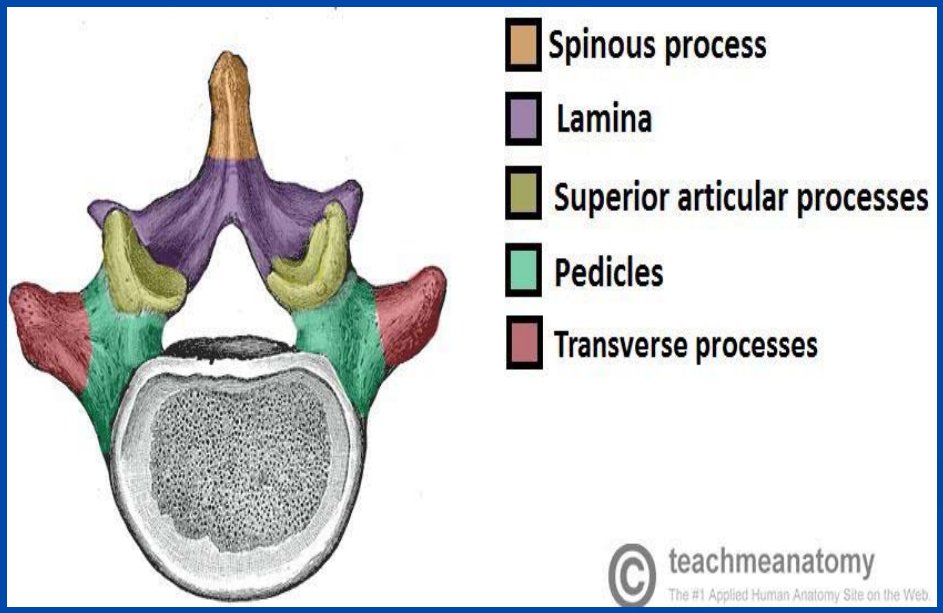
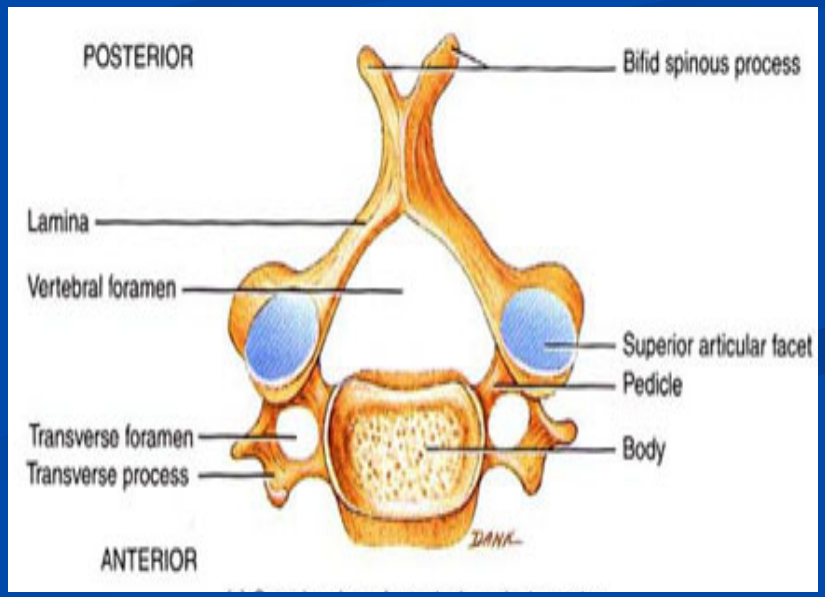
CERVICAL SPINE

- DEPARTMENT OF ANATOMY.
- DR.SANAA AL-SHAARAWY.





CERVICAL SPINES

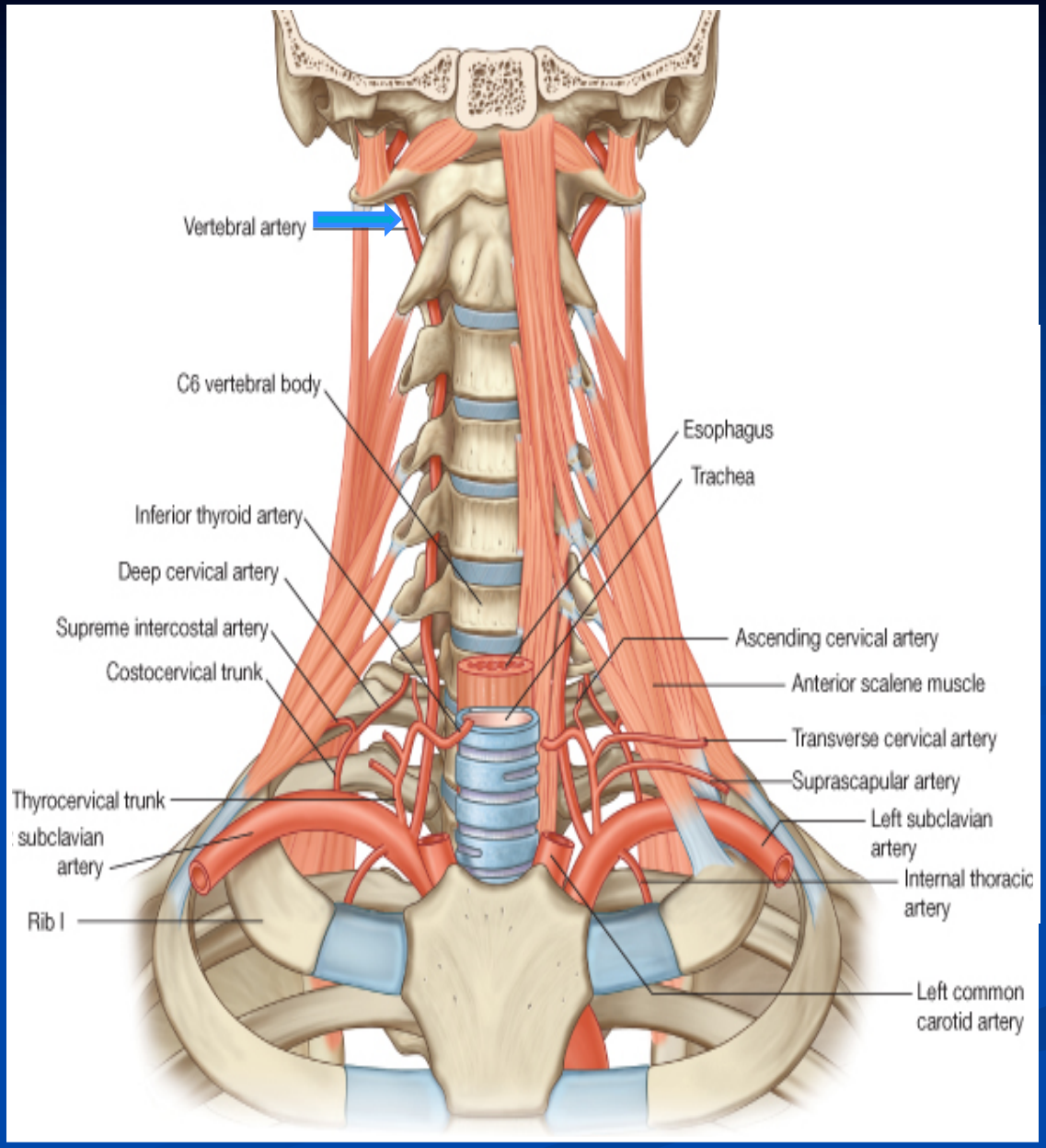
- *By the end of this lecture the student should be able to:*
- Describe the 7 cervical vertebrae, (typical & atypical).
- Describe the joints between the cervical vertebrae.
- Describe the movement which occur in the region of the cervical vertebrae.
- List the structures which connect 2 adjacent vertebrae together.

CERVICAL VERTEBRAE

- They are 7 in number.
- All characterized by presence of foramen transversarium in the transverse process.
- They are classified into:

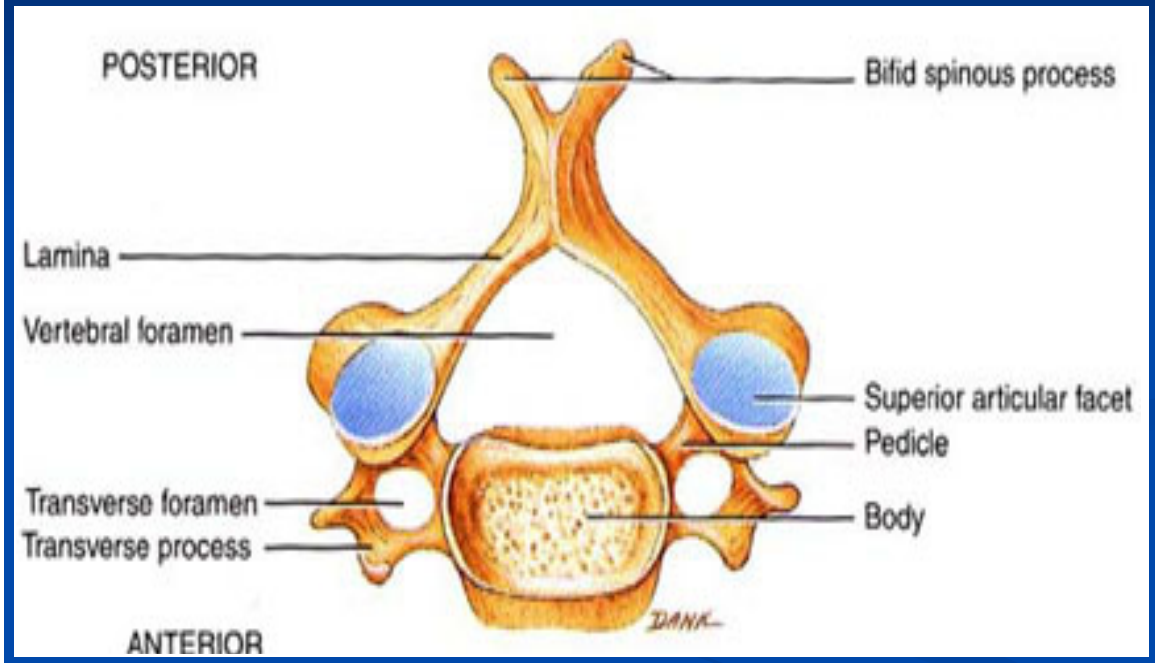
1- Typical: 3rd , 4th ,5th & 6th.

2- Atypical: 1st, 2nd and 7th.



TYPICAL CERVICAL VERTEBRAE C3, C4, C5 &C 6

- The body is small and longer horizontally than antero-posterior
- Its spinous processes is short bifid.
- The transverse processes has the foramen transversarium through which allows passage of the vertebral arteries & veins.



The vertebral foramen is large and triangular.

TYPICAL CERVICAL VERTABRAE

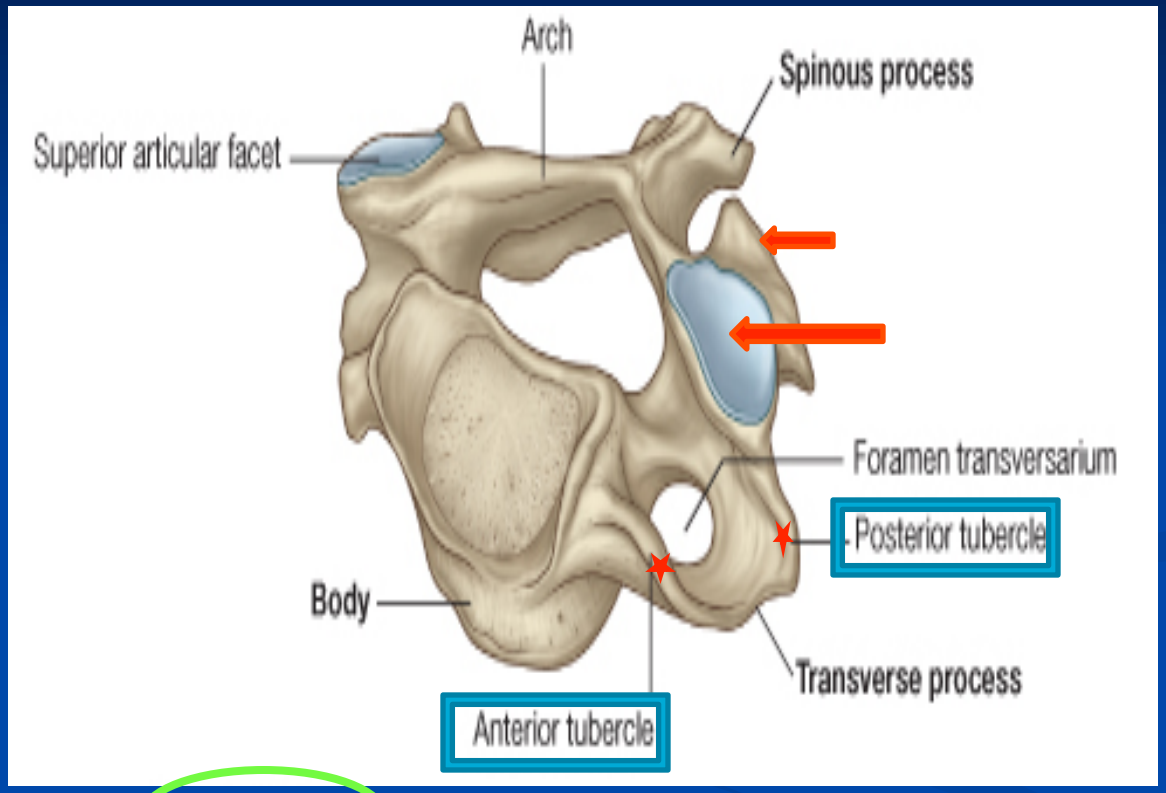
- **The superior articular processes:**

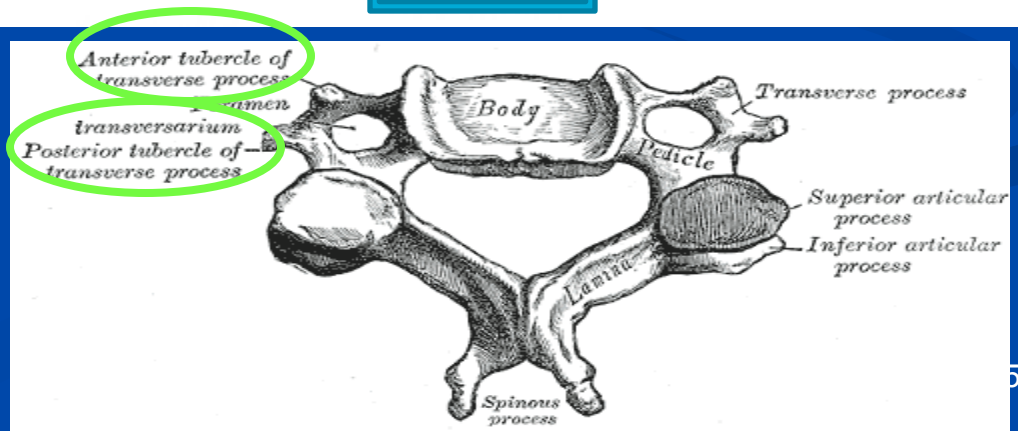
Which have small **facets** that face **upward** and **backward.**

- **The inferior articular processes:**

Which have **facets** that, face **downward** and **forward.**

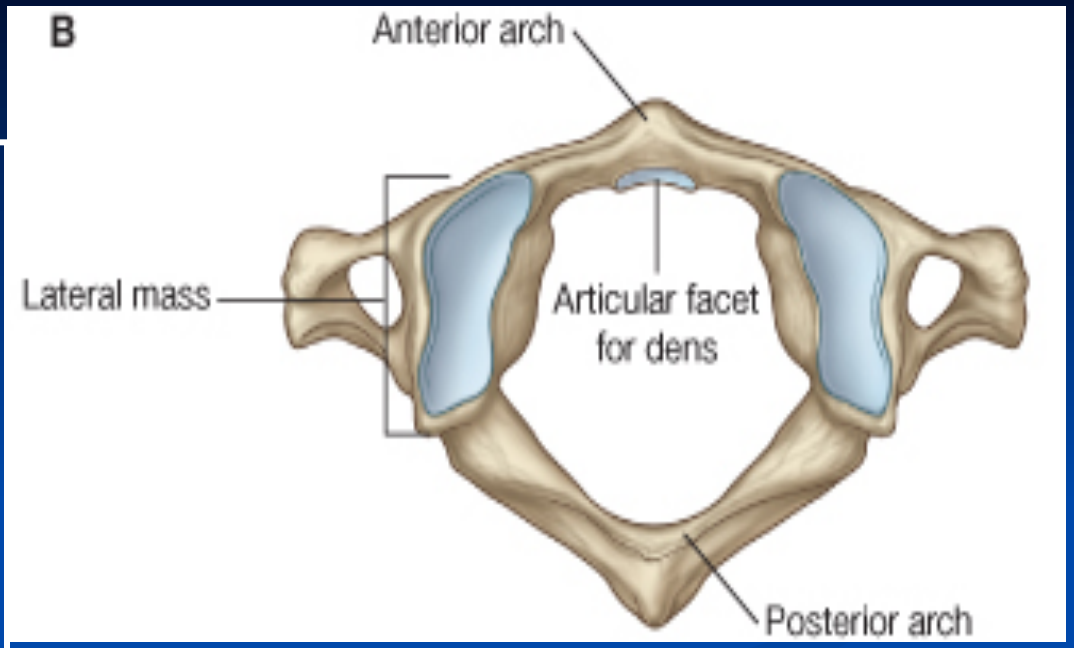
- **The transverse process** has **2 tubercles** one infront and one behind the transverse foramen.

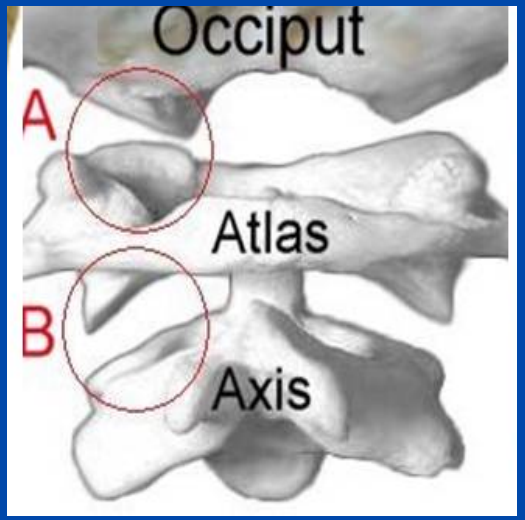




ATLAS- C1

- It has **No** body, **No** spine.
- It has **2 lateral masses** connected together by **small anterior arch** & **long posterior arch.**
- Each lateral mass has **articular surface** on its upper and lower aspects.



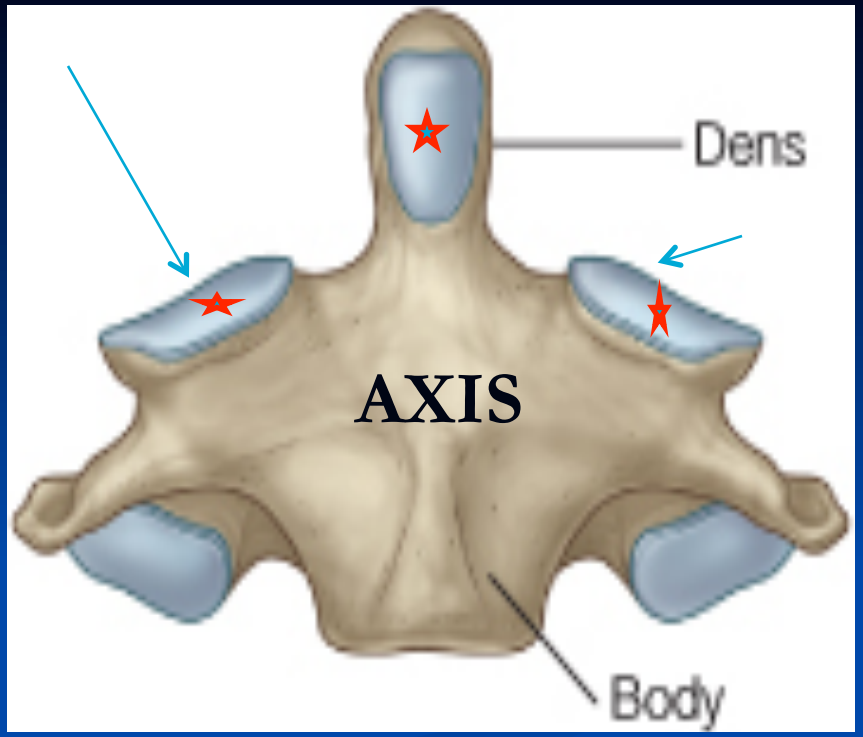


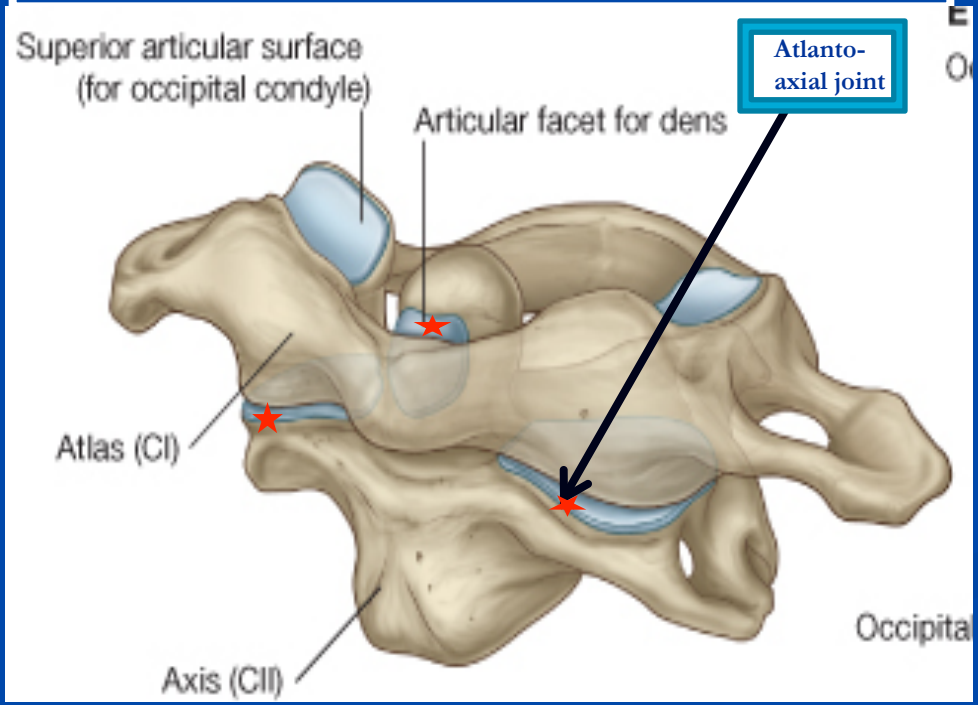
The superior articular surface :

- Articulates with the **occipital condyles of the skull.**
- It forms the **Atlanto-Occipital** joints.
- This joint allows you to nod **"say Yes".**

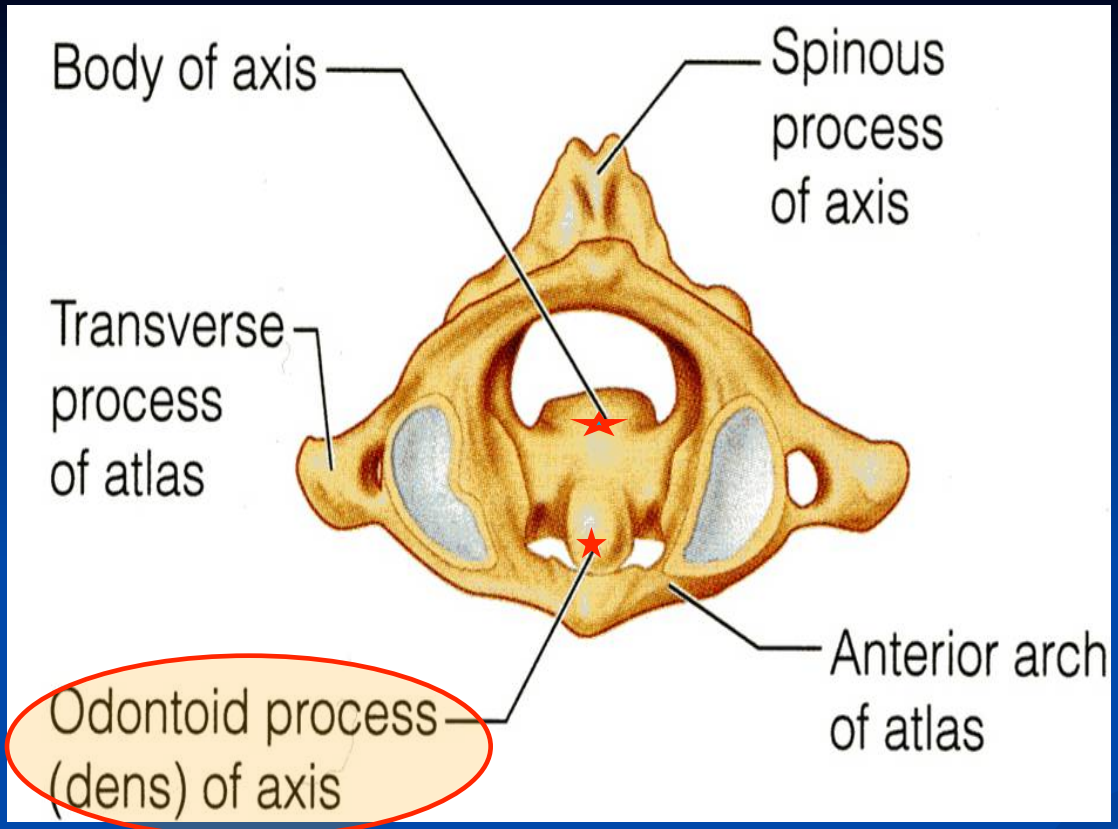
•**The inferior articular surface of the atlas is circular and** articulates with the axis. It forms the 2 lateral **Atlanto-Axial** joints.

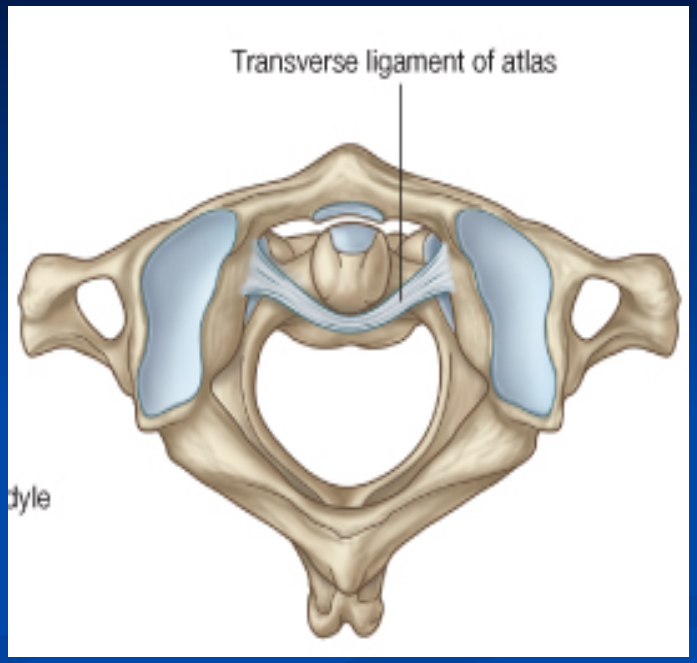
•**This joint together with the joint** between the **dens of axis** and the **anterior small arch of atlas,** they allow you to "**Say No** " **lateral rotation of the face.**





AXIS- C 2

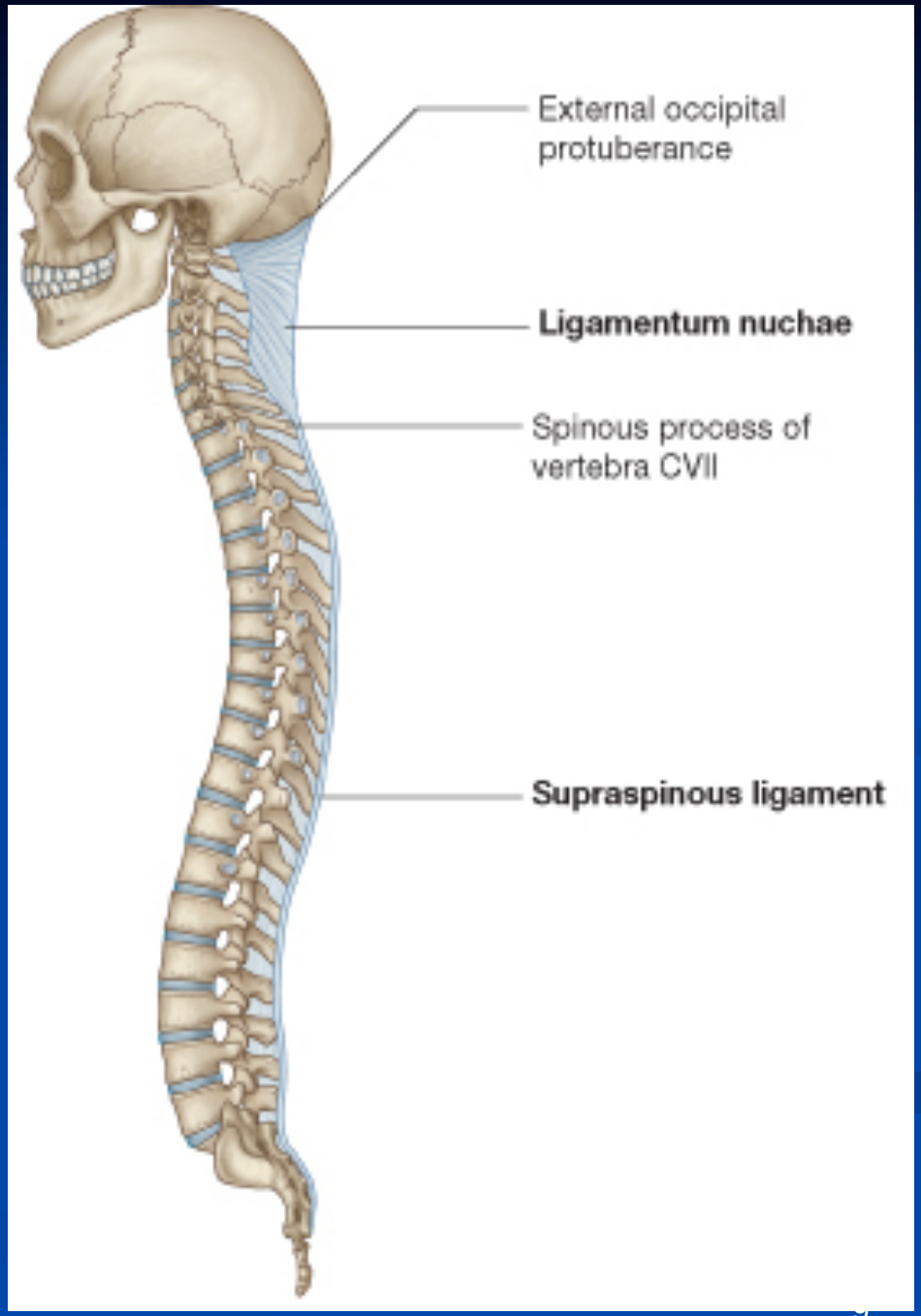




- It acts as a pivot for the rotation of the atlas (and the skull) above.
- It has a large upright peg-like odontoid process, or dens, which projects upward from the superior surface of the body.
- Actually it represents the body of the atlas that has fused with the axis.

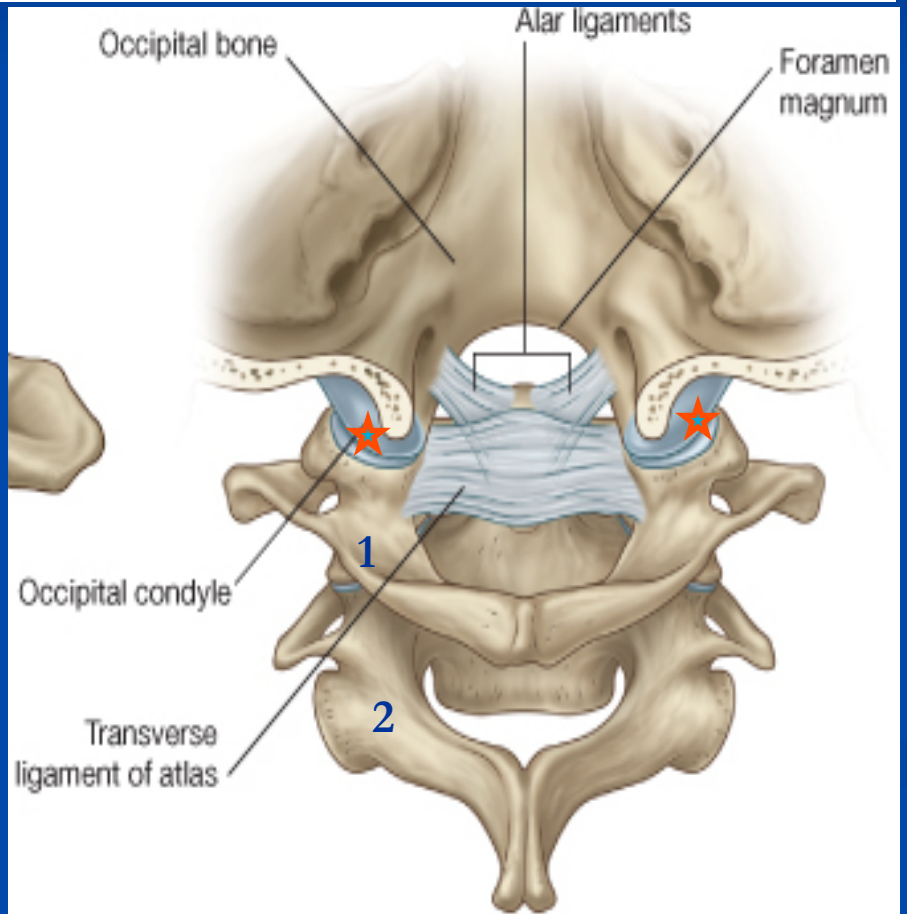
7th
CERVICAL VERTEBRA
OR
Cervica Prominens

- It has the longest spinous process which is not bifid.
- It is the first spine to be felt subcutaneously in the root of back of neck.
- The transverse process is large while its foramen transversaium is small and may be absent, and does not transmit the vertebral artery.

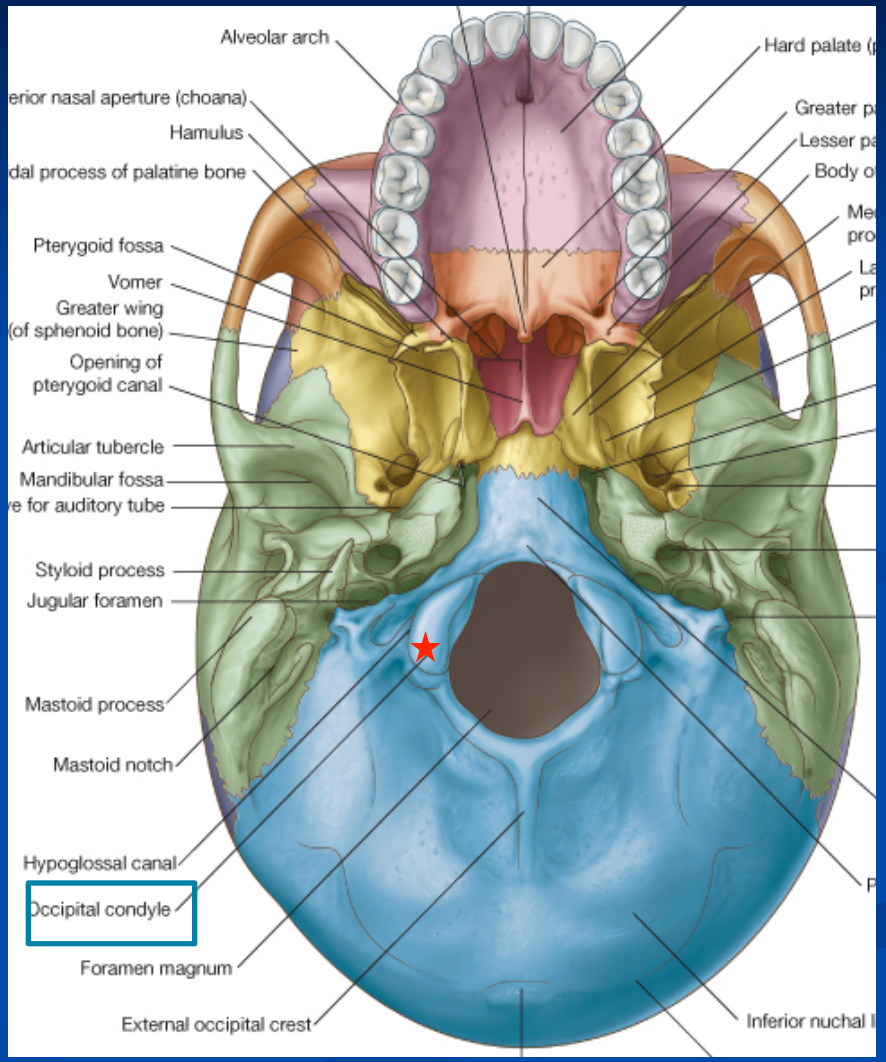


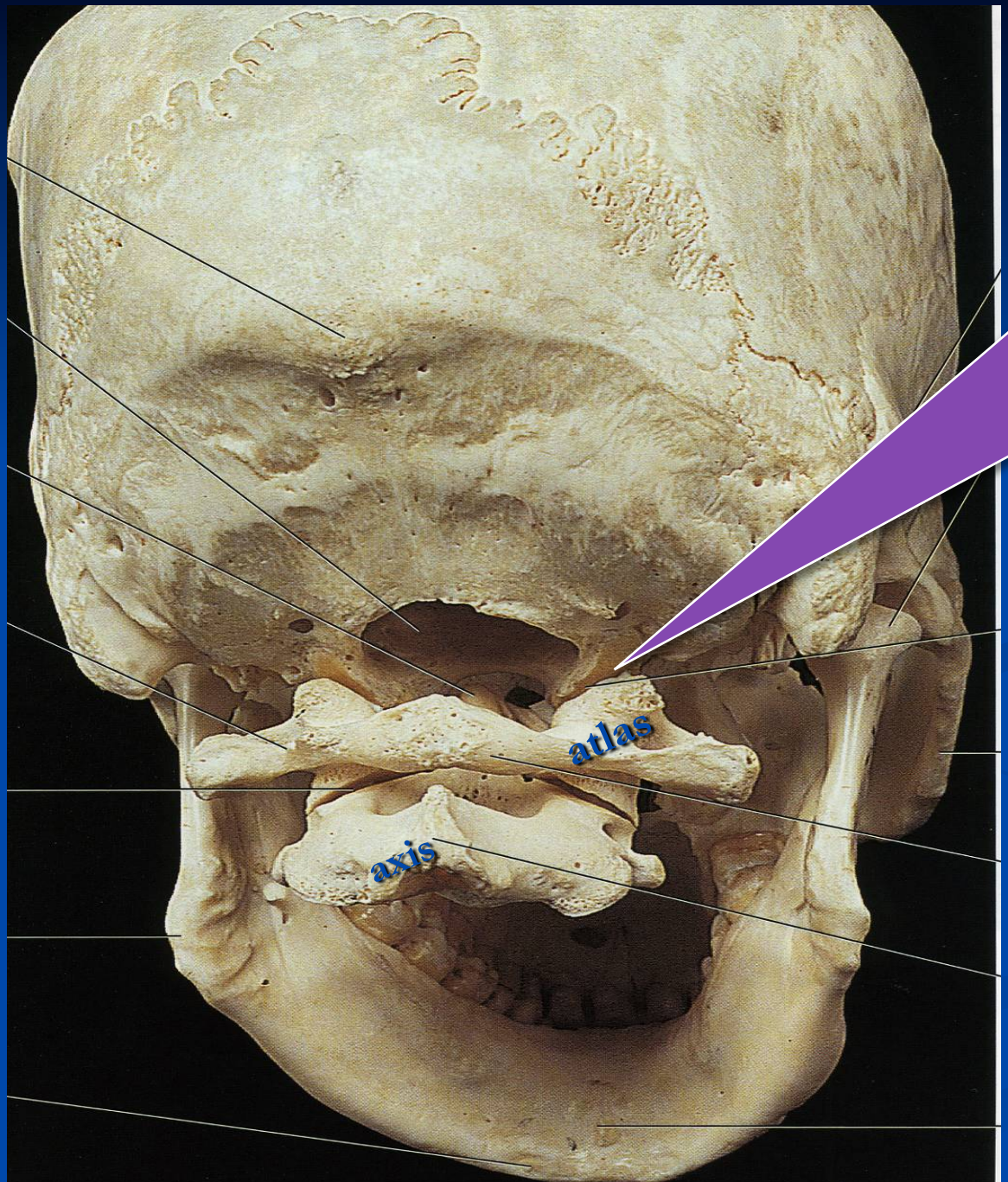
Atlanto-Occipital Joints

- Synovial joints between the occipital condyles of skull and upper facets on the lateral mass of the atlas.



Joints of Cervical Vertebrae





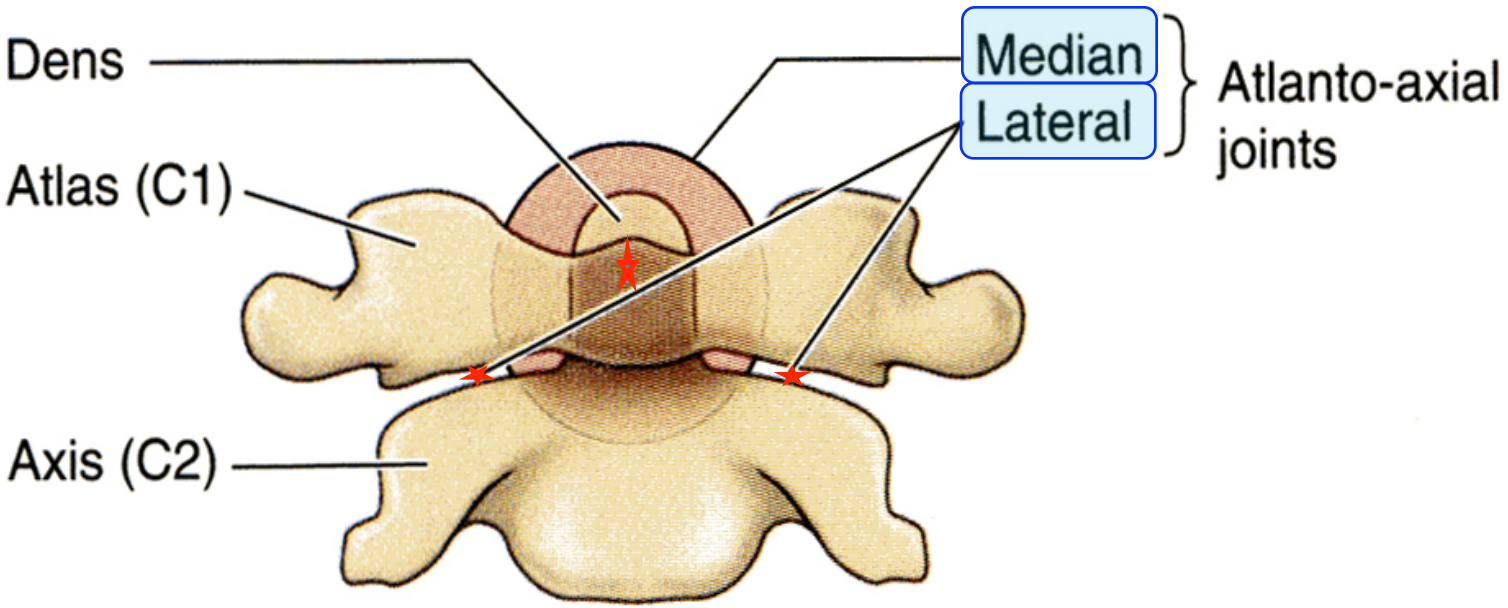
The Atlanto-occipital joints are synovial joints between the occipital condyles, and the superior facets of the lateral masses of the atlas below.

MOVEMENTS IN THE ATLANTO-OCCIPITAL JOINT

The joints are capable of:

- Flexion,
- Extension, and
- Lateral flexion;
- *They do not rotate.*

ATLANTO-AXIAL JOINTS



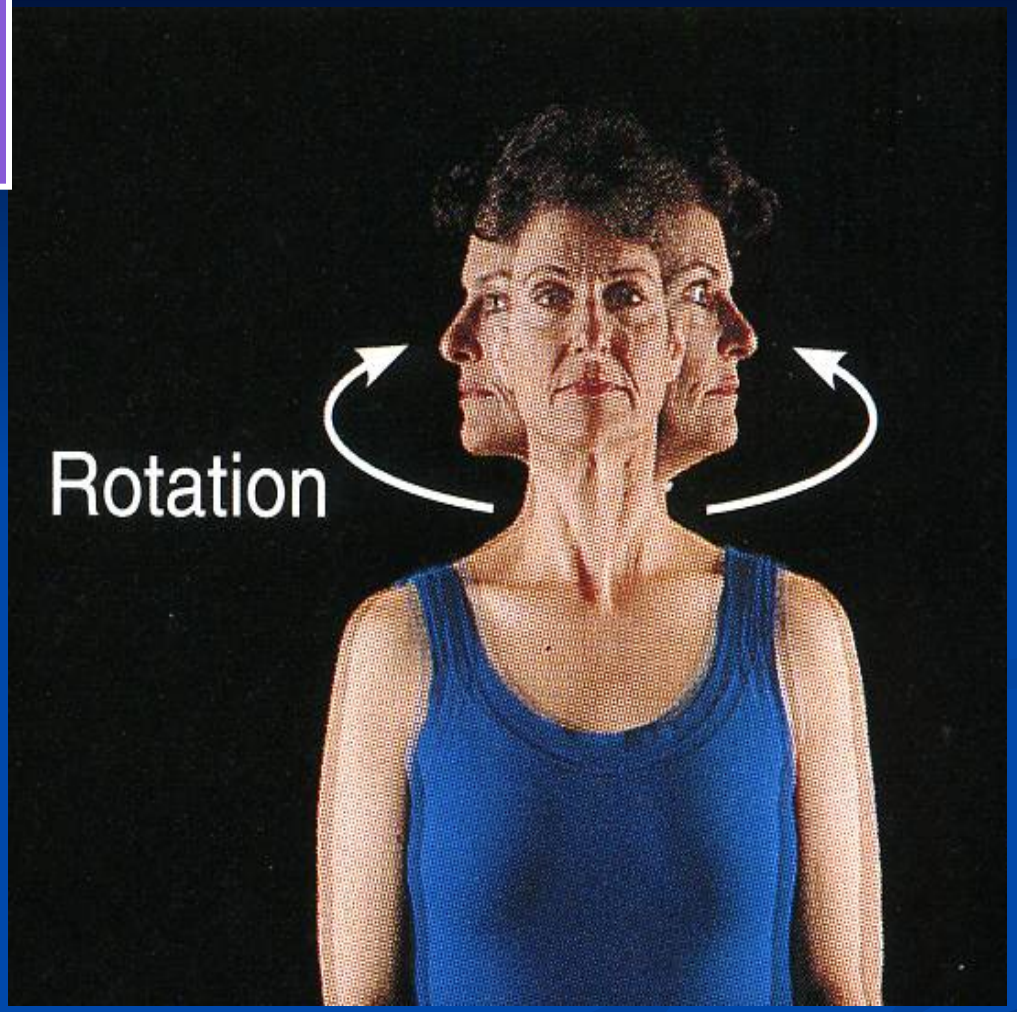
The Atlanto-axial joints are *Three Synovial Joints:*

- **One median**, between the odontoid process and the anterior arch of the atlas.
- the **other two** are between the inferior facet of lateral masses of the atlas and superior facets of the axis.

MOVEMENTS IN THE ATLANTO-AXIAL JOINT

- There can be **extensive rotation** of the **atlas** and the **skull** (and thus of the head on the **axis**).

N.B Atlanto-axial joint allows you to "Say No" lateral rotation of the face.

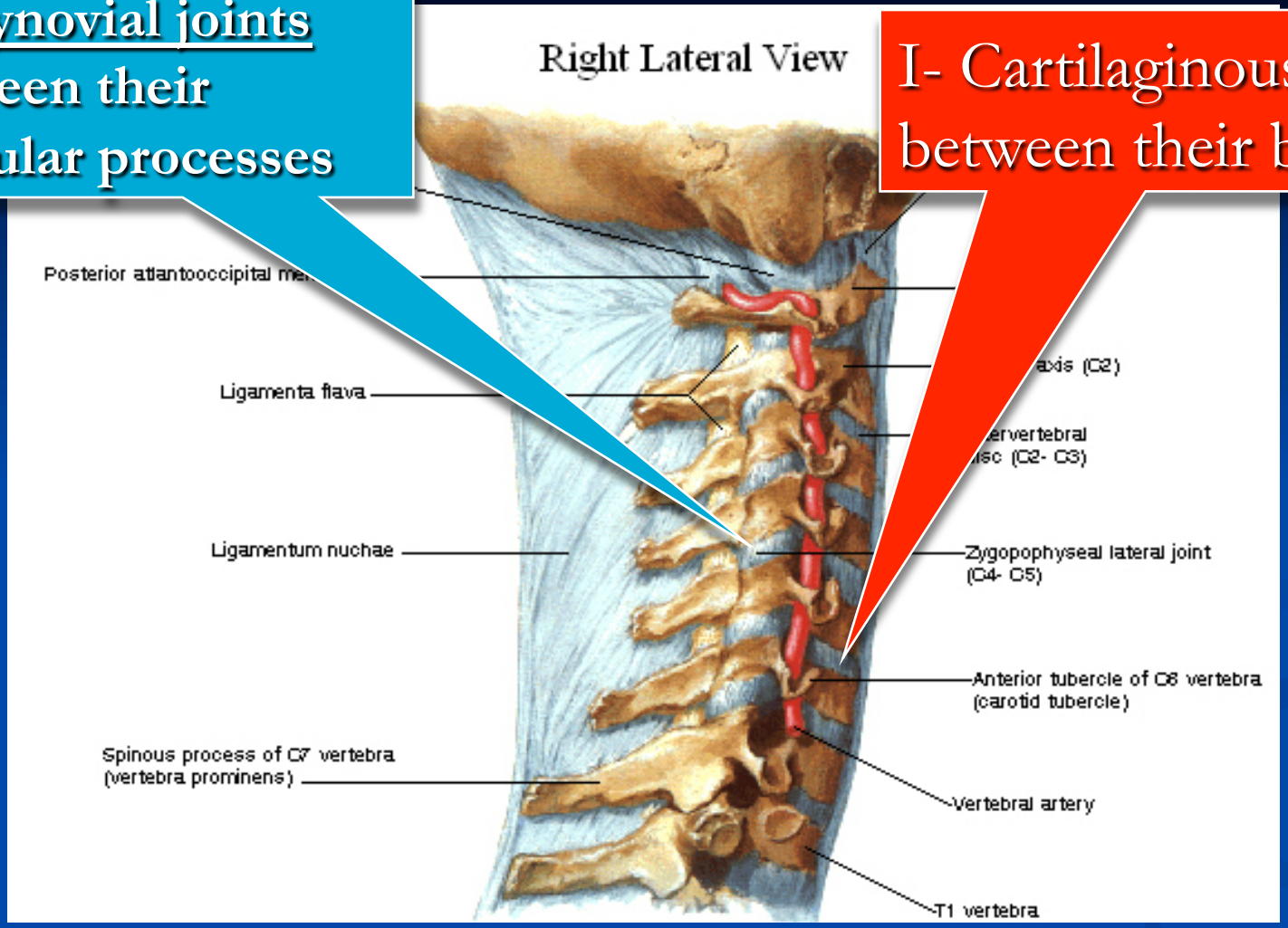


JOINTS OF THE VERTEBRAL COLUMN BELOW THE AXIS

JOINTS BETWEEN TWO VERTEBRAL BODIES

II- Synovial joints between their articular processes

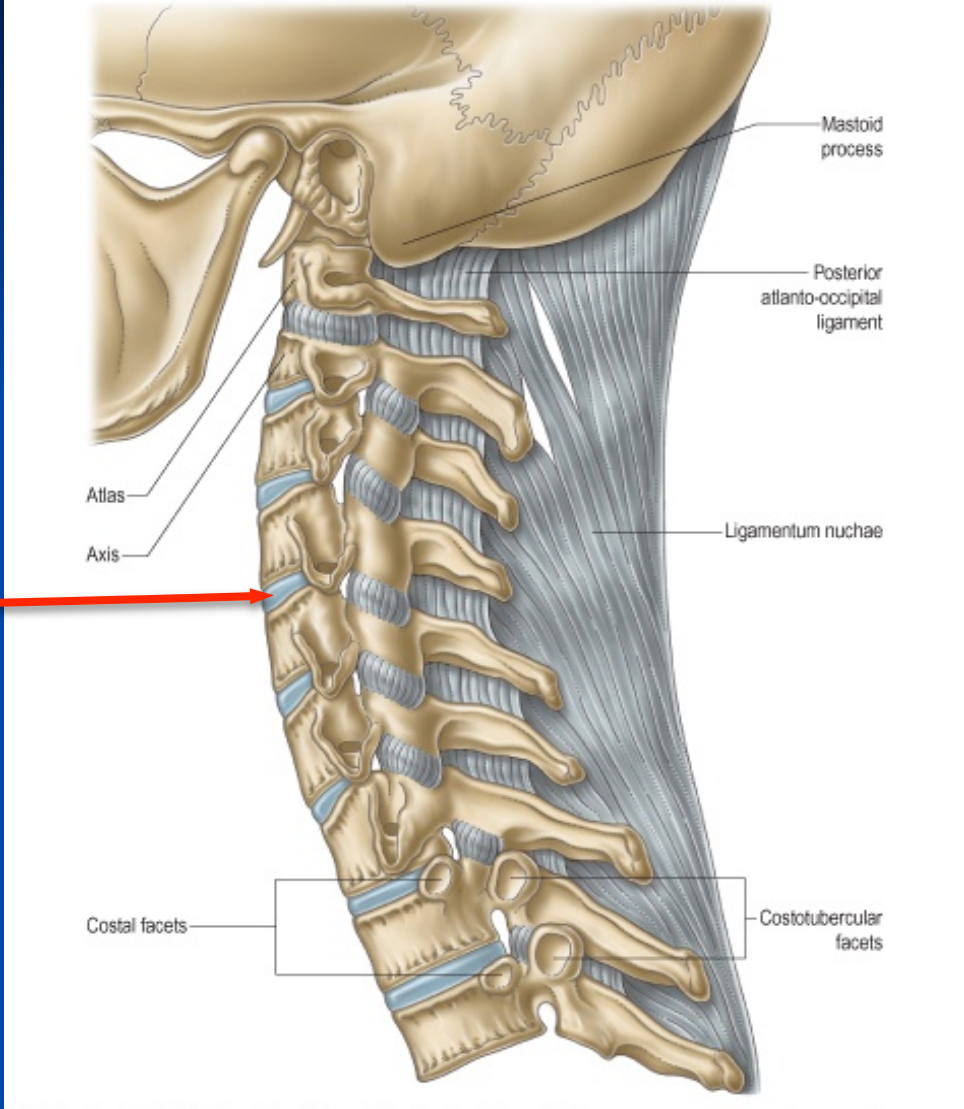
I- Cartilaginous joints between their bodies .



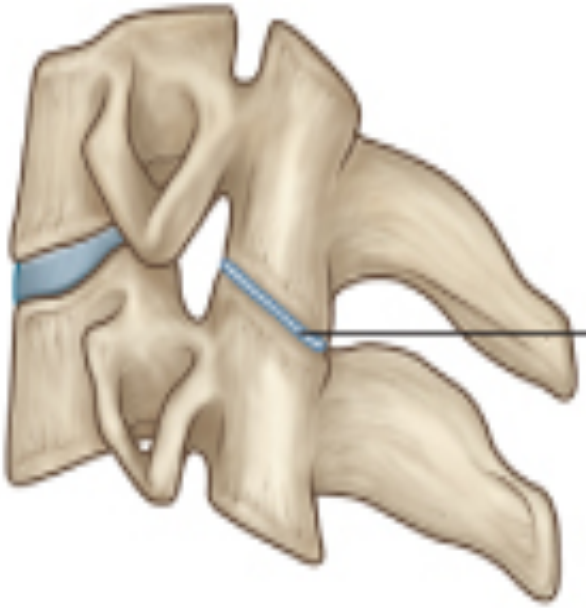
With **exception of the first two cervical vertebrae**, the other cervical vertebrae articulate with each other by means of :

I- Intervertebral disc

- The upper and lower surfaces of the bodies of 2 adjacent vertebrae are covered by thin plates of **hyaline cartilage.**
- Between the plates of hyaline cartilage is an **intervertebral disc** of *fibrocartilage.*
- The collagen fibers of the disc strongly connect the bodies of the two vertebrae.



JOINTS BETWEEN TWO VERTEBRAL ARCHES



Lateral view

Cervical

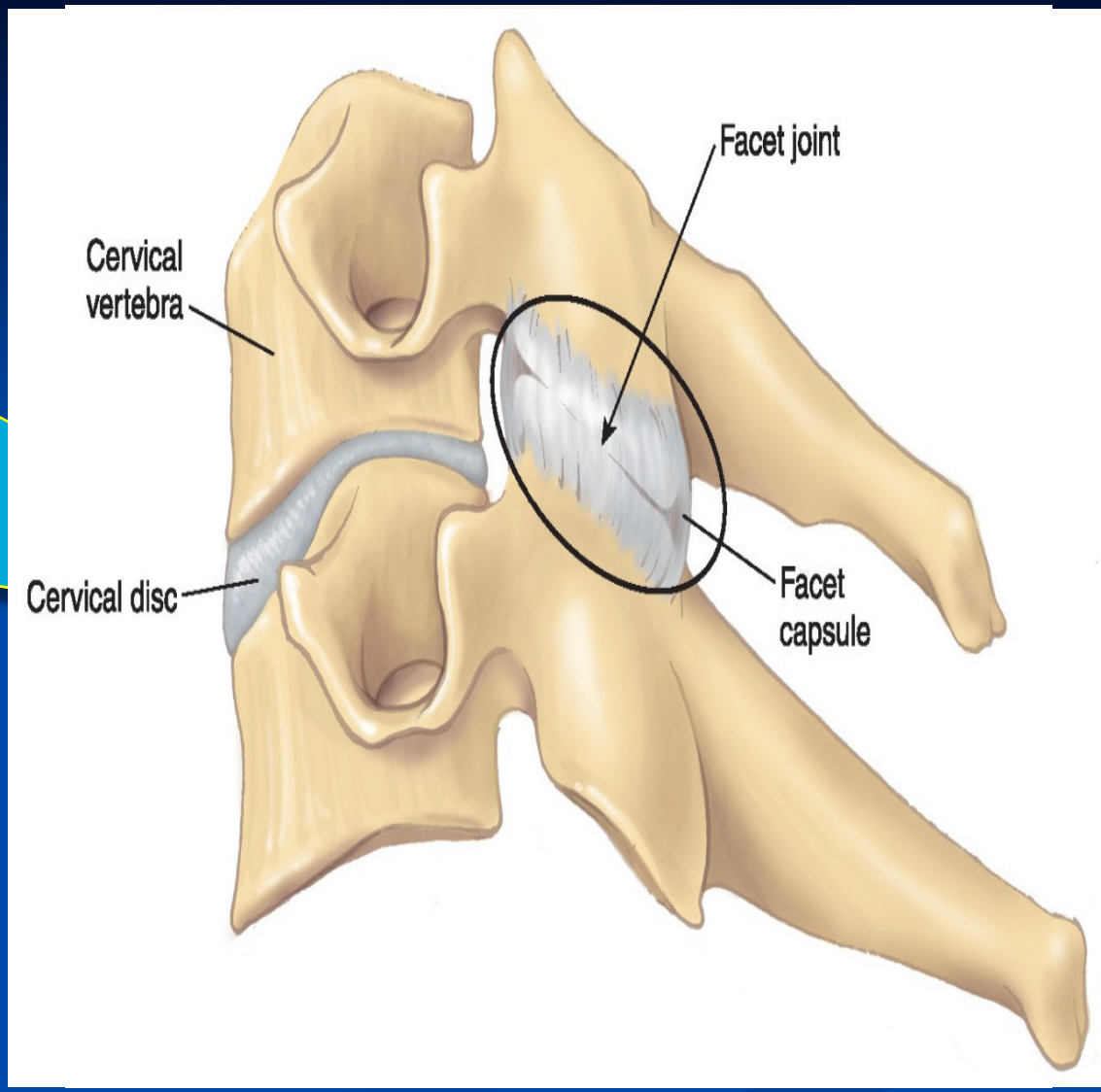
'Sloped from anterior to posterior'

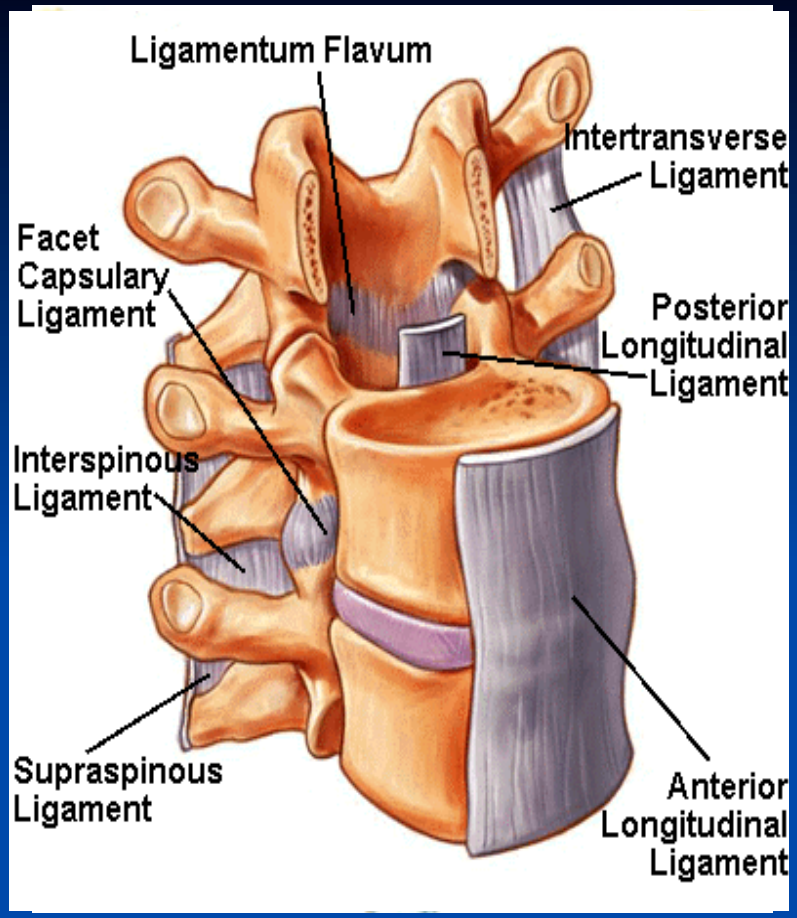
Zygapophysial joint

Joint between the articular processes of two adjacent vertebrae.

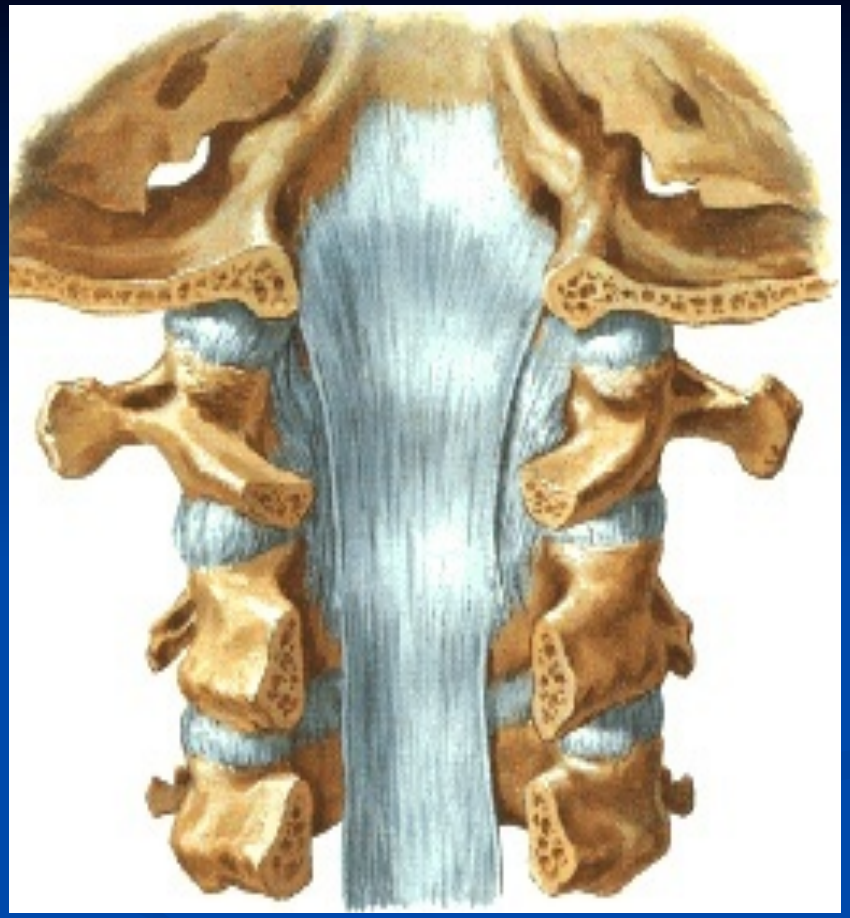
The joints between two **vertebral arches** consist of **synovial joints** between the **superior** and **inferior articular processes** of adjacent vertebrae.

The articular facets are covered with **hyaline cartilage**, and the joints are surrounded by a **capsule.**

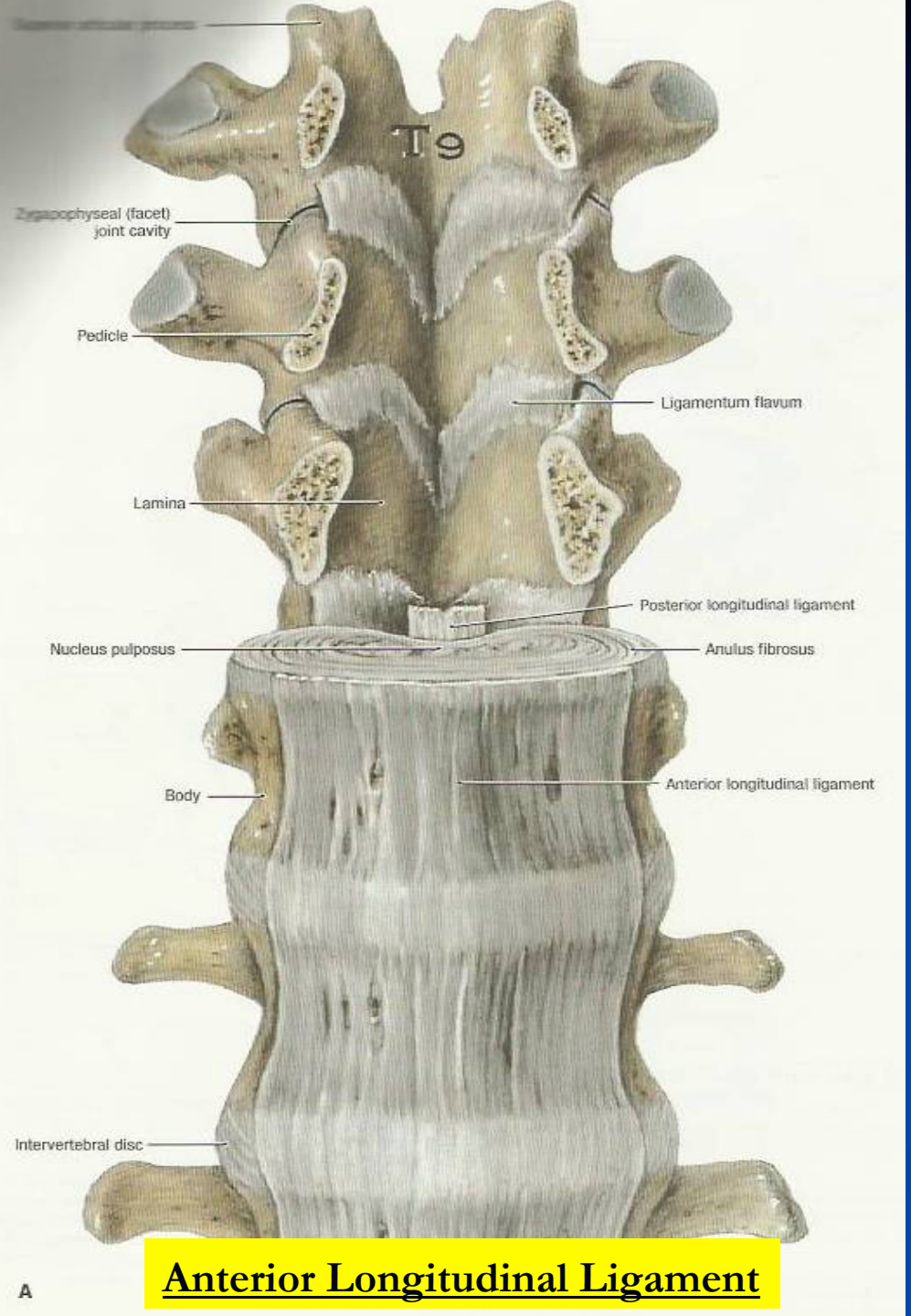




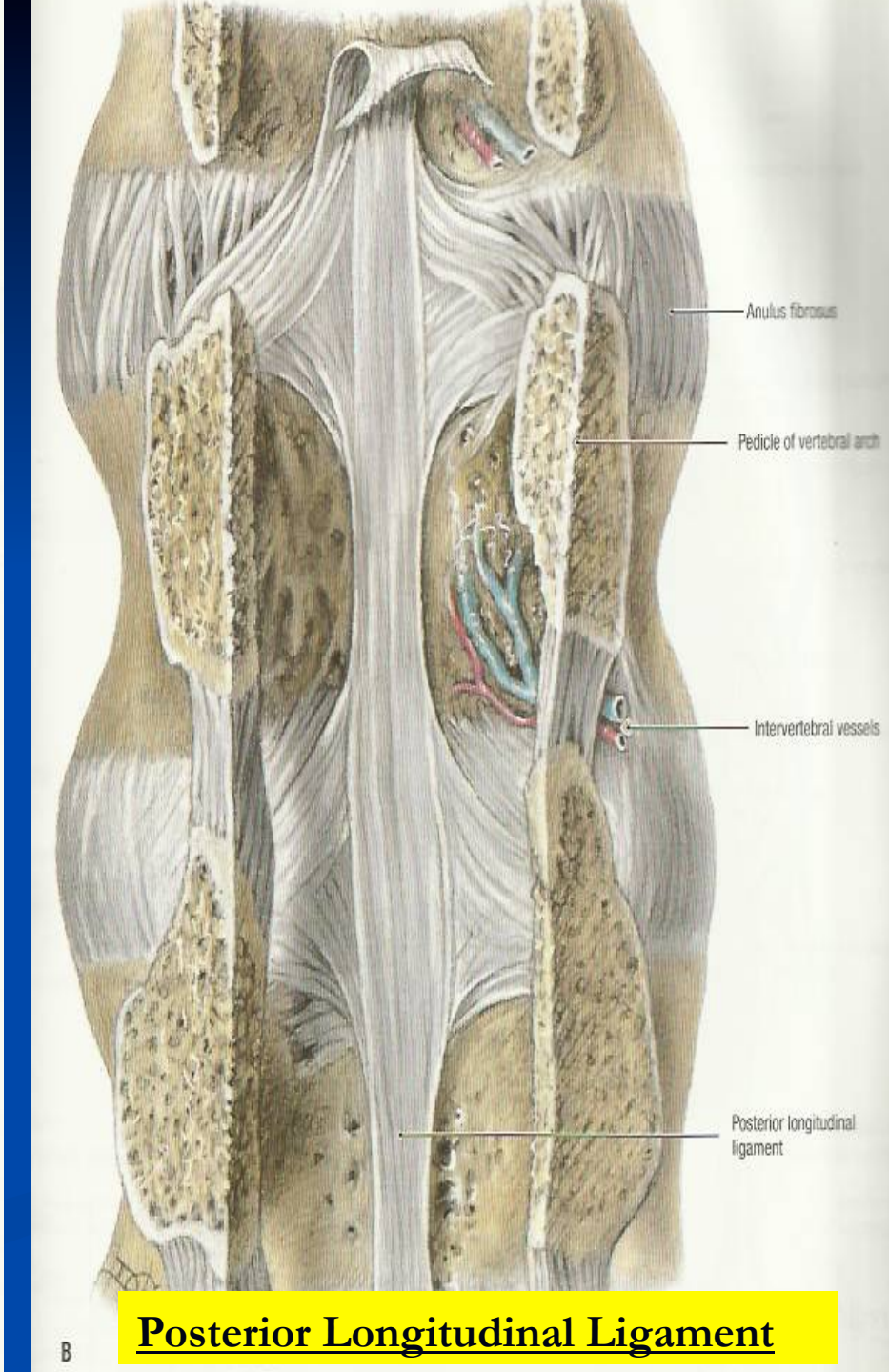
LIGAMENTS



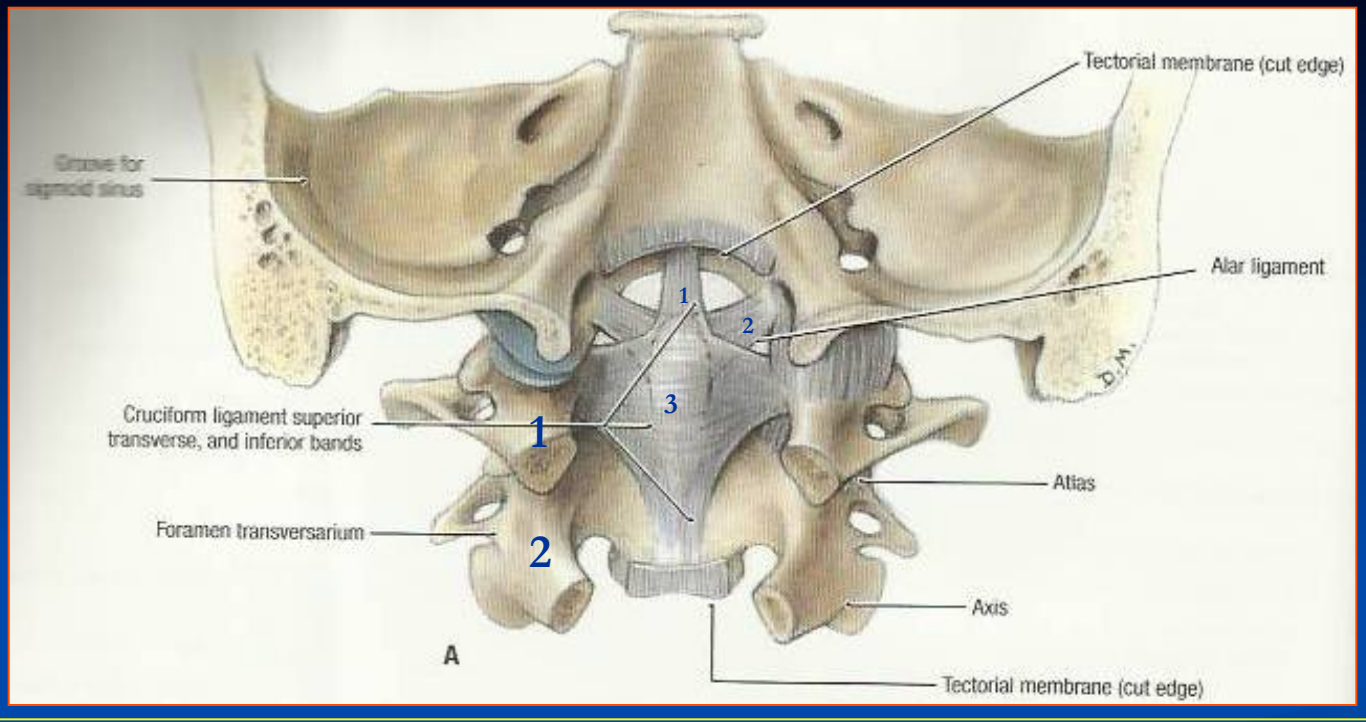
- The anterior and posterior longitudinal ligaments run as continuous bands along the anterior & posterior surfaces of the vertebral bodies.
- These ligaments hold the vertebrae firmly together but at the same time permit a small amount of movement to take place.



Anterior Longitudinal Ligament



Posterior Longitudinal Ligament



- **Apical ligament :** median ligament connects apex of odontoid process to foramen magnum (it is undercover of cruciate ligament).
- **Alar ligaments :** these lie on each side of apical ligament and connect odontoid process to medial side of occipital condyles.
- **Cruciate ligament :** consists of a transverse part & a vertical part/vertical (between body of axis and foramen magnum)/ transverse (binds odontoid process to anterior arch of atlas).

OTHER LIGAMENTS

Supraspinous ligament:

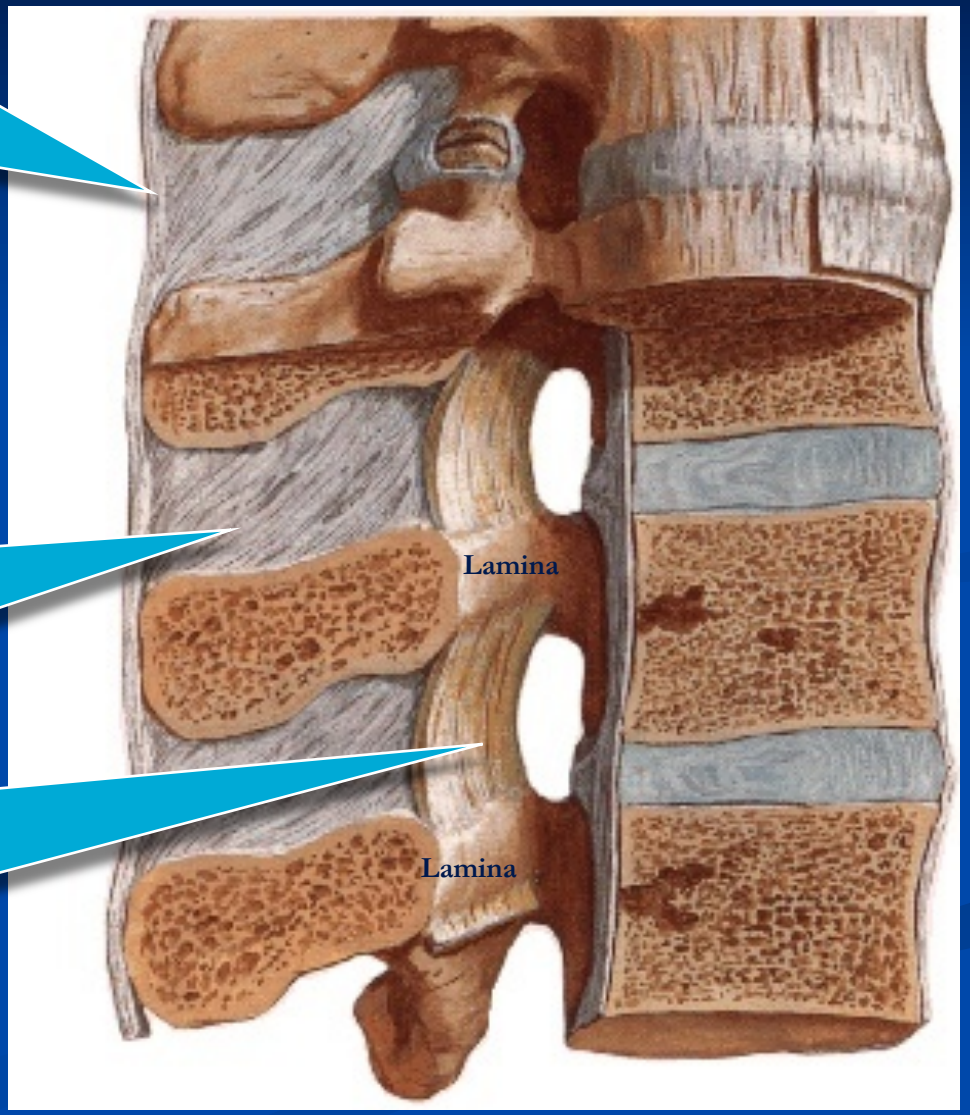
It runs between the tips of adjacent spines.

Interspinous ligament:

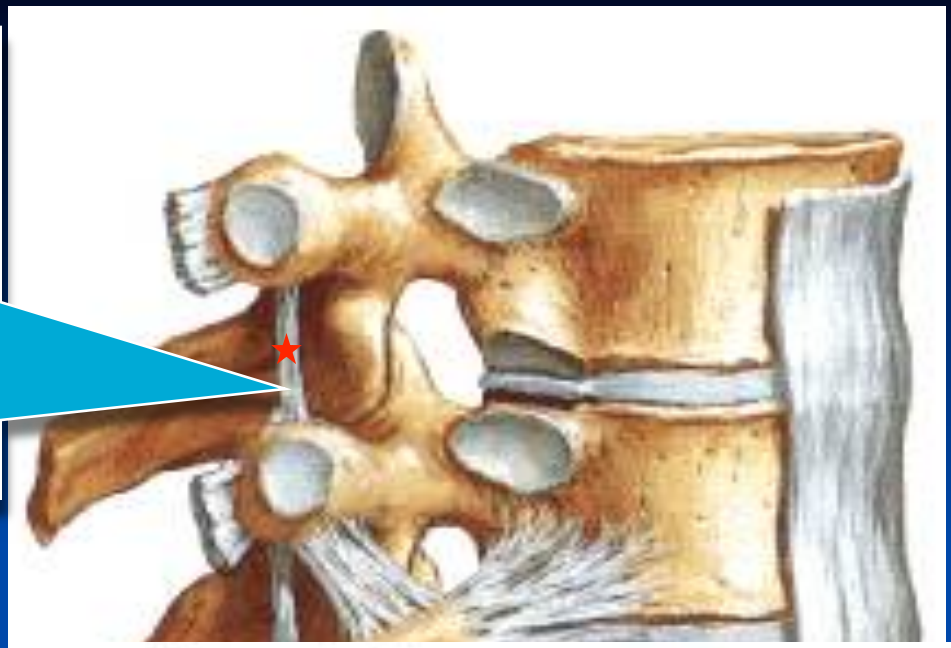
It connects adjacent spines.

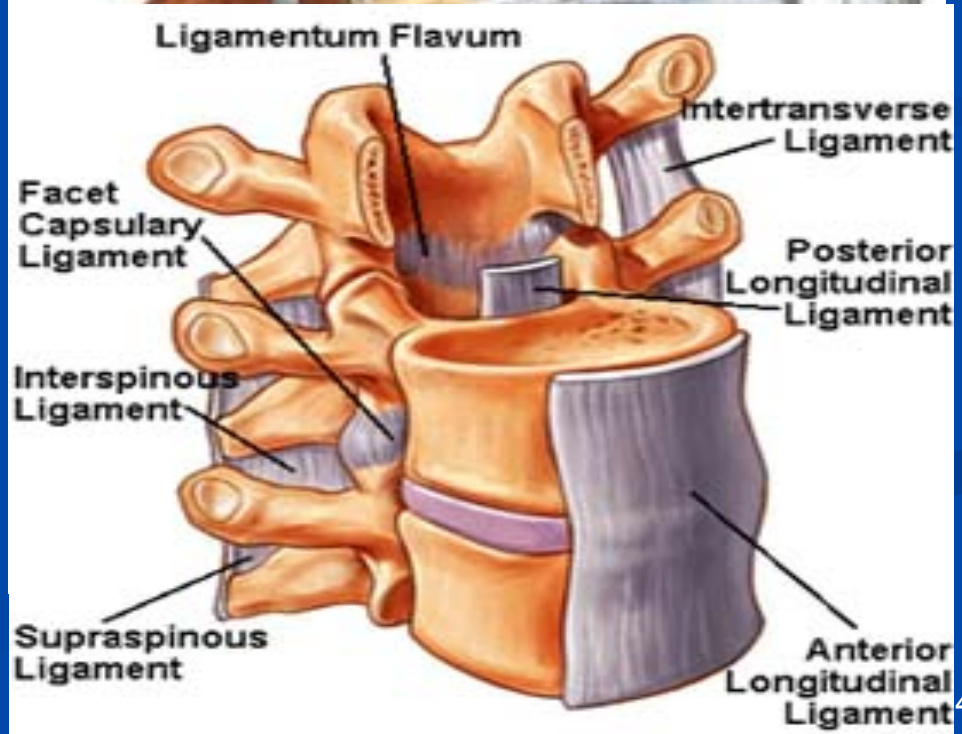
Ligamentum flavum:

It connects the laminae of adjacent vertebrae.



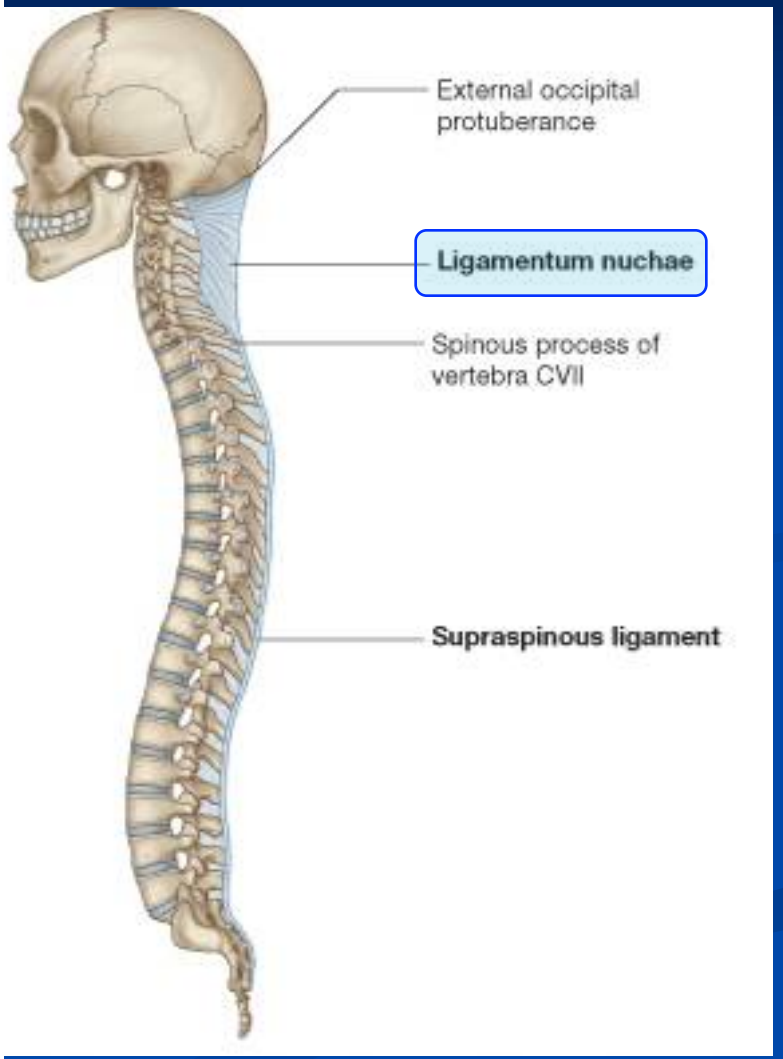
Intertransverse ligaments: They run between adjacent transverse processes.





LIGAMENTUM NUCHAE

- In the cervical region, the Supraspinous and Interspinous ligaments are greatly thickened to form the strong ligamentum nuchae.
- It extends from the spine of the seventh cervical vertebra to the external occipital protuberance of the skull, with its anterior border being strongly attached to the cervical spines.



THANK YOU