Action	Key treatment points
Basic Life Support phase			
A	No response to stimuli Apnoeic (U on AVPU)	Assess, airway opening manoeuvres, ensures oxygen running	Asks for help/arrest team Open airway
B	Apnoeic , no sats trace or respiratory effort	Assess – look, listen, feel (and signs of life check)	Recognises arrest and ensures 222 call put out 5 rescue breaths via BMV
C	Lifeless (pulseless) Pale, grey, cyanosed and has cool peripheries	Starts CPR	Commences CPR in 15:2 ratio
Advanced Life Support – 1st cycle, nurse arrives with arrest trolley and help			
Assess rhythm	Asystole once pads applied	Ensure application of defib pads	Recognises non-shockable path of algorithm
Basic life support	No signs of life	Ongoing CPR in 15:2 ratio Advanced airways may be considered	Ensures ongoing adequate CPR and ventilation.

		<i>The leader should move away from performing interventions and delegate as appropriate</i>	
Delivers drugs	IV access present	Recognises need for adrenaline administration	Ensures IV adrenaline administered 1.4ml 1:10000
Works systematically through 4 Hs and 4 Ts			
Advanced Life Support – 2nd cycle			
Assess rhythm	Asystole		Recognises non-shockable path of algorithm
Basic life support	No signs of life Difficulty bagging	Ongoing CPR in 15:2 ratio Advanced airways may be considered	Ensures ongoing adequate CPR and ventilation.
Delivers drugs	IV access present		
Works systematically through 4 Hs and 4 Ts - Tension pneumothorax recognised and treated (in this cycle or next)			
Advanced Life Support – 3rd cycle			
Assess rhythm	Asystole		Recognises non-shockable path of algorithm
Basic life support	No signs of life	Ongoing CPR in 15:2 ratio Advanced airways may be considered	Ensures ongoing adequate CPR and ventilation.
Delivers drugs	IV access present	Recognises need for adrenaline administration	Ensures IV adrenaline administered 1.4ml 1:10000
Works systematically through 4 Hs and 4 Ts			
NB: Patient will remain in asystole until tension pneumothorax recognised and decompressed. ROSC will be gained after this.			

Candidates should work their way down the list of reversible causes of arrest	
Hyperkalaemia/Hypoglycaemia etc	Gas requested: K 5.2, Glucose 4.5, Na 135 Ca 1.14
Hypoxia	Ensures adequacy of ventilation on high flow oxygen
Hypothermia	Temp 36
Hypovolaemia	No evidence however may administer fluid bolus
Tamponade Thrombus Toxins	No history suggestive of this
Tension pneumothorax	Reduced air entry on the right side, hyperresonance and tracheal deviation to the left

Reassessment

After a full cycle of CPR post decompression, patient begins to make occasional spontaneous respiratory effort. Monitor will show sinus rhythm if a rhythm check is performed.

Assess	Features	Action	Key treatment points
A	Requires ongoing airway support	Assess Consider oral airway or intubation	Recognises need for airway support (if not established)
B	Irregular respiratory effort, sats trace present – SpO₂ 92% reduced air entry right side with hyperresonance but improved	Assess including auscultation and SpO ₂ Recognises need for chest	High flow oxygen and ongoing ventilation Recognises need for chest drain

	since decompression. Trachea central.	chest drain	
C	Pale but improved colour, cool peripheries, pulses present, HS normal HR 130, BP 90/47	Requests ECG Requests bloods	Recognises ROSC
D	P on AVPU, BM 4 Pupils size 3	Assess Blood sugar	Request senior/PICU review
E	Temp 36.2 , pale, no rashes		

Once ROSC occurs, requires ongoing respiratory support (via ETT), and drain insertion. BP is stable (consider fluids/inotropes). Needs PICU support.

NB	<ul style="list-style-type: none"> • Discussion about the choking algorithm, and the difference between and awake/alive infant or child and one who has no signs of life. • Discussion about tension pneumothorax – needle thoracocentesis and thoracostomy
-----------	---

Debrief

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

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.

Algorithms

Asystole and pulseless electrical activity
Paediatric foreign body airway obstruction

Props to print and laminate

Cardiac 2 - Global overview (to be placed on SIM manikin)

The child looks pale, grey and cyanosed.

They appear lifeless.

Cardiac 2 - Results Information:

Venous Blood Gas

pH	7.15
PO ₂	5.8
pCO ₂	8.2
HCO ₃ ⁻	13
BE	-11
Na	135
K	5.2
Ca (ionised)	1.14
Lactate	4.8

BM 4.5

Faculty helper information – Cardiac 2

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	Apnoeic (U on AVPU) Patent when assessed	“Do you need any help?”
B	Apnoeic , no sats trace or respiratory effort	If doesn't open airway and look, listen, feel then prompt that child looks pale and lifeless.
C	Lifeless (pulseless) Pale, grey, cyanosed and has cool peripheries	“do you want any equipment or help” “do you want us to restart/continue BLS” “do you need the algorithm”

The child will remain in asystolic arrest until the tension pneumothorax is recognised and decompressed and a further full cycle of CPR has been performed.

Assess	Observation	Example prompt
Assess rhythm	Asystole once pads applied	If they ask you to defibrillate, “I don't think it's shockable?”
Basic life support	Patient remains unresponsive with no respiratory effort or spontaneous movement	If the chest has not been examined by the time of the second cycle: “I don't think the chest movement looks normal? it's not moving much on the right” If asked the patient is “difficult to bag”
Delivers drugs	IV access present	“do you need the algorithm?” “are there any drugs you need?”

Candidates should work their way down the list of reversible causes of arrest

Hyperkalaemia/Hypoglycaemia etc	Gas requested: K 5.2, Glucose 4.5, Na 135 Ca 1.14
Hypoxia	Ensures adequacy of ventilation on high flow oxygen
Hypothermia	Temp 36
Hypovolaemia	No evidence however may administer fluid bolus
Tamponade Thrombus Toxins	No history suggestive of these
Tension pneumothorax	Reduced air entry on the right side, hyperresonance and tracheal deviation to the left

Reassessment

Assess	Observation	Example prompt
A	Requires ongoing airway support	“What are you going to do with the airway?”
B	Irregular respiratory effort, sats trace present SpO₂ 92% reduced air entry right side with hyperresonance but improved since decompression. Trachea central.	“Is there anything else we need to do for the pneumothorax?”
C	Pale but improved colour, cool peripheries, pulses present, HS normal HR 130, BP 90/47	“I can feel a pulse”
D	P on AVPU, BM 4 Pupils size 3	“Do you want me to call a senior?”
E	Temp 36.2 , pale, no rashes	