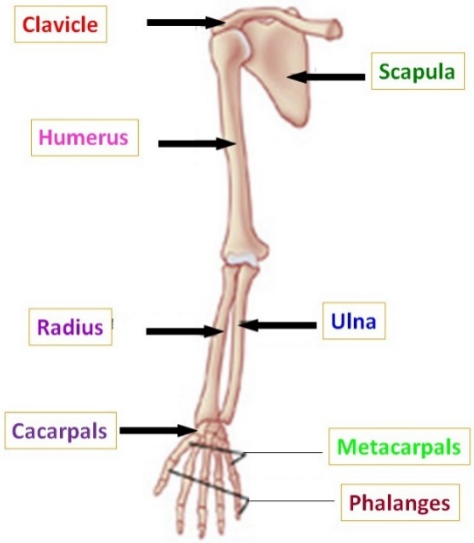
❖ Appendicular skeleton

- ➢ Shoulder (Pectoral girdle) girdles
- ➢ Upper extremities
- ➢ Pelvic girdle
- ➢ Lower extremities



- ➢ Shoulder (Pectoral girdle) girdles
  - ☒ Clavicle 2
  - ☒ Scapula 2
- ➢ Upper extremities
  - ☒ Humerus 2
  - ☒ Radius 2
  - ☒ Ulna 2
  - ☒ Carpals 16
  - ☒ Metacarpals 10
  - ☒ Phalanges 28

➢ Bones of the Shoulder (Pectoral girdle)girdles

The shoulder girdle consists of the clavicle and the scapula, which articulate with one another at the acromioclavicular joint.

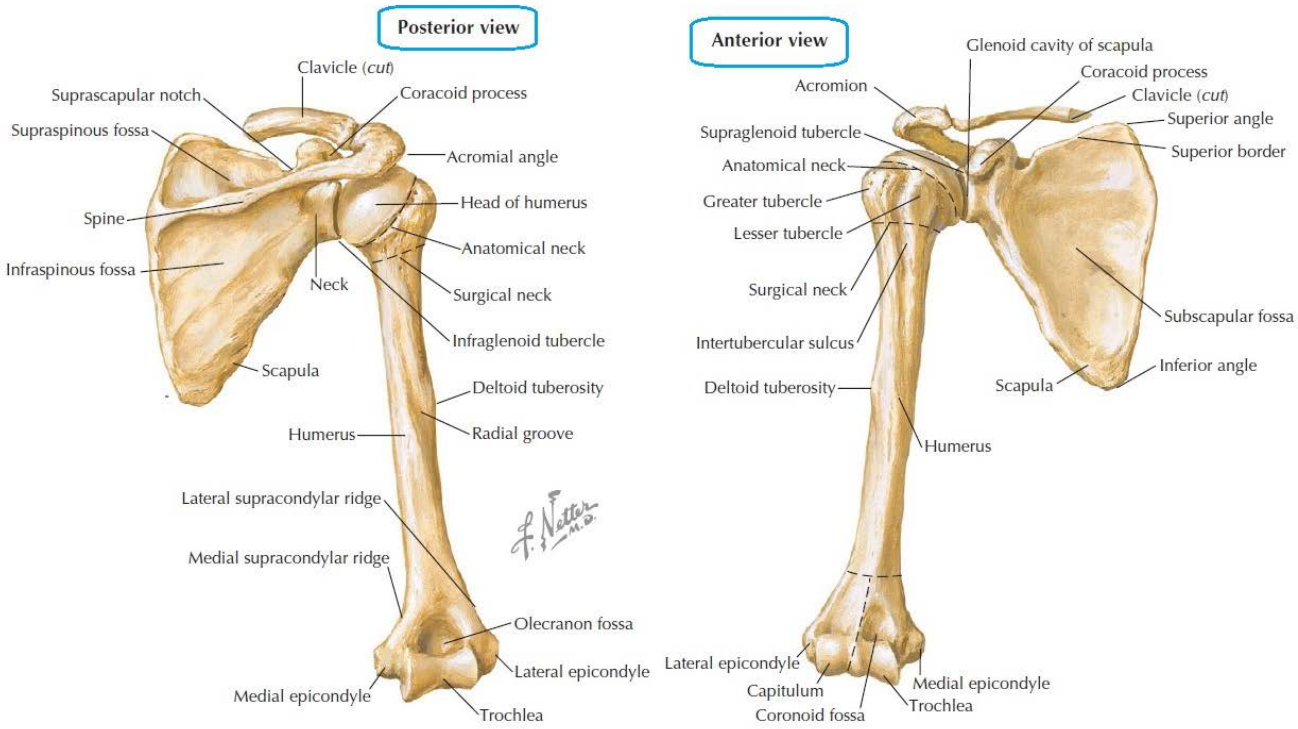
☒ Clavicle

The clavicle is a long, slender bone that lies horizontally across the root of the neck just beneath the skin. It articulates with the sternum and 1st costal cartilage medially and with the acromion process of the scapula laterally.

☒ Scapula

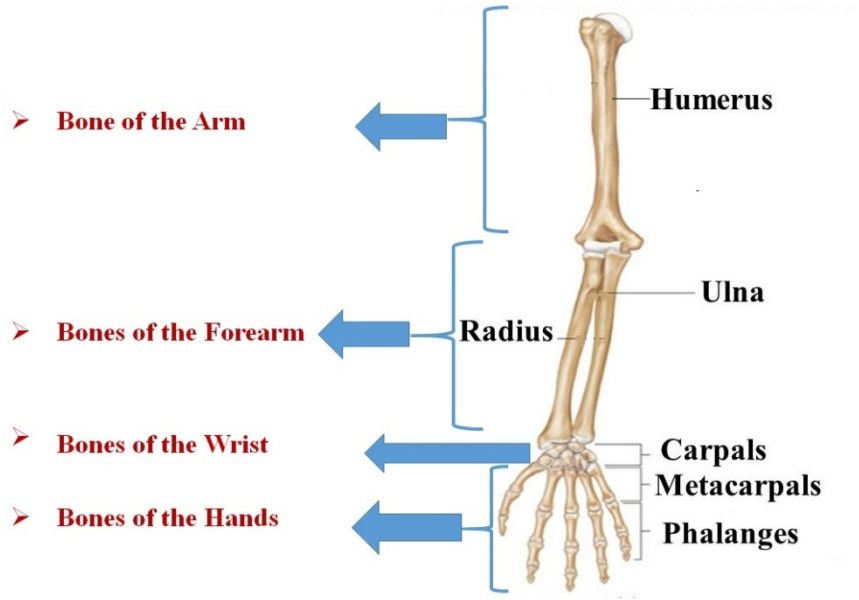
The scapula is a flat triangular bone that lies on the posterior chest wall. On its posterior surface, the **spine of the scapula** projects backward.

The lateral end of the spine is free and forms the **acromion,**which articulates with the clavicle. The superolateral angle of the scapula forms the pear-shaped **glenoid cavity,** or **fossa,** which articulates with the head of the humerus atthe shoulder joint. The anterior surface of the scapula is concave and forms the shallow **subscapular fossa.** The posterior surface of thes capula is divided by the spine into the **supraspinous fossa** above and an **infraspinous fossa** below.



➢ Upper extremities

The bones of the upper extremities is divided into: bone of the arm, bones of forearm, bones of the wrist and bones of the hand.

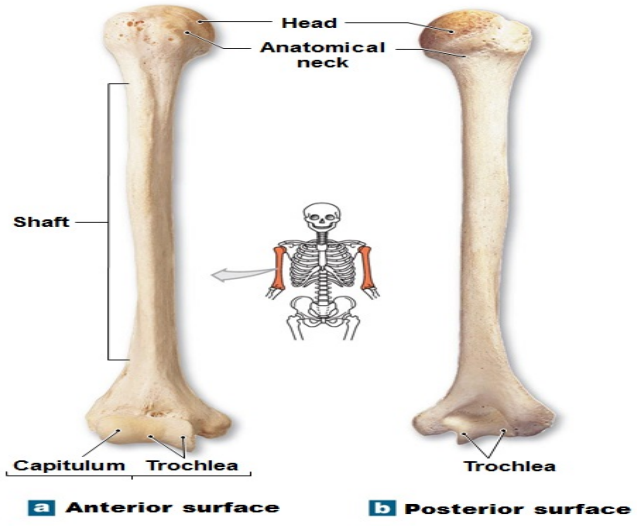


❖ **Bone of the arm**

☒ Humerus

The humerus articulates with the scapula at the **shoulder joint** and with the radius and ulna at the **elbow joint**. The upper end of the humerus has a **head** and articulates with the glenoid cavity of the scapula. Immediately below the head is the **anatomic neck.**

The lower end of the humerus possesses the rounded **capitulum** for articulation with the head of the radius, and the pulley-shaped **trochlea** for articulation with the trochlear notch of the ulna.



❖ Bones of the Forearm

The forearm contains two bones: the radius and the ulna.

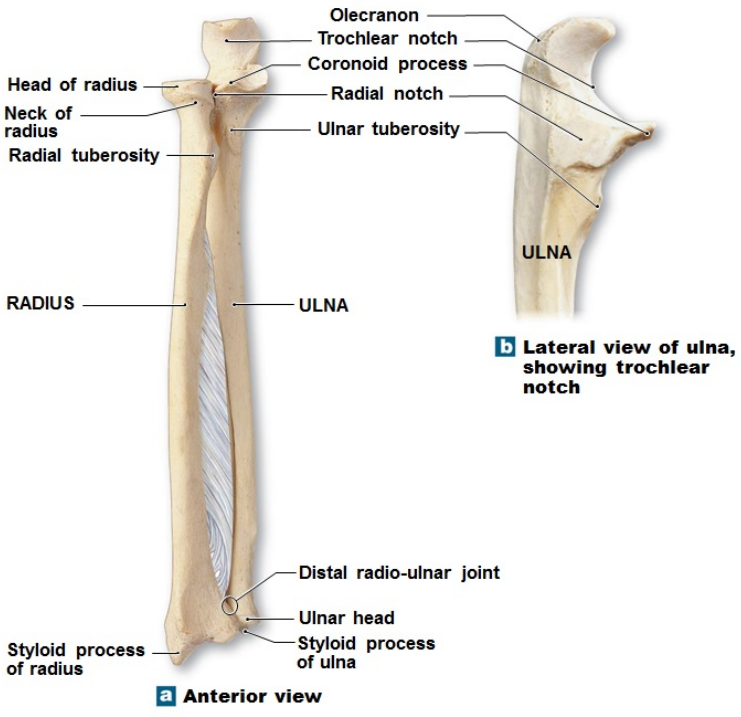
☒ Radius

The radius is the *lateral bone* of the forearm.

Its proximal end articulates with the humerus at the elbow joint and with the ulna at the proximal radioulnar joint. Its distal end articulates with the scaphoid and lunate bones of the wrist at the wrist joint and with the ulna at the distal radioulnar joint.

At the proximal end of the radius is the small circular **head.**The upper surface of the head is concave and articulates with the convex capitulum of the humerus.

At the distal end of the radius is the styloid process; this projects distally from its *lateral* margin. On the *medial* surface is the ulnar notch, which articulates with the round head of the ulna.

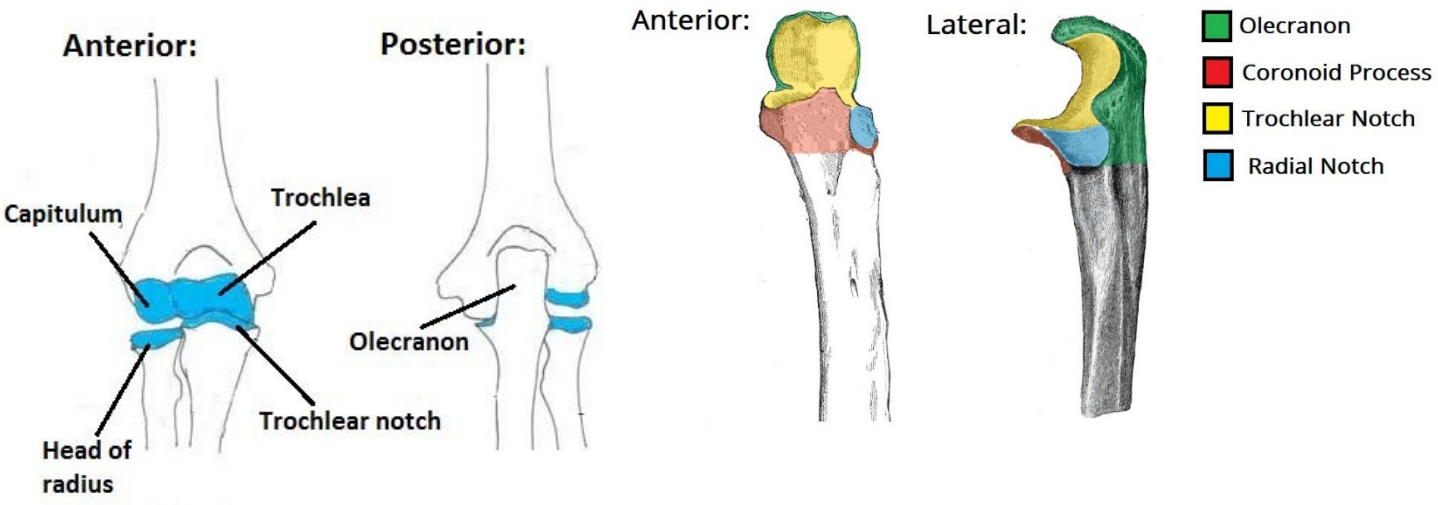


☒ Ulna

The ulna is the *medial bone* of the forearm. Its proximal end articulates with the humerus at the elbow joint and with the head of the radius at the proximal radioulnar joint. Its distal end articulates with the radius at the distal radioulnar joint.

The proximal end of the ulna is large and is known asthe **olecranon process;** this forms the prominence of the elbow. It has a notch on its anterior surface,the **trochlear notch,** which articulates with the trochlea of the humerus.

At the distal end of the ulna is the small rounded head, which has projecting from its medial aspect the styloid process.

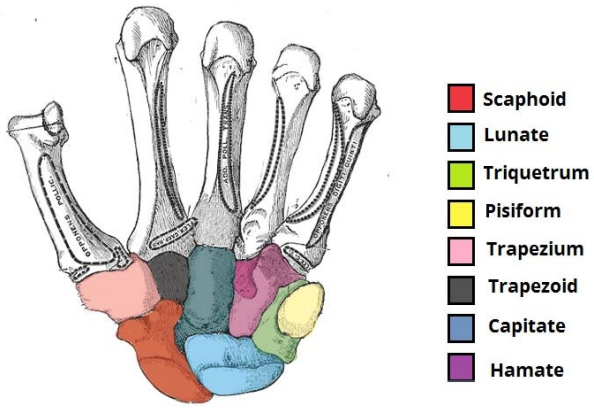


❖ Bones of the Wrist

The wrist connects the hand to the forearm and is composed of eight **carpal bones** aligned in a proximal and distal row (four carpals in each row).

The **proximal row** consists of (from lateral to medial) the **scaphoid, lunate, triquetral,** and **pisiform** bones.

The **distal row** consists of (from lateral to medial) the **trapezium, trapezoid, capitate,** and **hamate** bones.



❖ Bones of the Hand

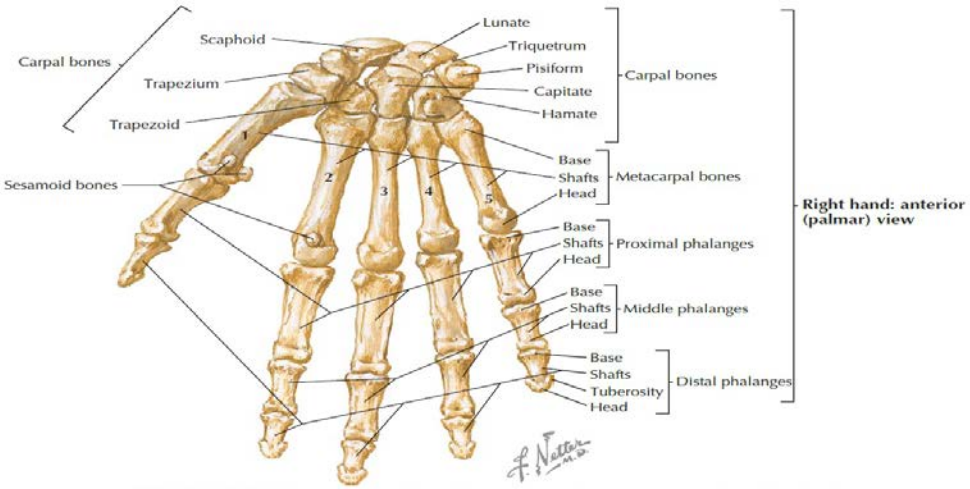
The hand includes the metacarpus (the palm, with five **metacarpal bones**) and five digits with their **phalanges.**

☒ The Metacarpals

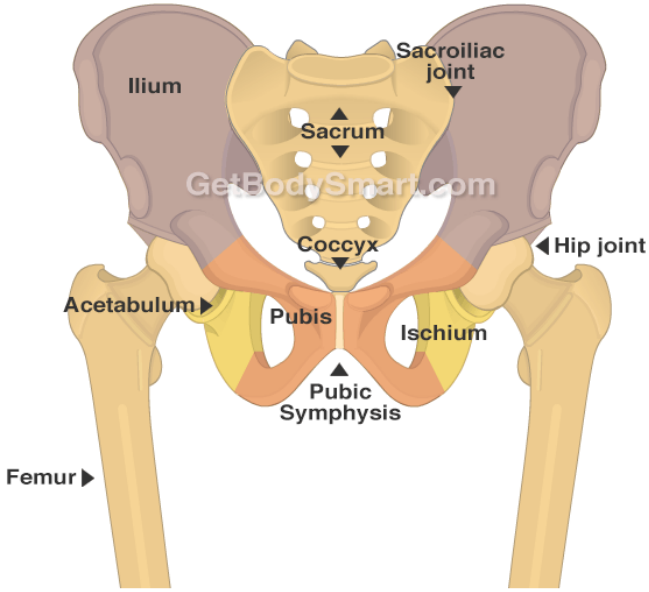
There are <u>five metacarpal bones</u>, each of which has a **base,a shaft, and a head.**
The first metacarpal bone of the thumb is the <u>shortest</u> and <u>most mobile</u>.
The bases of the metacarpal bones articulate with the distal row of the carpal bones; the heads, which form the knuckles, articulate with the proximal phalanges.

☒ The Phalanges

There are <u>three phalanges</u> for each of the fingers but <u>only two for the thumb.</u>It's termed **proximal, middle, and distal phalanges** and possess **base, shaft, and head**.



- **Pelvic girdle**
  - ☒ **Hip bone 2**
- **Lower extremities**
  - ☒ **Femur 2**
  - ☒ **Patella 2**
  - ☒ **Fibula 2**
  - ☒ **Tibia 2**
  - ☒ **Tarsals 14**
  - ☒ **Metatarsals 10**
  - ☒ **Phalanges 28**



- **Pelvic girdle**

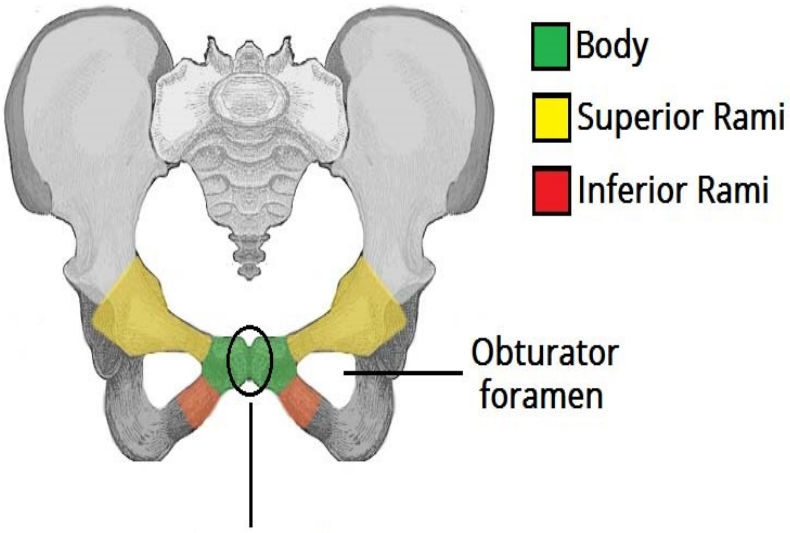
☒ Hip Bone

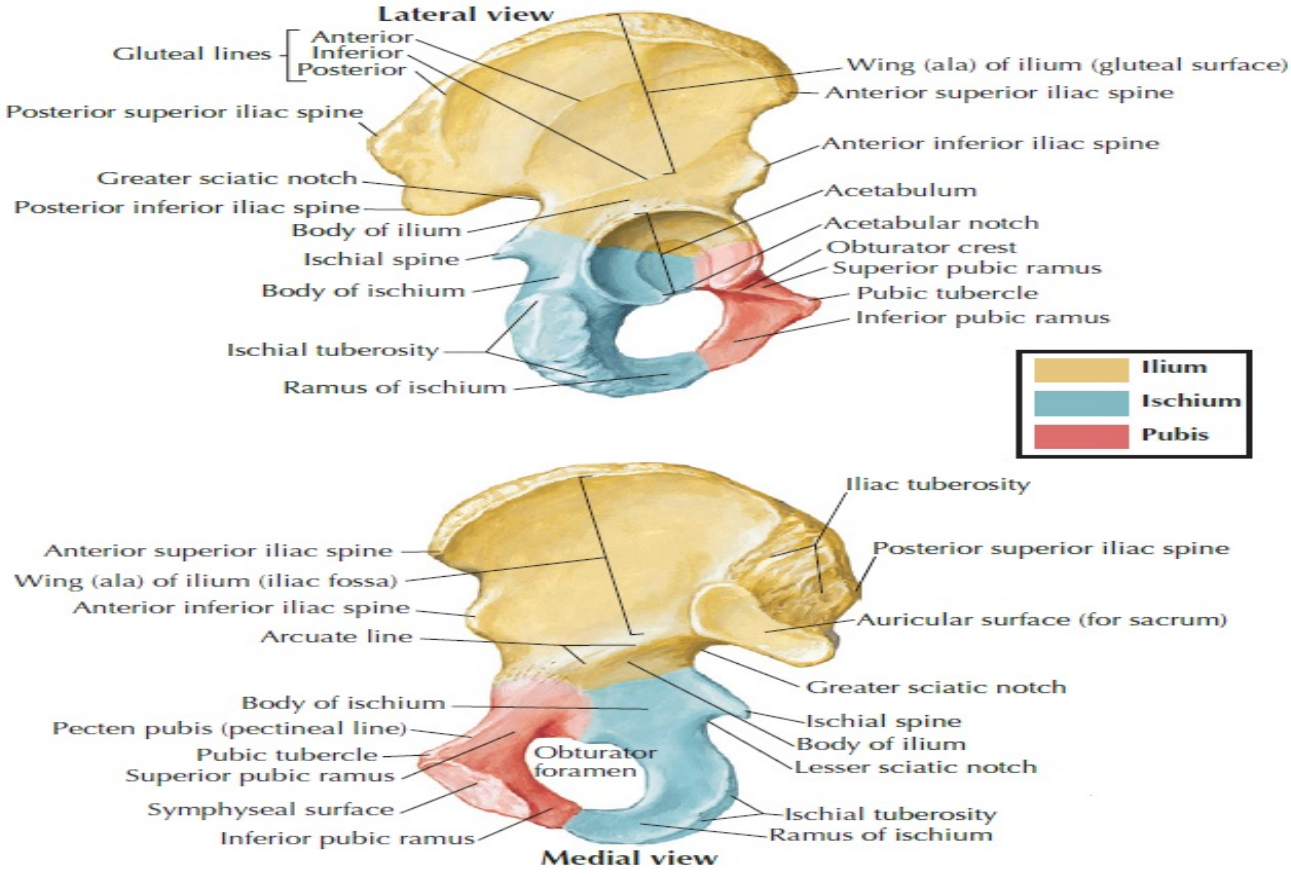
The **ilium, ischium, and pubis** form the hip bone. They meet one another at the **acetabulum**. The hip bones articulate with the sacrum at the sacroiliac joints; they also articulate with one another anteriorly at the symphysis pubis.

- The **ilium,**which is the upper flattened part of the bone, possesses the **iliac crest**. This can be felt through the skin along its entire length; it ends in front at the **anterior superior iliac spine** and behind at the **posterior superior iliac spine.** Below the anterior superior iliac spine is a prominence, the **anterior inferior iliac spine;** a similar prominence, the **posterior inferior iliac spine,** is located below the posterior superioriliac spine.

- The **ischium**is L shaped, possessing an upper thicker part, the **body,** and a lower thinner part, the **ramus**.
- The **pubis** can be divided into a **body,** a **superior ramus,** and an **inferior ramus**. The bodies of the two pubic bones articulate with each other in the midline anteriorly at the **symphysis pubis;** the superior ramus joins the ilium and ischium at the acetabulum, and the inferior ramus joins the ischial ramus below the **obturator foramen.** The obturator foramen in life is filled in by the **obturator membrane**.

On the outer surface of the hip bone is a deep depression,called the **acetabulum,** which articulates with the almost spherical head of the femur to form the hip joint.


Body
Superior Rami
Inferior Rami
Obturator foramen
Pubic symphysis

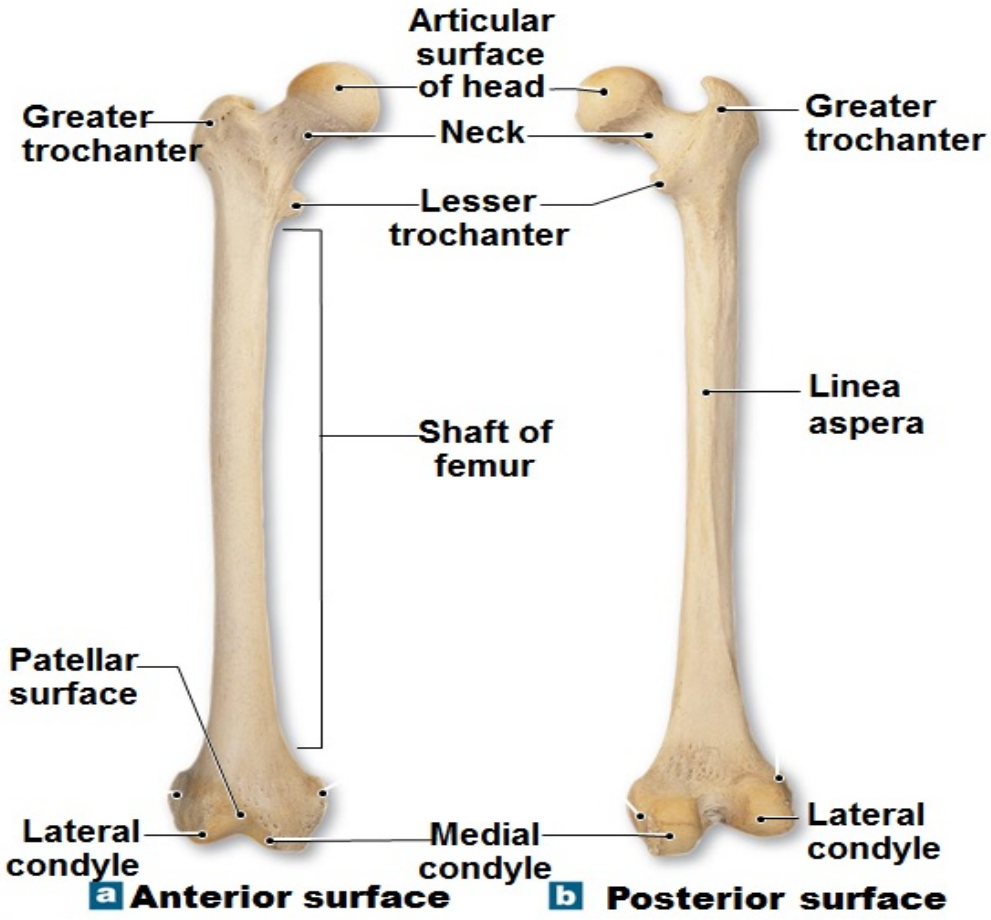

Lateral view
Gluteal lines
Anterior
Inferior
Posterior
Posterior superior iliac spine
Greater sciatic notch
Posterior inferior iliac spine
Body of ilium
Ischial spine
Body of ischium
Ischial tuberosity
Ramus of ischium
Wing (ala) of ilium (gluteal surface)
Anterior superior iliac spine
Anterior inferior iliac spine
Acetabulum
Acetabular notch
Obturator crest
Superior pubic ramus
Pubic tubercle
Inferior pubic ramus
Ilium
Ischium
Pubis
Iliac tuberosity
Anterior superior iliac spine
Wing (ala) of ilium (iliac fossa)
Anterior inferior iliac spine
Arcuate line
Body of ischium
Pecten pubis (pectineal line)
Pubic tubercle
Superior pubic ramus
Symphyseal surface
Inferior pubic ramus
Obturator foramen
Posterior superior iliac spine
Auricular surface (for sacrum)
Greater sciatic notch
Ischial spine
Body of ilium
Lesser sciatic notch
Ischial tuberosity
Ramus of ischium
Medial view

Lower extremities

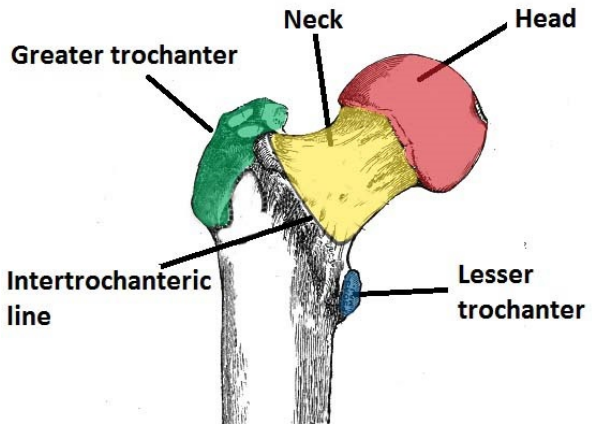
☒ Femur

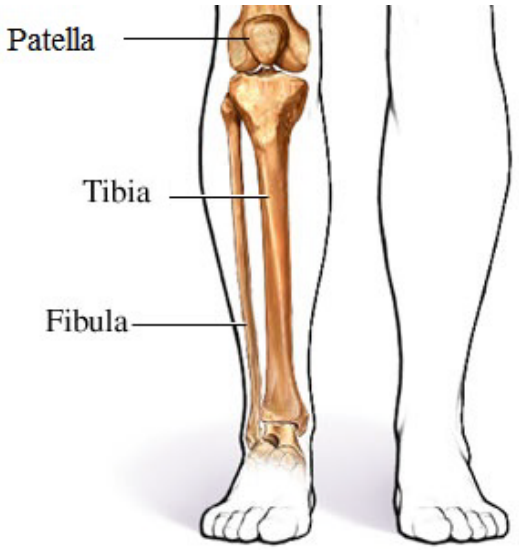
The femur **articulates above** with the acetabulum to form the hip joint and **below** with the tibia and the patella to form the knee joint.

➔ The upper end of the femur has a head, a neck, and greater and lesser trochanters.



➔ The lower end of the femur has **lateral** and **medial** condyles, separated posteriorly by the **intercondylar notch.** The anterior surfaces of the condyles are joined by an articular surface for the patella. The two condyles take part in the formation of the knee joint.





Patella

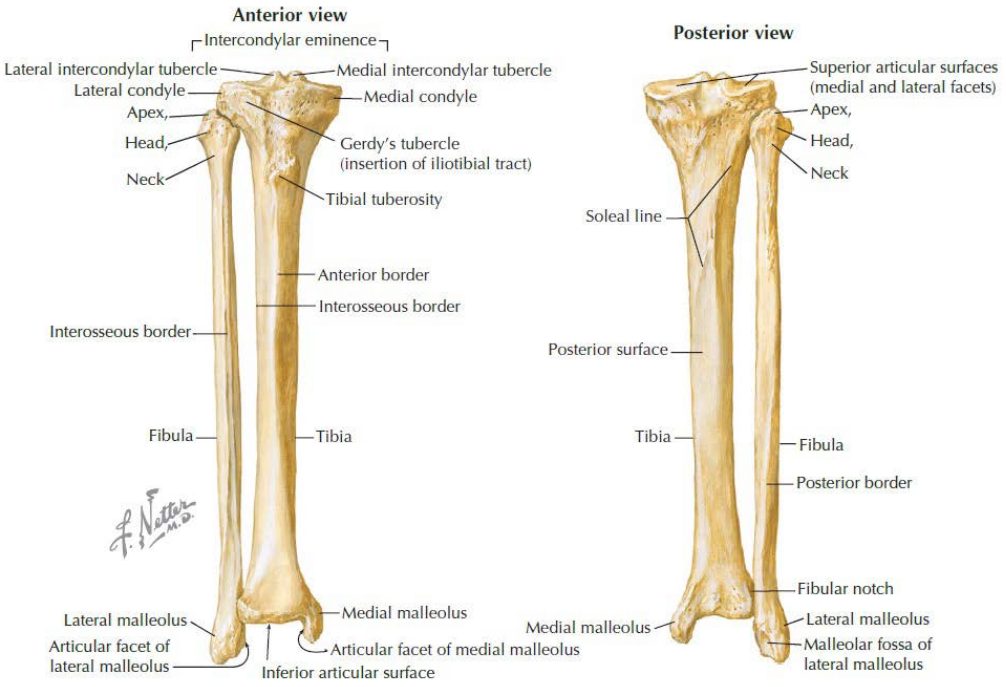
The patella is the largest sesamoid bone.The posterior surface articulates with the condyles of the femur. The patella is situated in an exposed position infront of the knee joint and can easily be palpated through the skin. It is separated from the skin by an important subcutaneous bursa.

Tibia

The tibia is the large weight-bearing medial bone of the leg. It articulates with the condyles of the femur and the head of the fibula above and with the talus and the distal end of the fibula below. It has an expanded **upper end**, a smaller **lower end**, and a **shaft**.

At the **upper end** are the **lateral** and **medial condyles** ,which articulate with the lateral and medial condyles of the femur. The lateral condyle possesses on its lateral aspect a small **circular articular facet for the head of the fibula**.

The **lower end** of the tibia is slightly expanded and on its inferior aspect shows a saddle-shaped articular surfacefor the talus. The lower end is prolonged downward mediallyto form the **medial malleolus**. The lateral surface of the medial malleolus articulates with the talus. The lower end of the tibia shows a wide, rough depression on its lateral surface for articulation with the fibula.



Fibula

The fibula is the slender lateral bone of the leg. It takes no part in the articulation at the knee joint, but below it forms the lateral malleolus of the ankle joint

The **upper end,** or **head,** is surmounted by a **styloid process**. It possesses an **articular surface** for articulation with the lateral condyle of the tibia.

➔ The **shaft of the fibula**

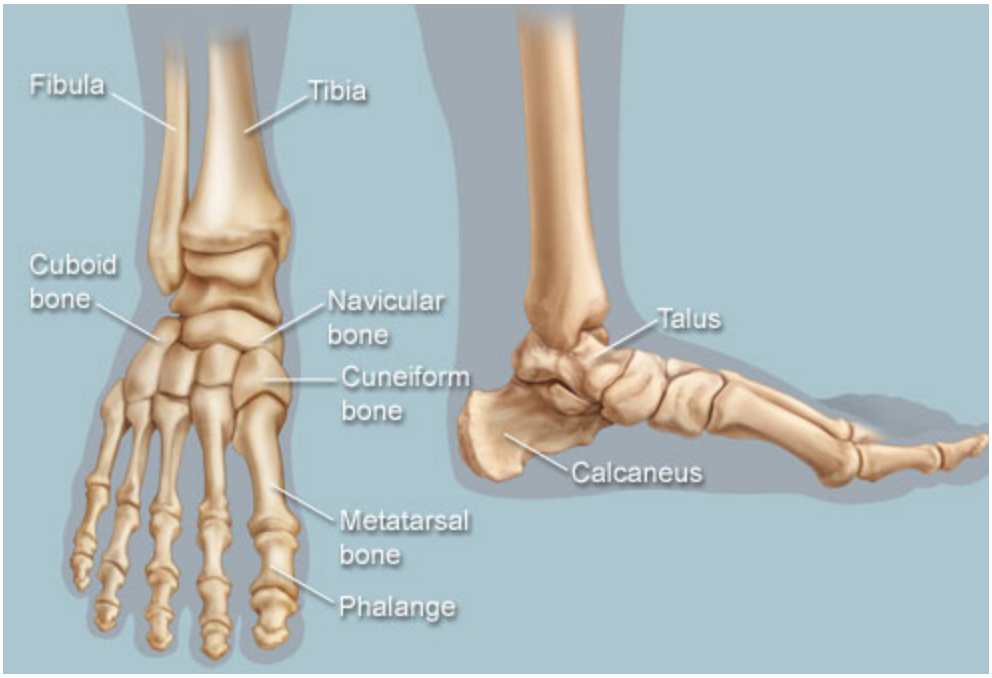
➔ The **lower end of the fibula** forms the triangular lateral malleolus, which is subcutaneous. On the medial surface of the lateral malleolus is a triangular **articular facet** for articulation with the lateral aspect of the talus.

❖ Bones of the Foot

The bones of the foot are the **tarsal bones,** the **metatarsals,** and the **phalanges**.

☒ Tarsal Bones

The tarsal bones are the calcaneum, the talus, the navicular,the cuboid, and the three cuneiform bones. Only the talus articulates with the tibia and the fibula at the ankle joint.



☒ Metatarsal Bones and Phalanges

The metatarsal bones and phalanges resemble the metacarpals and phalanges of the hand, and each possesses a **head** distally, a **shaft,** and a **base** proximally.
The five metatarsals are numbered from the medial to the lateral side.
Each toe has three phalanges except the big toe, which possesses only two.