# Appendix 5. Mobile Guideline for Adult Inpatient Rib Fracture Care Pathway

Click here for full guidelines

**Clinical course**

- Rib fractures imply a damaging transfer of energy from object to patient. Whilst patients with rib fractures may appear well at first, they often have significant underlying lung injury, whether this is haemo/pneumothorax or pulmonary contusion. They may also have associated injuries outside the chest (e.g. spinal fractures).
- Pulmonary contusions evolve over the first 48-72hrs, leading to deterioration in respiratory function.
- Inadequate analgesia leads to decreased tidal volumes, atelectasis and pneumonia.
- Damage to the structure of the chest wall (e.g. flail segment) affects respiratory mechanics and increases the work of breathing.
- Patients struggle to cough and clear secretions, leading to sputum retention and pneumonia.
- Patients are at high risk of tiring and succumbing to respiratory failure if not properly managed.

**Important Interventions**

- Identification and early stratification of injury severity.
- Identification and management of all other injuries.
- Early analgesia stratified according to injury severity with regular evaluation of effectiveness. This may require advanced analgesia with PCA, epidural or other regional anaesthetic.
- Chest physiotherapy.
- Oxygenation or ventilatory support if required.
- Vigilance for and management of pneumonia.
- Rib fixation in selected patients (see Thoracics referral criteria).

**PATIENTS MUST BE ABLE TO TAKE A DEEP BREATH AND COUGH EFFECTIVELY**

Start

**Is a Trauma Call Indicated?**

Serious mechanism of injury with abnormal physiology or anatomical features of major trauma
***Or***
High risk group (elderly / pregnant)

**Imaging obtained?**
In view of the poor sensitivity of CXR for significant and associated chest injury, all patients requiring admission for rib fractures should have **at least** a CT chest. However, a full Trauma CT will often be more clinically appropriate. The threshold for a full body scan should decrease with age.

**Risk Stratification**
Calculate and document the Chest Injury Score following imaging. This should be used to stratify analgesia, risk of complications and hence further care.

Multiple injuries or Chest Injury Score>30 should be discussed with Trauma Team Leader at Derriford ED for consideration of secondary transfer.

**Chest Injury Score**

- *Age:* ***+1 for each 10 years over age 10***
- *Rib fractures:* ***+3 for each individual fracture (ie 2 fractures on 1 rib = +6)***
- *Chronic lung disease:* ***+5 if present***
- *Anti-coagulant or anti-platelet use:* ***+4 (exclude Aspirin 75mg)***
- *Oxygen saturation on air (see ambulance chart):* ***+2 for each 5% decrease below 95%***

**Analgesia**

Prescribe analgesia using EPMA **'Major Trauma' chest injury analgesia bundle.** Protocols stratified by Chest Injury Scoring and populated by selecting 'Prescribable' or 'Treatment Protocols' and entering '**Major Trauma'**, not rib fractures.
Patients should be able to cough and take a deep breath. If they cannot, consider escalating their analgesia.
If epidural contraindicated, consider alternative regional nerve catheter technique.

**0-10 Conservative**
Regular oral analgesia. Consider for home discharge if pain sufficiently managed. PCA if pain persistent despite optimisation of oral analgesia.

**11-20 Progressive**
Regular oral analgesia +/-PCA. If pain persistent despite appropriate use of PCA, consider epidural or other appropriate regional technique.

**21-30 Aggressive**
Regular oral analgesia. Refer for epidural. Refer to Critical Care. *(To remain in ED Resus or go to Recovery whilst awaiting bed).*

**>31 Emergent**
Regular oral analgesia. Refer for epidural. Refer to Critical Care. *(To remain in ED Resus or go to Recovery whilst awaiting bed).*

**Other Injuries?**
**Make all referrals and get a plan at point of review in ED. All injuries should have a documented plan from either Registrar or Consultant from the relevant specialty.**

- *Orthopaedics* - Limb or pelvic fractures and wounds
- *General Surgery* - Intra-abdominal injury and all open 'surgical' chest drains outside ED/ICU
- *Urology* - Urinary or renal tract injury
- *Neurosurgeons* - Head or spinal injury
- *Thoracics* - Cardiac or lung injury
- *Max fax or ENT* - Facial or soft tissue neck injuries

**Thoracics Referral Criteria**

- Flail chest
- 3 or more consecutive ribs involved
- Significant co-morbidities
- Chest injury score>21
- Complications e.g. open injury or significant haemo- or pneumothorax
- Difficult analgesic management
- Failure to wean from ventilatory support
- Discuss anyone if in doubt

## Destination of Care

**Chest Injury Score <11**
Discharge or admit to CDU for first night and transfer to Wellington ward post tertiary survey and pain review.

**Chest Injury Score 11 - 20**
Admit to CDU for first night and admit to Wellington ward post tertiary survey and pain review if speciality care not indicated.

Consider Critical Care admission.

**Chest Injury Score >21**
Refer to Critical Care for admission if score >20, chest drain, regional anaesthesia or multiple injuries.

Transfer to recovery unit to await advanced regional technique or if accepted by Critical Care and bed unavailable. Urgent pain/anaesthetic review indicated.

- All specialities to review and document plan before patient leaves ED.
- Refer to Critical Care if Chest Injury Score >20, chest drain, advanced regional anaesthesia or multiple injuries.
- Patients **not** to go to wards other than those specified on pathway unless indicated for specialist care. If destination 'other' document rationale for specialist care in medical notes.
- Patients must **not** go straight to Wellington ward without CDU admission for tertiary survey and acute pain control**.**

## ADMISSION CHECKLISTS

**Ensure printed 'Adult Chest Wall Injury Pathway – RCH inpatient use' (CHA3949) completed and available in patient notes with reviewing clinician/date/time clearly documented**

## On presentation to ED

- Calculate and document Chest Injury Score
- Prescribe 'Major Trauma' analgesia chest injury bundle on EPMA according to Chest Injury Score
- Refer to Acute Pain Service:
  - *Mon-Fri: Acute Pain Team (0830-1630 Mon-Fri) via bleep 3233. 1st-on call anaesthetist (1630-2000 bleep via Switch), Senior Anaesthetic Trainee (2000-0800 via Switch)*
  - *Sat-Sun/Bank holidays: 1st-on call anaesthetist (1300-2000, bleep via Switch), Senior Anaesthetic Trainee (2000-0800, 0800-1300, bleep via Switch)*
  - *If unable to reach above anaesthetic trainees out of hours via bleep – suggest phoning CEPOD or Trauma theatre to discuss patient*
  - *Place an inpatient Pain referral on Maxims*
- Refer to Critical Care Outreach (bleep via Switchboard)
- Refer to Major Trauma Co-ordinator at RCHT via phone **07917167942** (*leave voicemail out of hours*) or via PAS/Swiftplus
- Refer for chest Physiotherapy
  - Referral route will depend on destination ward and time of day – contact On-call Physio if out-of-hours. Urgent referrals for secretion retention or lung collapse only overnight – non urgent to be referred the next day if overnight admission.
- Escalation plan for all patients before leaving ED (in conjunction with Critical Care Outreach/SAT)

**Next morning (Prior to leaving CDU or as part of ICU morning review)**

- Tertiary survey to be completed and documented (on formal tertiary paperwork) and plan for all other injuries (senior ED/ICU doctor)
- Refer to Physio if not already done (via destination ward)
- Refer to General Surgery on-call team for shared care and to make Thoracics referral
- Refer to Thoracics as per referral criteria (*Thoracics SpR in working hours, Cardiothoracic SpR out of hours via Derriford Switchboard)*
- Refer to Medicine (Respiratory team for ICU discharges) for shared care
- Inform Site Coordinator of impending Wellington admission
- In terms of rib fractures, patients may be classed as medically fit for discharge when established on oral analgesia (+/- oral antibiotics) and any nerve blockade has resolved.
- **Ensure printed 'Adult Chest Wall Injury Pathway – RCH inpatient use' (CHA3949) completed and available in patient notes**

End