

TRAUMA SIMULATION 1

Simulation focus – Brain injury (MILS and 20° tilt - skill)

Expected outcomes

Team Leader – Guides the faculty helper through the initial ABCDE assessment (primary survey), direct team and lead care – taking over any skills as necessary. Identify that the child has suffered a significant head injury and that there is a high possibility of non-accidental injury. The candidate should identify that the airway is at risk and request for early intubation to happen.

Team/More experienced candidate - Recognise that there are signs of raised intracranial pressure and that the child may benefit from hypertonic saline whilst awaiting transfer to a neurosurgical unit.

Assessment

This simulation allows for practise and assessment of MILS and 20° tilt.

History

Emergency staff

1-year-old named Zac is brought in, in parent's arms with a history of being found at the bottom of the stairs, possibly having fallen down a whole flight of stairs.

Ward staff

1-year-old named Zac is brought back to ward following weekend leave. He is in his parent's arms who say he was found at the bottom of the stairs 40 min ago, possibly having fallen down a whole flight of stairs. You can see the child is not responding.

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 he looks pale, is breathing irregularly and the left side of his head is swollen.

Clinical course (to be given as the simulation progresses)

Assess	Features	Action	Key treatment points
<c>	No signs of external bleeding	Assess	
A	The child is snoring	MILS Assess Give oxygen	MILS Appropriate airway opening (jaw thrust or OPA)
B	RR 26 with deep breaths. Equal air entry, no additional noises. SpO₂ 92% (no oxygen) SpO₂ 98% (with oxygen)	Assess including auscultation and SpO ₂ . Recognise respiratory rate on low side but not due to airway or breathing problem	High flow oxygen via face mask Consider ventilation
C	HR 110, CRT 2, BP 115/82 Normal colour	Assess and recognise heart rate is low side of normal and blood pressure is raised	Immediate IV/IO access Bloods (BM, ketones and VBG)
D	Unresponsive GCS 4 (E1V1M2) BM 4 Pupils 4mm sluggish, reflexes brisk glycemie 72	Recognise lowered level of consciousness and escalate concern Assess blood sugar	Ask for further assistance – need for airway management to facilitate CT head Blood sugar

E	Well perfused. Bruises noted to both upper arms, swelling to left side head, poor nappy hygiene. On tilting few bruises to posterior chest wall noted.	Recognise that bruising to upper arms and back is not normal in this age group. Appreciate that vomiting child will require a "tilt"	Co-ordinate safe 'tilt' to examine the back and manage the airway when vomiting. Raise concerns of NAI
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Reassessment

As candidate starts to initiate the tilt the child starts to vomit. The candidate needs to co-ordinate a tilt to safely manage the airway and to examine the back.

Assess	Features	Action	Key treatment points
A	Now clear of vomit. Still snoring without OP.	MILS Assess Give oxygen	Escalate airway management to ETT (request if not airway trained)
B	RR 22 with deep breaths. Equal AE, few crackles. SpO₂ 88% (no oxygen) 92% (with oxygen)	Assess including auscultation and SpO ₂ . Recognise crackles are likely due to aspiration and that RR is low for age.	Escalate airway management to ETT (request if not airway trained and talk through)
C	HR 96, CRT 2, BP 120/88. Normal colour	Recognise circulation numbers are abnormal and may be linked to intracranial haemorrhage	Vocalise need for CT head to be performed
D	Unresponsive, GCS 4 (E1V1M2). BM 4 Pupils: right 4mm sluggish, left 7mm fixed. glycemie 72 mg/dL	Repeat BM Recognise signs of uncal herniation	Consider hypertonic saline
E	Well perfused. Bruises as previous		

NB	<ul style="list-style-type: none"> Although failure to recognise that there is impending herniation would be detrimental to the child and not prompt the need for urgent intubation and CT head, the assistant can mention that the heart rate is slow and the breathing pattern irregular. Once the initial ABCDE has been conducted, if the candidate does not undertake a "tilt" then helper prompts that the child is retching to prompt safe tilt to be conducted.
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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 1 - Global overview (to be placed on SIM manikin)

The child looks pale.

He is breathing irregularly.

The left side of his head is swollen.

Faculty helper information – Trauma 1

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>	No signs of external bleeding	Assess
A	The child is snoring	If no MILS “What was the mechanism of injury?” If airway not opened “Zac is still snoring and making a funny noise”
B	RR 26 with deep breaths. Equal air entry, no additional noises. SpO₂ 92% (no oxygen) SpO₂ 98% (with oxygen)	If no oxygen is applied “Saturation probe is alarming”
C	HR 110, CRT 2, BP 115/82 Normal colour	If no IV access “Do you want a cannula now?” If no bloods “Do you want any blood tests done?”
D	Unresponsive GCS 4 (E1V1M2) BM 4 glycemie 72 mg/dL Pupils 4mm sluggish, reflexes brisk	
E	Well perfused. Bruises noted to both upper arms, swelling to left side head, poor nappy hygiene. On tilting few bruises to posterior chest wall noted.	If not exposed “He’s got some bruises on his arms” If no tilt “I’m a bit worried he’s retching and going to be sick”

Reassessment

Assess	Observation	Example prompt
A	Now clear of vomit. Still snoring without OP.	“Zac is making funny noises again”
B	RR 22 with deep breaths. Equal AE, few crackles. SpO₂ 88% (no oxygen) SpO₂ 92% (with oxygen)	“The breathing looks a bit odd to me”
C	HR 96, CRT 2, BP 120/88. Normal colour	“What’s made the heart rate drop?”
D	Unresponsive, GCS 4 (E1V1M2). Pupils: right 4mm sluggish, left 7mm fixed. BM 4 glycemie 72 mg/dL	“Is this what is called a blown pupil?” “Can we give the baby anything to help?” “Should we repeat the BM now?”
E	Well perfused. Bruises as previous	“Would there be lots of bruising already?”

Algorithms:

Traumatic Brain Injury

APLS: Emergency induction checklist

EMERGENCY INDUCTION CHECKLIST (PAEDIATRIC)

Prepare for difficulty

- Are any specific complications anticipated?
 - previous difficult airway
 - rapid desaturation
 - circulatory collapse / need for ECMO
- If the airway is difficult, could we wake the patient up?
- If the intubation is difficult, how will you maintain oxygenation? (facemask/supraglottic airway and adjuncts, front of neck access)
- Is the relevant equipment, including alternative airway, immediately available?

Prepare equipment

- What monitoring is applied?
 - ECG
 - Blood pressure (cycling)
 - Saturations
 - Capnography
- What equipment is checked and available?
 - Self-inflating bag/T-piece
 - Facemask and adjuncts
 - Suction
 - Correctly sized ET tubes - cuffed or uncuffed?
 - 2 laryngoscopes +/- CMAC
 - Stylet/Bougie
- Do you have all the drugs required, including vasopressors (dilute adrenaline) and IV fluid boluses?

Prepare patient

- Is pre-oxygenation optimal?
- Is the patient's position optimal?
- NG tube considered?
- Is iv access adequate?
- Can the patient's condition be optimised any further before intubation?
- How will anaesthesia be maintained after induction?

Prepare team

- Who is ...?
 - Team leader
 - First Intubator
 - Second Intubator
 - Cricoid Manipulation
 - Intubator's Assistant
 - Drugs
 - MILS (if indicated) (Manual [InLine](#) Stabilisation)
- How do we contact further help if required?



This Checklist is not intended to be a comprehensive guide to preparation for induction