

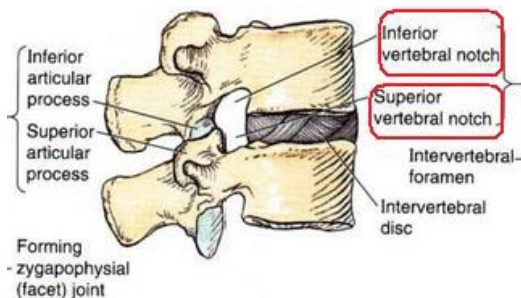
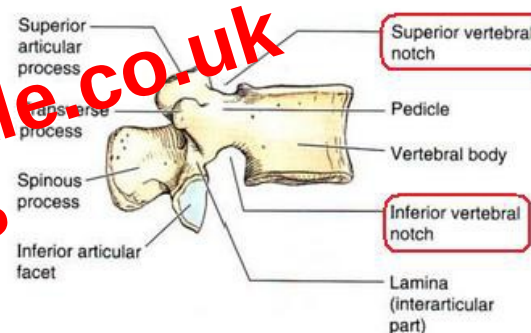
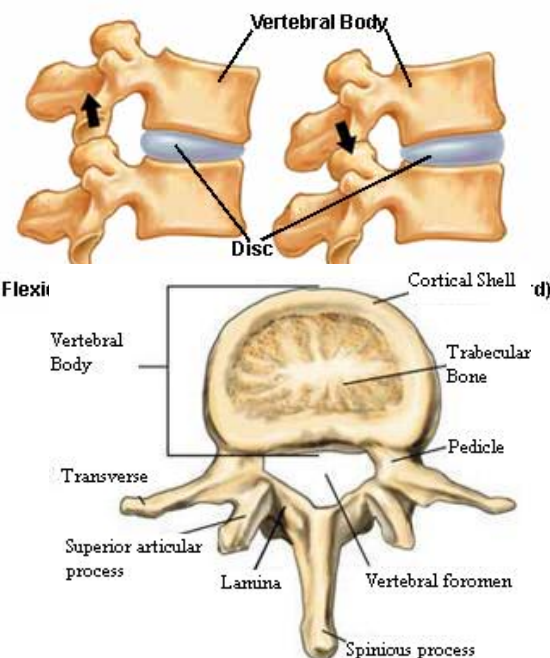
- Vertebral Column

- 33 vertebrae, functional entity- axis of the axial skeleton.
- Protects soft or hollow structures that travel vertically (longitudinally).
- **Examples: spinal cord; vertebral arteries and veins;**
- Movement of the vertebral column results from compressibility and elasticity of the Intervertebral discs (fibrocartilage)
- Capable of flexion, extension, lateral flexion and extension, rotation.
- Movement is limited by multiple factors:
 - Condition of IV discs
 - Shape and orientation of zygapophysial (facet) joints
 - Facet joints: between the articular processes of two adjacent vertebrae
 - Cervical facet joints are sitting in the horizontal plane, look like stacked joints (saddle)
 - Lumbar is more vertical
 - Tension of the facet joint capsules
 - Resistance of back musculature and connective tissues
 - Thoracic rib cage
 - Bulk of surrounding tissue
- Movement is freer in cervical and lumbar region- thoracic spine is relatively immobile (connected to ribs) and herniated disc here is rare
 - **Watch out for new onset thoracic pain, with no history of trauma**
 - **With osteoporosis a slight fall or bump can break a bone**
 - **Ex: 75 yo female: osteoporosis leading to compression fracture**
- Curvatures- 4 curvatures in adults, the cervical and sacral are primary and develop in the fetus

- Typical Vertebra Structure

- Vertebral body: anterior, supports body weight
 - Trabecular bone enclosed by thin layer of compact bone, highly active red bone marrow
- Vertebral arch: posterior to body, consisting of pedicles and laminae, forming the vertebral foramen
- Vertebral notches- indentations superior and inferior to pedicles, forming the intervertebral foramina- location of posterior root ganglia and exiting spinal nerves
- Vertebral processes: spinous process typically overlaps the next distal vertebra.
 - 2 transverse processes: muscle and rib attachment,
 - 4 articular processes- 2 superior and 2 inferior, each with an articular facet, forming zygapophysial (facet) joints.
 - Facet joints: articulate with superior and inferior vertebrae
 - Facet syndrome vs. spondolosis or soft tissue in the back
 - Facet joint injection under live fluoro

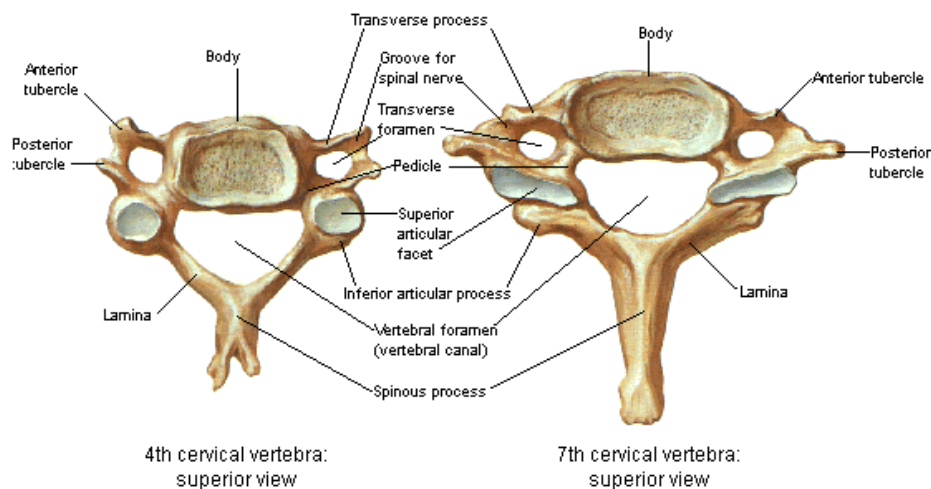
Facet Joints in Motion



- Regional Characteristics of Vertebrae

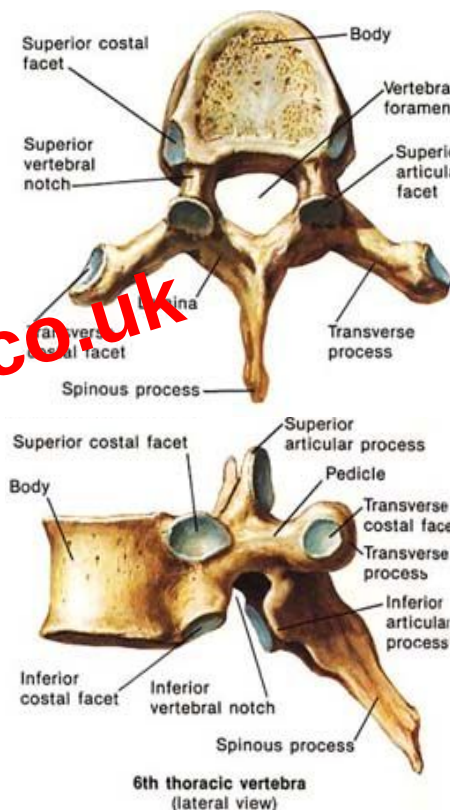
- Cervical- CA fig. 4.5

- Smaller size and bear less weight.
 - IV disks are relatively thick compared to the vertebral body size.
 - Articular facets are nearly horizontal in orientation.
 - Greatest range of motion and variety of movement: less surrounding body mass and above reasons
 - Transverse foramen located in the transverse process → vertebral arteries and veins pass
 - Transverse process with 2 lateral projections
 - anterior and posterior tubercle: attachment of levator scapulae and scalenes.
 - Vertebral foramina: large compared to body size to accommodate cervical enlargement of spinal cord
 - Spinous processes of C3-C6 are usually bifid in white males
 - C7 spinous process is long (vertebra prominens), and most prominent in 70% of population.



- Thoracic- CA fig. 4.7

- Costal facets (transverse, inferior and superior) articulation for the ribs
 - Limited Motion (flexion, extension, lateral flexion): due to Costal facets, vertical orientation of articular facets, and overlapping spinous processes
 - Vertebral foramen is circular and smaller.
 - Transverse processes extend posterolaterally with diminished length from T1 to T12 (called long and strong).
 - Articular facets nearly vertical
 - Spinous processes long, directed postero-inferiorly with tips overlapping adjacent vertebral body
 - To get between → place pt. in recumbent position
 - T12 is transitional, with superior aspect resembling thoracic vert., and inferior aspect resembling lumbar vert.**
 - Adds stress to T12 → most common risk for fracture**



- Lumbar

- Large kidney-shaped vertebral bodies for supporting increasing weight.
 - Vertebral foramen: triangular and medium in size.
 - Articular facets are nearly vertical, with mammillary processes on posterior surface of the superior articular facet (attachment for multifidus and intertransversarii muscles).
 - Transverse processes long and slender, projecting posterosuperiorly and laterally.
 - Spinous processes short, thick and broad (hatchet shaped).
 - L5: massive body and transverse processes
 - Anterior body is taller, resulting in the lumbosacral angle.
 - Body weight is transmitted from L5 to the base of the sacrum.

