NHS
Bedfordshire Hospitals
NHS Foundation Trust

CLINICAL PROCEDURAL DOCUMENTS

Document Title: Pain Management of Acute Rib Fractures in Adult Patients

This document is relevant for staff at: *(please indicate)*	**Luton Hospital site**	**Bedford Hospital site**	**Both Hospital sites** X

Document Type: *(please indicate)*	**Clinical Guideline** X	**Standard Operating Procedure**	**PGD**	**Integrated Care Pathway**

Document Author / Responsible Author(s):
[redacted] – Lead Pain Nurse Cross site
[redacted] – Senior Pain Nurse
[redacted] Lead Pain Nurse Bedford

Document Developed in consultation with:
Luton Site:
[redacted] – Anaesthetist and Acute Pain Consultant
[redacted] – Consultant in General Surgery
[redacted] Principal Pharmacist – critical care and surgery
[redacted] – Specialist Pharmacist Critical care and Theatres
[redacted] – Senior Physiotherapist
Bedford Site:
[redacted] – Senior Pain Nurse
[redacted] - Colorectal consultant
[redacted] - Colorectal consultant
[redacted] - Colorectal consultant
[redacted] - Colorectal consultant
[redacted] - Surgical care practitioner - SCP
[redacted] - surgical care practitioner - SCP
[redacted] - Upper GI Consultant
[redacted] - Anesthetic Consultant & lead for pain service Bedford Hospital site)
[redacted] - Anesthetic Consultant
[redacted] - Anesthetic Consultant
[redacted] - Physiotherapy team Leader
[redacted] - Physiotherapy team Leader
[redacted] - Physiotherapy team Leader

Is this document new or revised / or has minor amendments?
Amalgamated guideline to cover both hospital trust sites

Reason for minor amendments? Please highlight all amendments in your document.
Amalgamated guideline to cover both hospital trust sites

Document Number CG474T	**Version Number**: 1
Target Audience/Scope: *(who is the document applicable to)*	All trust nursing and medical teams

Associated Trust Documents: *(policies / guidelines which directly impact on this document)*	**Cross site** CG338T - Guideline for Patient Controlled Analgesia and Nurse Controlled Analgesia (PCA/NCA) in Adult Patients. CG02T – Guideline for Continuous Local Anaesthetic Infusion using Elastomeric pumps for Pain Management CG517T – Guideline for IV administration of Naloxone for reversal of opiate /opioid overdose in Adults CP06T - Policy for the Use of Medicines. M04T - Medical Devices Management Policy C18T – Consent Policy **Luton and Dunstable site;** CG464 – Guideline for Pain Assessment in Adults. CG463 – Guideline for Administration of Intravenous Opioids for Adult Patients. CG367 – Guideline for the Management of Continuous Epidural Infusion in Adult Patients CG 284L – Management of Local Anaesthetic Systemic Toxicity (LAST) CG248 - Guidelines for Regional Anaesthesia in Patients on Anticoagulants and Anti platelet drugs. **Bedford site;** Management of epidural infusions (adults) – Not applicable to obstetric patients)	
Date of Approval: 6th September 2023	**Review Date:** September 2026	
Chair of Clinical Guidelines Signature: [redacted]	[redacted]	**Date:** 6th September 2023

Contents

Purpose

The purpose of this guideline is to provide guidance in managing an adult patient (16 years and over), who may have sustained an acute fractured rib/s. This includes methodically and accurately managing the patient's pain.

Pain control for the patient with rib fracture/s is fundamental to decrease respiratory splinting, to clear pulmonary secretions and to maintain good respiratory function in order to prevent pulmonary complications.

This guideline will cover adult in-patients (16 years and over), who present with diagnosed or possible rib fracture/s.

Introduction

Rib fractures are a common consequence of an impact and/or blunt trauma to the thoracic cage, most commonly following road traffic accidents and falls. Less frequent causes include non-accidental injury i.e. abuse (referring to local safeguarding guidance as appropriate) aggressive cardiopulmonary resuscitation, athletic activities, or fractures from severe coughing with primary bone tumours or metastatic lesions. A higher number of rib fractures are associated with significant morbidity and mortality, especially when sustained alongside other serious injuries. Therefore conservative treatment includes adequate pain control and supportive pulmonary care, primarily reducing the risk and need for mechanical ventilation (Cundy & Williams 2021).

The elderly are particularly susceptible to rib fractures and the associated complications, with pneumonia rates as high as 31%. Ribs fracture more easily and are often a result of only moderate trauma. This is as a consequence of osteoporosis, cartilage degeneration, and reduced elasticity. Respiratory mechanics are affected due to a reduced muscle mass, a weakened diaphragm, and intercostal muscles, along with a loss of alveoli. These changes culminate in a reduced lung volume, decreased lung function, and impaired gas exchange with a poor respiratory reserve. All these alterations, along with other co-morbidities, put the elderly patient with rib fractures at increased risk of hypoventilation, atelectasis, pneumonia, and subsequent ventilator complications. The key to managing patients with rib fractures is early recognition of those at risk of deterioration, prompt and effective analgesia, early mobilisation and physiotherapy plus respiratory support where indicated. (Cundy & Williams 2021).

May et al (2016) identify three main complications from rib fractures: hypoventilation due to pain, impaired gas exchange due to lung damage around the injury, and changes with physiological breathing mechanics. As pain from rib fractures can also lead to the identified increase in respiratory complications (pneumonia, pulmonary effusion, aspiration, acute respiratory distress syndrome (ARDS), pulmonary emboli, pneumothorax or haemo-pneumothorax) prompt and appropriate administration of multimodal analgesia

will assist the patient to deep breath and cough, helping prevent the severe complications of respiratory failure.

Supplementary oxygen, nebulisers, referral for chest physiotherapy and careful management of fluid balance, minimising a positive fluid balance, should all be considered by the patient's admitting team. This is all in order to optimise recovery, ability to complete breathing exercises and mobility as soon as possible after injury.

*If conservative measures are not adequate, referral to a specialist centre for rib fracture stabilisation may need to be considered. Surgical fixation of fractures is not presently provided at Bedfordshire's Hospital's. Nearest centres: Addenbrooke's Trauma centre, Papworth and Harefield can be consulted.

Surgery is indicated in:

- Flail segment
- Severely displaced fractures
- Difficulty in weaning from mechanical ventilation.

Fixation of severe thoracic wall injuries can reduce length of stay, duration of ventilation, duration of critical care, better control of pain and reduced mortality.*

Assessment of severity of injury.

Cundy & Williams (2021) suggest assessing, key diagnostics, including:

- assessing for the presence of risk factors i.e. blunt trauma, abuse, osteoporosis or sporting injury
- pain assessment
- observation of the chest wall i.e. impaired chest movement, flail chest
- Appropriate history to be taken about type of trauma and associated injuries (e.g. RTC, Penetrating injury, non-accidental trauma, falls)

Clinical findings

- Patients with rib fracture/s will frequently complain of pain on inspiration, twisting, bending and dyspnoea.
- Tenderness on palpation, crepitus (surgical emphysema) and chest wall deformity; consider flail chest.
- Signs of ventilatory insufficiency; cyanosis, tachypnea, retractions and use of accessory muscles for ventilation, e.g. abdominal breathing.
- To look out for other associated injuries (blood vessel, cardiac, lung, spleen, liver and clavicle).
- Visible bruising around the rib area is not common initially.

Diagnosis

- Can be reached by patient history, physical examination and clinical presentation.
- Radiological studies are also used to confirm findings. X-rays generally requested are anteroposterior (AP) and lateral chest films. However, sensitivity can be as low as 50%.
- Ultrasound, CT scan, angiography (where vascular damage is suspected, due to increasing haemothorax or cardiovascular instability)
- Bone Scan (where a pathological or malignant cause is suspected) may also be used.

Management

Treat pain immediately and reassess regularly, particularly following any treatment by using the pain functional activity score (see page 7). Vital observations as guided by the relevant national early warning score document (NEWS 2) in addition to following any interventional/pain management guidance, re-evaluating effectiveness of treatment.

As with all pain management, clinicians are to give primary consideration to Bedfordshire Hospitals Acute Pain analgesic ladder for adult patients, in addition to the recommendations within this guidance.

In-patient admission for fractured rib/s should be under the care of the admitting surgical team, unless clinically indicated otherwise.

See below poster of pathway for pain management for acute rib fracture/s in adults.

Pain management Pathway for Acute Rib Fracture/s in Adults

NHS Bedfordshire Hospitals NHS Foundation Trust

Step 1. Confirmation of NEW fractured rib/s – via appropriate imagining/clinical investigation
In-patient admission for acute fractured rib/s ideally under the admitting Surgical team.

Step 2. Assess Pain Functional Activity Score

1 No function limitation due to pain	2 Patient able to deep breathe but with moderate to severe pain	3 Patient unable to deep breathe due to pain

Step 3: Prescribe Appropriate Analgesia *(based on assessment of Pain Functional Activity Score)*

Regular Analgesia:

Paracetamol 1g QDS
< 50kg please see guidance on Nerve centre

Ibuprofen 400mg TDS
-Avoid in patients over 75yrs old
-Avoid in patients with renal impairment.
-Avoid in suspected/confirmed haemothorax patients
-See BNF for all contra-indications

AND

Regular Opioid:
(Consider patients sensitivities / allergies & age)

Codeine Phosphate 30-60mg QDS

Or

Tramadol 50mg QDS

AND

PRN Morphine Sulphate Oral Solution 10mg 2 hourly

OR

Oxycodone immediate release 2.5mg-5mg PO 2hourly

Regular Analgesia:

Paracetamol 1g QDS
< 50kg please see guidance on Nerve centre

Ibuprofen 400mg TDS
-Avoid in patients over 75yrs old
-Avoid in patients with renal impairment.
-Avoid in suspected/confirmed haemothorax patients
-See BNF for all contra-indications

AND

Initial bolus Morphine Sulphate 10mg IV (in ED / de-signated areas only)
See Local Guideline.

AND

Morphine PCA OR Oxycodone PCA
See PCA Guideline & Use PCA Booklet

Regional Anaesthesia may also be considered.

Regular Analgesia:

Paracetamol 1g QDS
< 50kg please see guidance on Nerve centre

Ibuprofen 400mg TDS
(Unless contra-indications see BNF)

AND

Initial bolus Morphine Sulphate 10mg IV (in ED / de-signated areas only)
See Local Guideline

AND

1st Line – Regional Anaesthesia
Patient to be discussed with On-call Anaesthetist and booked on Emergency List if appropriate.

Serratus Anterior Plane (SAP) block +/- continuous infusion via 'Pain Buster'
(local for anterior / lower rib fractures)

Or

Erector Spinae Plane (ESP) block +/- continuous infusion via 'Pain Buster'
(local for posterior rib fractures)

Or

Thoracic epidural 'Critical care only'

+/-

Morphine PCA or Oxycodone PCA)
See PCA Guideline & Use PCA Booklet

If Scoring 2 – 3:

1. Discuss & contact on call Anaesthetist / Anaesthetist covering Theatre Emergency List
   Information needed:
   - How many rib/s fractured
   - Location (Left/Right/Bilateral) and Position (anterior or posterior)
   - Coagulation status i.e. are they on anticoagulation therapy, if so what, INR (if available)
   - Any other relevant clinical details – other injuries, co-morbities.
2. Book on Theatre Emergency List
3. Inform Pain Team for support (within working hours – Monday-Friday 8am-4pm)
4. Nursing staff to prepare patient – Surgical gown, surgical check list.
   NB Patient does **NOT** need to be Nil by Mouth while waiting for a nerve block.
5. Consent patient (anaesthetist).
6. Consider prescribing a PCA while waiting for nerve block (see PCA guideline/booklet).

Inpatient Pain Service - July 2023

Please note:

- As with any medications/prescriptions, consideration must be given to the patient's age, weight, renal function and other pharmacodynamics, with dose adjustments made accordingly.
- All usual prescribing cautions, contraindications and/or drug interactions are to be considered when prescribing any of the following medications, referring to the most relevant and up to date BNF for guidance.
- For invasive local anaesthetic procedures, contraindications and complications must also be considered, and discussed with the patient, prior to the procedure wherever possible.
- Do not use Entonox in suspected haemo/pneumothorax.
- Under pain team advice only if unsuitable for a regional block it may be appropriate to consider Lidocaine plaster 5% topical (12 hours on 12 hours off) inpatient only. This will be decided on specialist advice only as per local drug formulary.

Regional Anaesthesia Techniques – *Stop Before You Block (SBYB)*

For regional anaesthesia please add the patient to the emergency theatre list and contact the on-call anaesthetist/pain team.
The technique of choice depends on various factors including unilateral/bilateral fractures, other fractures (apart from rib fractures), coagulation status and cardiovascular stability. The on-call anaesthetist will assess the patient before offering a procedure and technique of choice.

Serratus Anterior Plane (SAP) / Erector Spinae Plane (ESP) Block/Continuous Infusion: These are technically simple and low risk. The procedure involves deposition of local anaesthetic in SAP/ESP, which blocks the intercostal nerves. SAP is more suitable for anterior/lateral, whereas ESP is more reliable for posterior/lateral rib fracture/s. It can provide analgesia for the whole of a hemi-thorax. A catheter can be used for infusions via use of an elastomeric pump. Can be managed on any surgical ward.

Thoracic Epidural: More suitable for bilateral and multi-level rib fractures. The epidural should be sited at the level of the mid-point of the extent of the fractured rib segments. Patients with a thoracic epidural can only be managed in Critical care.

N.B.

** Regional anaesthesia techniques offered by the on-call anaesthetist will depend on skills available at the time of referral**

*** Types of regional anaesthesia see appendix 1***

*** To manage effects of severe LA toxicity refer to appendix 2. Refer to Local anaesthetic prescription and monitoring chart see appendix 3. LA toxicity trays are in designated areas including theatres/recovery and ICU. ***

Designated areas for management of analgesia and treatment

Oral Analgesia	Any ward
PCA	Ideally, patient to be cared for on surgical wards. See Trusts PCA guidelines for more information
Local Anaesthetic Infusion (regional anaesthetic techniques)	Surgical wards /Critical care See Trusts Local anaesthetic infusion guidelines for more information
Thoracic Epidural	**Designated surgical ward/s only:** • if epidural level is T6/7 or below **and** patient is stable **OR** **Critical care only:** • if epidural level is required to be T5/6 or higher or patient unstable

Physiotherapy

The goal of physiotherapy is to prevent the onset of complications due to compromised ventilation and impaired clearance of pulmonary secretions.

The treatment techniques that are needed for the individual patient will be based on a full assessment by a Physiotherapist, determination of the patient's main problems and production of a relevant treatment plan. The Physiotherapist will decide from their assessment which treatment technique(s) is required.

The techniques required to optimise the patient's respiratory function, in the presence of rib fractures, are reliant on good, effective, regular analgesia being in place. Please consider reviewing analgesia before referring to physiotherapy, otherwise treatment is likely to be limited.

The following techniques are frequently used to ensure effective ventilation and clearance of secretions:

- Early and regular mobilisation - this is essential to aid re-inflation of atelectasis and movement of secretions.
- Positioning – upright positioning is useful to optimise V/Q matching. In the presence of segmental or lobar collapse side lying can be used to improve recruitment of alveoli and improve ventilation.
- Incentive Spirometry - to encourage deep breathing. This allows targets (volume) for the patient to achieve and helps to measure improvement. It can continue after discharge.
- Positive pressure adjuncts (e.g. IPPB, PEEP) – can be used as long as there is no undrained pneumothorax. This is utilised in the presence of severe atelectasis/lobar collapse.
- Use of towels / pillows to support the chest wall to aid effective cough.
- If the patient has pre-existing lung disease e.g. COPD, or other condition which leads to excess sputum production, they may require the Active Cycle of Breathing Technique (ACBT). This uses a

combination of different breathing techniques to aid expectoration of secretions and reduce work of breathing.

- Manual techniques to aid secretion clearance should not be used directly over the fractures and only if all other techniques have proved unsuccessful in removing retained secretions.
- These techniques can be used alongside ventilation support (CPAP/AIRVO) on HDU.

During weekday working hours contact would need to be made to the Physiotherapy team covering that ward regarding assessment. Outside of normal working hours/weekends the On-Call Physiotherapy team can be contacted for emergencies. All patients referred to the On-Call service must be assessed by a member of the Medical team and the appropriate referral form completed. The Physiotherapy team will then screen the referral regarding a need for urgent intervention, to provide advice or assess the patient.

Referral to Critical Care Outreach

Early referral to Critical Care outreach team (available 24 hours a day) or on- call Anaesthetist is essential where the following referral criteria are met:

- Patients requiring additional cardiovascular, respiratory (CPAP/NIV) support.
- Patients requiring Epidural infusions or background opioid infusions on PCA.

Audit and Review

Adherence to this guideline will be audited yearly by the Pain Service. Audit by exception via Trust's incident reporting system (InPhase). This guideline will be reviewed every 3 years by the Pain Service.

Appendix 1: Role of anaesthetic interventions

Technique	Strengths	Weaknesses
Thoracic epidural • Traditional gold standard for major rib injuries • Needs appropriate training & post-procedure management • Performed in theatre with OPD assistance and full resuscitation drugs/equipment • Refer to guideline: Management of epidural infusions (not applicable to obstetric patients)	• Familiar technique • Effective analgesia • Long safety record • Reliable effects	• Hypotension • Urinary retention • Motor blockade • Nausea and vomiting • Headache • Nerve injury • Consideration of coagulopathy
Erector spinae plane block • Targets the musculofascial plane superficial to the transverse processes (away from pleura, major vessels and discrete nerves) with indirect spread of local anaesthetic to paravertebral and epidural space to produce analgesia but not clinically significant motor block or hypotension • Needs appropriate training and post-procedure management: specific local anaesthetic device and specific care for duration of infusion • Infused drugs: levobupivacaine/bupivacaine 0.125% 5-15ml/hr	• Unilateral technique • Easy to perform • Amenable to catheter techniques • Possible in coagulopathy	• Best performed with ultrasound • Single-shots of limited duration • May require multiple injections • Variable local anaesthetic spread
Serratus plane block • Needs appropriate training and post-procedure management: specific local anaesthetic device and specific care for duration of infusion • Infused drugs: levobupivacaine/bupivacaine 0.125% 5-15ml/hr	• Unilateral technique • Easy to perform • Amenable to catheter techniques • Possible in coagulopathy	• Requires ultrasound • Variable local anaesthetic spread • Only covers antero-lateral rib fractures • Insertion can be hampered by subcutaneous emphysema or chest drains

Appendix 2: Guidelines for the Management of Severe Local Anaesthetic Toxicity

(The Association of Anaesthetists of Great Britain & Ireland 2010)

AAGBI Safety Guideline

Management of Severe Local Anaesthetic Toxicity

1 Recognition

Signs of severe toxicity:

- Sudden alteration in mental status, severe agitation or loss of consciousness, with or without tonic-clonic convulsions
- Cardiovascular collapse: sinus bradycardia, conduction blocks, asystole and ventricular tachyarrhythmias may all occur
- Local anaesthetic (LA) toxicity may occur some time after an initial injection

2 Immediate management

- Stop injecting the LA
- Call for help
- Maintain the airway and, if necessary, secure it with a tracheal tube
- Give 100% oxygen and ensure adequate lung ventilation (hyperventilation may help by increasing plasma pH in the presence of metabolic acidosis)
- Confirm or establish intravenous access
- Control seizures: give a benzodiazepine, thiopental or propofol in small incremental doses
- Assess cardiovascular status throughout
- Consider drawing blood for analysis, but do not delay definitive treatment to do this

3 Treatment

IN CIRCULATORY ARREST

- Start cardiopulmonary resuscitation (CPR) using standard protocols
- Manage arrhythmias using the same protocols, recognising that arrhythmias may be very refractory to treatment
- Consider the use of cardiopulmonary bypass if available

GIVE INTRAVENOUS LIPID EMULSION
(following the regimen overleaf)

- Continue CPR throughout treatment with lipid emulsion
- Recovery from LA-induced cardiac arrest may take >1 h
- Propofol is not a suitable substitute for lipid emulsion
- Lidocaine should not be used as an anti-arrhythmic therapy

WITHOUT CIRCULATORY ARREST
Use conventional therapies to treat:

- hypotension,
- bradycardia,
- tachyarrhythmia

CONSIDER INTRAVENOUS LIPID EMULSION
(following the regimen overleaf)

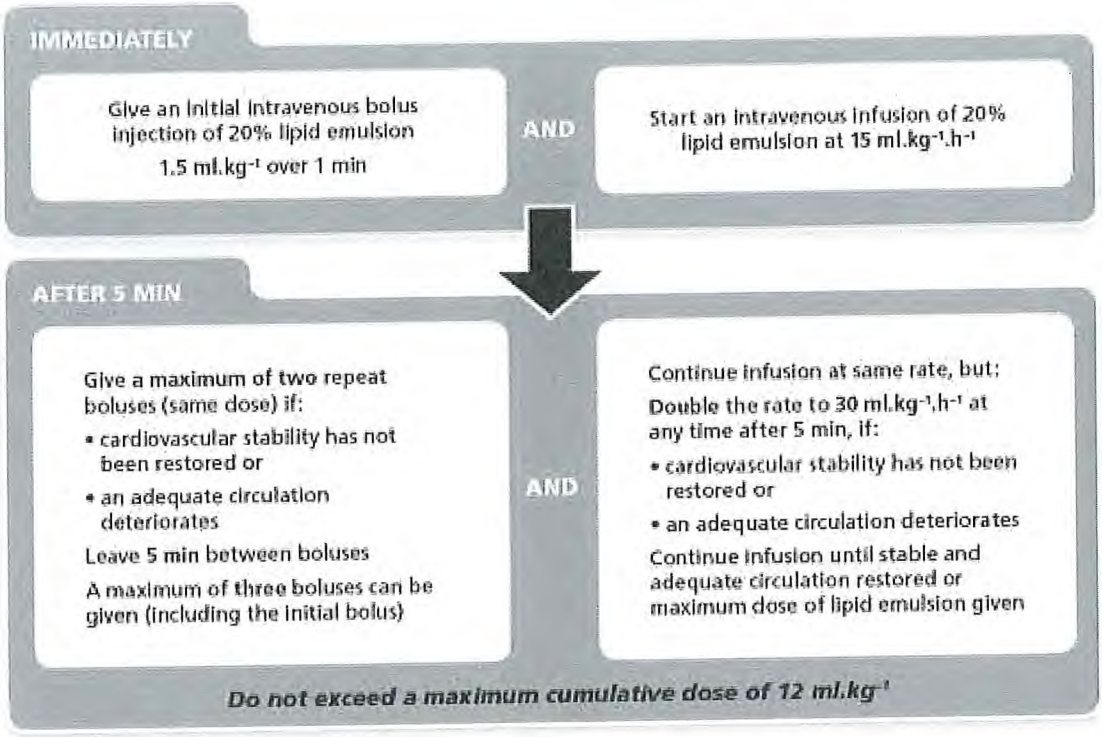
- Propofol is not a suitable substitute for lipid emulsion
- Lidocaine should not be used as an anti-arrhythmic therapy

4 Follow-up

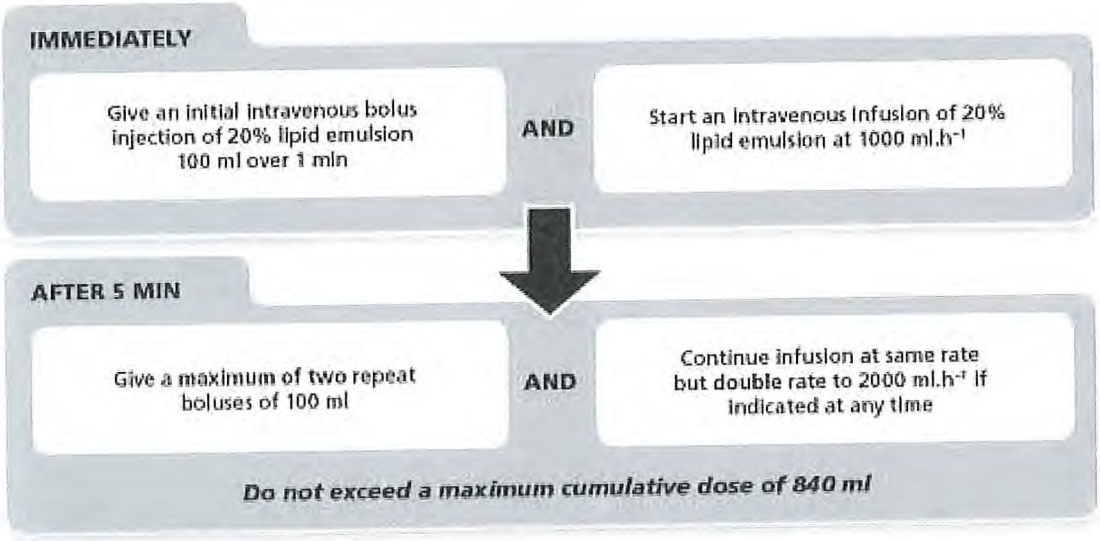
- Arrange safe transfer to a clinical area with appropriate equipment and suitable staff until sustained recovery is achieved
- Exclude pancreatitis by regular clinical review, including daily amylase or lipase assays for two days
- Report cases as follows:
  - In the United Kingdom to the National Patient Safety Agency (via **www.npsa.nhs.uk**)
  - In the Republic of Ireland to the Irish Medicines Board (via **www.imb.ie**)

If Lipid has been given, please also report its use to the International registry at **www.lipidregistry.org**. Details may also be posted at **www.lipidrescue.org**

Your nearest bag of Lipid Emulsion is kept .....



An approximate dose regimen for a 70-kg patient would be as follows:



This AAGBI Safety Guideline was produced by a Working Party that comprised:
Grant Cave, Will Harrop-Griffiths (Chair), Martyn Harvey, Tim Meek, John Picard, Tim Short and Guy Weinberg.

This Safety Guideline is endorsed by the Australian and New Zealand College of Anaesthetists (ANZCA).

Appendix 3 – Local Anaesthetic Prescription and Monitoring Chart (elastomeric Pump)

(Ordered and printed externally)

Date	Time	Infusion Rate 1	Infusion Rate 2	Functional Pain Score	ACVPU Score	Site Checked	Motor Block Score L	Motor Block Score R	Clamps Open/ Closed	Any Signs of LA Toxicity	Comments	Initials

Removal: Date_____ Time_____ Sign_____

Catheter inspected and tip fully intact: Yes ☐ No ☐

Action_____

If resistance is felt on removal - STOP, call pain team or bleep on-call anaesthetist and follow trust guidelines: (CG02T).

Version 2
Pain exam November 2022

Manufacturer's Sticker with Product Details

NHS
Bedfordshire Hospitals
NHS Foundation Trust

Local Anaesthetic Prescription and Monitoring Chart (Elastomeric Pump)

Date:

Operation/Condition:

Allergy status

Date_____

Sign_____

Patient Sticker

Standard Infusion: Pre filled **Local Anaesthetic Infiltration Infuser** with 0.125% bupivacaine/levobupivacaine *(delete as appropriate)* infusing at variable flow from 1ml/hr - 14ml/hr.

The infusion must be recorded on the electronic Drug Prescription chart as a refer to paper chart quicklist.

Continuous Infusion Dose single catheter 1-14ml/hr	Signature_____
Single Catheter 1 - _____ ml/hr background	Date_____

Continuous Infusion Dose double catheter each to infuse 1-7ml/hr	Signature_____
Double Catheter 1: 1- _____ ml/hr background	Date_____
Double Catheter 2: 1- _____ ml/hr background	

ADMINISTRATION	Starting Rate (mls/hr)	Start Time	Volume to be Infused (VTBI)
Signature 1: Signature 2:			

Details of Infusion/Catheters

Site of insertion of catheters_____

Rate change (ml)		Date	Time	Signature
1: From	To			
2: From	To			
3: From	To			

Version 2
Pain exam November 2022

Functional Pain Activity Score

1. No function limitation due to pain
2. Patient able to breathe or move but with moderate to severe pain
3. Patient unable to deep breathe or move due to severe pain

Sedation Score

- A Alert
- C Confusion
- V Voice
- P Pain
- U Unresponsive

Signs of Local Anaesthetic Toxicity		Action
none		Continue infusion
mild -	Restlessness / confusion Light headedness Numbness of the lips / tongue Tinnitus	Stop infusion by closing the clamps Maintain oxygenation Increase frequency of observations Contact Pain Team / on call anaesthetist
moderate -	As above including: Heaviness of limbs Muscle twitching Convulsions	Stop infusion by closing the clamps Phone [redacted] Maintain airway oxygenation
severe -	As above including Cardiac Arrhythmias Hypotension Respiratory arrest Cardiac arrest	Stop infusion by closing the clamps Call [redacted] Commence CPR if required Locate intralipid and follow the guidance

If appropriate, complete motor assessment

Block Lower Limb/s (Bromage)	OR	Motor Block Upper Limb/s (Movement)
0= No motor block full flexion of knees + ankles and able to lift legs against gravity		0= No motor block full movement and strength
1= Partial - just able to move knees + ankles		1= Inability to move wrist
2= Almost complete - just able to move ankles		2= Inability to flex elbow
3= Complete - unable to move ankles		3= Inability to raise, extend arm

Observations

Complete News 2 Chart
every 15 minutes for 1 hour
every 30 minutes for 1 hour
then 4 hourly if stable

Also record the following:
- Rate of infusion ml/hr
- Functional pain score rest/movement
- ACVPU score
- Motor block (if applicable)
- Catheter site check
- Clamps open/closed
- Signs of local anaethetic toxicity

Any signs of local anaesthetic toxicity inform the pain team/ on call anaesthetist and stop infusion by closing clamp. Maintain oxygenation, increase frequency of observations.

Motor block score 2 or above stop infusion, contact the pain team/on call anaesthetist.

Name:

Date of Birth:

Hospital No:

Date	Time	Infusion Rate 1	Infusion Rate 2	Functional Pain Score	ACVPU Score	Site Checked	Motor Block Score L	Motor Block Score R	Clamps Open/ Closed	Any Signs of LA Toxicity	Comments	Initials

Governance

Training *(training requirements – if applicable)*	Training for regional anaesthesia techniques – part of anaesthetic trainee curriculum. Management of pain devices – delivered via pain team. Replacement of elastomeric pumps must be carried out by Pain Team or trained anaesthetists.
References	Cundy, P. & Williams, N. (2021) BMJ Best Practice; Rib fractures. Available at: Rib fractures - Symptoms, diagnosis and treatment | BMJ Best Practice (Accessed 04/05/2023) Frederick B.R. Nicholas, J.L. & Benoit, X.B. (2023) *Comprehensive Review of current Pain Management in Rib Fractures with Practical Guidelines for Clinicians.* Journal of intensive care medicine. (Accessed 06/07/2023) Keir, A. & Hart, R. (2023) *Management of the patient with rib fractures.* Anaesthesia & Intensive Care Medicine. (Accessed 06/07/2023) May, L., Hillermann, C. & Patil, S. (2016) *Rib fracture management.* BJA Education 16(1) pp26-32. (Accessed 04/05/2023) Melendez, S. (2017). Rib Fracture. Medscape [Accessed 04/05/2023] Mukherjee, K. et al. (2023) *Non-surgical management and analgesia strategies for older adults with multiple rib fractures: A systematic review, meta-analysis, and practice management guideline from the Eastern Association for the Surgery of Trauma and the Chest Wall Injury Society*. Journal of Trauma and Acute Care Surgery. (Accessed 06/07/2023) Sarani, B. (2021) *Inpatient management of traumatic rib fractures.* Uptodate [online] (Accessed 24/03/2022)
Search Terms / Key words	Rib fractures Chest injury Pain

Equality Analysis - Impact Assessment Screening Tool for Policies

Equality Impact Assessment date completed	04/05/2023

Monitoring Criteria /Audit Criteria: Including the method, frequency, reporting arrangements and the responsible owner(s):

Adherence to this guideline will be audited yearly by the Pain Service. Audit by exception via Trust's incident reporting system (InPhase). This guideline will be reviewed every 3 years by the Pain Service.

AREA	NEGATIVE IMPACT		SIGNIFICANT Y/N?	
	Y ✓	N *	Y ✓	N *
1. Gender		N *		N *
2. Religion/ belief		N *		N *
3. Age		N *		N *
4. Disability (includes: mental health, learning disability, physical, sensory)		N *		N *
5. Ethnicity (includes: travellers and gypsies)		N *		N *
6. Sexual Orientation (includes: gay, lesbian, bisexual)		N *		N *
7. Transgender / Tran-sexual		N *		N *
8. Marriage or Civil Partnership		N *		N *
9.Pregnancy or Maternity		N *		N *
Additionally		N *		N *
10. Social / Economic		N *		N *
11. Rural / Urban		N *		N *
12. Health Inequalities		N *		N *
13. Application of NHS Accessible Information Standard		N *		N *

Impacts are usually measured in terms of positive, neutral and negative impact. E.g. it is useful to record if an impact is significantly positive for one group and neutral or negative for another group and to weigh up this along with the size of the groups within decisions.

For the purposes of this policy it is a significant positive impact to include and ensure that all these factors will be considered and embedded in all strategies, policies, procedures and frameworks written. This is along with the use of the Equality Analysis - Impact Assessment Screening Tool for Policies which will ensure that informed decisions are made that enable fair treatment, access and inclusion.

For any boxes marked as 'yes' above please complete details below

Area	Issue	Further Steps to be Taken

Negative Impact

Q1. Will the policy create any problems or barriers to any community or group? No
Q2. Will any group be excluded because of the policy? No
Q3. Will the policy have a negative impact on community relations? No

If yes, a full equality assessment must be done.

WILL THE POLICY …	**POSITIVE IMPACT**		**State how, i.e. evidence used to reach this decision**
	Y ✓	**N ***	
1. Remove the risk of direct or indirect discrimination			
2. Remove the risk of poor conduct or harassment			
3. Promote good community relations			
4. Promote a positive attitude between and to people of different groups			
5. Encourage participation of people from different and under-represented groups			
6. Consider more favourable treatment of disabled people			
7. Promote and protect human rights			
8. Promote Equal Opportunities and Fair Treatment			
9. Promote Access and inclusion			
10. Promote Dignity and Respect			

Assessed by (Name/s) _____

Signed		Post:		Date:	
Signed		Post:		Date:	