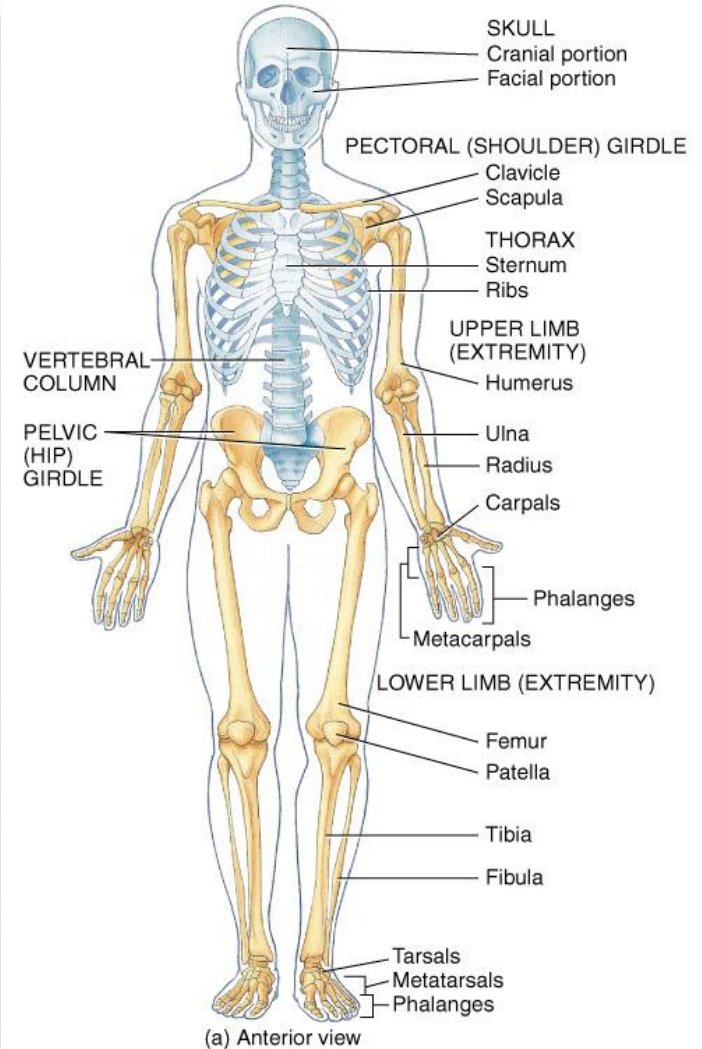


# THE SKELETAL SYSTEM: PART 1

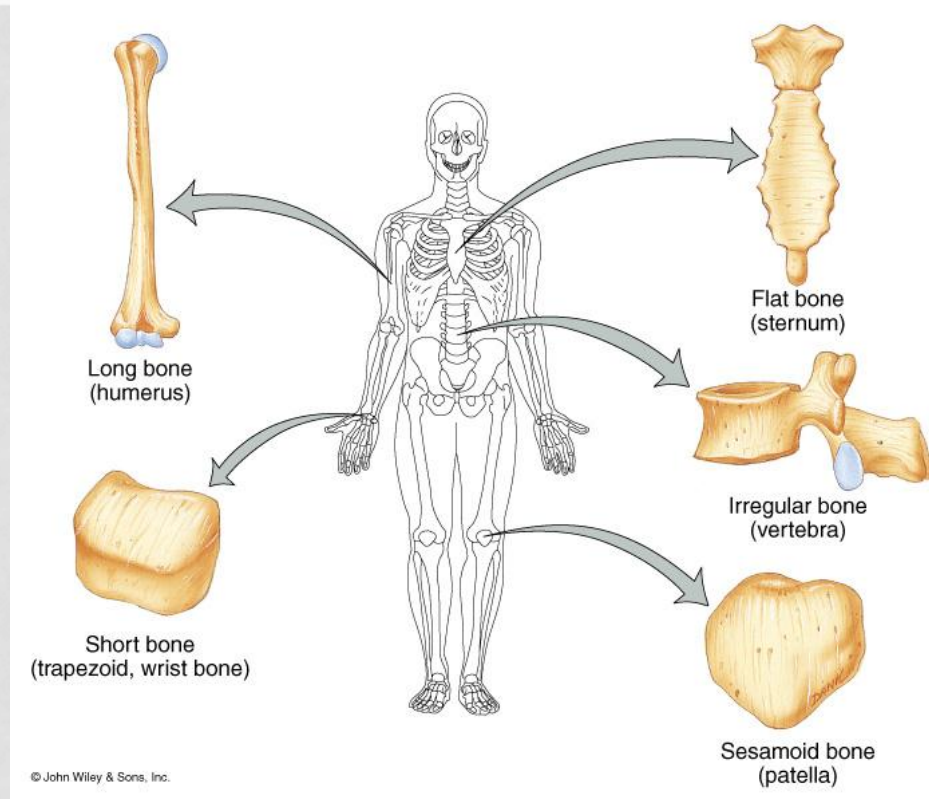
## THE AXIAL SKELETON

- Axial Skeleton
  - 80 bones
  - lie along longitudinal axis
  - skull, hyoid, vertebrae, ribs, sternum, ear ossicles
  - mostly unpaired bones
- Appendicular Skeleton
  - 126 bones
  - upper & lower limbs and pelvic & pectoral girdles
  - mostly paired bones



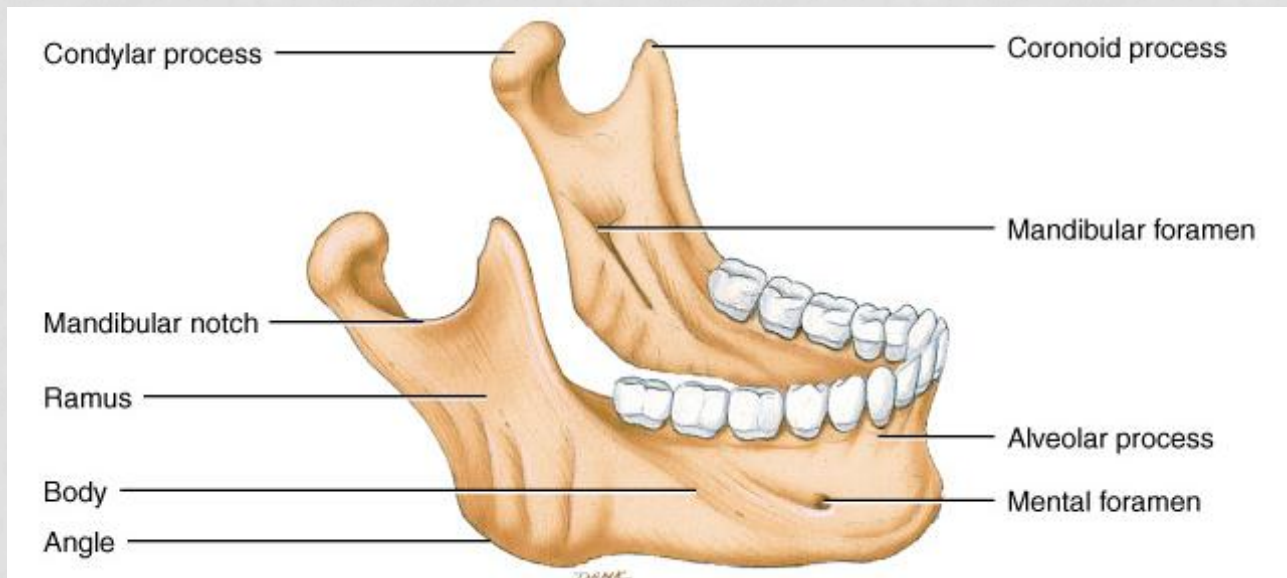
# TYPES OF BONES

- 5 basic types of bones:
  - long = compact
  - short = spongy except surface
  - flat = plates of compact enclosing spongy
  - irregular = variable
  - sesamoid = develop in tendons or ligaments (patella)
- Sutural bones = in joint between skull bones



# BONE SURFACE MARKINGS

- Surface features-- rough area, groove, openings, process
- Specific functions
  - passageway for blood vessels and nerves
  - joint formation
  - muscle attachment & contraction

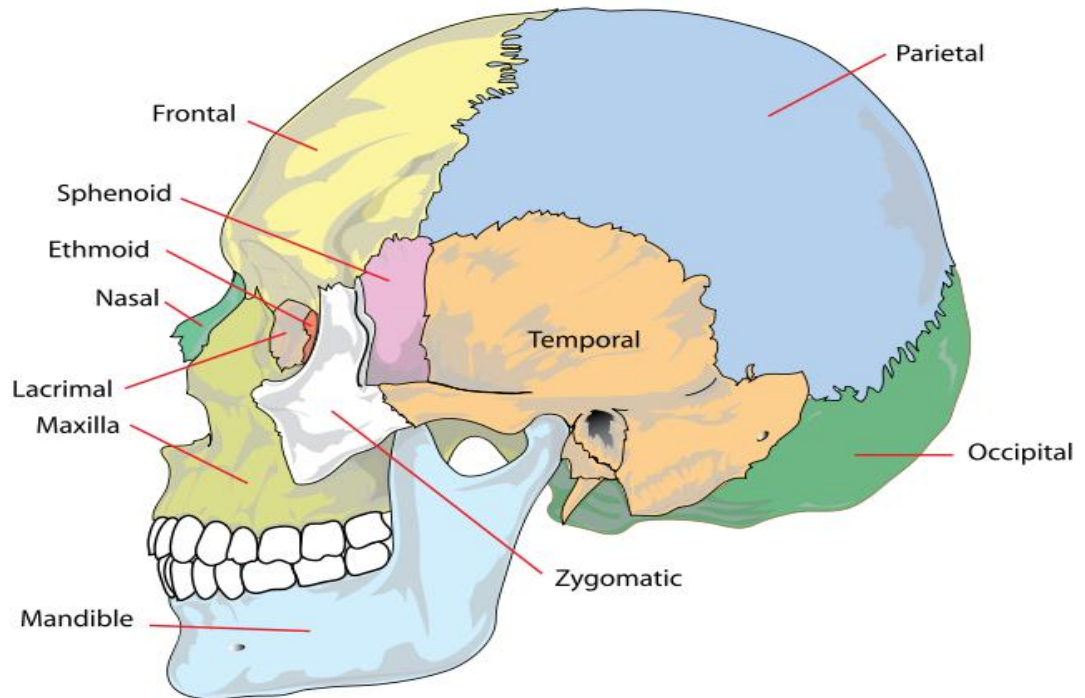


# BONE SURFACE MARKINGS

## FROM TABLE 7.1

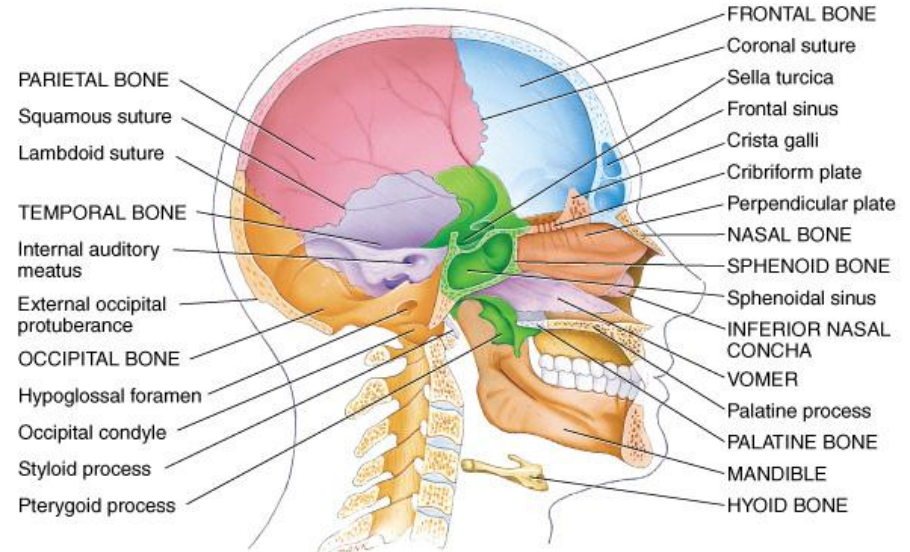
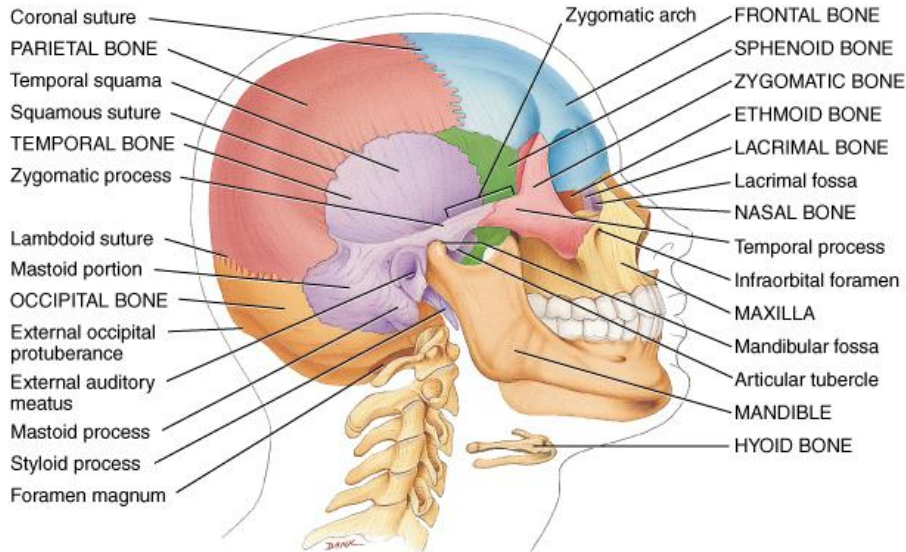
- **Foramen** = opening
- **Fossa** = shallow depression
- **Sulcus** = groove
- **Meatus** = tubelike passageway or canal
- **Condyle** = large, round protuberance
- **Facet** = smooth flat articular surface
- **Trochanter** = very large projection
- **Tuberosity** = large, rounded, roughened projection like a knob
- **Spine** = very high ridge
- **Process** = prominent projection
- Learning the terms found in this Table will simplify your study of the skeleton.

# THE SKULL



- 8 Cranial bones
  - protect brain & house ear ossicles
  - muscle attachment for jaw, neck & facial muscles
- 14 Facial bones
  - protect delicate sense organs -- smell, taste, vision
  - support entrances to digestive and respiratory systems

# THE 8 CRANIAL BONES



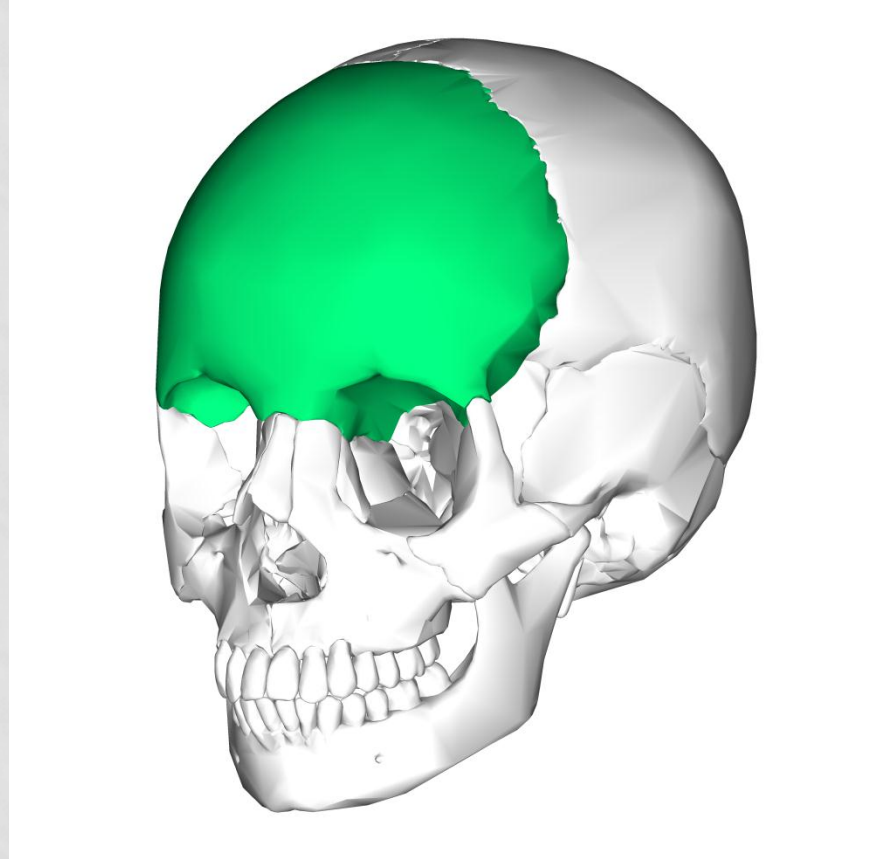
**Frontal**  
**Parietal (2)**  
**Temporal (2)**  
**Occipital**

**Sphenoid**  
**Ethmoid**

**You need to know these!!**

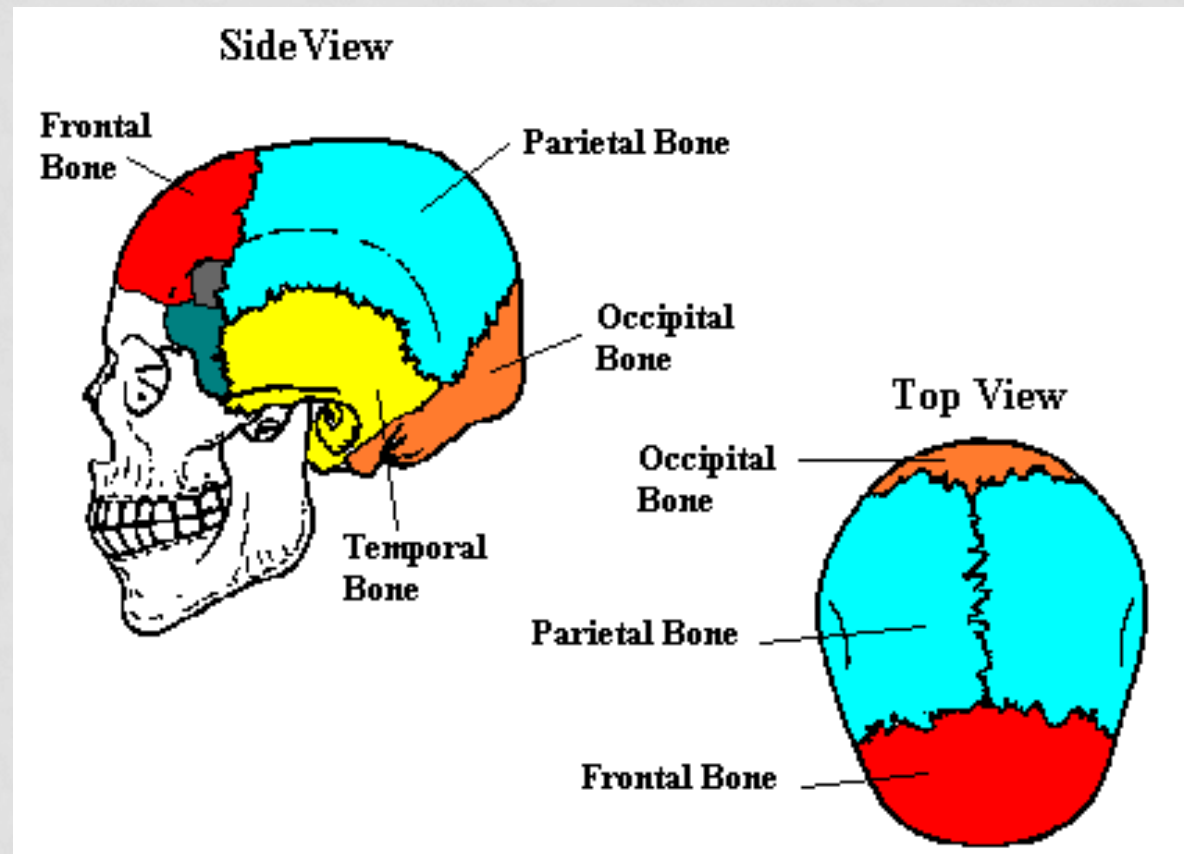
# FRONTAL BONE

- Forehead, roof of orbits, & anterior cranial floor



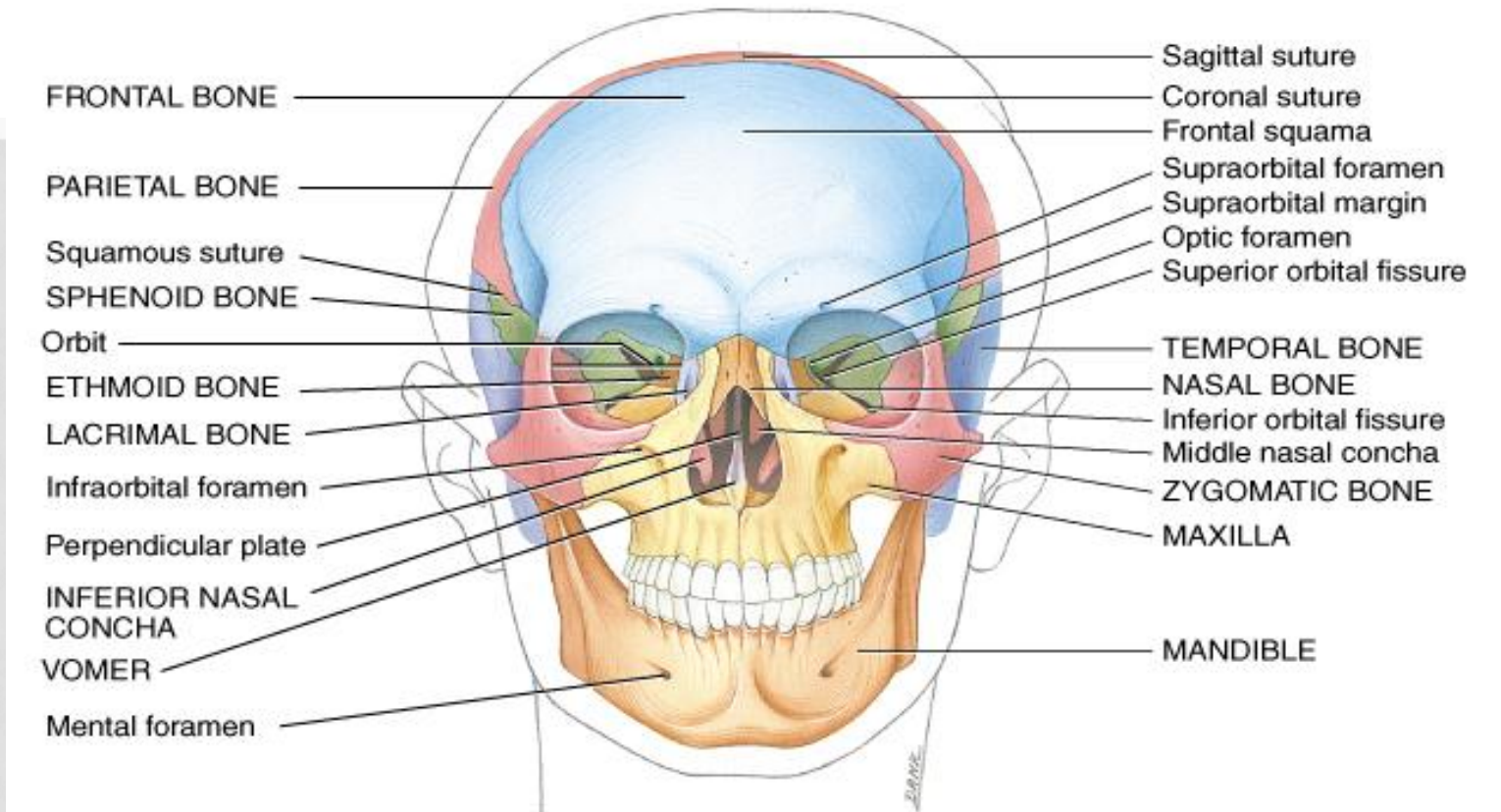
# PARIETAL & TEMPORAL BONES

- Parietal
  - sides & roof of cranial cavity
- Temporal
  - Side of the cranial cavity (temples)
  - Means passage of time (grays 1<sup>st</sup>)





# 14 FACIAL BONES



Nasal (2)

Maxillae (2)

Zygomatic (2)

Mandible (1)

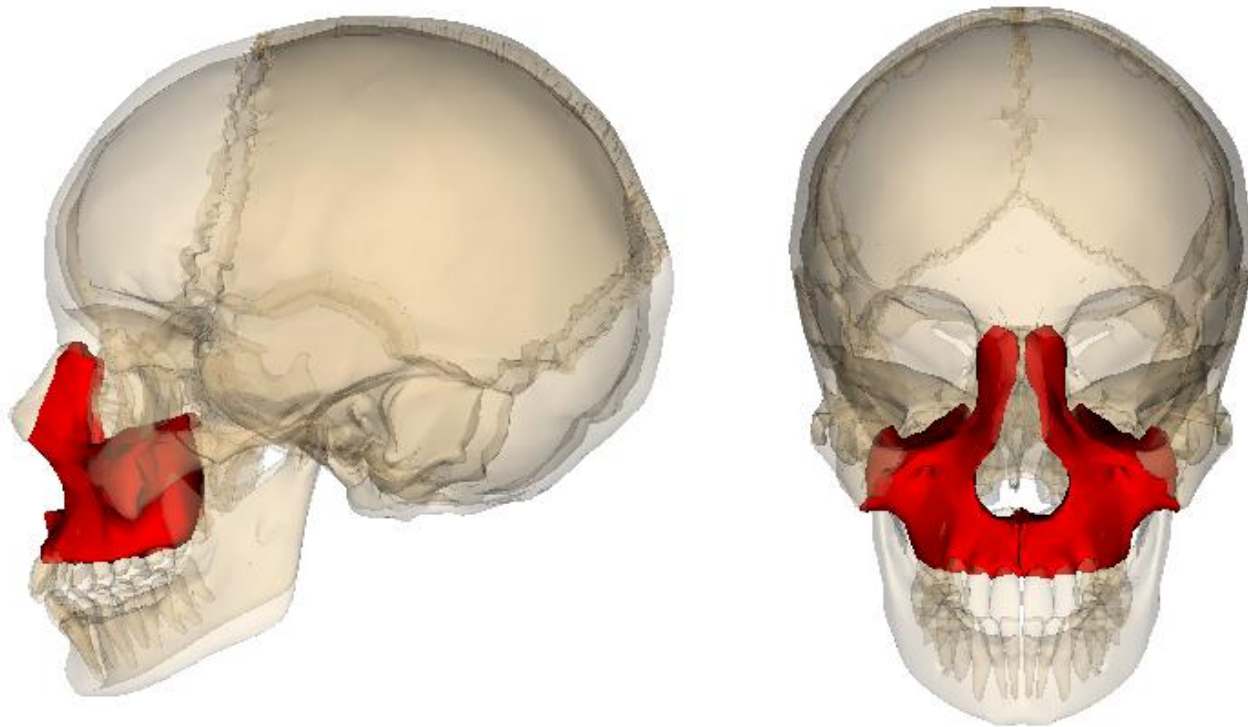
Lacrimal (2)

Palatine (2)

Inferior nasal conchae (2) Vomer (1)

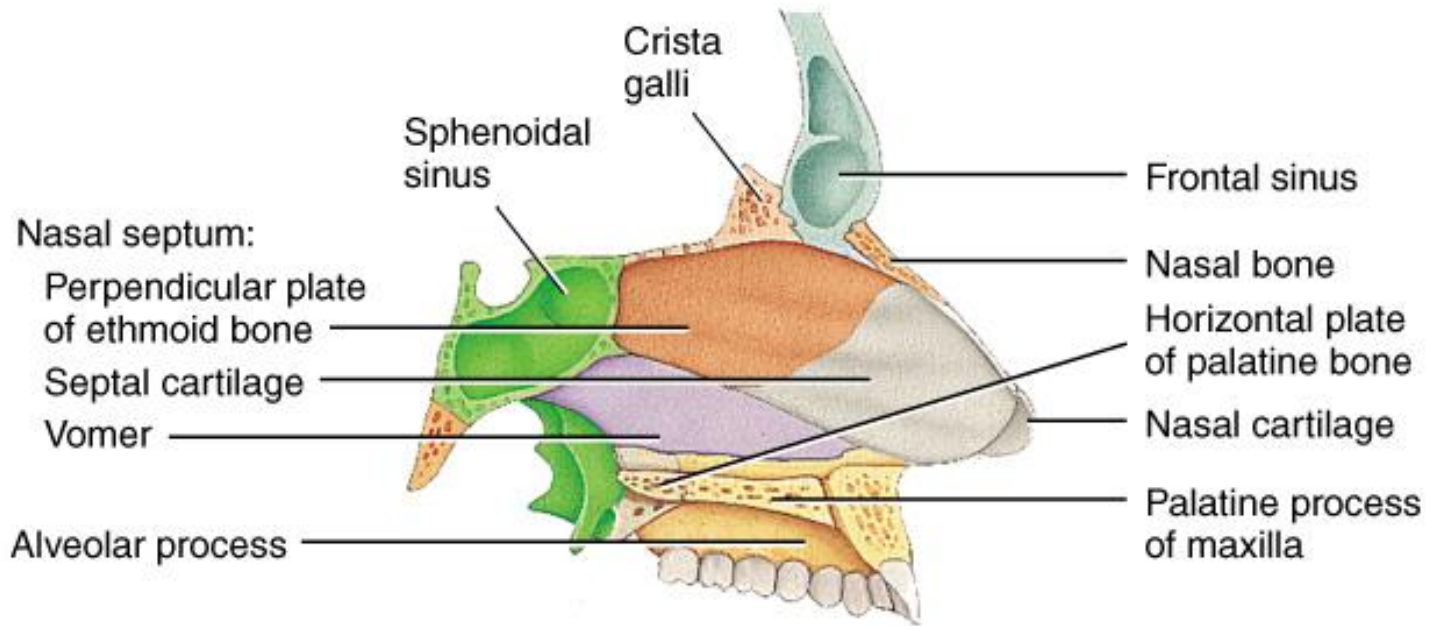
You need to know these!!

# MAXILLARY BONES



- Floor of orbit, floor of nasal cavity or hard palate
- Maxillary sinus
- Cleft palate is lack of union of maxillary bones

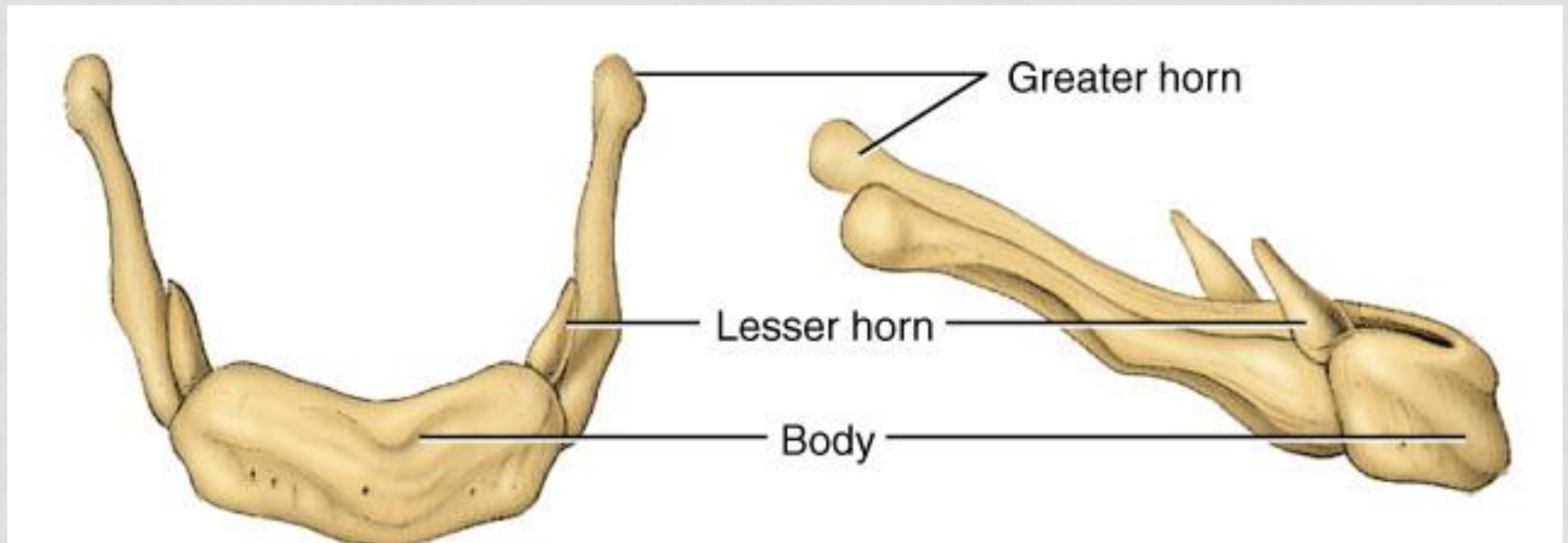
# NASAL SEPTUM



- Divides nasal cavity into left and right sides
- Formed by vomer, perpendicular plate of ethmoid and septal cartilage
- Deviated septum does not line in the midline
  - developmental abnormality or trauma

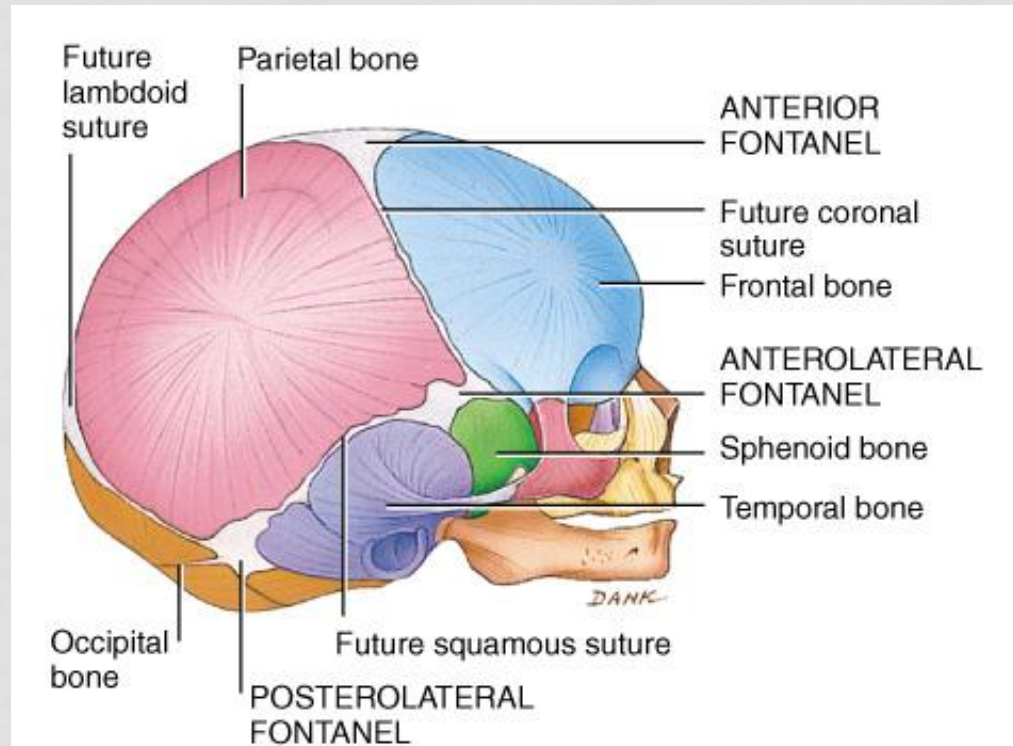
# HYOID BONE

- U-shaped single bone
- Articulates with no other bone of the body
- Suspended by ligament and muscle from skull
- Attachment for some tongue muscles, neck and pharyngeal muscles, and lifts the larynx during speech & swallowing



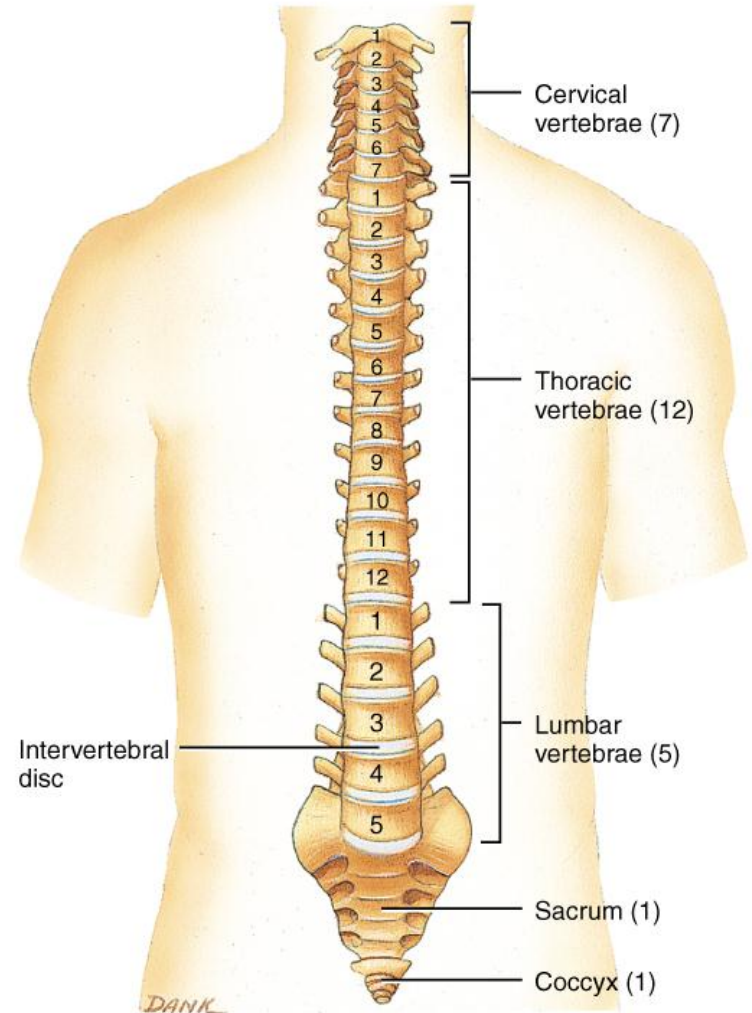
# FONTANELS OF THE SKULL AT BIRTH.

- Dense connective tissue membrane-filled spaces (soft spots)
- Unossified at birth but close early in a child's life.
- Fetal skull passes through the birth canal.
- Rapid growth of the brain during infancy



# VERTEBRAL COLUMN

- Backbone or spine built of 26 vertebrae
- Five vertebral regions
  - cervical vertebrae (7) in the neck
  - thoracic vertebrae ( 12 ) in the thorax
  - lumbar vertebrae ( 5 ) in the low back region
  - sacrum (5, fused)
  - coccyx (4, fused)

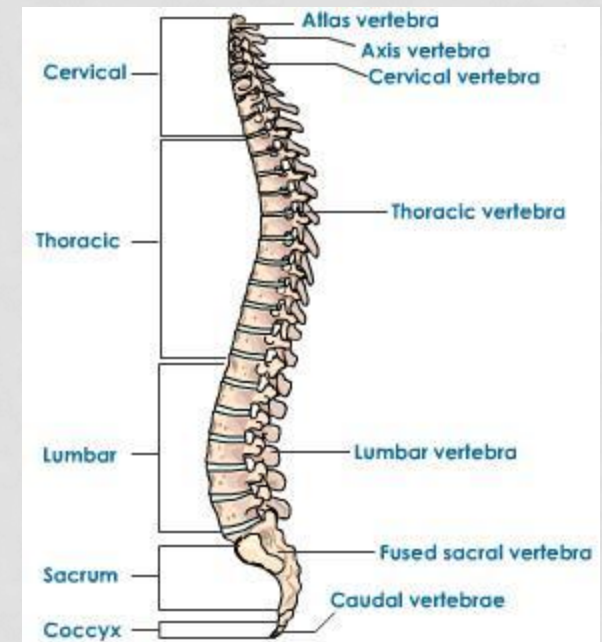


You need to know these!!

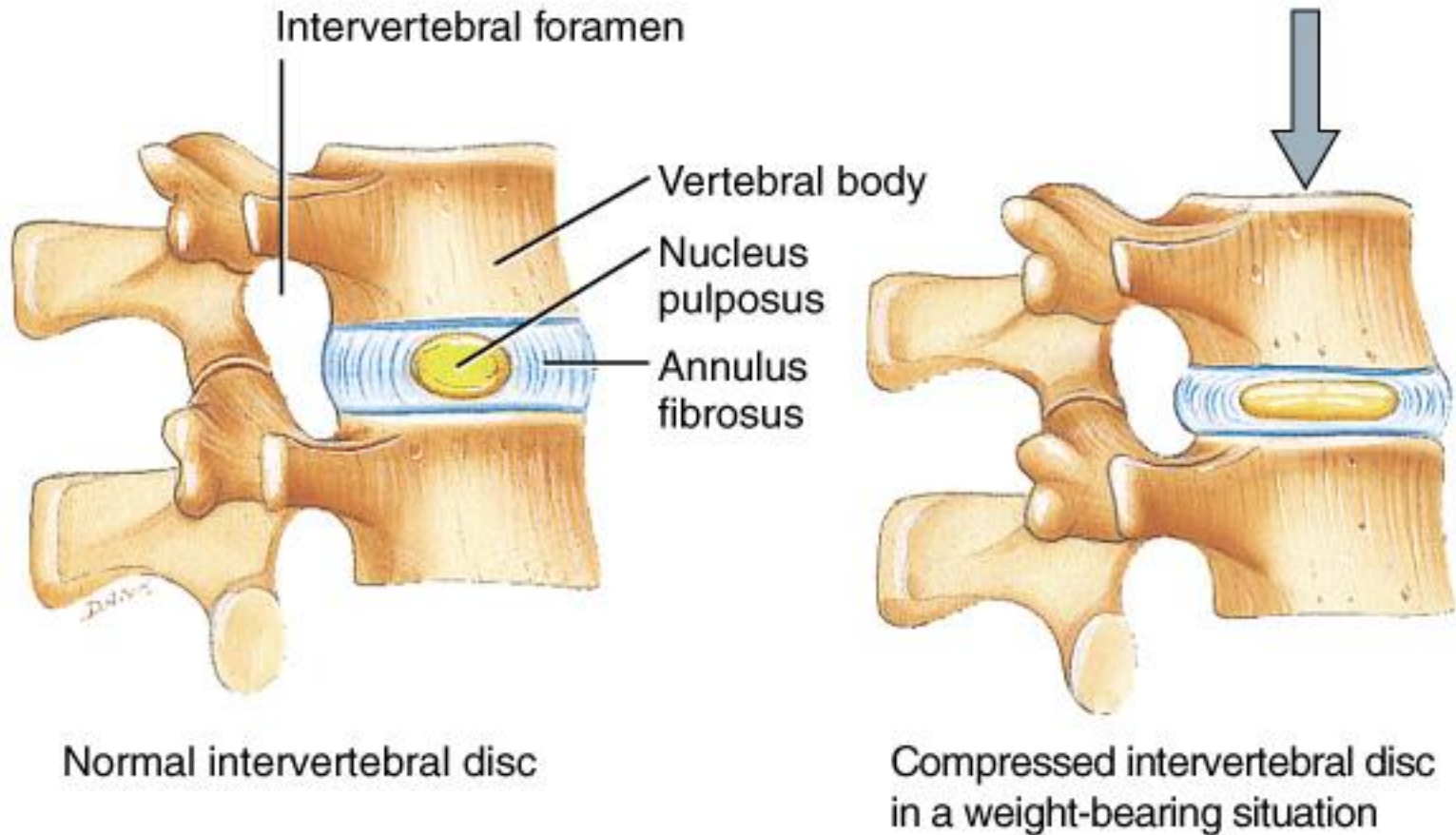
# VERTEBRAL COLUMN FUNCTIONS

- There are 5 major functions:
  - Support the weight of the head and trunk
  - Protect the spinal cord
  - Allow for exiting of spinal nerves from spinal cord
  - Provide a site for muscle attachment
  - Permit movement of the head and trunk

You need to know these!!



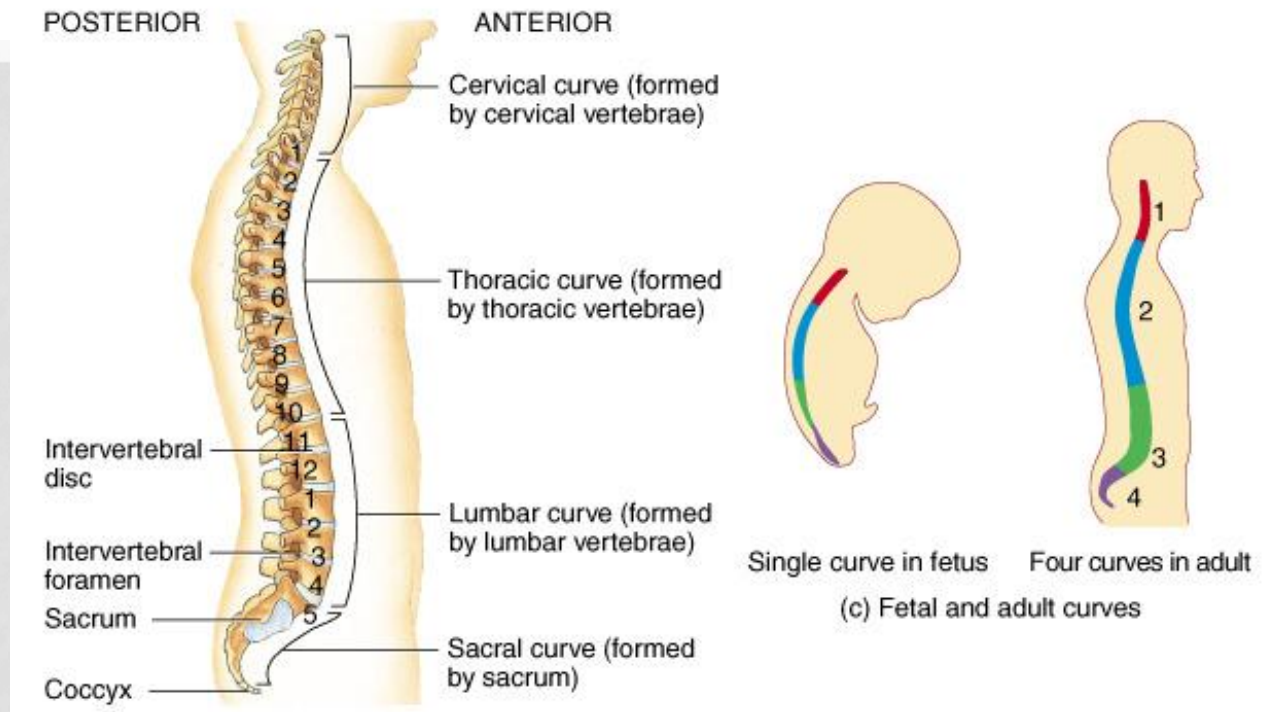
# INTERVERTEBRAL DISCS



- Between adjacent vertebrae absorbs vertical shock
- Permit various movements of the vertebral column

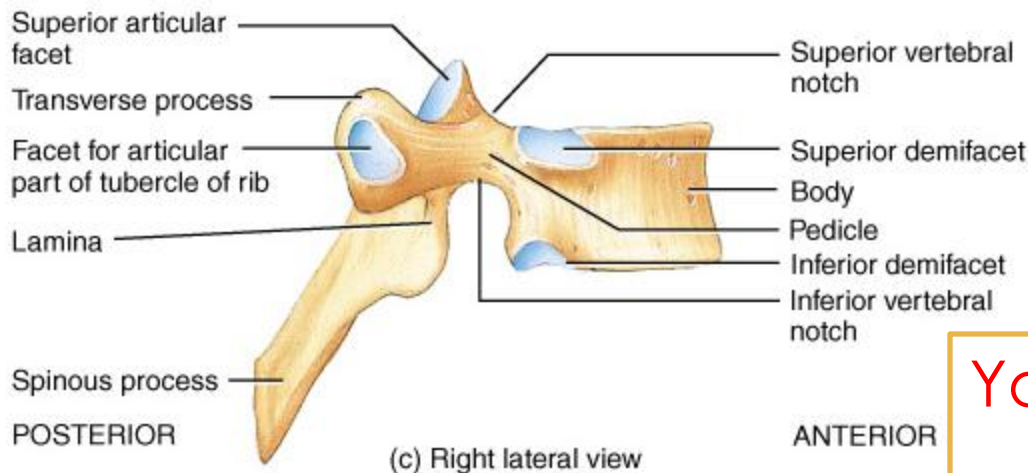
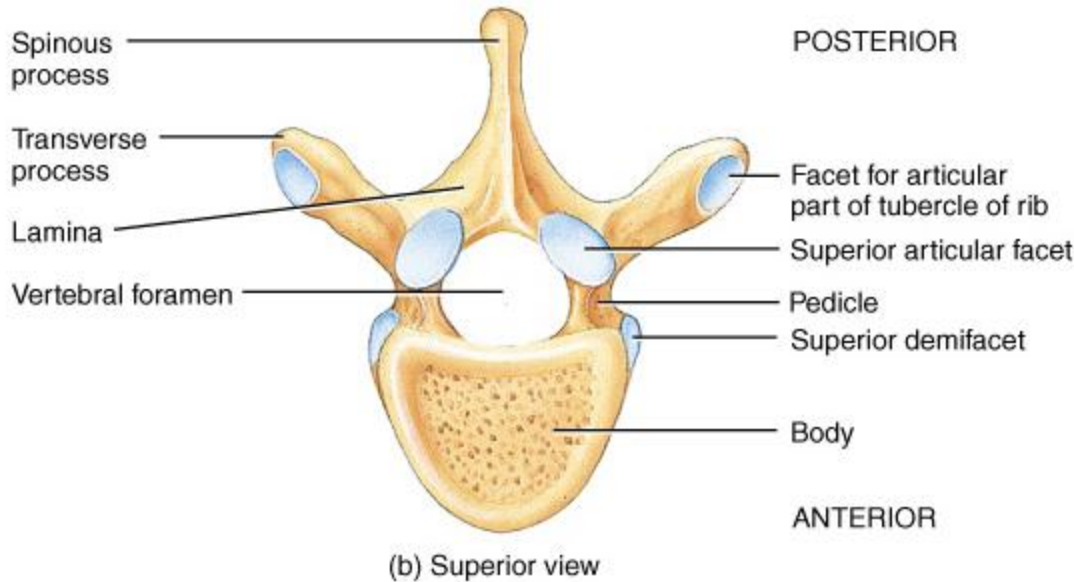


# NORMAL CURVES OF THE VERTEBRAL COLUMN



- Primary curves
  - thoracic and sacral are formed during fetal development
- Secondary curves
  - cervical is formed when infant raises head at 4 months
  - lumbar forms when infant sits up & begins to walk at 1 year

# TYPICAL VERTEBRAE

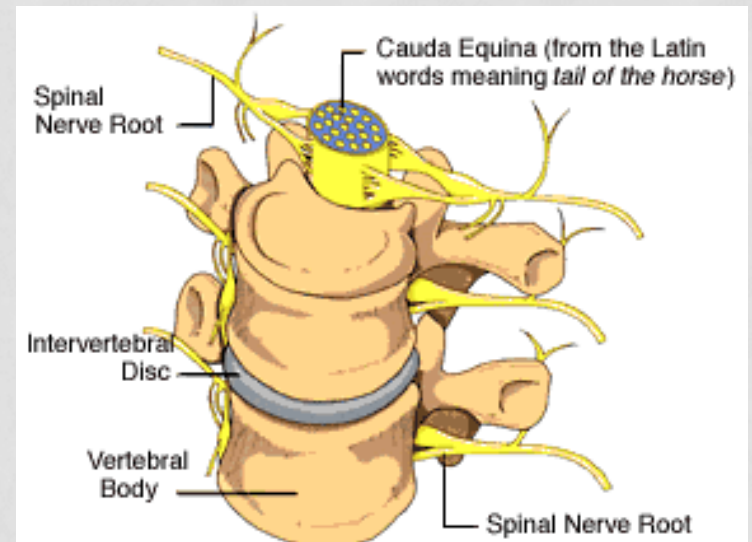
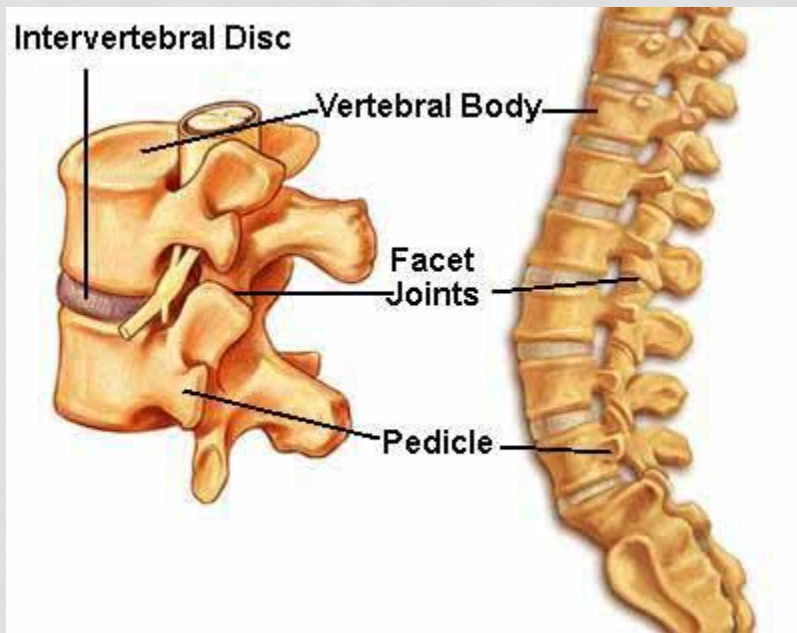


- Body
  - weight bearing
- Vertebral arch
- Vertebral foramen
- Seven processes
  - 2 transverse
  - 1 spinous
  - 4 articular
- Vertebral notches

**You need to know these!!**  
 Spinous Process, (2) transverse process, foramen, & body

# HOW DOES THE SPINE WORK?

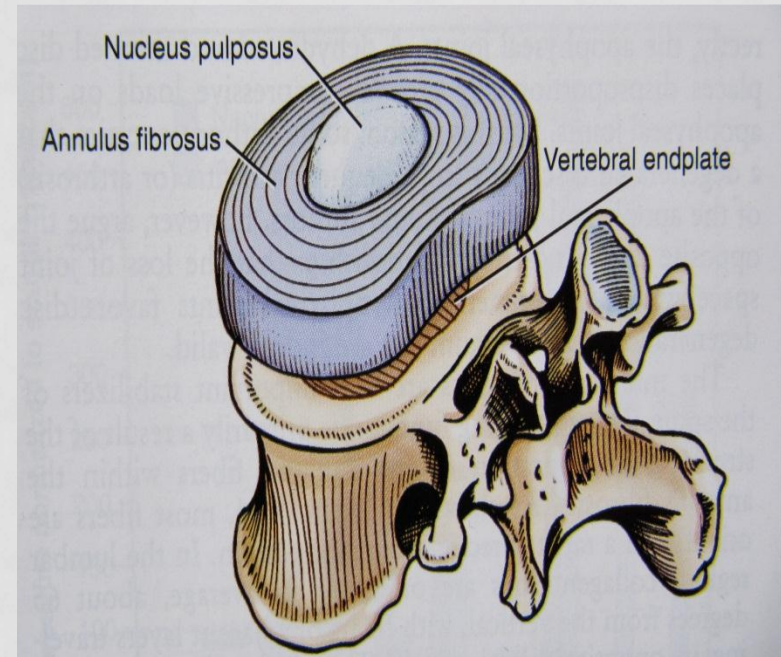
- The inferior articulation of one vertebrae sit right on top of the superior articulation of the one below it.
- The **Cauda Equina** fits right into the vertebral foramen.
- Spinal nerves branch out



**Figure #4** A portion of the lumbar spine (as seen from the side), showing the vertebrae, the intervertebral discs and spinal nerve roots.

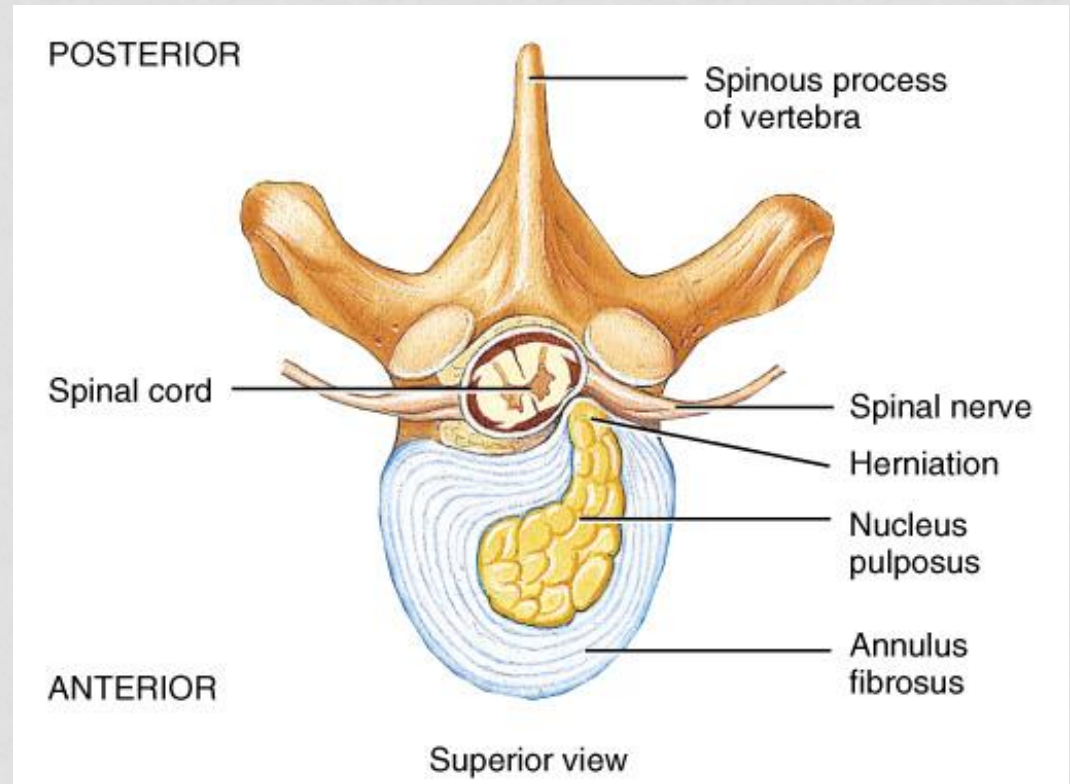
# INTERVERTEBRAL DISKS

- Pads of fibrocartilage that act as shock absorbers between the vertebrae.
  - 2 parts:
    - Annulus fibrosus- outer ring
    - Nucleus pulposus- pulp or gel in ring
- The disks become more depressed with age and you shrink



# HERNIATED (SLIPPED) DISC

- Protrusion of the nucleus pulposus
- Most commonly in lumbar region
- Pressure on spinal nerves causes pain
- Surgical removal of disc

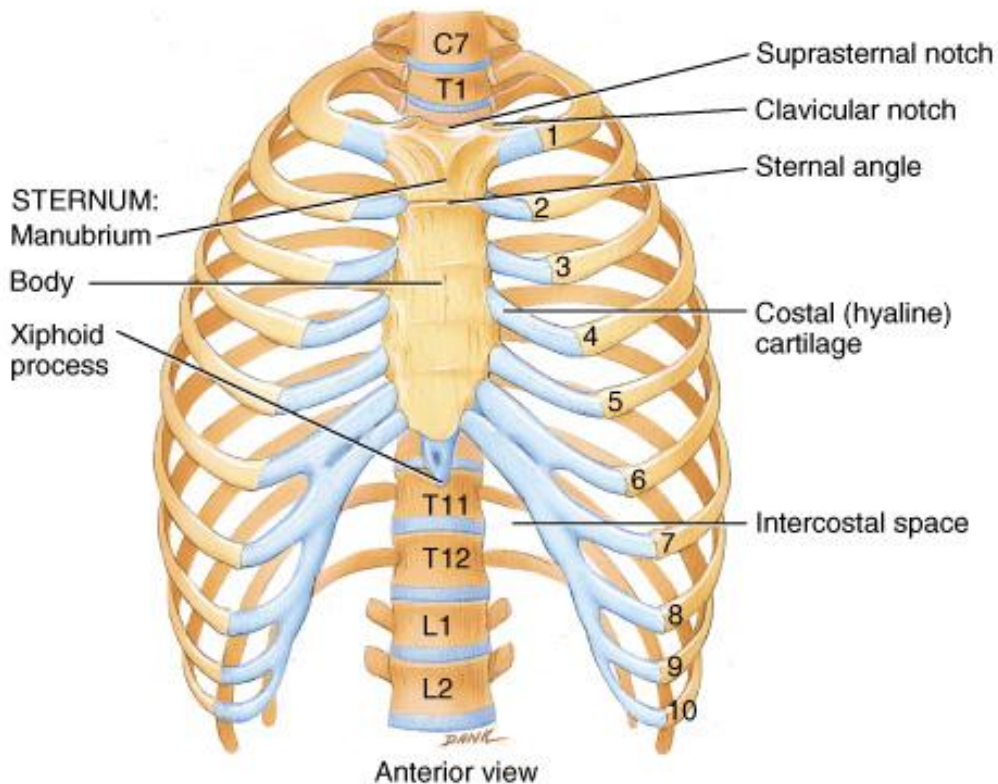


# CLINICAL PROBLEMS

- Abnormal curves of the spine.
  - scoliosis (lateral bending of the column)
  - kyphosis (exaggerated thoracic curve) hump
  - lordosis (exaggerated lumbar curve) swayback
- Spina bifida is a congenital defect
  - failure of the vertebral laminae to unite
  - nervous tissue is unprotected
  - paralysis



# THORAX

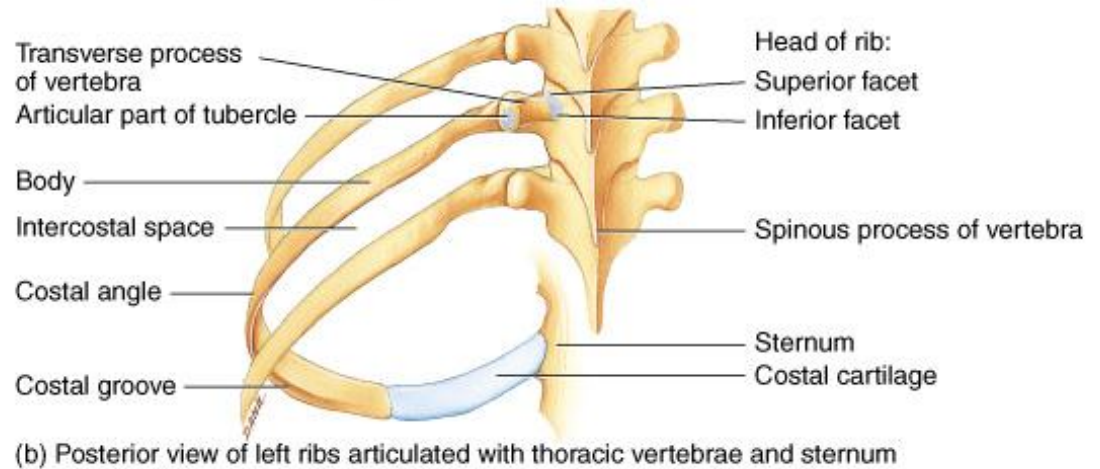
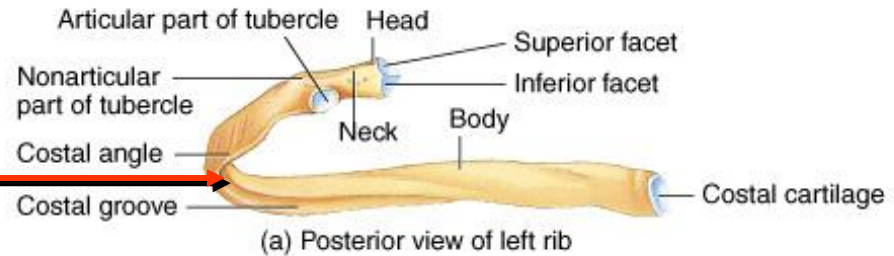


- Bony cage flattened from front to back
- Sternum (breastbone)
- Ribs
  - 1-7 are true ribs (vertebrosternal)
  - 8-12 are false ribs (vertebrochondral)
  - 11-12 are floating
- Costal cartilages
- Bodies of the thoracic vertebrae.

You need to know these!!

# RIBS

Fracture at site of greatest curvature.



- Intercostal spaces contain intercostal muscles



# WHAT DO I NEED TO KNOW

- Axial vs. Appendicular
- General understanding of bone feature terms
- 8 cranial bones
- 14 facial bones
- Sections of the spinal column
- 4 parts of a vertebrae (body, processes, foramen)
- Types of ribs and sternum