CHEST WALL INJURIES – CLINICAL PUZZLE

1. Farmer with Multiple Rib Fractures

Mr. Velu, 58-year-old farmer, fell from a tree. Now complains of severe pain on breathing 6 hours post-trauma. Observation: shallow breathing, splinting right chest, tenderness 5–8th ribs. Real-time: SpO2 93%, clear breath sounds. History: smoker. Focus: pain management and breathing exercises in rib fractures.

Options for Intervention:

A. Strapping of chest wall

B. Supported coughing + thoracic expansion exercises with pain control

C. Immediate incentive spirometry without analgesia

D. Complete bed rest for 1 week

Structured Reasoning: Compare accuracy (pain–splinting–atelectasis cycle), safety (restrictive defect), efficiency (lung volume), resources, long/short-term, ethics (livelihood).

Option A restricts breathing, outdated. Option B breaks pain cycle, safe, efficient, ethical. Option C painful, poor compliance. Option D risks pneumonia.

Best: B for physiological accuracy and early mobility.

2. Young Biker with Flail Chest

22-year-old Arun brought to trauma ICU after a bike accident. Observation: paradoxical movement left chest, using accessory muscles. Real-time: SpO2 86% on room air, multiple rib fractures 3–7 with flail segment. Focus: stabilization and ventilation strategy.

Options for Intervention:

A. Immediate sandbag fixation on flail segment

B. Manual stabilization + early positive pressure ventilation support

C. Strapping entire chest

D. Deep breathing exercises only

Structured Reasoning: Evaluate accuracy (paradoxical movement), safety (hypoxemia), efficiency (work of breathing), ethics (survival).

Option B most effective and current evidence-based. Option A outdated, Option C worsens ventilation.

Best: B for safety and physiological correction.

3. Office Goer with Traumatic Pneumothorax

35-year-old Priya, hit by handlebar, presents with sudden dyspnea and left chest pain. Observation: reduced left chest expansion, hyper-resonant percussion. Real-time: SpO2 90%, tracheal deviation to right. Focus: recognition of tension pneumothorax.

Options for Intervention:

A. Start thoracic expansion exercises immediately

B. High-flow oxygen + urgent medical referral for decompression

C. Postural drainage affected side down

D. Incentive spirometry 10 repetitions

Structured Reasoning: Assess accuracy (intrapleural pressure), safety (life-threatening), efficiency, ethics.

Option B lifesaving and mandatory. Others contraindicated.

Best: B – emergency recognition and referral.

4. Construction Worker with Haemothorax

48-year-old Murugan fell from scaffolding. Observation: dullness right base, reduced breath sounds. Real-time: BP 90/60 mmHg, SpO2 92%. CXR shows massive haemothorax. Focus: precautions before physiotherapy.

Options for Intervention:

A. Start ACBT immediately

B. Positioning with affected side up + monitor vitals + medical clearance

C. Chest percussion and vibrations

D. Early ambulation

Structured Reasoning: Accuracy (hemostasis vs re-bleed), safety (shock), ethics.

Option B prevents further bleeding, safe. Others risk worsening haemorrhage.

Best: B for safety and physiological focus.

5. Athlete with Lung Contusion

27-year-old Kabaddi player kicked in chest. Now 24 hours post-injury, SpO2 dropping to 89%, bilateral crackles, hemoptysis <30 ml. Focus: monitoring and gentle intervention.

Options for Intervention:

A. Aggressive manual techniques

B. Gentle positioning (injured side down) + supported huffing + close SpO2 monitoring

C. Forced expiration technique

D. Avoid all breathing exercises

Structured Reasoning: Accuracy (alveolar hemorrhage), safety (worsening contusion), efficiency.

Option B promotes clearance without trauma. Others contraindicated.

Best: B for safety and gradual clearance.

6. Elderly Lady with Flail Chest and COPD

72-year-old Kamala, fall at home. Multiple left rib fractures with flail segment. History: COPD on home oxygen. Real-time: fatiguing, CO_2 rising. Focus: ventilation strategy in flail chest.

Options for Intervention:

A. Routine chest strapping

B. Early non-invasive ventilation (BiPAP) + pain control + cautious breathing exercises

C. Deep suctioning

D. Bed rest only

Structured Reasoning: Accuracy (fatigue), safety (respiratory failure), ethics (quality of life).

Option B gold standard. Others harmful.

Best: B for physiological support and ethics.

7. Child with Simple Rib Fractures

9-year-old Ravi fell from bicycle. Three right rib fractures, crying with pain. Focus: paediatric pain relief and breathing play.

Options for Intervention:

A. Chest binder

B. Bubble PEP + blow toys + arm overhead exercises with analgesia

C. Incentive spirometry adult protocol

D. No breathing exercises

Structured Reasoning: Accuracy (pain cycle), safety (child cooperation), efficiency (play).

Option B fun, effective, safe.

Best: B for compliance and physiology.

8. Driver with Haemopneumothorax Post-RTA

40-year-old lorry driver, steering wheel injury. Chest tube in situ, bubbling and swinging. Real-time: wants to return to work early. Focus: precautions with chest drain.

Options for Intervention:

A. Mobilize and exercise affected arm freely

B. Axillary padding + supported coughing + gradual mobility with drain secured

C. Avoid all movement till drain removal

D. Remove drain early for comfort

Structured Reasoning: Accuracy (lung re-expansion), safety (dislodgement), ethics (livelihood).

Option B safe and promotes recovery.

Best: B for balance of safety and function.

9. Cricketer with Suspected Occult Pneumothorax

19-year-old fast bowler hit by ball on left chest. Painful but SpO2 96%, CXR normal. CT shows small apical pneumothorax. Focus: conservative vs active management.

Options for Intervention:

A. Start full thoracic expansion exercises

B. Analgesia + gentle supported breathing + avoid positive pressure techniques + monitor

C. Immediate chest tube

D. Stop all sports for 6 months

Structured Reasoning: Accuracy (risk of enlargement), safety, efficiency (return to sport).

Option B evidence-based conservative approach.

Best: B for safety and evidence.

10. Elderly with Multiple Rib Fractures and Osteoporosis

75-year-old Lakshmi, domestic fall. 4–7th rib fractures, severe pain, shallow breathing. History: osteoporosis on bisphosphonates. Focus: pain control and fracture risk.

Options for Intervention:

A. Chest percussion and vibrations

B. Multimodal analgesia + gentle thoracic expansion + avoid forceful techniques

C. Tight strapping

D. Complete immobilization

Structured Reasoning: Accuracy (pain–atelectasis cycle), safety (fragile ribs), ethics (independence).

Option B safest and effective.

Best: B for physiological correction and fracture protection.