

Articulations & axial skeleton

Classification of articulations/joints

- Two classification methods:
 - The **type of movement allowed** at the joint (the **function** of the joint) (subjective)
 - The **type of connective tissue** that joins the bones (the **structure** of the joint)

Functional joint classification

- **Synarthroses**-no movement at the joint
 - Between skull bones
- **Amphiarthroses**-slight motion at the joint
 - Symphysis pubis
- **Diarthroses/Synovial** -freely moveable joint with a joint cavity
 - elbow

Synarthroses

- Bony edges interlock
- Connective tissue fibers attach bones
- epiphyseal plate in developing long bone

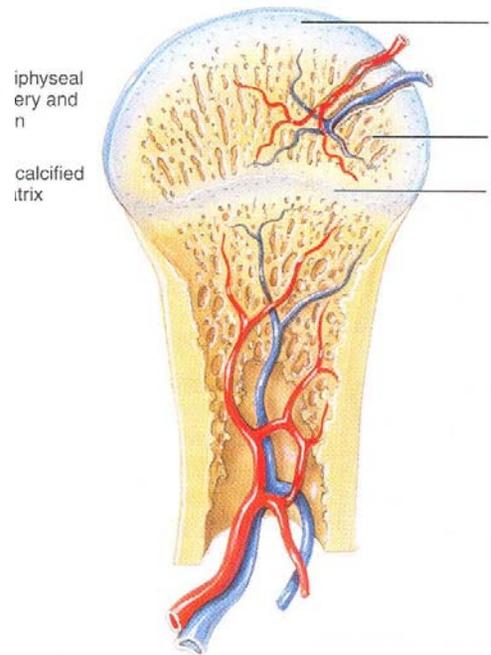
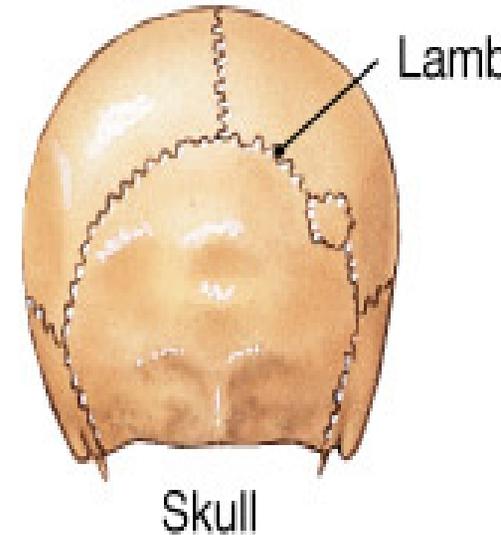
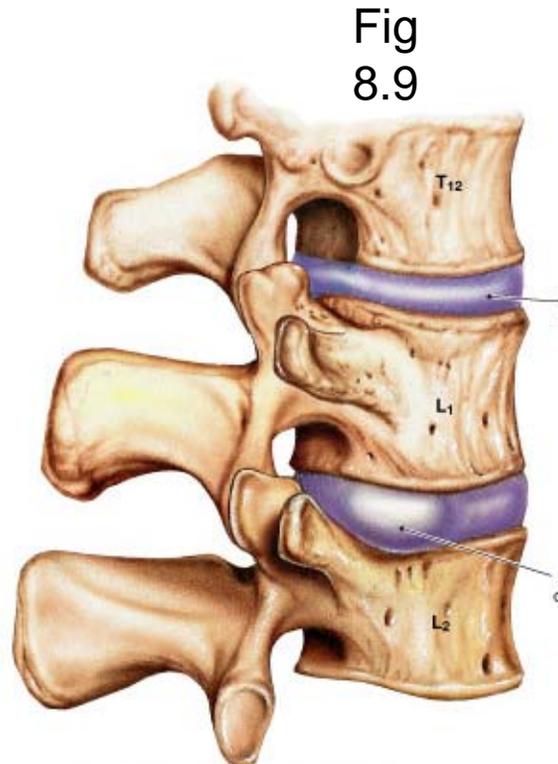


table
5.2

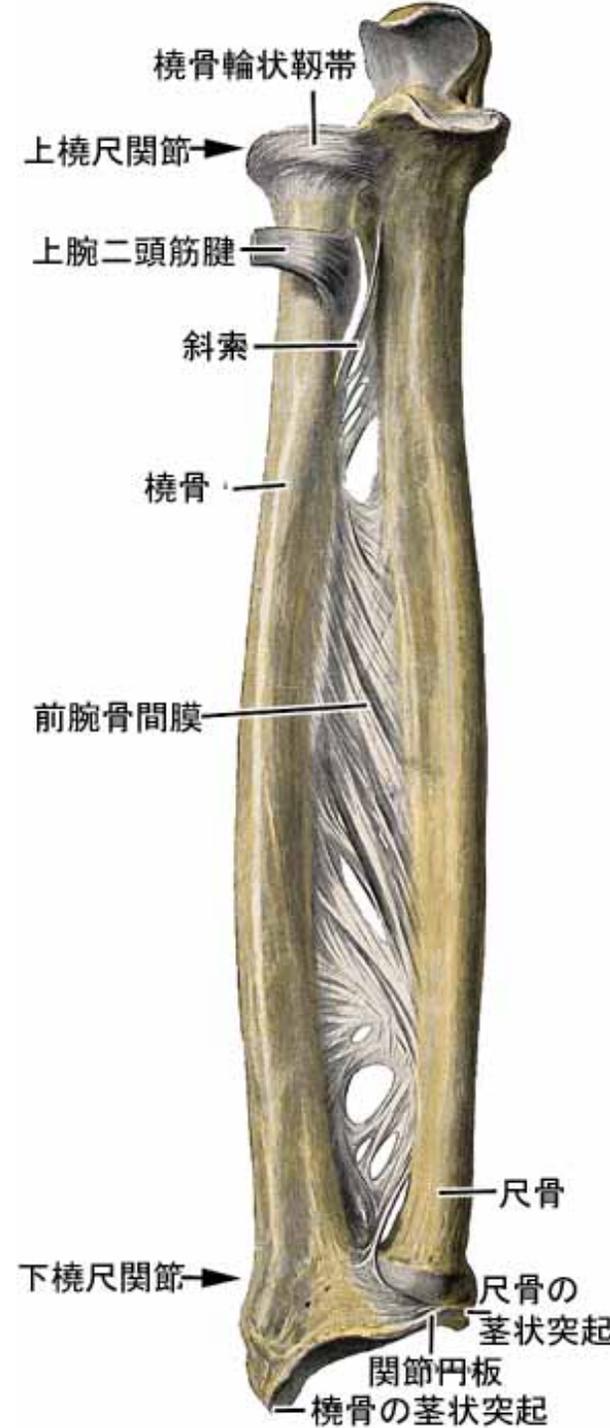
Amphiarthroses

- Very limited movement



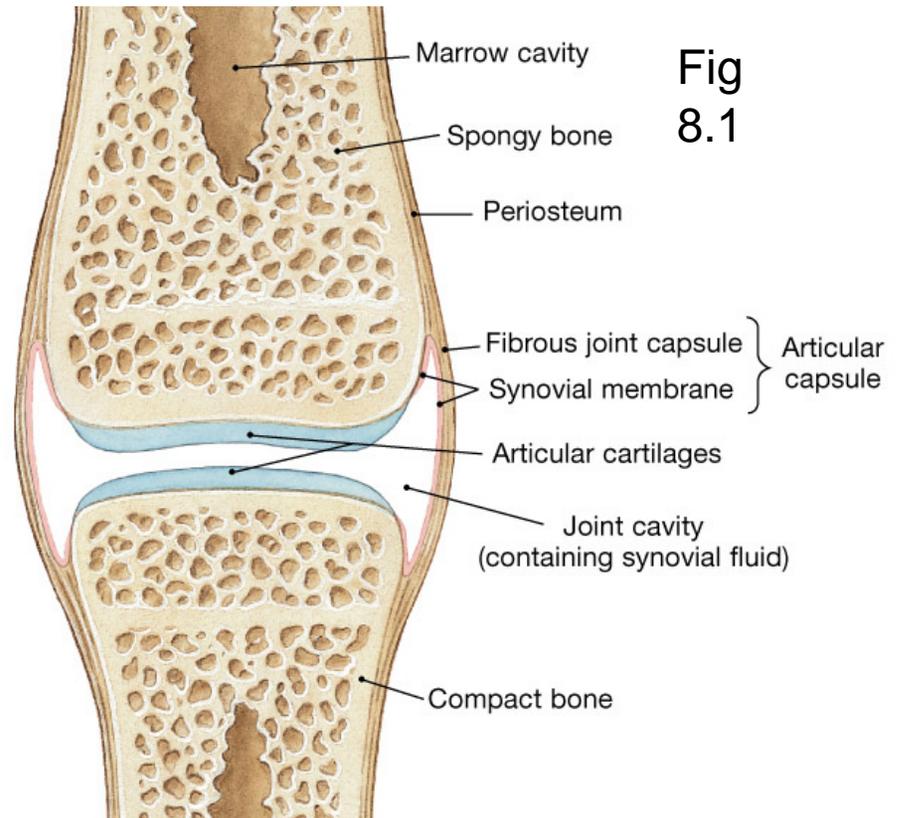
(a) Lateral view of distorted intervertebral disc

Fig 8.9



Diarthroses/Synovial

- Wide range of motion
- Bones do not contact each other



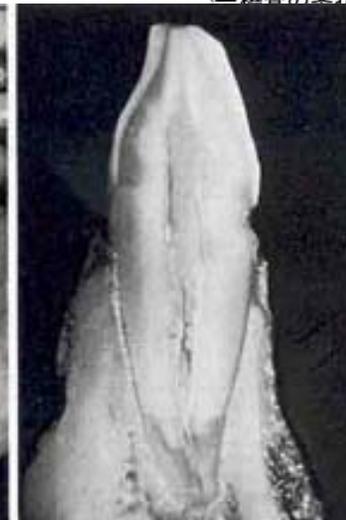
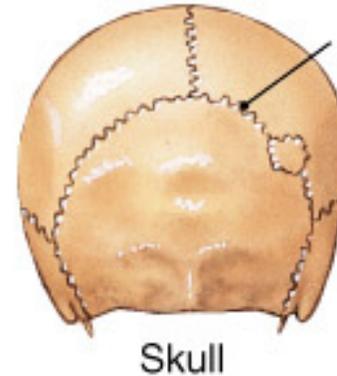
(a) Synovial joint, sagittal section

Structural joint classification

- Three types:
- **Fibrous joints**-fibrous connective tissue holds the joint together
- **Cartilaginous joints**-cartilage hold the joints together
- **Synovial joints**-bones are held together by a joint cavity (knee, elbow)

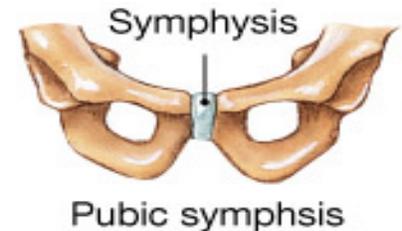
Fibrous joints

- **Sutures**-suture bone holding bones together
- **Syndesmoses**-long connective tissue bands (interosseous membrane between bones in distal appendages)
- **Gomphosis**-short connective tissue bands (only example-ligaments attached to the teeth)



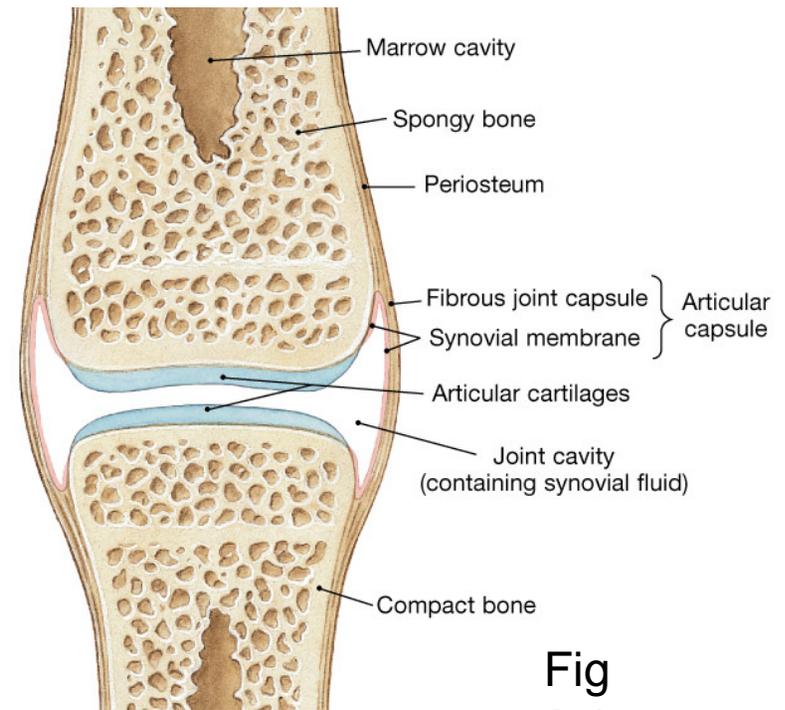
Cartilaginous joints

- **Synchondroses**-hyaline cartilage between bones (1st rib to sternum, epiphyseal plate in growing long bone)
- **Symphyses**-fibrocartilage holds bones together (symphysis pubis, intervertebral discs)



Synovial joint -cavity between the bones

- Bones separated by articular cartilage
 - Reduce friction
 - absorb shock
- Articular capsule
 - Fibrous joint capsule
 - Synovial membrane
 - Produces synovial fluid

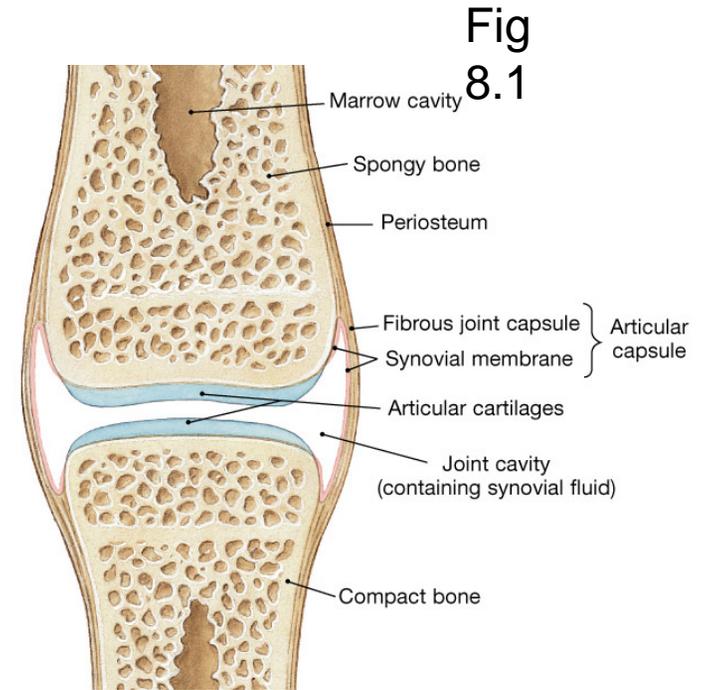


(a) Synovial joint, sagittal section

Fig
8.1

Synovial fluid

- Synovial fluid:
- Provides lubrication
- Nourishes chondrocytes
- Acts as a shock absorber

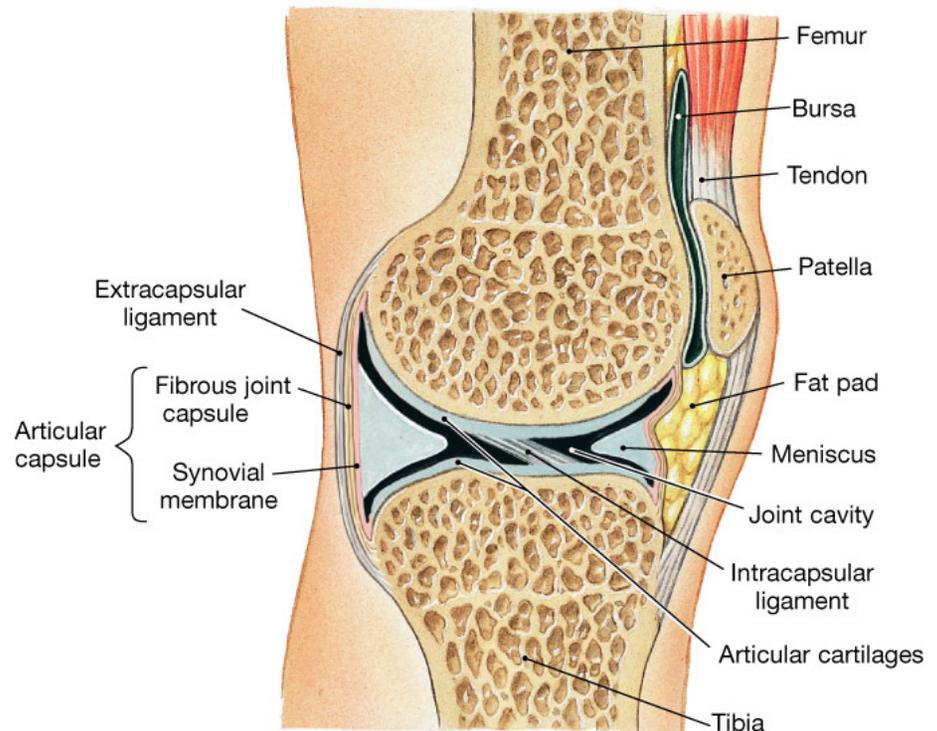


(a) Synovial joint, sagittal section

Accessory structures of synovial joints

- **menisci**—subdivide cavity/restrict movement
- **Ligaments**-connect bone to bone
- **Tendons**-connect muscle to bone

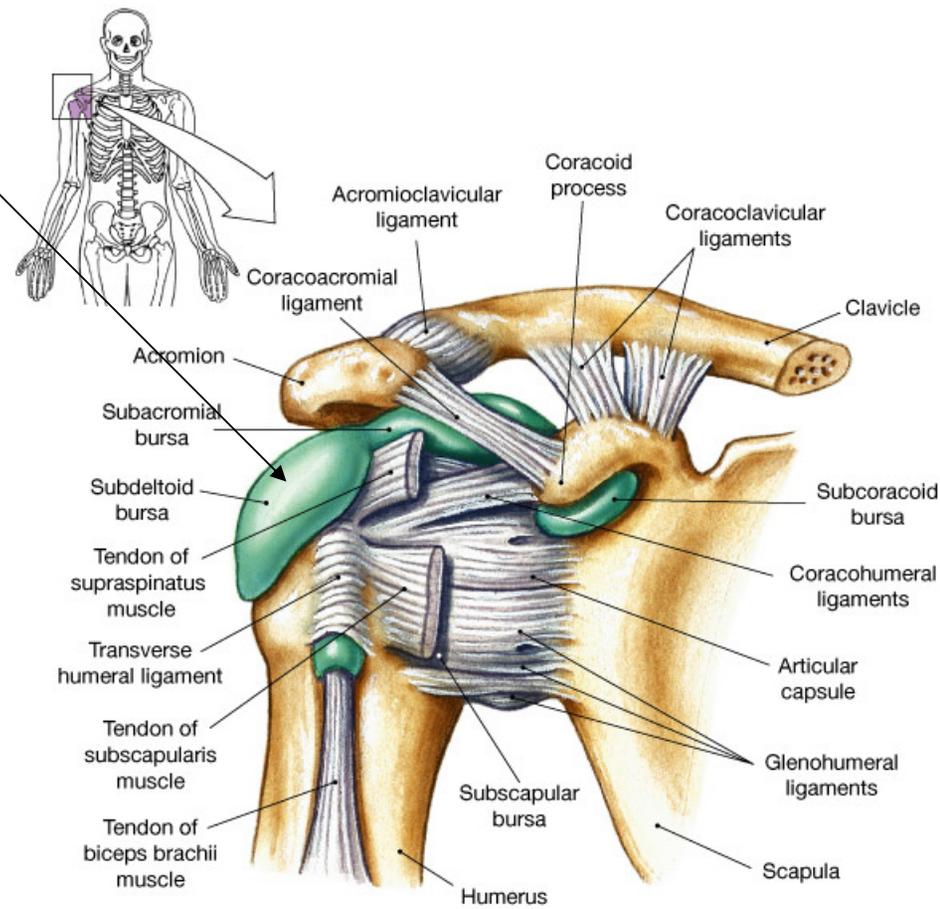
Fig
8.1



(b) Knee joint, sagittal section

- **Bursae**-small pockets filled with synovial fluid
- reduce friction put tendons

Fig 8.11



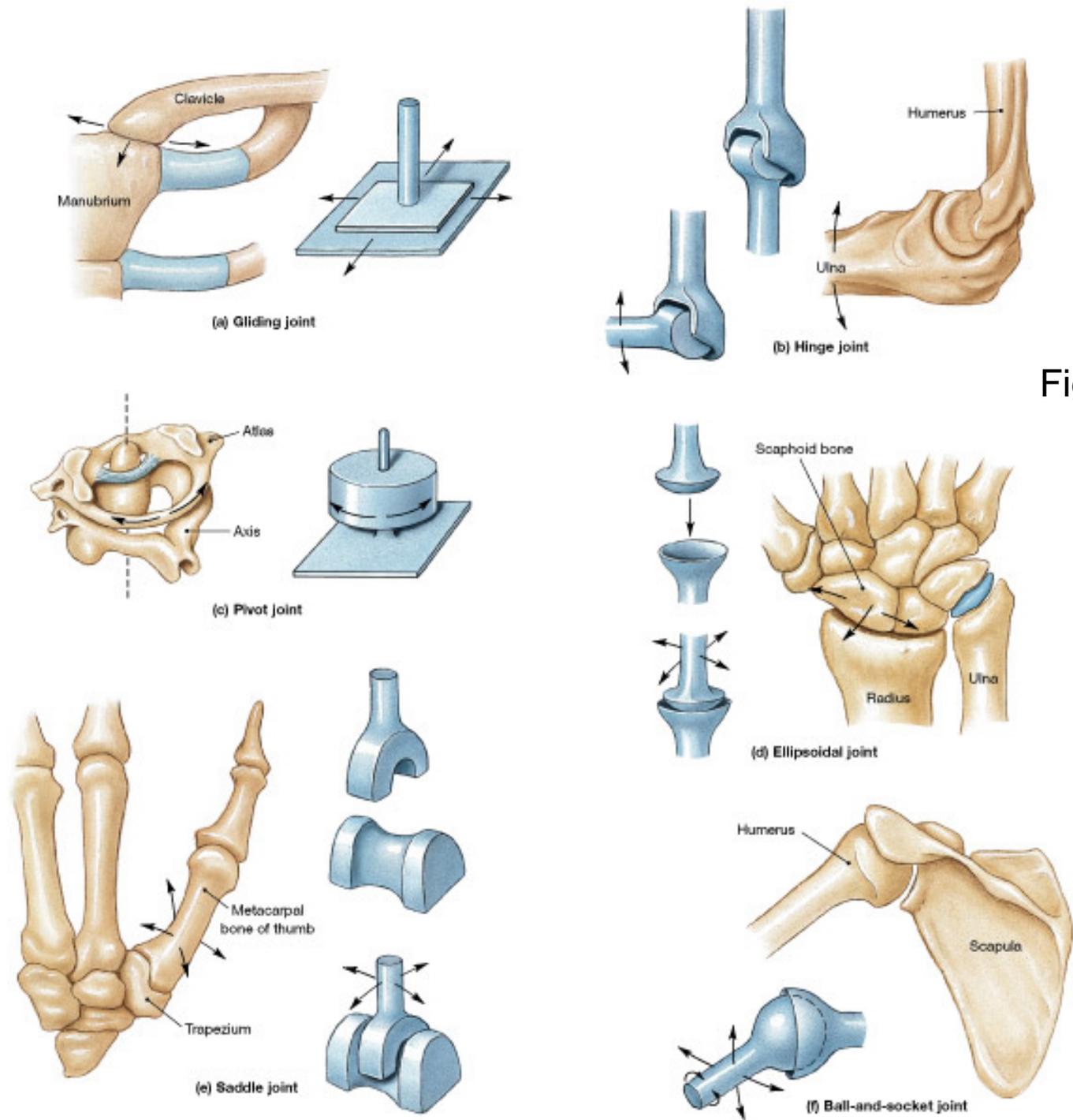
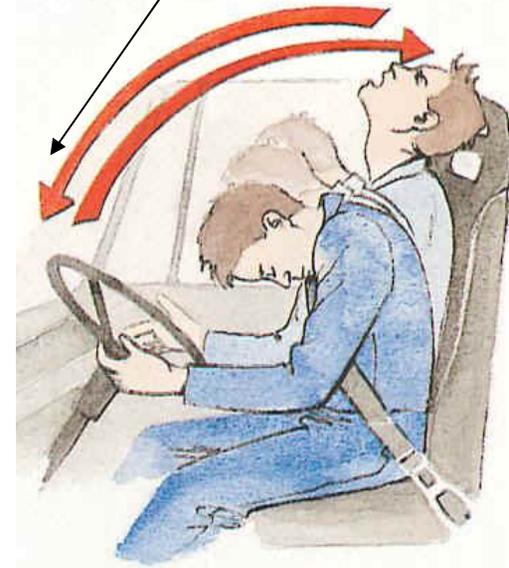


Fig 8.6

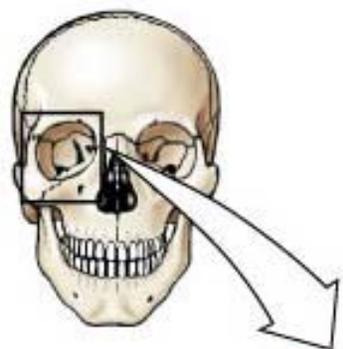
- A hyperextension-hyperflexion injury
- The neck hyperextends:
 - Anterior longitudinal ligament
 - Torn, swelling
 - Atlas
 - Vertebral arch may break
 - Anulus fibrosus
 - C2/C3 may rupture-dislocation of skull
- The neck is hyper flexed:
 - Supraspinous/Interspinous ligament
 - tear
 - Interspinales muscles
 - tear
 - Crushed vertebral bodies
 - Dens of axis may be jammed into the spinal cord
 - Herniated intervertebral discs

Whiplash

hyperflexion

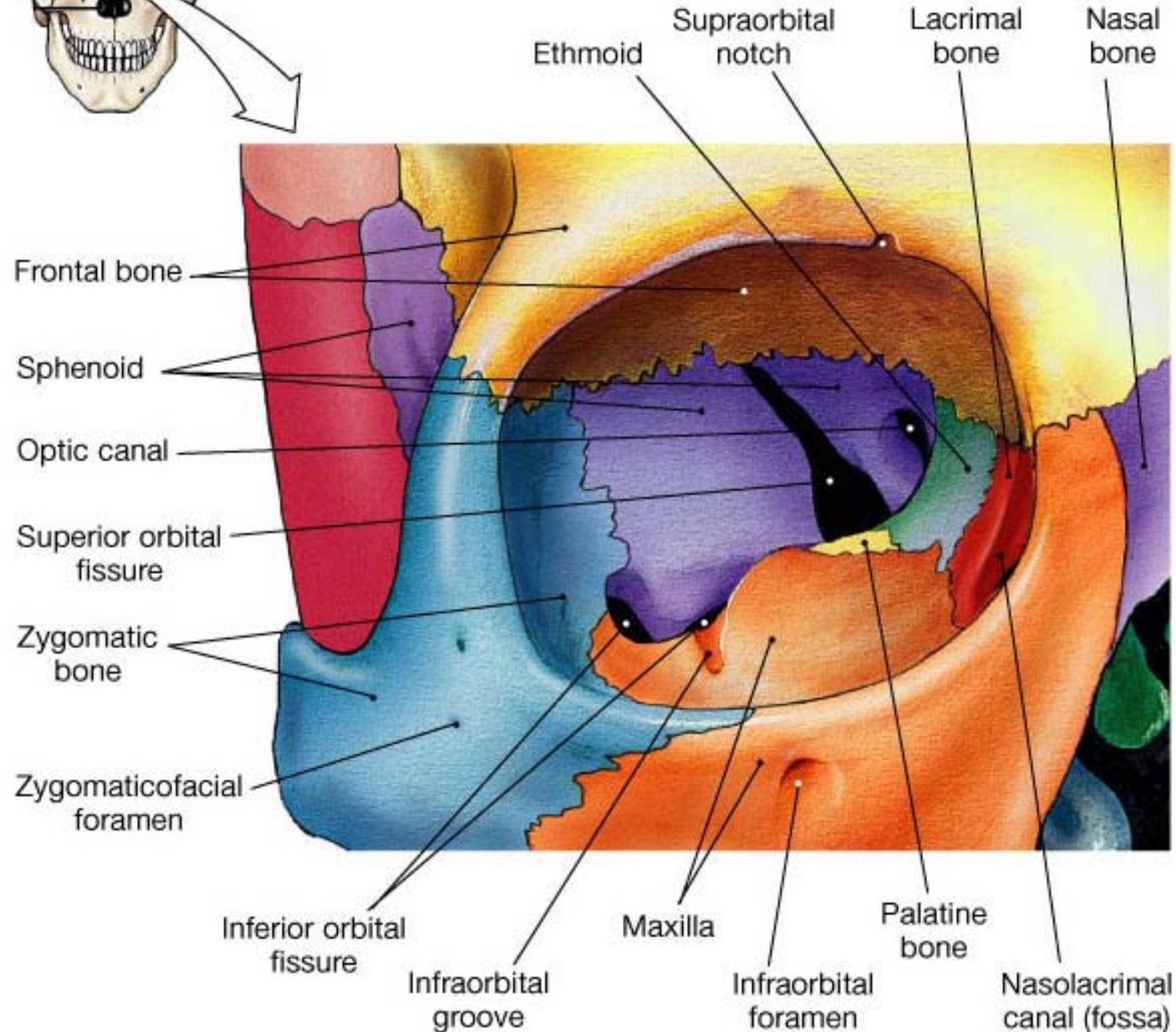


Bony orbit-
bones around
the eye socket



PLEaSe Feed
My Zebra

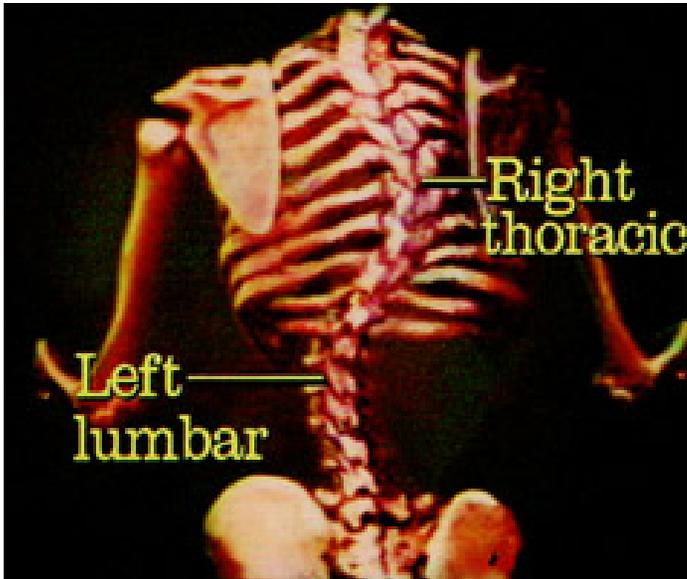
Palatine,
lacrimal,
ethmoid,
sphenoid,
frontal,
maxillary, &
zygomatic
bones



Normal spinal curve



Scoliosis



lateral thoracic/lumbar curve

J.Lo dorsis

Lordosis of the spine



Exaggerated lumbar curve

Kyphosis



Exaggerated thoracic curve

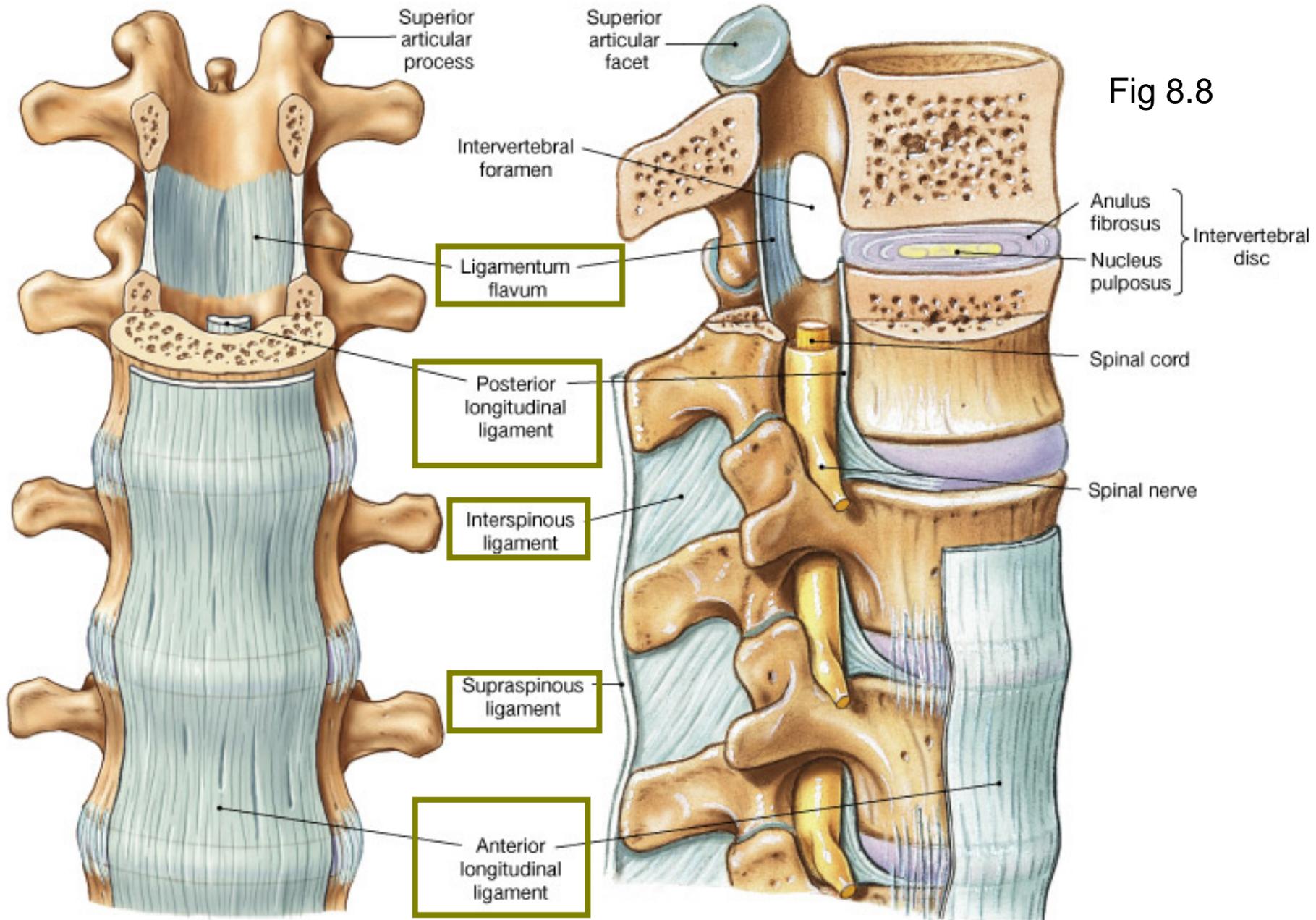


Fig 8.8

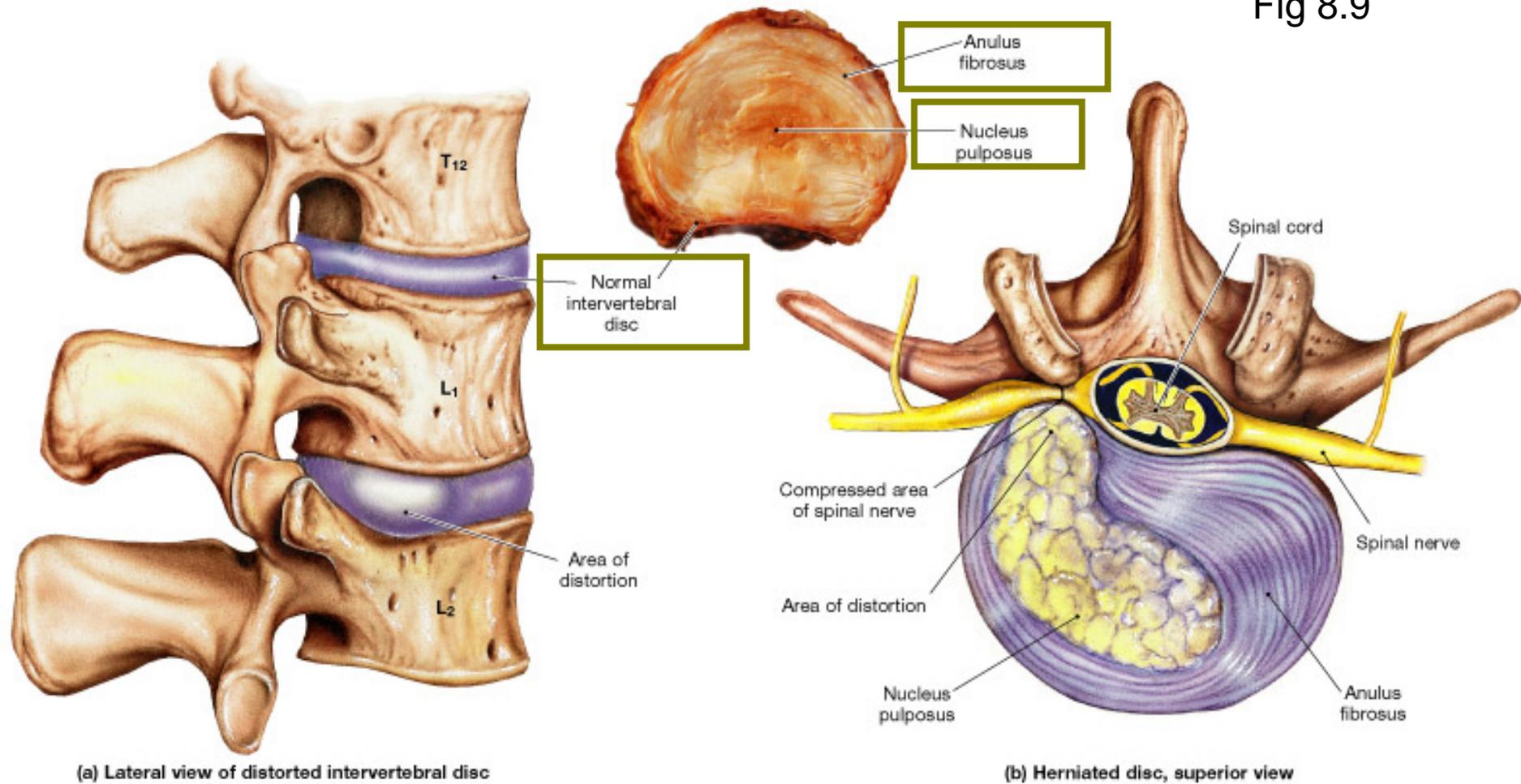
(a) Anterior view

(b) Lateral and sectional view

Ligamentum nuchae

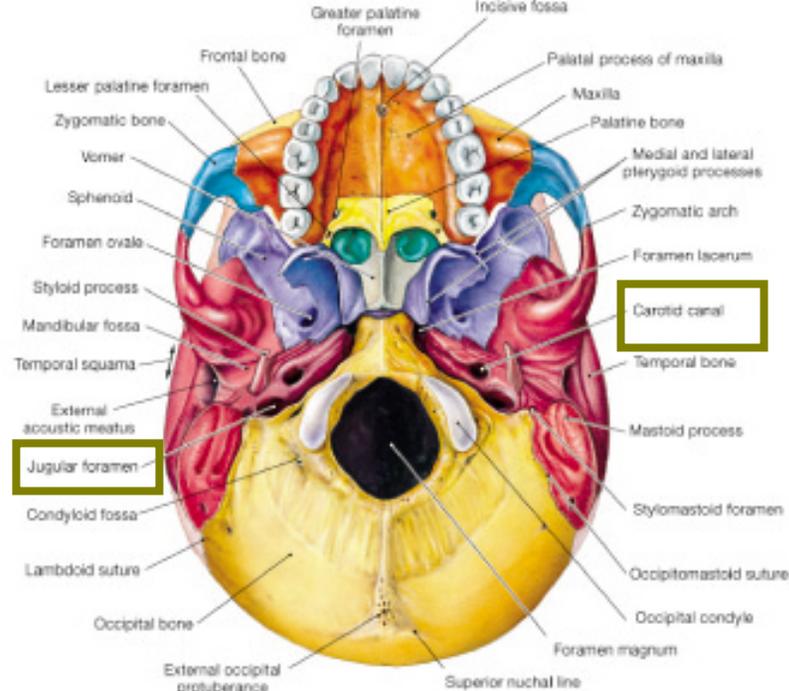
- The name of the supraspinous ligament when it reaches the cervical vertebrae

Fig 8.9



(a) Lateral view of distorted intervertebral disc

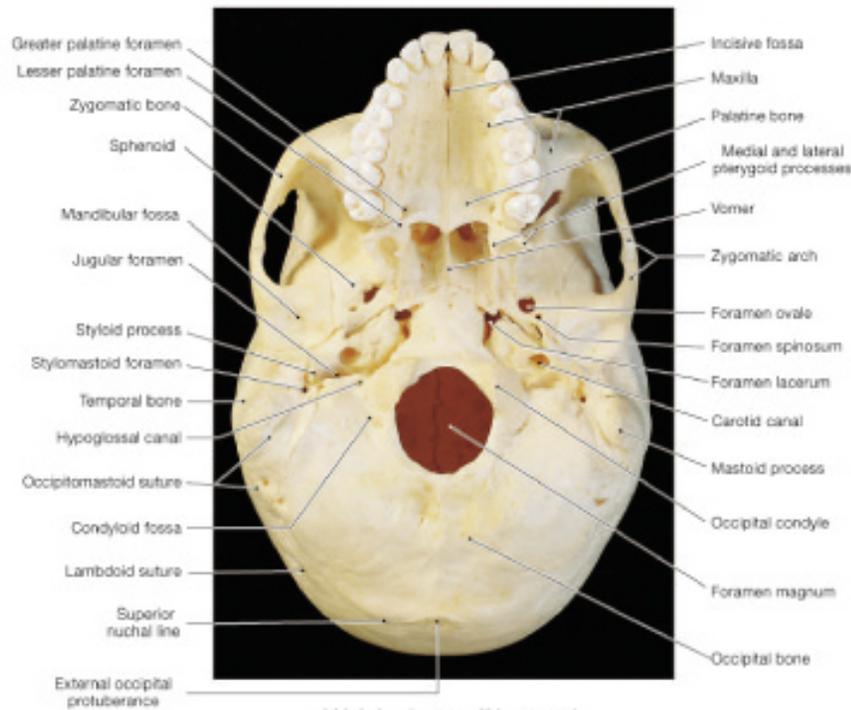
(b) Herniated disc, superior view



Carotid canal

Jugular foramen

Fig 6.3



Nasal septum =
 Vomer (inferior) +
 Perpendicular plate of
 the ethmoid bone
 (superior)

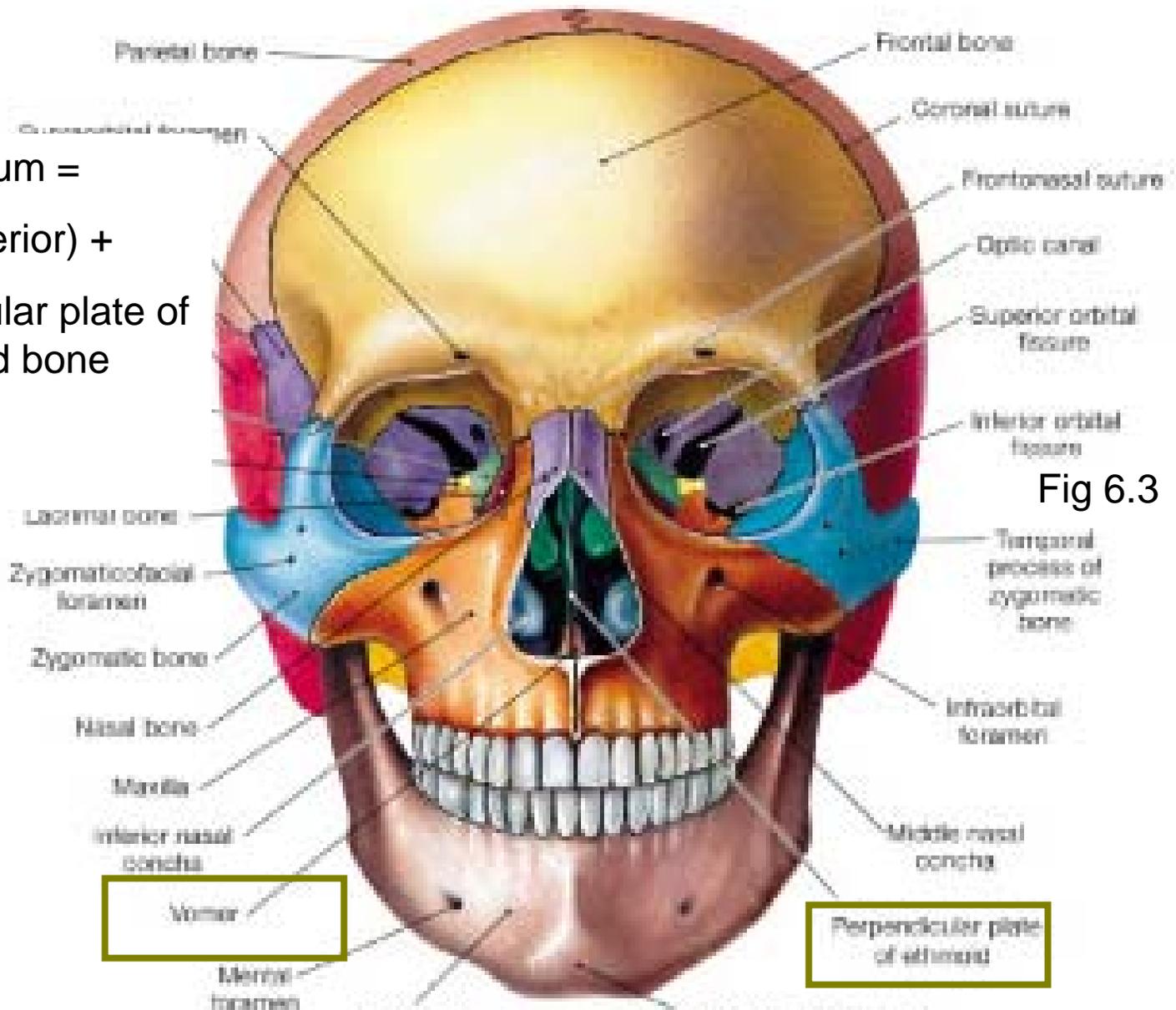
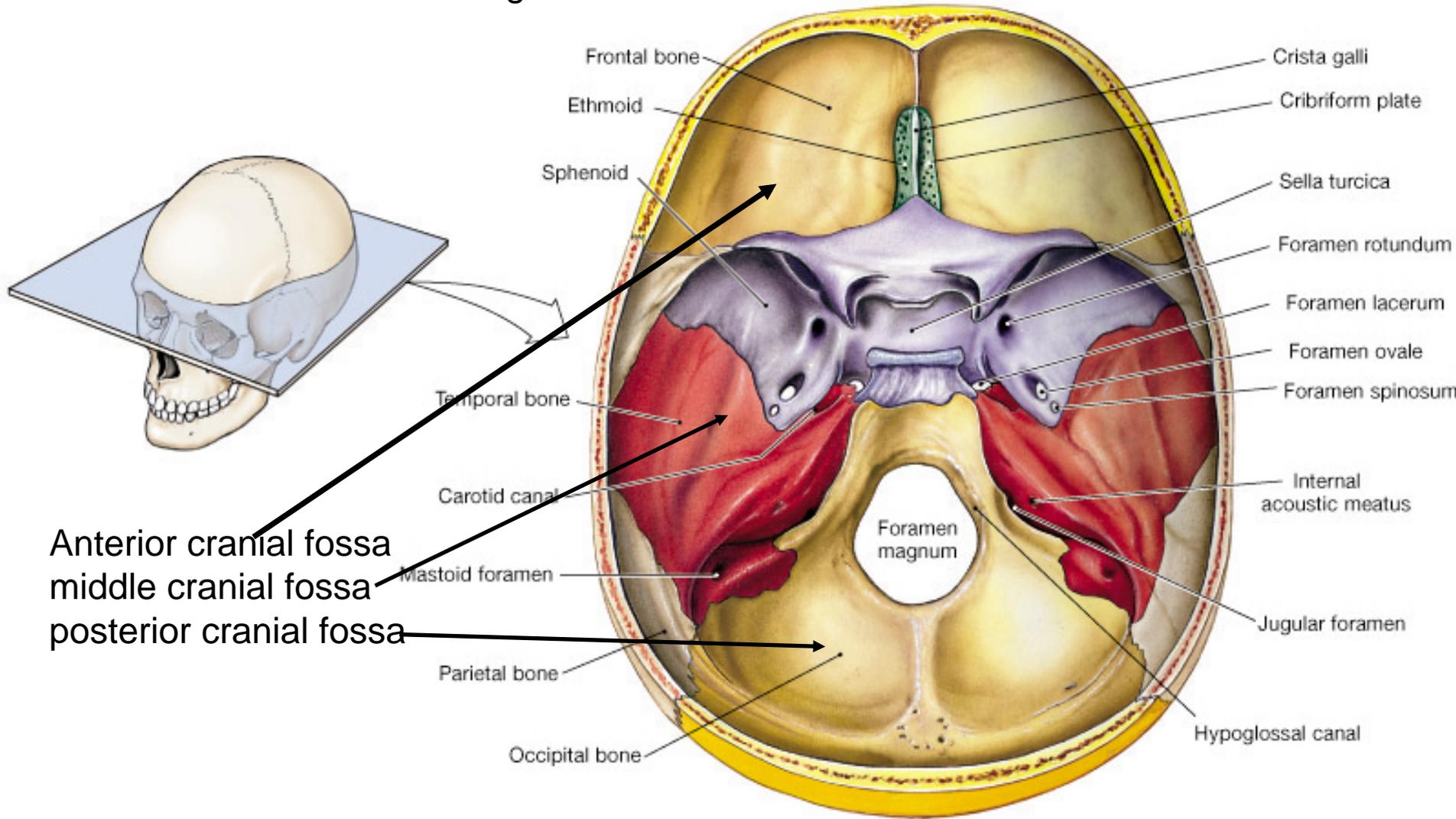


Fig 6.3

Fig 6.4

anterior



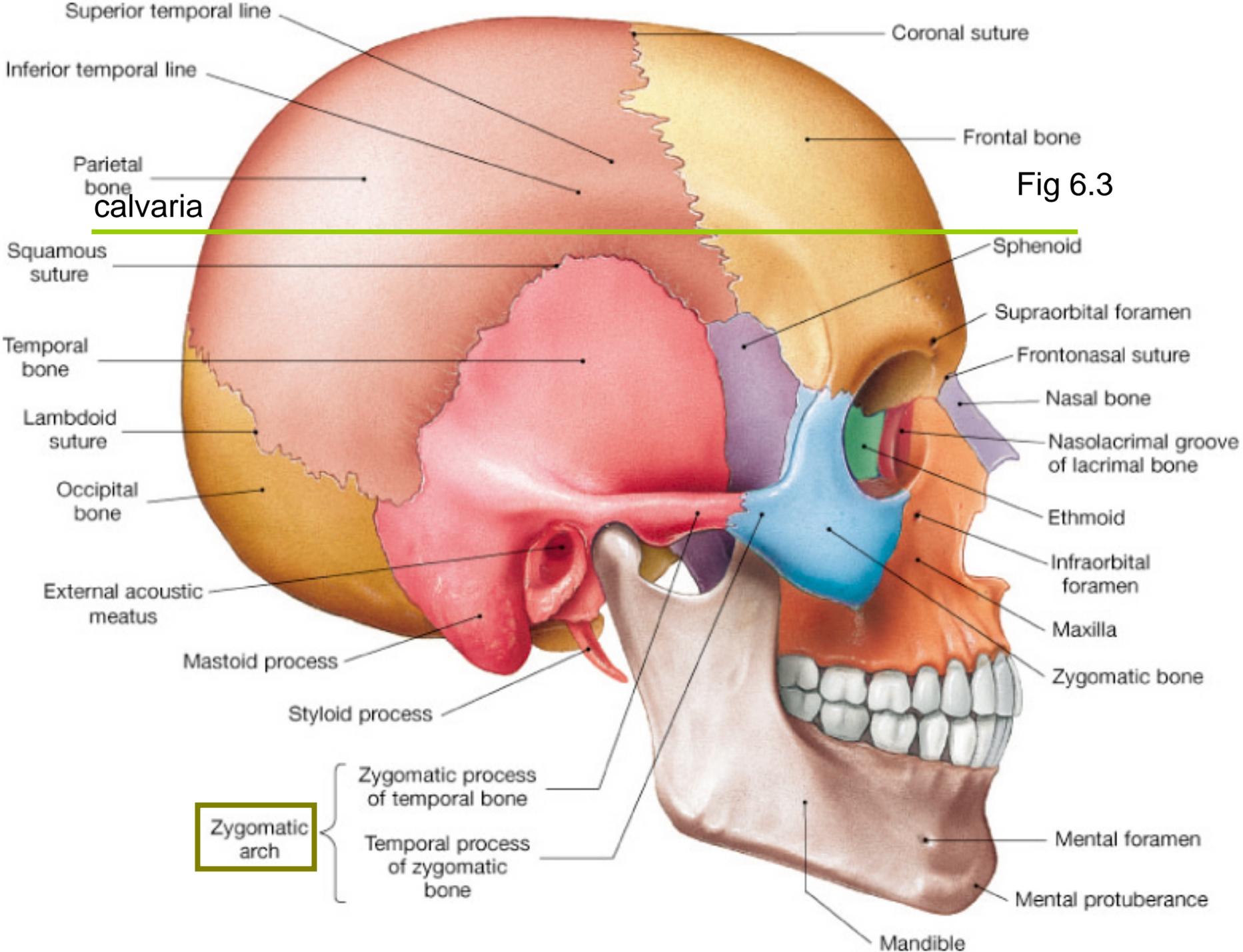


Fig 6.3

calvaria

Zygomatic arch

Zygomatic process of temporal bone
 Temporal process of zygomatic bone

Mandible

Mental foramen
 Mental protuberance

Zygomatic bone

Maxilla

Infraorbital foramen

Ethmoid

Nasolacrimal groove of lacrimal bone

Nasal bone

Frontonasal suture

Supraorbital foramen

Sphenoid

Coronal suture

Frontal bone

Parietal bone

Inferior temporal line

Superior temporal line

Squamous suture

Temporal bone

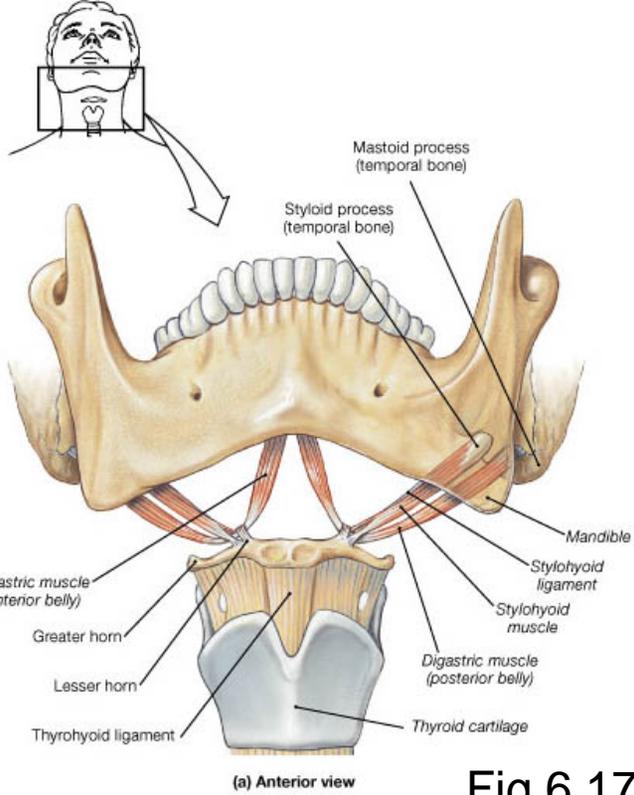
Lambdoid suture

Occipital bone

External acoustic meatus

Mastoid process

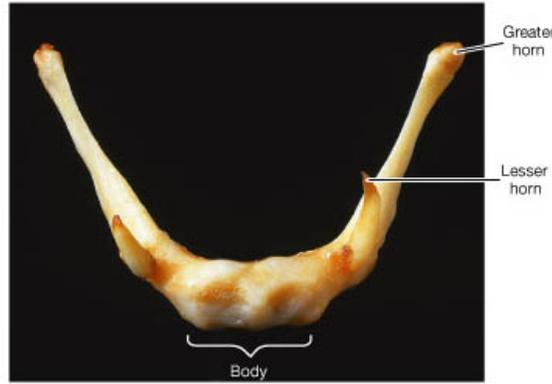
Styloid process



(a) Anterior view

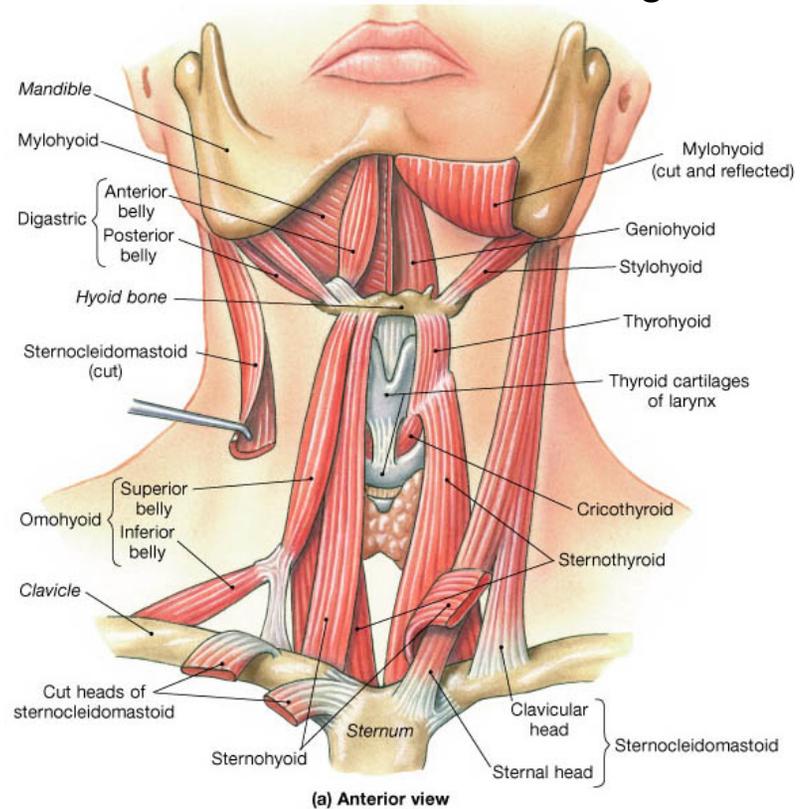
Fig 6.17

Hyoid bone



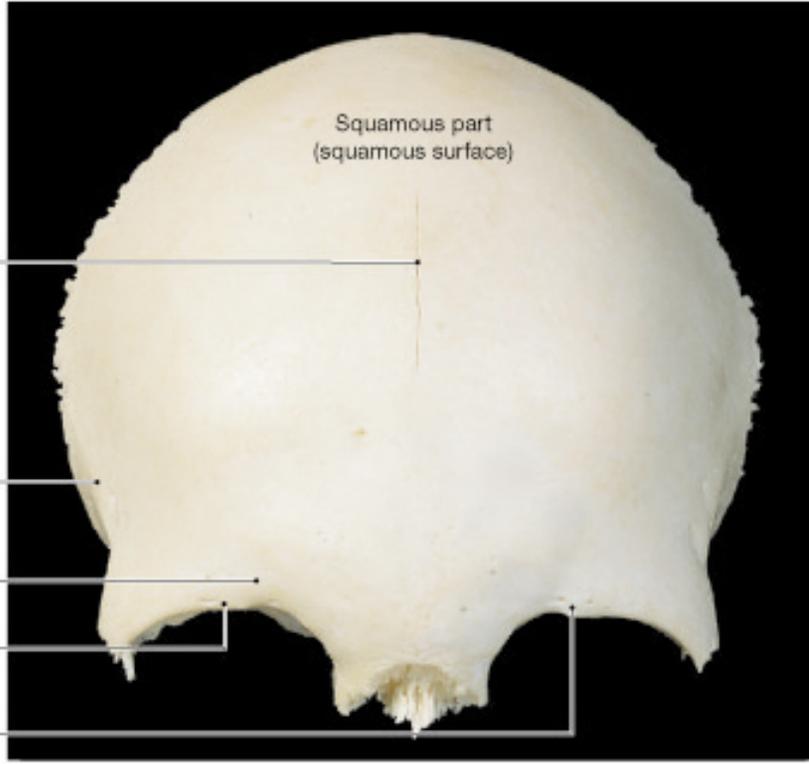
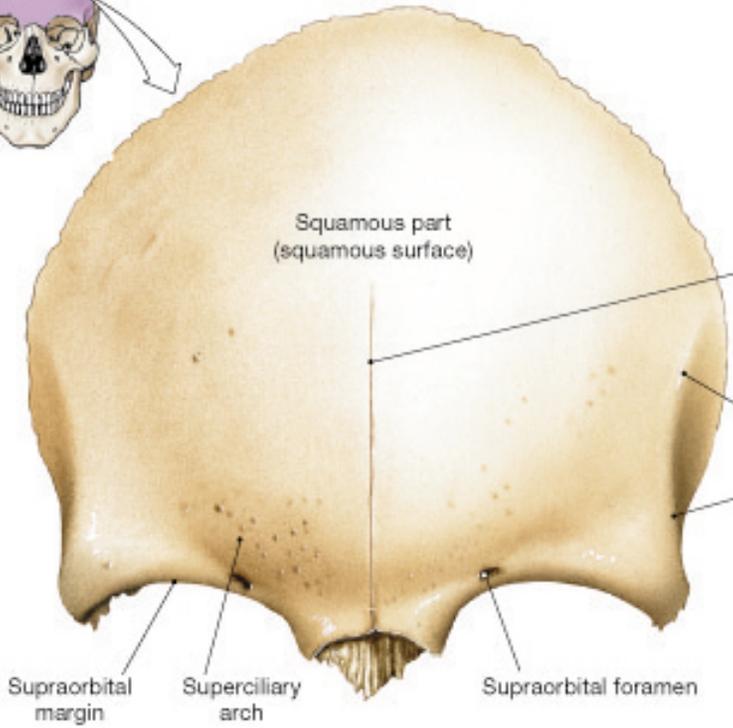
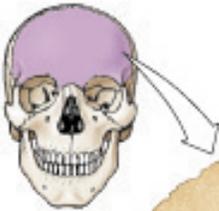
(b) Hyoid bone, anterosuperior view

Fig 10.10



(a) Anterior view

Frontal bone



Squamous part
(squamous surface)

Metopic
(frontal) suture

Superior
temporal line

Superciliary
arch

Supraorbital
margin

Supraorbital
notch

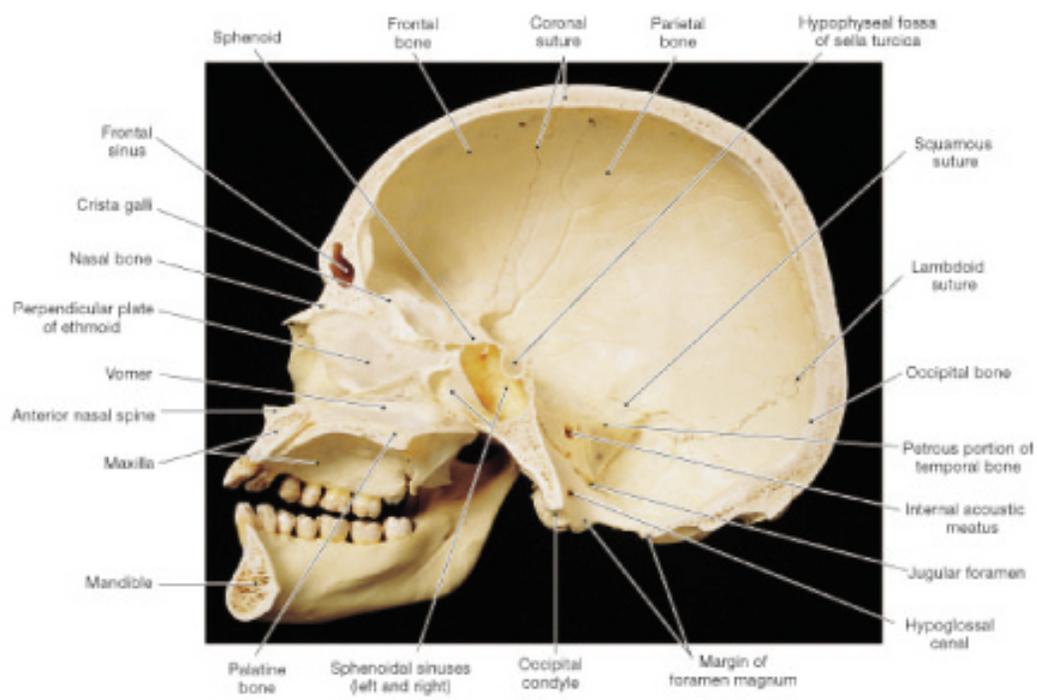
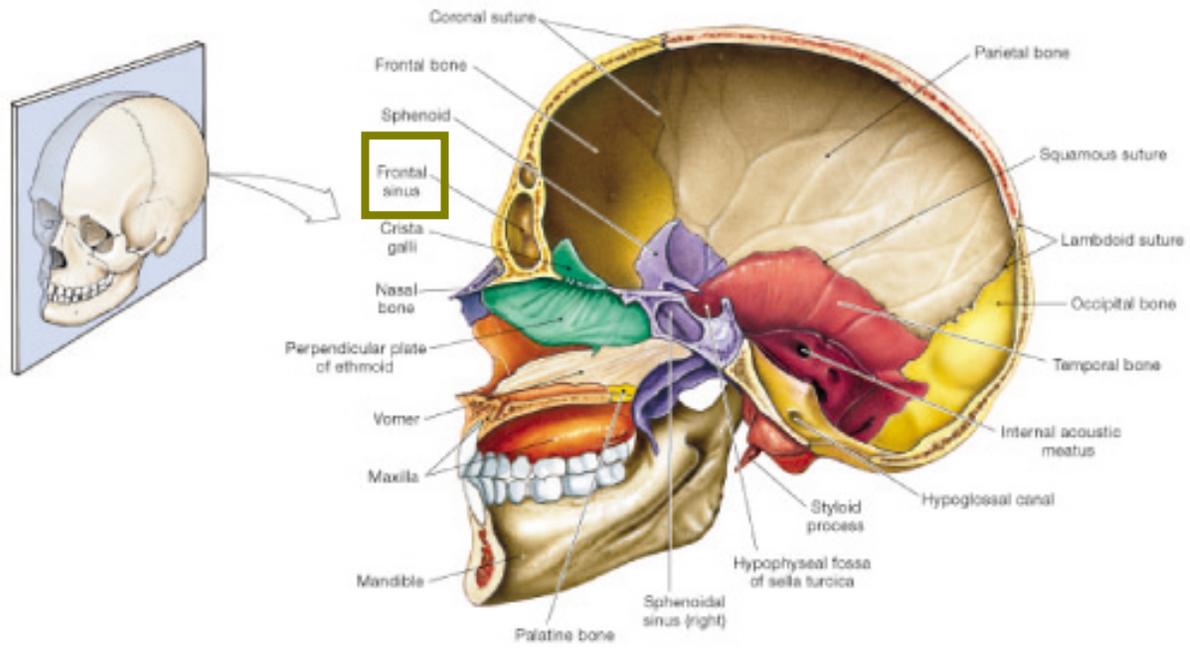
Supraorbital
margin

Superciliary
arch

Supraorbital
foramen

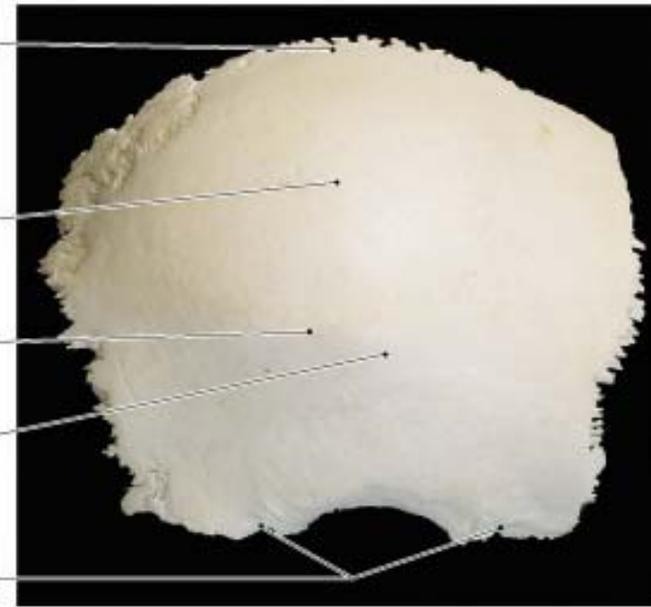
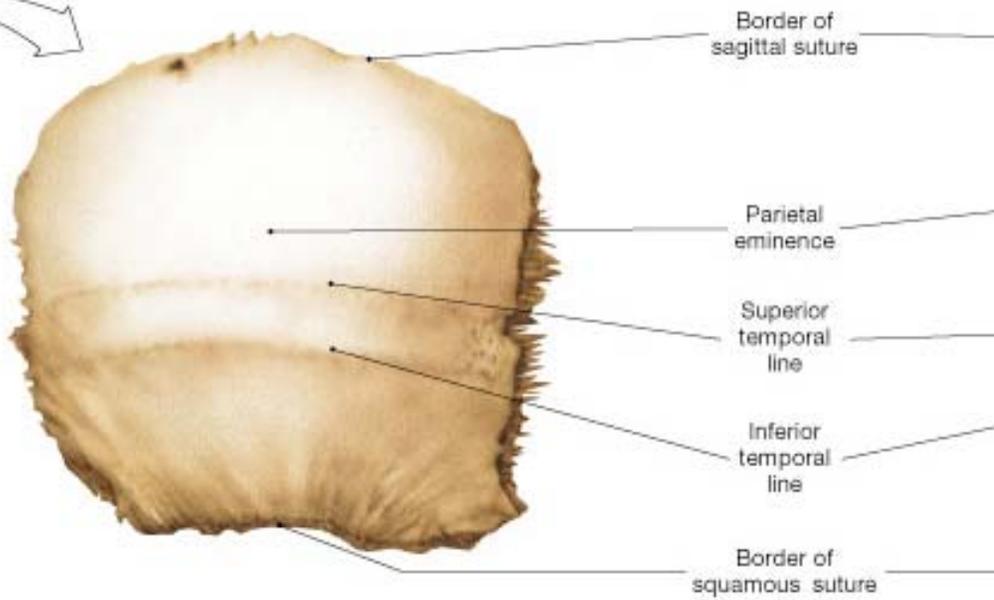
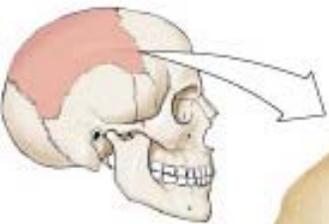
Squamous part
(squamous surface)

(a) External surface

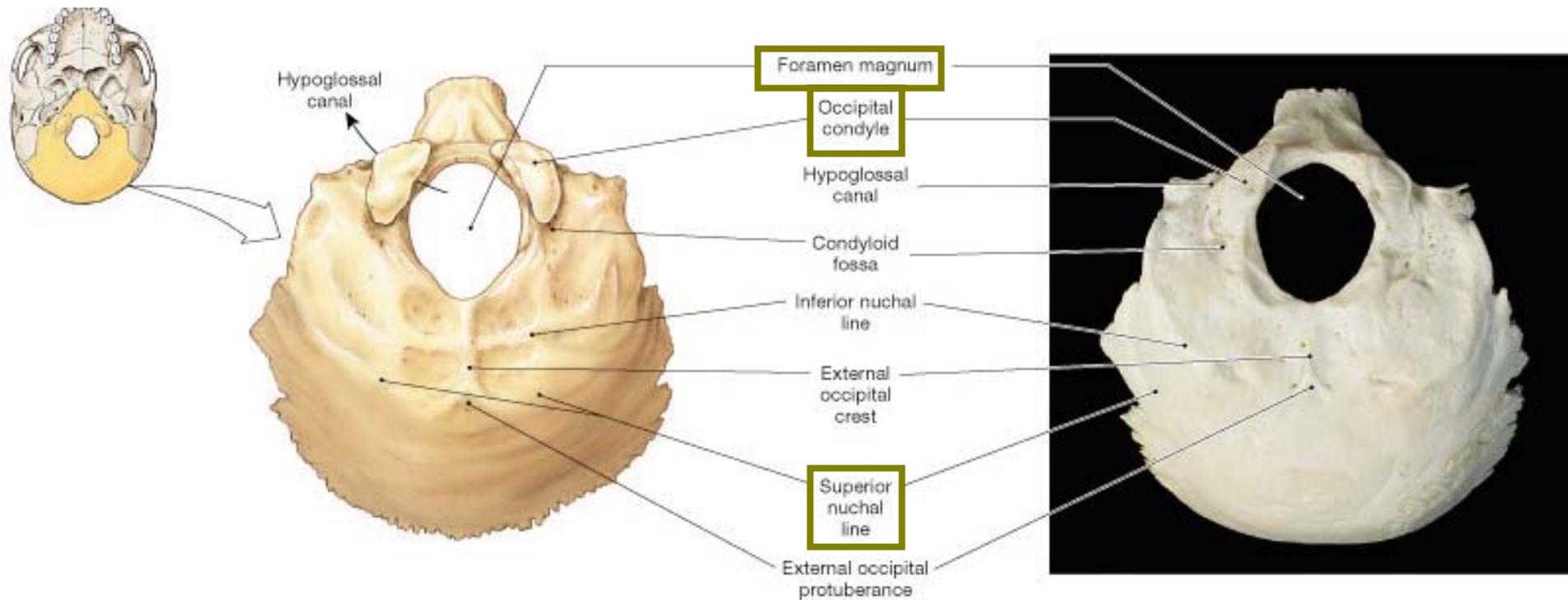


Sagittal sections

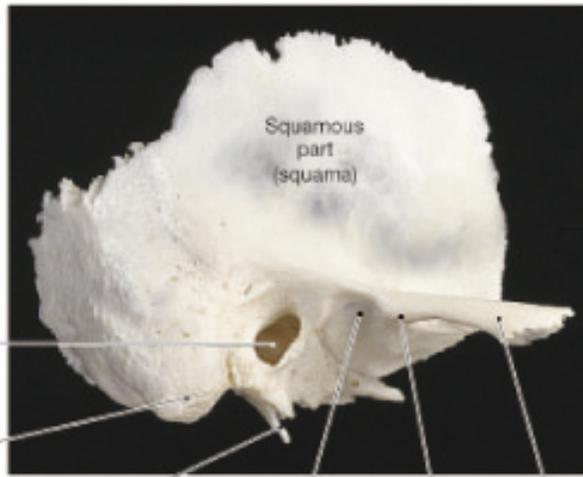
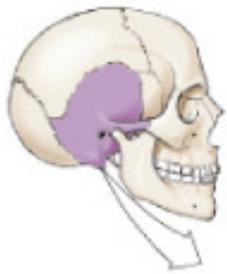
Right vs. left parietal bone



(c) Parietal bone, external surface



(a) Occipital bone, inferior (external) view



External acoustic meatus
Mastoid process

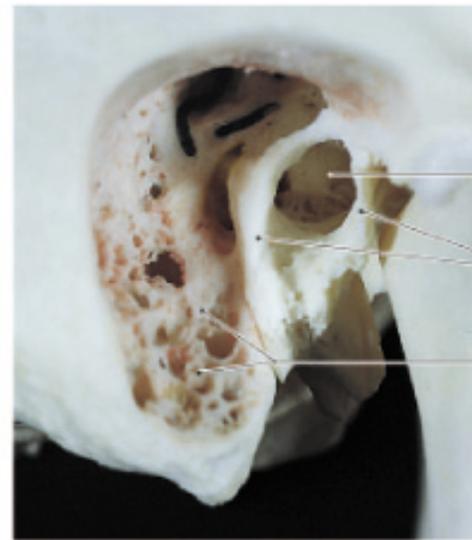
Styloid process

Mandibular fossa

Articular tubercle

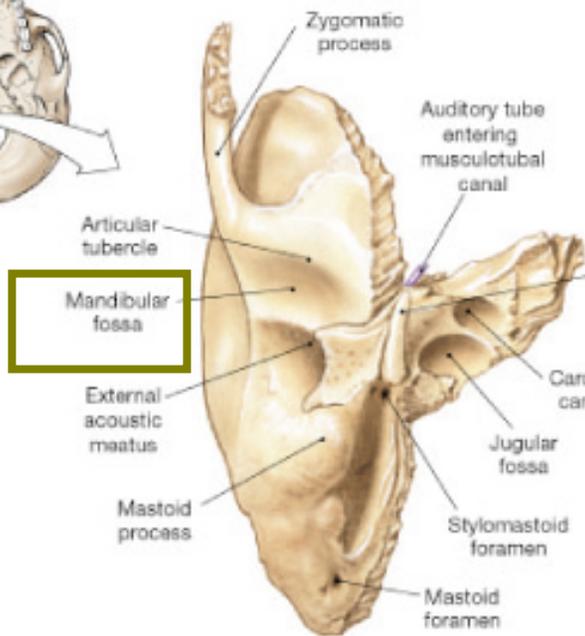
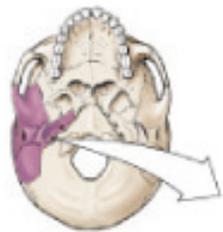
Zygomatic process

(a) Right temporal bone, lateral view



External acoustic meatus
Tympanic part
Mastoid process, cut to show mastoid air cells

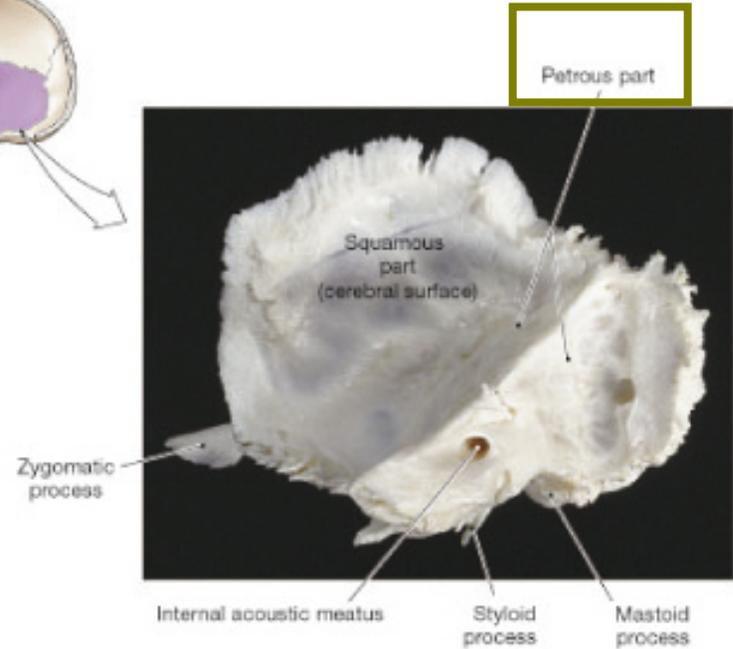
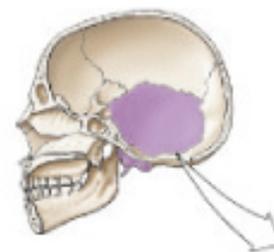
(b) The mastoid air cells



Mandibular fossa

Styloid process

(c) Right temporal bone, inferior view

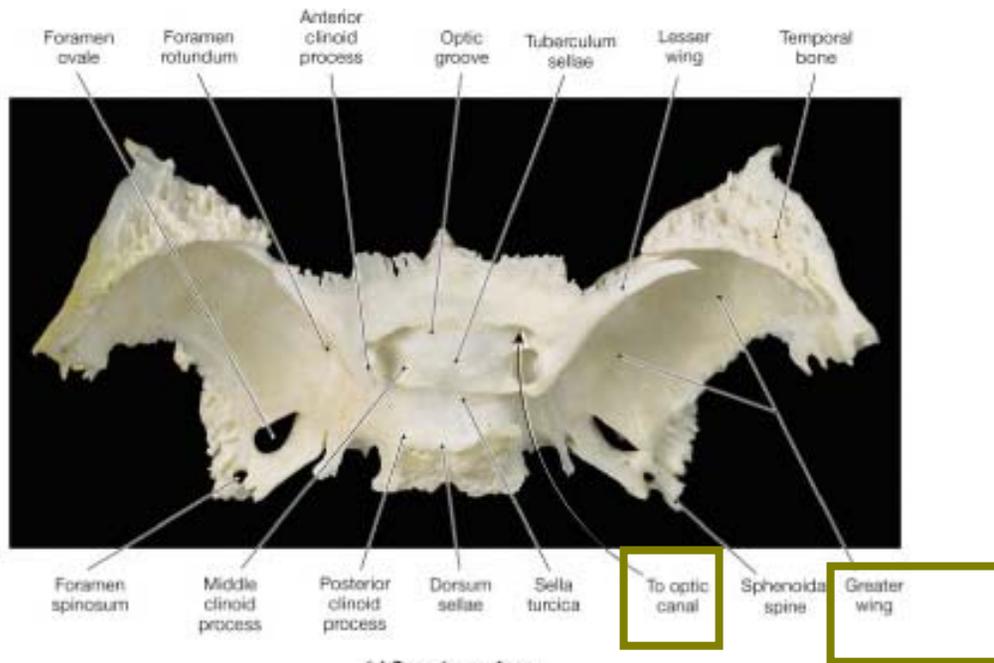
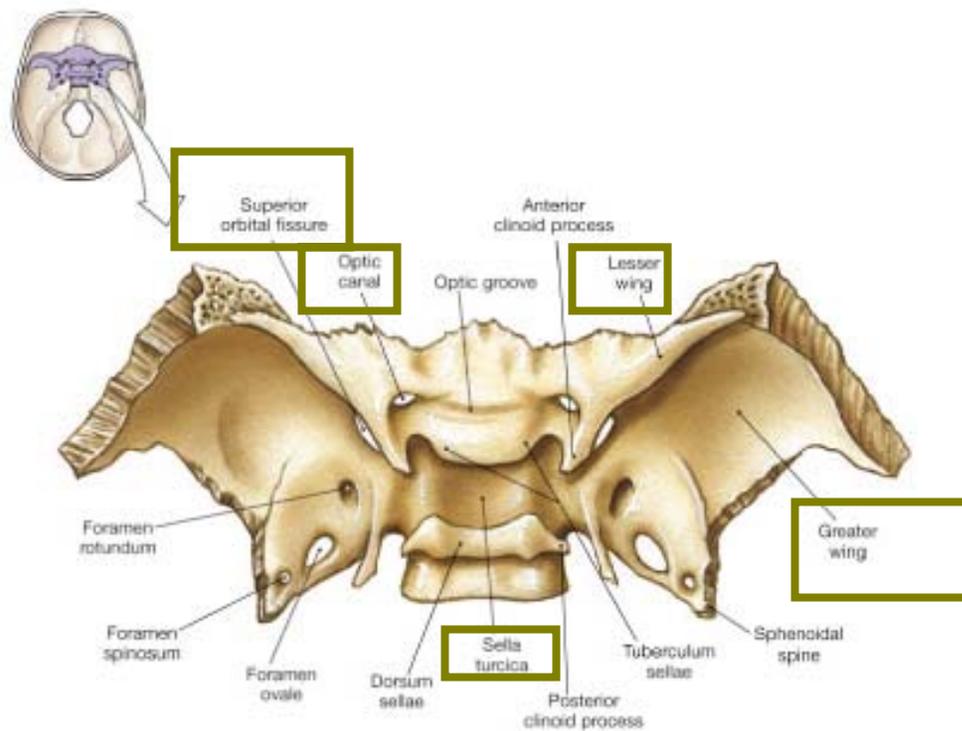


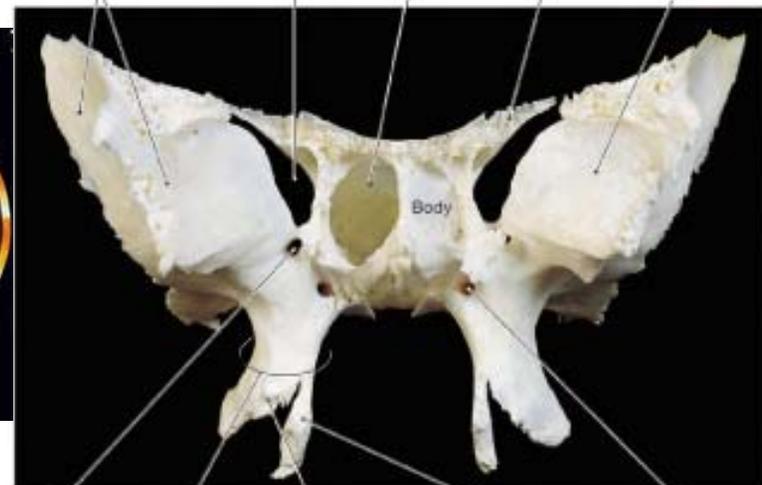
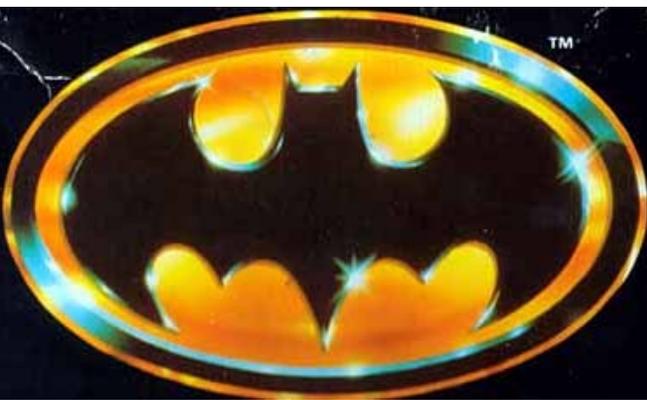
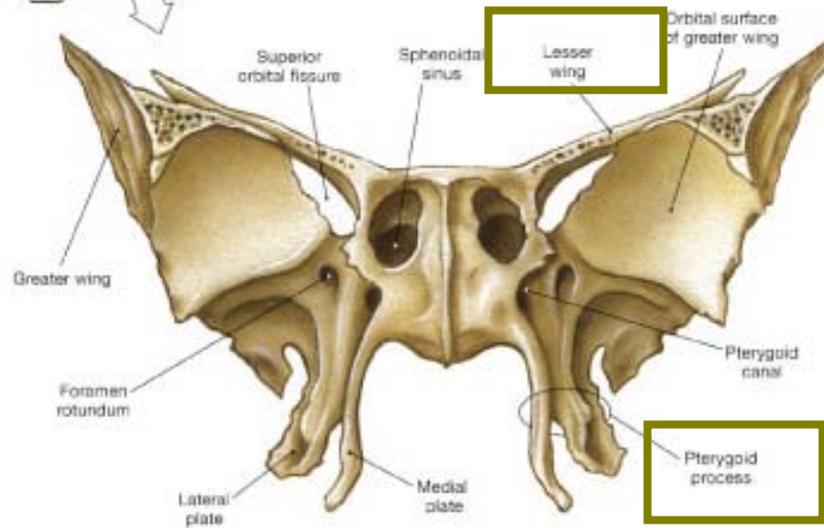
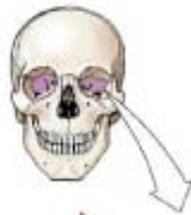
Petrous part

Internal acoustic meatus
Styloid process
Mastoid process

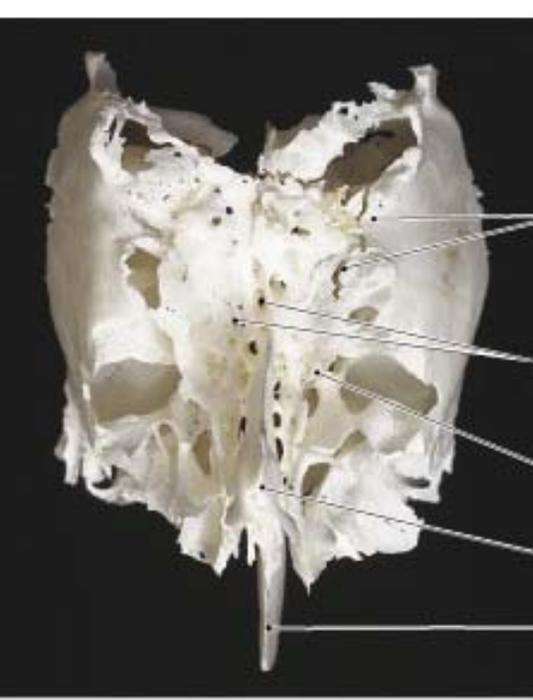
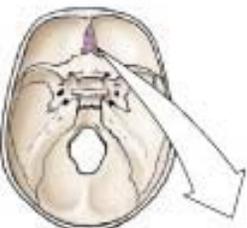
(d) Right temporal bone, medial view

The pituitary gland sits in the sella turcica of the sphenoid bone

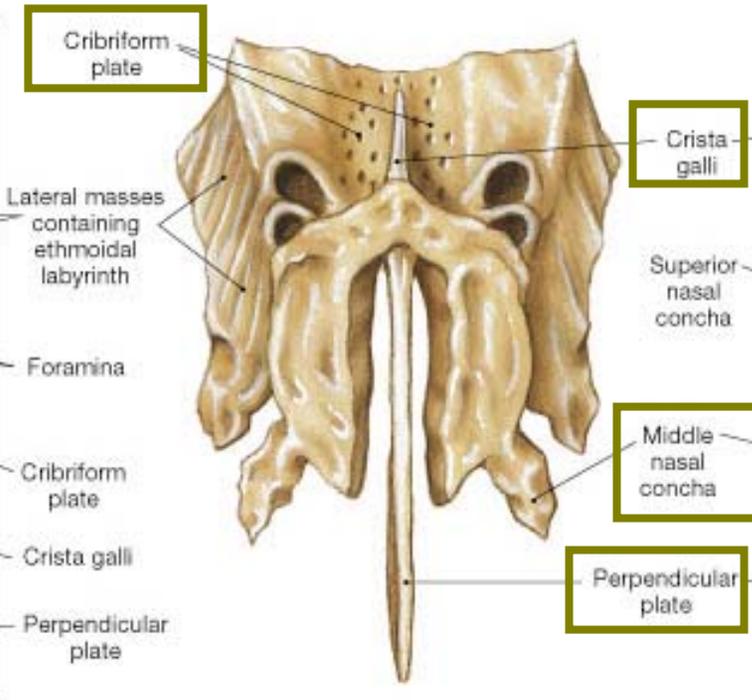




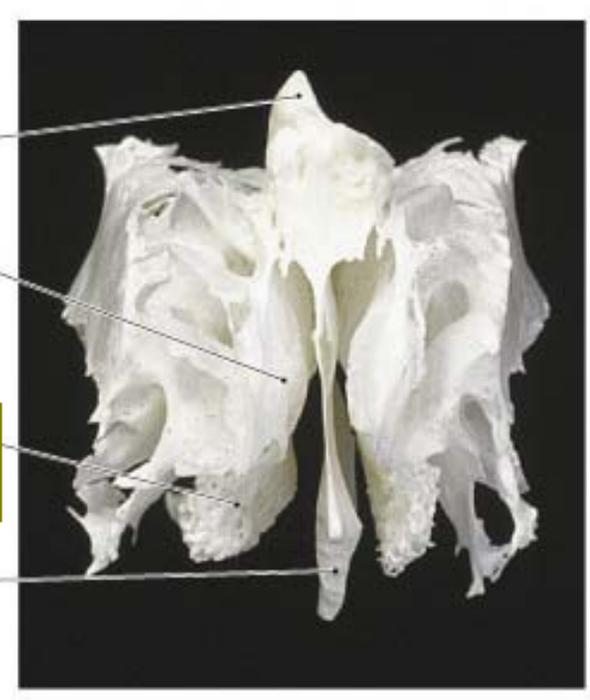
(b) Anterior surface



(a) Superior view



(b) Anterior view



(c) Posterior view

Cribriform plate

Lateral masses containing ethmoidal labyrinth

Foramina

Cribriform plate

Crista galli

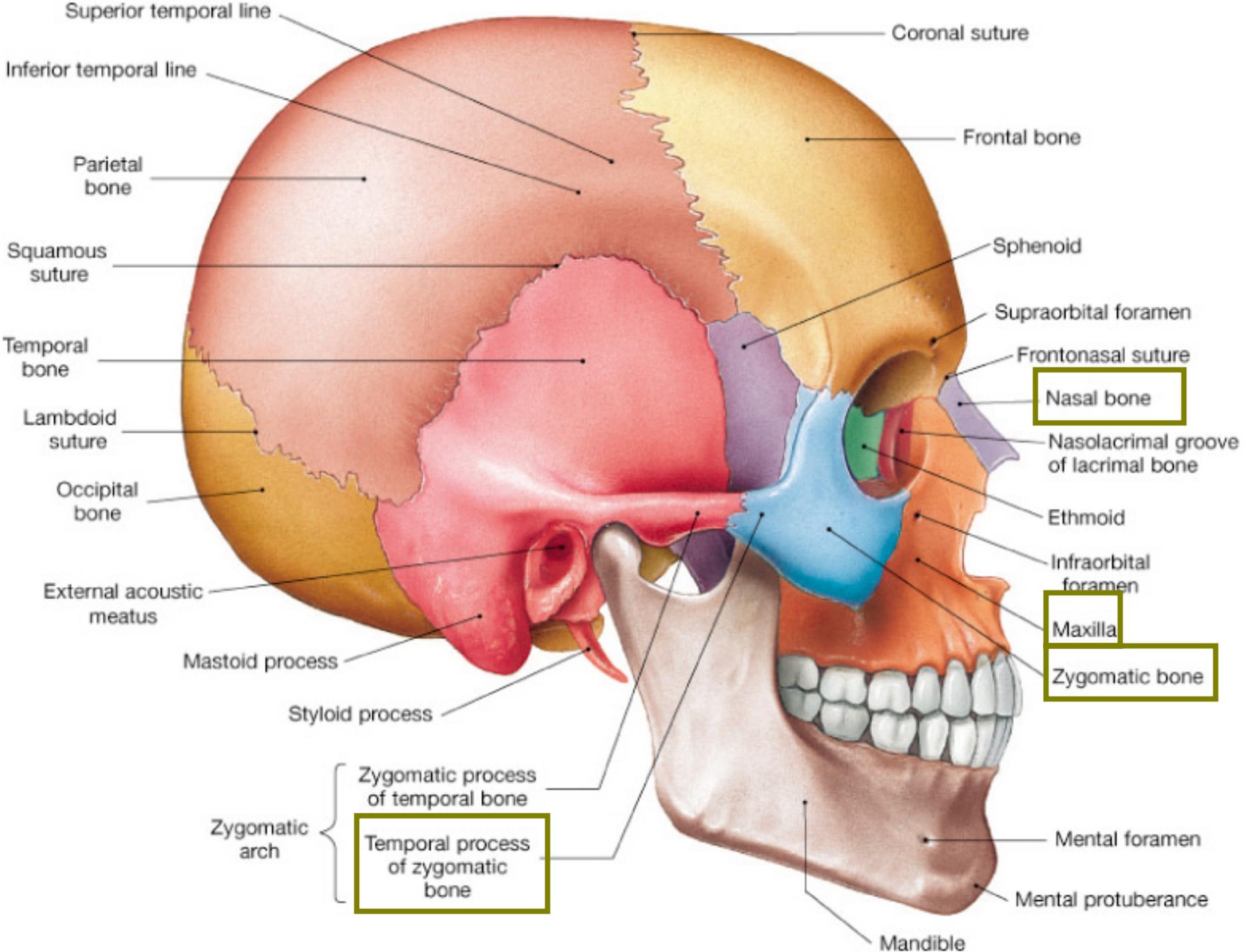
Perpendicular plate

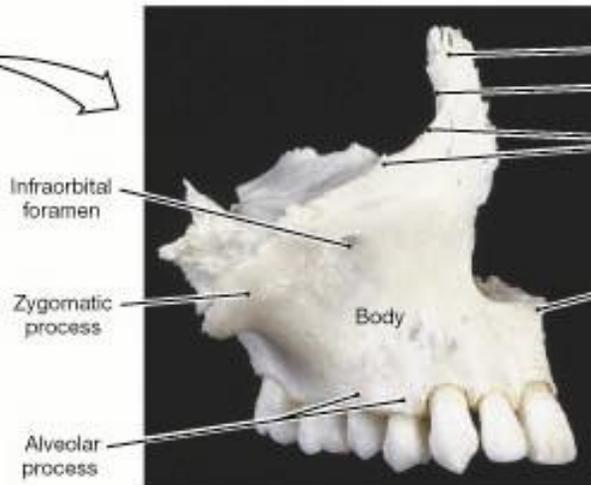
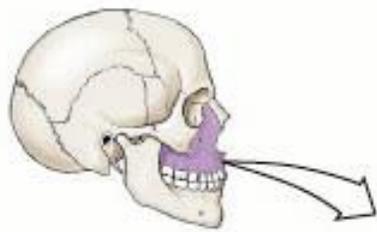
Crista galli

Superior nasal concha

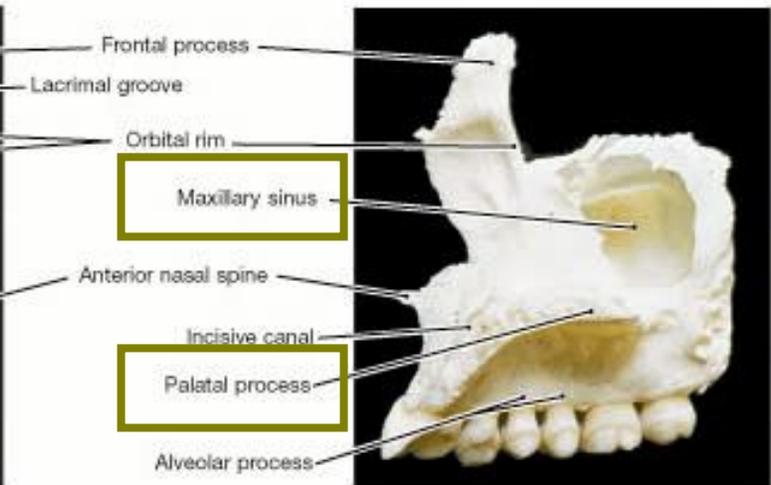
Middle nasal concha

Perpendicular plate

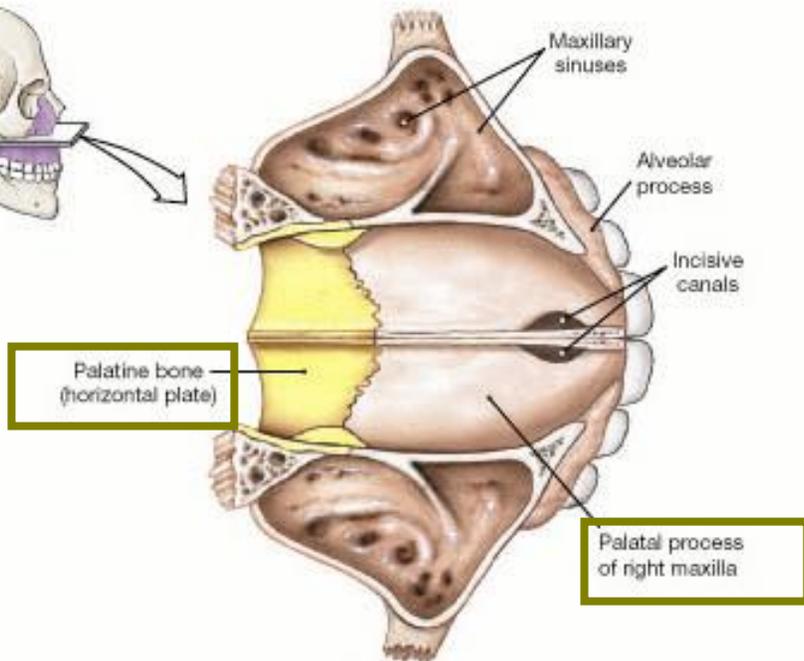
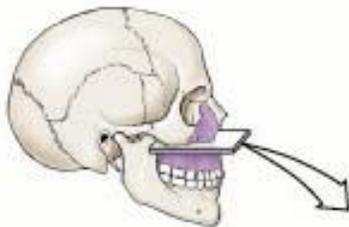




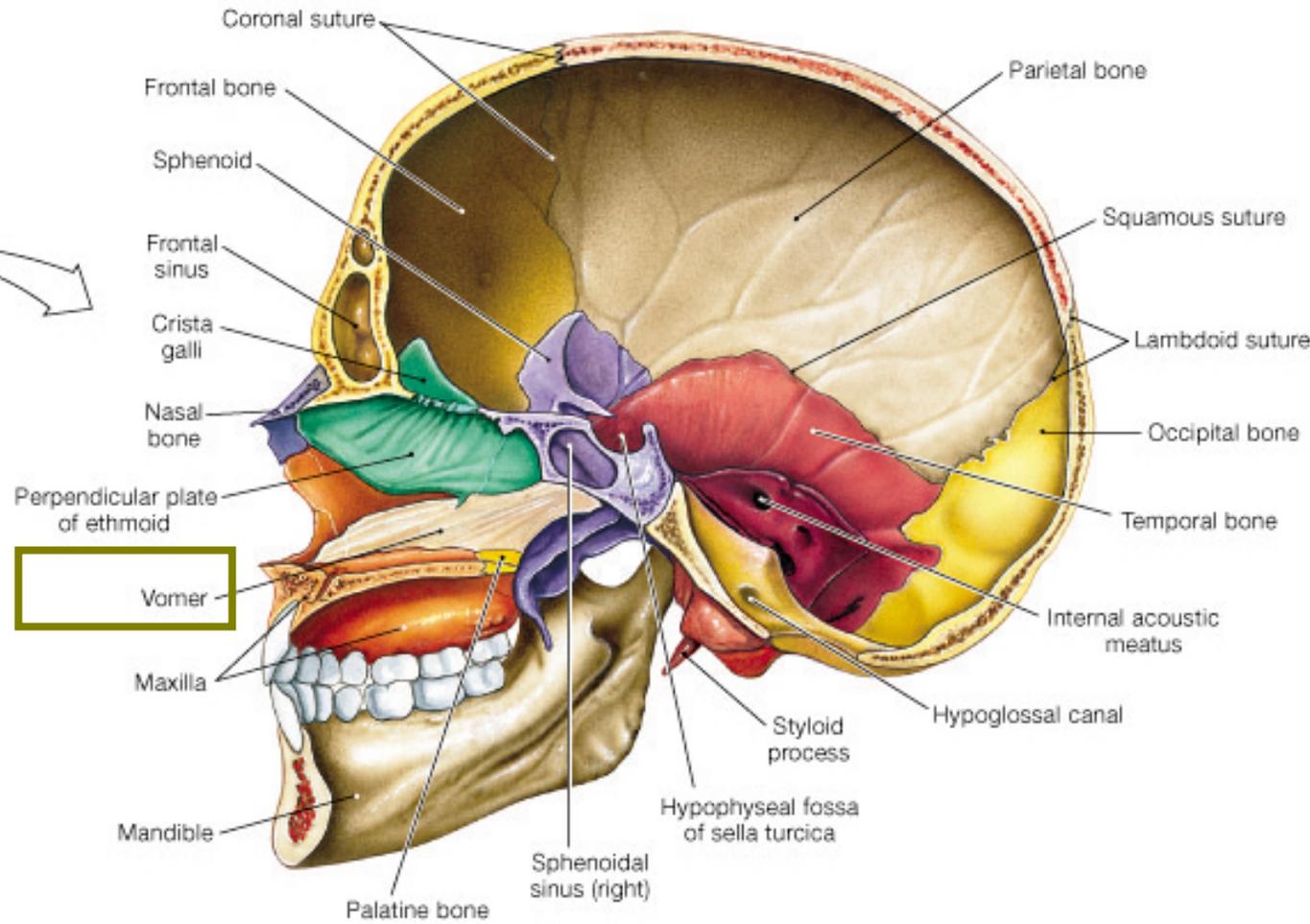
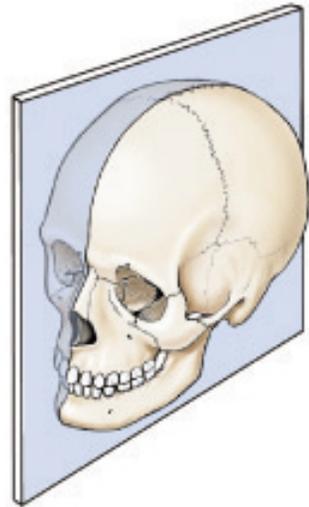
(a) Right maxilla, lateral view

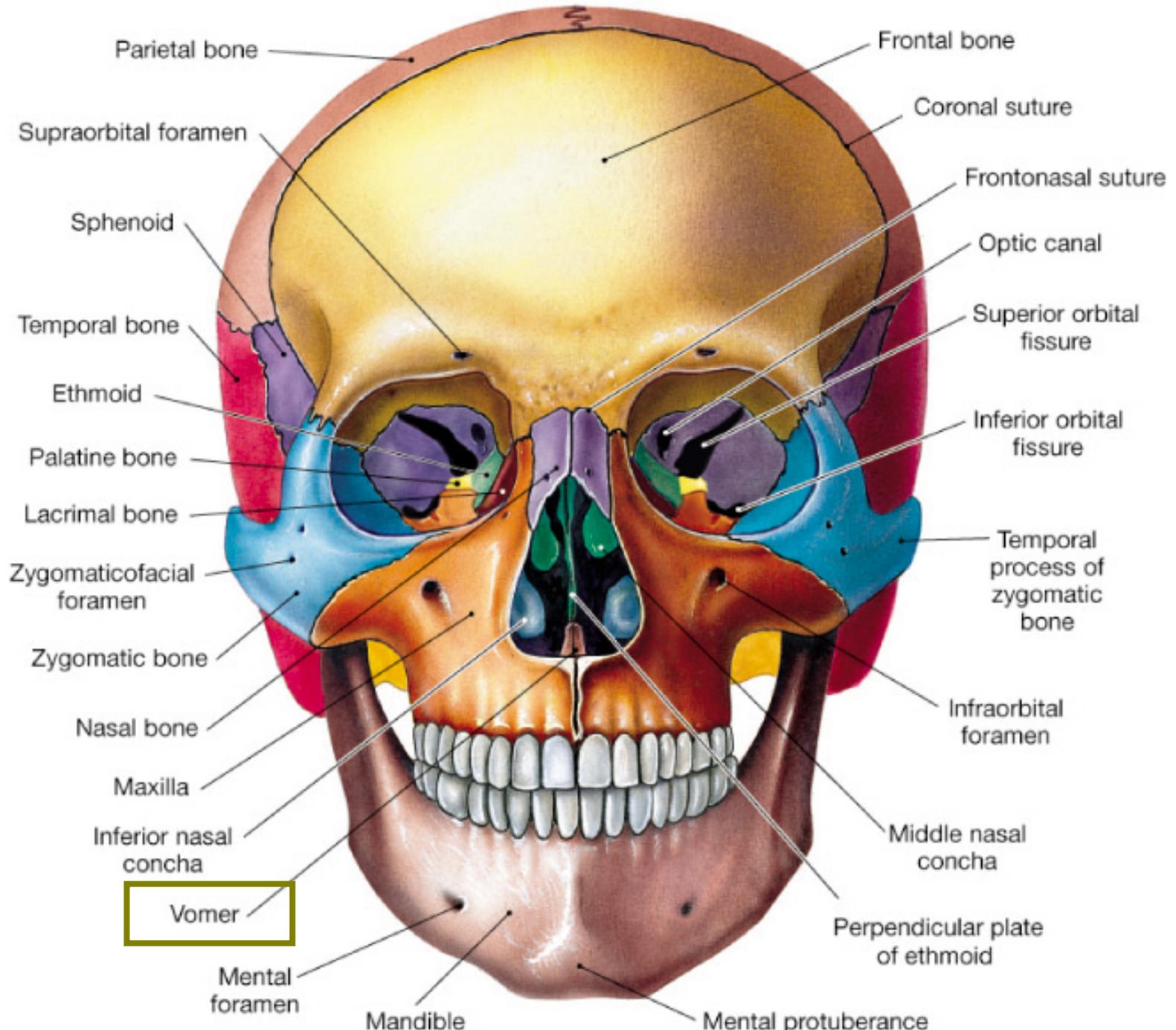


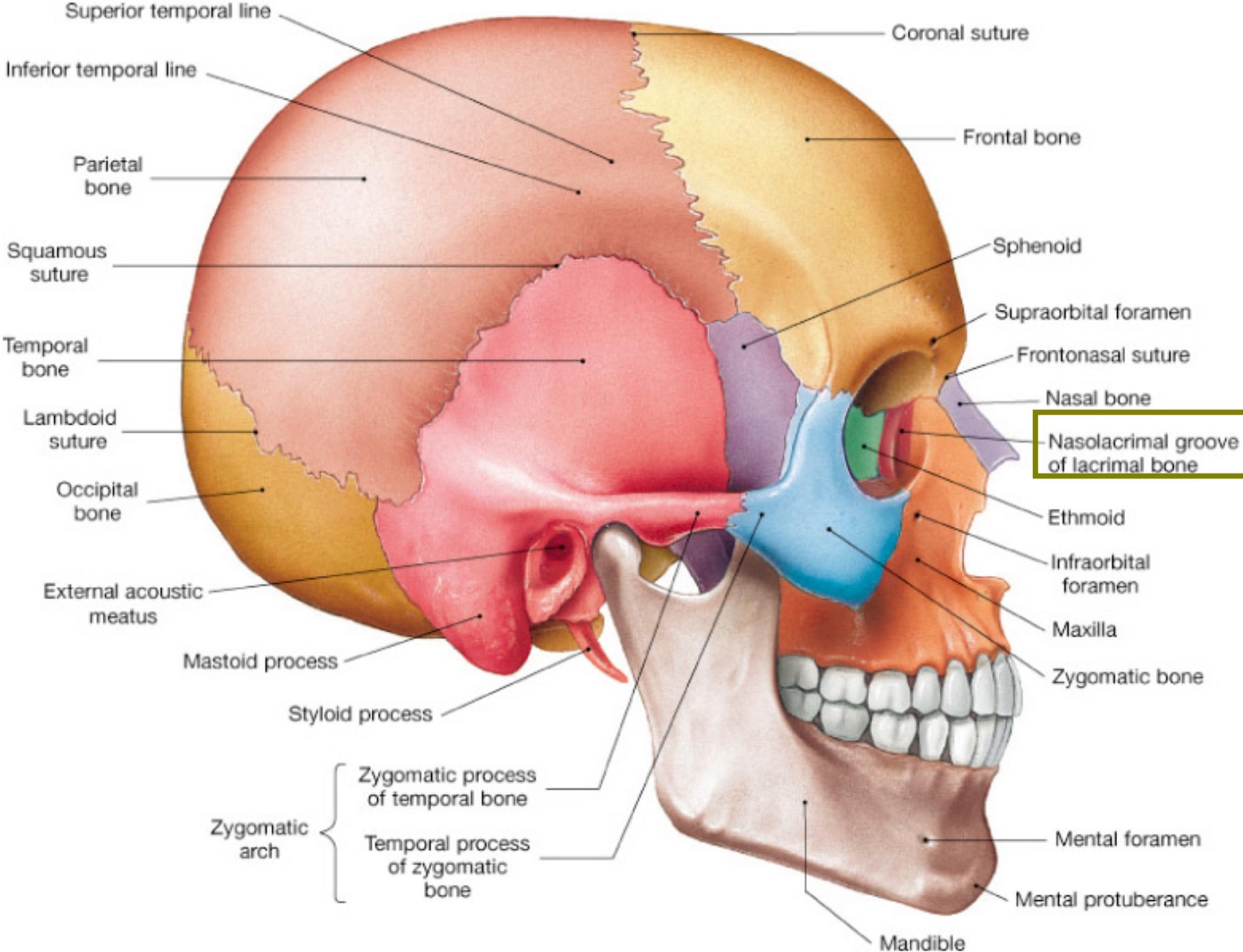
(b) Medial view



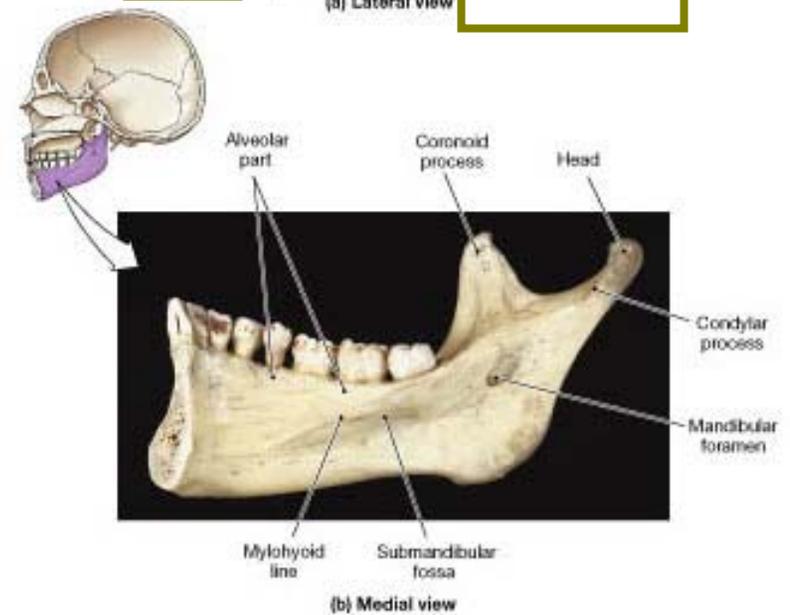
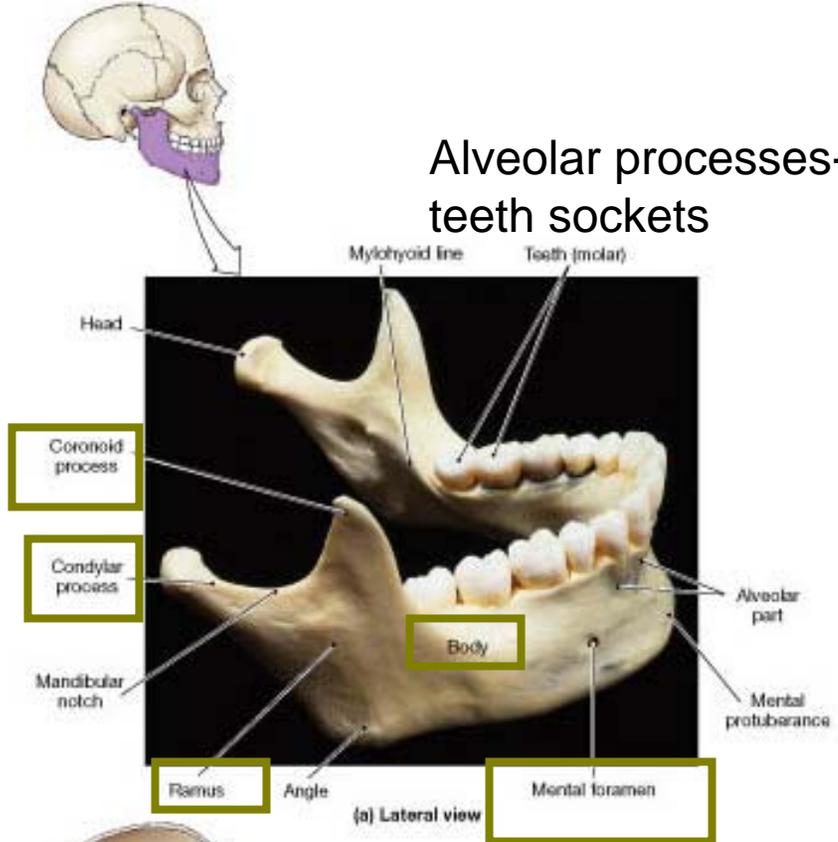
(c) Maxillae and palatine bones, sectional view

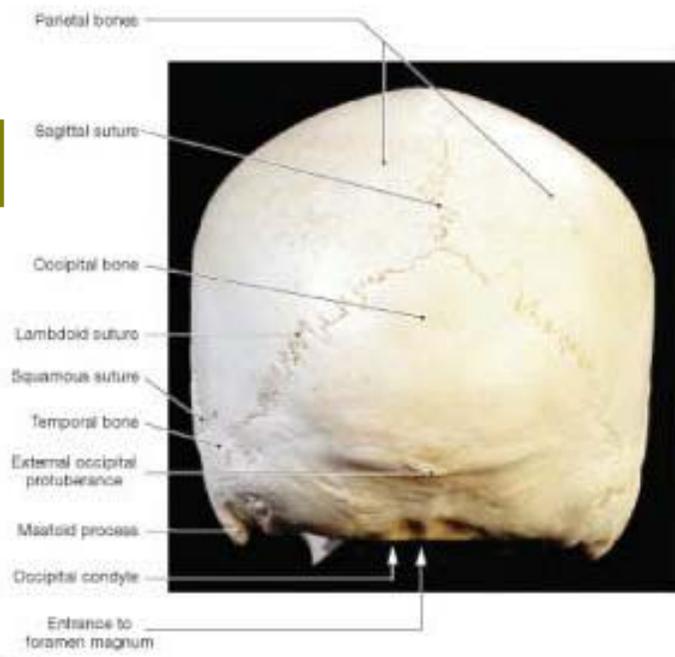
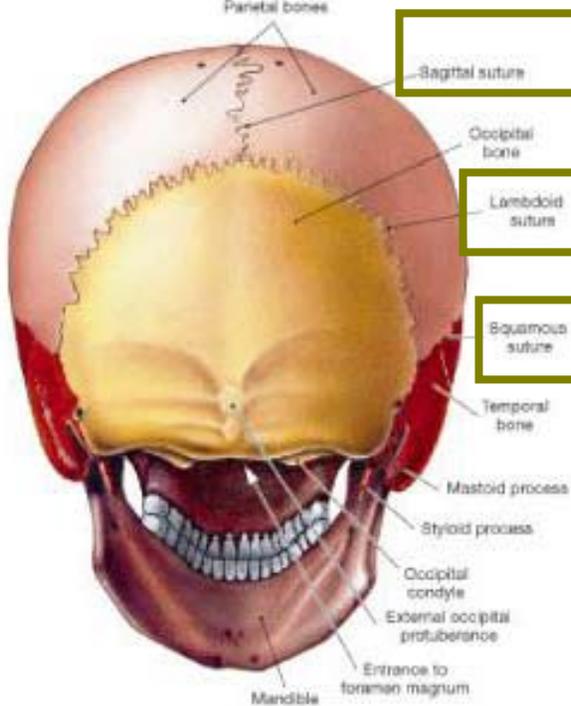




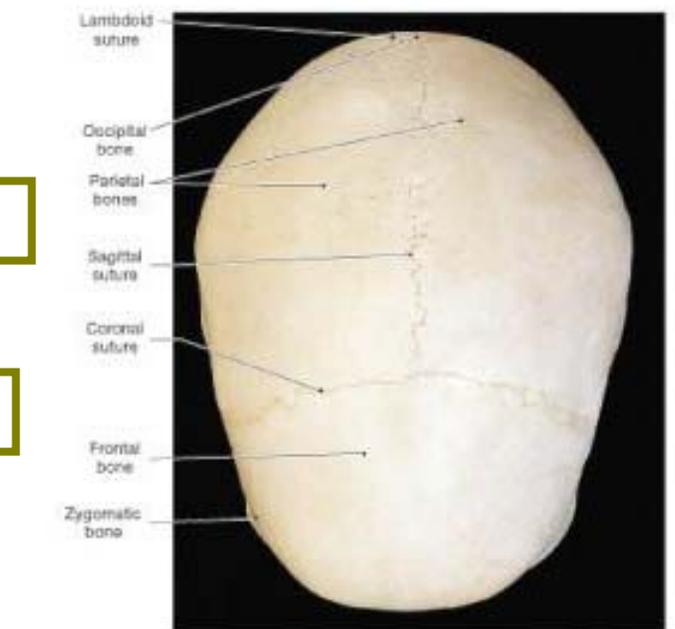
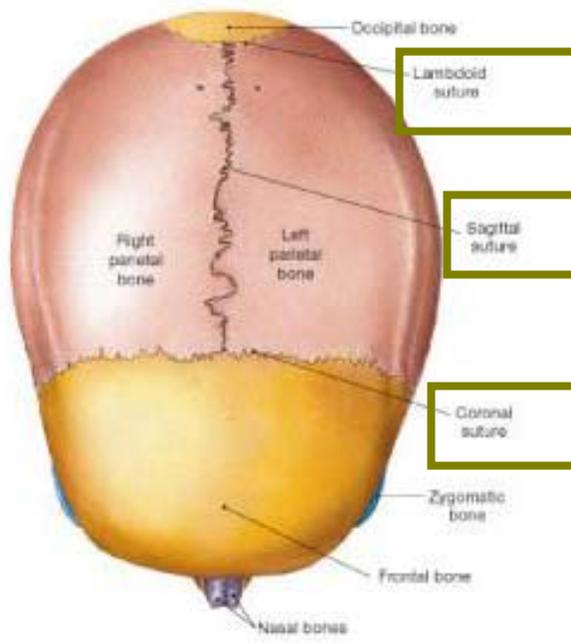


Alveolar processes-the teeth sockets

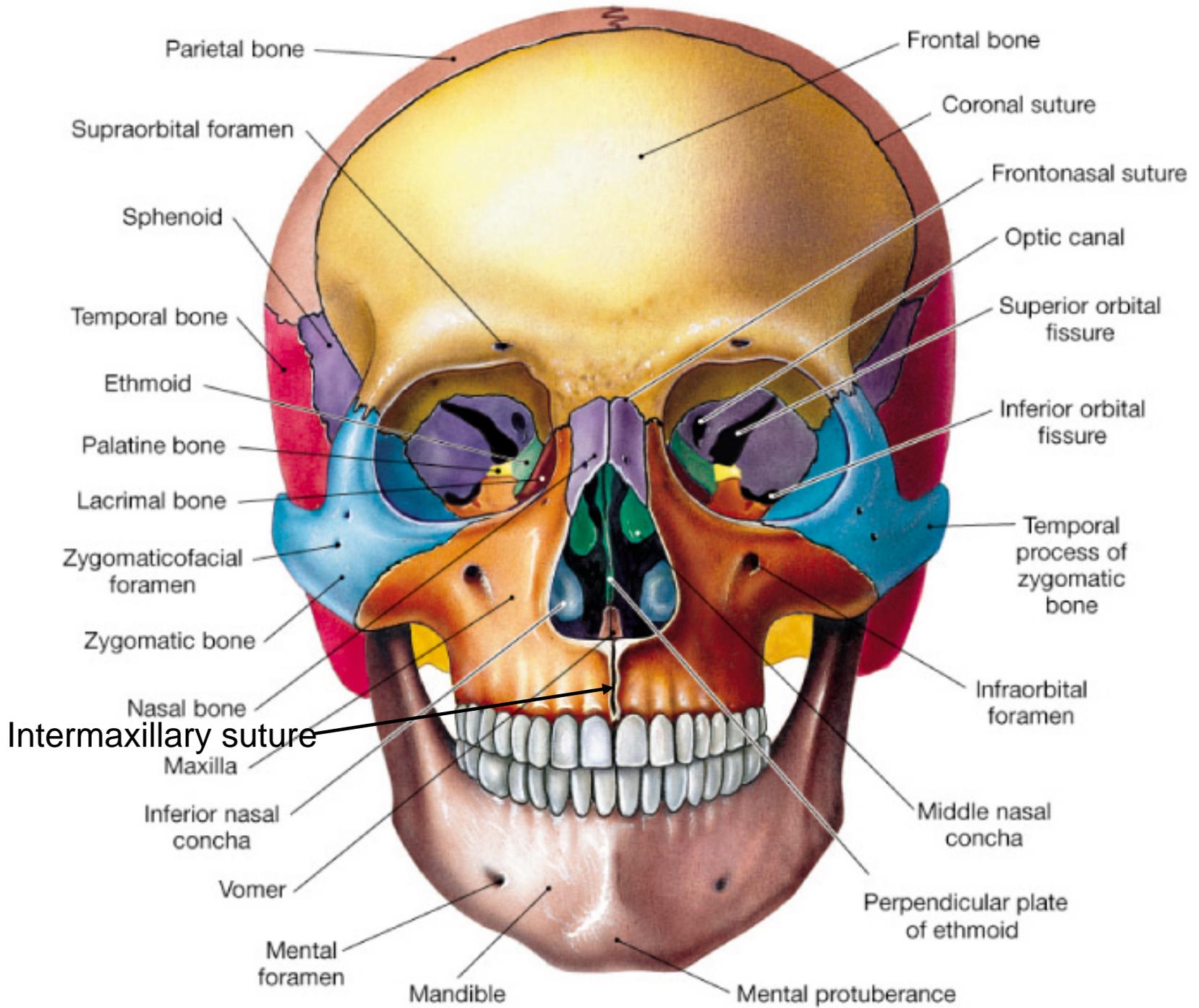


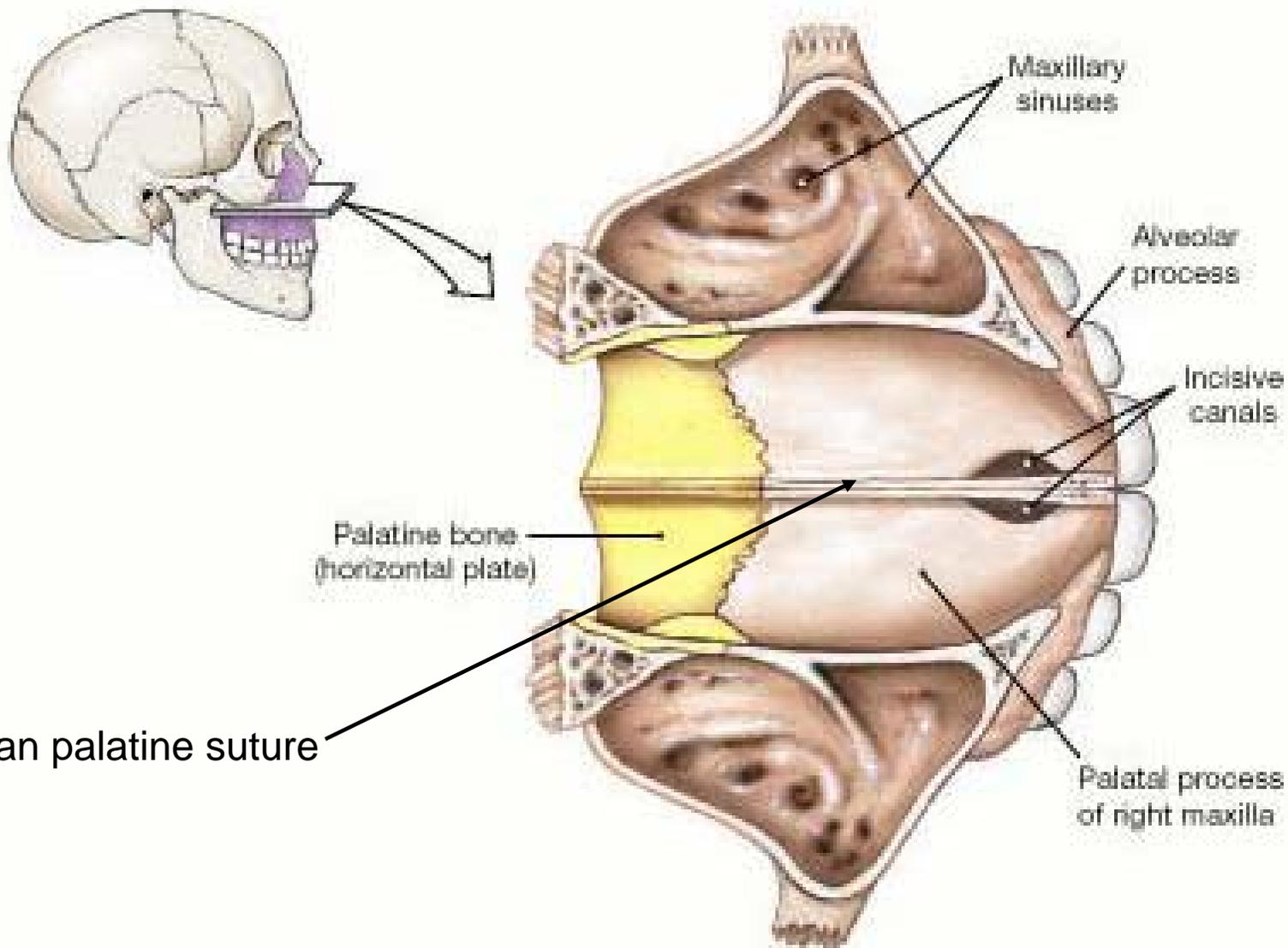


(a) Posterior view



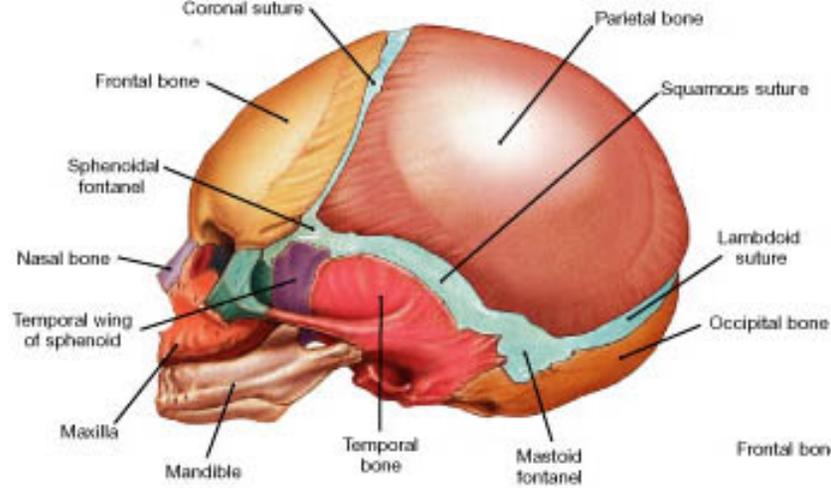
(b) Superior view



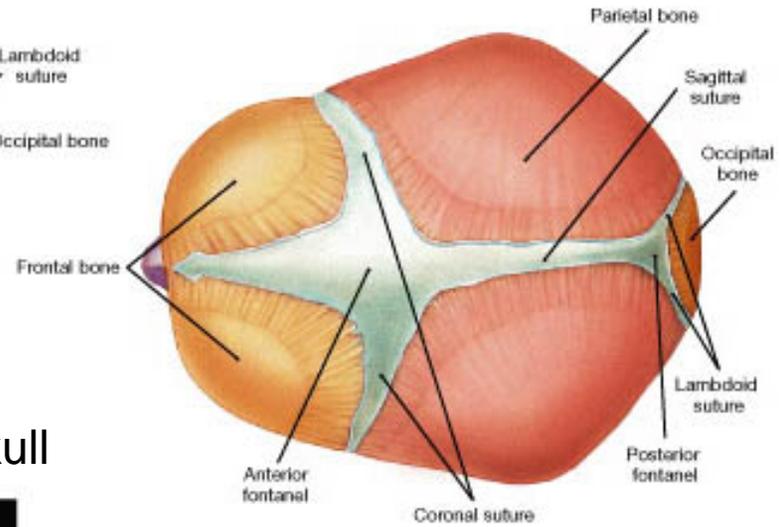


Median palatine suture

(c) Maxillae and palatine bones, sectional view

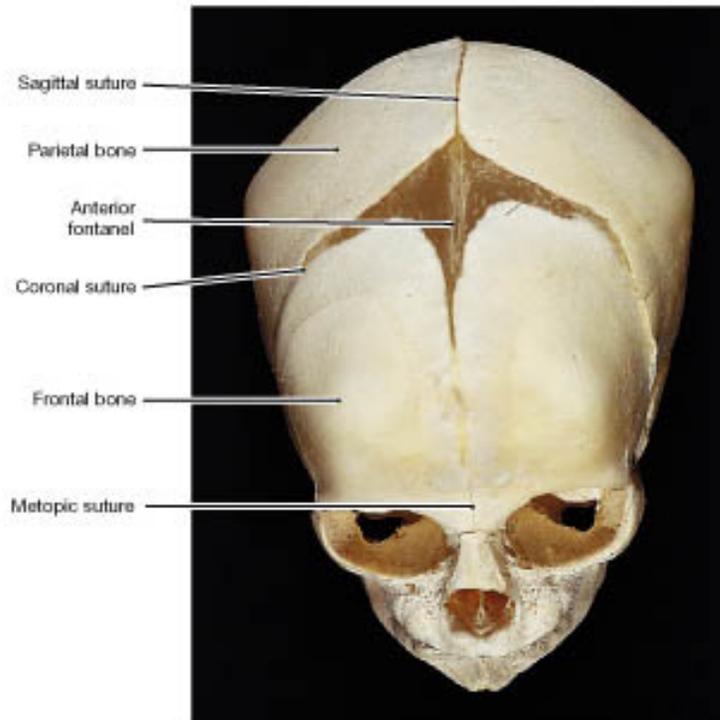


(a) Lateral view

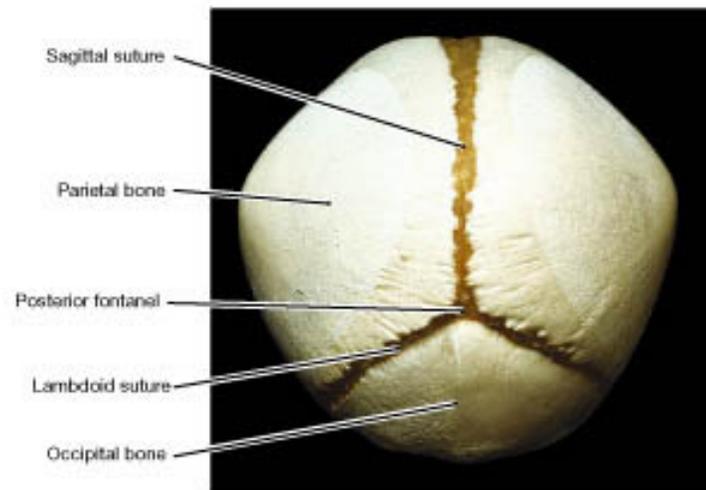


(b) Superior view

Fontanel-soft spots on a fetal/baby skull



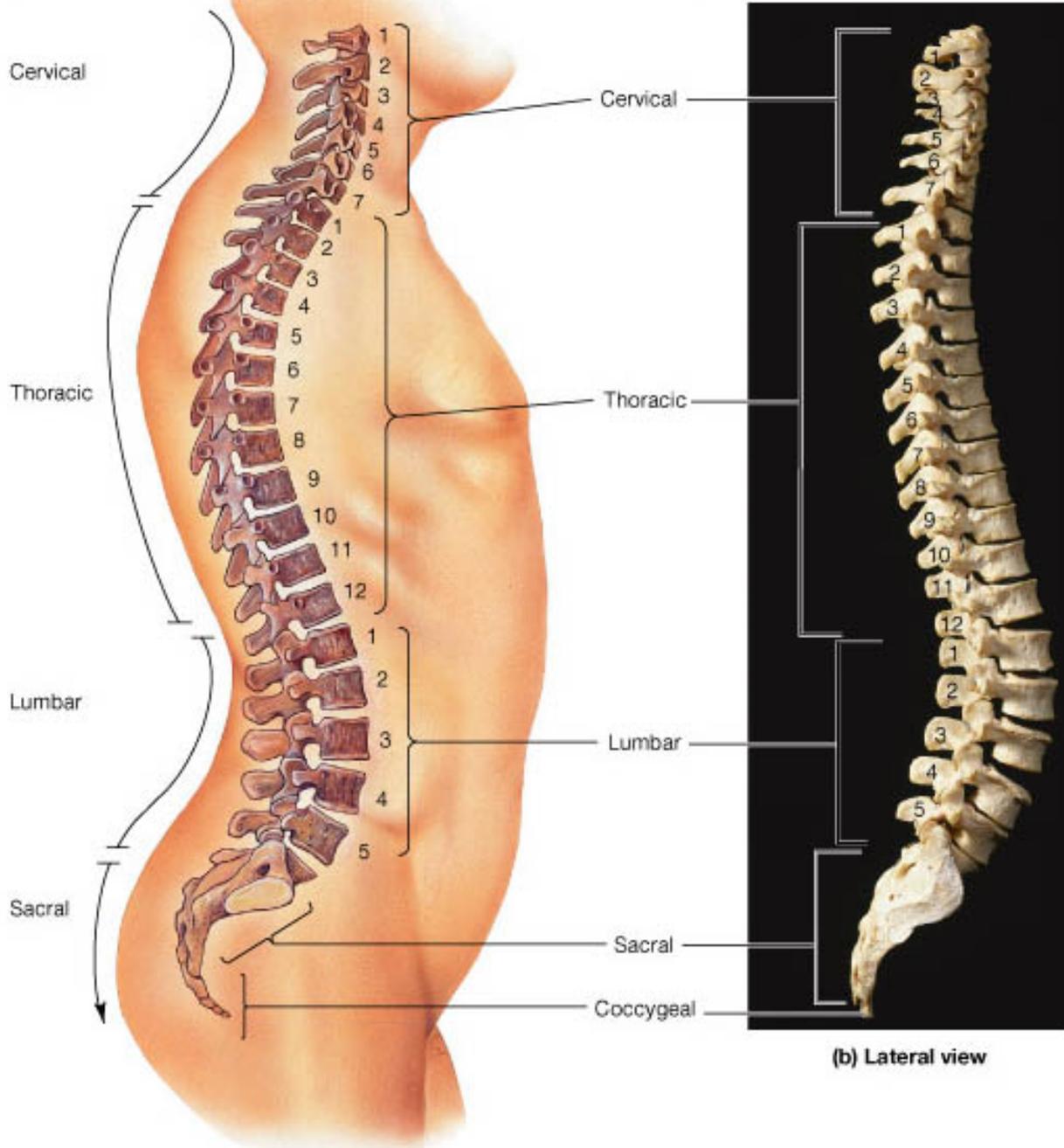
(c) Anterior view



(d) Posterior view

Spinal curves

Vertebral regions



Cervical

Thoracic

Lumbar

Sacral

Cervical

Thoracic

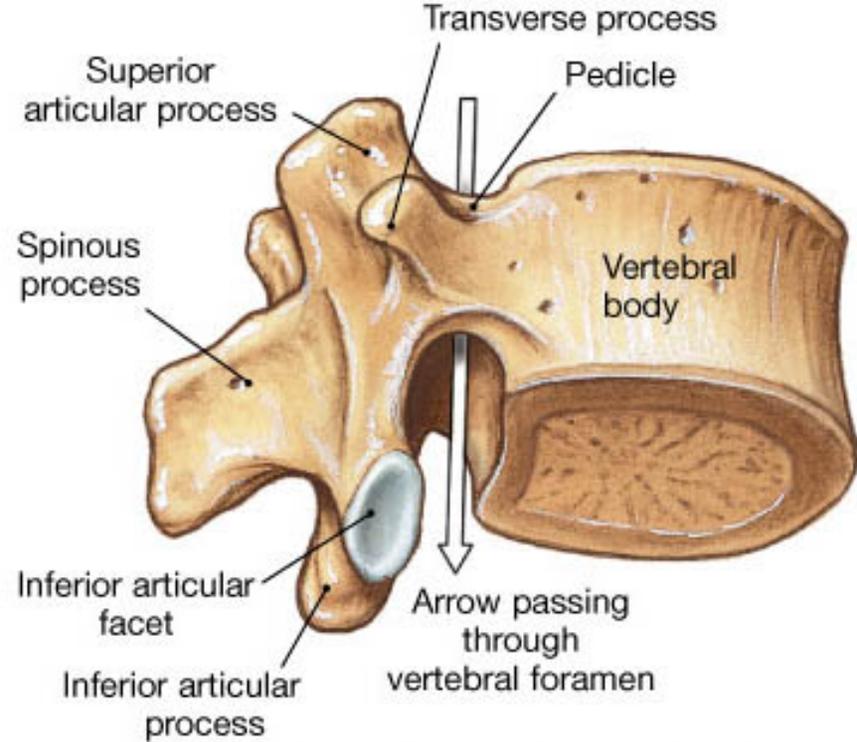
Lumbar

Sacral

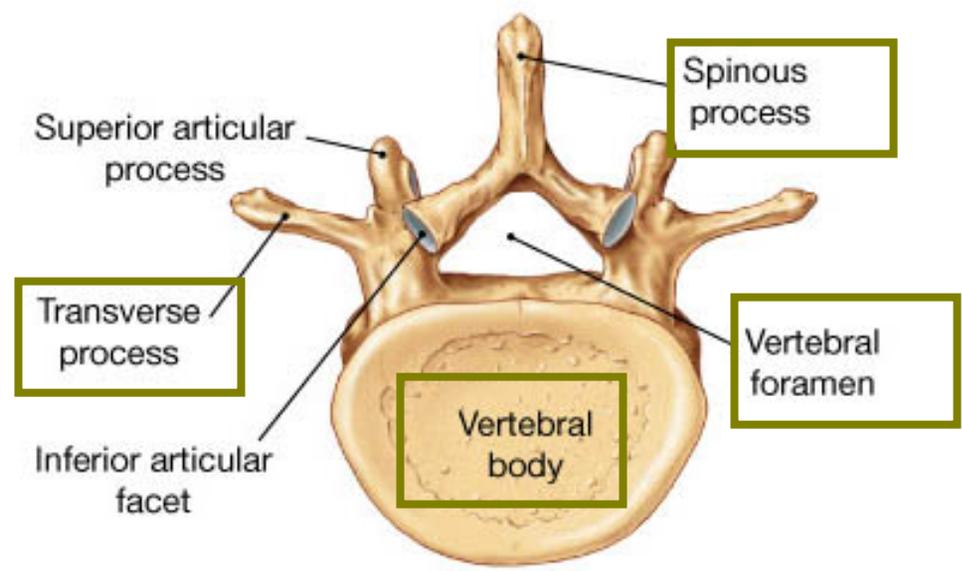
Coccygeal

(b) Lateral view

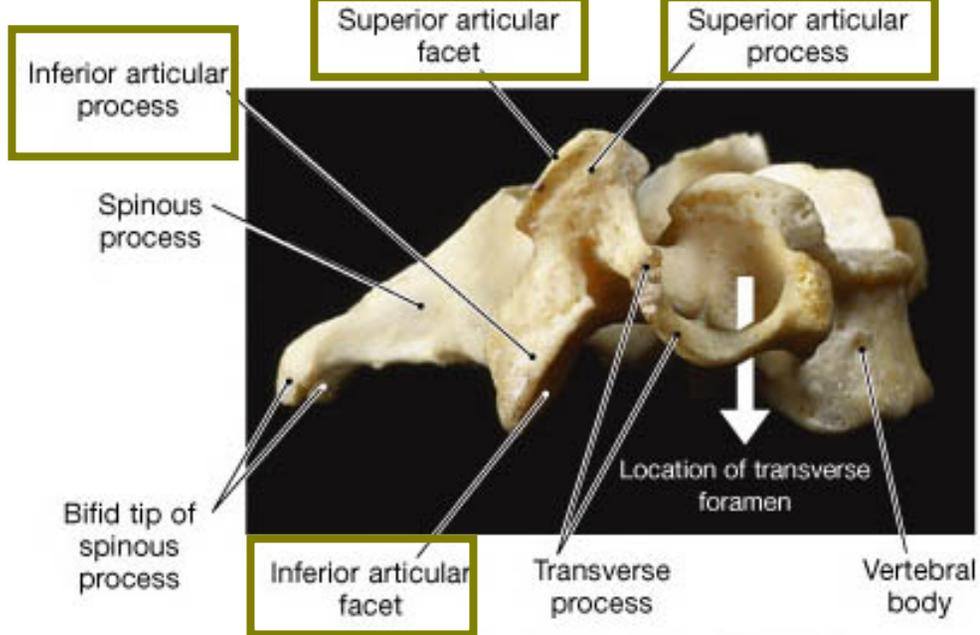
(a) Lateral view



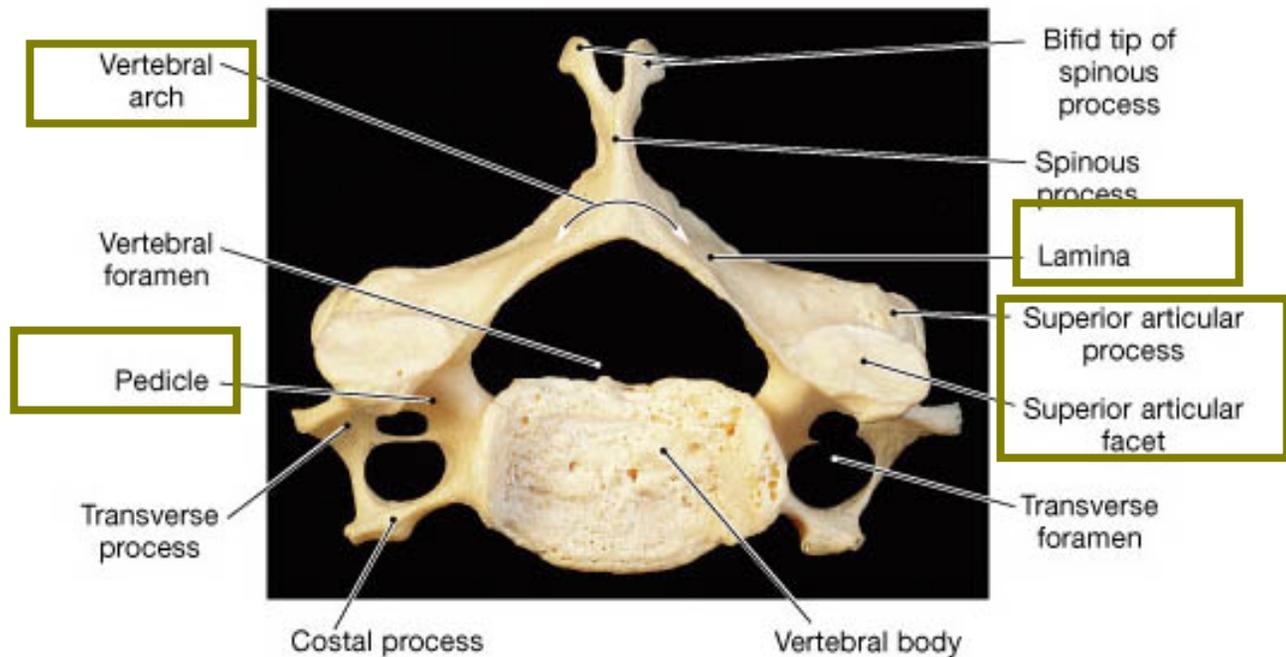
(a) Lateral and inferior view



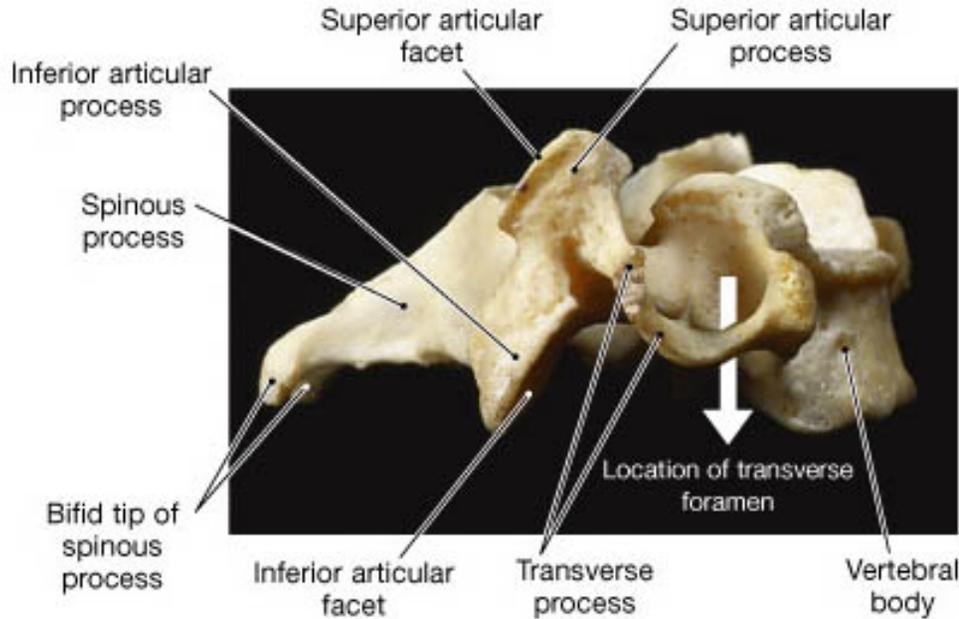
(b) Inferior view



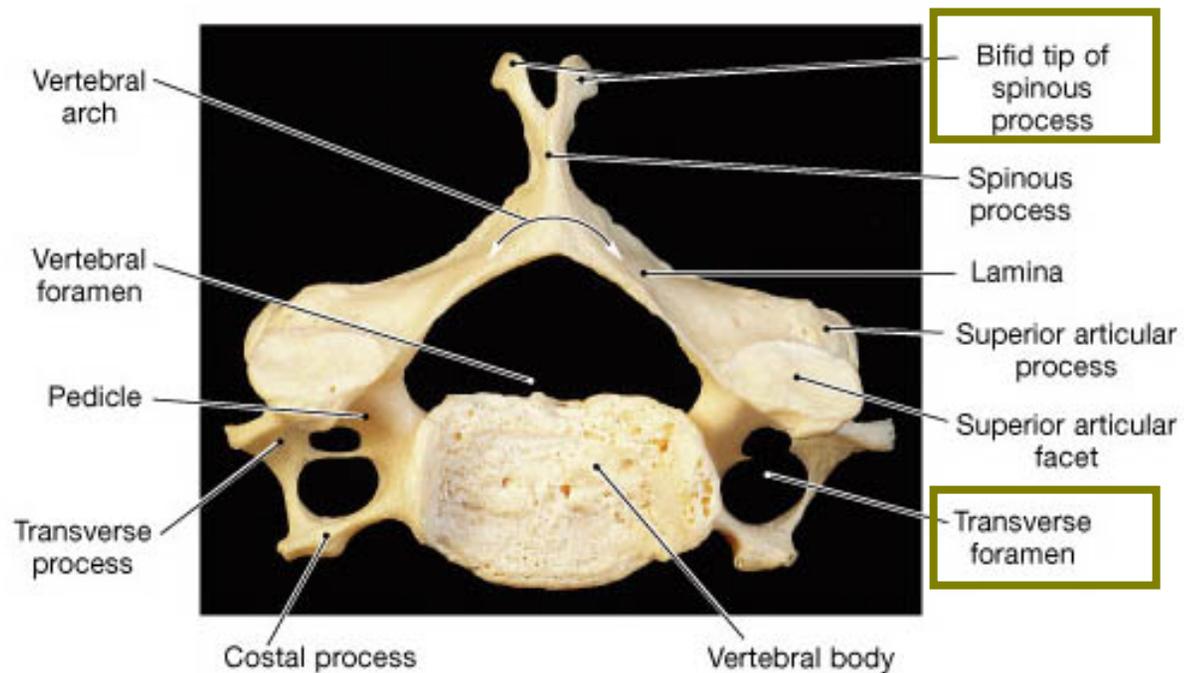
(b) Typical cervical vertebra, lateral view



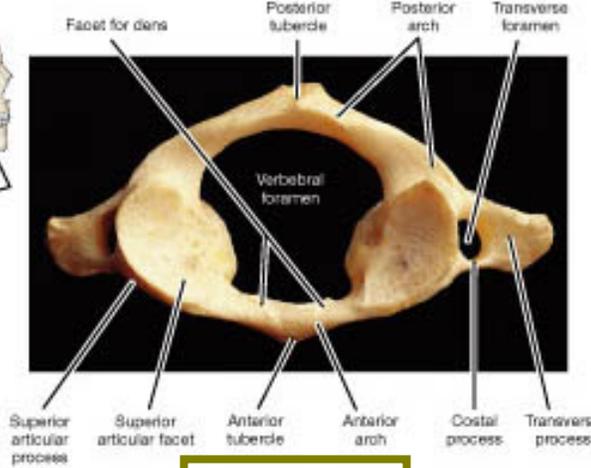
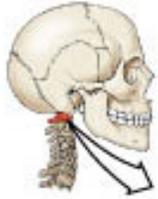
(c) Typical cervical vertebra, superior view



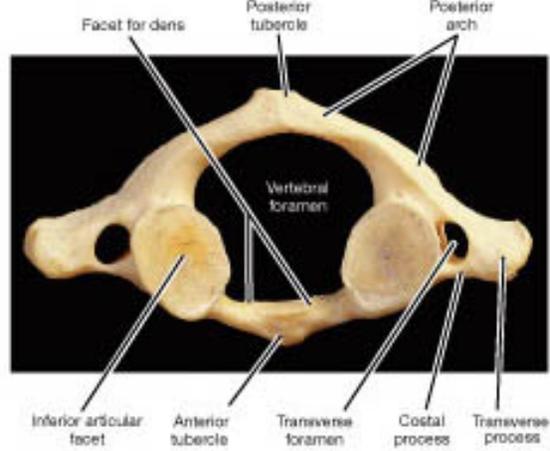
(b) Typical cervical vertebra, lateral view



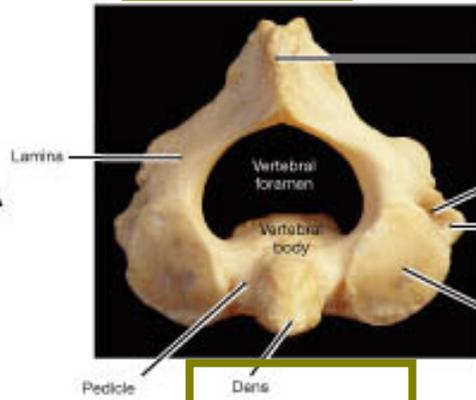
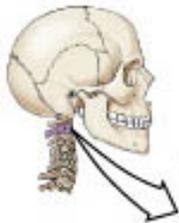
(c) Typical cervical vertebra, superior view



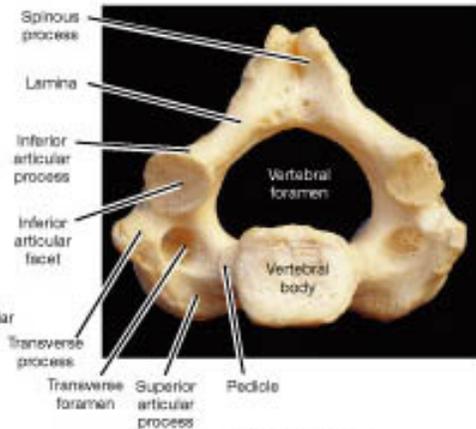
(a) Atlas, superior view



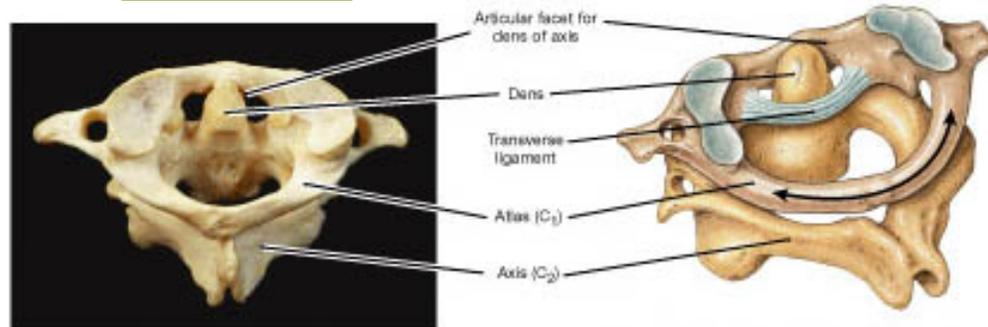
(b) Atlas, inferior view



(c) Axis, superior view

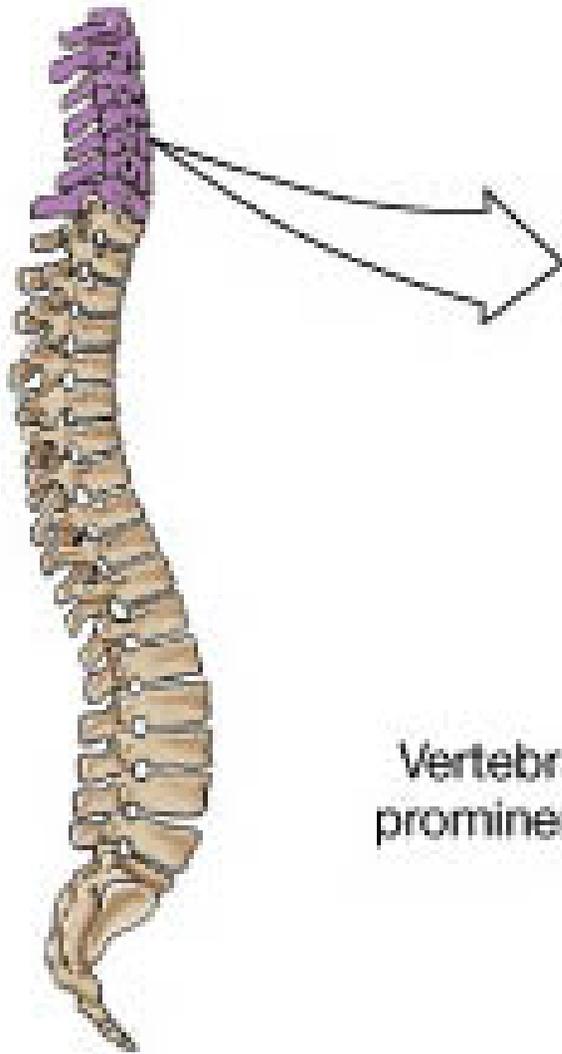


(d) Axis, inferior view

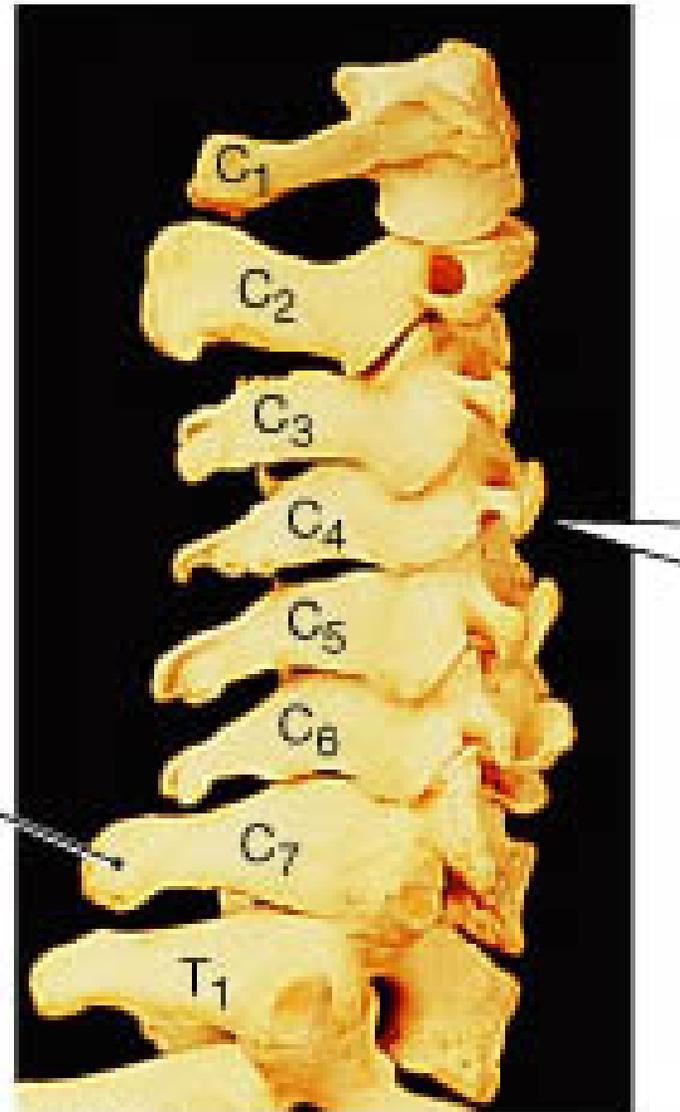


(e) Articulated atlas and axis, superior and posterior view

(f) The articulated atlas and axis; note the location and orientation of the transverse ligament.



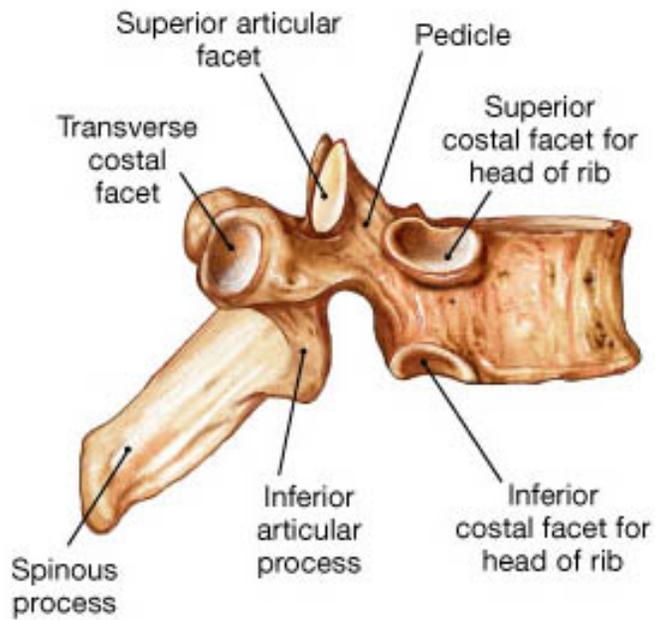
Vertebra prominens



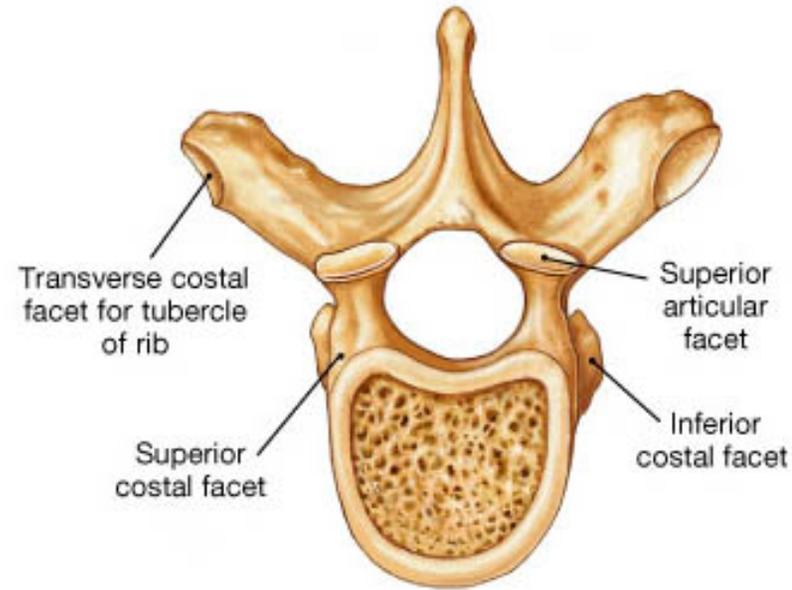
(a) Cervical vertebrae



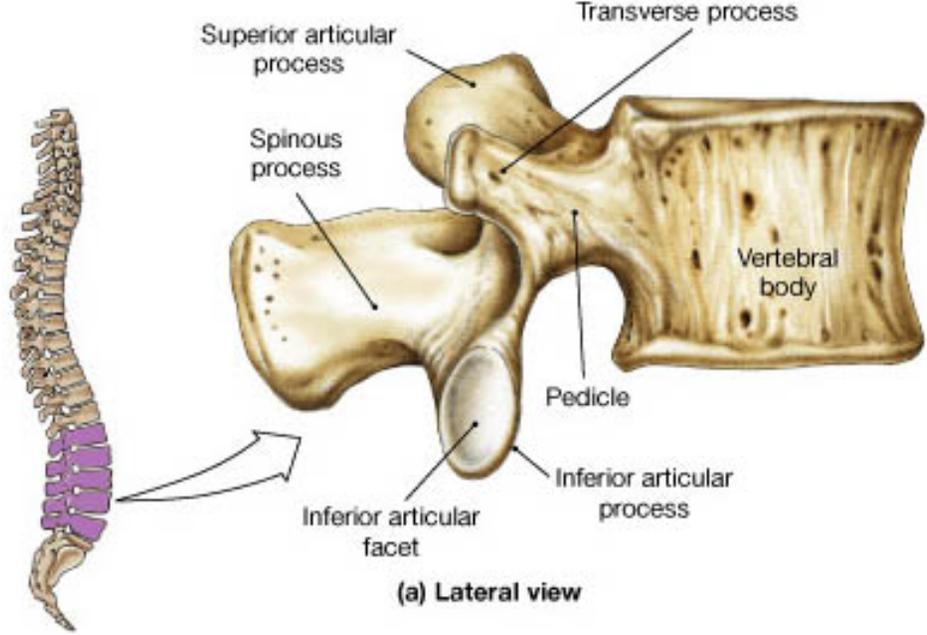
(a) Thoracic vertebrae, lateral view



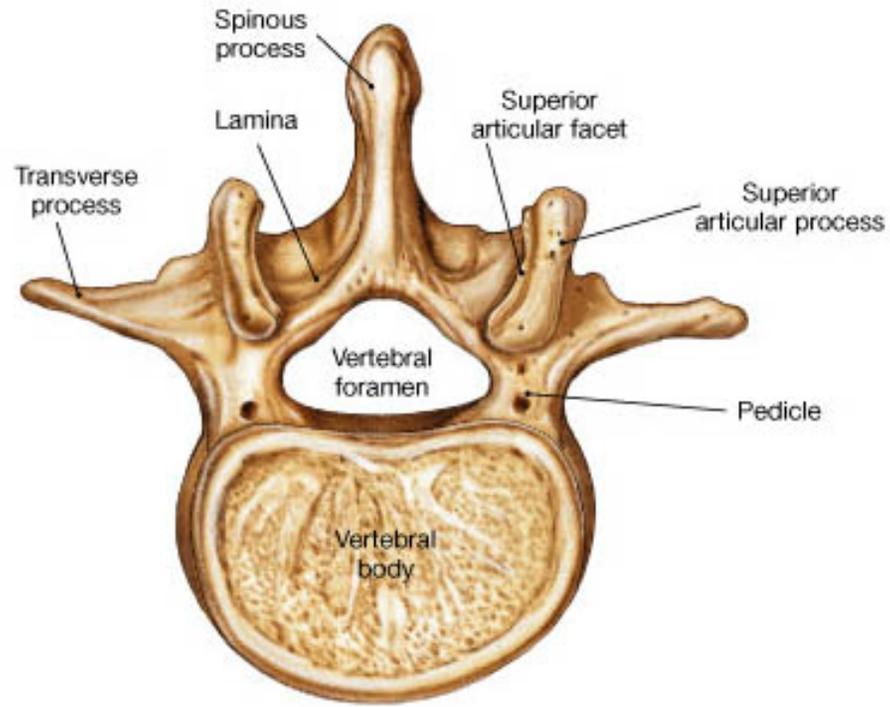
(b) Thoracic vertebra, lateral view



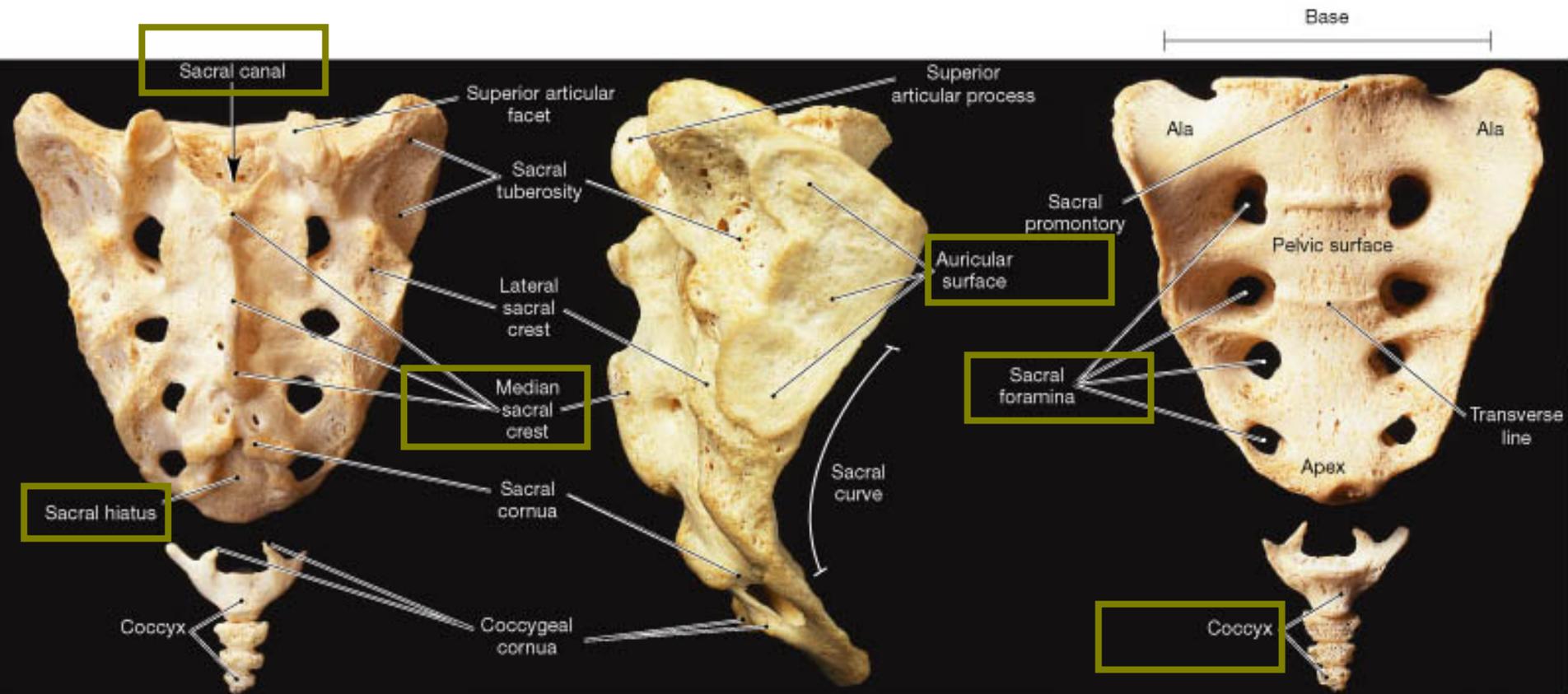
(c) Thoracic vertebra, superior view



(a) Lateral view



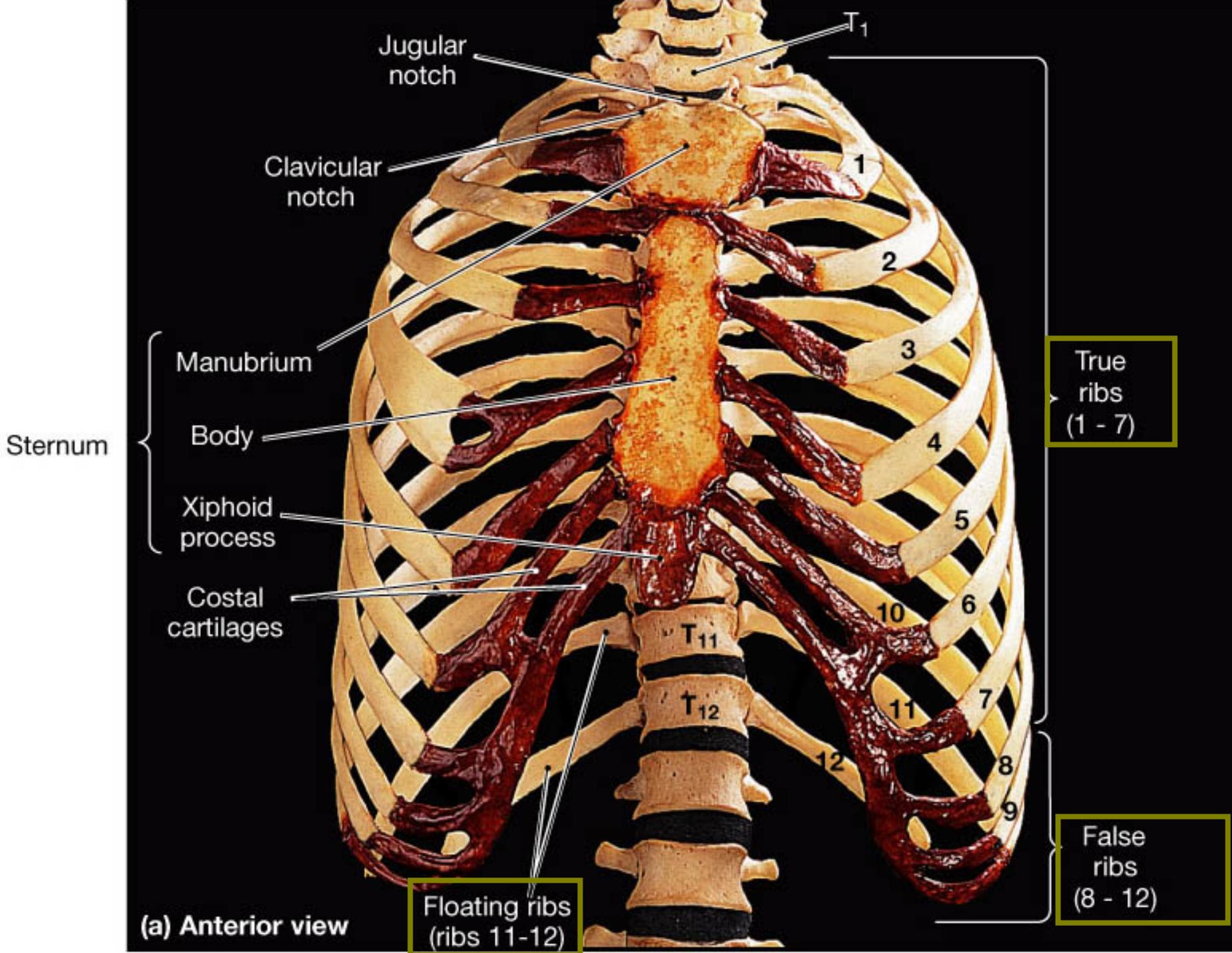
(b) Superior view

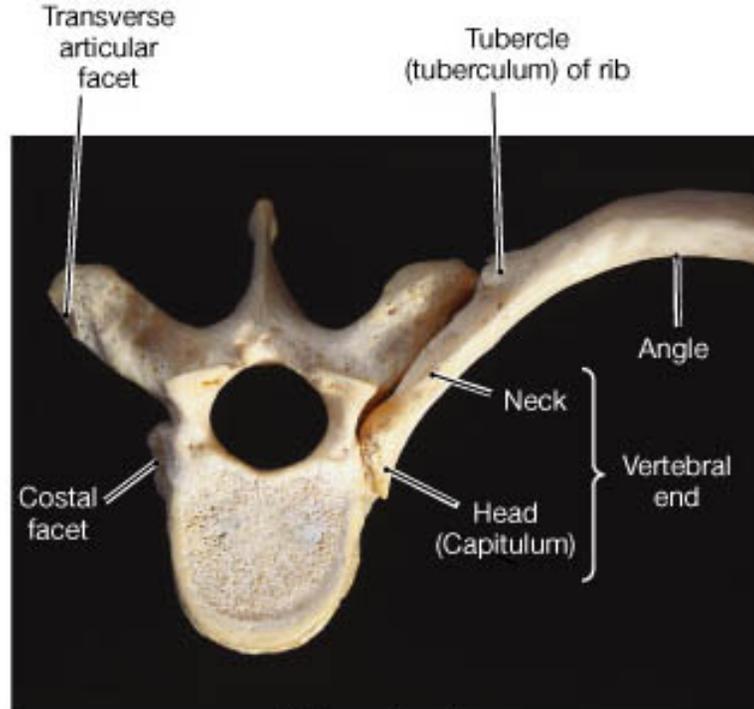


(a) Posterior surface

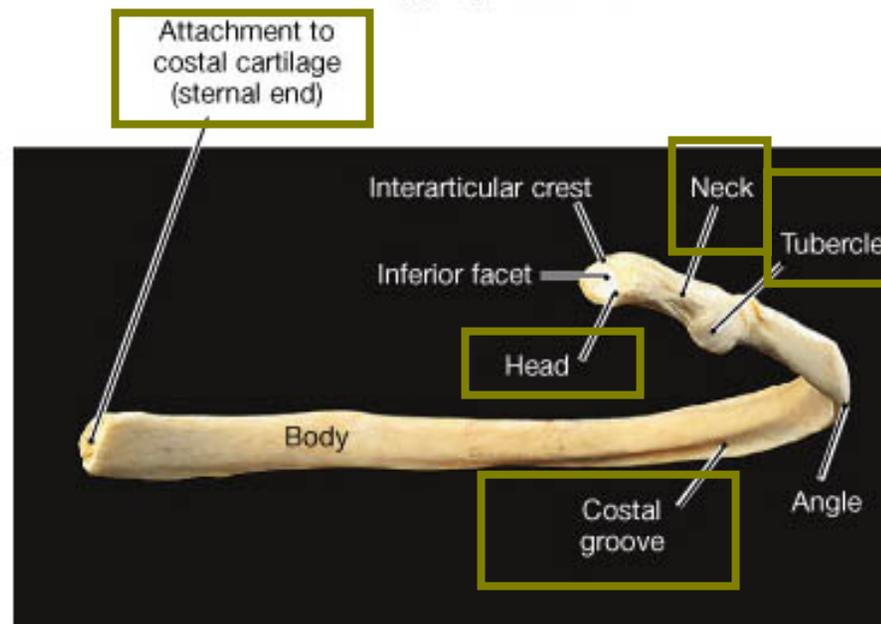
(b) Lateral surface

(c) Anterior surface





(b) Superior view



(d) Posterior view

