Clinicoanatomical Problem

1. Case of Rib Fracture

Problem:
A 45-year-old man sustains blunt chest trauma in a car accident. He has pain on inspiration and tenderness over the lateral chest wall.
Diagnosis: Fracture of ribs (most likely at the **angle**).
Anatomical Basis:

- The angle of the rib is its weakest part.
- Pain worsens with breathing due to intercostal nerve irritation.

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2. Flail Chest

Problem:
A patient presents with paradoxical movement of a segment of the chest wall during breathing.
Diagnosis: Flail chest.
Anatomical Basis:

- Occurs when **multiple consecutive ribs** fracture at two points, creating a free-floating segment.
- The segment moves inward during inspiration and outward during expiration, impairing ventilation.

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3. Costochondritis

Problem:
A young woman complains of sharp pain over the upper chest wall, aggravated by deep

breathing but not radiating to the arm.
Diagnosis: Costochondritis.
Anatomical Basis:

- Inflammation at the **costochondral or sternocostal junction**, commonly of the 2nd to 5th ribs.
- Mimics cardiac pain but is localized and tender to touch.

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4. Cervical Rib Syndrome

Problem:
A young woman presents with pain, numbness, and tingling in the medial side of the forearm and hand.
Diagnosis: Cervical rib compressing lower trunk of brachial plexus.
Anatomical Basis:

- Cervical rib arises from **C7** and compresses the **C8–T1 nerve roots** and **subclavian artery** at the thoracic inlet.

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5. Thoracic Outlet Syndrome

Problem:
A patient complains of upper limb weakness and diminished radial pulse on arm abduction.
Diagnosis: Thoracic outlet syndrome.
Anatomical Basis:

- Compression of **subclavian artery and brachial plexus** between scalenus anterior and cervical rib.
- Leads to ischemic pain and neurogenic symptoms.

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6. Sternal Puncture for Bone Marrow

Problem:
A clinician performs a sternal puncture to examine bone marrow in a patient with anemia.
Question: Why is the **manubrium** chosen?
Answer:

- It is broad, thick, and has cancellous bone rich in marrow.
- The **arch of aorta** lies posterior to the **lower sternum**, so upper manubrium is safer.

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7. Pott's Spine (Tuberculosis of Vertebrae)

Problem:
A child presents with a humpback deformity in the upper back and fever.
Diagnosis: Pott's disease (tuberculous osteomyelitis of vertebrae).
Anatomical Basis:

- Infection destroys vertebral bodies, leading to **collapse and anterior wedging**.
- Produces **gibbus deformity** (acute angular kyphosis).

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8. Spina Bifida

Problem:
A newborn has a midline swelling in the lower back with cerebrospinal fluid leakage.
Diagnosis: Spina bifida with meningocele.
Anatomical Basis:

- Failure of **neural arches to fuse** during development.
- May expose meninges or spinal cord.

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9. Sternal Foramen during Acupuncture

Problem:
An acupuncturist inserts a needle into a sternal foramen, and the patient develops cardiac tamponade.
Diagnosis: Injury to pericardium through congenital sternal foramen.
Anatomical Basis:

- A **sternal foramen** may occur due to incomplete fusion of **sternebrae**, leaving a gap anterior to the heart.

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10. Scoliosis and Unequal Shoulder Height

Problem:
A teenage girl presents with lateral curvature of the spine and uneven shoulders.
Diagnosis: Structural scoliosis.
Anatomical Basis:

- Uneven vertebral growth causes lateral and rotational deformity.
- Commonly affects the **thoracic vertebrae**, altering rib angles and chest symmetry.