



WBCS 2022



SCIENCE

SKELETAL SYSTEM



12:30 PM



20 APRIL 2022



The Skeletal System





The Skeletal System

- **Parts of the skeletal system:**
- **Bones (skeleton)**
- **Joints**
- **Cartilages**
- **Ligaments (bone to bone) (tendon = bone to muscle)**
- **Divided into two divisions**
- **Axial skeleton-** skull, spinal column
- **Appendicular skeleton-** limbs and girdle



Functions Of skeletal system

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

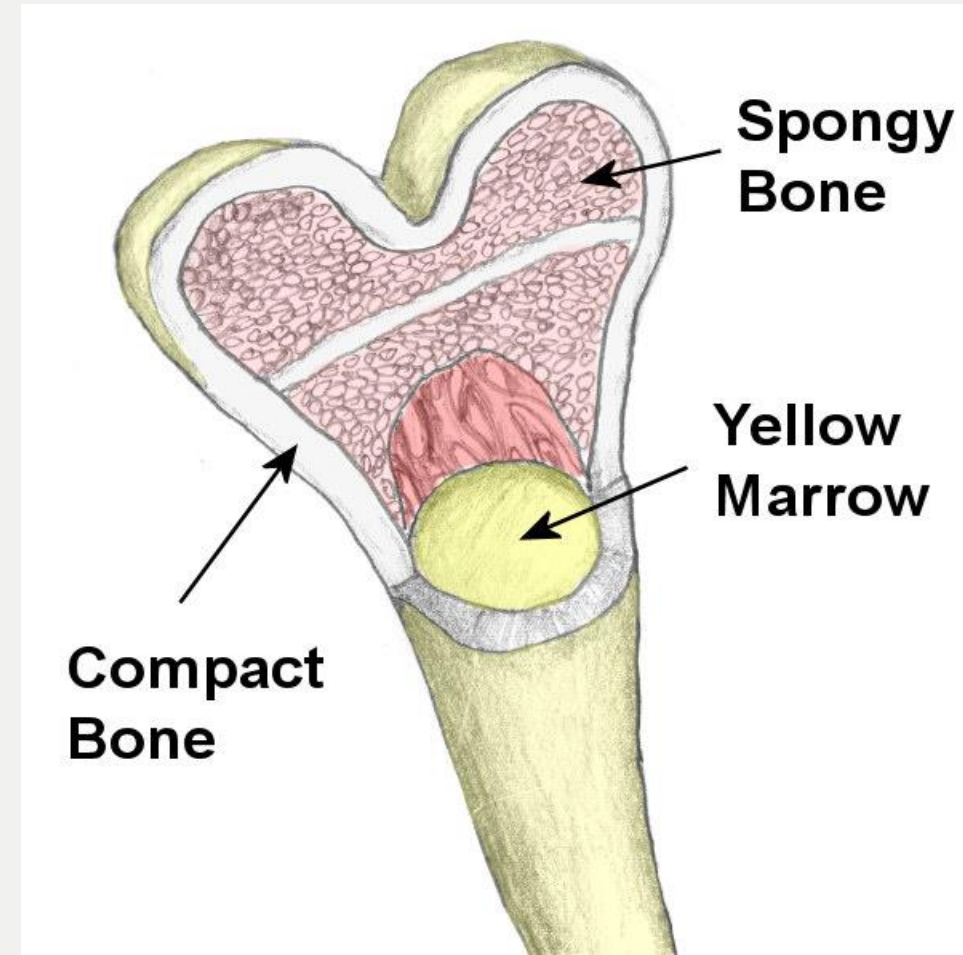


Bones of the Human Body

- The skeleton has 206 bones
- Two basic types of bone tissue

❖ **Compact bone**

❖ **Spongy bone**





TYPES OF BONE CELLS

➤ Osteoblasts

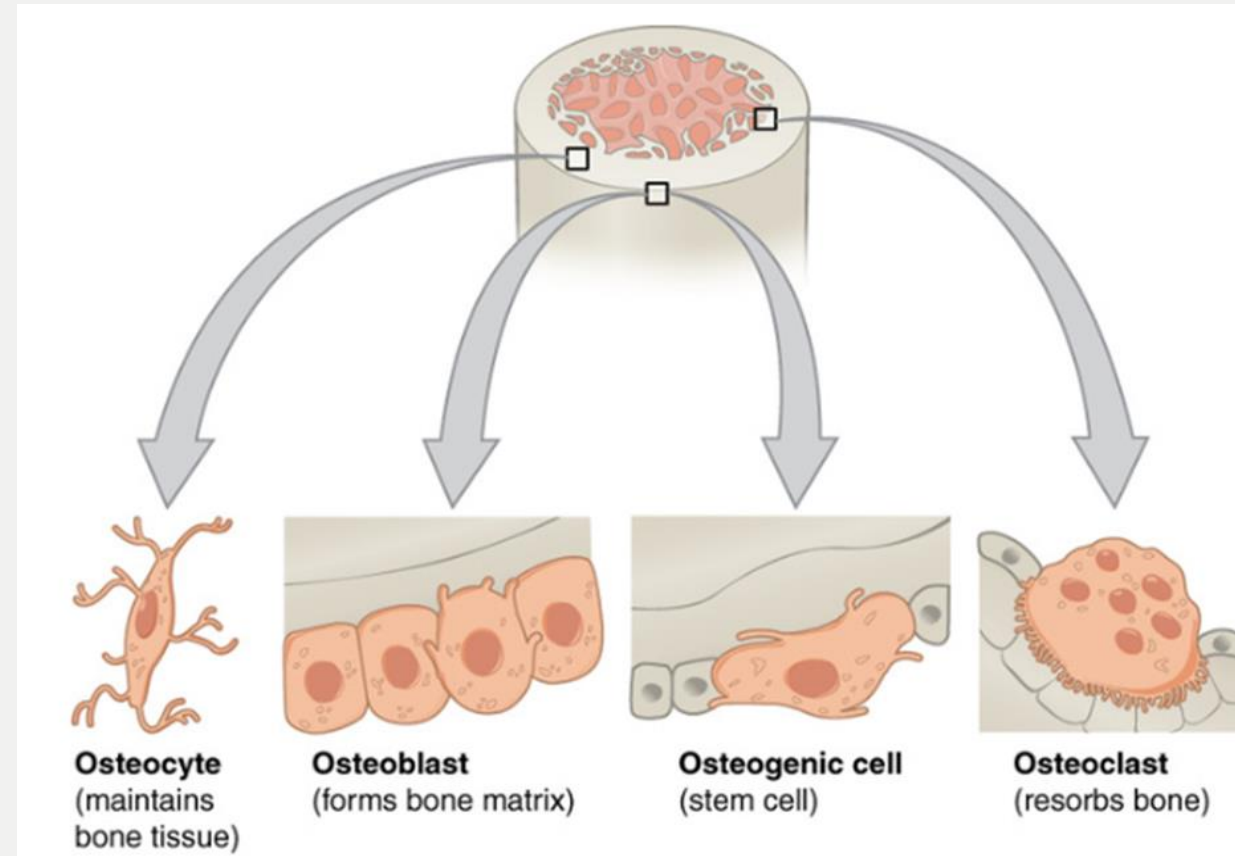
Bone-forming cells

➤ Osteocytes

Mature bone cells

➤ Osteoclasts

Osteoclasts are the cells responsible for bone resorption and remodelling.



Bone remodeling is a process by both osteoblasts and osteoclasts .



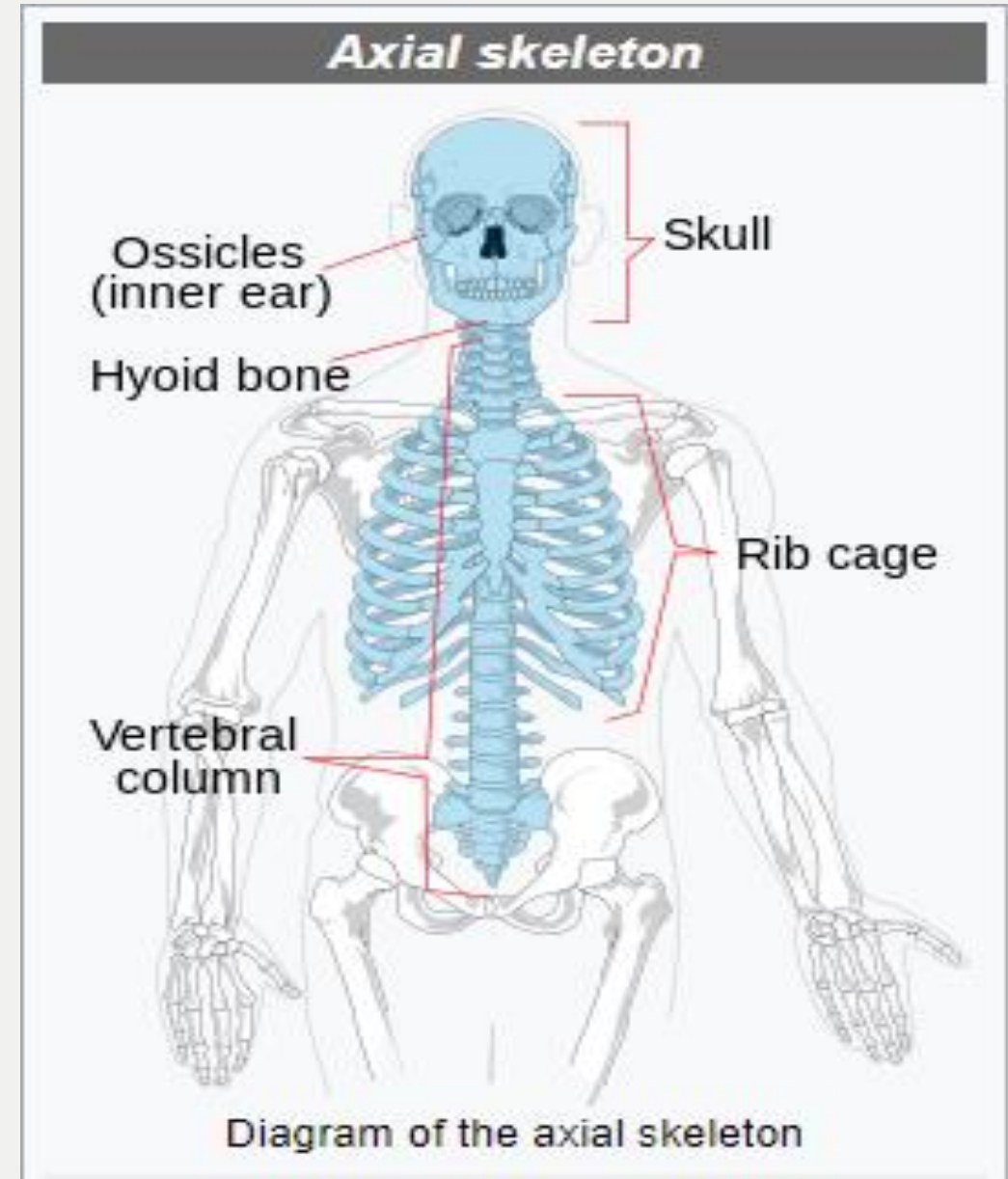
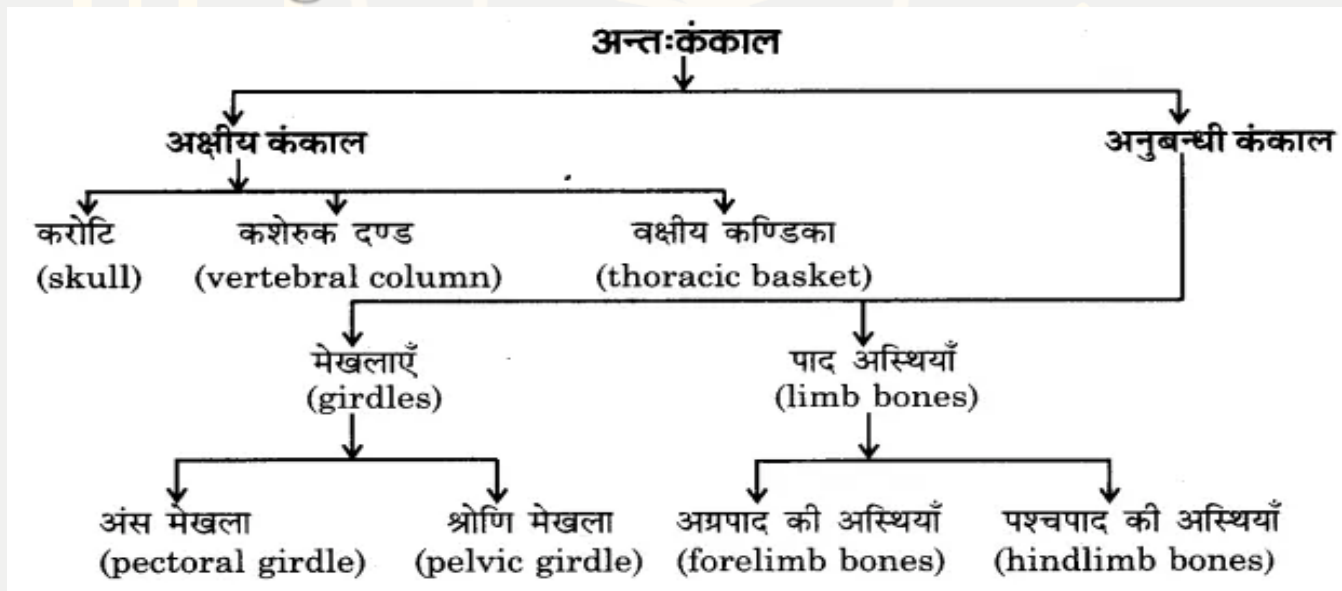
Change in the Human Skeleton

- In embryos, the skeleton is primarily hyaline cartilage
- During development, much of this cartilage is replaced by bone
- Cartilage remains in isolated areas
 - Bridge of the nose
 - Parts of ribs
 - joints



- Forms the longitudinal part of the body
- Divided into three parts

- **Skull**
- **Vertebral column**
- **Rib cage**





Bone Fractures

- Types of bone fractures
 - Closed (simple) fracture- break that does not penetrate the skin
 - Open (compound) fracture- broken bone penetrates through the skin
 - Greenstick- frays, hard to repair, breaks like a green twig
- Bone fractures are treated by reduction and immobilization
 - Realignment of the bone



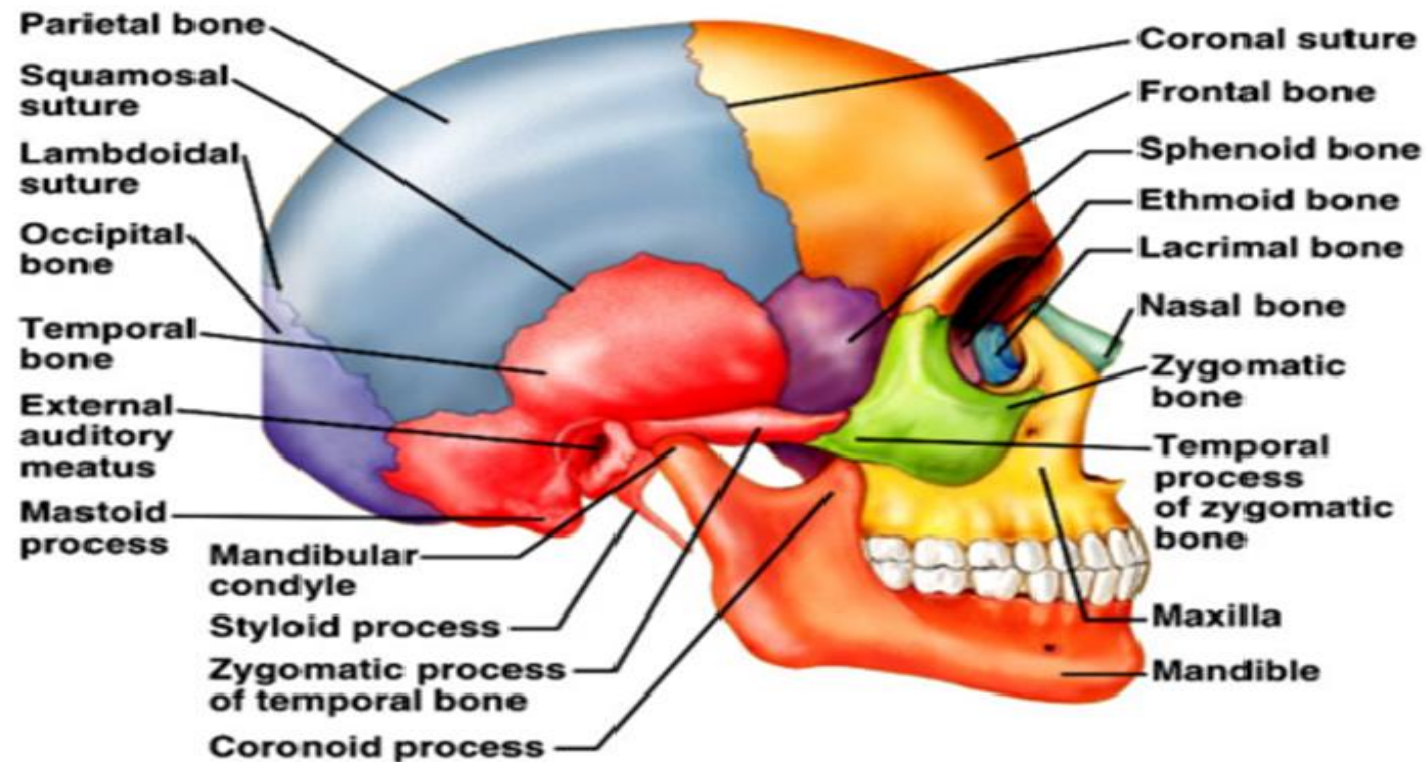
Most bone fracture are caused by falls and accidents.

1. Bone fracture caused by disease are called **PATHOLOGICAL FRACTURES**. Underlying diseases or condition has weakend the bone.
2. **AVULSION FRACTURE**- Amuscle or ligament pulls on the bone, fracturing it.
3. **COMMINUTED FRACTUTRE**- The bone shattered into many pieces.
4. **FRACTURE DISLOCATION**- A joint becomes dislocated and one of the bones of the joint has a fracture.
5. **HAIRLINE FRACTURE**- A partial fracture of the bone. Sometimes this type of fracture is harder to detect with routine X-Rays.



Bones of the skull

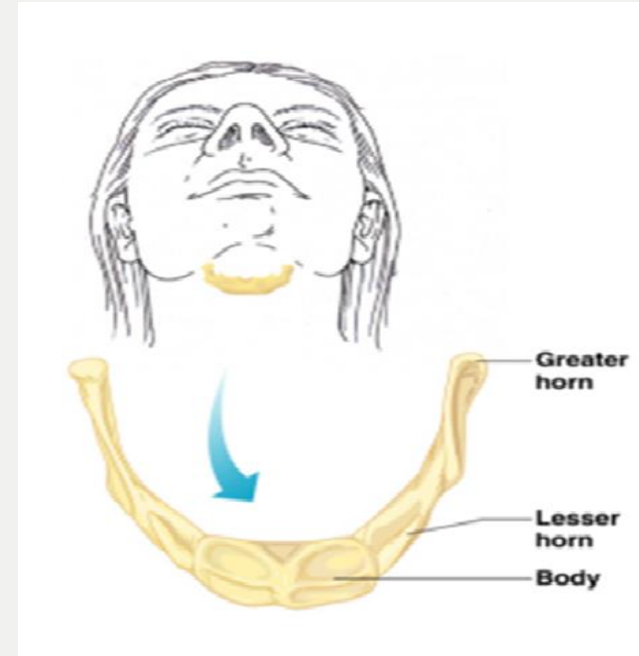
The human skull is generally considered to consist of twenty-two bones—eight cranial bones and fourteen facial skeleton bones.





The Hyoid Bone

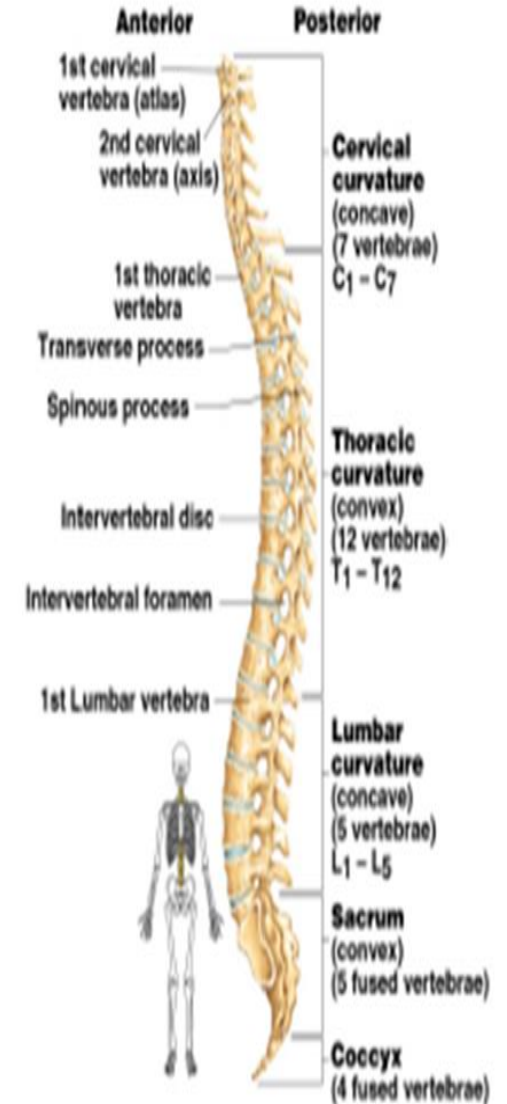
- The only bone that does not articulate with another
- bone .
- Serves as a moveable base for the tongue and other muscle attachments .





The Vertebral column

- Vertebrae separated by intervertebral discs made of cartilage
- The spine has a normal s curvature
- Each vertebrae is given a name according to its location



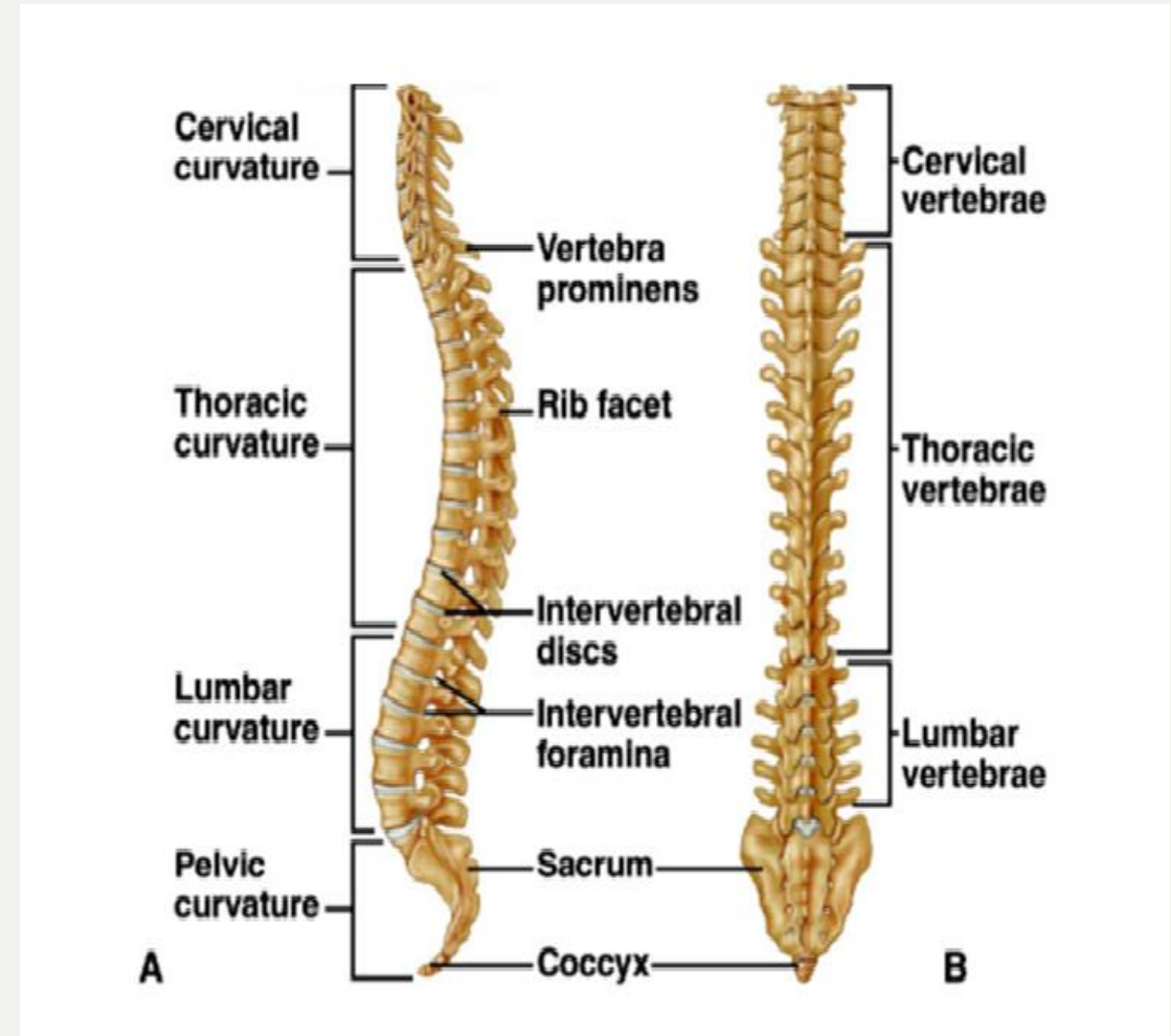


The Vertebral column

➤ In Vertebral Column of an adult:

Number of vertebrae – 33

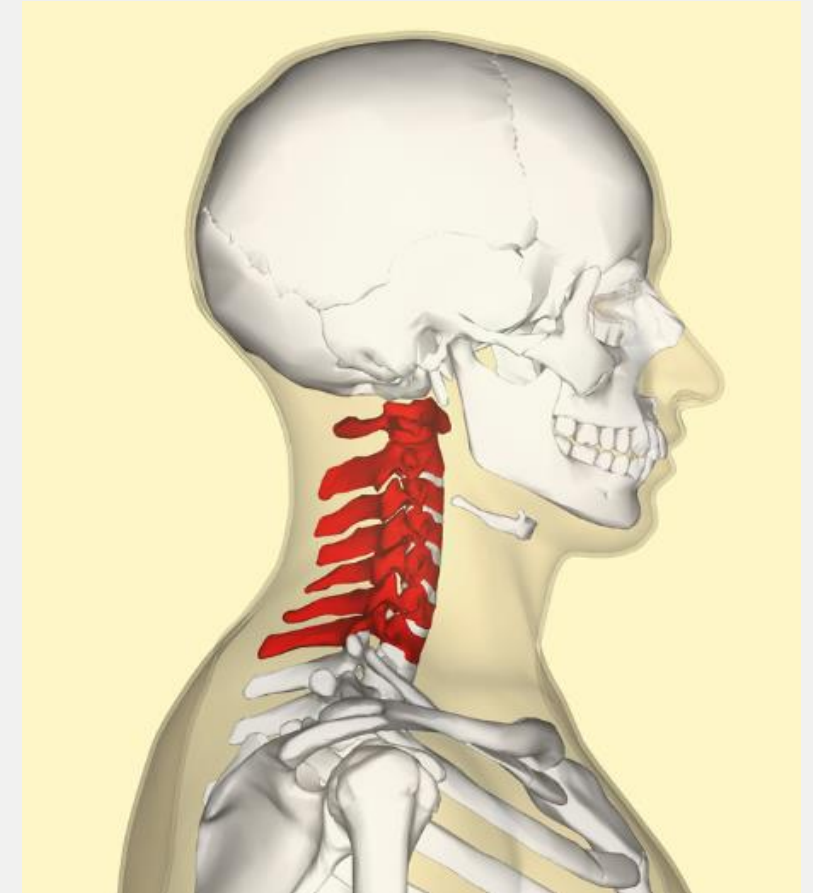
- Cervical region-7 vertebrae
- Thoracic region - 12 vertebrae
- Lumbar region - 5 vertebrae
- Sacral region - 5 vertebrae
- Caudal region - 4 vertebrae





Cervical region

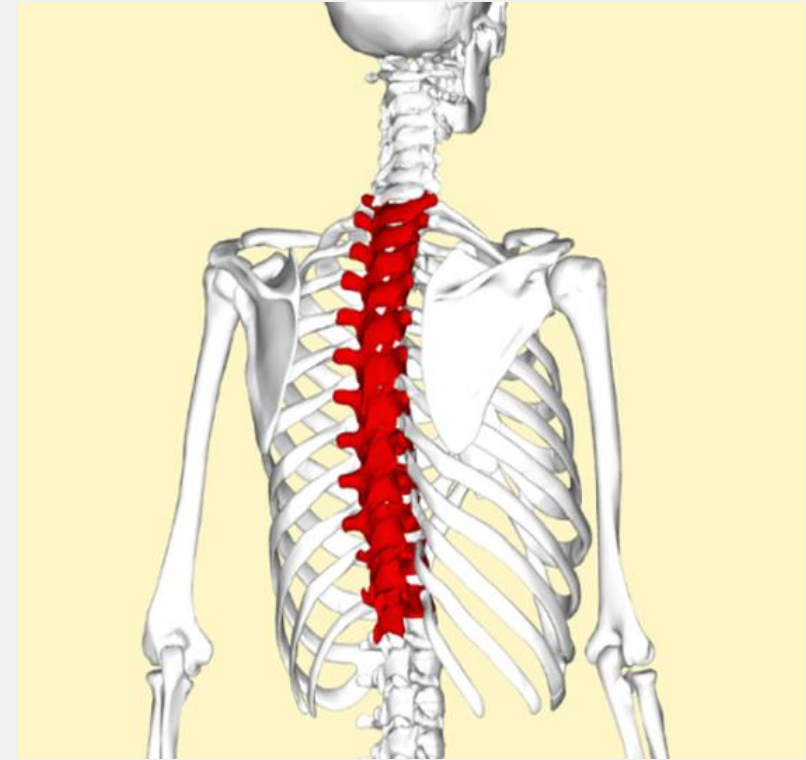
- Cervical vertebrae (singular: vertebra) are the vertebrae of the neck, immediately below the skull.
- Truncal vertebrae (divided into thoracic and lumbar vertebrae in mammals) lie caudal (toward the tail) of cervical vertebrae.





Thoracic region

- twelve thoracic vertebrae and they are intermediate in size between the cervical and lumbar vertebrae.





TYPE OF JOINTS

HINGE JOINT- Hinge joint is a common class of synovial joint that includes ankle, elbow and knee joints. Hinge joints are formed between two or more bones where the bone can only move along one axis or flex or extend.

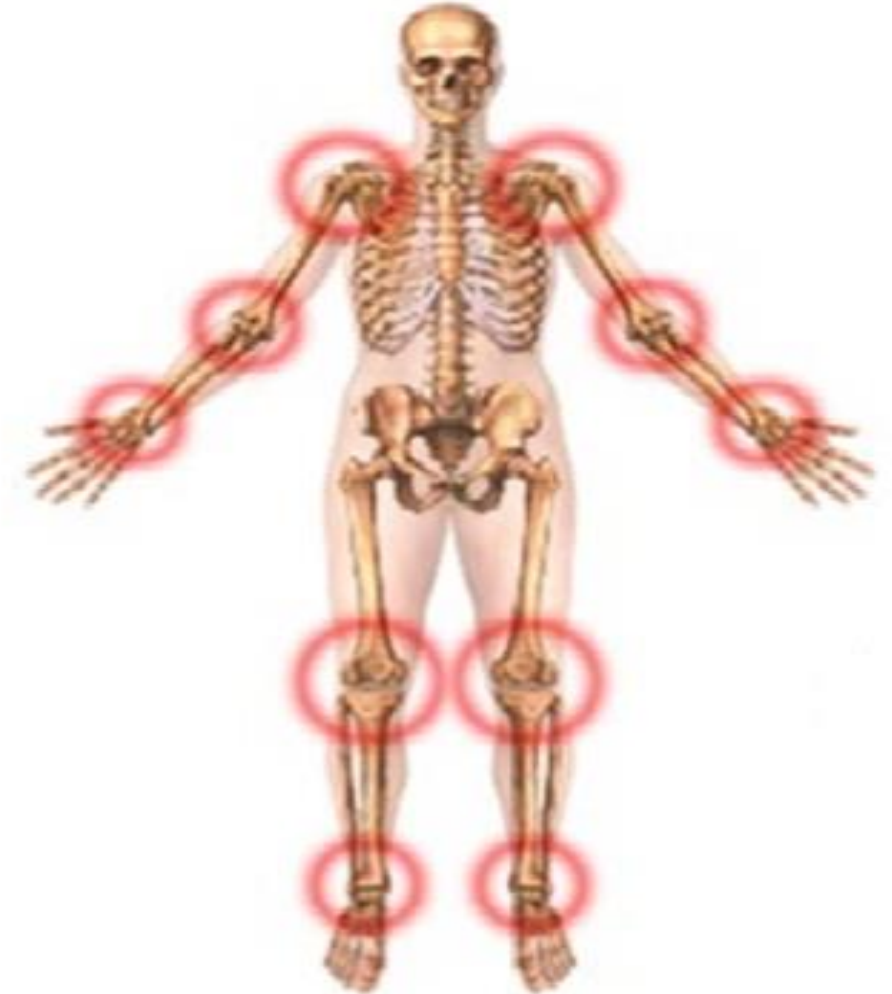
PIVOT JOINT- This is also called rotary joint or trochoid joint. It is a freely moveable joint that allows only rotary movement around a single axis. The moving bone rotates within a ring.

BALL AND SOCKET JOINT- Consists of a bone with a ball shaped head that attaches with the CUP SHAPED cavity of another bone. This type of joint allows for a wider range of motion. All allows for a wider range of motion. All rotational movement around a central axis is possible.



Bone and muscles related diseases

ARTHRITIS- Rheumatoid arthritis usually affects joints symmetrically (on both sides equally) , may initially begin in a couple of joints only and most frequently attacks the wrists , hands, elbows, shoulders , knees and ankles.





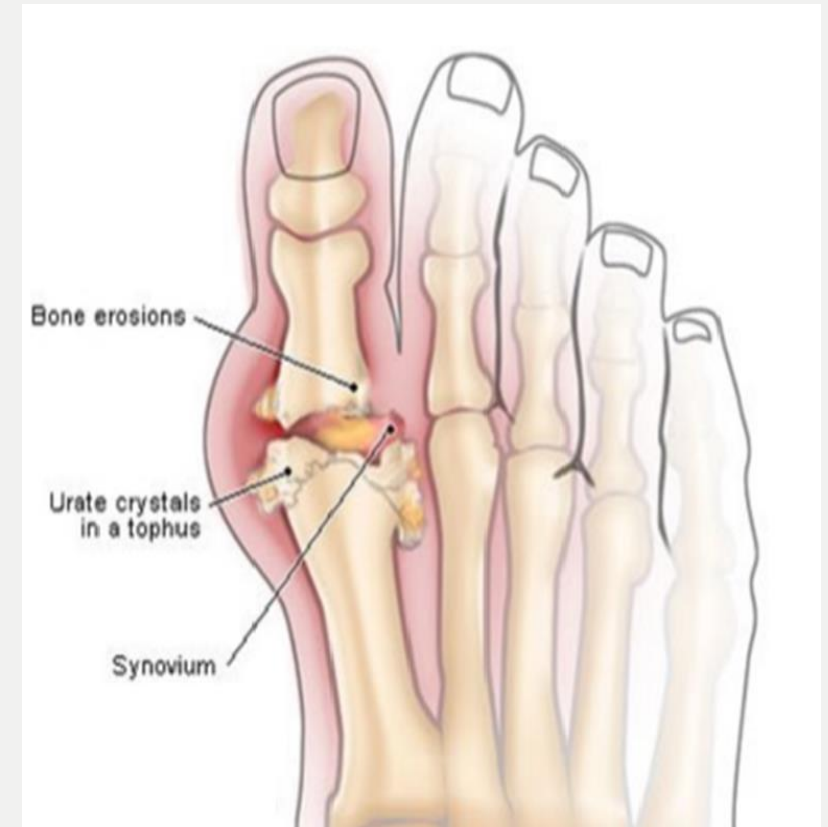
Rickets-

Rickets is a skeletal disorder that's caused by a lack of vitamin D, calcium, or phosphate. These nutrients are important for the development of strong, healthy bones. People with rickets may have weak and soft bones, stunted growth.





Gout- Gout is a form of inflammatory arthritis that develops in some people who have high levels of uric acid in the blood. The acid can form needle-like crystals in a joint and cause sudden, severe episodes of pain, tenderness, redness, warmth and swelling.





Important facts:

- **Total number of bones in the human body - 206**
- **Total number of bones in childhood - 300**
- **Total number of bones in skull of man - 22**
- Total number of bones in both arms and legs of humans – 124 (64+60)**
- **Number of total bones in the human spine (33)**
- **Total number of bones of spine after development - 26**
- **Total number of bones in human ribs - 24**



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you*

