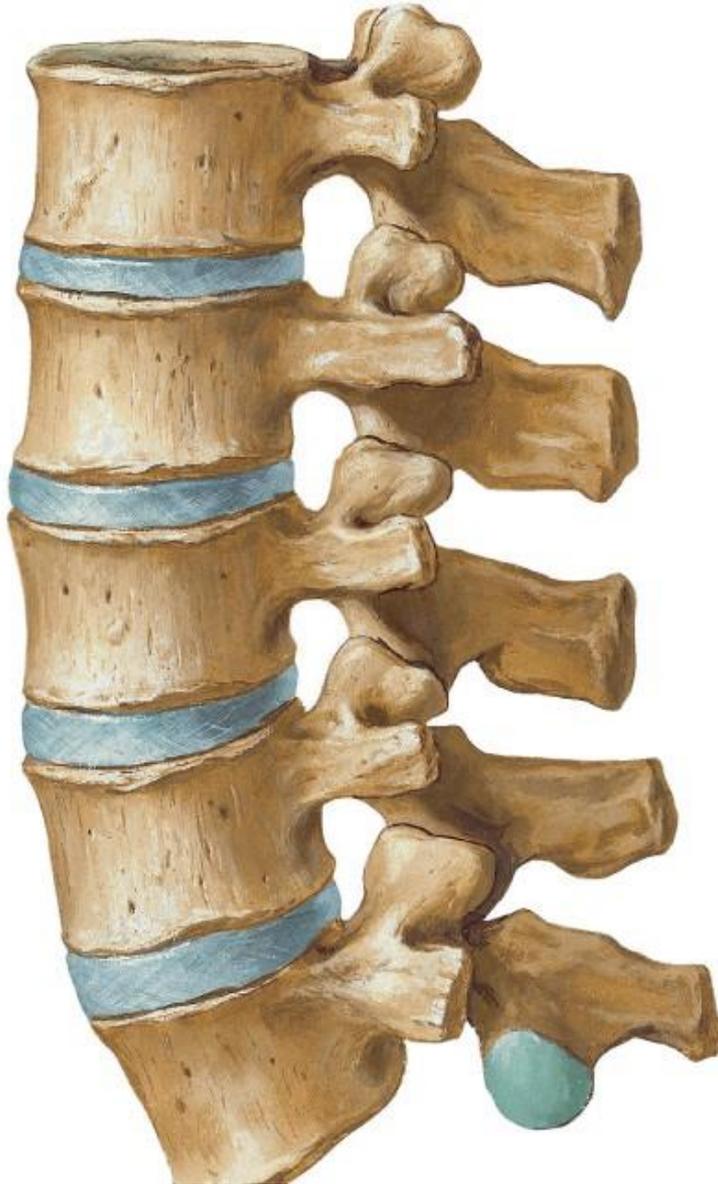


# VERTEBRAL COLUMN



BY

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# STRUCTURE

## VERTEBRAE

7 cervical

12 thoracic

5 lumbar

5 sacral

3±1 coccygeal

## INTERVERTEBRAL DISCS

each disc is formed of 2 parts

### Annulus fibrosus

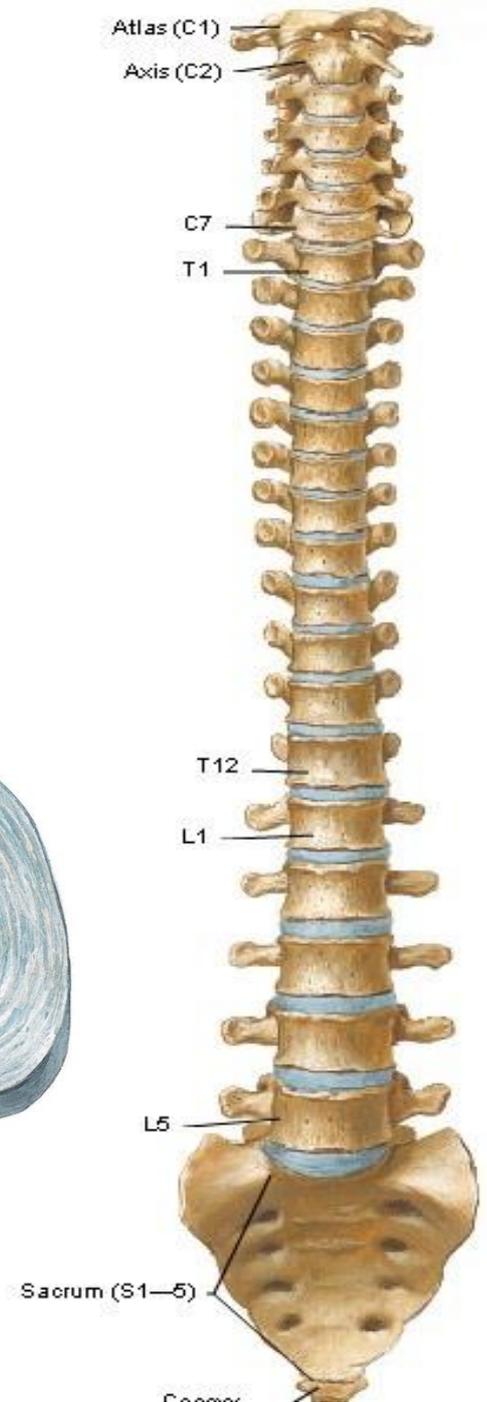
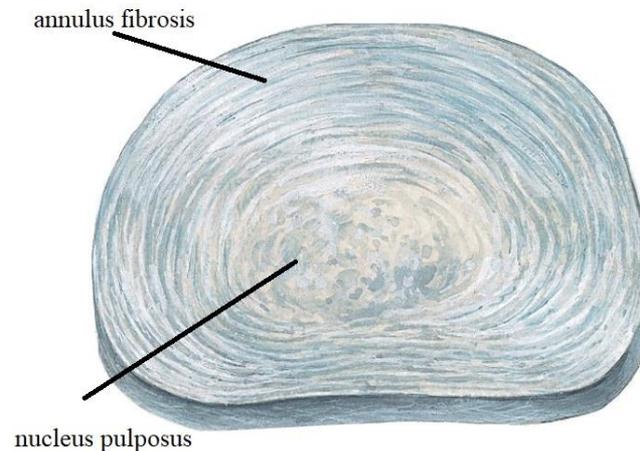
a fibrous ring

in the periphery of the disc

### Nucleus pulposus

a gelatinous material

in the center of the disc to absorb shocks



# CURVATURES

## 1. primary curves

- present during fetal life.
- Concave anteriorly
- Continue in thoracic and pelvic curves.

## 2. Secondary curves:

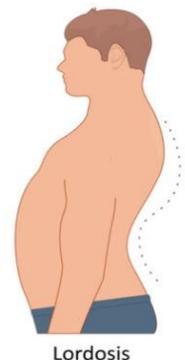
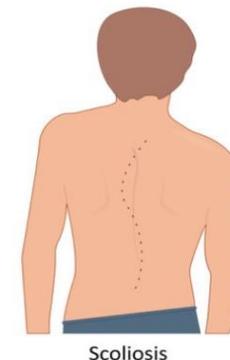
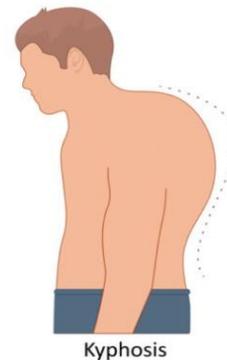
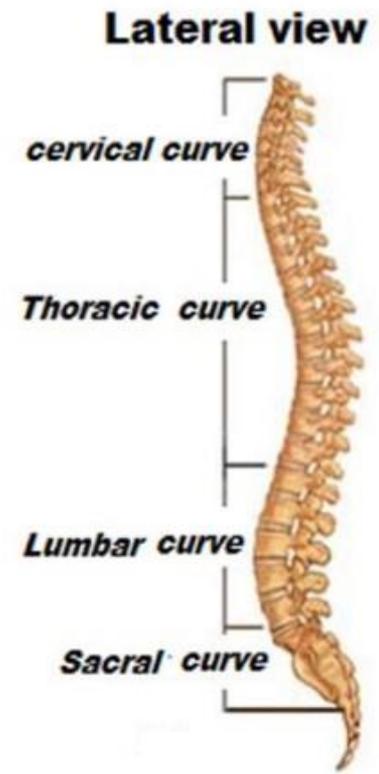
- Developed after birth.
- Concave posteriorly
- Includes cervical and lumbar curves.

- **N.B.**

**Kyphosis**:- exaggerated curvature in thoracic region

**Lordosis**:- exaggerated curvature in the lumbar region

**Scoliosis**:- S-shaped curvature of the whole vertebral column



# PARTS OF VERTEBRA

**A-Body:**

**B- 2 vertebral (neural)arches:**

each arch is formed of

**Pedicle:**

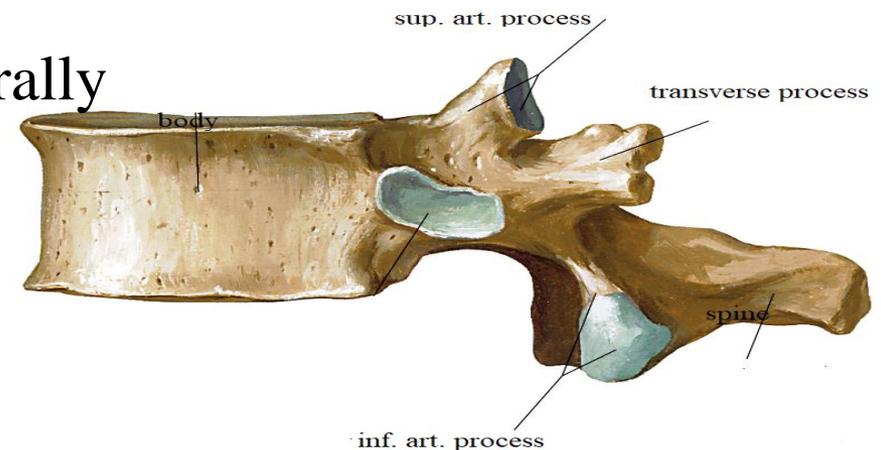
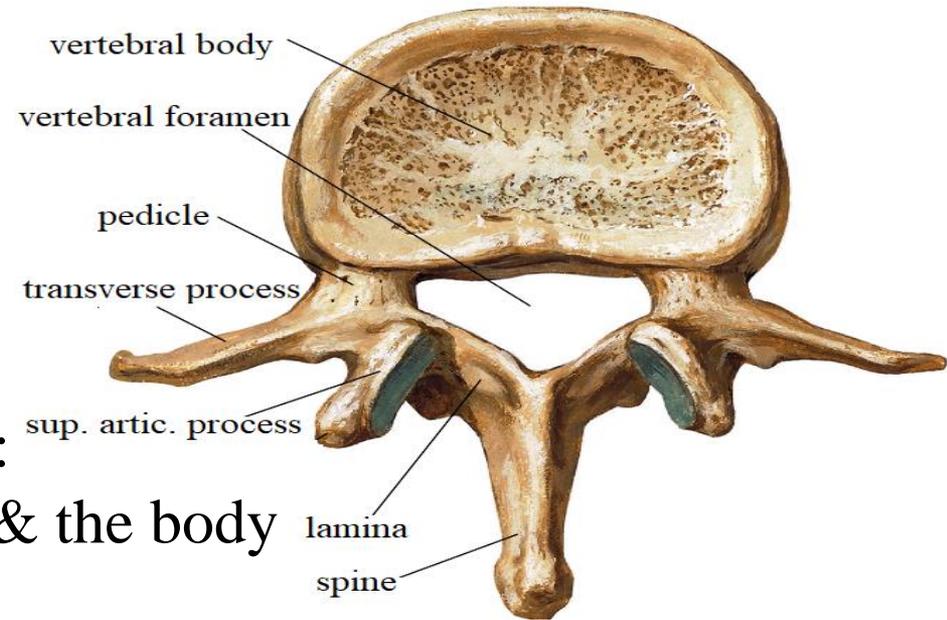
**Lamina:**

**N.B.:- Vertebral foramen (or canal):**  
lies between the 2 vertebral arches & the body

**C- 7 processes:**

- **Spine:** directed posteriorly
- **2 transverse processes:** directed laterally
- **2 Superior articular processes:** articulate with the inferior articular process of the vertebra above
- **2 Inferior articular processes:**

articulate with the superior articular process of the vertebra below



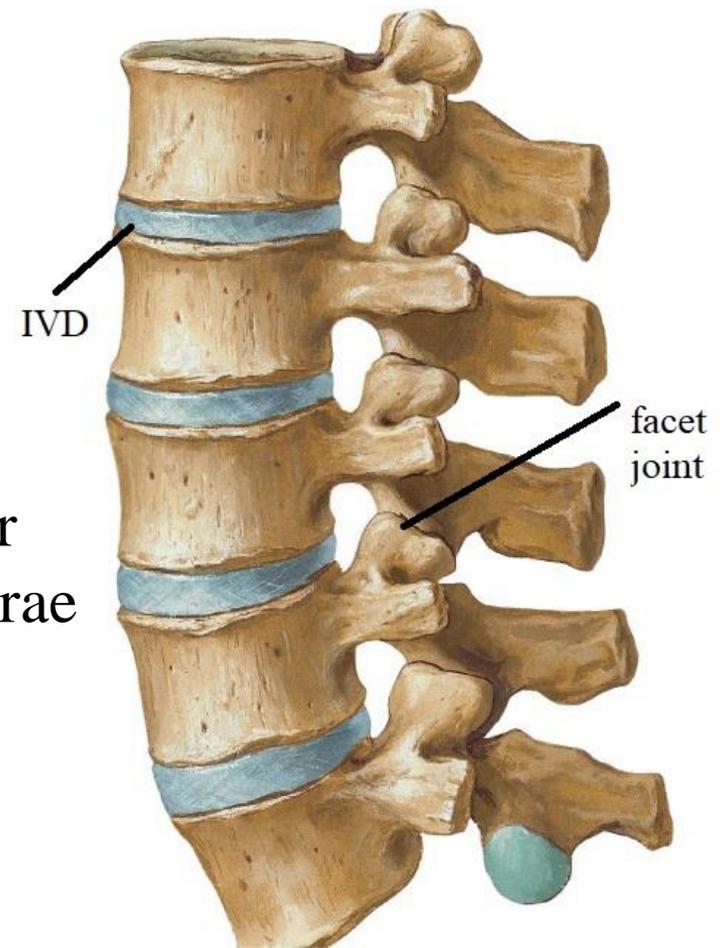
# JOINTS OF VERTEBRA

## Intervertebral disc

type & variety:- Secondary cartilaginous  
between:- the 2 vertebral bodies

## Facet joint

type & variety:- plane synovial  
between:- The superior and inferior articular  
processes of two adjacent vertebrae



# LIGAMENTS OF VERTEBRA

## Anterior longitudinal ligament

( ) the anterior surfaces of the vertebrae & IVD

## Posterior longitudinal ligament

( ) the posterior surfaces of the vertebrae & IVD

## Ligamentum flavum

( ) the laminae of the vertebrae

## Intertransverse ligaments

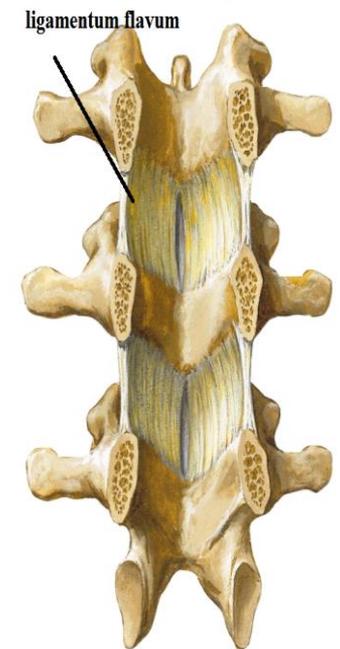
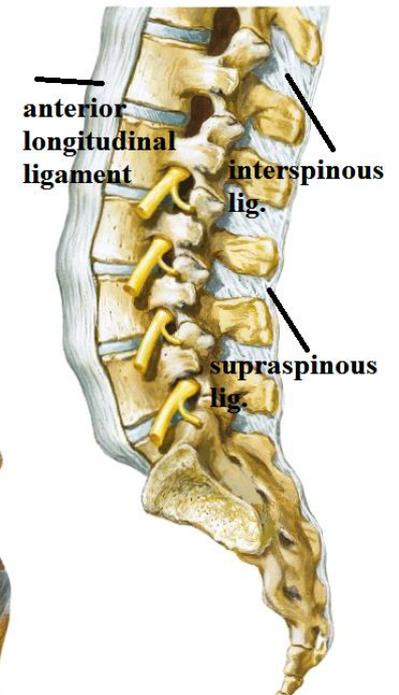
( ) the transverse processes of the vertebrae

## Interspinous ligaments

( ) the spines the vertebrae

## Supraspinous ligaments:

( ) the tips of vertebral spines



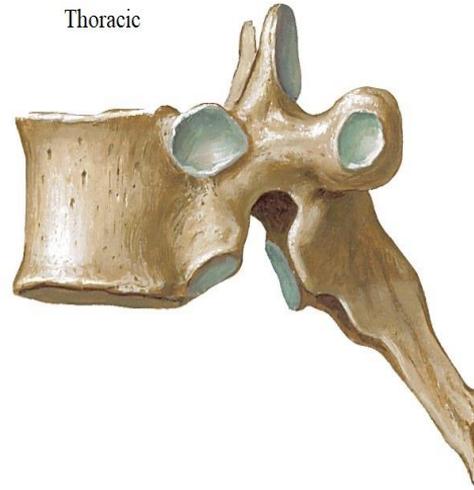
# HOW TO IDENTIFY THE VERTEBRA

- If it has a **foramen in the transverse process** :  
it is a cervical vertebra
- If **no foramen in the transverse process** with a **facet on the side of the body** of the vertebra :  
it is thoracic vertebra
- **If no foramen in the transverse process** and **the body has no facet** :  
it is lumbar vertebra.

Lumbar



Thoracic



cervical



# CERVICAL VERTEBRAE

NO. 7

## characters

- 1-presence of foramen transversarium
- 2-bifid spine

## classified into

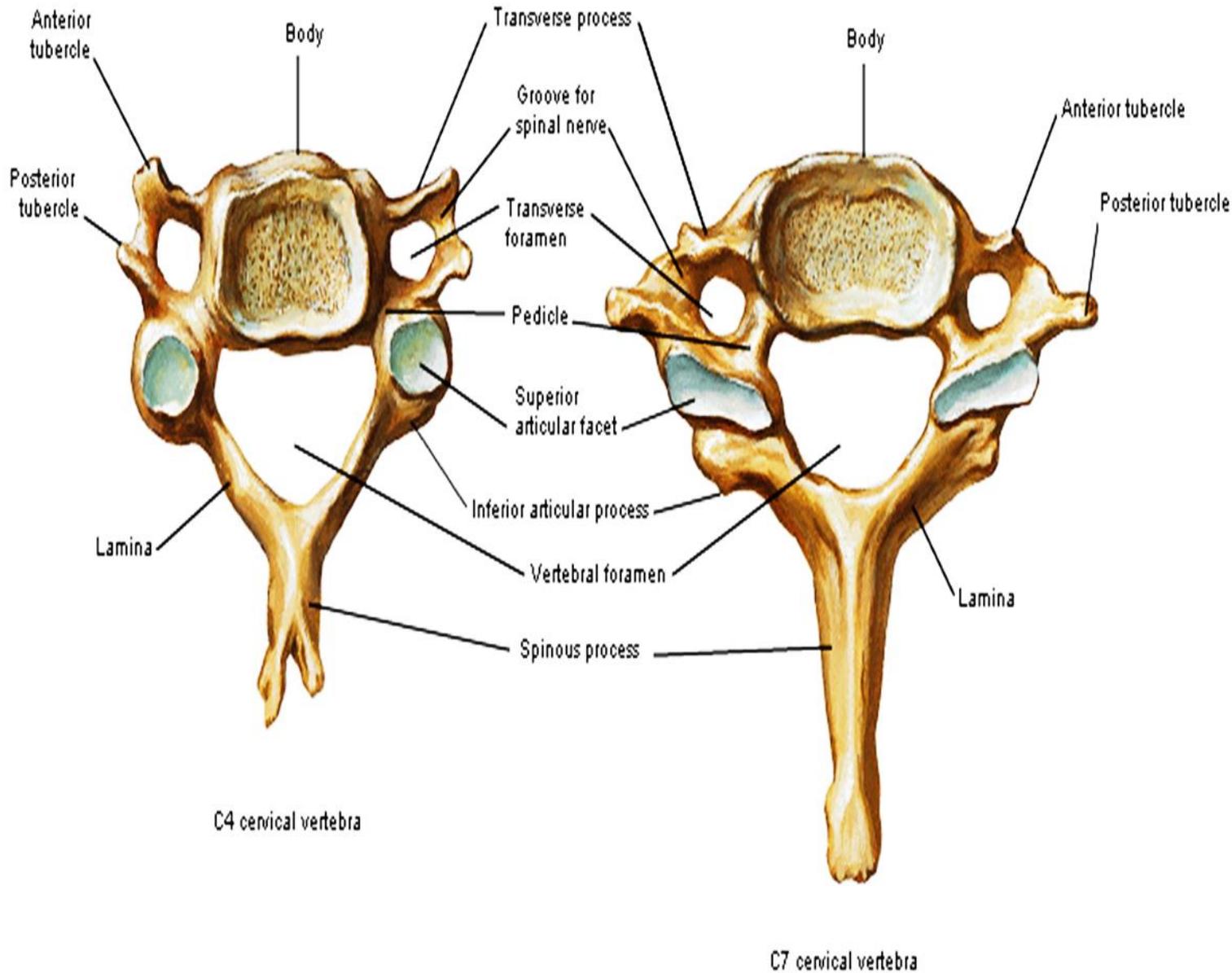
a- Typical 3-6.

b- atypical

1 (atlas)

2 (axis)

7 its spine is not bifid

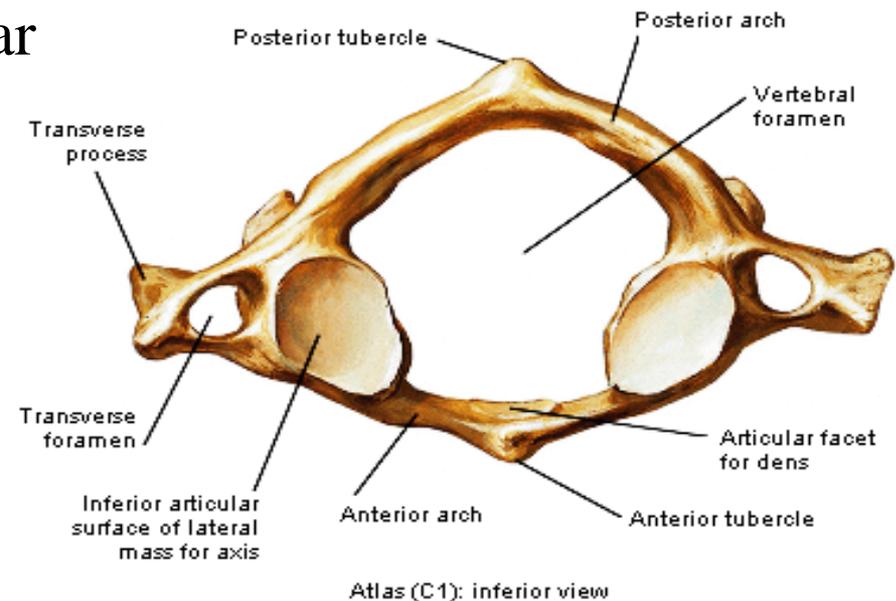
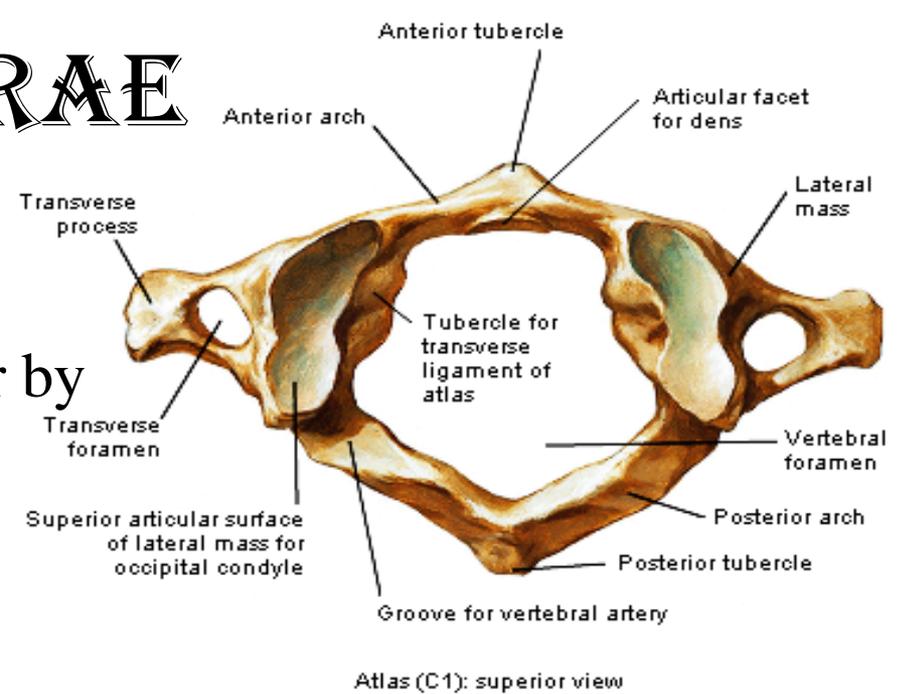


# CERVICAL VERTEBRÆ

## C1 ATLAS

-a bony ring formed of  
2 lateral masses connected together by  
short anterior arch and  
a longer posterior arch.

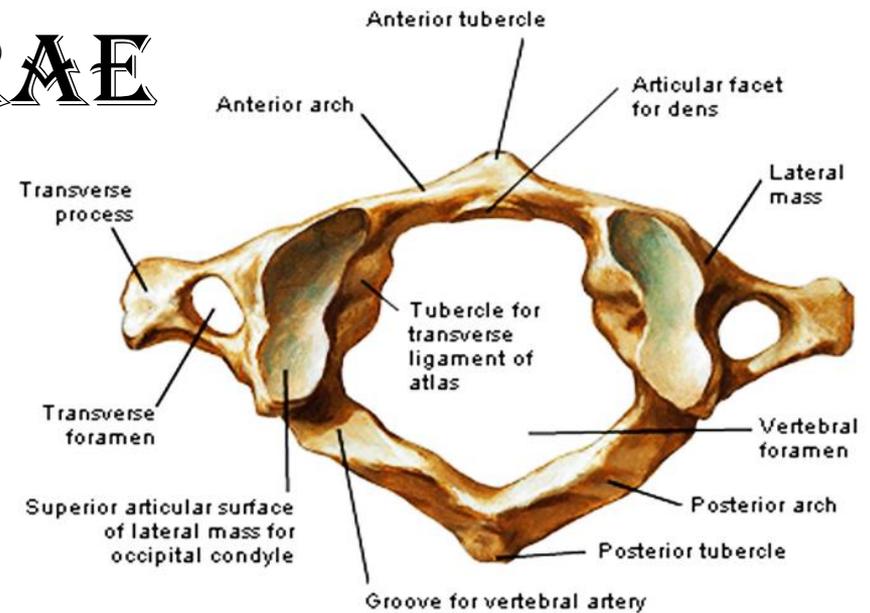
-the **2 Lateral mass** carries  
a kidney-shaped superior articular facet  
and a nearly circular inferior articular  
facet



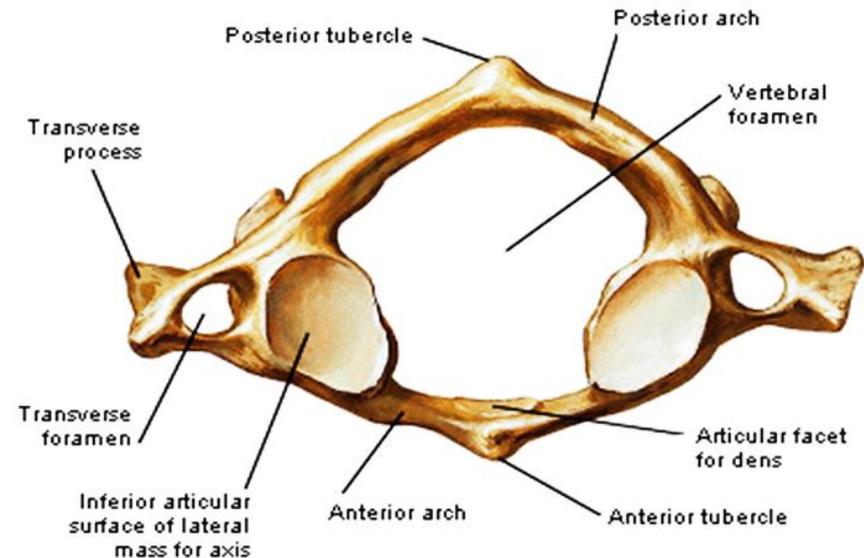
# CERVICAL VERTEBRAE

## C1 ATLAS

- The medial side of each lateral mass presents a tubercle for attachment of the transverse ligament of the atlas.
- **The anterior arch** carries an anterior tubercle.
- **Posterior arch** shows a posterior tubercle



Atlas (C1): superior view



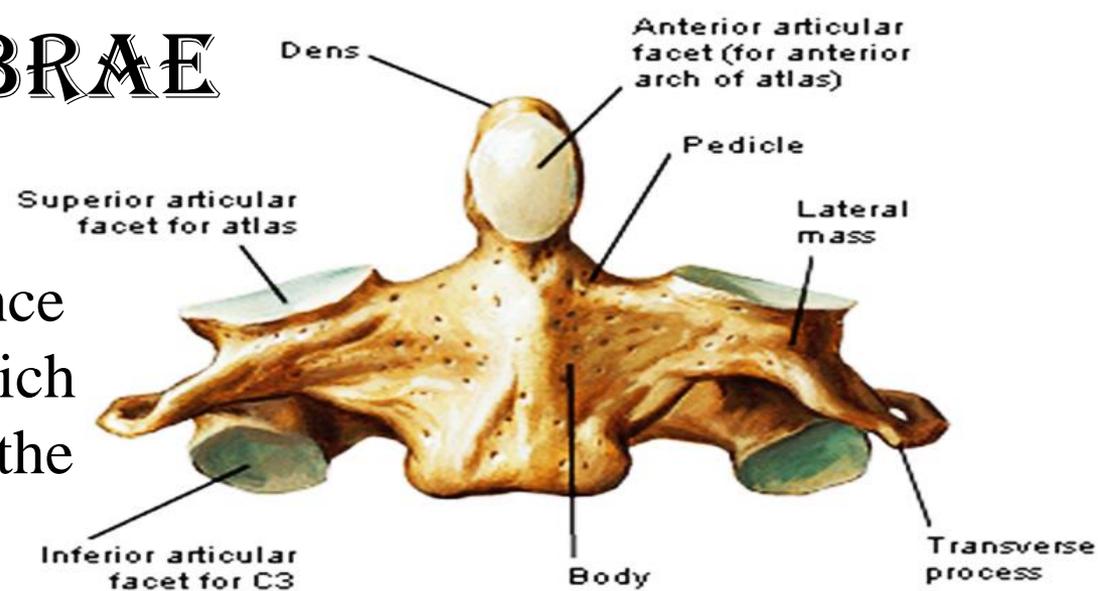
Atlas (C1): inferior view

# CERVICAL VERTEBRAE

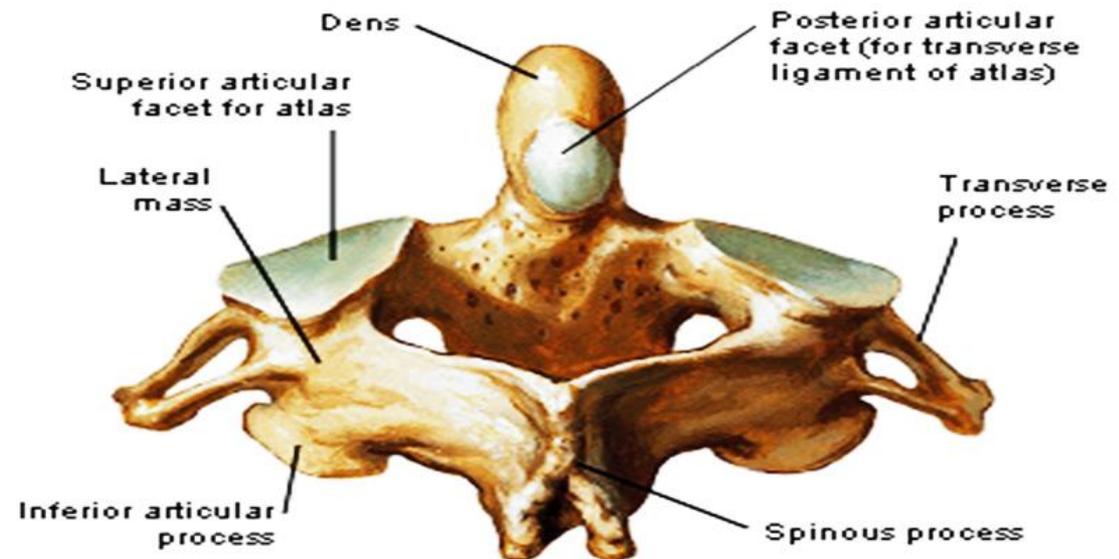
## C2 AXIS

It is characterized by the presence of dens or odontoid process which projects from the upper part of the body.

The dens is grooved posteriorly by transverse ligament of atlas.

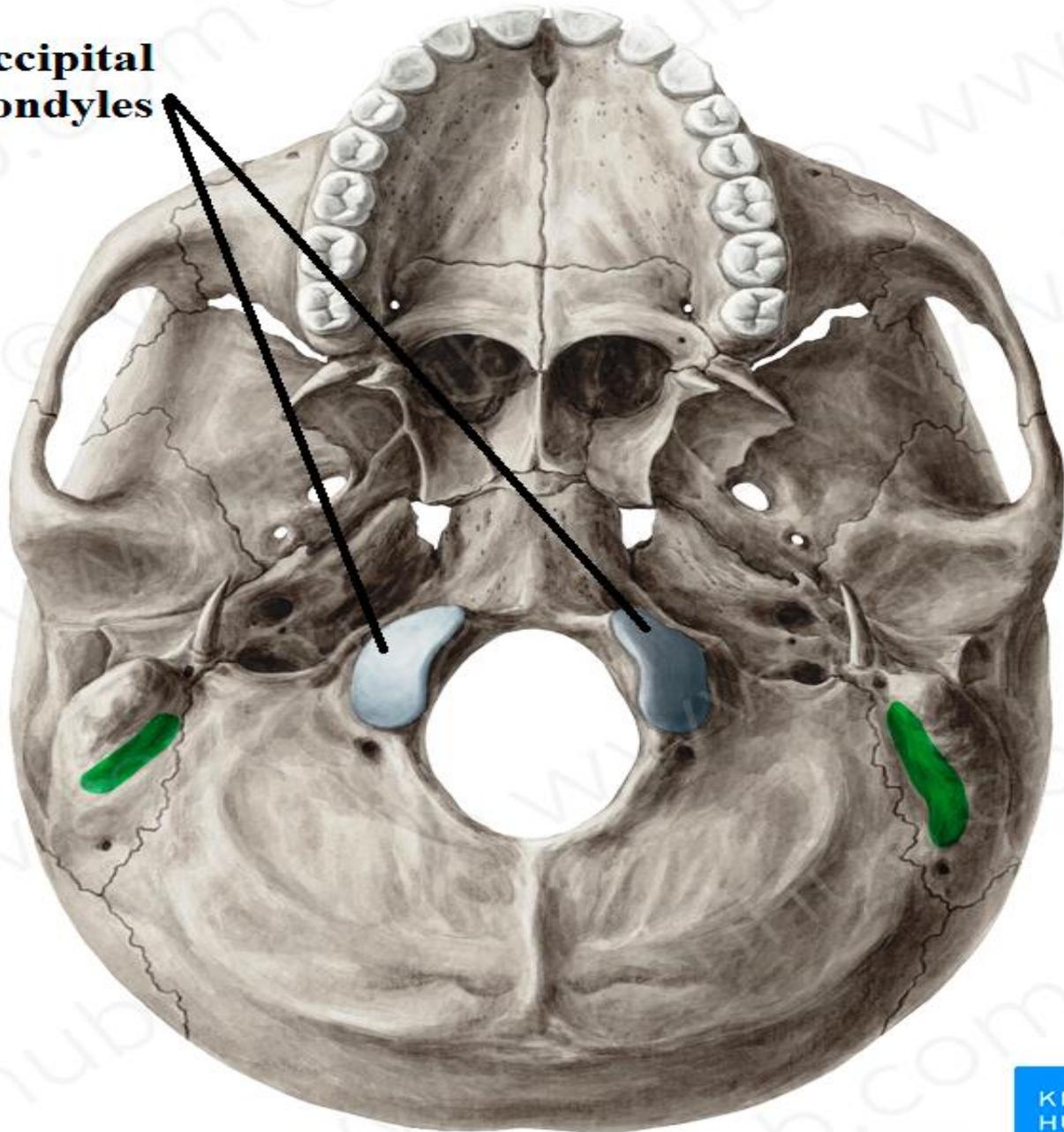


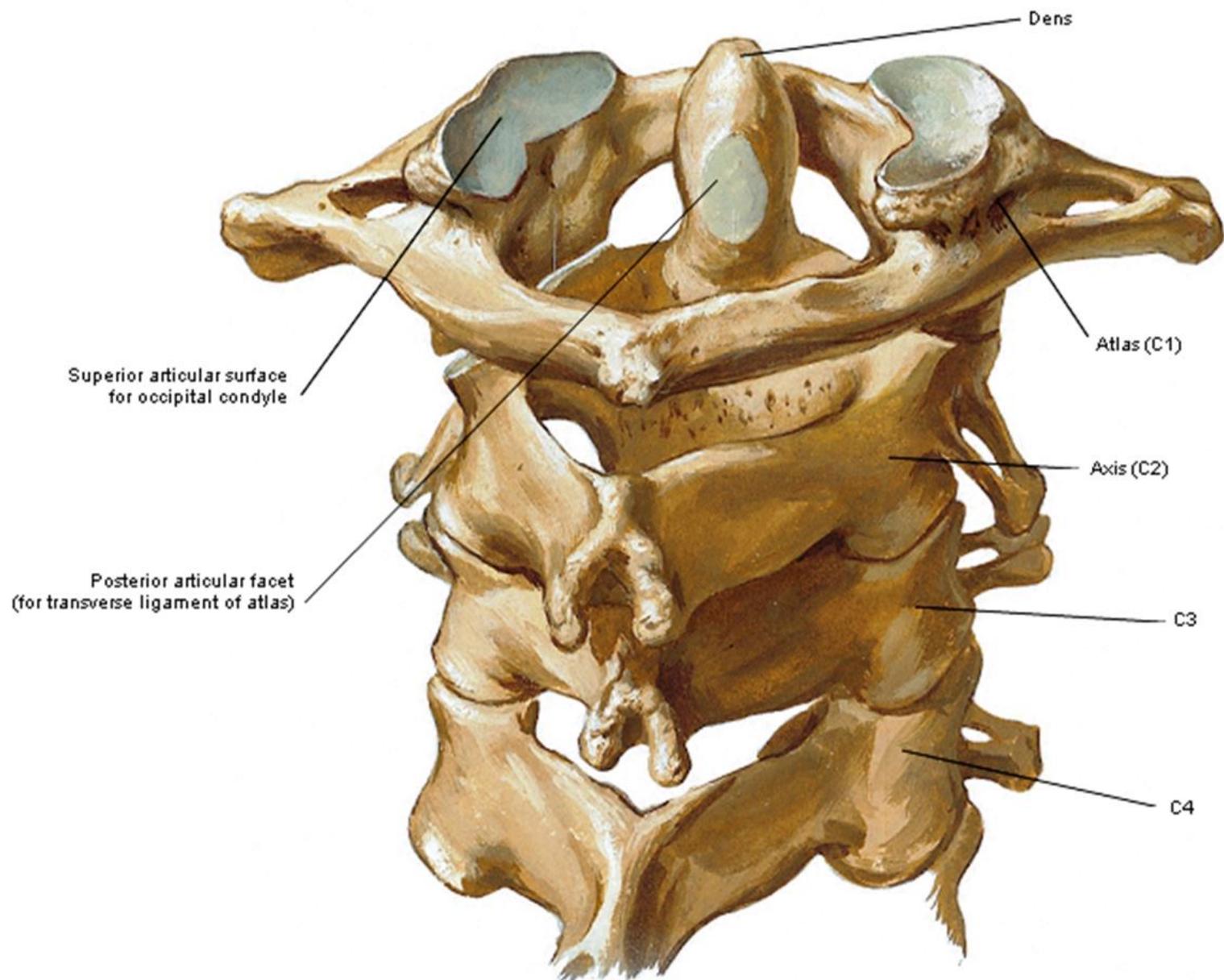
Axis (C2): anterior view



Axis (C2): posterosuperior view

**occipital  
condyles**





# ATLANTO OCCIPITAL JOINT

**Type:** synovial.

**Variety:** condylar.

**Articular surfaces:**

**Above:**

occipital condyles of the skull

**Below:**

the kidney shaped  
articular facet of C1(atlas)

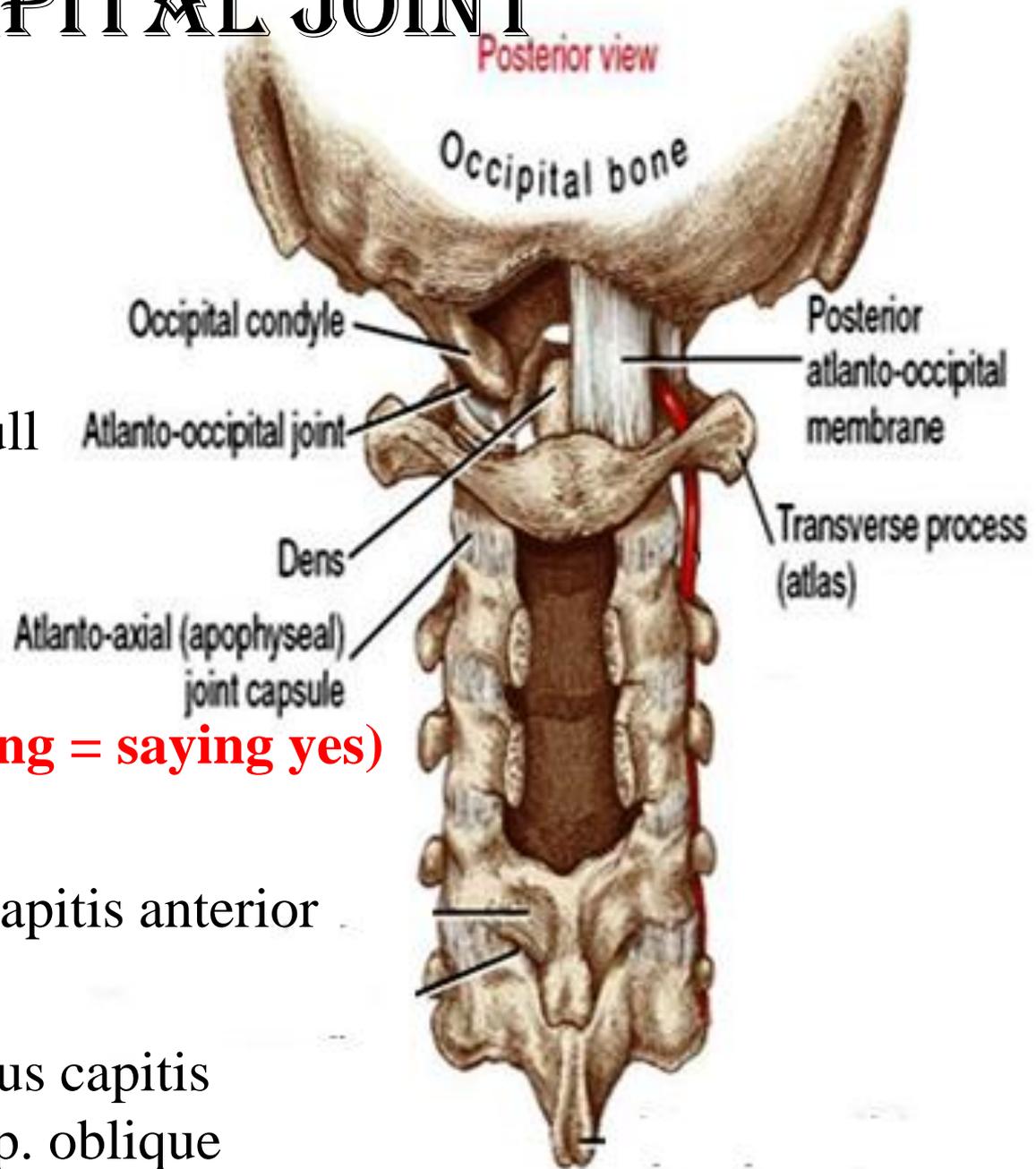
**Movements: - (head nodding = saying yes)**

**1- Flexion.**

By longus capitis & rectus capitis anterior

**2- Extension**

By semispinalis capitis, rectus capitis  
posterior major & minor, sup. oblique



# ATLANTO OCCIPITAL JOINT

## Ligaments:

### 1- Anterior Atlanto-occipital membrane.

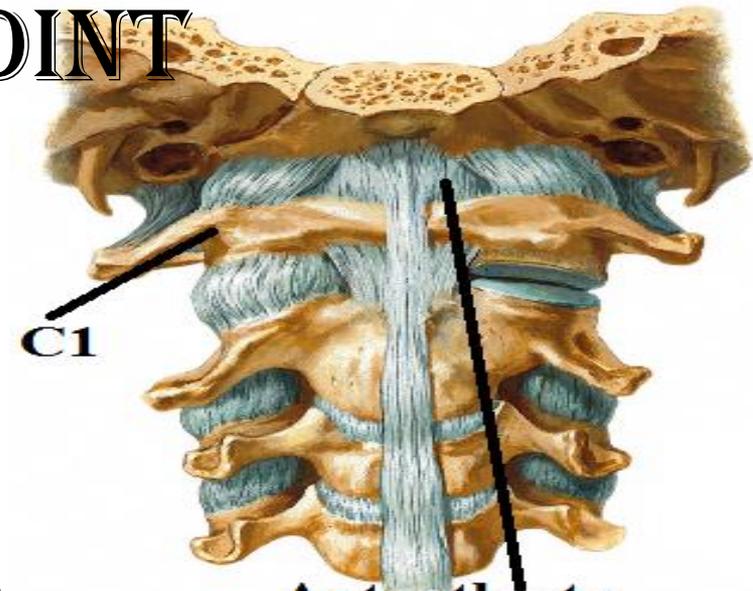
From: upper border of anterior arch of atlas

To : anterior margin of foramen magnum

### 2- Posterior Atlanto-occipital membrane.

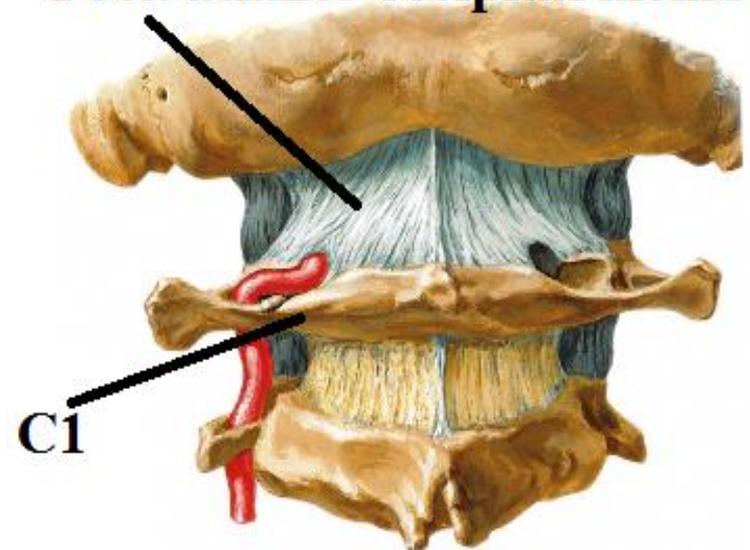
From: upper border of posterior arch of atlas

To : posterior margin of foramen magnum

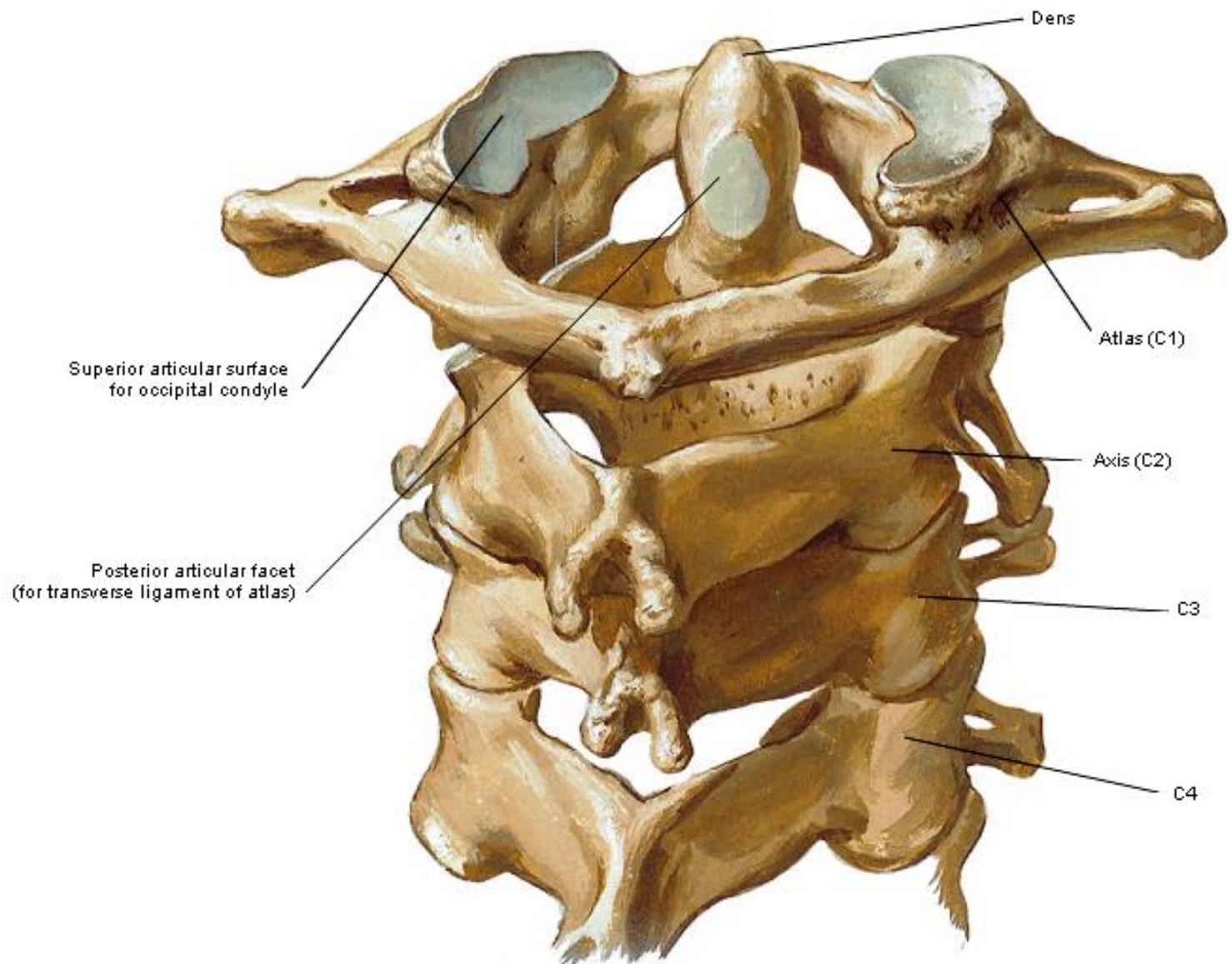


**Ant. atlanto  
occipital memb.**

**Post. atlanto occipital memb.**



# ATLANTO AXIAL JOINTS



# ATLANTO AXIAL JOINTS

3 joints (1 median & 2 lateral Atlanto axial)

**Type:** synovial

**Variety:** the median is pivot  
while the 2 lateral are plane

**Articular surfaces:**

**The median Atlanto axial:**

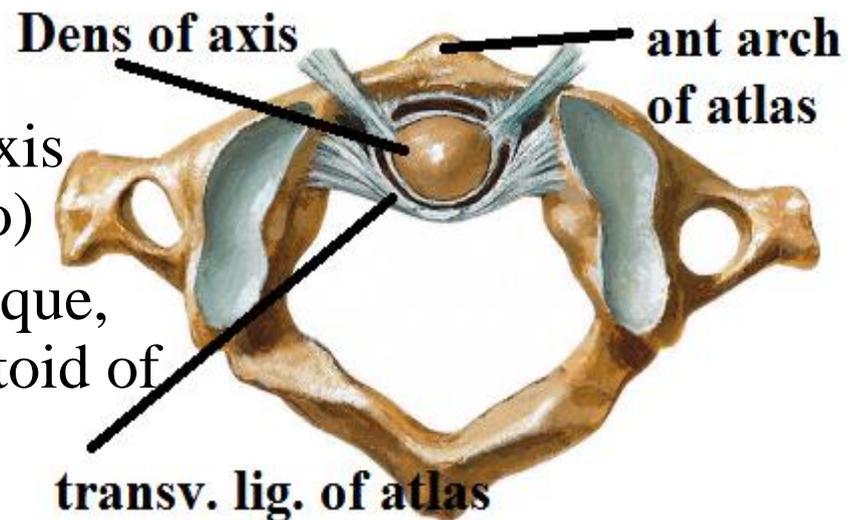
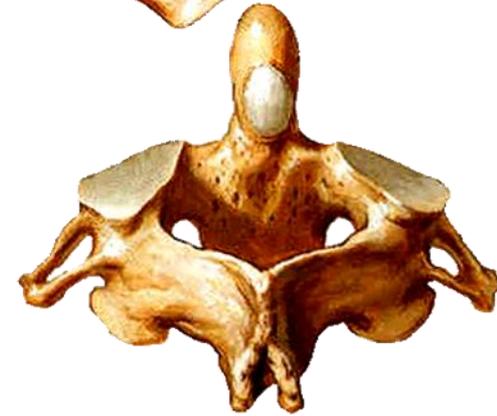
Between the odontoid process of axis  
& anterior arch of atlas and transverse  
ligament of atlas

**The lateral Atlanto axial joints:**

Between the articular facets of atlas & axis

**Movements:** - (head rotation = saying no)

By rectus capitis post major, inferior oblique,  
splenius capitis of one side & Sternomastoid of  
the opposite side



# ATLANTO AXIAL JOINTS

## Ligaments:

### 1- Apical ligament.

From: tip of odontoid process of C2

To : anterior margin of foramen magnum.

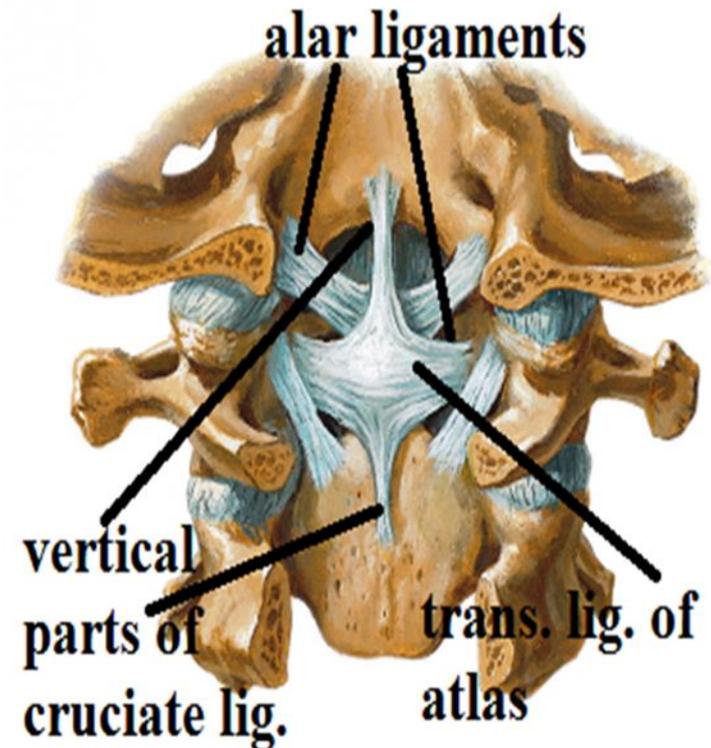
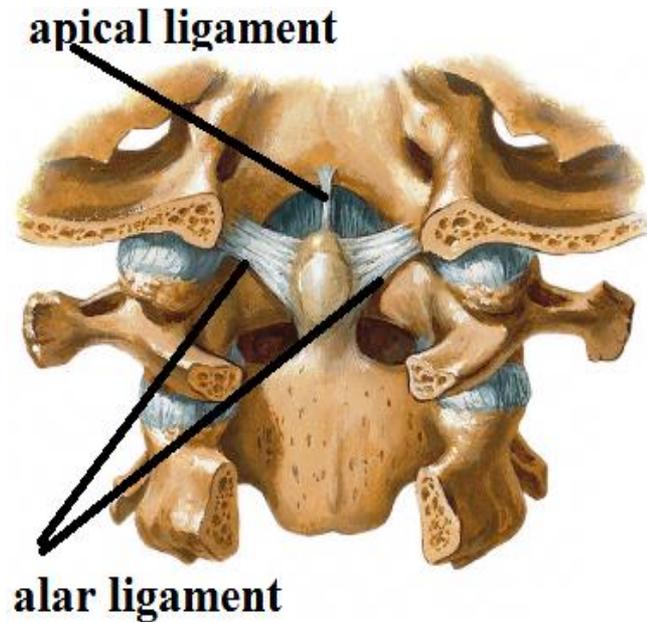
### 2- Alar ligament.

From: sides of odontoid process of C2

To : medial sides of occipital condyle.

### 3-Cruciate ligament:

- Transverse ligament between two tubercles on the atlas.
- Vertical ligament, upper band, from transverse ligament to the basilar part of occipital bone, lower band from transverse ligament to the body of the axis



# ATLANTO AXIAL JOINTS

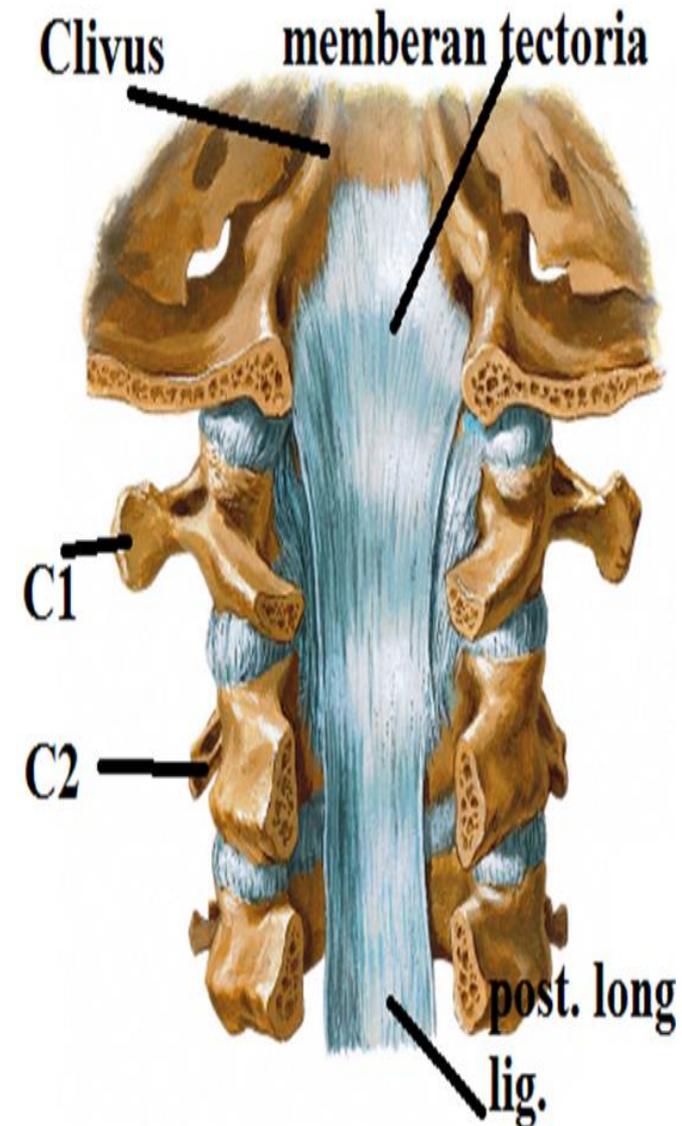
## Ligaments:

### 4- Memberana tectoria

the continuation of post. Long. ligament

From: back of body of C2

To : clivus in front of foramen magnum



THANQ