



Anatomy Team

433

3

**King Saud University
College of medicine
Musculoskeletal block**

Cervical Spines

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For any comments

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Objectives

- ❖ 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.

Color Index

- Red : Important.
- Violet: Explanation.
- Gray: Additional Notes.

Other colors are for
Coordination

An overview

- Cervical vertebrae are the **smallest** of the true vertebrae, and can be readily distinguished from those of the thoracic or lumbar regions by the presence of a **foramen** in each transverse process.
- The cervical vertebrae of the spine consist of **seven** vertebrae that reside at the base of the skull and reach to the thoracic vertebrae
- Classification : a- Typical: 3rd, 4th, 5th & 6th
b- Atypical: 1st, 2nd & 7th } **They all have "Transverse Foramens"**
- The cervical spine functions to provide **mobility and stability** to the head and neck while connecting it to the relatively immobile thoracic spine.
- The cervical spine is much more mobile than the thoracic or lumbar regions of the spine.
- C1 and C2 form a unique set of **articulations** that provide a great degree of **mobility for the skull**.
- **UNLIKE** the other parts of the spine, the cervical spine has **foramen transversarium** in each vertebra (except C7) for the vertebral arteries that supply blood to the brain
- The facet joints in the cervical spine are (zygapophyseal= synovial) joints with fibrous capsules.

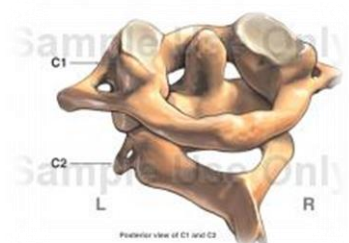
Atlas – C1

- The atlas is ring-shaped and does have **neither a body nor a spine**, unlike the rest of the vertebrae.
- The atlas is made up of a ***small anterior arch**, ***a large posterior arch**, ***2 prominent lateral masses**, ***2 transverse processes** and ***2 transverse foramens**.
- The transverse foramen, through which the vertebral artery passes, is enclosed by the transverse process.
- On each lateral mass is a superior and inferior facet. **These facets are (Zygapophyseal = synovial) joints**.
- The superior articular facets are kidney-shaped and they articulate with the **occipital condyles** of the skull.
- The inferior articular facets are circular and articulate with the superior facets of the **axis**.

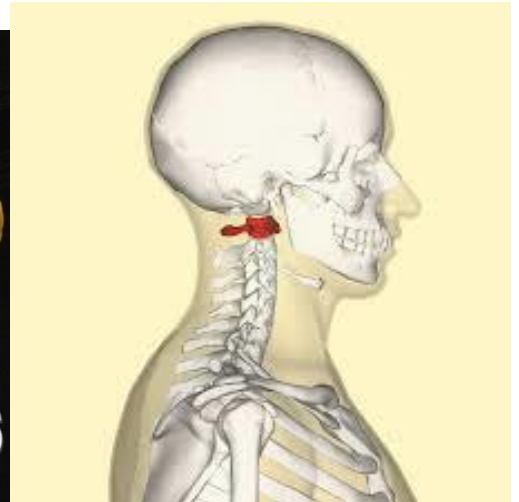
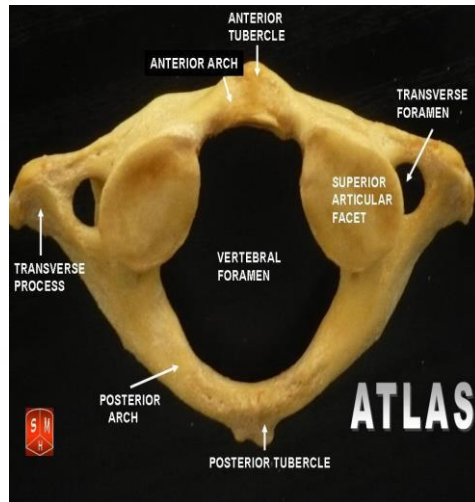
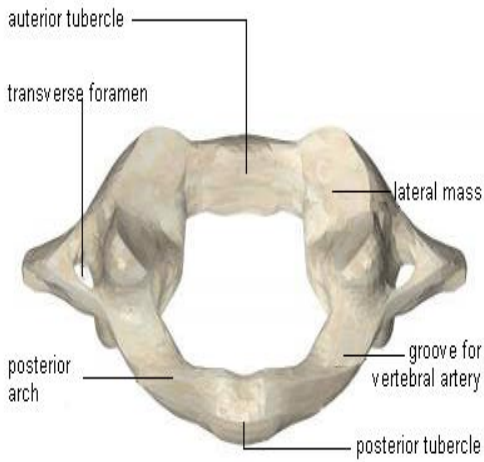
→→→ The atlas articulates:

A-superiorly with the **occipital condyle** of the skull forming the (**atlanto-occipital joint**)

B-Inferiorly with the **axis** forming the (**atlanto-axial joint**).

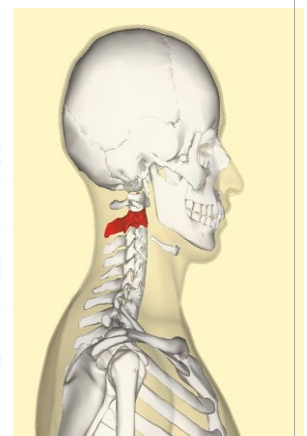
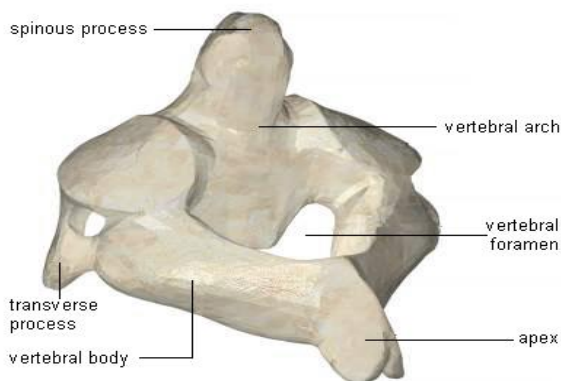
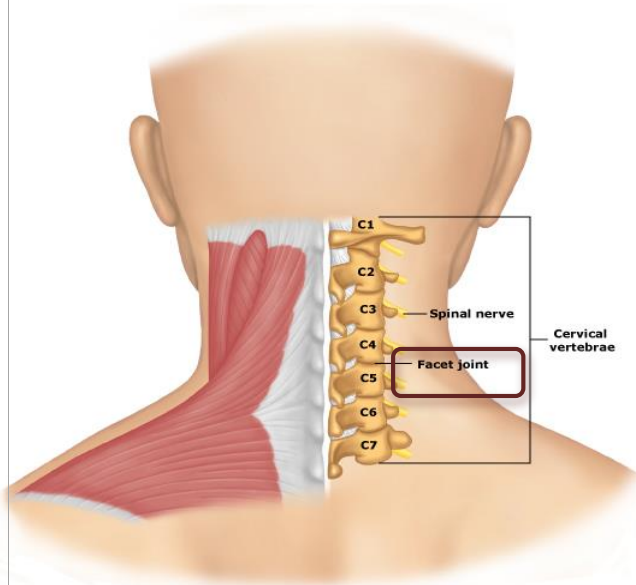


- The **Atlanto-axial joint** is responsible for the cervical rotation. This allows you to “Say No “
 meanwhile the **Atlanto-occipital joint** is responsible for the flexion and extension of the head. This joint allows you to nod “say Yes”.



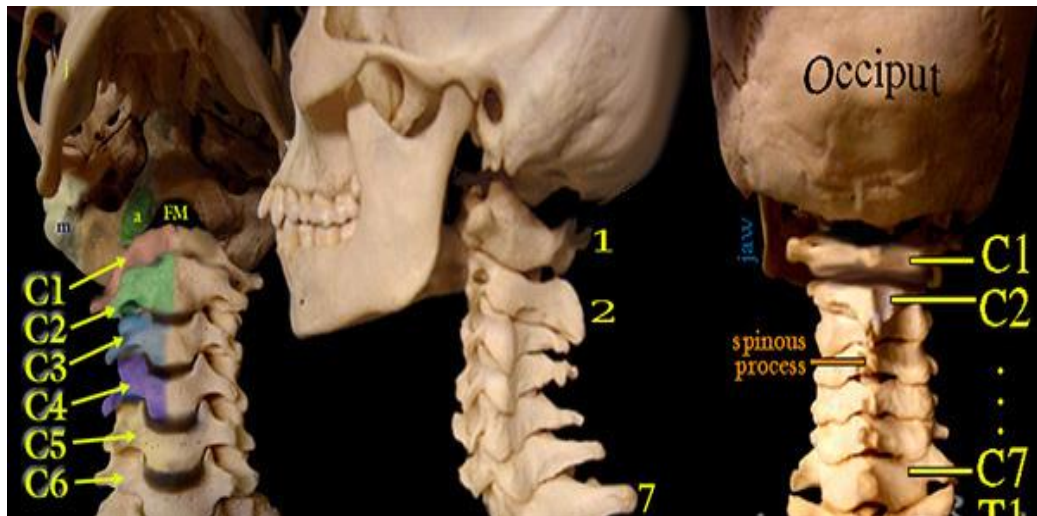
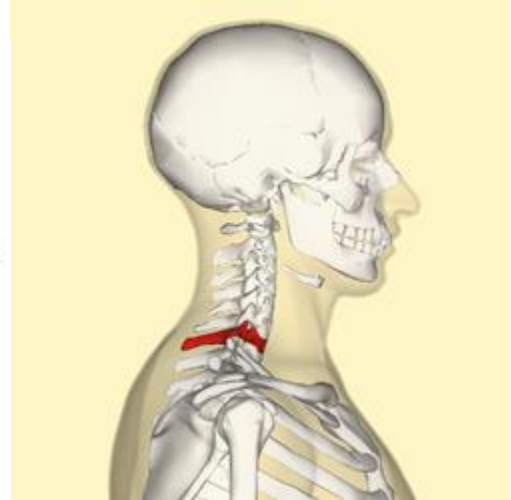
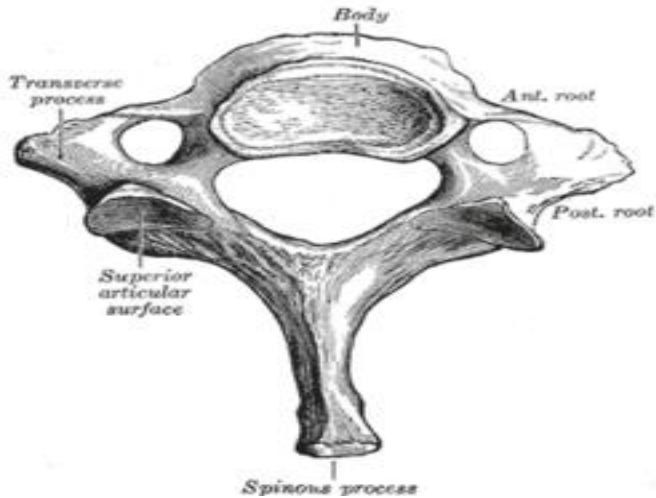
Axis – C2

- The axis has a large vertebral body, which contains the odontoid process (dens)
- Odontoid process (dens): Actually it represents the body of the atlas that has fused with the axis.
- The odontoid process is held tightly to the anterior arch of the atlas by the intertransverse ligament, which stabilizes the Atlanto-axial joint.



Vertebra prominens – C7

- The most distinctive characteristic of this vertebra is the existence of a long and prominent spinous process (which is not bifid), hence the name vertebra prominens (بروز).
- It is the **first** spine felt subcutaneously



Typical Cervical Spines

Component	Characteristics
Body	<ul style="list-style-type: none"> ✿ small ✿ longer horizontally than antero-posteriorly
Spinous process	<ul style="list-style-type: none"> ✿ short ✿ bifid (مشقوقه من الاعلى)
Transverse process	<ul style="list-style-type: none"> ✿ It has: <ul style="list-style-type: none"> ▪ transverse foramen: vertebral vessels¹ pass through it ▪ 2 tubercles (anterior and posterior)
Vertebral foramen	<ul style="list-style-type: none"> ✿ large ✿ triangular
Superior articular process	<ul style="list-style-type: none"> ✿ faces upward and backward
Inferior articular process	<ul style="list-style-type: none"> ✿ faces downward and forward

Atypical spines**Atlas – C1**

component	Characteristics
2 lateral masses	<ul style="list-style-type: none"> ✿ they are connected by anterior and posterior arches ✿ each lateral mass has an upper (superior) and lower (inferior) articular surfaces
Upper articular surface	<ul style="list-style-type: none"> ✿ located on the lateral mass of the atlas ✿ kidney shaped ✿ articulates with the occipital condyles of the skull, forming the "Atlanto-occipital joint"
Lower articular surface	<ul style="list-style-type: none"> ✿ located on the lateral mass of the atlas ✿ circular ✿ articulates with the axis (C2) , forming 2 lateral "Atlanto-axial joints" and 1 median joint

¹ Arteries and veins

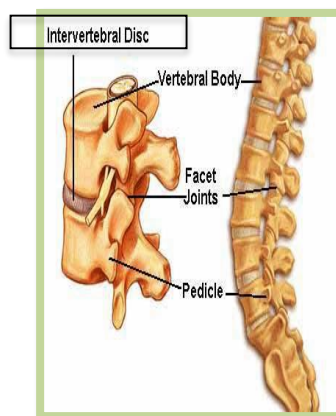
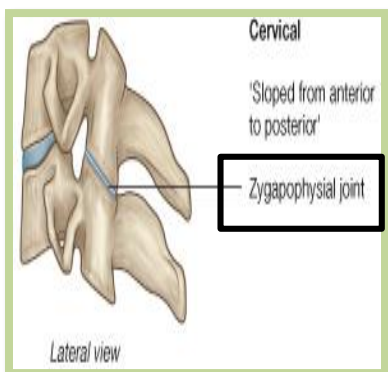
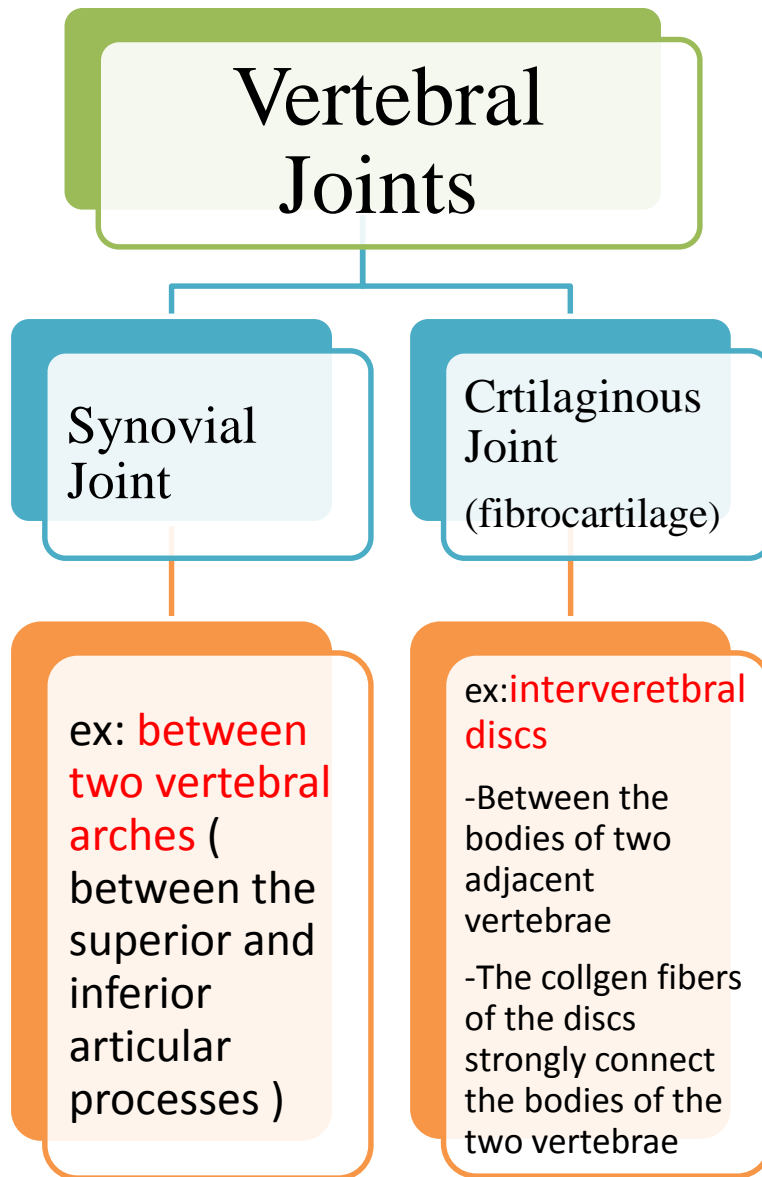
Axis – C2

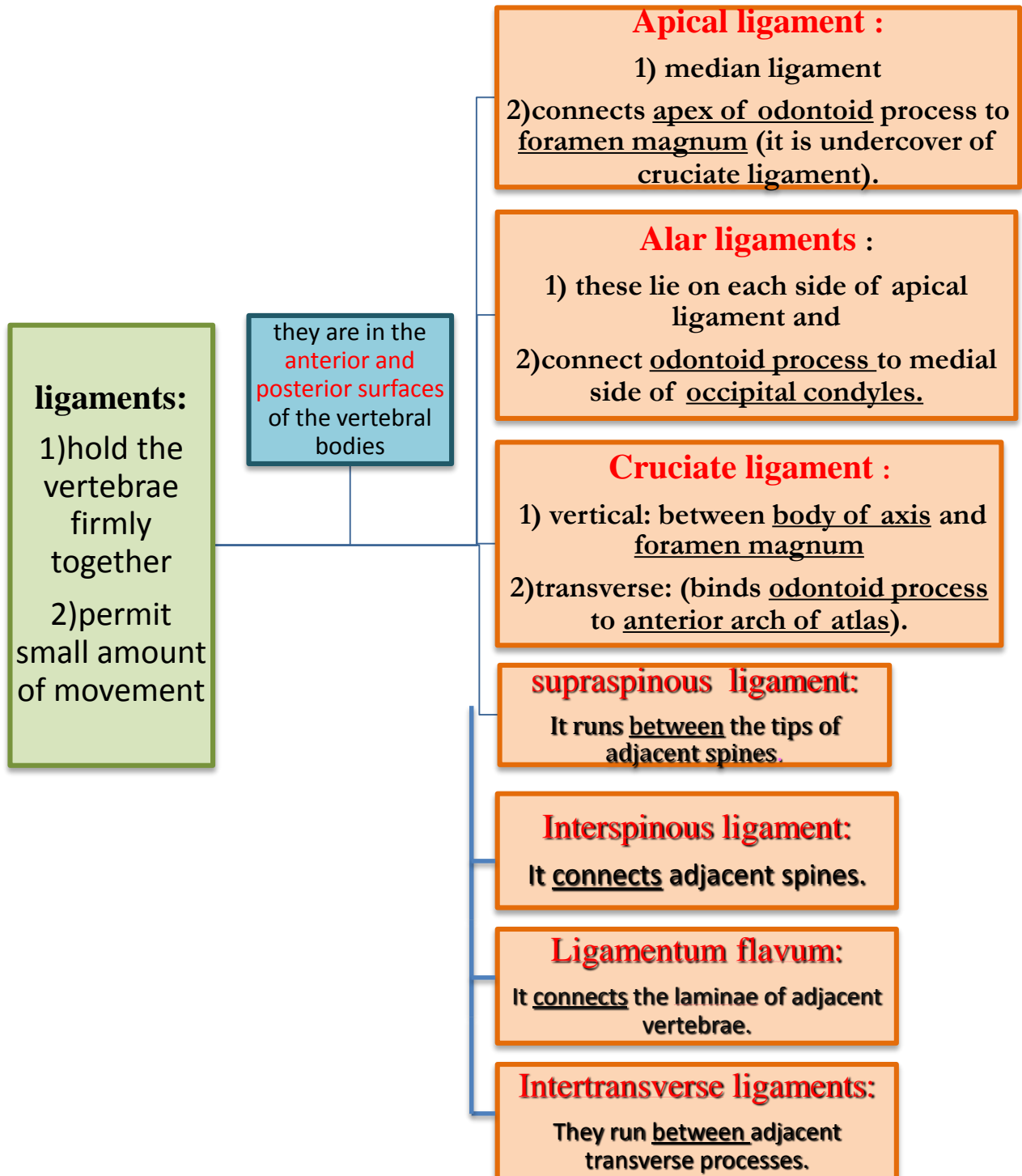
components	Characteristics
Odontoid process (Dens)	<ul style="list-style-type: none"> ⊗ it is a pivot for the rotation of C1 and the skull

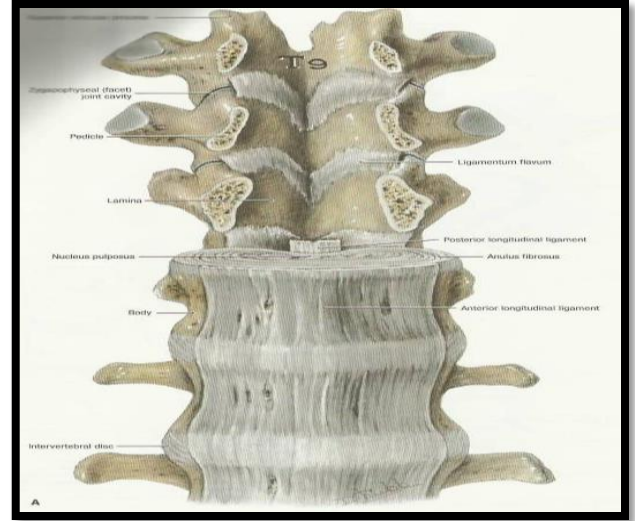
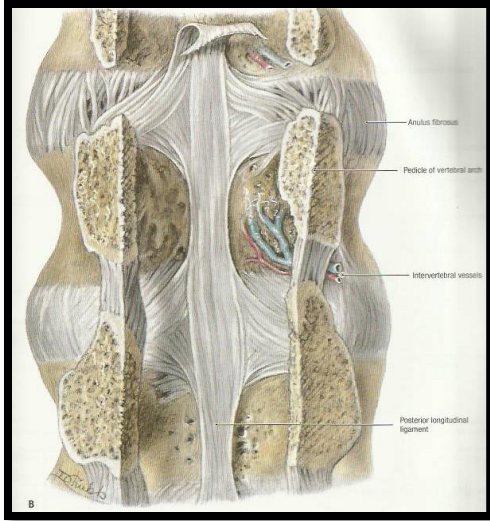
Vertebra Prominens – C7

components	Characteristics
Spinous process	<ul style="list-style-type: none"> ⊗ the longest spine ⊗ felt sub-cutaneous ⊗ not bifid
Transverse process	<ul style="list-style-type: none"> ⊗ it may have small or no foramen transversarium <ul style="list-style-type: none"> → thus no transmission of vertebral Arteries ² ⊗ small accessory veins may pass through

² NB. Compare it to the typical Cervical spines

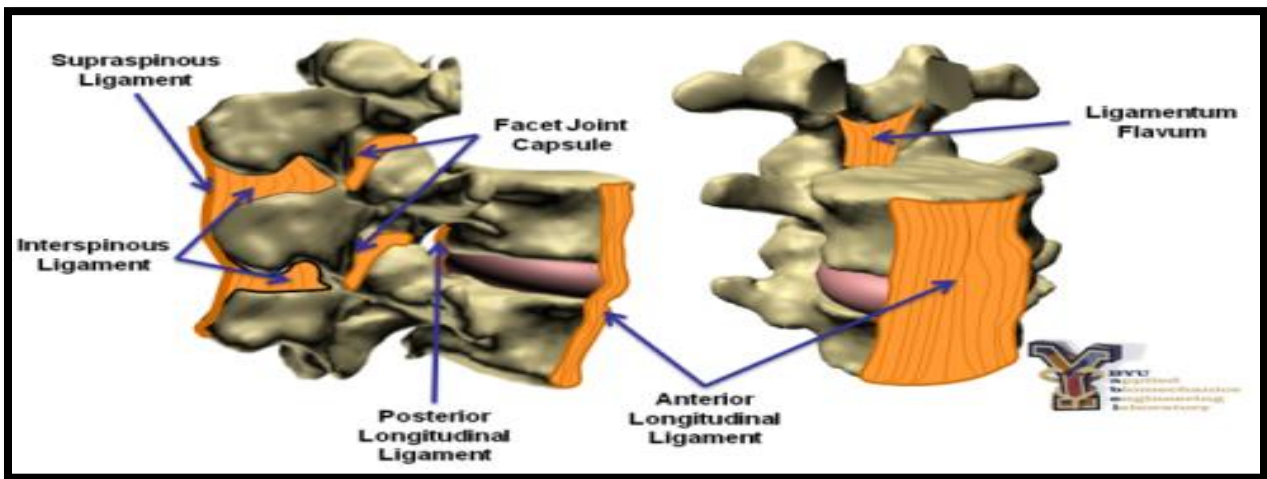
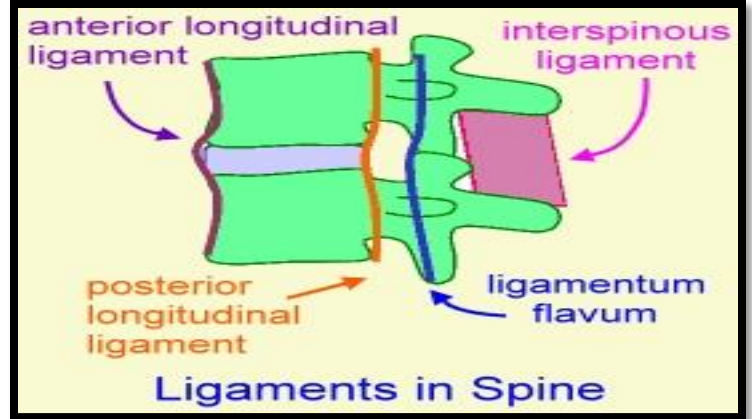
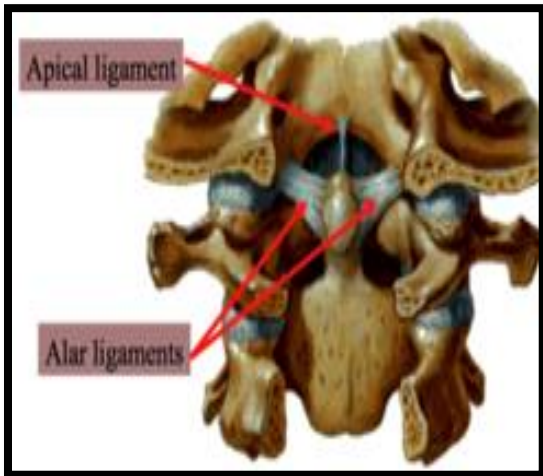






Posterior Longitudinal Ligament

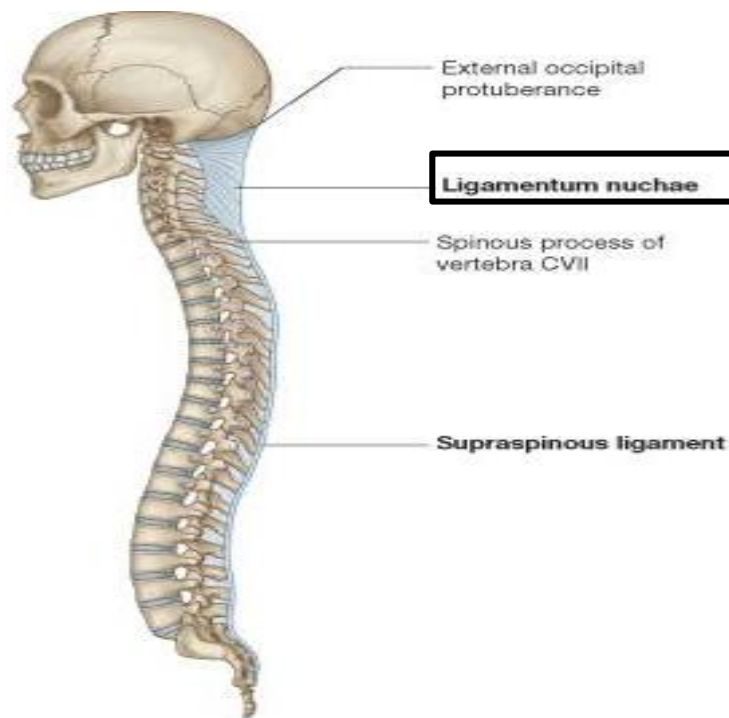
Anterior Longitudinal Ligament



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 in between**.





Cervical
Spine
Anatomy



Cervical
Vertebrae -
Anatomy
Study Aid
and Quiz



Remember That:

- ✓ Ligaments hold the vertebrae firmly together but at the same time permit a small amount of movement to take place
- ✓ The Cruciate ligaments consist of transverse ((binds odontoid process to anterior arch of atlas) vertical (between body of axis and foramen magnum)
- ✓ Ligamentum Nuchae consist of: Supraspinous and Interspinous ligaments

Multiple Choice Questions

1- The first spine to be felt subcutaneously:

A- C6 B- C7 C- T1 D- T2

2- The Atlanto-occipital joints are:

A- synovial joint B- cartilage joint C- fibrous joint D- none

3- Which one of cervical vertebrae has small foramen transversarium

A- 1st B- 3rd C- 5th D- 7th

4- The superior articular processes in typical cervical vertebrae has:

A- Face upward & backward. B- Face upward & forward.
C- Face downward & backward. D- Face downward and forward.

Q Ans. :

1- B 2- A 3- D 4- A