NGN NCLEX 2026 · RESPIRATORY / TRAUMA

Rib Fractures

Blunt-force chest wall injury — the silent threat isn't the broken bone, it's the breathing pattern that follows. Pain → shallow respirations → atelectasis → pneumonia. Your job is to break that chain.

🫁 Respiratory | ⚠️ Trauma | 🩺 Priority: Airway/Breathing | ⏱️ Healing: 4–6 weeks

1 Definition & Overview

WHAT IT IS

- Break in continuity of one or more ribs from blunt chest trauma
- Most common chest wall injury (MVA, falls, assault, sports, CPR)
- Ribs 4–9 most frequently fractured (less protected by muscle)

WHY IT MATTERS

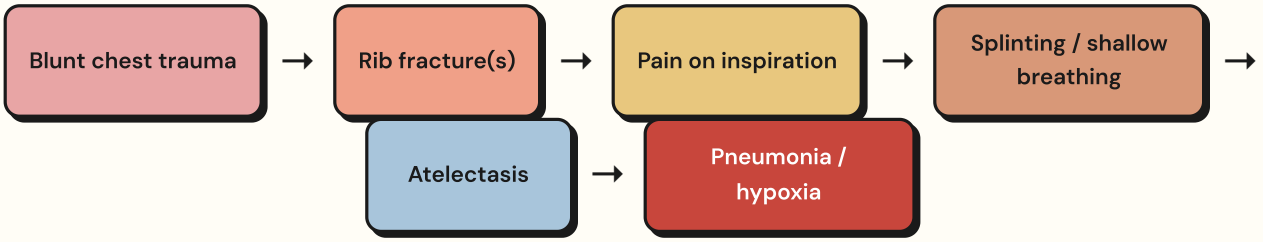
- Pain → splinting → hypoventilation → atelectasis & pneumonia
- Adjacent organ injury is the real killer, not the fracture itself
- Elderly clients have 5× mortality vs. younger adults — same injury

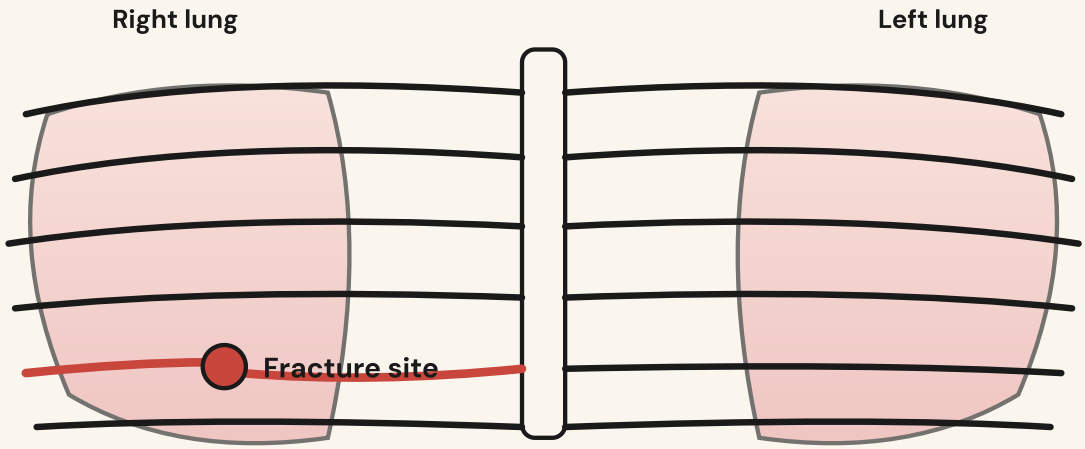
LOCATION = INJURY SUSPICION

- **Ribs 1–3:** high-energy trauma → suspect aorta, great vessels, brachial plexus, spinal cord
- **Ribs 4–9:** classic site → suspect pneumothorax, hemothorax, pulmonary contusion
- **Ribs 9–12:** lower → suspect liver (right), spleen (left), kidney injury

2 Pathophysiology

Blunt force fractures the rib(s). Pain on inspiration causes the client to "splint" — taking shallow breaths to avoid movement. Shallow breathing collapses alveoli, secretions pool, and infection follows.





Anterior view — ribs 4–9 are the most commonly fractured zone.

🚨 **Flail chest: ≥ 2 adjacent ribs fractured in ≥ 2 places → free-floating segment moves *paradoxically* (inward on inspiration, outward on expiration). This is a respiratory emergency.**

3 Signs & Symptoms

EARLY / LOCALIZED

- Sharp, localized chest pain — worse with inspiration, coughing, movement
- Point tenderness over fracture
- Crepitus (palpable grating)
- Shallow, rapid respirations (splinting)
- Ecchymosis, swelling at site
- Leans toward injured side, supports chest with hand

LATE / SEVERE 🚨

- **Paradoxical chest movement** → flail chest
- **Subcutaneous emphysema** (crackling under skin) → air leak
- **Decreased or absent breath sounds** → pneumo/hemothorax
- **Tracheal deviation** → tension pneumothorax
- **Hemoptysis** → pulmonary contusion
- Hypoxia, cyanosis, restlessness, ↓ LOC
- Hypotension + tachycardia → hemorrhagic shock

⚠️ **Restlessness is the earliest sign of hypoxia — don't dismiss it as anxiety or pain.**

4 Priority Nursing Interventions

A — AIRWAY & BREATHING FIRST

- Assess respiratory rate, depth, effort, symmetry q1–2h
- Auscultate breath sounds bilaterally
- Continuous SpO_2 monitoring; ABGs as ordered
- Administer humidified O_2 to maintain $SpO_2 \geq 92\%$

B — POSITION & MOBILITY

- **High-Fowler's or semi-Fowler's** — maximizes lung expansion
- Reposition q2h; encourage early ambulation
- Splint chest with pillow during coughing & deep breathing

C — PAIN CONTROL = BREATHING CONTROL

- Administer analgesics *around the clock*, not PRN only
- Pre-medicate before coughing, IS, ambulation
- Use pain scale; titrate to allow deep breathing
- Anticipate intercostal nerve block or epidural for severe pain

D — PULMONARY HYGIENE

- Incentive spirometer q1h while awake
- Cough and deep breathe q1–2h
- Encourage fluids (2–3 L/day unless contraindicated) to loosen secretions
- Monitor sputum: color, amount, consistency

✅ **NEVER apply chest binders, tape, or tight straps. They restrict chest expansion and dramatically increase atelectasis & pneumonia risk. This is a classic NCLEX trap.**

IF FLAIL CHEST DEVELOPS

- Prepare for intubation and mechanical ventilation with **PEEP** (internal stabilization)
- Provide O_2 and call rapid response
- Continuous cardiac & respiratory monitoring

5 Pharmacology

DRUG / CLASS	MECHANISM	KEY SIDE EFFECTS	NURSING CONSIDERATIONS
Morphine / Hydromorphone *Opioids*	Bind μ-receptors → analgesia	Respiratory depression, sedation, constipation, hypotension	Monitor RR & sedation scale; have naloxone available; assess pain & breathing together
Ketorolac / Ibuprofen *NSAIDs*	Inhibit COX → ↓ inflammation & pain	GI bleed, renal injury, platelet inhibition	Give with food; monitor renal function; avoid if active bleed or anticoagulated
Acetaminophen	Central pain pathway inhibition	Hepatotoxicity (> 4 g/day)	Check total daily dose across products; assess LFTs in chronic use
Lidocaine *Intercostal nerve block / epidural*	Blocks nerve conduction at fracture site	Hypotension, local reaction, rare systemic toxicity	Gold standard for severe multi-rib pain; monitor BP & motor/sensory function
Stool softeners (docusate)	Soften stool → less straining	Mild GI	Routine with opioids; straining worsens pain & fracture stress

💡 **Pain management myth-buster: Withholding opioids "to avoid respiratory depression" causes *more* harm — untreated pain = shallow breathing = atelectasis. Adequate analgesia is a respiratory intervention.**

6 NCLEX Test Traps

❌ WRONG	✅ RIGHT
Apply a chest binder or tape ribs to immobilize the fracture	Splint with a pillow only during coughing; chest must expand freely
Hold opioids because RR is 18 and you're "worried about respiratory depression"	Give analgesia on schedule — uncontrolled pain causes hypoventilation
Keep client on strict bed rest in supine position	High-Fowler's + early ambulation prevents pneumonia
Treat single rib fracture and flail chest the same way	Flail chest = paradoxical movement → intubation + PEEP for internal stabilization
Focus only on the fractured ribs	Assess for organ injury based on rib level (ribs 1–3 great vessels; 9–12 liver/spleen/kidney)
Attribute restlessness to anxiety	Restlessness = earliest sign of hypoxia — check SpO_2 & breath sounds

7 Patient & Family Education

DAILY SELF-CARE

- Use incentive spirometer 10 breaths every hour while awake
- Cough and deep breathe — splint chest with a pillow
- Walk and change position frequently — don't lie flat all day
- Take pain medication *before* activity, not after pain peaks
- Drink plenty of fluids to keep secretions thin

AVOID & REPORT

- Do NOT wrap or bind your chest
- Avoid smoking & secondhand smoke — slows healing & worsens lungs
- Avoid heavy lifting (> 10 lb) for 4–6 weeks
- Report: fever > 101°F, productive/colored sputum, increased SOB
- Report: severe new pain, chest tightness, blood in sputum
- Expect healing in 4–6 weeks; soreness can last up to 12 weeks

8 Memory Boosters

🧠 **Mnemonic: "PAIN" — care for rib fractures**

P	A	I	N
Position high-Fowler's	Analgesia around the clock	Incentive spirometer hourly	No binders or tight wraps

RIB-LEVEL INJURY MAP

- **1–3 (high):** "Head of the body" → great vessels, aorta, brachial plexus
- **4–9 (middle):** "Lungs zone" → pneumothorax, hemothorax, contusion
- **9–12 (low):** "Organs below" → R = liver, L = spleen, both = kidneys

QUICK ASSOCIATIONS

- **Flail chest = PARADOX** (paradoxical movement)
- **Restless = Respiratory** (first hypoxia clue)
- **Splint with a pillow, not a strap**
- **Treat the pain to treat the lungs**
- **Crackling skin = air leak** (subcutaneous emphysema)

9 NCJMM Clinical Judgment Scenario

SCENARIO

A 68-year-old male is admitted after an MVA. He reports sharp right-sided chest pain rated 8/10, worse with inspiration. Vitals: HR 112, RR 28 shallow, BP 138/86, SpO_2 89% on room air, T 98.6°F. Auscultation reveals diminished breath sounds at the right base. He is leaning to the right side, splinting his chest with his hand, and appears restless. Chest X-ray confirms fractures of ribs 5, 6, and 7 on the right.

1 RECOGNIZE CUES

RR 28 shallow, SpO_2 89% on room air, HR 112, restlessness, pain 8/10 worse with inspiration, splinting behavior, diminished breath sounds R base, three adjacent rib fractures, age 68 (high-risk demographic).

2 ANALYZE CUES

Hypoxia (SpO_2 89%, restlessness, tachycardia) driven by pain-induced splinting and shallow respirations. Diminished breath sounds suggest atelectasis or possible pneumothorax/hemothorax. Three adjacent rib fractures raise concern for evolving flail segment or pulmonary contusion. Elderly status compounds mortality risk.

3 PRIORITIZE HYPOTHESES

1. **Impaired gas exchange / ineffective breathing pattern** (highest — ABCs)
2. **Acute pain** driving the respiratory compromise
3. **Risk for pneumothorax / hemothorax / flail chest**
4. **Risk for pneumonia & atelectasis** (developing)

4 GENERATE SOLUTIONS

Apply humidified O_2 to keep SpO_2 ≥ 92%. Position in high-Fowler's. Administer prescribed IV opioid analgesia and reassess pain in 15–30 min. Initiate incentive spirometry once pain is controlled. Anticipate orders for ABG, chest CT, and possible intercostal nerve block. Monitor for paradoxical chest wall movement, subcutaneous emphysema, and tracheal deviation. Notify provider of SpO_2 and respiratory pattern.

5 TAKE ACTION

Place client in high-Fowler's. Apply O_2 at 2–4 L via nasal cannula (humidified). Administer morphine 4 mg IV per order. Educate on pillow-splinting for cough and IS technique. Begin continuous SpO_2 and cardiac monitoring. Auscultate lungs q1h. Draw ABG. Document baseline neuro & respiratory exam. Withhold any chest binder; advocate for around-the-clock analgesia.

6 EVALUATE OUTCOMES

Expected within 1–2 hours: SpO_2 ≥ 92% on O_2, RR 14–20 with improved depth, pain rated ≤ 4/10, client able to perform IS to 1000 mL, breath sounds clearer at R base, less restless, no paradoxical chest movement. If

not improving — escalate: reassess for pneumothorax, pulmonary contusion, or evolving flail chest; prepare for advanced airway management.