Clinical Guideline

RIB FRACTURE ASSESSMENT AND INITIAL MANAGEMENT IN ADULTS

SETTING UHBW NHS Foundation Trust

FOR STAFF Trust wide Medical, Nursing and Allied Health Professionals

PATIENTS Adult patients with Rib Fractures

Guidance

BACKGROUND

- Each year on average 150 patients with chest trauma are admitted to the Bristol Royal Infirmary. Of those, an average of 13% require surgical intervention. Most patients are managed conservatively across a range of specialities.
- Rib fractures can result in pneumonia (approximately 30%) through retained secretions and altered respiratory mechanics as well as chronic pain, disability and a prolonged length of stay. The average mortality is 10%.
- Morbidity and mortality increases with age (the risk of death 2-5x greater >65yr olds), frailty and comorbidities.
- The 2nd most common site of trauma in the elderly is the chest wall. Rib fractures may be difficult to detect clinically or on chest X-ray (screening xrays can miss up to 50%). Other injuries are also common.
- The Rib Fracture Severity Score helps to identify those at greatest risk and provides proactive analgesia management to reduce the risk of complications. **NOTE that complex analgesia management can only take place on a surgical or intensive care ward (not on the medical wards).**

This guideline was developed to ensure that patients with rib fractures are assessed appropriately on admission in ED by the right specialist at the right time, and managed on the right ward. It is a multidisciplinary initial assessment and management pathway divided into three sections:

- The initial assessment in ED, Rib Fracture Severity Score and analgesia management
- The pathway for isolated rib fracture patients
- The pathway for rib fracture with other traumatic injuries/fractures

RIB FRACTURE INITIAL MANAGEMENT for ADULTS

Assessment in ED

Review NEWS score & acute pain management. Major Trauma Protocol if appropriate.
Clarify mechanism of injury, comorbidities, medication & pre-admission functional status.
Primary & Secondary survey to assess ALL injuries – clarify if isolated rib fractures or major trauma?
Consider CT chest if high clinical suspicion of flail chest or a full trauma scan in correlation with Radiological Guidelines for Elderly Trauma.
Calculate Rib Fracture Severity Score and treat according to level in analgesia guidelines (see table)

Assessment in ED

Review NEWS score & acute pain management. Major Trauma Protocol if appropriate.
Clarify mechanism of injury, comorbidities, medication & pre-admission functional status.
Primary & Secondary survey to assess ALL injuries – clarify if isolated rib fractures or major trauma?
Consider CT chest if high clinical suspicion of flail chest or a full trauma scan in correlation with Radiological Guidelines for Elderly Trauma.
Calculate Rib Fracture Severity Score and treat according to level in analgesia guidelines (see table)

Rib Fracture Severity Score = (Breaks x Sides) + Age factor + High Risk Factor

1. Total number of *fractures* to the ribs (not number of fractured ribs) = x
2. Sides: Unilateral = 1 or Bilateral = 2
3. Age Factor: 0 = <50yrs 1= 51-60yrs 2 = 61-70yrs 3 = 71-80yrs 4 = >80yrs
4. High risk factors (1 point for each) = Smoker/ Chronic respiratory disease/ Malnourished/ Obesity/ Substance misuse/ Chronic pain with prescribed opioids and/or Gabapentin or Pregabalin/ Trauma Major and/or associated features/ Reduced oxygen saturations post injury/ Signs of chest infection/ Flail segment/ Pre-injury anticoagulation therapy

If patient is ≥65yrs age

Complete silver trauma checklist

+ Calculate Rockwood Clinical Frailty Score

Discuss treatment escalation plan (suitability for HDU/ICU) and resuscitation status. Document on RESPECT form

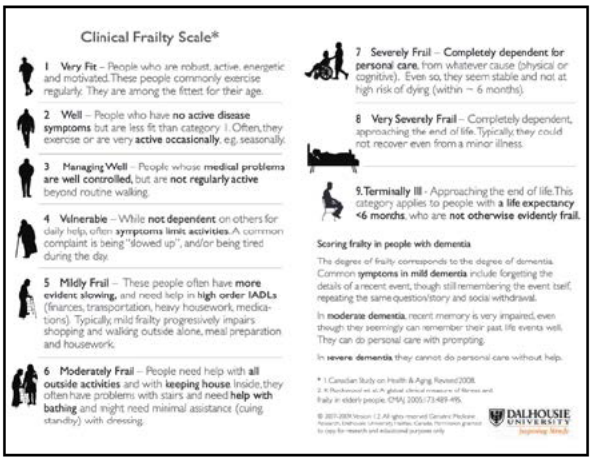
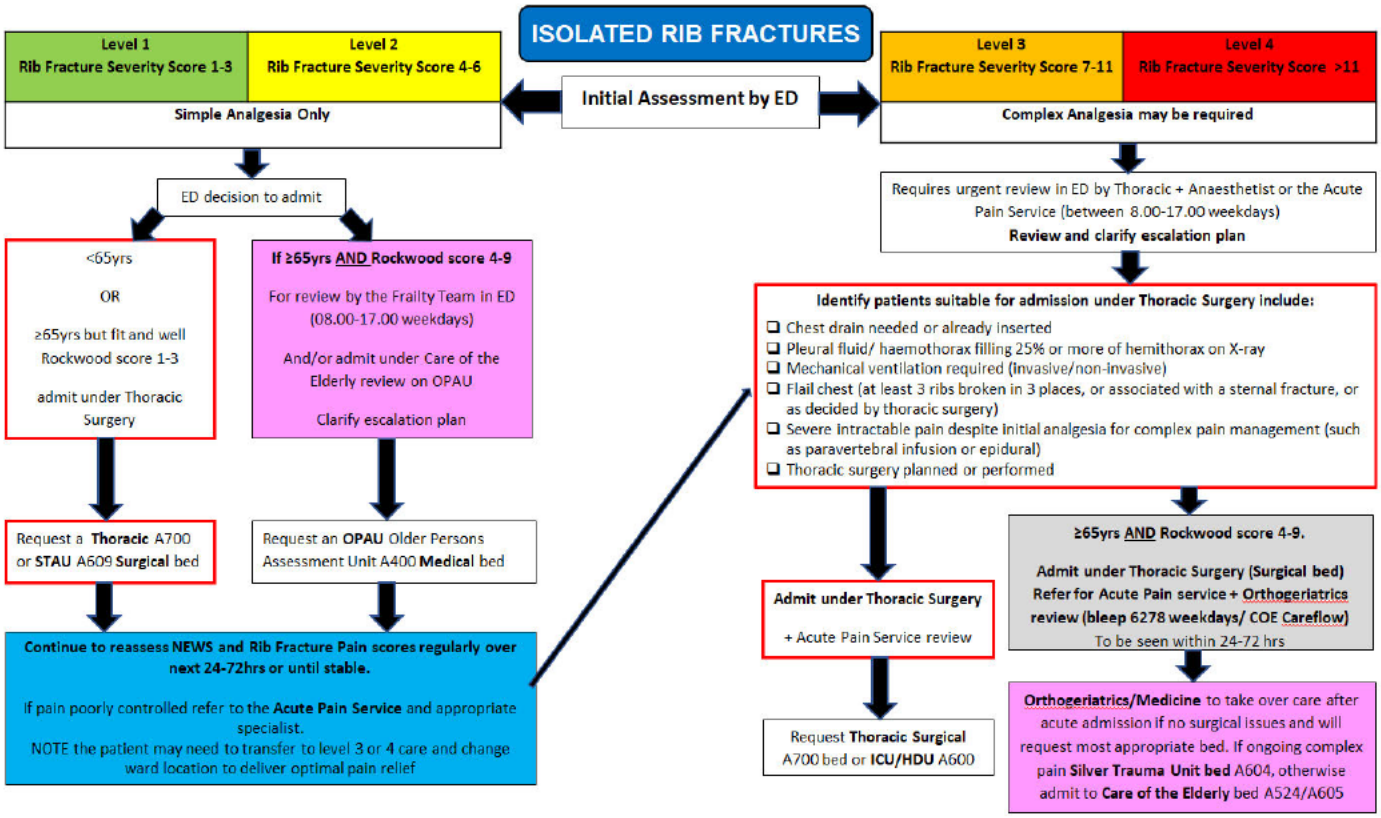
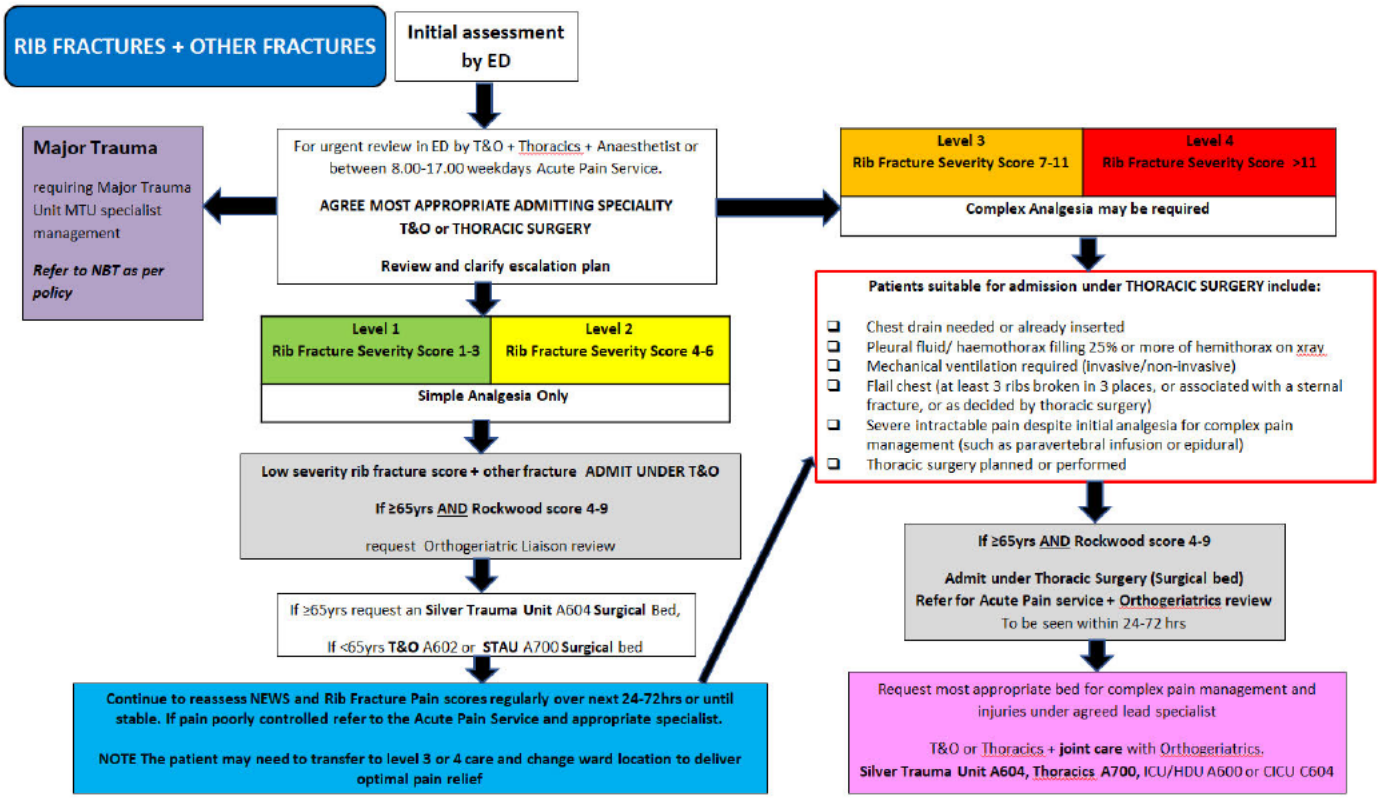


Table A

UHB Rib Fracture Analgesia Guidelines		
	Initial Pain Assessment	If uncontrolled pain progress to the next level Review NEWS regularly as per trust guidelines
Level 1 = Rib Fracture score 1-3	Dynamic pain score (on deep breathing/ coughing) VAS 0-4 Abbey 0-7	Regular Paracetamol 500mg-1g qds Regular Tramadol 50-100mg qds* or Regular codeine 15-60mg qds +/- Ibuprofen 400mg tds*
Level 2 = Rib Fracture score 4-6	Dynamic pain score VAS ≥ 5 Abbey ≥ 8	**Refer to Adult Acute Pain Service APS via Medway Service order within 24hrs of diagnosis** Level 1 analgesia + Prn oral immediate release Morphine or prn oral Oxycodone **+ Physiotherapy** in or out of hours (if meets on call criteria)
Level 3 = Rib Fracture score 7-11	Dynamic pain score VAS ≥ 5 Abbey ≥ 8	Contact Adult Acute Pain Service APS (bleep [redacted]) or Anaesthetist (bleep [redacted]) within 1hr of diagnosis Regular Paracetamol 500mg-1g qds +/- Regular Tramadol 50-100mg qds * or codeine 30-60mg qds +/- Ibuprofen 400mg tds* Patient Controlled Analgesia PCA (Surgical wards or CICU C604 only) Naloxone, antiemetics & laxatives **+ Physiotherapy** in or out of hours (if meets on call criteria)
Level 4 = Rib Fracture score >11	Dynamic pain score VAS ≥ 5 Abbey ≥ 8	Contact Adult Acute Pain Service APS (bleep 3916) or Anaesthetist (bleep 3036) within 1hr of diagnosis As per level 3 + consider regional block analgesia: -Serratus anterior or Erector Spinae plane blocks (ALL surgical wards including A602 & A604, ICU A600 & CICU C604) -Paravertebral or Thoracic epidural infusions (Thoracic A700, Gen Surgery C808, A600 ICU A600, CICU C604 only) -Consider surgical rib fixation **+ Physiotherapy** or out of hours (if meets on call criteria)
NOTE Co-prescribe laxatives with opiates ***AVOID Ibuprofen/NSAIDS/Tramadol in the elderly & renal impairment**		


ISOLATED RIB FRACTURES
Initial Assessment by ED
Level 1
Rib Fracture Severity Score 1-3
Level 2
Rib Fracture Severity Score 4-6
Simple Analgesia Only
Level 3
Rib Fracture Severity Score 7-11
Level 4
Rib Fracture Severity Score >11
Complex Analgesia may be required
ED decision to admit
<65yrs
OR
≥65yrs but fit and well
Rockwood score 1-3
admit under Thoracic Surgery
If ≥65yrs AND Rockwood score 4-9
For review by the Frailty Team in ED (08.00-17.00 weekdays)
And/or admit under Care of the Elderly review on OPAU
Clarify escalation plan
Request a Thoracic A700 or STAU A609 Surgical bed
Request an OPAU Older Persons Assessment Unit A400 Medical bed
Continue to reassess NEWS and Rib Fracture Pain scores regularly over next 24-72hrs or until stable.
If pain poorly controlled refer to the Acute Pain Service and appropriate specialist.
NOTE the patient may need to transfer to level 3 or 4 care and change ward location to deliver optimal pain relief
Requires urgent review in ED by Thoracic + Anaesthetist or the Acute Pain Service (between 8.00-17.00 weekdays)
Review and clarify escalation plan
Identify patients suitable for admission under Thoracic Surgery include:
Chest drain needed or already inserted
Pleural fluid/ haemothorax filling 25% or more of hemithorax on X-ray
Mechanical ventilation required (invasive/non-invasive)
Flail chest (at least 3 ribs broken in 3 places, or associated with a sternal fracture, or as decided by thoracic surgery)
Severe intractable pain despite initial analgesia for complex pain management (such as paravertebral infusion or epidural)
Thoracic surgery planned or performed
Admit under Thoracic Surgery
+ Acute Pain Service review
Request Thoracic Surgical A700 bed or ICU/HDU A600
≥65yrs AND Rockwood score 4-9.
Admit under Thoracic Surgery (Surgical bed)
Refer for Acute Pain service + Orthogeriatrics review (bleep 6278 weekdays/ COE Careflow)
To be seen within 24-72 hrs
Orthogeriatrics/Medicine to take over care after acute admission if no surgical issues and will request most appropriate bed. If ongoing complex pain Silver Trauma Unit bed A604, otherwise admit to Care of the Elderly bed A524/A605


RIB FRACTURES + OTHER FRACTURES
Initial assessment by ED
Major Trauma
requiring Major Trauma Unit MTU specialist management
Refer to NBT as per policy
For urgent review in ED by T&O + Thoracics + Anaesthetist or between 8.00-17.00 weekdays Acute Pain Service.
AGREE MOST APPROPRIATE ADMITTING SPECIALITY
T&O or THORACIC SURGERY
Review and clarify escalation plan
Level 1
Rib Fracture Severity Score 1-3
Level 2
Rib Fracture Severity Score 4-6
Simple Analgesia Only
Low severity rib fracture score + other fracture ADMIT UNDER T&O
If ≥65yrs AND Rockwood score 4-9
request Orthogeriatric Liaison review
If ≥65yrs request an Silver Trauma Unit A604 Surgical Bed,
If <65yrs T&O A602 or STAU A700 Surgical bed
Continue to reassess NEWS and Rib Fracture Pain scores regularly over next 24-72hrs or until stable. If pain poorly controlled refer to the Acute Pain Service and appropriate specialist.
NOTE The patient may need to transfer to level 3 or 4 care and change ward location to deliver optimal pain relief
Level 3
Rib Fracture Severity Score 7-11
Level 4
Rib Fracture Severity Score >11
Complex Analgesia may be required
Patients suitable for admission under THORACIC SURGERY include:
Chest drain needed or already inserted
Pleural fluid/ haemothorax filling 25% or more of hemithorax on xray
Mechanical ventilation required (invasive/non-invasive)
Flail chest (at least 3 ribs broken in 3 places, or associated with a sternal fracture, or as decided by thoracic surgery)
Severe intractable pain despite initial analgesia for complex pain management (such as paravertebral infusion or epidural)
Thoracic surgery planned or performed
If ≥65yrs AND Rockwood score 4-9
Admit under Thoracic Surgery (Surgical bed)
Refer for Acute Pain service + Orthogeriatrics review
To be seen within 24-72 hrs
Request most appropriate bed for complex pain management and injuries under agreed lead specialist
T&O or Thoracics + joint care with Orthogeriatrics.
Silver Trauma Unit A604, Thoracics A700, ICU/HDU A600 or CICU C604

GUIDELINE CONSULTATION

Key stakeholders involved in the development of this cross divisional guideline and admission pathway include:

- Adult Acute Pain Service – [redacted]
- Thoracics and National GIRFT Cardiothoracic Surgery Clinical Lead – [redacted]
- ED – [redacted]
- The Silver Trauma Steering Group – [redacted]
- Major Trauma Steering Group – [redacted]
- Trauma & Orthopaedics – [redacted]
- Division on Surgery – [redacted]

Table B

REFERENCES	Schmoekel N et al. 2019. Rib Fractures in the Elderly: Physiology Trumps Anatomy. Traum Surg Acute Care Open; 4:e000257. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6560485/ Coary R et al. 2019. New horizons in rib fracture management. Age and Ageing. 00:1-7 Swart L et all. 2017. The Comparative Risk of Delerium with Different Opioids: A Systemic review. Drugs Ageing 34:437-443 British Orthopaedic Association/ Society for Cardiothoracic Surgical Audit Standards for Trauma 2016. The Management of Blunt Chest Wall Injury (BOAST 15). https://www.boa.ac.uk/resources/knowledge-hub/boast-15-pdf.html May L & Hillerman C. 2016. Rib Fracture Management. British Journal of Anaesthesia. 16 (1):26-32 Shenvi C. 2015. Rib Fractures in Older Adults – What's the Big Deal? ALiEM Academic Life in Emergency Medicine. June 3rd 2015. https://www.aliem.com/rib-fractures-in-older-adults-whats-the-big-deal NICE IPG 361. 2010. Insertion of metal rib reinforcements to stabilise a flail chest wall. http://www.nice.org.uk/guidance/ipg361 AAGBI Safety Guidelines 2010. Management of severe local anaesthetic toxicity in adults Easter A. 2001. Management of patients with multiple rib fractures. American Journal of Critical Care. 10 (5):320-7
RELATED DOCUMENTS AND PAGES	Radiological Guidelines for Elderly over 65 Years Analgesia Prescribing in Adults with Renal Impairment. Post Operative Nausea & Vomiting – Prophylaxis and treatment Adult Acute Pain Service: Serratus Anterior Catheter Insertion for Management of Patient with Rib Fractures Fracture -Adult patients requiring admission to hospital
AUTHORISING BODY	UHBW Adult Emergency Department (BRI)
SAFETY	
QUERIES AND CONTACT	[redacted] – Consultants in Thoracic Surgery [redacted] – Clinical Chair and Trauma & Orthopaedic Consultant [redacted] – Consultant in Care of the Elderly Medicine [redacted] – Acute Pain Service Lead Clinical Nurse
AUDIT REQUIREMNTS	