Joints of the upper limb II

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Elbow joint
The **elbow** joint is connecting the upper arm to the forearm. It is classed as a hinge-type synovial joint.

**Structures of the Elbow Joint**
- **Trochlear notch** of the ulna and the **trochlea** of the humerus
- **Head of the radius** and the **capitulum** of the humerus
Capsule and Ligaments

The elbow joint has a capsule enclosing the joint, it is strong and fibrous, strengthening the joint. It is attached to the upper border of the olecranon, coronoid process and radial fossa of the humerus. It blends with the upper border of the annular ligament of the proximal radio-ulnar joint. The joint capsule is thickened medially and laterally to form collateral ligaments, which stabilise the flexing and extending motion of the arm.

The radial collateral ligament is found on the lateral side of the joint, extending from the lateral epicondyle, and blending with the annular ligament of the radius (a ligament from the proximal radioulnar joint).

The ulnar collateral ligament originates from the medial epicondyle, and attaches to the coronoid and olecranon
Bursae around the elbow joint

A bursa is a membranous sac filled with synovial fluid. It acts as a cushion to reduce friction between the moving parts of a joint, limiting degenerative damage. There are many bursae in the elbow, but only a few have clinical importance:

1. **Intratendinous** – located within the tendon of the triceps brachii
2. **Subtendinous** – between the olecranon and the tendon of the triceps brachii
3. **Subcutaneous (olecranon) bursa** – between the olecranon and the overlying connective tissue (implicated in olecranon bursitis)
Blood supply of the elbow joint
The arterial supply to the elbow joint is from the cubital anastomosis, which includes branches from the brachial, radial and ulnar arteries.

Nerve supply is provided by the median, musculocutaneous and radial nerves anteriorly, and the ulnar nerve posteriorly.

Movements of the Joint
Extension: Triceps brachii and anconeus
Flexion: Brachialis, biceps brachii, brachioradialis

pronation and supination do not occur at the elbow – they are produced at the nearby radioulnar joints.
Proximal radio-ulnar joint
The **proximal radio-ulnar joint** is a synovial pivot joint between the circumference of the **head of the radius** and the ring formed by the **radial notch of the ulna** and the **annular ligament**

Ligament
The **annular ligament** lined by hyaline cartilage surrounds the head of the radius and is attached to the anterior and posterior borders of the radial notch on the ulna. The synovial membrane lines this joint is continuous with that of the elbow joint.

Stability of the joint is kept by the **annular ligament**

Nerve Supply
**median nerve, musculocutaneous nerve and radial nerve**
Proximal radio-ulnar joint
Distal radio-ulnar joint
The distal synovial radioulnar joint is a pivot-joint formed between the **head of ulna** and the **ulnar notch on the lower extremity of radius**.

Ligaments
The articular surfaces are connected together by the following ligaments:

1. Palmar radioulnar ligament
2. Dorsal radioulnar ligament
3. Articular disk (triangular fibrocartilaginous Disc)

Ball & socket  
Condyloid J  
Saddle J  
Hing J  
Pivot joint
Stability
Depends on the strength of the articular cartilage

**Interosseous membrane of forearm**

The *interosseous membrane of the forearm* is a fibrous sheet that connects the interosseous margins of the radius and the ulna. It is the main part of the radio-ulnar syndesmosis, a fibrous joint between the two bones.

**Function**

The interosseous membrane divides the forearm into anterior and posterior compartments, serves as a site of attachment for muscles of the forearm, and transfers loads placed on the forearm.
Movements at the radio-ulnar joints

Movements are **supination** and **pronation**

The movements occur about an axis joining the centre of the radial head above and the styloid process of the ulna below.

Muscles that contribute to function are all **supinator** (*Biceps Brachii, Brachioradialis, and Supinator*) and **pronator muscles** (*Brachioradialis, Pronator Quadratus, and Pronator Teres*).

The range of either supination or pronation from the neutral position is about 90 degrees
Wrist joint

Articulating Surfaces
The wrist joint is a synovial Ellipsoid joint formed by:
**Distally** – The proximal row of the carpal bones (Scaphoid, lunate and triquetral).
**Proximally** – The distal end of the radius, and the articular disk.

The ulna is not part of the wrist joint – it articulates with the radius, just proximal to the wrist joint, at the distal radioulnar joint. It is prevented from articulating with the carpal bones by a fibrocartilaginous disk, called the articular disk, which lies over the superior surface of the ulna.
Together, the carpal bones form a **convex** surface, which articulates with the **concave** surface of the radius and articular disk.
Wrist joint

- Radius
- Articular disk
- Lunate
- Scaphoid
- Triquetrum
**Joint Capsule**
The fibrous joint capsule is attached to the radius, ulna and the proximal row of the carpal bones.

**Ligaments**

**Capsule**
Capsular thickenings: *anterior and posterior ligaments* and *medial and lateral collateral ligaments*
Blood supply of the wrist joint is from radial and ulnar arteries.

Innervation to the wrist is delivered by branches of three nerves:
- **Median nerve** – Anterior interosseous branch.
- **Radial nerve** – Posterior interosseous branch.
- **Ulnar nerve** – Deep and dorsal branches.

**Movements of the Wrist Joint**
The wrist is an *ellipsoid* type synovial joint, allowing for movement along two axes. This means that *flexion*, *extension*, *adduction* and *abduction* can all occur at the wrist joint.
Thank You