SNS COLLEGE OF NURSING

SARAVANAMPATTI ,COIMBATORE.

DEPARTMENT OF NURSING

COURSE NAME : BSC (NURSING) I YEAR

SUBJECT : ANATOMY AND PHYSIOLOGY

UNIT: MUSCULOSKETELAL SYSTEM

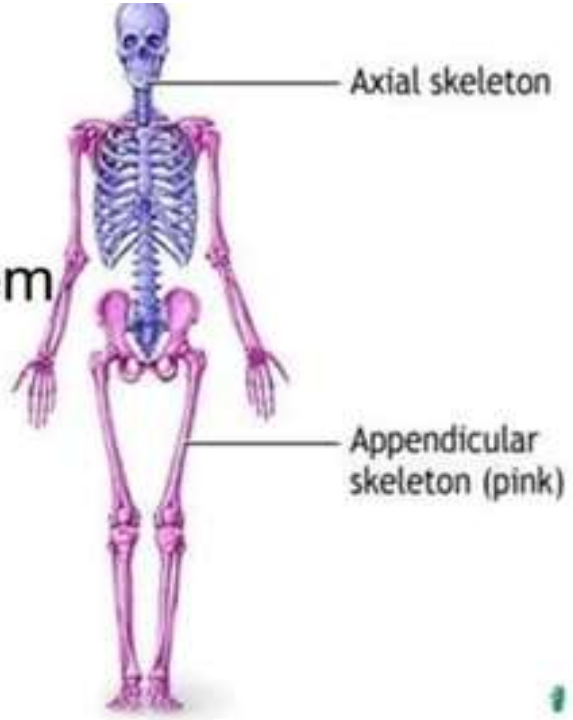
TOPIC : AXIAL SKELETON

INTRODUCTION

- The Skeletal system is an important compenent of the human body.
- The bones and muscles gives the shape , size and outlook of the person.
- The bones have its own type of cells, function and remodelling nature.
- Various types of bones are present throughout the body.

THE SKELETAL SYSTEM

- Divided into two divisions
  - Axial skeleton
  - Appendicular skeleton
- Parts of the skeletal system
  - Bones (skeleton)
  - Joints
  - Cartilages
  - Ligaments

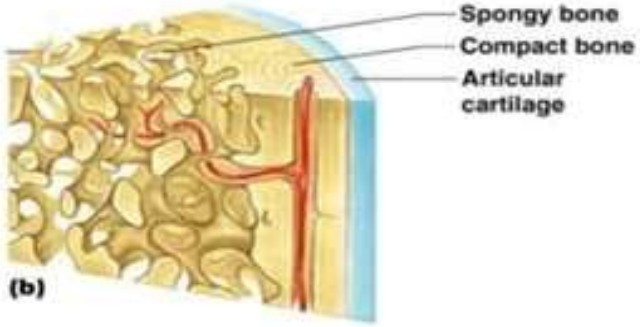


FUNCTIONS OF THE BONE

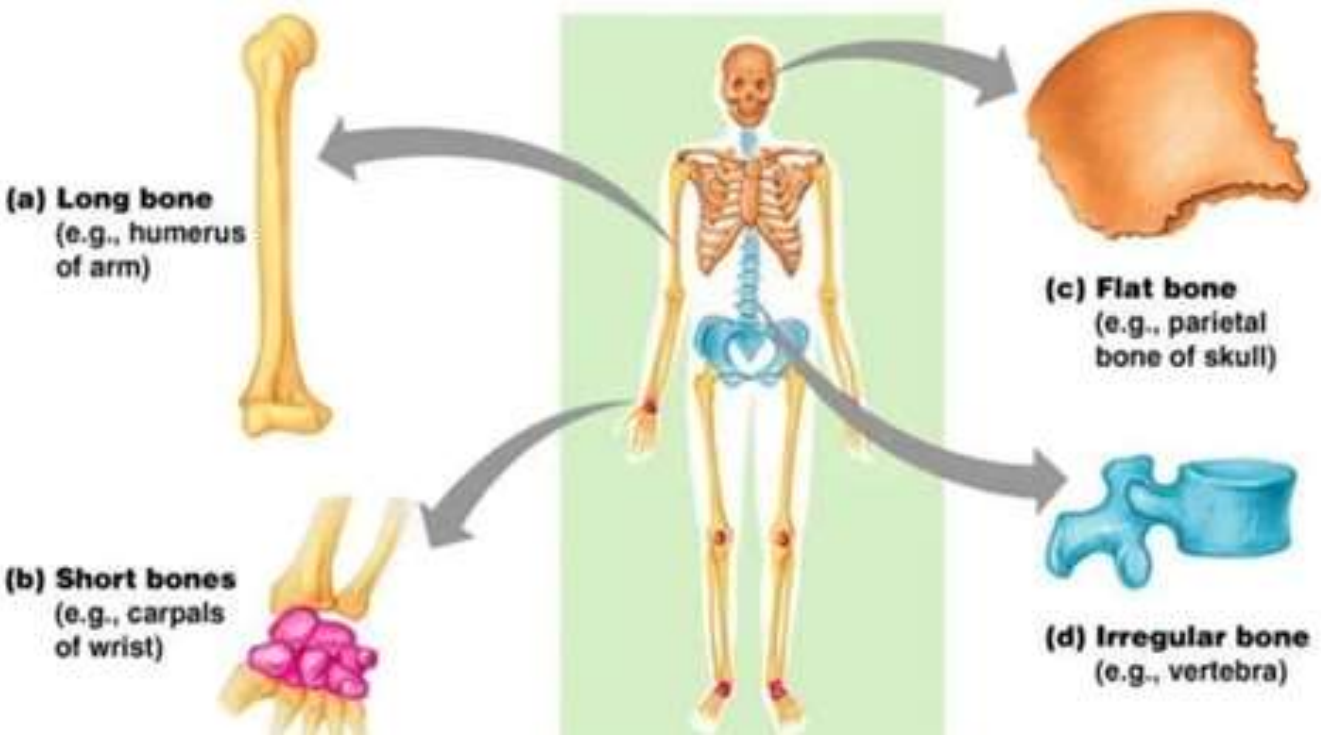
- Support of the body
- Protection of soft organs
- Movement due to attached skeletal muscles
- Storage of minerals and fats
- Blood cell formation

CLASSIFICATION OF BONES

- The adult skeleton has 206 bones
- Two basic types of osseous tissue
  - Compact bone
    - ✓Is dense and looks smooth
    - ✓Homogenous
  - Spongy bone
    - ✓Small needle-like pieces of bone
    - ✓Many open spaces



CLASSIFICATION OF BONES



CLASSIFICATION OF BONES

- Long bones
  - Typically longer than wide
  - Have a shaft with heads at both ends
  - Contain mostly compact bone
    - Examples: Femur, humerus

CLASSIFICATION OF BONES

- Short bones
  - Generally cube-shape
  - Contain mostly spongy bone
    - Examples: Carpals, tarsals

CLASSIFICATION OF BONES

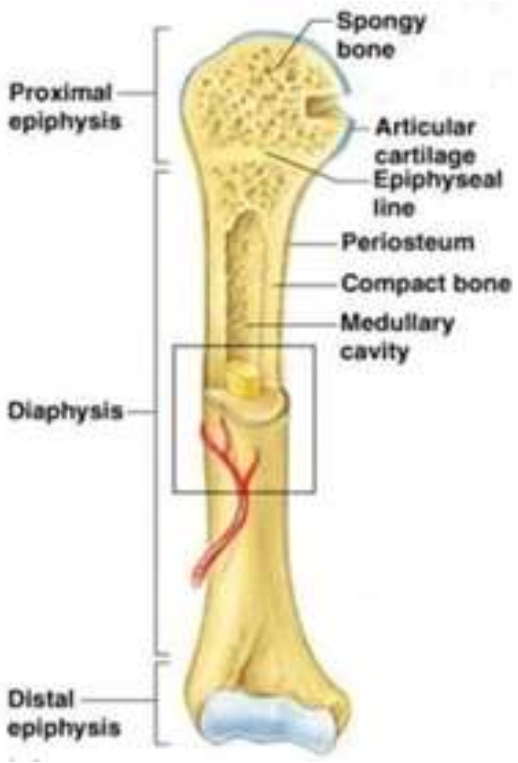
- Flat bones
  - Thin and flattened
  - Usually curved
  - Thin layers of compact bone around a layer of spongy bone
    - Examples: Skull, ribs, sternum

CLASSIFICATION OF BONES

- Irregular bones
  - Irregular shape
  - Do not fit into other bone classification categories
    - Example: Vertebrae and hip

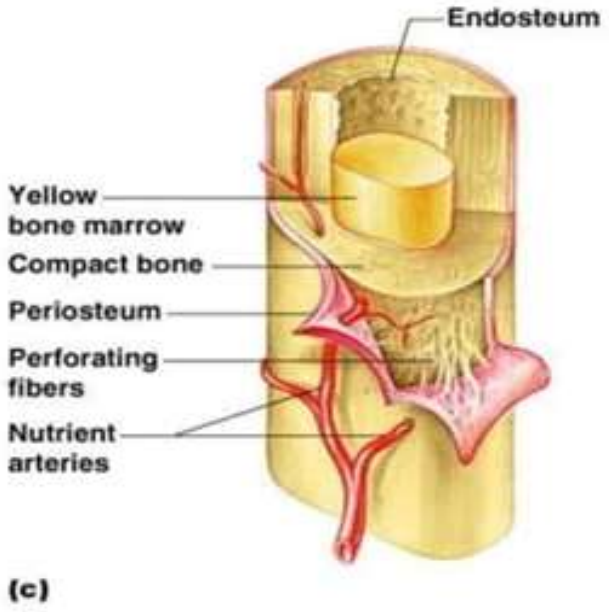
GROSS ANATOMY OF LONG BONE

- Diaphysis
  - Shaft
  - Composed of compact bone
- Epiphysis
  - Ends of the bone
  - Composed mostly of spongy bone



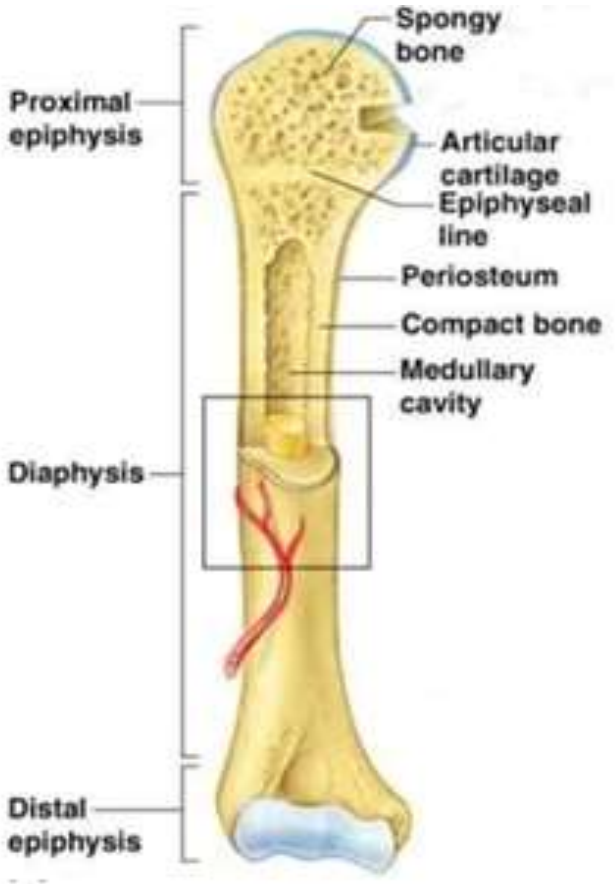
STRUCTURE OF LONG BONE

- Periosteum
  - Outside covering of the diaphysis
  - Fibrous connective tissue membrane
- Sharpey's fibers
  - Secure periosteum to underlying bone
- Arteries
  - Supply bone cells with nutrients



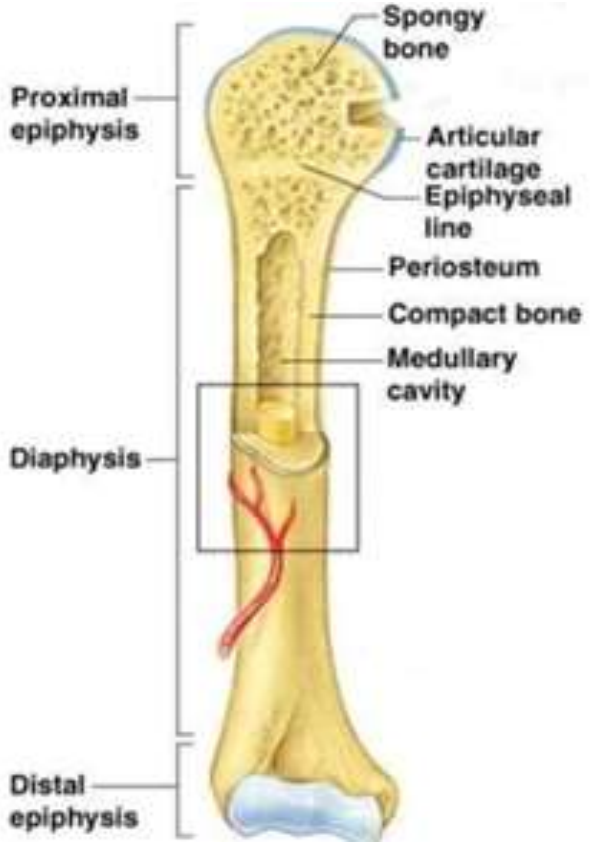
CLASSIFICATION OF BONES

- Articular cartilage
  - Covers the external surface of the epiphyses
  - Made of hyaline cartilage
  - Decreases friction at joint surfaces



CLASSIFICATION OF BONES

- Medullary cavity
  - Cavity of the shaft
  - Contains yellow marrow (mostly fat) in adults
  - Contains red marrow (for blood cell formation) in infants



BONE MARKINGS

- Surface features of bones
- Sites of attachments for muscles, tendons, and ligaments
- Passages for nerves and blood vessels
- Categories of bone markings
  - Projections and processes – grow out from the bone surface
  - Depressions or cavities – indentations

BONE MARKINGS

- Bones are remodelled continually in response changes in two factors:
  - Calcium levels in the blood
  - The pull of gravity and muscles on the skeleton.

TYPES OF BONE CELLS

- Osteocytes
  - Mature bone cells
- Osteoblasts
  - Bone-forming cells
- Osteoclasts
  - Bone-destroying cells
  - Break down bone matrix for remodeling and release of calcium
- Bone remodeling is a process by both osteoblasts and osteoclasts

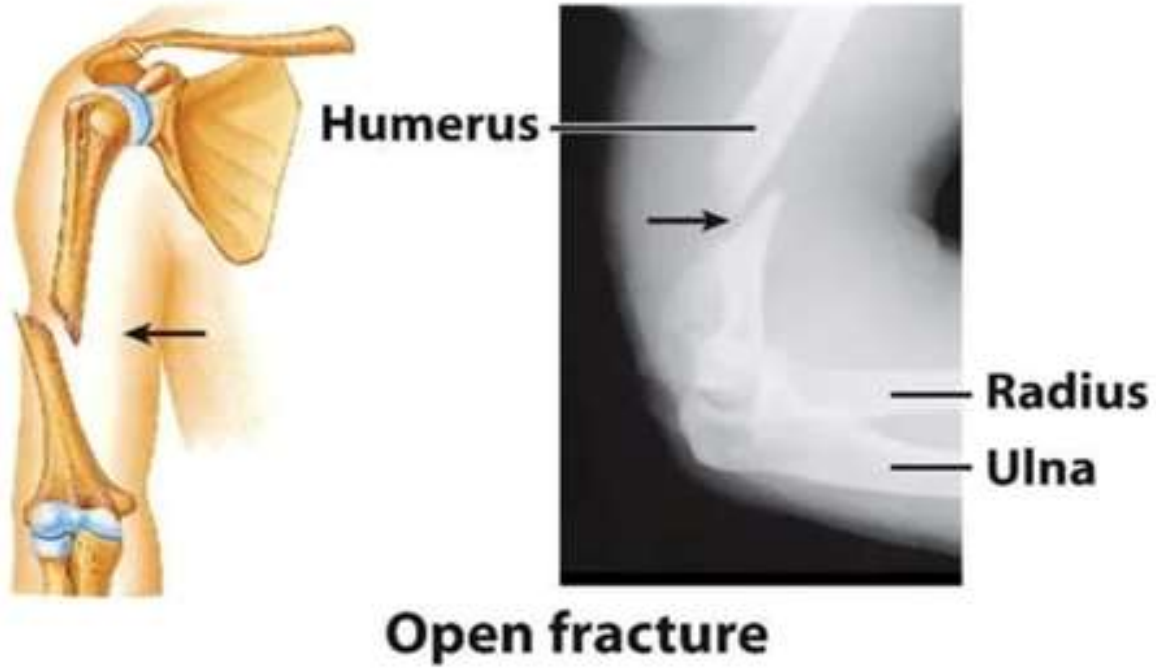
BONE REMODELLING

- Is essential if bones are retain normal proportions and strength during long-bone growth as the body increases in size and weight.
- Bones become thicker and form large projections to increase their strength in areas where bulky muscles are attached.

FRACTURE

- A break in a bone
- Types of bone fractures
  - Closed (simple) fracture- break that does not penetrate the skin.
  - Open (compound) fracture- broken bone penetrates through the skin
- Bone fractures are treated by reduction or immobilization
  - Realignment of the bone

FRACTURE



Open fracture

AXIAL SKELETON

- Forms the longitudinal axis of the body
- Divided into three parts:
  - Skull
  - Vertebral column
  - Bony thorax

THE SKULL

- Two sets of bones
  - Cranium
  - Facial bones
- Bones are joined by sutures
- Only the mandible is attached by a freely movable joint.

CRANIUM

- The boxlike cranium is composed of eight large flat bones.
  - **Frontal Bone-** forms the forehead, the bony projections under the eyebrows and the superior part of each eye's orbit.
  - **Parietal Bones-** form most of the superior and lateral walls of the cranium. They meet in the midline of the skull at the **sagittal suture** and form the **coronal suture,** where they meet the frontal bone.

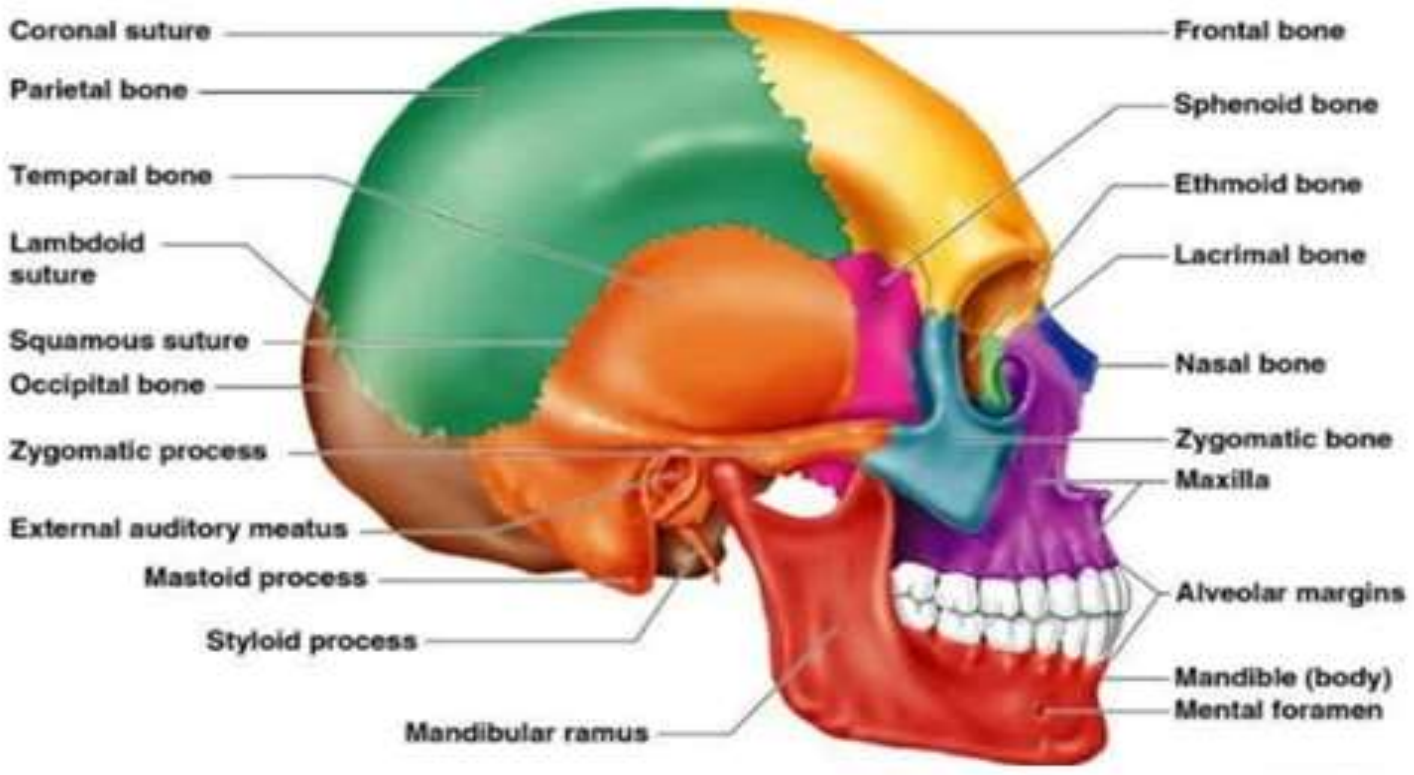
CRANIUM

- **Temporal Bone**- it lies inferior to the parietal bones; they join them at the **squamous sutures.**
- **Occipital Bone-** the most posterior part of the cranium. It forms the floor and black wall of the skull.
- **Sphenoid Bone-** the butterfly-shaped sphenoid bone spans the width of the skull and forms part of the floor of the cranial cavity.

CRANIUM

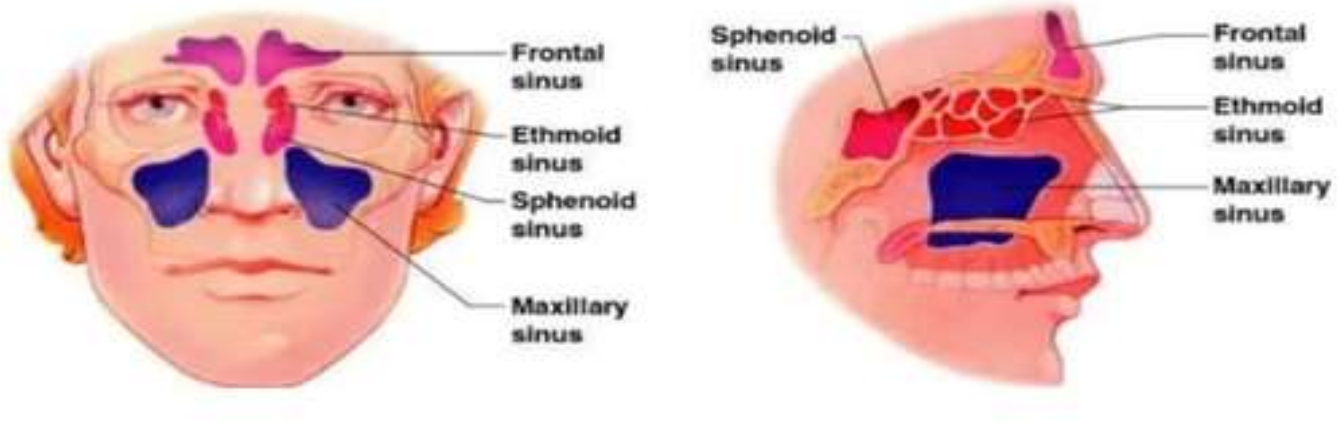
- **Ethmoid Bone-** is very irregularly shaped and lies anterior to the sphenoid. It forms the roof of the nasal cavity and part of the medial walls of the orbits.

SKULL BONE


Coronal suture
Parietal bone
Temporal bone
Lambdoid suture
Squamous suture
Occipital bone
Zygomatic process
External auditory meatus
Mastoid process
Styloid process
Mandibular ramus
Frontal bone
Sphenoid bone
Ethmoid bone
Lacrimal bone
Nasal bone
Zygomatic bone
Maxilla
Alveolar margins
Mandible (body)
Mental foramen

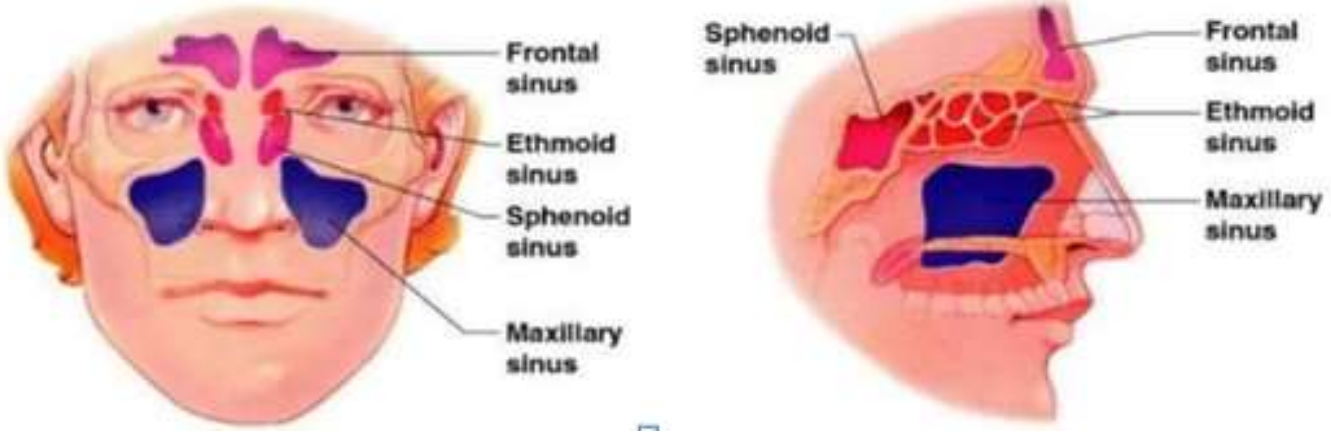
PARANASAL SINUSES

- Hollow portions of bones surrounding the nasal cavity



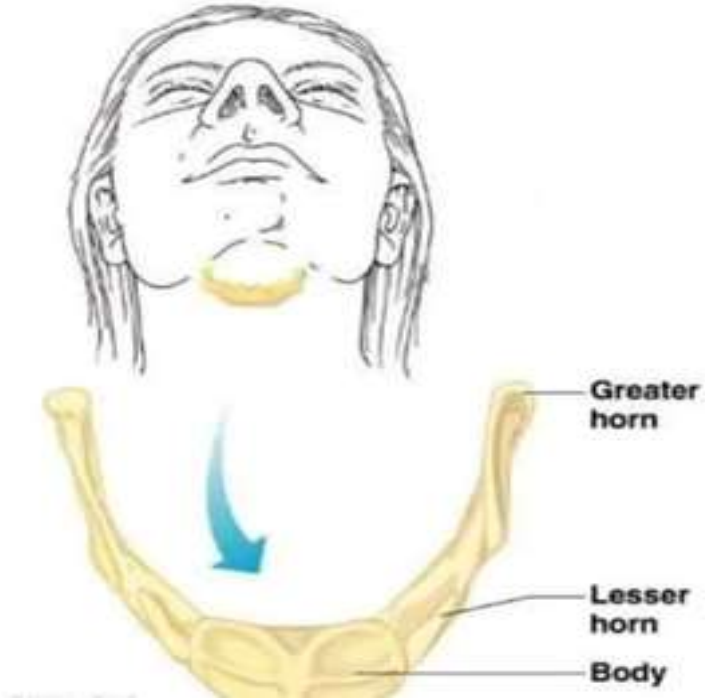
PARANASAL SINUSES

- Functions of paranasal sinuses
  - Lighten the skull
  - Give resonance and amplification to voice

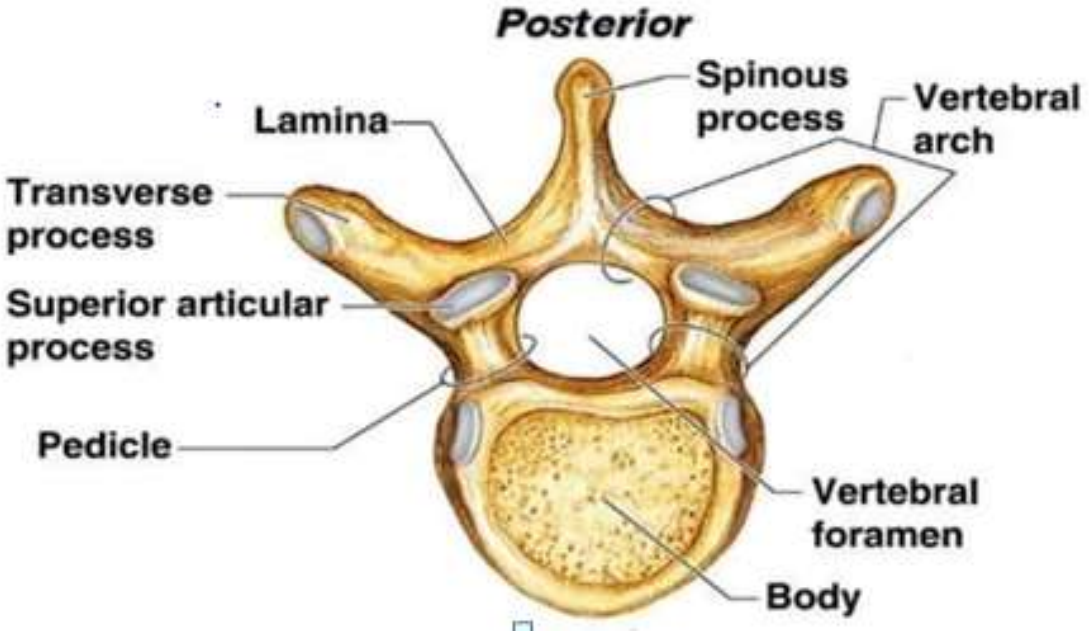


HYOID BONE

- The only bone that does not articulate with another bone
- Serves as a moveable base for the tongue

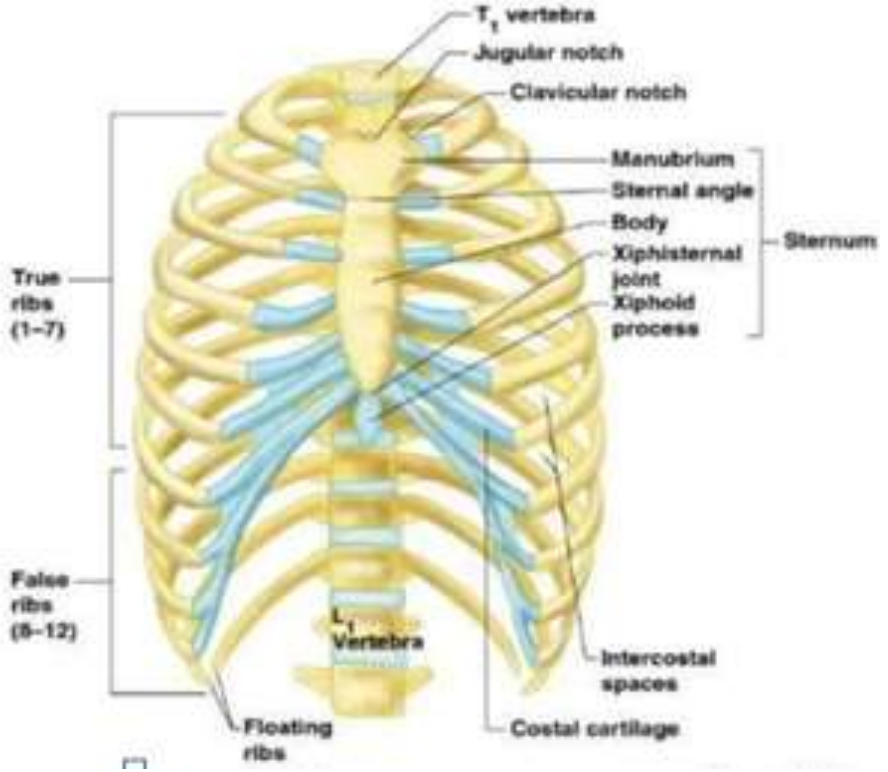


STRUCTURE OF VERTERBRA



RIB CAGE

- Forms a cage to protect major organs




Thank
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