

# **Lecture 7**

# **Thoracic , lumbar ,sacral &coccygeal vertebrae**

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**2023-2024**  
**3<sup>rd</sup> stage \ first semester**

## **The lumbar vertebrae ( L1- L5 )**

**lumbar vertebrae** are five vertebrae between the rib cage and the pelvis . They are the largest and heavier than vertebral bodies in other regions of the vertebral column and are characterized by the absence of the foramen transversum within the transverse process (since it is only found in the cervical region ) and by the absence of facets on the sides of the body (as found only in the thoracic region )

### **Lumbar vertebrae (L<sub>1</sub>–L<sub>5</sub>)**

**Vertebral body** :- oval-kidney shaped bodies , thicker bodies than thoracic VBs , no costal facets .

**vertebral foramen**:- triangular and is larger than in the thoracic vertebrae but smaller than in the cervical vertebra .

### **Pedicles**

The pedicles originate posteriorly. The pedicles become shorter and broader becoming more lateral .

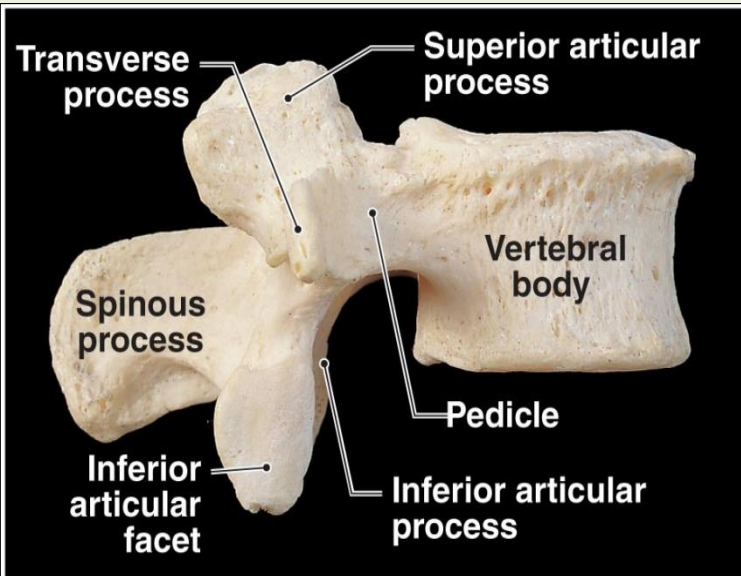
### **Laminae**

Forming the Vertebral Arch with the Pedicles, each laminae is flat and broad blending in centrally with the spinous process

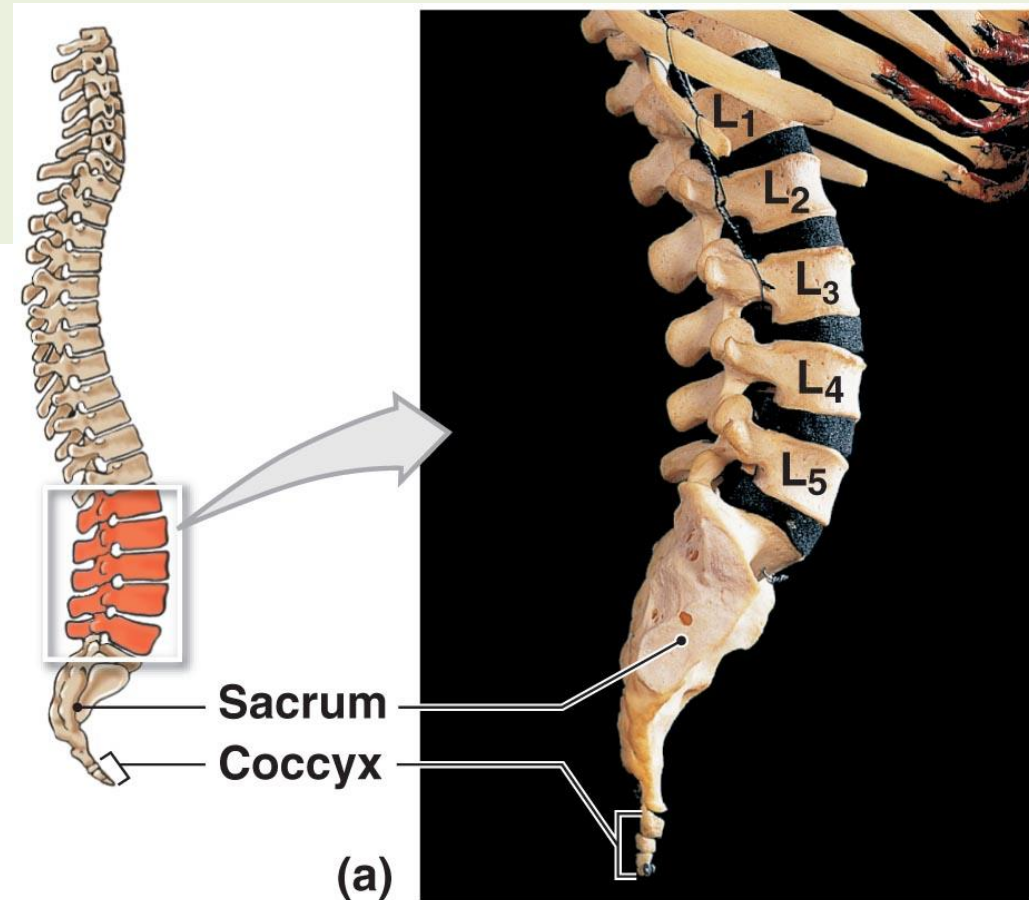
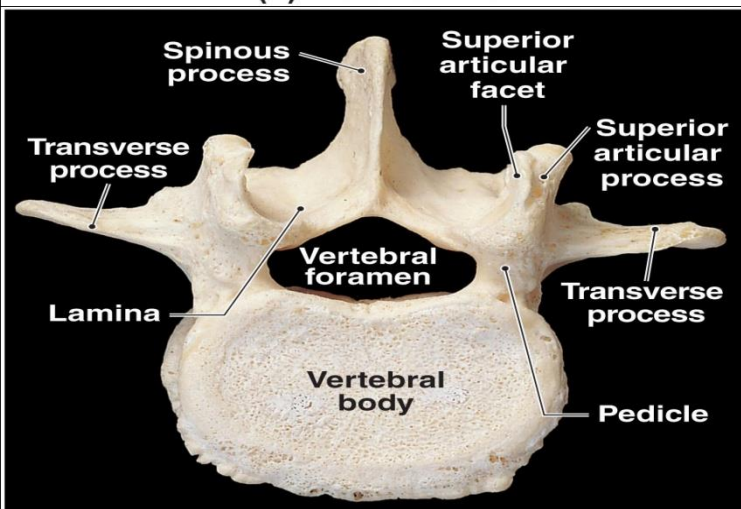
### **Spinous Processes**

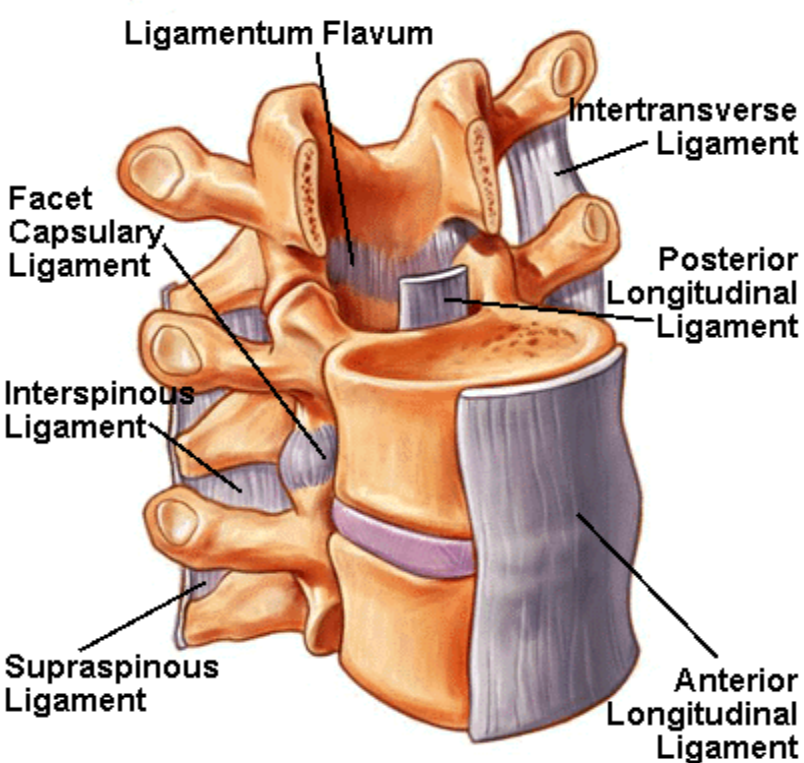
The spinous processes are short and sturdy , Short, heavy for attachment of lower back muscles

**Transverse Process** The transverse processes of the **upper four lumbar vertebrae** are spatulate and increase in size from above downwards. The **transverse process of the fifth lumbar** vertebra is shorter but strong and pyramidal and, in contrast to those of the other vertebrae, does not arise from the junction of the pedicle and lamina but from the lateral aspect of the pedicle and the vertebral body itself.



(b) Lateral view





# Spinal Ligaments

Anterior Longitudinal

Posterior Longitudinal

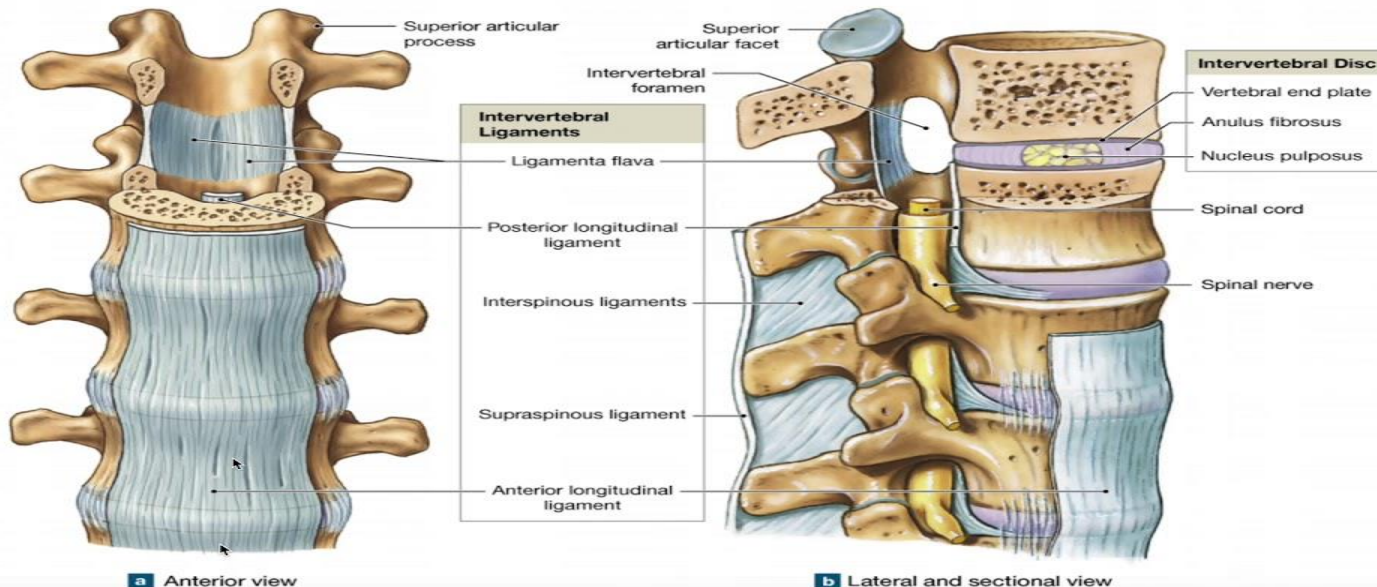
Ligamentum Flavum

Interspinous Ligaments

Supraspinous Ligaments

Intertransverse Ligaments

## Vertebral Ligaments | Stabilizing the Spine





# Difference between cervical , thoracic and lumbar Spines

Feature	Cervical Vertebrae (7)	Thoracic Vertebrae (12)	Lumbar Vertebrae (5)
Location	Neck	Chest	Inferior portion of back
Body	Small, oval, curved faces	Medium, heart-shaped, flat faces; facets for rib articulations	Massive, oval, flat faces
Vertebral foramen	Large	Smaller	Smallest
Spinous process	Long; split tip; points inferiorly	Long, slender; not split; points inferiorly	Blunt, broad; points posteriorly
Transverse processes	Have transverse foramina	All but two [T <sub>11</sub> , T <sub>12</sub> ] have facets for rib articulations	Short; no articular facets or transverse foramina
Functions	Support skull, stabilize relative positions of brain and spinal cord and allow controlled head movement	Support weight of head, neck, upper limbs, and chest; articulate with ribs to allow changes in volume of thoracic cage	Support weight of head, neck, upper limbs, and trunk

# Sacral vertebrae ( sacrum ) S1- S5

Is a large, triangular bone at the base of the spine that forms by the fusing of the **sacral vertebrae** (S1–S5) between ages 18 and 30

The sacrum situates at the upper, back part of the pelvic cavity, between the two wings of the pelvis . It forms joints with four other bones. The two projections at the sides of the sacrum are called the alae (wings), and articulate with the [ilium](#) at the [sacroiliac joints](#). The upper part of the sacrum connects with the last lumbar vertebrae (L5), and its lower part with the coccyx (tailbone) . The sacrum has three different surfaces which are shaped to accommodate surrounding pelvic structures. Overall it is concave (curved upon itself). The base of the sacrum , the broadest and uppermost part, is tilted forward as the sacral promontory internally. The central part is curved outward toward the posterior , allowing greater room for the pelvic cavity .

Sacrum is sexually dimorphic. It is shorter and wider in females than in males. In females, the sacrum is also distributed more obliquely backwards which increases the size of the pelvic cavity, making it more convenient for enduring pregnancy and offering more space for the developing fetus.

## Four regions of the sacrum

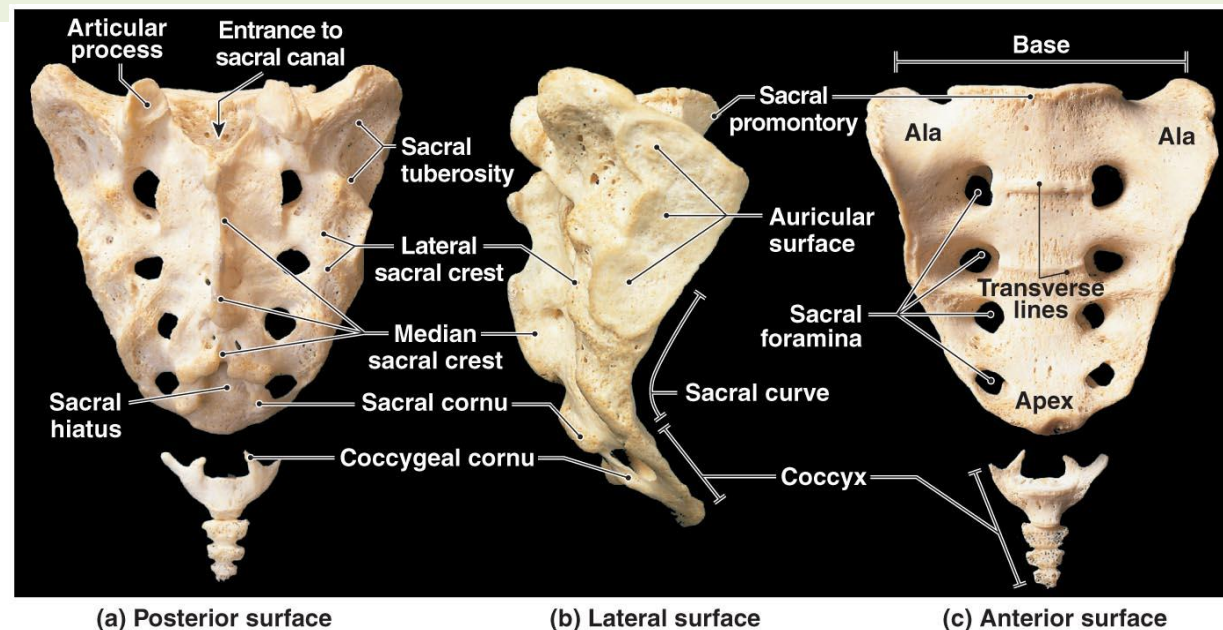
**Base:**the broad superior surface

**Ala:**wings at either side of the

base to attach muscles

**Sacral promontory:**at the center of the base

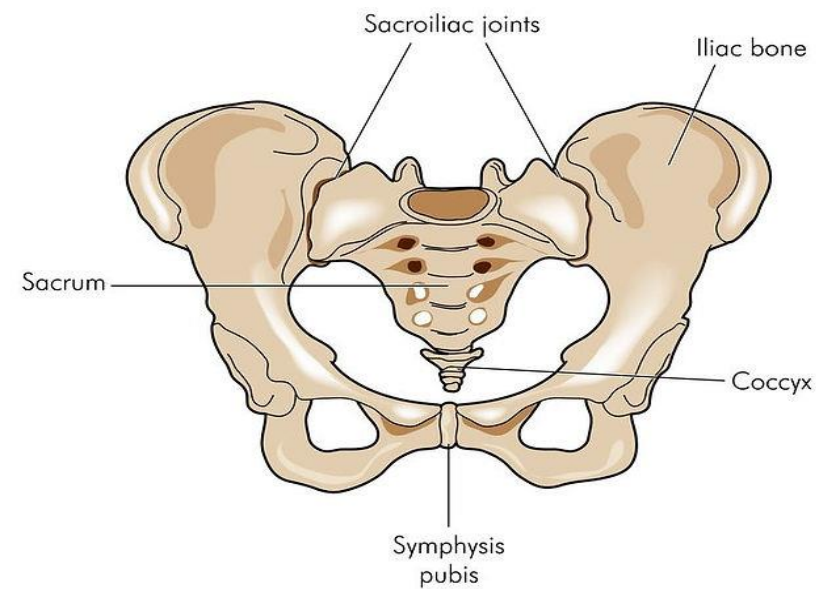
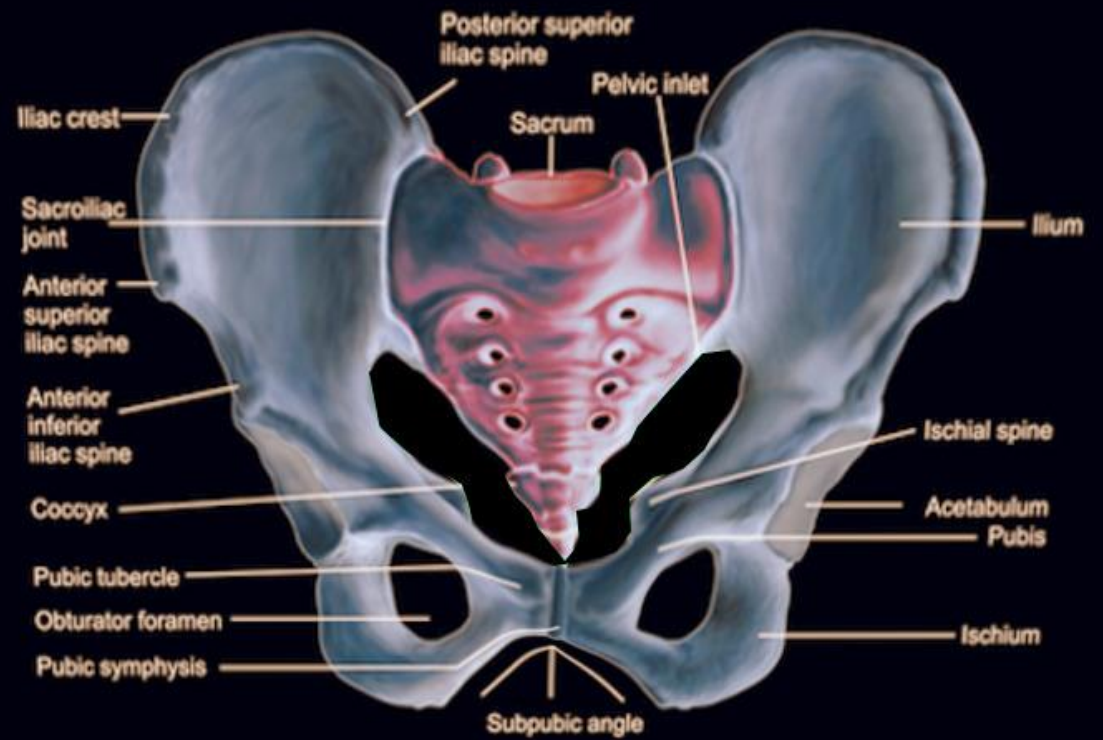
**Apex:**the narrow inferior portion articulates with the coccyx



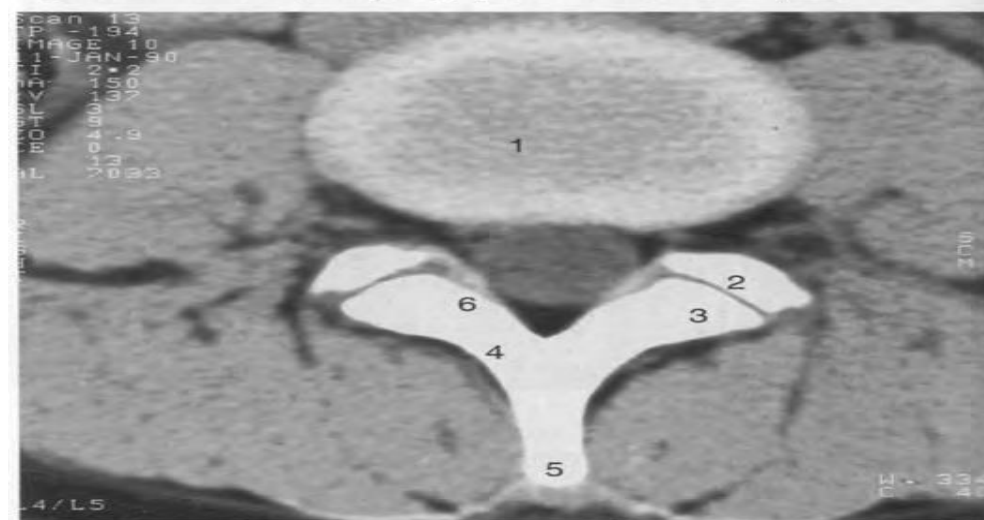
**coccyx** is comprises four vertebrae that are fused into a triangular bone which forms part of the floor of the pelvis and does not contain a spinal canal, pedicles, laminae or spinous processes. The first segment is the largest, and the subsequent are smaller in size. Structure of the coccygeal vertebral junctions is variable and age-related, ranging from fully developed to rudimentary intervertebral discs with varying degrees of cystic or fibrotic change, to fusion of the vertebrae in the later decades.







**Fig. 3.11** CT scan through  $L_4/L_5$  intervertebral disc space.



1. Disc of  $L_4/L_5$
2. Inferior articular process of  $L_4$
3. Superior articular process of  $L_5$
4. Right lamina of  $L_5$
5. Spinous process of  $L_5$
6. Ligamentum flavum