THE HUMERUS

This bone is a typical long bone. It forms through cartilage ossification.

It forms the main bone of the arm.

To identify the right or left side:

1. The upper end has a rounded head like half a ball.
2. The lower end has the trochlea and capitulum.
3. The medial side shows the head, which points inward.
4. The posterior surface has a deep olecranon fossa at the lower end.

GENERAL FEATURES OF THE HUMERUS

The humerus has a shaft and two wider ends: upper and lower.

1. THE UPPER END (head, two tuberosities, and two necks)

A. Head of the humerus:

a. It forms less than half a sphere. Articular cartilage covers it in the body.

b. It points upward, medial, and backward.

c. It joins the glenoid cavity of the scapula at the shoulder joint.

B. Anatomical neck:

a. This narrow part sits near the head's edges. It separates the head from the tuberosities.

b. The shoulder joint capsule attaches here. Except medially, where it drops 1 cm to the surgical neck.

C. Surgical neck:

a. Fibrous capsule of the shoulder joint attaches here.

b. It joins the upper end to the shaft.

c. It sits one finger width below the head and tuberosities.

d. The circumflex nerve and posterior circumflex humeral vessels lie medial to it.

D. Lesser tuberosity:

1. It sticks out forward. It lies medial to the intertubercular sulcus.
2. The upper part has one facet for the subscapularis muscle.
3. Its lateral edge joins the medial lip of the bicipital groove.

E. Greater tuberosity:

1. It sits on the lateral part of the upper end.
2. The anterior margin joins the lateral lip of the bicipital groove below. The medial edge lies 10 mm lateral to the humeral canal axis. The superior edge sits 6 mm below the head's upper edge.
3. It has three facets on upper and posterior sides for muscle attachments.

F. Intertubercular sulcus (bicipital groove):

1. It runs between the tuberosities. It reaches the upper third of the shaft.
2. It has a floor and two lips (medial and lateral) for muscle attachments.
3. The transverse humeral ligament bridges its upper part.

THE LOWER END

A. Articular parts:

These include the trochlea and capitulum. They act as condyles of the lower end.

1. Trochlea:

a. This pulley-shaped process covers anterior, inferior, and posterior parts of the medial articular area.

b. It joins the trochlear notch of the ulna.

c. The medial lip extends lower than the lateral lip.

2. Capitulum:

a. This small ball-shaped process sits lateral to the trochlea.

b. It covers only anterior and inferior surfaces of the lateral articular area.

c. It joins the head of the radius.

B. Epicondyles:

1. Medial epicondyle:

a. It projects from the medial side of the lower end.

b. It stands out more than the lateral one. It lies just under the skin.

c. The anterior surface has a rough spot for muscle attachment.

d. The posterior surface may have a shallow groove for the ulnar nerve.

2. Lateral epicondyle:

a. It projects from the lateral side of the lower end. It is less prominent.

b. Anterior and lateral surfaces have rough spots for muscle attachments.

C. The three fossae:

1. Olecranon fossa:

a. This deep pit sits on the posterior surface above the trochlea.

b. It holds the olecranon tip of the ulna when the elbow extends.

2. Radial fossa:

a. This shallow pit lies on the anterior surface above the capitulum.

b. It takes the edge of the radius head in full elbow flexion.

3. Coronoid fossa:

a. This shallow pit sits above the trochlea on the anterior surface.

b. It takes the coronoid process tip of the ulna in full elbow flexion.

The Shaft of the Humerus

It features three borders and three surfaces.
The top 1.5 inches show a round cross-section. The bottom 1.5 inches form a triangle.

Borders of the Humerus

1. Anterior border:
   The upper part makes the lateral lip of the bicipital groove.
   The middle part sets the front edge of the deltoid tuberosity.
   The lower part stays smooth and rounded.
2. Medial border:
   It runs from the lesser tuberosity at the top to the medial epicondyle at the bottom.
   The upper part lacks a clear edge. The lower end sits above the medial epicondyle. It stands out and forms the medial supracondylar ridge.
3. Lateral border:
   It stretches from the back of the greater tuberosity above to the lateral epicondyle below.
   The lower part stands out. It forms the lateral supracondylar ridge.

Surfaces of the Humerus

1. Anteromedial surface:
   It sits between the anterior and medial borders.
   The upper third holds the bicipital groove. This groove has a floor and two lips—lateral and medial.

Just below the middle, a nutrient foramen appears. It points downward.

2. Anterolateral surface:
   It lies between the anterior and lateral borders.
   The middle area has a V-shaped rough patch. This forms the deltoid tuberosity.
3. Posterior surface:
   It rests between the medial and lateral borders.
   The upper third has an oblique ridge. The ridge runs downward and outward.
   The middle third crosses the spiral groove. This groove holds the radial nerve. It runs downward and outward.

Angles of the Humerus

1. Carrying angle:
   This angle forms between the arm's long axis and the forearm's long axis. It measures about 165 degrees.
   The medial lip of the trochlea sticks down. This tilts the ulna outward.
2. Angle of torsion:
   This angle sits between the long axis of the upper end and the lower end of the humerus. It also measures 165 degrees.

Nerves Related to the Humerus

1. Circumflex (axillary) nerve:
   With circumflex vessels, it curves around the surgical neck.

2. Radial nerve:
   With profunda brachii vessels, it travels in the spiral groove of the humerus.
3. Ulnar nerve:
   With superior ulnar collateral vessels, it passes behind the medial epicondyle.

Note on the radial nerve: These nerves face injury risk in humerus fractures. They lie close to the bone.