**Midterm Lab Assignment**

**Fall 2020.**

**Name: Aliya Rasool**

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**Assignment: Anatomy**

**Submitted by: *Aliya Rasool***

**Submitted To: Arooba Sajjad**

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**Topic: Write brief note on the joints of upperlimb.**

***Wrist Joint\****

The wrist joint (also known as the radiocarpal joint) is a synovial joint in the upper limb, marking the area of transition between the forearm and the hand.

In this article, we shall look at the structures of the wrist joint, the movements of the joint, and the relevant clinical syndromes.

Structures of the Wrist Joint

Articulating Surfaces

The wrist joint is formed by:

Distally – The proximal row of the carpal bones (except the pisiform).

Proximally – The distal end of the radius, and the articular disk (see below).

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 ligament, 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.

Movements of the Wrist Joint

The wrist is an ellipsoidal (condyloid) type synovial joint, allowing for movement along two axes. This means that flexion, extension, adduction and abduction can all occur at the wrist joint.

All the movements of the wrist are performed by the muscles of the forearm.

Flexion – Produced mainly by the flexor carpi ulnaris, flexor carpi radialis, with assistance from the flexor digitorum superficialis.

Extension – Produced mainly by the extensor carpi radialis longus and brevis, and extensor carpi ulnaris, with assistance from the extensor digitorum.

Adduction – Produced by the extensor carpi ulnaris and flexor carpi ulnaris

Abduction – Produced by the abductor pollicis longus, flexor carpi radialis, extensor carpi radialis longus and brevis.

***Shoulder Joint\****

* The shoulder joint (glenohumeral joint) is a ball and socket joint between the scapula and the humerus. It is the major joint connecting the upper limb to the trunk.
* It is one of the most mobile joints in the human body, at the cost of joint stability. In this article, we shall look at the anatomy of the shoulder joint and its important clinical correlations.
* Structures of the Shoulder Joint

Articulating Surfaces

* The shoulder joint is formed by the articulation of the head of the humerus with the glenoid cavity (or fossa) of the scapula.
* This gives rise to the alternate name for the shoulder joint – the glenohumeral joint.
* Like most synovial joints, the articulating surfaces are covered with hyaline cartilage.
* The head of the humerus is much larger than the glenoid fossa, giving the joint a wide range of movement at the cost of inherent instability. To reduce the disproportion in surfaces, the glenoid fossa is deepened by a fibrocartilage rim, called the glenoid labrum.

Joint Capsule and Bursae

* The joint capsule is a fibrous sheath which encloses the structures of the joint.extends from the anatomical neck of the humerus to the border or ‘rim’ of the glenoid fossa.
* The joint capsule is lax, permitting greater mobility (particularly abduction).
* The synovial membrane lines the inner surface of the joint capsule, and produces synovial fluid to reduce friction between the articular surfaces.
* To reduce friction in the shoulder joint, several synovial bursae are present.
* A bursa is a synovial fluid filled sac, which acts as a cushion between tendons and other joint structures.
* The bursae that are important clinically are:
* Subacromial – located deep to the deltoid and acromion, and superficial to the supraspinatus tendon and joint capsule.
* The subacromial bursa reduces friction beneath the deltoid, promoting free motion of the rotator cuff tendons. Subacromial bursitis (i.e. inflammation of the bursa) can be a cause of shoulder pain.
* Subscapular – located between the subscapularis tendon and the scapula.
* It reduces wear and tear on the tendon during movement at the shoulder joint.
* There are other minor bursae present between the tendons of the muscles around the joint, but this is beyond the scope of this article.

Movements

* As a ball and socket synovial joint, there is a wide range of movement permitted:
* Extension (upper limb backwards in sagittal plane) – posterior deltoid, latissimus dorsi and teres major.
* Flexion (upper limb forwards in sagittal plane) – pectoralis major, anterior deltoid and coracobrachialis. Biceps brachii weakly assists in forward flexion.
* Abduction (upper limb away from midline in coronal plane):
* The first 0-15 degrees of abduction is produced by the supraspinatus.
* The middle fibres of the deltoid are responsible for the next 15-90 degrees.
* Past 90 degrees, the scapula needs to be rotated to achieve abduction – that is carried out by the trapezius and serratus anterior.
* Adduction (upper limb towards midline in coronal plane) – pectoralis major, latissimus dorsi and teres major.
* Internal rotation (rotation towards the midline, so that the thumb is pointing medially) – subscapularis, pectoralis major, latissimus dorsi, teres major and anterior deltoid.
* External rotation (rotation away from the midline, so that the thumb is pointing laterally) – infraspinatus and teres minor.

***Elbow Joint\****

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

In this article, we shall look at the anatomy of the elbow joint; its articulating surfaces, movements, stability, and the clinical relevance.

Structures of the Elbow Joint

Articulating Surfaces

It consists of two separate articulations:

Trochlear notch of the ulna and the trochlea of the humerus

Head of the radius and the capitulum of the humerus

Note: The proximal radioulnar joint is found within same joint capsule of the elbow, but most resources consider it as a separate articulation.

Joint Capsule and Bursae

Like all synovial joints, the elbow joint has a capsule enclosing the joint. This in itself is strong and fibrous, strengthening the joint. The joint capsule is thickened medially and laterally to form collateral ligaments, which stabilise the flexing and extending motion of the arm.

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:

Intratendinous – located within the tendon of the triceps brachii.

Subtendinous – between the olecranon and the tendon of the triceps brachii, reducing friction between the two structures during extension and flexion of the arm.

Subcutaneous (olecranon) bursa – between the olecranon and the overlying connective tissue (implicated in olecranon bursitis).

Movements of the Joint

The orientation of the bones forming the elbow joint produces a hinge type synovial joint, which allows for extension and flexion of the forearm:

Extension – triceps brachii and anconeus

Flexion – brachialis, biceps brachii, brachioradialis

Note – pronation and supination do not occur at the elbow – they are produced at the nearby radioulnar joints.

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