

TRAUMA SIMULATION 3

Simulation focus – Chest injury (tension pneumothorax management – demo/discussion)

Expected outcomes

Team Leader - Perform initial ABCDE assessment, direct team and lead care. Should do a 'full' assessment at B.

Team/More experienced candidate - Recognise and treat tension pneumothorax. Discuss common 'B' problems in trauma.

Assessment

This simulation allows for demonstration/discussion around pneumothorax management (thoracostomy/needle thoracocentesis) and optional candidate practise.

History

Emergency staff

Pre-alert for paediatric trauma:
Kai, a 10-year-old, who was climbing a tree and fell 10-15ft onto rocks in a shallow river. Being brought in by a non-paramedic crew who say he is awake, breathing and cold. He has an injury to the right side of his chest and is in considerable pain.

Ward staff

Paediatric trauma team call to ED - pre-alert received for a paediatric trauma:
Kai, a 10-year-old, who was climbing a tree and fell 10-15ft onto rocks in a shallow river. Being brought in by a non-paramedic crew who say he is awake, breathing and cold. He has an injury to the right side of his chest and is in considerable pain.

Immediately apparent

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

The child arrives wrapped in a thermal blanket crying noisily and rapidly. As you approach the child you notice he looks pale, is breathing fast and holding his right side.

Clinical course (to be given as the simulation progresses)

Assess	Features	Action	Key treatment points
<C>	There is some bleeding on the right side of the chest.	Assess	
A	Patent	Assess patency	MILS
B	Rapid shallow breathing visible RR 42, SpO₂ 90% on air (poor trace) Extensive bruising to right side of chest with some bleeding and a crackling sensation on palpation. Reduced air entry on the right. Left chest examines entirely normally. Trachea is central with no engorged vessels.	Assess chest including inspection, palpation, expansion and auscultation Apply SpO ₂ and assess resp rate Recognise significant chest injury	Apply 15l oxygen via non-rebreathe face mask - SpO ₂ improve to 95% Consider significant chest injury Organise further investigation

C	Pale, cold peripheries, palpable radial pulse. HR 100, CRT 5s, BP 90/68 No sign of significant external bleeding. Abdomen is SNT. No long bone injuries	Assess circulation including applying monitoring Recognise signs of possible shock	Immediate IV/IO access Blood tests (inc VBG, X-Match) Activate Massive Haemorrhage Protocol Consider fluid bolus
D	Fully alert and answering questions GCS 15, BM 5	Assess level of consciousness	Assess GCS Blood sugar
E	Complaining of chest pain Shivering: tympenic temperature 33.2 Bruising and swelling to right elbow	Acknowledge pain, arrange analgesia Recognise hypothermia Prioritise treatments	Ask for appropriate analgesia Ask for appropriate passive re-warming

Reassessment

As Candidate starts their reassessment the child becomes distressed and agitated, breathing rate increases and the child appears very unwell.

Assess	Features	Action	Key treatment points
A	Patent	Assess patency	
B	Rapid breathing, RR 52 SpO₂ 85% on 15L Right side of the chest is not moving Right side of the chest is silent Right side is hyper-resonant Left chest still examines normally Veins in the neck appear engorged	Assess including auscultation	Continue oxygen Recognise Tension Pneumothorax - ask for appropriate treatment
C	Very pale, cold peripheries, thready radial pulse HR 144, BP not recording	Assess, understanding that BP machine may struggle to get a measurement	Recognise worsening shock Give bolus of packed RBC
D	Agitated and distressed, acting purposefully but not obeying commands GCS 13 (E4M5V4)	Assess GCS	Recognise dropping GCS
E	Temp 34.1	Assess temperature	
NB	<ul style="list-style-type: none"> This simulation is designed to allow candidates to do a full 'B' assessment and discuss common 'B' problems in trauma. Candidate should be prompted towards patient's difficulty in breathing if not recognised, and towards finger thoracostomy if unsure how to manage tension pneumothorax. Choice of treatment can be discussed in Learning Conversation - for traumatic tension pneumothorax, finger thoracostomy is recommended due to high air leak/presence of haemothorax. For infant or small child forceps and clamps are needed - if equipment not readily available in infant/small child needle decompression may still need to occur to buy time. 		

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.

Trauma 3 - Global overview (to be placed on SIM manikin)

The child is wrapped in a thermal blanket crying noisily and rapidly.

He looks pale, is breathing fast.

He is holding his right side.

Trauma 3 - Results Information:

Venous blood gas

pH	7.29
pCO ₂	3.1
pO ₂	6.9
HCO ₃	21.1
BE	-4.6
Lactate	3.1

Glucose 4.8

Faculty helper Information – Trauma 3

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
<c>	There is some bleeding on the right side of the chest.	Assess
A	Patent	
B	Rapid shallow breathing visible RR 42, SpO₂ 90% on air (poor trace) Extensive bruising to right side of chest with some bleeding and a crackling sensation on palpation. Reduced air entry on the right. Left chest examines entirely normally. Trachea is central with no engorged vessels	If no oxygen applied “He seems very short of breath and the monitor is alarming.”
C	Pale, cold peripheries, palpable radial pulse. HR 100, CRT 5s, BP 90/68 No sign of significant external bleeding. Abdomen is SNT. No long bone injuries	“He looks pale.”
D	Fully alert and answering questions GCS 15, BM 5	
E	Complaining of chest pain Shivering: tympanic temperature 33.2 Bruising and swelling to right elbow	If not recognised “His skin is freezing and he is shivering.”

Reassessment

Assess	Observation	Example prompt
A	Patent	
B	Rapid breathing, RR 52 SpO₂ 85% on 15L Right side of the chest is not moving Right side of the chest is silent Right side is hyper-resonant Left chest still examines normally Veins in the neck appear engorged	If not recognised “His sats are dropping and he is breathing rapidly.”
C	Very pale, cold peripheries, thready radial pulse HR 144, BP not recording	If asked say “it keeps cycling but is struggling to get a reading”
D	Agitated and distressed, acting purposefully but not obeying commands GCS 13 (E4M5V4)	If not recognised “He’s getting worse, he’s not responding properly.”
E	Temp 34.1	

Algorithms:

Massive haemorrhage protocol