



Queensland  
Trauma Education

**TRAUMA AND THE OLDER PERSON**

# Chest trauma

## Case discussion

Facilitator resource kit

**CSDS**



Clinical Skills Development Service



Queensland  
Government

## 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

#### Trauma and the Older Person – Chest trauma: Case discussion – Facilitator resource kit Version 1.0

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## About this training resource kit

This resource kit provides healthcare workers with the knowledge to effectively assess and manage the elderly patient with blunt chest trauma.

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



### Target audience

Medical and Nursing clinicians who care for elderly patients.

### Duration

30 minutes.

### Group size

4-6 participants per group.

### Learning objectives

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

- Recognise the risk for significant injury with low velocity trauma in the elderly.
- Assess the impact of co-morbidities and frailty on injury and management options.
- Perform a multi-disciplinary approach to care.
- Understand a patient centred focus with attention to the barriers to effective treatment.

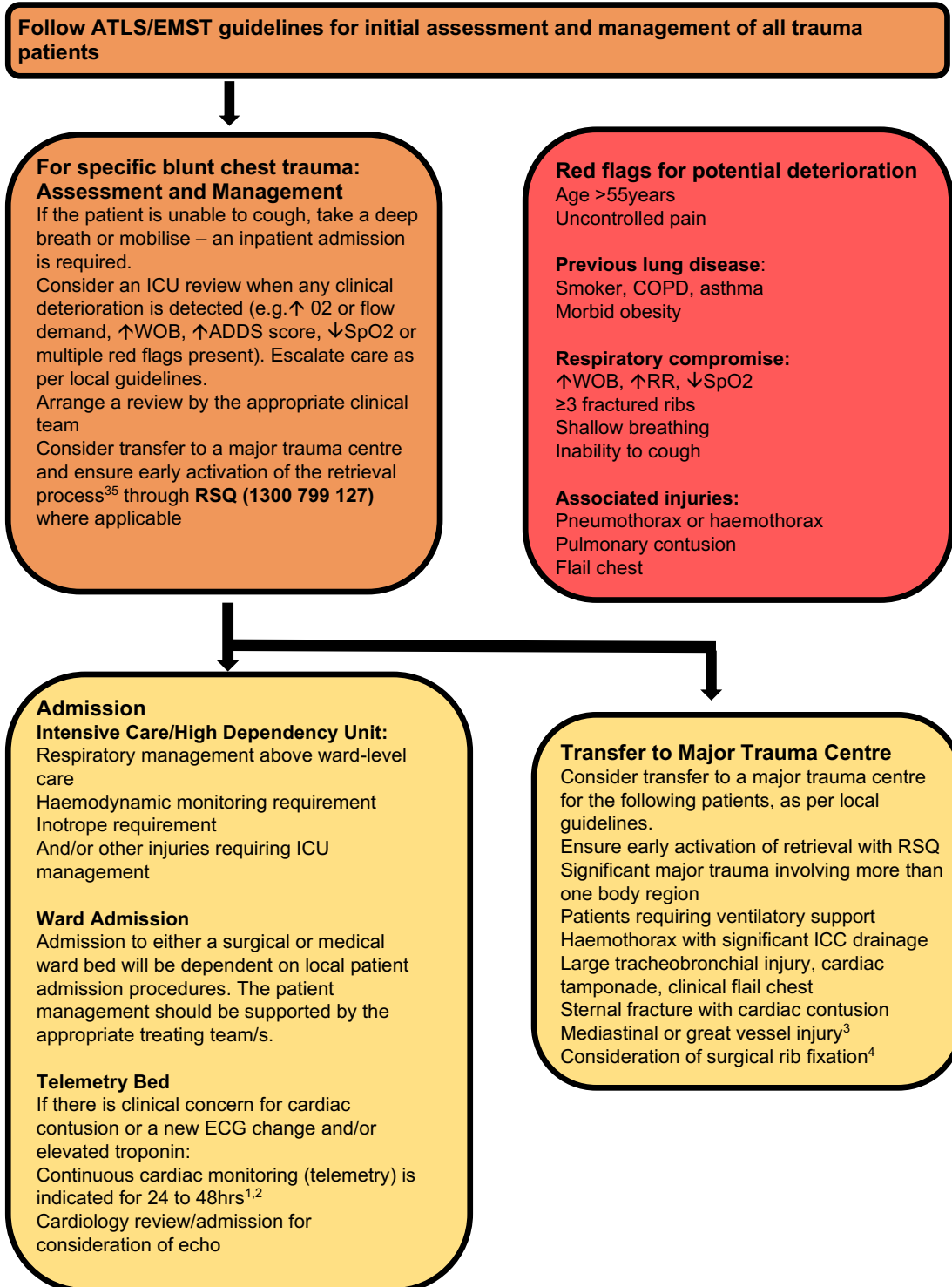
### Facilitation guide

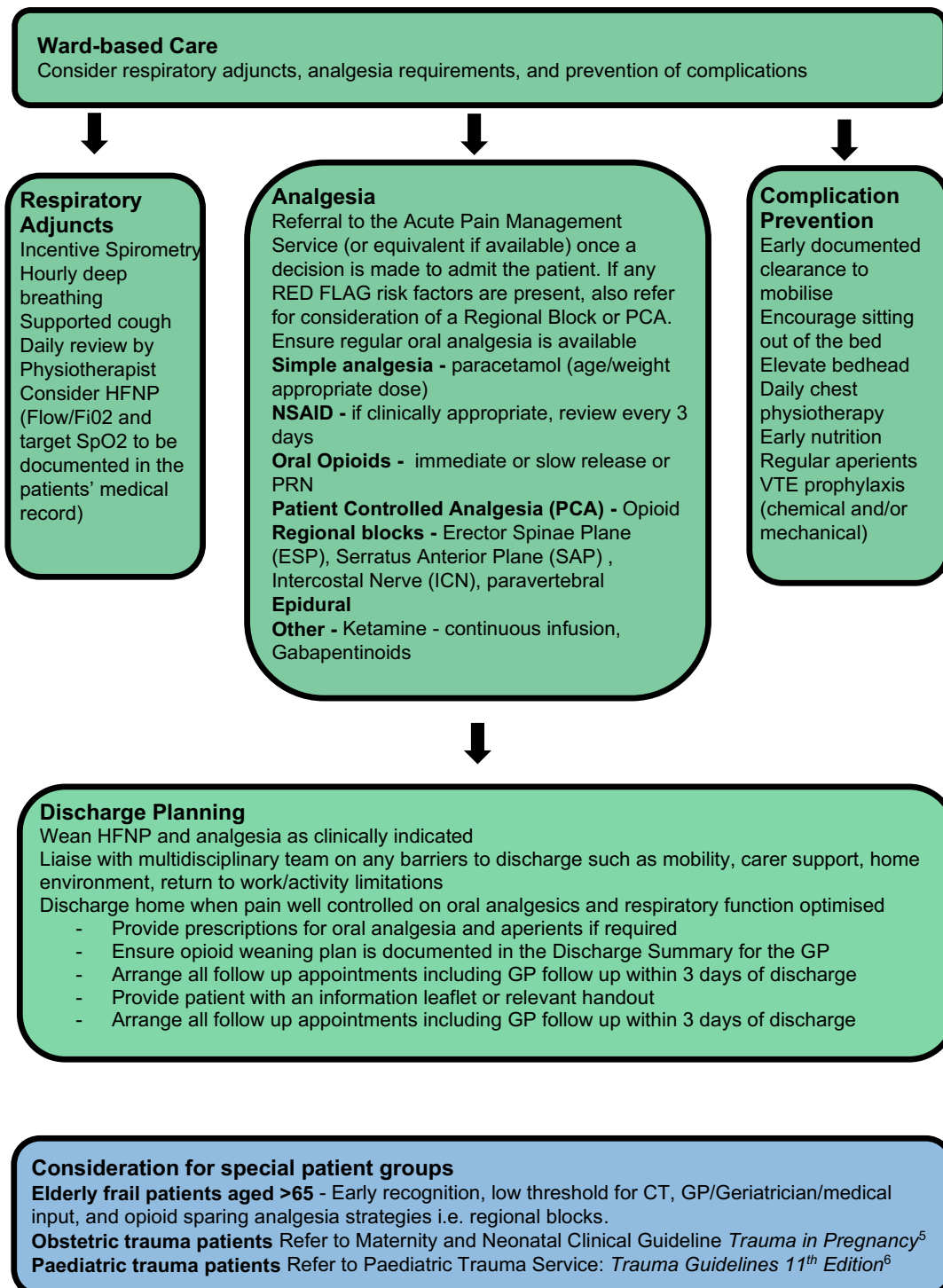
1. Facilitator to provide participant resource kit to participants.
2. Facilitator to utilise question and answer guide to discuss the assessment and management of an elderly trauma patient.
3. Utilise supporting documents to maximise participant learning.

### Supporting resources

- Clinical Practice Guideline: Blunt chest trauma - Queensland Health

## Flowchart: Blunt Chest Trauma





## Overview of blunt chest trauma in the older person

The poorer outcomes in the elderly trauma population with rib fractures following blunt chest trauma is likely to be multifactorial and related in part to reduced physiological reserve and the contribution of medical comorbidities. They also suffer an increased rate of complications from the injury and hospital admission when compared to a younger cohort.<sup>1,2</sup>

Given the increased susceptibility to complications, the provision of adequate analgesia to allow the patient with rib fractures to maintain an appropriate respiratory tidal volume will prevent atelectasis, pneumonia and other pulmonary complications.<sup>3</sup>

### Further reading

<b>Comprehensive approach to the management of the patient with multiple rib fractures: a review and introduction of a bundled rib fracture management protocol</b>	
Publication	Trauma Surgery & Acute Care
Link	<a href="http://dx.doi.org/10.1136/tsaco-2016-000064">http://dx.doi.org/10.1136/tsaco-2016-000064</a>

<b>Rib fractures in the elderly</b>	
Publication	J Trauma
Link	<a href="https://pubmed.ncbi.nlm.nih.gov/10866248/">https://pubmed.ncbi.nlm.nih.gov/10866248/</a>



## Case discussion

### Case study

An elderly patient presents to ED complaining of chest pain after a fall at home. The case discussion explores the assessment and management, including risk factors for complications following a blunt chest injury. The additional challenge of clinical care when a language barrier is present is considered in this case discussion.

84yo Vietnamese woman, 'Hau' is BIBA after a fall at her daughter's home down three concrete steps onto a tiled floor. Patient was attempting to go to the bathroom in the night and missed the top step, falling down the stairs. Did not hit her head, complaining of pain to R chest. She was not able to weight bear and the paramedics had to help her up onto the stretcher.

PMHx:

- NESB- moderate English, daughter as translator
- Ex-smoker 40 packs/year
- Ramipril 5mg nocte for HTN
- Aspirin 100mg mane

Nil known allergies.

QAS have given her 50mcg IV fentanyl and 3mls methoxyflurane inhaled.

Her observations on arrival to ED are:

GCS 15, HR 80, BP 140/90mmHg, sats 96% RA, RR 24, afebrile.

## Question and answer guide

### 1. What injury profiles are suspected in this presentation?

Any body region in the elderly can be injured with minor/low velocity trauma.

Most likely in this presentation:

- chest trauma
- abdominal trauma
- pelvic injury.

Less likely:

- extremity trauma - fractures and soft tissue injury
- traumatic brain injury
- spinal injury.

### 2. Describe what clinical examination findings would suggest significant injury on the primary and secondary survey in ANY trauma assessment?

**Head** - reduced conscious state, localising signs, bruising/swelling/boggy wounds to suggest compound skull fracture.

**Face** - tenderness, bruising, swelling, wounds, crepitus- examine for orbital/midface/mandibular fractures.

**Neck** - cervical spine tenderness, anterior neck wounds/swelling/bruising.

**Chest** - wounds, crepitus, tenderness, subcutaneous emphysema, decreased breath sounds to suggest pneumo or haemothorax.

**Abdo** - bruising, tenderness, wounds to indicate solid organ injury or peritonism from hemoperitoneum.

**Pelvis** - ASIS alignment, bruising or tenderness, crepitus to suggest pelvic fractures.

**Limbs** - tenderness, swelling, wounds, bruising, decreased range of movement to suggest fracture or dislocation.

**Spine** - to identify fractures with tenderness and bruising/swelling, perianal sensation and PR tone if spinal cord injury is suspected.



*Facilitator to use following information to facilitate discussion.*

**On examination of this patient the team identify the following:**

- GCS 15, nil external evidence head trauma.
- Cervical spine non tender and normal ROM.
- Tender across R chest wall, nil crepitus or subcutaneous emphysema.
- Equal BS bilaterally.
- HS dual, well perfused.
- Abdo soft, non-tender, BS present, nil bruising/wounds.
- Pelvis aligned, limbs all non-tender, normal ROM all joints, nil wounds/bruising.
- ECG normal sinus rhythm.

**3. a) Given the above clinical findings, what initial radiological investigations should be arranged and why?**

1. CXR: mechanism of injury - age related risk factors and injury profile: risk of rib fractures, pulmonary contusions, haemo/pneumothorax.
2. Pelvic Xray: mechanism of injury - age related risk factors and injury profile: can be challenging to clear pelvis in elderly, often require CT imaging if unable to mobilise to detect subtle fractures not seen on plain Xray.

**b) What are the limitations of these investigations in elderly patients?**

Limitations of plain radiological imaging:

- Often not a definitive investigation and requires further advanced imaging.

*Facilitator to issue CXR and pelvic xray to group for interpretation and discuss the following findings.*

**CXR:** R) rib #s- 6-8 minimally displaced.

**Pelvic Xray:** NAD (Facilitator can use this as prompt to discuss challenges interpreting bony imaging in elderly patients).

**4. What is the role of CT in blunt chest injury?**

Can delineate injury further:

- Identification of rib fracture level and location (anterior, lateral and posterior).
- Pulmonary complications - contusion, pneumothorax, haemothorax.
- Great vessel injury.
- Other bony injury - sternal, scapula, spinal, clavicle injury.

*Facilitator to issue CT images 1 and 2 to group for interpretation and discuss the following findings.*

CT findings: Minimally displaced R) rib fractures 3-8th, small haemothorax and small pneumothorax.

**5. The patient complains of significant R chest wall pain, difficulty taking deep breaths and cannot cough due to pain. What are the options for her pain management?**

- Escalated therapy.
- Simple regular analgesia.
- IV opiates - bolus dosing fentanyl/morphine.
- PCA.
- Ketamine infusion.
- Regional block - epidural, paravertebral, erector spinae.

**6. Following the commencement of a fentanyl PCA, Hau is more comfortable. What functional assessment is used to determine adequacy of her analgesia?**

*Facilitator to issue 'PIC' infographic to group and discuss:*

- Pain at rest/movement/coughing.
- Inspiration - ability to take deep breath.
- Cough - adequacy.
- Incentive spirometry <1000mls.

**7. What risk factors are present that may impact on this patient's progress?**

- Age – frailty.
- Elderly often under report pain.
- NESB/language barrier.
- Tolerance of opiates/side effects - respiratory depression, nausea/vomiting, ileus.
- Underlying lung disease – ex-smoker.

**8. What strategies can be implemented to reduce complications?**

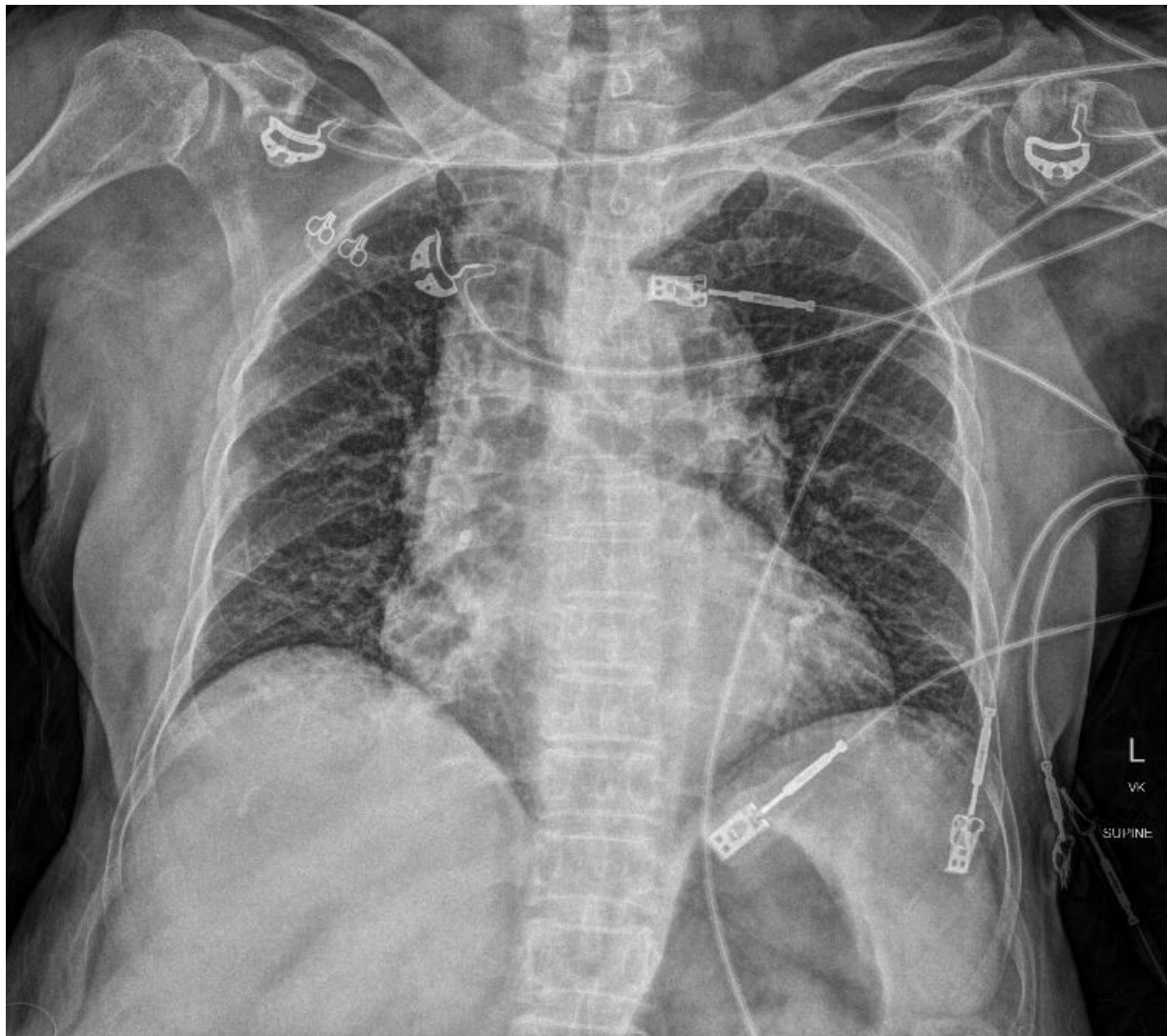
- Effective pain control, use of non-opiate medications including regional techniques.
- Early physiotherapy and mobilisation.
- Deep breathing exercises, use of incentive spirometry as adjunct and visual aid
- Active intervention to prevent and manage possible complications (pneumonia, DVT, ileus).
- Early involvement of geriatrician.
- Use of interpreter to ensure overcome any language barrier.

## Supporting documents

The following supporting documents are provided for this case discussion:

1. CXR
2. Pelvic xray
3. CT 1: chest bone windows
4. CT 2: chest lung windows
5. PIC Score

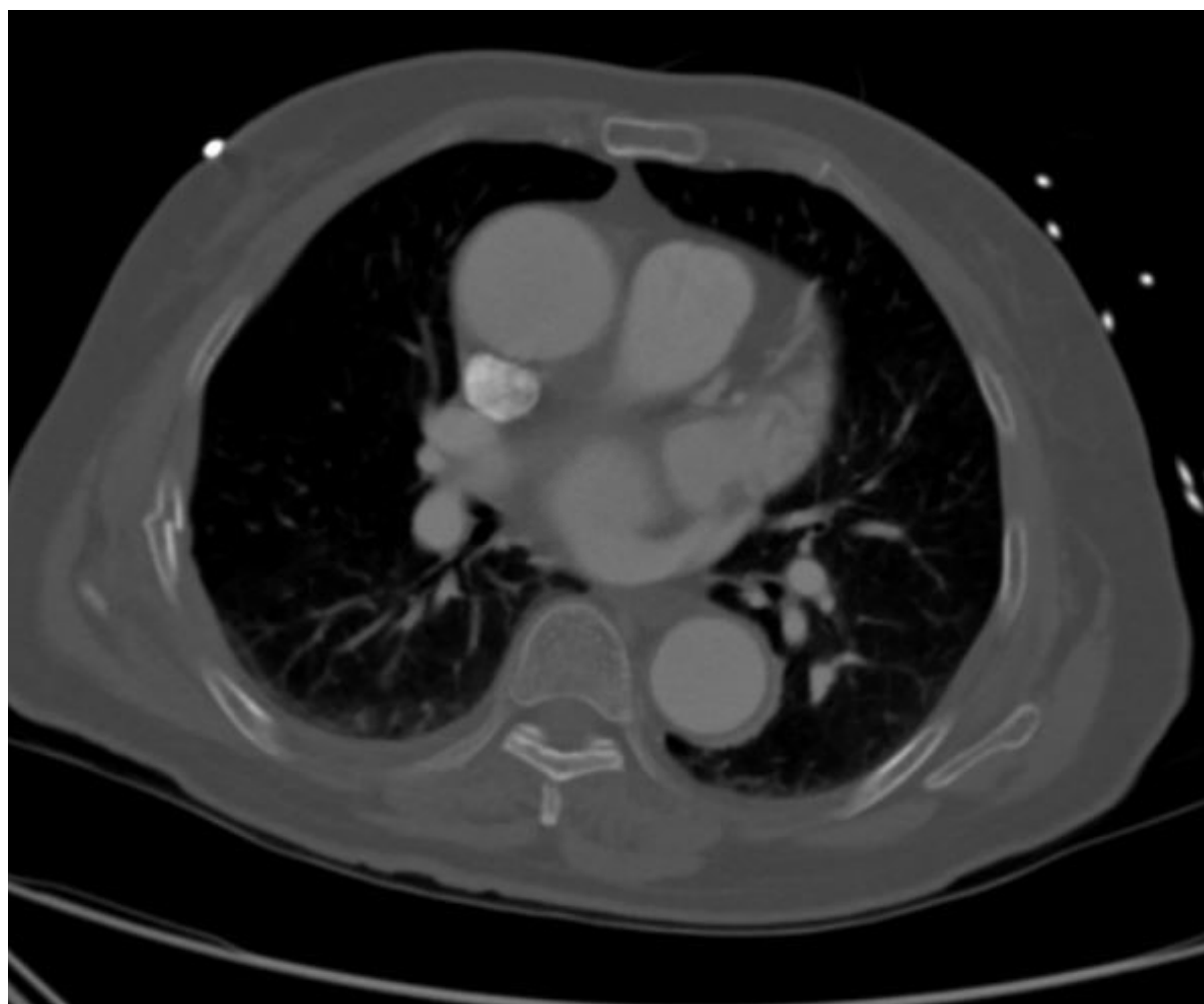
**CXR**



## Pelvic xray

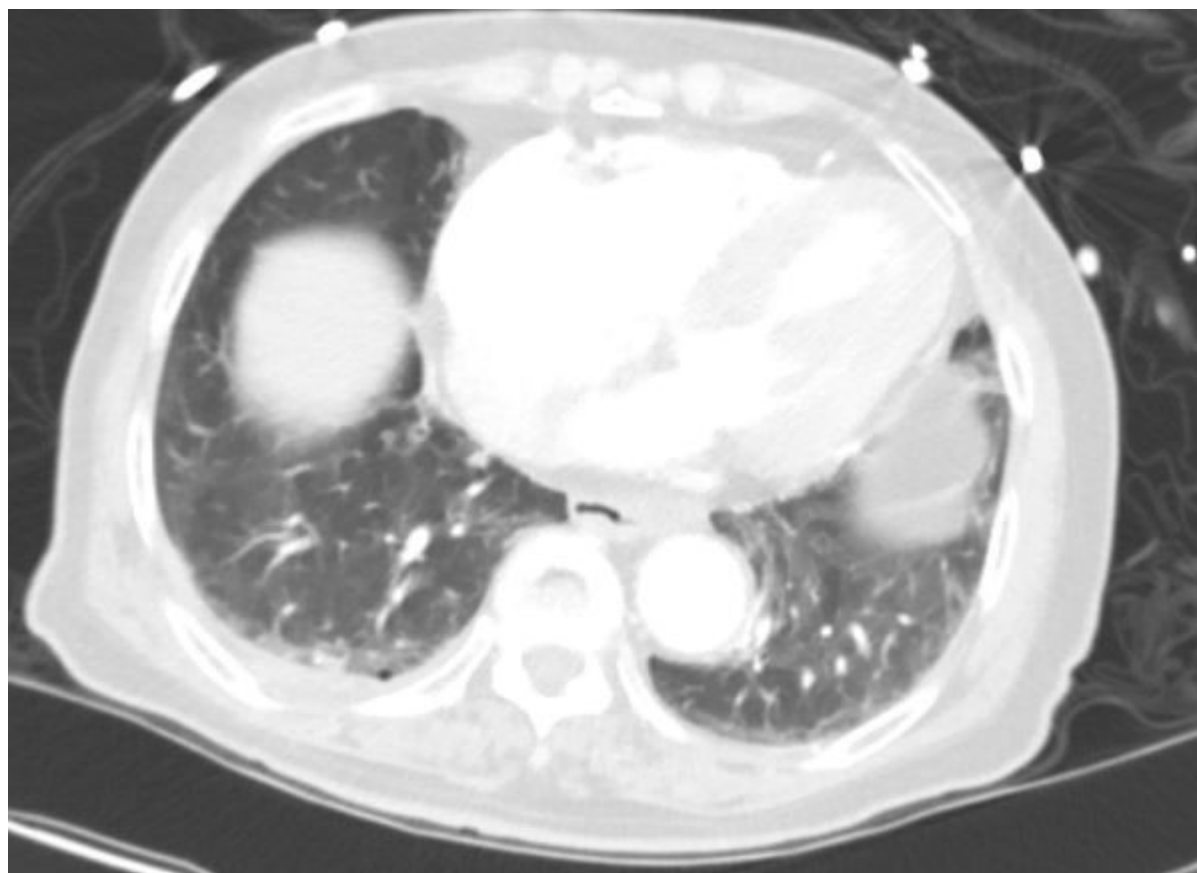


## CT 1: chest bone windows





## CT 2: chest lung windows



## PIC Score

# PIC Score

1 2 3 4 5 6 7 8 9 10

## Pain

Patient-reported, 0-10 scale

## Inspiration

Inspiratory spirometer; goal and alert levels set by respiratory therapist

## Cough

Assessed by bedside nurse

<b>3 - Controlled</b> (Pain intensity scale 0-4)	4 - Above goal volume	<b>3 - Strong</b>
<b>2 - Moderate</b> (Pain intensity scale 5-7)	3 - Goal to alert volume	<b>2 - Weak</b>
<b>1 - Severe</b> (Pain intensity scale 8-10)	2 - Below alert volume	<b>1 - Absent</b>
	1 - Unable to perform incentive spirometry	

Patient name:

Date:

IS Goal:

## Acronyms and abbreviations

Term	Definition
CT	computed tomography
PCA	patient controlled analgesia

## References

1. Witt CE, Bulger EM. Comprehensive approach to the management of the patient with multiple rib fractures: a review and introduction of a bundled rib fracture management protocol. *Trauma Surgery & Acute Care Open* 2017;2:e000064.  
<http://dx.doi.org/10.1136/tsaco-2016-000064>
2. Bulger E, Arneson M, Mock C, Jurkovich G. Rib Fractures in the Elderly. *The Journal of Trauma: Injury, Infection, and Critical Care: June 2000 – 48:6 – p1040-1047*  
<https://pubmed.ncbi.nlm.nih.gov/10866248/>

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