Bones of the Upper Limb

The Clavicle

- The clavicle is an S-shaped long bone, which forms part of the pectoral girdle
- It articulates proximally with the sternum and distally with the acromion of scapula
- Bony features include:
  - Acromial facet
  - Sternal facet
  - Impression for costoclavicular ligament
  - Subclavian groove
  - Conoid tubercle
  - Trapezoid line

FACTOIDS
- Its occasionally pierced by a branch of the supraclavicular nerve
- Thicker and more curved in manual workers
- Weakest part is the junction of the middle and lateral thirds: most commonly fractured; more common in children
- After a fracture, the sternocleidomastoid elevates the medial fragment of the clavicle, and the shoulder drops.
- The lateral fragment of the clavicle gets pulled medially by the arm adductors, eg. pectoralis major
- The clavicle is the first long bone to ossify in the embryo (5th-6th week)
- Protects the neurovascular bundle supplying the upper arm, forming a bony boundary of the cervical canal
- Transmits traumatic impact force from the upper limb to the axial skeleton
- Contains NO MEDULLARY CAVITY
The Scapula

- The clavicle is a triangular flat bone which lies on the posterolateral surface of the thorax
- Proximally, it is curved to move over the chest wall, and distally it articulates with the clavicle at the acromioclavicular joint, and with the head of humerus at the glenohumeral joint
- Bony features include:
  - Subscapular fossa
  - Spine of scapula,
    - Delotid tubercle on the spine of scapula
    - Acromion process of the spine of scapula
    - Facet for articulation with the clavicle
  - Supraspinous fossa
  - Infraspinous fossa
  - Coracoid process
    - Suprascapular notch
  - Glenoid cavity

Right Scapula

Supraspinous fossa

Spine of the scapula

Facet for the clavicle

Acromion

Coracoid process

Supraglenoid tubercle:
For attachment of long head of biceps

Glenoid cavity:
4cm by 2-3 cm;
Faces anterolaterally and slightly superiorly

Infraglenoid tubercle:
For attachment of long head of triceps

Lateral border: a thick bar of bone, the stress-bearing region of the scapula

Superior border:
THINNEST bone

This whole surface is the subscapular fossa

Body of scapula (forms the head)

Infraspinous fossa

Head of scapula

Medial (vertebral) border:
Thin bone
The Humerus

- the humerus is a long bone, the largest in the upper limb
- it articulates proximally with the scapula at the scapulohumeral (glenohumeral) joint
- it articulates distally with the ulna at the elbow joint

**The Right Humerus**

- The anatomical neck is formed by a groove distal to the head but proximal to the tubercles
- The surgical neck is the narrow part past the tubercles
- The Deltoid Tuberosity is where the deltoid attaches
- The Radial groove is where the radial nerve and deep artery of the arm pass next to the humerus
- The sharp lateral supracondylar ridge
- The sharp medial supracondylar ridge
- The Medial Epicondyle: attachment for EXTENSORS
- The Lateral Epicondyle: attachment for FLEXORS
- The olecranon fossa: receives the olecranon process of ulna
- The radial fossa: receives the head of radius
- The trochlea articulates with the trochlear notch of the ulna
- The coronoid fossa: receives the coronoid process of the ulna
- The capitulum: articulates with the head of radius

**Bony features include:**
- The head of humerus
- The anatomical neck
- The greater tubercle
- The lesser tubercle
- Intertubercular groove – bicipital groove
- The surgical neck
- The deltoid tuberosity
- The radial groove
- The medial and lateral supracondylar ridges
- The radial fossa
- The olecranon fossa
- The trochlea
- The coronoid fossa
- The radial fossa
- The capitulum

**The humerus is in direct contact with a bunch of important nerves:**
- The Axillary Nerve
- The Radial Nerve
- The Median Nerve
- The Ulnar Nerve

**The Axillary Nerve**
- At the surgical neck

**The Radial Nerve**
- At the radial groove

**The Median Nerve**
- At the distal humerus

**The Ulnar Nerve**
- At the medial epicondyle
The Humerus
common fracture sites and the position of the nerves relative to these

- **COMMONEST fracture site: the SURGICAL NECK**
  - AXILLARY NERVE is injured by this

- **MID-SHAFT** fracture: either transverse, from a direct blow, or spiral, from a fall on an outstretched arm
  - RADIAL NERVE is injured this way as it runs in the radial groove

- **INTERCONDYLAR FRACTURE**: fall on a flexed elbow; the olecranon is driven into the olecranon fossa, shattering it;
  - MEDIAN NERVE is damaged by this
  - ULNAR NERVE may be damaged by this

- The greater tubercle can get avulsed, but there are no nerves around to be harmed by this
The Radius

- the humerus is a long bone, the largest in the upper limb
- it articulates proximally with the scapula at the scapulohumeral (glenohumeral) joint
- it articulates distally with the ulna at the elbow joint
- the radius is a long bone, the shorter of the two in the forearm
- proximally, the head of radius articulates with the capitulum of the humerus
- the head also articulates with the radial notch of the ulna
- the radial tuberosity separates the neck of radius from the body

The head of radius

The neck of radius

Radial tuberosity

The body of radius

Bony features include:
- head of radius
- neck of radius
- radial tuberosity
- body of radius
- radial styloid process

Dorsal markings on the distal radius,
- ulnar notch
- groove for extensor digitorum and extensor indices
- groove for extensor pollicis longus
- dorsal tubercle of radius
- groove for extensor carpi radialis
- groove for extensor carpi radialis longus and brevis

Ulnar notch: this is where the head of the ulna articulates

Radial styloid process: MUCH LARGER than the ulna. It extends further distally by about 1 fingers breadth.
Markings on the Dorsal Radius

- The humerus is a long bone, the largest in the upper limb.
- It articulates proximally with the scapula at the scapulohumeral (glenohumeral) joint.
- It articulates distally with the ulna at the elbow joint.

**Diagram:**
- **Dorsal tubercle of radius**
- **Ulnar notch**
- **Extensor CARPI RADIALIS LONGUS and BREVIS**
- **Extensor POLLICIS LONGUS**
- **Extensor DIGITORUM and extensor INDICES**
The Ulna

- The ulna is a medial long bone, the longer of the two in the forearm.
  - Proximally, it articulates with the capitulum and trochlea of the humerus;
  - At the radial notch, it articulates with the head of radius
- It stabilizes the forearm
- The HEAD LIES DISTALLY.

Humerus and ulna: landmarks and articulations

- The humerus is a long bone, the largest in the upper limb
- It articulates proximally with the scapula at the scapulohumeral (glenohumeral) joint
- It articulates distally with the ulna at the elbow joint
- The ulna and humerus articulate at the elbow joint
- The articulations include:
  - Articulation between the trochlea of the humerus and the trochlear notch of the ulna
  - Articulation of the olecranon process and the olecranon fossa during extension
  - Articulation of the coronoid process and the coronoid fossa during flexion
- The surface landmarks include
  - The medial and lateral epicondyle
  - The olecranon
  - The posterior border of the ulna

Bony features include:
- Olecranon
- Trochlear notch
- Coronoid process
- Radial notch
- Tuberosity of ulna
- Supinator fossa
- Supinator crest
- Head of ulna
- Ulnar styloid process
The Articulated Carpus

- the humerus is a long bone, the largest in the upper limb
- it articulates proximally with the scapula at the scapulohumeral (glenohumeral) joint
- it articulates distally with the ulna at the elbow joint
- the carpals are eight bones arranged in two rows
- the carpus is convex anteriorly and concave posteriorly
- these bones glide on each other, as well as the two rows gliding on each other, as well as gliding along the radiocarpal joint.
- Some Lovers Try Positions That They Cant Handle:
  Scaphoid, Lunate, Triquetrum, Pisiform, Trapezium, Trapezoid, Capitate, Hamate.

The scaphoid, linate and triquetrum articulate with the radius.