

## عظام الهيكل العظمي Bones of Skeleton

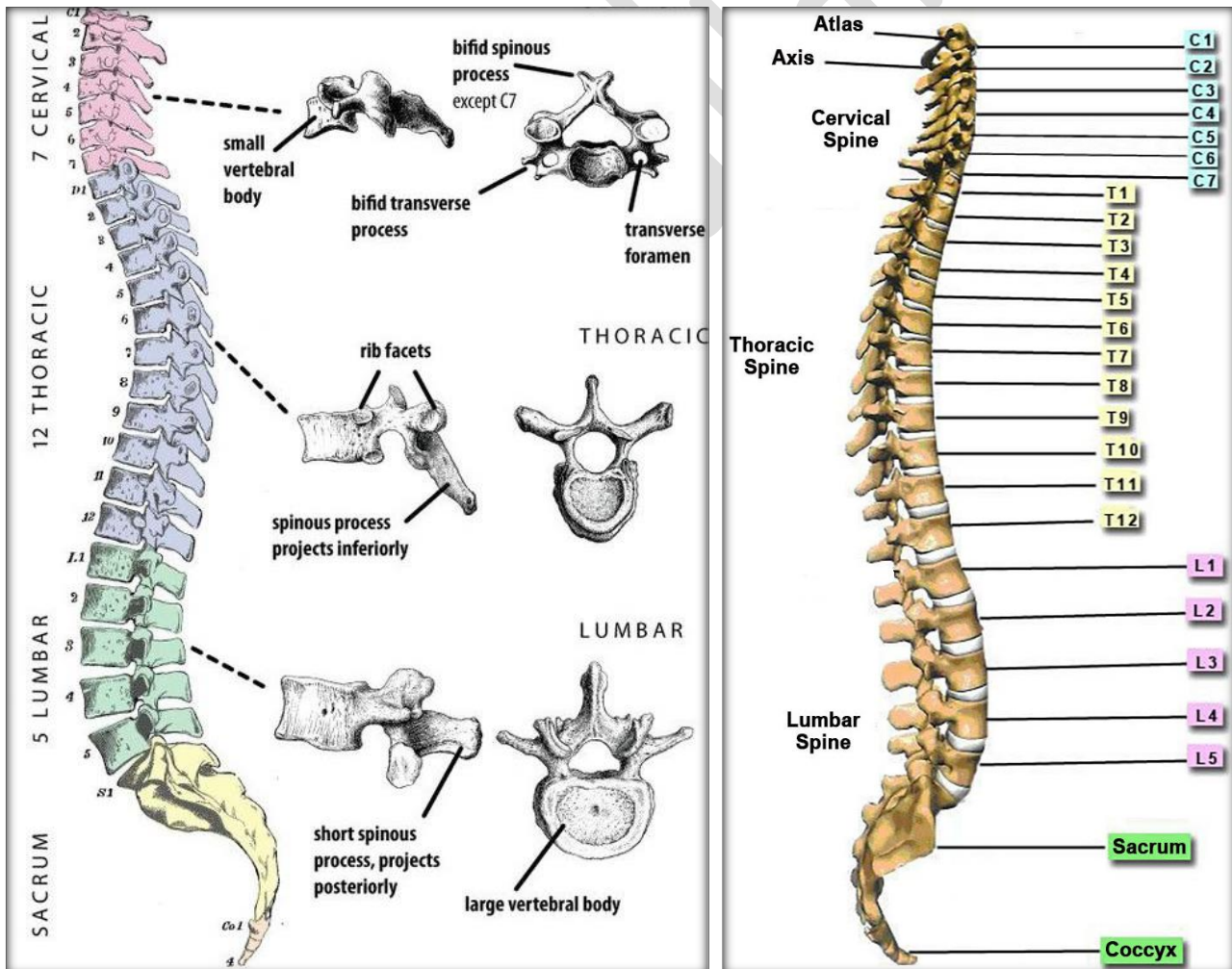
The human skeleton is composed of 206 bones.

تم شرح skull bones في المحاضرة السابقة

- **Skull** - Made up of 22 bones that protect the brain and give structure to the face.
- **Vertebral column** – consist of 26 bones called vertebrae that surround and protect the spinal cord:

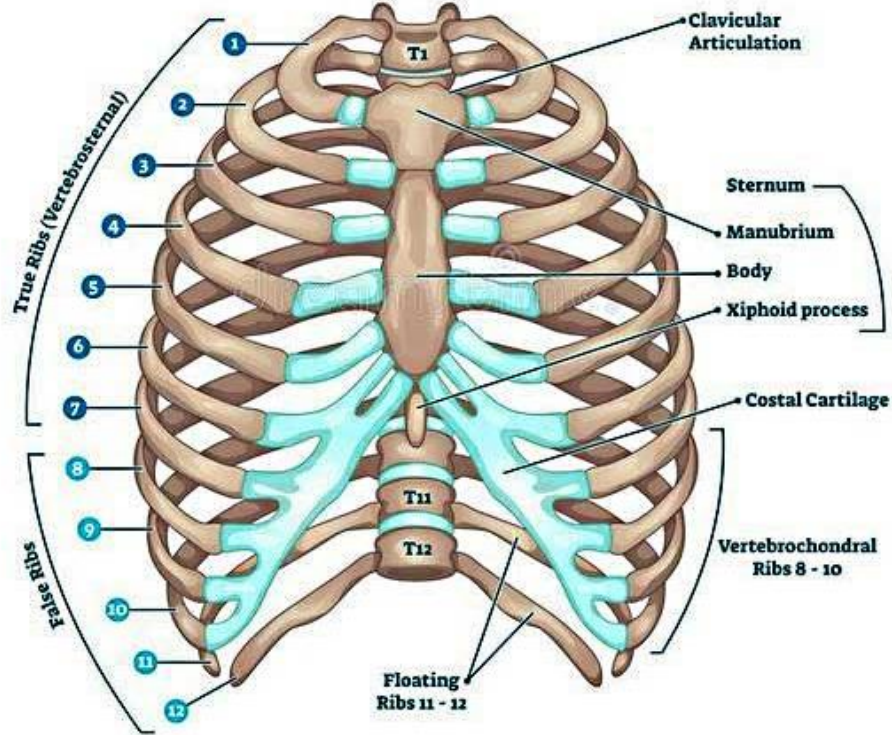
العمود الفقري

- ✓ cervical (7 bones) عنقية
- ✓ thoracic (12 bones) صدرية
- ✓ lumbar (5 bones) قطنية
- ✓ sacrum (1 bone) عجزية
- ✓ coccyx (1 bone) عصبعية



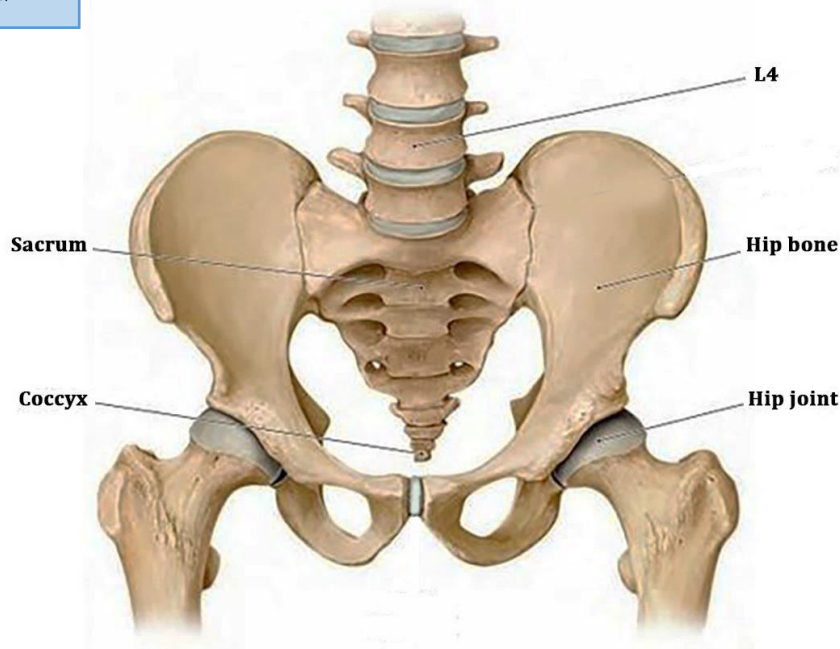
- **Ribs** - There are 12 pairs of ribs that form a protective cage around vital organs like the heart and lungs. They attach to the thoracic vertebrae.

الاضلاع



- **Pelvis** - Formed by the hip bones, sacrum and coccyx. Important in bearing weight, locomotion and childbirth.

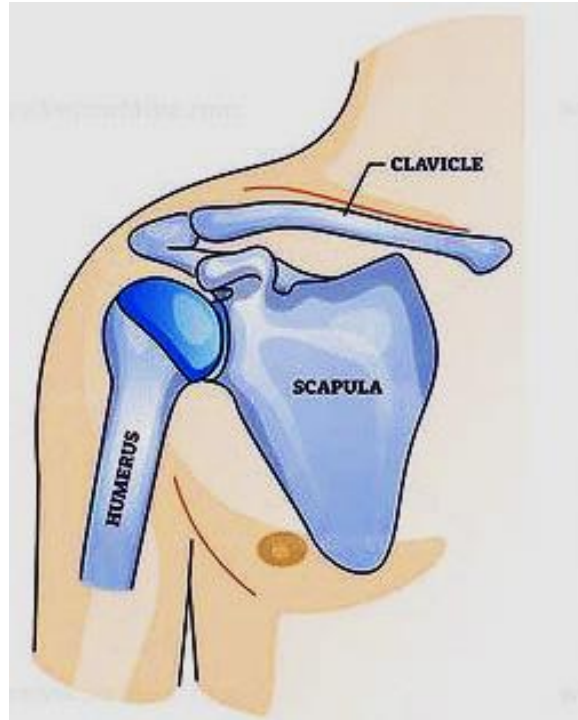
الحوض



- **Shoulder** - Composed of the clavicle (collarbone) and scapula (shoulder blade).

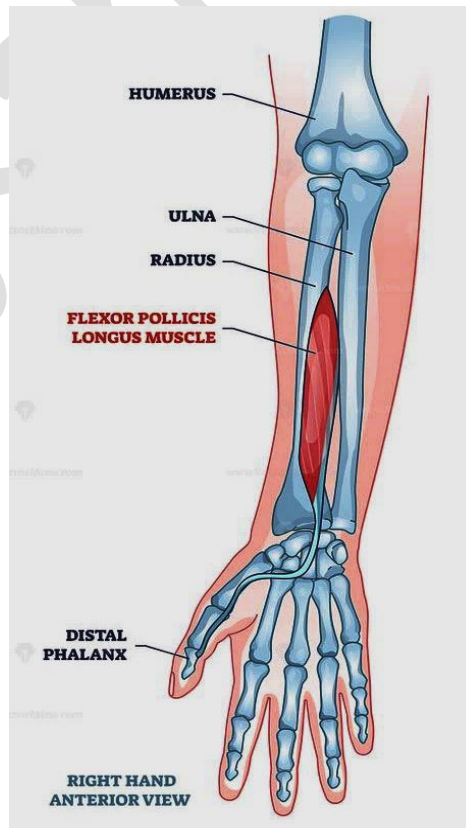
Important for upper limb movement.

الكتف



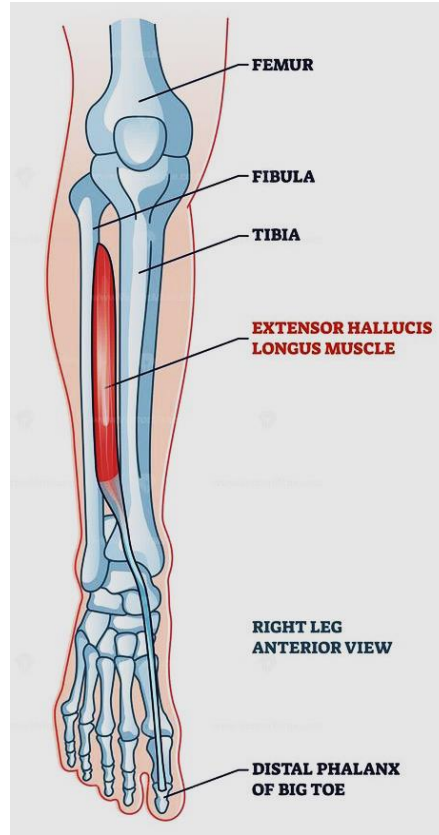
- **Arms** - Humerus in upper arm, radius and ulna in forearm, carpals in wrist, metacarpals and phalanges (fingers).

الذراع



- **Legs** - Femur in thigh, patella (kneecap), tibia and fibula in calf, tarsals in ankle, metatarsals and phalanges (toes).

الساق



### Skeletal Bone Shapes أشكال عظام الهيكل العظمي

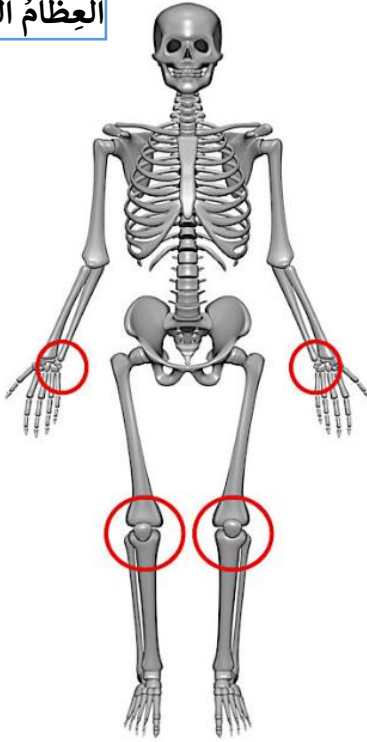
The different bone shapes allow the skeletal system as a whole to balance stability, protection, flexibility and weight, serving in total to support the body and enable movement.

- **Long bones** - These bones are longer than they are wide, such as the femur (thigh bone), tibia (shin bone), humerus (upper arm bone) and phalanges (finger and toe bones). Their length allows them to provide leverage and movement.
- **Short bones** - Smaller cuboid bones such as the tarsals (ankle bones) and carpals (wrist bones). They provide stability and some flexible movement.
- **Flat bones** - Thin and curved bones such as cranium, ribs, sternum, scapulae (shoulder blades) and pelvis. They usually providing protection or broad surfaces for muscle attachment



- **Irregular bones** - Bones with complex shapes such as vertebrae and facial bones. Their irregularity allows them to fit perfectly with adjoining bones and protect internal structures.
- **Sesamoid bones** - Small round bones embedded in tendons such as kneecaps and carpal bone. They provide extra leverage and reduce friction.

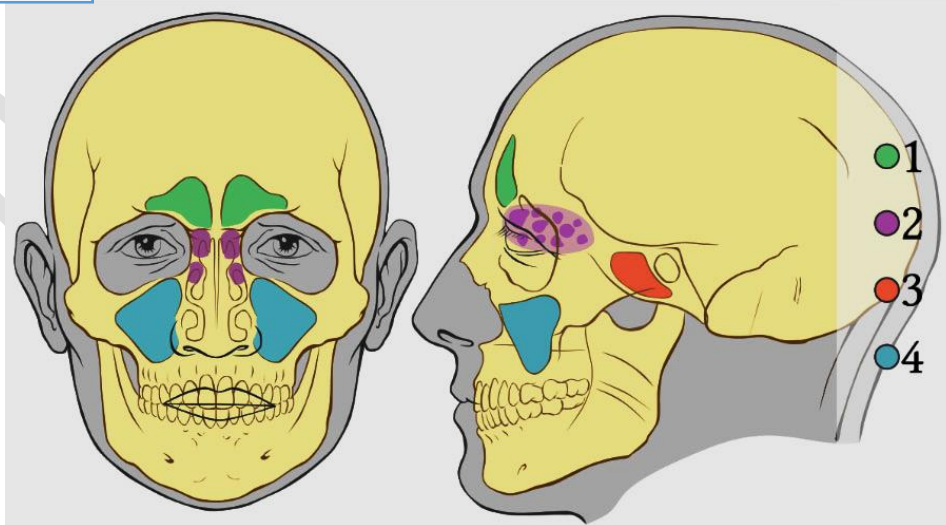
## العظام السمسمانية



- Pisiform (2) - Carpal Bones
- Patella (2) - Kneecap

- **Pneumatized bones** - Bones that have air-filled spaces, such as sphenoid and temporal bones of the skull. This makes the skull lighter.

## العظام الهوائية



## مفاصل الجسم Joints of the Body

are the points where two or more bones come together in the human body.

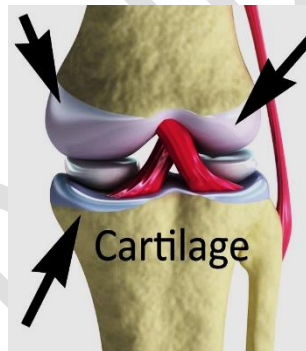
There are several types of joints in the human body, classified based on their structure and the degree of movement:

**1. Fibrous Joints:** These joints have minimal or no movement and are held together by fibrous connective tissue. Examples include sutures in the skull, where the bones are tightly connected.

المفاصل الليفية

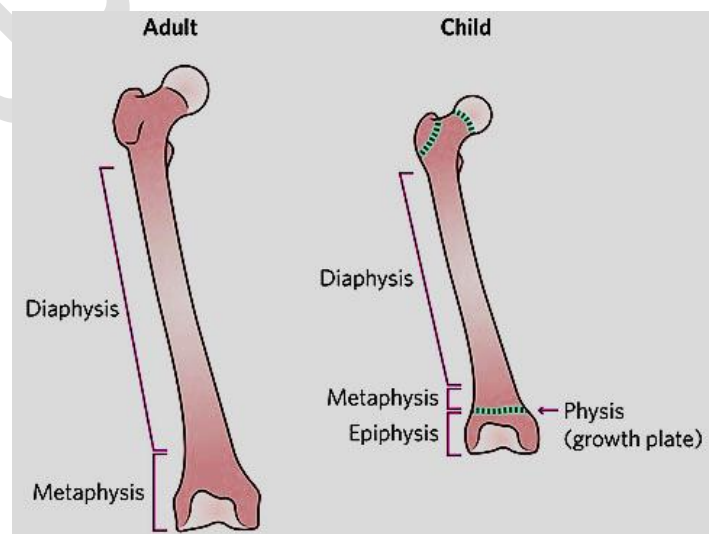
**2. Cartilaginous Joints:** These joints are connected by cartilage and allow limited movement. There are two types:

المفاصل الغضروفية



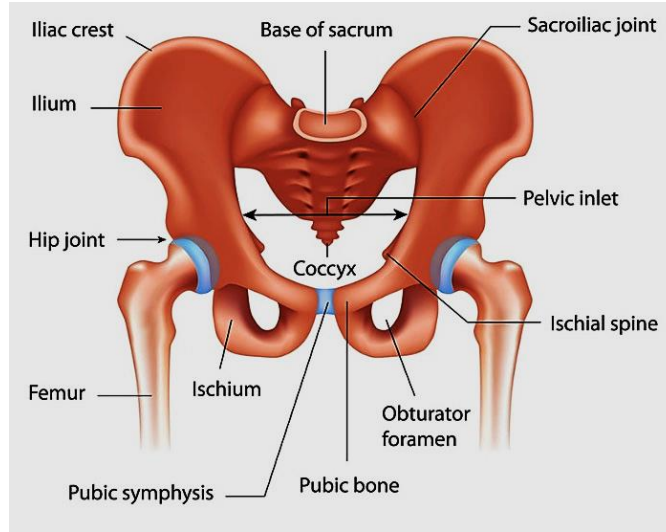
**a. Synchondroses:** These joints are connected by hyaline cartilage, example epiphyseal plate that growth plate found in long bones of children.

الالتحامات



**b. Symphyses:** These joints are connected by fibrous cartilage, example pubic symphysis that provides shock absorption and support to the pelvis.

الارتفاقات



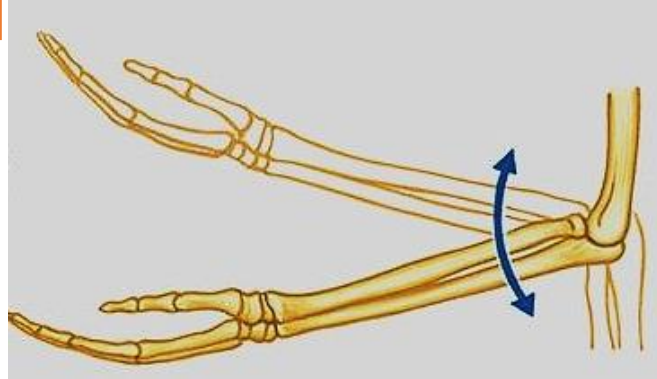
**3. Synovial Joints:** These are the most common and functionally important joints in the body. They are characterized by a joint cavity filled with synovial fluid, which lubricates the joint and reduces friction. Classified into various types:

المفاصل الزليلية



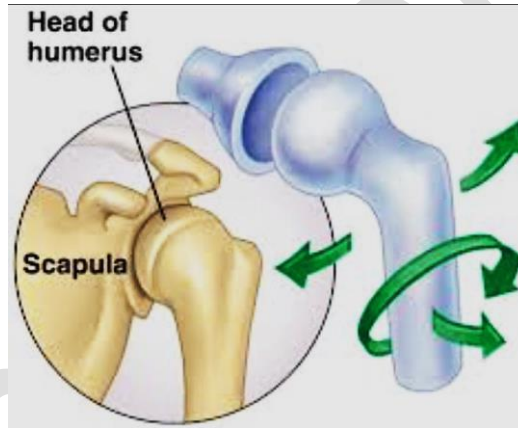
- a. Hinge Joints:** These joints allow movement in only one plane, like a hinge on a door. Example is the elbow and knee joints.

المفاصل المفصليّة



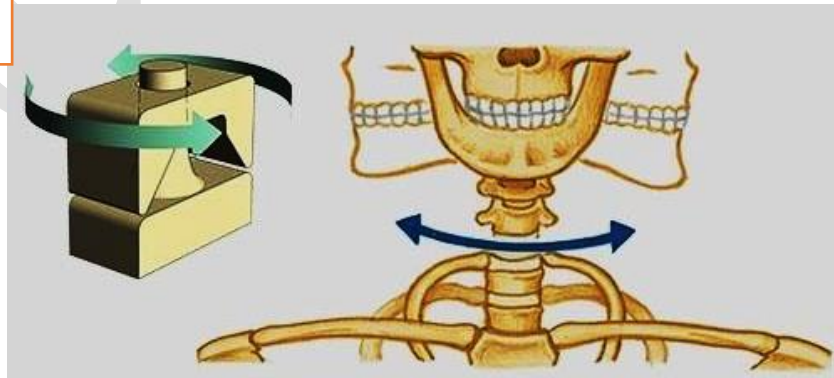
- b. Ball-and-Socket Joints:** These joints allow movement in multiple directions, including rotation. Example is the hip and shoulder.

مفصل الكرة والتجويف



- c. Pivot Joints:** These joints enable rotational movement around a central axis. Example is the joint between the first and second cervical vertebrae (atlas and axis).

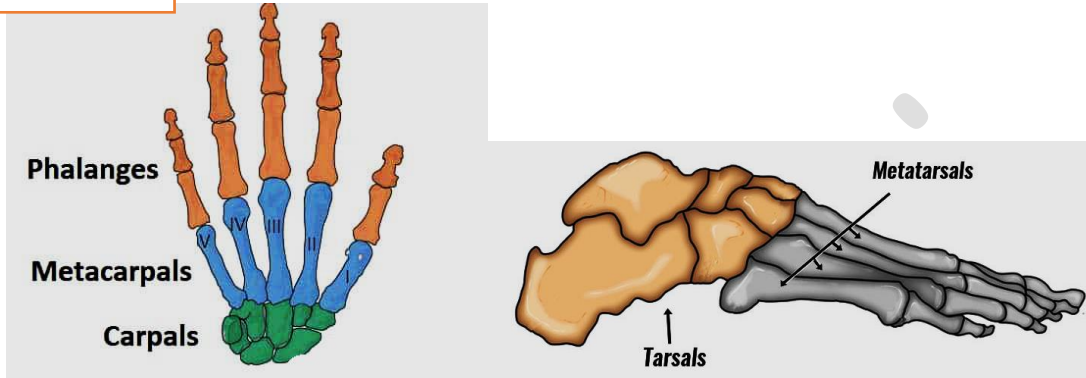
مفصل محوري





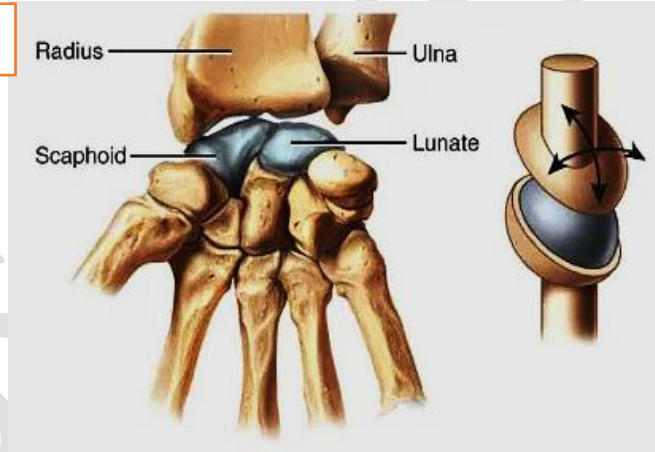
- d. Gliding Joints:** These joints allow sliding or gliding movements between bones. Example is the joints between the small bones of the wrist (carpals) and ankle (tarsals).

مفصل منزلق



- e. Condylod (Ellipsoidal) Joints:** These joints permit movement in two planes, allowing flexion, extension, abduction, adduction, and circumduction. Example is the joint between the radius bone and the carpal bones in the wrist.

مفصل لقمي (أهليلجي)



- f. Saddle Joints:** These joints allow movement in two planes, similar to condyloid joints, but with a greater range of motion. Example is the joint at the base of the thumb.

المفاصل السرجية

