

The Vertebral Column

*the vertebral column is central pillar of the body .it serve to protect the spinal cord and support the weight of the head trunk , which it transmits to the hip bones & the lower limbs . is the flexible structure made up of irregular bone called **Vertebrae** , separated by fibrocartilaginous discs called **intervertebral disc**. The intervertebra discs form one quarter of the length of the column. The vertebra are arranged in the following group **Cervical (7), Thoracic (12), Lumbar (5) , Sacral (5 fused to form the sacrum)and coccygeal (4 the lower 3 are commonly fused)**.*

General Characteristics of the vertebrae;

*A typical vertebra consist of a round **body** anteriorly & a **vertebral arch** posteriorly , these enclose a space called the **vertebral foramen** , through , which run the spinal cord & its covering . the vertebral arch consists of a pair of cylindrical **pedicles** , which form the sides of the arch , & a pair of flattened **laminae** , which complete the arch posteriorly . The **spinous process , or spine** ,is directed posteriorly from the junction of the two laminae ,. the **transverse processes** are directed laterally from junction of the laminae and pedicles . The **articular processes** are vertically arranged & consist of two superior & two inferior processes .They arise from the the junction of lamina and pedicles , & their articular surfaces are covered with hyaline cartilage . The pedicles are noted on their upper & lower borders , forming the **superior & inferior vertebral notches** .The superior notch of one vertebrae & the inferior notch of an adjacent vertebra together form an **intervertebral foramen**.*

Cervical Vertebrae

*A typical cervical vertebrae has following characteristic ;1- Each transverse processes a **foramen transversarium** for the vertebral vessels (note that the vertebral artery passes through transverse processes c1-c6 & not through c7). 2- The spines are small & bifid .3- The body is small &*
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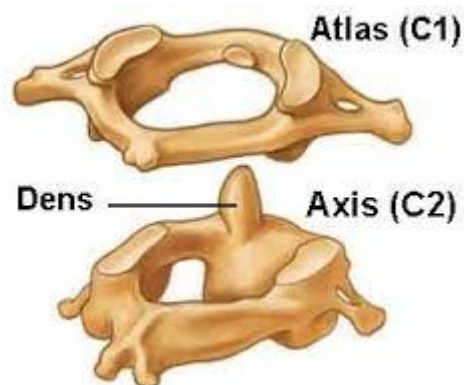
broader from side to side than from front to back ; there are small synovial joints on each side . 4- the vertebral foramen is large & triangular in shape .5- the superior articular processes have small , flat articular facet which face backward & upward ; the inferior articular processes have facet that face downward& forward .

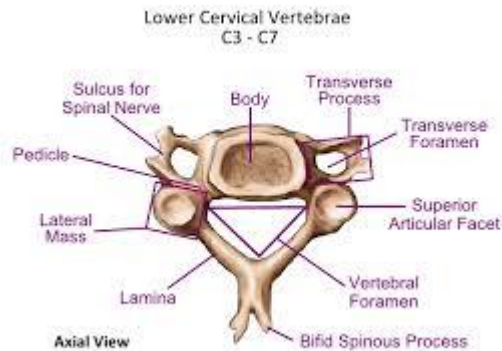
The first , second & seventh cervical vertebrae are atypical.

*The **first cervical vertebra , or atlas** , has no body & no spinous process.its merely a ring of bone consisting of anterior & posterior arches & a lateral mass on each side ,Each lateral mass has articular surface on aspects . The bone articulates above with the occipital its upper & lower condyles , forming the **atlanto- occipital joint** .below the bone articulate with the axis , forming the **atlanto- axial joint** .*

*The **second cervical vertebra or axis** , has a peglik odontoid process , which surmounts the body & represents the body of the atlas , which has fused with the axis*

*The **seventh cervical vertebra , or vertebra prominens** , is so named because it has the longest spinous process is not bifid , the transverse **process** is large , but the foramen transversarium is small and transmit the vertebral vein .*





Thoracic Vertebrae

1- The thoracic vertebrae increase in size from above downward .2- The body is heart –shaped .3- The vertebral foramen is relatively small & circular . 4- Costal facets are present on the side of the body where the heads of the ribs articulate , &on the transverse processes for articulation with the tubercles of the ribs . 5- The superior articular processes bear facets that face backward &laterally , while the facet on the inferior articular processes face medially .6- The inferior articular processes of the twelfth vertebra face laterally , as do those of the

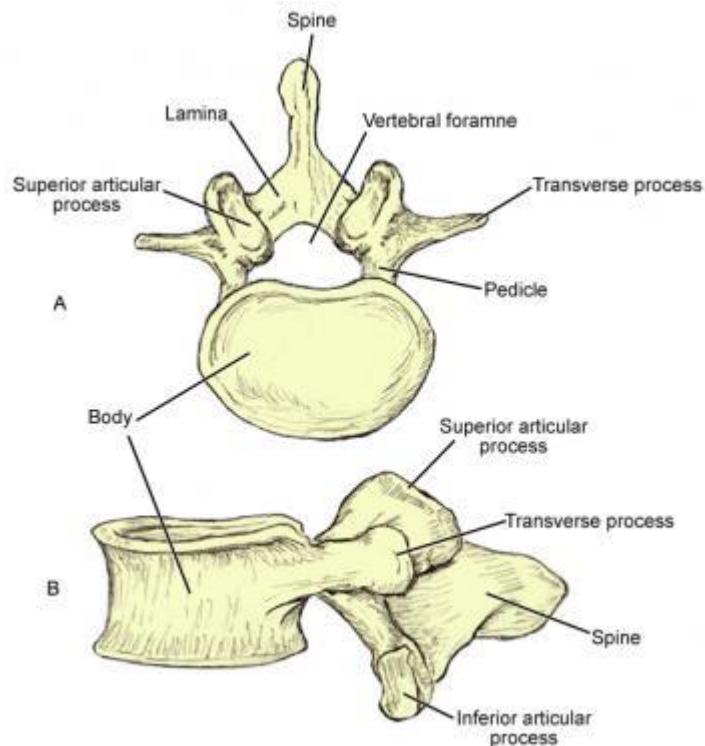


lumbar vertebrae.

Lumbar Vertebrae

1-The body of each lumbar vertebra is massive & kidney –shaped .2- The pedicles are strong & the directed backward ,. 3- The laminae are thick , & the vertebral foramina are triangular in shape . 4- The transverse processes are long & slender .5- The spinous process is short , flat, & quadrangular in shape & project directly backward . 6- The articular surface of the superior articular processes face medially & reference, snell clinical anatomy

those of the inferior articular processes face laterally . 7- The lumbar vertebrae have no facets for articulation with ribs & no foramina in the



transverse processes .

Sacrum

*The sacrum consist of five rudimentary vertebrae fused together to form a wedge-shape bone . which is concave anteriorly .The superior border or base of the bone articulate with the fifth lumbar vertebra . The narrow inferior border articulate with coccyx .The vertebra foramina are present & form the **sacral canal**. The lamina of the fifth sacral vertebra, and sometime those of the fourth also ,fail to meet in the midline , forming the **sacral hiatus**.*

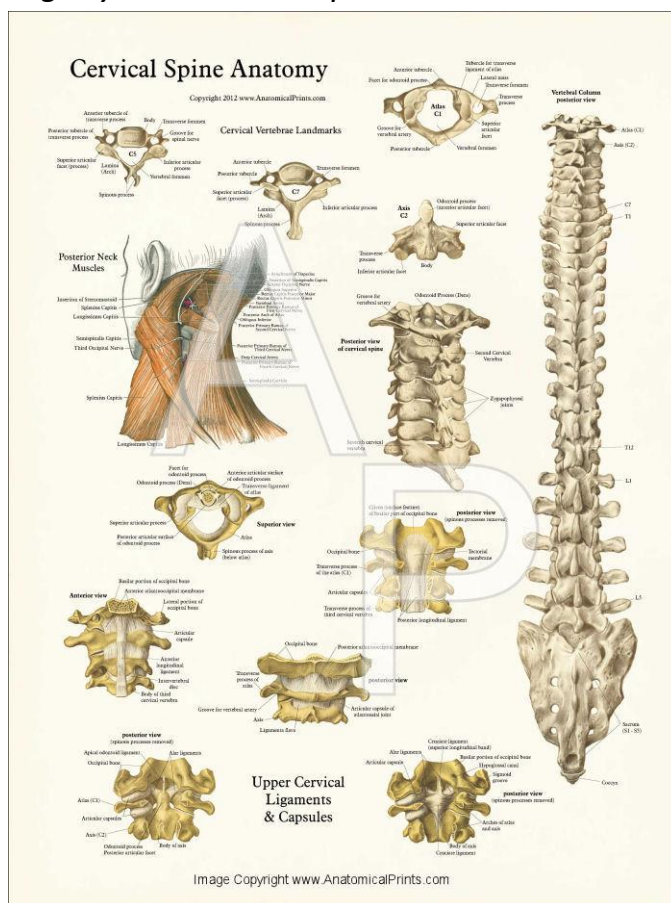
Coccyx

The coccyx consist of four vertebrae fused together to form a small triangular bone, which articulates at its base with the lower end of the sacrum . the first coccygeal vertebrae commonly is not fused , or is

incompletely fused, with the second vertebra.

Intervertebral discs

The intervertebral discs are responsible for one-quarter of the length of the vertebral column .they are thickest in the cervical & lumbar region , where the movements of the vertebral column are greatest they may be regarded as semi-elastic disc , which lie between the rigid bodies of the adjacent vertebrae . Each disc consists of a peripheral part , the annulus fibrosus The annulus fibrosus is composed of fibrocartilage , in which the collagen fibers are arranged in concentric lamellae . the collagen bundles pass obliquely between adjacent vertebral bodies . the more peripheral fibers are strongly attached to the anterior & posterior longitudinal ligaments of the vertebral column. The nucleus pulposus in the child is an ovoid mass of gelatinous material containing a large amount of water , a small number of collagen fiber & few cartilage cells its normally under pressure & situated slightly nearer to the posterior than to the anterior



margin of the disc.