



Queensland  
Trauma Education

**SPINAL TRAUMA**

# Cervical Spine Trauma

## Immersive Scenario

Facilitator resource kit

**CSDS**



Clinical Skills Development Service



## 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

#### Neck and Spinal Trauma – Cervical spine trauma: Immersive scenario – Facilitator resource kit Version 2.0

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## About this training resource kit

This resource kit provides the learner with the skills and knowledge to manage a patient with a suspected spinal cord injury.

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



### Target audience

Emergency department medical and nursing clinicians.

### Duration

45 minutes, including debrief.

### Group size

4-6 participants (or team composition applicable to local area).

### Learning objectives

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

- Identify a clinical syndrome associated with cervical spine injury
- Perform emergent management of complications from cervical spinal cord injury

### Facilitation guide

1. Facilitator to discuss the pre-simulation briefing and deliver the immersive scenario on cervical spine trauma.
2. Utilise the supporting documents to maximise the learning throughout immersive scenario.
3. Utilise the debriefing guide to evaluate participant performance and provide feedback.

### Supporting resources

1. Pre-simulation briefing poster
2. Venous Blood Gas (VBG)
3. Chest Xray (Normal)
4. Pelvis Xray (Normal)
5. CT Cervical Spine Lateral (Abnormal: Unstable C6 flexion tear drop type fracture. 5mm fracture retropulsion with narrowing of the cervical canal).

## 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
5. Debriefing guide

### Immersive scenario

<b>Type</b>	Immersive scenario
<b>Target audience</b>	Emergency medical and nursing clinicians
<b>Overview</b>	Spinal cord injury following trauma with evidence of ventilatory and haemodynamic involvement.
<b>Learning objectives</b>	<ul style="list-style-type: none"><li>• Recognition of clinical features consistent with spinal cord injury following trauma.</li><li>• Commence appropriate initial management for ventilatory and haemodynamic support.</li></ul>
<b>Duration</b>	45 minutes, including debrief

## Resource requirements

### Physical resources

<b>Room setup</b>	Resuscitation bay
<b>Simulator/s</b>	3G SimMan or ALS manikin
<b>Simulator set up</b>	<ul style="list-style-type: none"> <li>• Street clothes lying supine</li> <li>• Moulage: normal patient</li> <li>• Cervical collar</li> </ul>
<b>Clinical equipment</b>	<ul style="list-style-type: none"> <li>• Resuscitation medications</li> <li>• Oxygen therapy</li> <li>• IDC equipment</li> </ul>
<b>Access</b>	2 x PIVC setups with no IV stickers attached
<b>Other</b>	ED chart & relevant paperwork

### Human resources

<b>Faculty</b>	2 facilitators (Dr/Nurse with debriefing experience) to take on roles of scenario commander and primary debrief
<b>Simulation coordinators</b>	<ul style="list-style-type: none"> <li>• Standardised patient – facilitators to control simulated monitor</li> <li>• 1 x for manikin set up and control</li> </ul>
<b>Confederates</b>	QAS officer
<b>Other</b>	1 nurse and 1 doctor in room

## Handover card

Handover from ambulance officer

This is James, he is 22 years old. We were called to him after he came off his skateboard trying to make a jump at the local skatepark. Witnesses say he landed on his head, he was wearing a helmet and was not knocked out.

Immediately he complained of not being able to move his arms or legs and can't feel his legs. We are concerned he has a spinal injury.

His vital signs are normal: HR 70, BP 100/80mmHg, Sats 99% RA and RR 14. He is afebrile, BSL 6.3.

We have administered 5mg IV morphine for pain in his neck, he has a cervical collar on, and spinal precautions have been maintained.

James has no past medical history, does not use regular medications, and has no allergies. He uses occasional THC and alcohol on weekends.

## Scenario progression

STATE 1: Initial Assessment				
Vital signs		Script	Details	Expected actions
ECG	SR	<b>James:</b> I can't feel my legs- what's going on?	<b>Primary survey results</b>  A: intact, cervical collar, mid cervical tenderness, anterior neck exam normal  B: equal breath sounds, nil crepitus/sub cut emphysema  C: pink and warm peripherally  D: GCS 14 (E4,V5,M6) able to obey commands shrugging shoulders and weak elbow flexion, sensation level at T4), PEARL 2mm  E: normothermia	<input type="checkbox"/> Commence Primary Survey <input type="checkbox"/> Recognise abnormal neurological examination
HR	70			
SpO <sub>2</sub>	99% RA			
BP/ART	100/80mmHg			
RR	14			
Temp	36.5			
BGL	6			
GCS	15			

STATE 2: Secondary Survey and Investigations				
Vital signs		Script	Details	Expected actions
<b>ECG</b>	SR	<b>James:</b> I am finding it hard to breathe	<b>Secondary survey results</b>  Neurological assessment: Sensory level T4, motor level C5/6  Abdominal breathing pattern  <b>Results</b>  CXR: normal  PXR: normal  CT Cervical Spine Lateral: Unstable C6 flexion tear drop type fracture. 5mm fracture retropulsion with narrowing of the cervical canal	<b>Secondary survey</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Formal neurological assessment</li> </ul> Recognition of spinal cord injury and likely level with effect on respiratory and cardiovascular systems  <b>Investigations</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Trauma blood panel</li> <li><input type="checkbox"/> Plain XR imaging</li> <li><input type="checkbox"/> CT trauma scan</li> </ul> <b>Management</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Increase FiO2/consider HFNP</li> <li><input type="checkbox"/> Provide fluid bolus +/- vasopressor support</li> <li><input type="checkbox"/> Apply spinal precautions</li> <li><input type="checkbox"/> Insert IDC</li> </ul>
<b>HR</b>	60			
<b>SpO<sub>2</sub></b>	90% RA			
<b>BP/ART</b>	90/60mmHg			
<b>RR</b>	8			
<b>Temp</b>	35.5			
<b>BGL</b>	6			
<b>GCS</b>	15			



STATE 3: Ongoing Management				
Vital signs		Script	Details	Expected actions
ECG	SR	<b>James</b> My breathing feels a bit better now	Improvement with haemodynamic and respiratory support	<b>Assessment</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Reassess post interventions- improved saturations and BP</li> </ul> <b>Management</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> BP improves post fluid bolus/vasopressor support</li> <li><input type="checkbox"/> Ventilatory function improves with respiratory support</li> <li><input type="checkbox"/> Recognition of high-risk spinal level and need for ICU management/intubation for transfer</li> <li><input type="checkbox"/> Supportive care - maintain normothermia, electrolytes, consider pressure area care and nutrition</li> <li><input type="checkbox"/> Psychological support for patient</li> </ul>
HR	60			
SpO <sub>2</sub>	97% 15LNRB			
BP/ART	100/70mmHg			
RR	8			
Temp	36			
BGL	7			
GCS	15			

## Debriefing guide

### Scenario objectives

- Recognition of clinical features consistent with spinal cord injury following trauma
- Commence appropriate initial management for ventilatory and haemodynamic support

### Example questions

#### Exploring Assessment

- What are the features of spinal cord injury, as differs from spinal column injury?
- What leads to the respiratory distress in patients with cervical spine injury?
- What causes the hypotension and bradycardia in this setting?

#### Discussing Management

- What are the priorities in management with suspected or confirmed spinal cord injury?
- What options are there for ventilatory support? What prompts progression to intubation?
- How can the patient's blood pressure be improved?

#### Crisis resource management

- How do you allocate roles in receiving and managing trauma patients?
- When prioritising the interventions how is this communicated to the team?

### Key moments

- Spinal precautions
- Clinical examination features of spinal cord injury
- Management of ventilatory and circulatory distress following spinal cord injury

## Acronyms and abbreviations

Term	Definition
THC	Tetrahydrocannabinol
QAS	Queensland Ambulance Service
HFNP	High flow nasal prongs
IDC	Indwelling catheter
PXR	Pelvic xray
CXR	Chest xray
CT	Computed tomography
BP	Blood pressure
ICU	Intensive care unit

## References

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