



Queensland
Trauma Education

CHEST TRAUMA

Delayed respiratory deterioration post blunt chest trauma Immersive scenario

Participant 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

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About this training resource kit

This resource kit provides healthcare workers with useful resources and key practice points to assist them to identify and manage respiratory complications in patients following blunt chest trauma injuries.

National Safety and Quality Health Service (NSQHS) Standards



Learning objectives

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

- Identify patient and injury-related factors that place a patient at greater risk of delayed respiratory complications post chest trauma.
- Identify three key signs of impending respiratory deterioration – poorly controlled pain, impaired inspiration, and impaired cough.
- Demonstrate the skill of teaching a patient the correct incentive spirometry technique.

Supporting resources

- Structured assessment
- Specific management

Overview of chest trauma

Chest trauma is the second most common traumatic injury in non-intentional trauma.²

After blunt chest trauma patients are managed in a number of locations including the emergency department, the intensive care unit, a dedicated trauma unit, or orthopaedic, medical or surgical wards. Ongoing assessment and early identification of respiratory deterioration is crucial as patients who appear stable on early assessment may later deteriorate on the ward due to respiratory complications such as atelectasis and pneumonia.

A number of factors have been associated with a higher risk of respiratory complications post blunt chest trauma¹, including:

- number of ribs fractured (>3)
- age (>55 years)
- other serious injury such as head, extremity, abdominal, cardiac, or spinal cord injury
- smoking history or chronic lung condition.

Best practice management for the prevention and management of respiratory deterioration:

1. Regular monitoring and patient assessment.
2. Early identification of at-risk patients and signs of respiratory deterioration, such as:
 - a. early warning scores (EWS)
 - b. PIC score algorithm (pain, inspiration, cough).⁴
3. Effective pain management.
4. Optimisation of lung volumes and cough effectiveness through upright positioning and chest physiotherapy.
 - a. Incentive spirometry devices can be used as a visual aide to teach optimal deep breathing technique (slow, deep breath with inspiratory hold).
 - b. Poor performance of incentive spirometry (volumes <1L) may be predictive of higher risk of respiratory complications.³
5. Multidisciplinary care and communication.

Structured assessment

A	Airway <ul style="list-style-type: none">• Voice – quality, breathiness, speaking in sentences.• Airway noises – stridor, audible upper airway secretions.
B	Breathing <ul style="list-style-type: none">• RR, SpO₂, supplemental oxygen requirement.• Breath sounds on auscultation.• Chest wall – external bruising or deformity, symmetry, flail.• Estimated inspiratory capacity – chest wall movement with quiet and deep breathing, performance of incentive spirometry (ability to sustain max inspiration or achieve volume >1000ml on volume device).• Cough – moist or dry, maximal volitional effort or pain inhibited.• Dyspnoea rating score – VAS or Modified BORG dyspnoea scale.• CXR.
C	Cardiovascular/circulatory <ul style="list-style-type: none">• HR, cardiac rhythm, BP.
D	Disability <ul style="list-style-type: none">• Assess GCS.• Pain rating scores – at rest, on movement/deep breath/cough.
E	Exposure <ul style="list-style-type: none">• Assess other injuries.• ICC observations.

Specific management

1. Referral to Acute Pain Management service and effective pain relief.
2. Upright positioning when in bed.
3. Early mobilisation and sitting out of bed.
4. Deep breathing exercises (+/- incentive spirometry).
5. Oxygen therapy +/- humidification.

Acronyms and abbreviations

Term	Definition
CXR	chest x-ray
GCS	Glasgow coma scale
HFNP	High flow nasal prongs
ICC	Intercoastal catheter
ORIF	Open reduction and internal fixation
QAS	Queensland Ambulance Service
CT	computed tomography

References

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