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Applicability Erlanger
Health -
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Rib Fracture Practice Management Guideline

1. Guideline Statement:

To develop and provide a systematic and safe approach to the care of the adult trauma patient with rib fractures.

Background: Ten percent of all blunt trauma patients sustain rib fractures. Rib fractures can lead to significant morbidity and mortality with a 35% rate of pulmonary complications and 12% mortality rate. The morbidity and mortality associated with rib fractures is caused by three main problems: hypoventilation due to pain, impaired gas exchange in damaged lung underlying the fractures, and altered breathing mechanics (Easter, 2001) The consequences of rib fractures are more severe as patients age, and the inflection point for age-related morbidity in rib fractures has been found to be age greater than 45 years (Kelley et al., 2019).

2. Scope:

All adult patients with a diagnosed traumatic rib fracture(s).

3. Purpose:

To improve clinical outcomes for patients with rib fracture(s)

4. Care Guidelines:

- Perform initial assessment and resuscitation
- Initiate O2 to maintain O2 saturation >92% unless history of home O2 then maintain Sat of 89-92%
- Obtain baseline chest x-ray (CXR) and/or CT scan of chest per injury pattern
- Obtain baseline EKG
- Calculate RIG score
- Respiratory Therapy to do initial patient instruction:
 - Teach patient to use incentive spirometry (IS) and document incentive goal in chart and on patient white board in room
 - Patients unable to perform IS need to be provided a Aerobika
 - Measure baseline negative inspiratory force (NIF) and positive expiratory force (PEF); if NIF and/or PEF decreased by 10% respiratory to notify physician
 - ICU patients within 1 hour of admission
 - Floor admissions patients within 6 hours of admission (nursing to notify upon admission)
 - Serial evaluations by respiratory therapists
 - ICU patients twice daily at the beginning of each shift for 5 days for manometry
 - Floor admissions once every morning between 0700-0900 for 5 days manometry
 - Bedside Nurse
 - Elevate HOB to 30 degrees unless contraindicated
 - Encourage hourly incentive spirometry in alert and cooperative patients, coughing and deep breathing and document
 - Mobilize at least three times daily unless contraindicated, if on (HI-VNI) VapoTherm or high flow device, coordinate with respiratory at bedside to assist with ambulation and respiratory assessment
 - RIG scores charted on white board and in EMR *team notification trigger: Any increase in RIG score increases
 - Resident
 - Present RIG score, IS, and manometry readings daily team rounds and record in progress note
 - Notify Chief for RIG score > 10, or if NIF and/or PEF decreased by 10%
 - Heparin lock IV when tolerating diet

RIG Score Calculator		
Variable		Points
Age ≥60 years		4
Incentive Spirometry <750 mL		4
Severe pulmonary contusions on CT scan		2
Rib fractures ≥5		2
COPD, Asthma, or smoker		2
Hemothorax, Pneumothorax, or chest tube placed		2
Pain score ≥6/10		1
Weak or absent cough		1
RIG Category	RIG Score	Disposition
RIG 1	≤2	Discharge if possible
RIG 2	3-9	Floor
RIG 3	≥10 or severe extra-thoracic injuries	ICU

Admit to ICU

- RIG 3- RIG score greater than or equal to 10 or severe extra-thoracic injuries

Admit to Floor/Trauma Stepdown Unit if admission required

- RIG 2- RIG score between 3 and 9.
- If requiring oxygen to maintain oxygen saturation with no history of underlying pulmonary dysfunction (i.e. COPD, emphysema)

Discharge Home

- RIG 1- RIG score less than 2 and no other injuries requiring admission.
- RIG 2- At Trauma attending discretion

Admission orders include:

- Incentive spirometry ten times per hour while awake
- Out of bed and ambulate as appropriate
- Cough and deep breath every 2 hours
- Breathing treatments to be included on initial order if needed for wheezing or per home regimen
- Obtain f/u CXR within 24 hours or with any change in status
- If febrile or having increased O2 requirements, mental status changes, or elevated WBC count, obtain order for CXR, urinalysis, respiratory to perform induced sputum culture and blood cultures X2
- **Respiratory: Respiratory Therapy modalities and treatments are tiered based on RIG scoring. Please refer to the EPIC Rib Fracture Order Set for appropriate treatment selection and guidance.**
- Pain Control: Multimodal systemic analgesia ordered upon admission or at the time of extubation, unless contraindicated (utilizing epic pre-built post-op orders for mild, mod, severe, and breakthrough pain)

Patients < 65 years of age

- Robaxin 1000 mg Q6 PO hours
- Tylenol 650 mg PO Q6 hours
- Single Select
 - Ibuprofen 600 mg PO Q6 hours x 5 days **OR**
 - Toradol 15 mg IV Q6 hours x3 days
 - Do not give in patients with renal insufficiency (SCr >1.2, creatinine clearance < 30) or in patients with history of gastric ulcers. Use caution in patients on concomitant nephrotoxic medications.
 - Check BMP every other day for patients on Toradol.
 - Protonix 40mg IV/PO is automatically ordered when Toradol and/or Ibuprofen are selected, with duration matched to the NSAID(s).
- Oxycodone 5 mg PO q 6 hours prn for pain scale 4-6
- Oxycodone 10 mg PO q 6 hours prn for pain scale 7-10
- If pain unrelieved call physician

Patients ≥ 65 years of age

- Robaxin 1000 mg PO q 8 hours
- Tylenol 650 mg PO q 6 hours
- Ibuprofen 600 mg PO Q6 x 5 days
 - Do not give in patients with renal insufficiency (SCr >1.2, creatinine clearance < 30) or in patients with history of gastric ulcers. Use caution in patients on concomitant nephrotoxic medications.
 - Check BMP every other day for patients on Ibuprofen.
 - Protonix 40mg IV/PO is automatically ordered when Ibuprofen is selected, with duration matched to the NSAID.
- Tramadol 50 mg PO Q6 hours prn for pain scale 4-6
- Oxycodone 5 mg PO Q 6 hours prn for pain scale 7-10
 - IF pain unrelieved call physician

****Thoughtful assessment of geriatric patients who may be less likely to tolerate multimodal systemic analgesia**

- Erector Spinae Plane (ESP) Block: Trauma Faculty must approve all Anesthesia consults regarding ESP.
 - Consideration of Erector Spinae Plane Block
 - Patients with a RIG score of greater or equal to 6
 - Trauma faculty approval required for patients with a RIG score less than 6
 - Patients with significant opioid abuse history
 - Patient should be hemodynamically stable
 - Patient should be cooperative
 - Should be able to assume a side lying position and/or be able to sit up and not in skeletal traction
- ESP Workflow For **Acute Care Patients** (this includes ED patients who are not ICU status):
 - Order Placement:
 - The referring provider will place an inpatient consult: Anesthesiology ESP BLOCK [CON1112].
 - Notification:
 - After placing the order, page **5966 or 5580** to ensure the team is aware.
 - Scheduling and Coordination:
 - Preop will see the case on their schedule. When ready, surgical services will arrange transport and call for report.

- Pre-Transport Communication:
 - Nurse-to-nurse report is required between the floor/ED nurse and Preop prior to transport.
- Procedure:
 - The patient is transported to Preop for the ESP block.
- Post-Procedure:
 - Preop will call the floor/ED nurse for report. The patient will then be transported back to the unit, arranged by surgical services.
- ESP Workflow for ICU Patients
 - 0700-1500 Call #5966. APS NP will complete consult and arrange block if indicated. Placing consults directly after morning report will facilitate coordination.
 - 1500-0700 Call #5580. Faculty should call the Anesthesia phone to discuss availability. Consults after 6pm will be chart reviewed and arrangements made for block to be completed the following morning.
 - Weekends Call #5580. Faculty should call the Anesthesia phone to discuss availability.
 - Consult to be completed within 24 hours.
 - Information needed when placing consult:
 - Imaging and location, number, and laterality of rib fractures
 - Comorbid conditions
 - Any coagulopathies or anticoagulant use
 - Current pain scores and therapies provided (Faculty to ensure multi modals have been ordered)
 - Ability to tolerate positioning for block (sitting, prone, lateral)
 - Ability for patient (or family) to consent to the procedure. The Trauma Team will have a discussion with the patient regarding the ESP consult so he/she is aware and has a general idea of what to expect upon Anesthesia arrival.

** For patients with uncontrolled pain despite above measures consider Ketamine Continuous Infusion Order set No 10402 (Patient must be admitted to the ICU)

Rib Plating:

Consideration for rib plating:

- Goal is to plate early <72 hours
- Flail segments (3 or more ribs broken in two or more places in ribs #3-10)
- Multiple displaced rib fractures > 2 cm

	• Uncontrolled pain despite Erector Spinae block, with limited mobility (unable to get OOB due to pain) • Elderly with impaired pulmonary function • Free of other injuries that would prolong mechanical ventilation
	Patient and Family Education Bedside nurse • Reinforce initial patient instruction by Respiratory Therapy in proper technique for incentive spirometry, coughing, and deep breathing • Provide patient and family education handout • PIC scoreboard placed in patient room in visible location, enabling patient and family to track progress
	Discharge Planning Medication Considerations • For patients older than 65 years of age use discretion when prescribing robaxin at discharge. Patients should be informed it may cause dizziness and nausea. • Recommend discharge pain meds Tylenol and ibuprofen; limit sending geriatric patients home with opiates, muscle relaxers, and Neurontin as this increases the patients fall risk. • If ibuprofen use anticipated ≥ 72 hours and risk factors are present (i.e. smoker), consider prescribing either an H2 Blocker or Proton Pump Inhibitor at time of discharge.

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Attachments

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Approval Signatures

Step Description	Approver	Date
VP Approval	Jessica Holladay: VP & CNO Surg & Trauma Svcs	06/2026
Trauma Services Committee Approval	Stephanie Spain: Trauma Prgm Mgr Adult	06/2026
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Applicability

Erlanger Health - Baroness