

# Chest Injury

## Injury Guideline

Action:	Trauma Team Leaders, ED Middle Grades Acute Care Physicians ITU Consultants, ITU Middle Grades Acute Care Team (Pain Management Team) Physiotherapy				
Info:	MTMC				
Related documents:					
Publication date:	Jul 15	Review date:	Apr 17	Version	1
Authors:	Robin Berry, Mark Rocket, Kate Sharpe				

### References:

- a. Predicting outcomes after blunt chest wall trauma: development and external validation of a new prognostic model. Cerri Battle et al; *Critical Care* 2014, 18:R98
- b. Rib Fractures in Older Adults – What’s the Big Deal? Christina Shenvi, ALiEM, June 3<sup>rd</sup> 2015

**1. Introduction.** It is well recognised that morbidity and mortality associated with rib fractures is due to poor analgesia, inadequate physiotherapy and respiratory support leading to atelectasis and pneumonia. The risk of developing complications following rib fractures can be stratified using well recognized physiological markers such as age and number of ribs fractured. Using an adaptation of a published and validated prognostic model we have developed a chest trauma tool to facilitate the correct placement and management of patients with rib fractures.

**2. Inclusion Criteria.** All patients with rib fractures.

**3. Patient Identification.** Patients will be identified through the Emergency Departments and Assessment Units.

**4. Responsible Clinician** The assessing clinician will be responsible for initiating the chest trauma pathway and contacting the relevant team.

**5. Procedure** Responsible clinician should assign a score to the patient and the appropriate outcome as indicated by the tool (Annex A). This should be audited against the patient’s actual pathway through the hospital.

**6. Indications for rib fixation**

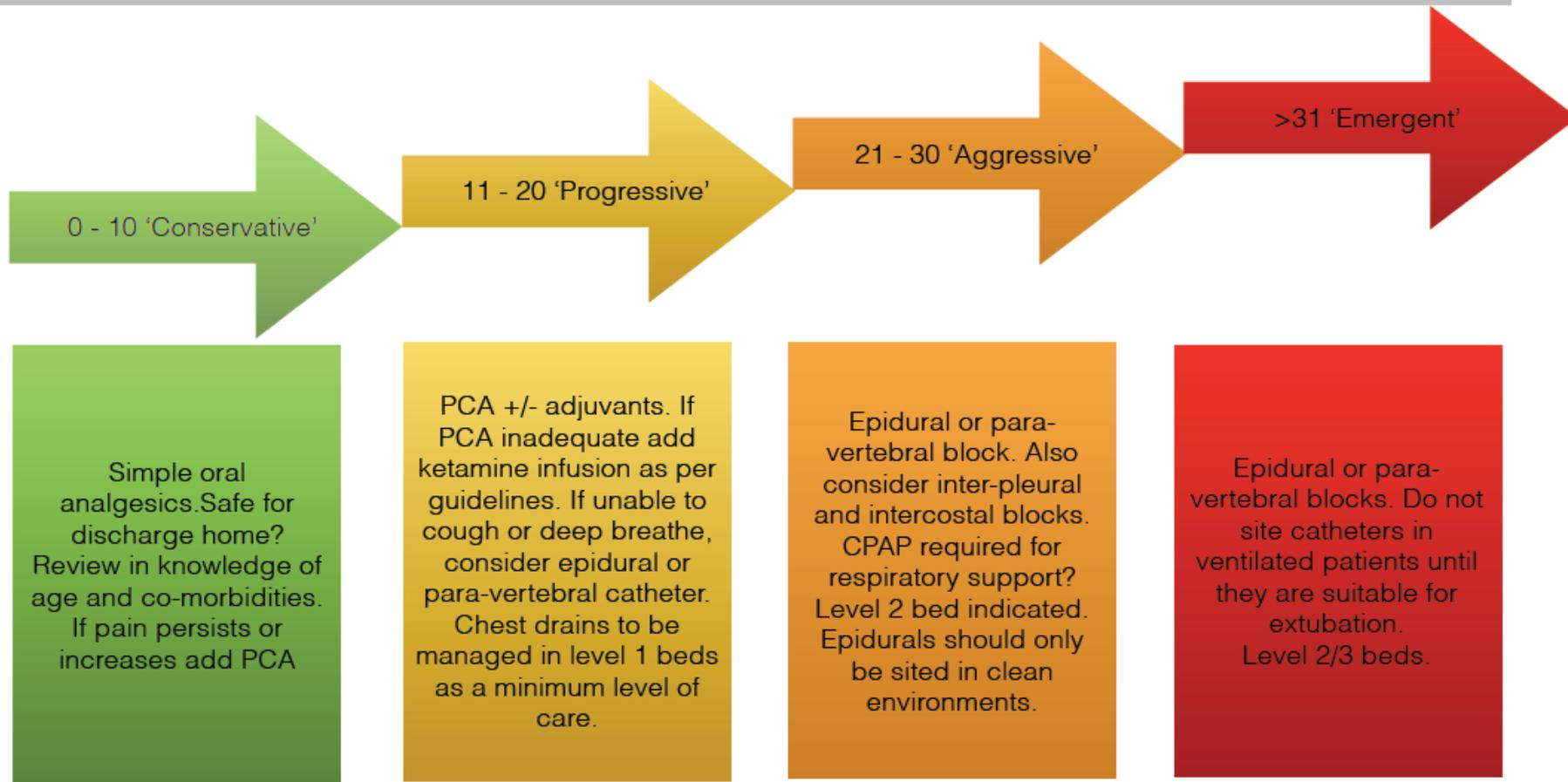
- a. Likelihood of respiratory compromise (symptomatic fractures of 3 or more consecutive ribs, flail segment, significant co-morbidities, chest score > 21)
- b. Difficult pain management in non-intubated patients despite appropriate use of the Derriford analgesic ladder and regional techniques (Annex B).
- c. Intubated patients who fail to wean from the ventilator.
- d. Thoracotomy being undertaken for associated thoracic injury.
- e. Patients with severe anterolateral flail chest and or severe chest wall deformity, with or without pulmonary herniation.

**7. Future Developments.** To use audit data from the tool to assess the existing capacity for level 2 and 3 beds and to evaluate the requirement for a trauma ward with staff adequately

trained in chest drains and regional analgesic techniques. The outcomes from rib fixation to be audited.

**8. Assurance.** Compliance with the SOP will be assured via the Trauma Audit Research Network process and Peninsula Major Trauma Centre Governance pathway.

## Derriford Hospital Chest Injury Tool



Score: Age + 1 for each 10 years from age 10; Ribs + 3 for *each individual fracture*; Chronic lung disease + 5; Existing anti-coagulant or anti-platelet use + 4; SaO<sub>2</sub> + 2 for each 5% decrease below 95%.

Cardio-thoracic (Bleep 0771) referral for complex cases and when chest drains fail to resolve symptoms and for opinions regarding rib fixation. Physiotherapy (bleep 89226) with rehabilitation prescription as indicated by TARN.

Use Derriford analgesic ladder and prescription guidelines. Refer all patients to Acute Care Team Bleep 0500/0195

# Derriford Hospital Analgesic Ladder for non-malignant acute pain

## If pain unresolved:

Identify type of pain and consider adjuvant medication or alternative / parenteral opioid. Contact Acute Care Team for advice or review.

ACT Pain Nurse Specialist 0500

## Mild pain

**Regular Paracetamol 1g qds**  
(maximum paracetamol dosage 60mg/kg/day if weight < 50kg. See drug chart for further advice)

**eGFR ≥ 60ml/min**

Consider **PRN NSAID** unless contraindicated (see drug chart for further advice)

**eGFR < 60ml/min**

Avoid non-steroidal anti-inflammatory drugs.

## Moderate pain

**Regular Paracetamol 1g qds**  
(maximum paracetamol dosage 60mg/kg/day if weight < 50kg. See drug chart for further advice)

**Plus**

**Regular NSAID (Naproxen or Ibuprofen)**

(unless contraindicated e.g. eGFR < 60ml/min. See drug chart for further advice)

**and**

**PRN intermediate opioid**  
(eg: Codeine 30-60mg qds, Tramadol 50-100mg qds)

**eGFR < 60ml/min**

Avoid non-steroidal anti-inflammatory drugs.

**eGFR < 30ml/min**

Caution with tramadol and codeine

## Severe pain

**eGFR ≥ 30ml/min**

**As for moderate pain Plus**

**Surgical Patients or acute medical pain of limited duration**

**Oramorph 2 hourly PRN**  
(adjust by age - see notes)

**Medical Patients**

**For ongoing pain (if strong opioids appropriate)**

**Regular Oramorph 5mg 4 hourly**  
**Increase to 10mg 4 hourly if necessary**  
**>75 yrs reduce to 2.5mg 4 hourly**

**Plus Oramorph of the same dose 2 hourly PRN**

**eGFR < 30ml/min**

**Surgical Patients**  
**Oxycodone IR caps**  
**2 hourly PRN**  
(adjust by age - see notes)

**Medical Patients**

**Regular Oxycodone IR caps**  
**2.5mg 4 hourly**  
**1-2mg for >75yo**  
**Also available as liquid**

## Notes

### Opioid dosing

#### Oramorph PRN 2hrly

Age (years)	Dose(mg)
18-59	20-30mg
60-69	10-20mg
70-89	5-10mg
>89	2.5-5mg

#### Oxycodone IR PRN 2hrly

Age (years)	Dose(mg)
18-59	10-15mg
60-69	5-10mg
70-89	2.5-5mg
>89	1-2.5mg

- This guideline is to be used in conjunction with the BNF and PHNT joint formulary.
- Ensure a full pain history is taken from all patients (using SOCRATES) and regular analgesics are prescribed.
- Be aware of the dose equivalence of opioids prescribed – particular care is needed with opioid patches.
- Subcutaneous route is preferred to repeated im or iv injections.
- Be aware of the influence of renal impairment, age and opioid tolerance on opioid prescribing.

### Opioid equivalence:

- 10mg oral morphine
  - 5 mg Morphine SC / IM
  - 3mg Morphine iv
  - 5mg oral Oxycodone
  - 100mg oral Tramadol
  - 120mg oral Codeine
  - 200mcg sublingual Buprenorphine
- NB: Fentanyl patches are very high dose with slow onset **and are not to be used for acute pain** (consultant prescribing only)

Pain is the “Fifth Vital Sign” and must be assessed and recorded alongside other vital signs. All staff involved in the prescribing, dispensing and administration of controlled drugs must be familiar with the characteristics of the drugs used.

M. Rockett for ACT 2014  
V12.0 review 2016