



Queensland Trauma Education

**PRE-HOSPITAL AND RETRIEVAL**

# Multi-trauma

Immersive scenario

Facilitator resource kit

## Queensland Trauma Education

The resources developed for Queensland Trauma Education are designed for use in any Queensland Health facility that cares for patients who have been injured as a result of trauma. Each resource can be modified by the facilitator and scaled to the learners needs as well as the environment in which the education is being delivered, from tertiary to rural and remote facilities.

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### Queensland Trauma Education

#### Pre-Hospital and Retrieval – Multi-trauma: Immersive scenario – Facilitator resource kit Version 2.0

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## About this training resource kit

This resource kit provides pre-hospital clinicians with the skills to assess and manage a patient with blunt chest and extremity injury following trauma.

### National Safety and Quality Health Service (NSQHS) Standards



### Target audience

Pre-hospital / Retrieval / Rural and Remote clinicians.

### Duration

45-60 minutes.

### Group size

Suited to small group participation.

### Learning objectives

By the end of this session the participant will be able to:

- Understand the importance of pre-hospital limb reduction and splinting.
- Demonstrate understanding of the priorities in managing blunt chest trauma in the awake patient.
- Consider the impact of flight physiology on the trauma patient.

### Facilitation guide

1. Use the facilitation guide and resources to deliver the learning objectives outlined.

### Supporting resources (in Printable Resources)

1. Pre-simulation briefing poster
2. Supporting documents
3. EFAST images- RUQ/LUQ/Subxiphoid and pelvic normal
4. L lung EFAST normal
5. R lung EFAST seashore sign

## Simulation event

### This section contains the following:

1. Immersive scenario
2. Resource requirements
3. Handover card
4. Scenario progression
  - a. State 1
  - b. State 2
  - c. State 3
  - d. State 4
5. Debriefing guide

### Immersive scenario

Type	Immersive scenario
Target audience	Clinicians involved in prehospital care.
Overview	Competing priorities requiring assessment and management in the pre-hospital setting. Consideration for concurrent management of the orthopaedic and chest trauma in addition to the impact of flight on trauma physiology.
Learning objectives	<ul style="list-style-type: none"><li>• Understand the importance of pre-hospital limb reduction and splinting.</li><li>• Demonstrate understanding of the priorities in managing blunt chest trauma in the awake patient.</li><li>• Consider the impact of flight physiology on the trauma patient.</li></ul>
Duration	45 minutes, including debrief.

## Resource requirements

### Physical resources

<b>Room setup</b>	Outside environment
<b>Simulator/s</b>	3G or ALS Manikin
<b>Simulator set up</b>	<ul style="list-style-type: none"><li>• Street clothes lying supine</li><li>• Moulage: normal patient, moulage for pulseless R arm with compound fractures, cervical collar</li><li>• iSimulate for patient monitor</li></ul>
<b>Clinical equipment</b>	<ul style="list-style-type: none"><li>• QAS equipment</li><li>• Intubation medications and equipment</li><li>• Finger thoracostomy set up +/- ICC (Intercostal Catheter) and drain</li><li>• Pelvic binder, limb splint equipment</li><li>• US machine.</li></ul>
<b>Access</b>	2 x PIVC setup with 'No IV' stickers in place
<b>Other</b>	Relevant paperwork Radiological resources

### Human resources

<b>Faculty</b>	2x facilitators (Dr/Nurse/Paramedic with debriefing experience) to take on roles of scenario commander and primary debrief
<b>Simulation coordinators</b>	<ul style="list-style-type: none"><li>• Facilitators to control simulated monitor</li><li>• 1x for manikin set up and control</li></ul>
<b>Confederates</b>	Ambulance Officer
<b>Other</b>	Team composition as appropriate for environment

## Handover card

Handover from ambulance officer

This is Brian. He was reportedly witnessed to crash into a tree on his motorbike. He was then thrown about 10 meters from the bike.

Witnesses pulled over and found him dazed but awake. We arrived on scene about 7 minutes later.

On our arrival he was confused and dazed. Notably tachypnoeic and hypoxic- Sats 89% before we put O2 on him. First blood pressure was 90mmHg and HR 110.

He's still on the ground but we're just getting an IV into him.

The helicopter is en-route and about 20 minutes away. We don't know anything else about him yet.

## Scenario progression

STATE 1: INITIAL ASSESSMENT				
Vital signs		Script	Details	Expected actions
ECG	ST	<b>Brian</b> <i>(Moaning)</i> 'Oh, my chest hurts' 'I can't breathe'	<b>Primary survey results</b> <b>A:</b> Intact, cervical collar <b>B:</b> Decreased BS R, bilateral chest wall tenderness, R side crepitus and subcutaneous emphysema in axilla <b>C:</b> Poorly perfused peripherally, HS dual, tachycardic <b>D:</b> Confused to place, unable to move R arm – obvious compound injuries <b>E:</b> Afebrile	<b>Commence primary survey</b> <input type="checkbox"/> Identify respiratory distress and chest injury  <b>Management</b> <input type="checkbox"/> Increase O2 delivery <input type="checkbox"/> Provide analgesia <input type="checkbox"/> Plan for management of priorities
HR	110			
SpO <sub>2</sub>	91% 10L NRB			
BP/ART	90/60			
RR	40			
Temp	36.9			
BGL	6			
GCS	14 (E4V4M6)			

STATE 2: ONGOING MANAGEMENT / SECONDARY ASSESSMENT				
Vital signs		Script	Details	Expected actions
ECG	ST	<b>Brian</b> <i>(Less responsive)</i> <i>(Mumbling words only)</i> <i>(Localizing to pain)</i>	<b>Secondary survey results</b> <ul style="list-style-type: none"> <li>No external evidence of facial or head injury</li> <li>Abdo soft, non-tender</li> <li>Pelvis aligned, no tenderness</li> <li>Right upper limb (RUL) deformity, open wounds, no palpable pulse, hand pale and cold</li> </ul> <b>Results EFAST:</b> <ul style="list-style-type: none"> <li>RUQ/LUQ/subxiphoid/pelvis: NAD</li> <li>R lung: no pleural sliding</li> <li>L lung US: normal</li> </ul>	<b>Secondary survey</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Head to toe assessment</li> <li><input type="checkbox"/> Identify compromised R upper limb</li> </ul> <b>Investigations</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> EFAST</li> </ul> <b>Management</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Pelvic binder application</li> </ul>
HR	120			
SpO <sub>2</sub>	94% 15L NRB			
BP/ART	90/60			
RR	38			
Temp	36.9			
BGL	6			
GCS	11 (E3V3M5)			



STATE 3: AIRWAY MANAGEMENT				
Vital signs		Script	Details	Expected actions
ECG	ST	<b>Confederate</b> Prompt team of respiratory distress - consider options for delivery of oxygen/airway protection	<ul style="list-style-type: none"> <li>Recognition of deterioration in conscious state requiring airway support.</li> <li>Consider chest decompression vs intubation timing.</li> <li>Perform other procedures in timely fashion- fracture reduction/ splinting and resuscitation.</li> </ul>	<b>Assessment</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Identify shock state</li> <li><input type="checkbox"/> Recognise competing priorities: improving oxygenation, chest decompression, volume expansion and fracture reduction</li> </ul> <b>Management</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Consider intubation for oxygenation/ventilation- protective lung strategy</li> <li><input type="checkbox"/> Sedative agents- reduction in dose to hemodynamic (HD) state</li> <li><input type="checkbox"/> Finger thoracostomy on R- ICC placed if not intubated</li> <li><input type="checkbox"/> Sedation dose appropriate to HD state</li> <li><input type="checkbox"/> Commence blood transfusion</li> <li><input type="checkbox"/> PRBC, calcium, FFP, TXA</li> <li><input type="checkbox"/> Reduce and splint RUL, wound care management</li> <li><input type="checkbox"/> Liaise with Retrieval Services Queensland for retrieval</li> </ul>
HR	120			
SpO <sub>2</sub>	93% NRB			
BP/ART	100/80			
RR	35			
Temp	36.9			
BGL	6			
GCS	11 (E3V3M5)			

STATE 4: PREPARING FOR RETRIEVAL				
Vital signs		Script	Details	Expected actions
ECG			<p>Improvement in vital signs when chest decompression performed.</p> <p>Haemodynamic state improves post blood resuscitation.</p> <p>Perfusion improves with limb reduction and splinting.</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Review primary and secondary survey</li> <li><input type="checkbox"/> Confirm improved neurovascular status in RUL post reduction and splinting</li> <li><input type="checkbox"/> Consider the following prior to the flight:               <ol style="list-style-type: none"> <li>1. adequate IV access points</li> <li>2. access to chest- R ICC vs re-exploration if deteriorates</li> <li>3. analgesia</li> <li>4. ongoing resuscitation plan</li> <li>5. documentation and notification to receiving hospital</li> </ol> </li> </ul>
HR				
SpO <sub>2</sub>				
BP/ART				
RR				
Temp				
BGL				
GCS				

## Debriefing guide

### Scenario objectives

1. Understand the importance of pre-hospital limb reduction and splinting
2. Demonstrate understanding of the priorities in managing blunt chest trauma in the awake patient
3. Consider the impact of flight physiology on the trauma patient

### Example questions

#### Exploring diagnosis

- Describe the assessment of this patient how it differs in the pre-hospital environment?
- What investigations can be performed in the prehospital setting?
- How is shock determined in the field? Does this differ from 'in hospital'?

#### Discussing management

- What is the significance of flight physiology and Boyles Law?
- How does this impact on decision making for the intubation and chest decompression timing?
- Is this different for road-based retrieval?
- At what stage should the at-risk limb be reduced/splinted?
- What strategy was used to manage the patient's respiratory distress?
- What are 'value adding interventions'?

#### Discussing teamwork / crisis resource management

- How do you prioritise your team in clinical assessment of the trauma patient?
- What roles are allocated?
- What strategies do you utilise to encourage all team members to voice their concerns/recognition of the deteriorating patient?
- How does the communication pathway occur with on ground and aeromedical teams occur?
- How do you balance 'stay and play' with 'scoop and run' principles?

#### Key moments

- Decision process for respiratory support- intubation vs chest decompression
- Timing for limb fracture vs chest management interventions

## Acronyms and abbreviations

Term	Definition
FFP	Fresh frozen plasma
ICC	Intercostal catheter
PRBC	Packed red blood cells
RSQ	Retrieval Services Queensland
RUL	Right upper limb
TXA	Tranexamic acid
RUQ	Right upper quadrant
EFAST	Extended focused assessment with sonography in trauma

## References

1. Hannon, L., St Clair, T., Smith, K., Fitzgerald, M., Mitra, B., Olaussen, A., Moloney, J., Braitberg, G., Judson, R., Teague, W., Quinn, N., Kim, Y. & Bernard S. (2020). Finger thoracostomy in patients with chest trauma performed by paramedics on a helicopter emergency medical service. *Emergency Medicine Australasia*, 32: 650-656. <https://bit.ly/3BgMtgp>
2. Kaserer, A., Stein, P., Simmen, H-P., Spahn, D. & Neuhaus, V. (2017). Failure rate of prehospital chest decompression after severe thoracic trauma. *Am J Emerg Med*. 35(3): 469-474. <https://doi.org/10.1016/j.ajem.2016.11.057>

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