AXIAL / APPENDICULAR SKELETON

CN: Use light but contrasting colors for A and B. (1.)
* (1) Color the axial skeleton (A) in all three views. Do not color the spaces between the ribs (intercostal).
(2) Color the darker, outlined appendicular skeleton (B).
(3) Color the arrows identifying bone shape/classification.

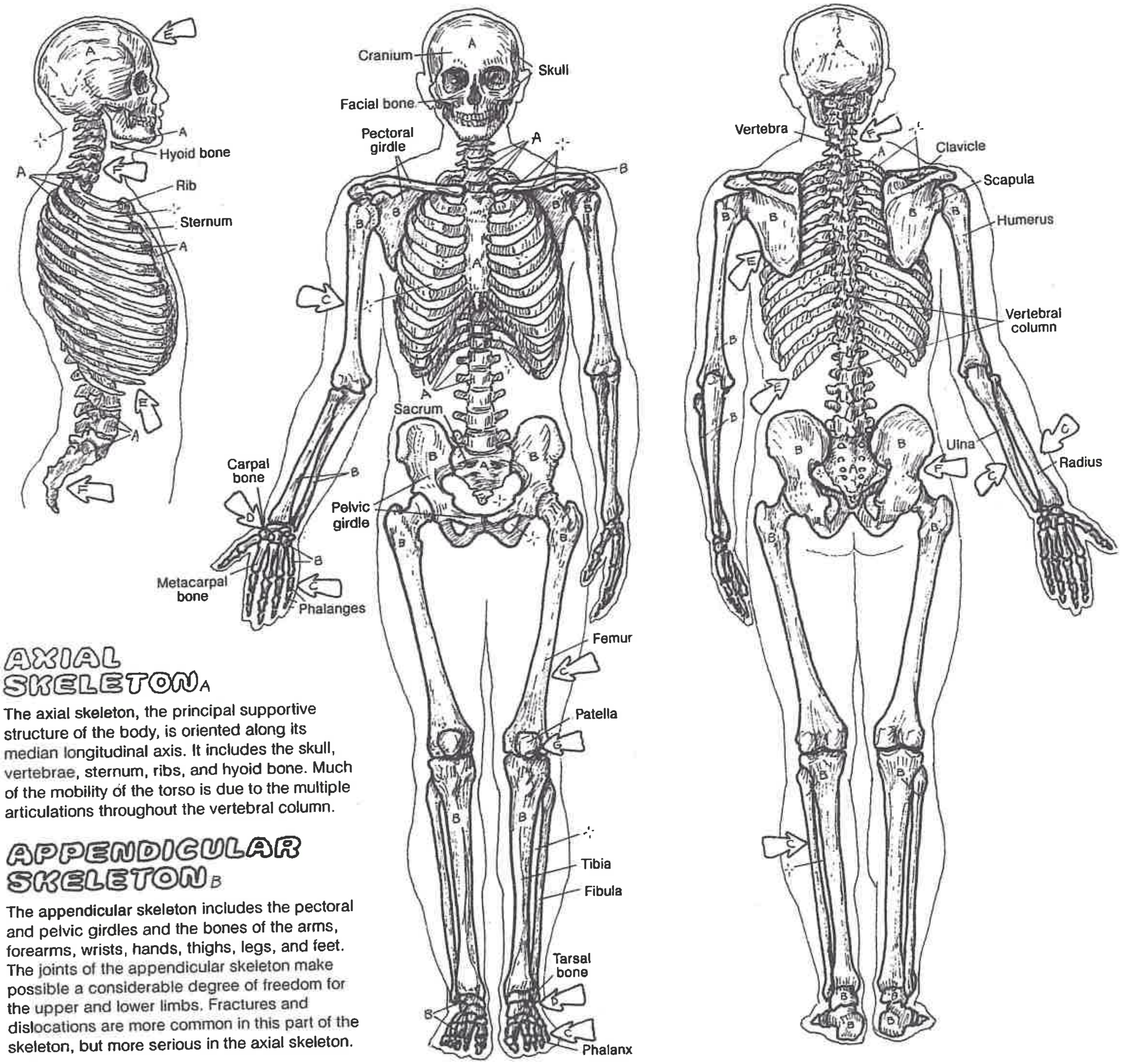
CLASSIFICATION OF BONES -¦- (2.)

LONG C
SHORT D
FLAT E
IRREGULAR F
SESAMOID G

Color the arrows

Bones have a variety of shapes and defy classification by shape; yet such a classification historically exists. *Long bones* are clearly longer in one axis than in another; they are characterized by a medullary cavity, a hollow diaphysis of compact bone, and at least two epiphyses—e.g., femur, phalanx. *Short bones* are roughly cube-shaped; they are predominantly cancellous bone with a thin cortex of compact bone and have no cavity—e.g., carpal and tarsal bones. *Flat bones* (cranial bones, scapulae, ribs) are generally more flat than round, and *irregular bones* (vertebrae) have two or more different shapes. Bones not specifically long or short fit this latter category. *Sesamoid bones* are developed in tendons (e.g., patellar tendon); they are mostly bone, often mixed with fibrous tissue and cartilage. They have a cartilaginous articular surface facing an articular surface of an adjacent bone; they may be part of a synovial joint ensheathed within the fibrous joint capsule. The structures are generally pea-sized and are most commonly found in certain tendons/joint capsules in hands and feet, and occasionally in other articular sites of the upper and lower limbs. The largest is the patella, integrated in the tendon of quadriceps femoris. Sesamoid bones resist friction and compression, enhance joint movement, and may assist local circulation.

Remember, -¦- means do not color.



AXIAL SKELETON A

The axial skeleton, the principal supportive structure of the body, is oriented along its median longitudinal axis. It includes the skull, vertebrae, sternum, ribs, and hyoid bone. Much of the mobility of the torso is due to the multiple articulations throughout the vertebral column.

APPENDICULAR SKELETON B

The appendicular skeleton includes the pectoral and pelvic girdles and the bones of the arms, forearms, wrists, hands, thighs, legs, and feet. The joints of the appendicular skeleton make possible a considerable degree of freedom for the upper and lower limbs. Fractures and dislocations are more common in this part of the skeleton, but more serious in the axial skeleton.

BONES OF THE SKULL (1)

8 CRANIAL +

OCCIPITAL A 2 PARIETAL B FRONTAL C

2 TEMPORAL D ETHMOID E SPHENOID F

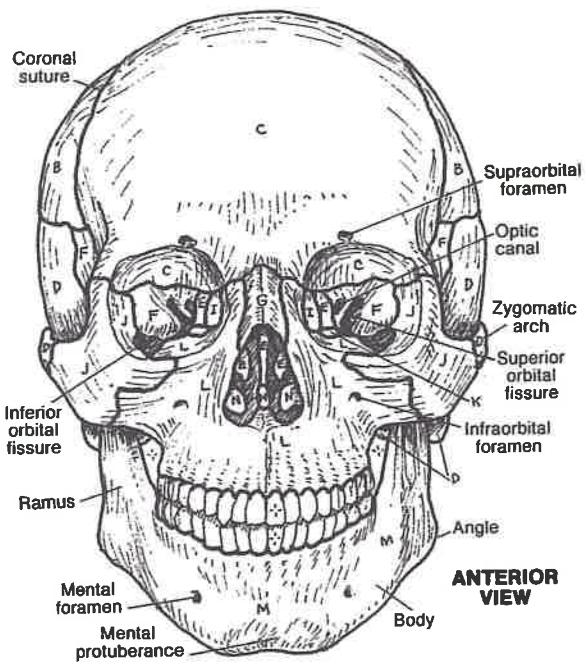
14 FACIAL +

2 NASAL G VOMER H 2 LACRIMAL I

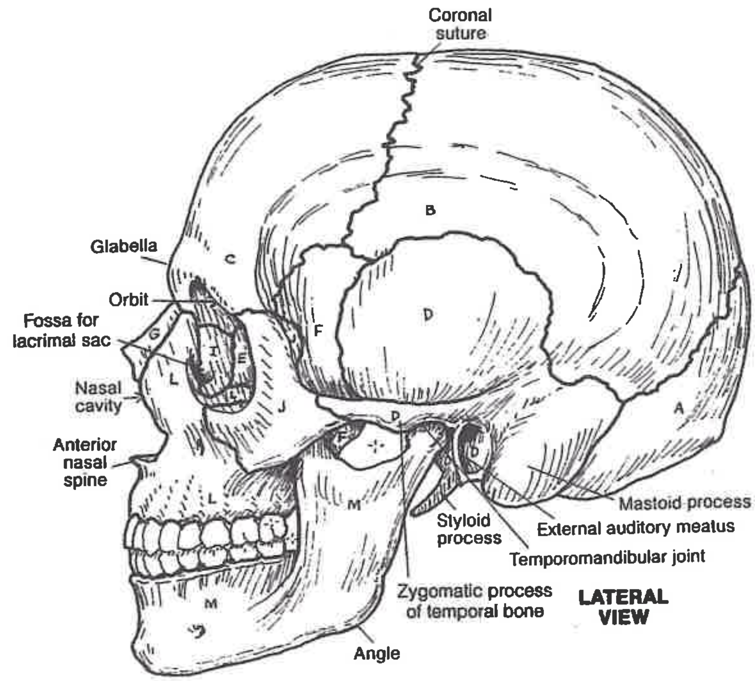
2 ZYGOMATIC J 2 PALATINE K 2 MAXILLA L

MANDIBLE M ~~2 INFERIOR NASAL CONCHA~~ N

CN: Save the brightest colors for the smallest bones and the lightest colors for the largest. (1) Color one bone in as many views as it appears before going on to the next. (2) There are some very small bones to color in the orbits and in the lower part of the posterior view of the skull. Study these areas carefully before coloring to determine the color boundaries. (3) Do not color the darkened areas in the orbits and nasal cavity in the anterior view.



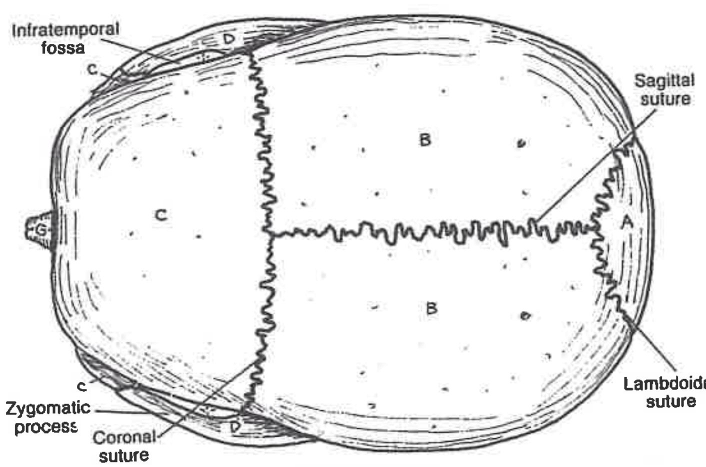
ANTERIOR VIEW



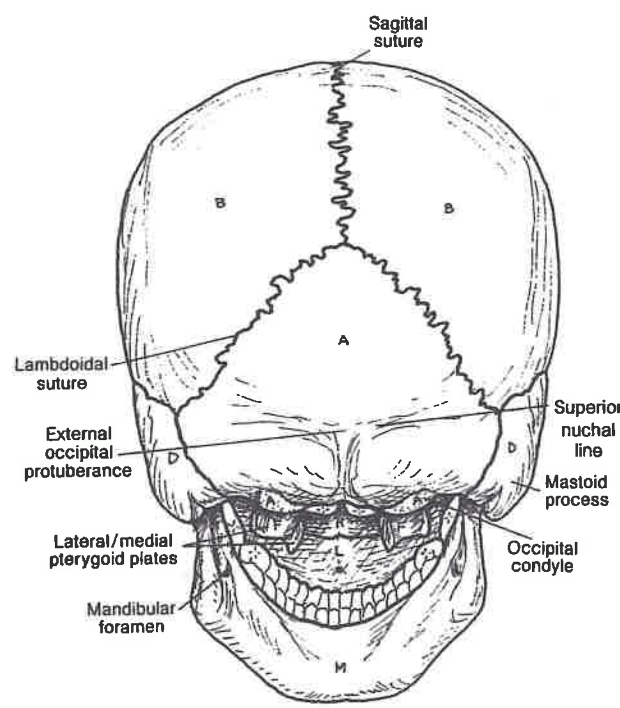
LATERAL VIEW

The skull is composed of *cranial bones* (forming a vault for the brain) and *facial bones* (giving origin to the muscles of facial expression and providing buttresses protecting the brain). Except for the temporomandibular joint (a synovial joint), all bones are connected by generally immovable fibrous sutures.

The orbit is composed of seven bones, has three significant fissures/canals, and is home to the eye and related muscles, nerves, and vessels. The most delicate of the skull bones is at the medial orbital wall. The external nose is largely cartilaginous and is therefore not part of the bony skull.



SUPERIOR VIEW



POSTERIOR VIEW

VERTEBRAL COLUMN

(1) Begin with regions of the column.

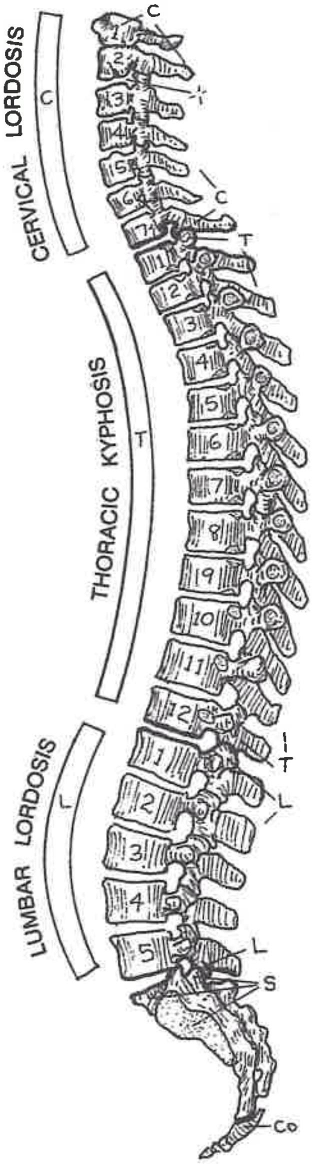
Color the same color as letter G on pg. 30

REGIONS
CERVICAL C
THORACIC T
LUMBAR L
SACRAL S
COCCYGEAL Co

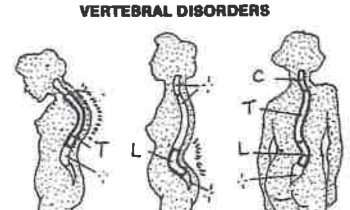
The vertebral column has 24 individual vertebrae arranged in *cervical, thoracic,* and *lumbar* regions; the *sacral* and *coccygeal* vertebrae are fused (sacrum/coccyx). Numbers of vertebrae in each region are remarkably constant; rarely S1 may be free or L5 may be fused to the sacrum (transitional vertebrae). The seven mobile cervical vertebrae support the neck and the 3–4 kg (6–8 lb) head. The cervical spine is normally curved (*cervical lordosis*) secondary to the development of postural reflexes about three months after birth. The 12 thoracic vertebrae support the thorax, head, and neck. They articulate with 12 ribs bilaterally. The thoracic spine is congenitally curved (*kyphosis*) as shown.

The five lumbar vertebrae support the upper body, torso, and low back. The column of these vertebrae becomes curved (*lumbar lordosis*) at the onset of walking at 1–2 years of age. The sacrum is the keystone of a weightbearing arch involving the hip bones. The sacral/coccygeal curve is congenital. The variably numbered 1–5 coccygeal vertebrae are usually fused, although the first vertebra may be movable.

Vertebral curvatures may be affected (usually exaggerated) by posture, activity, obesity, pregnancy, trauma, and/or disease; these conditions are given the same names as the normal curves. A slight lateral curvature to the spine often reflects dominant handedness; a significant, possibly disabling, lateral curve (*scoliosis*) may occur for many reasons.



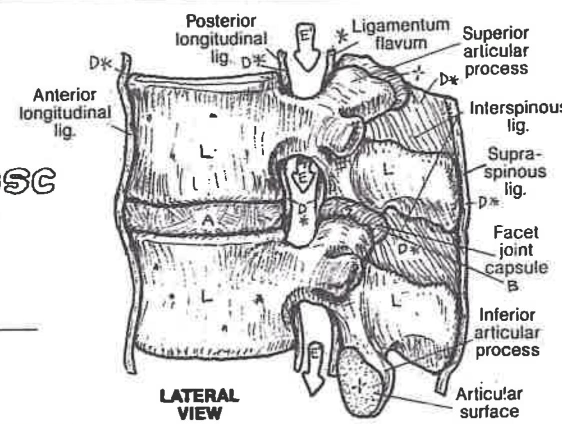
VERTEBRAL DISORDERS



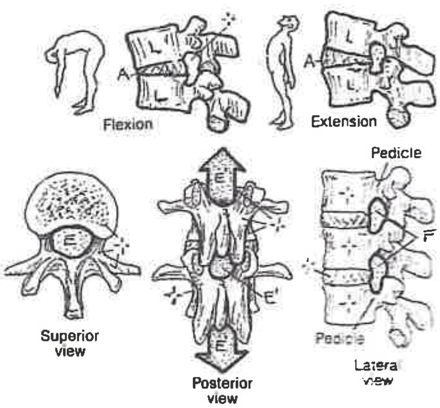
KYPHOSIS LORDOSIS SCOLIOSIS

MOTION SEGMENT
VERTEBRA L
JOINTS:
INTERVERTEBRAL DISC
POSTERIOR (FACET)
LIGAMENT
VERTEBRA L

VERTEBRAL FORAMEN
VERTEBRAL CANAL
INTERVERTEBRAL FORAMEN

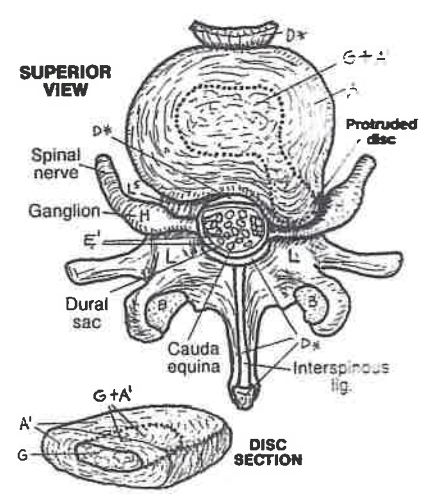


Each pair of individual, unfused vertebrae constitutes a *motion segment*, the basic movable unit of the back. Combined movements of motion segments underlie movement of the neck and the middle and low back. Each pair of vertebrae in a motion segment, except C1–C2, is attached by three joints: a partly movable, *intervertebral disc* anteriorly and a pair of gliding synovial *facet* (zygapophyseal) *joints* posteriorly. *Ligaments* secure the bones together and encapsulate the facet joints (joint capsules). The *vertebral* or *neural canal*, a series of *vertebral foramina*, transmits the spinal cord and related coverings, vessels, and nerve roots. Located bilaterally between each pair of vertebral pedicles are passageways, each called an *intervertebral foramen*, transmitting spinal nerves, their coverings/vessels, and some vessels to the spinal cord.



INTERVERTEBRAL DISC
ANNULUS FIBROSUS
NUCLEUS PULPOSUS
SPINAL NERVE

The intervertebral disc consists of the *annulus fibrosus* (concentric, interwoven collagenous fibers integrated with cartilage cells) attached to the vertebral bodies above and below, and the more central *nucleus pulposus* (a mass of degenerated collagen, proteoglycans, and water). The discs make possible movement between vertebral bodies. With aging, the discs dehydrate and thin, resulting in a loss of height. The cervical and lumbar discs, particularly, are subject to early degeneration from one or more of a number of causes. Weakening and/or tearing of the annulus can result in a broad-based bulge or a localized (focal) protrusion of the nucleus and adjacent annulus; such an event can compress a *spinal nerve* root as shown.



BONY THORAX *

CN: (1) Color the anterior view of the bony thorax. Color each rib completely before going on to the next. (2) Color the posterior view in the same manner. (3) Color the lateral view of the bony thorax. (4) When coloring the drawings of a rib and the sites of articulation, note that the rib facets (drawn with dotted lines) are to be colored even though they are on the underside of the rib.

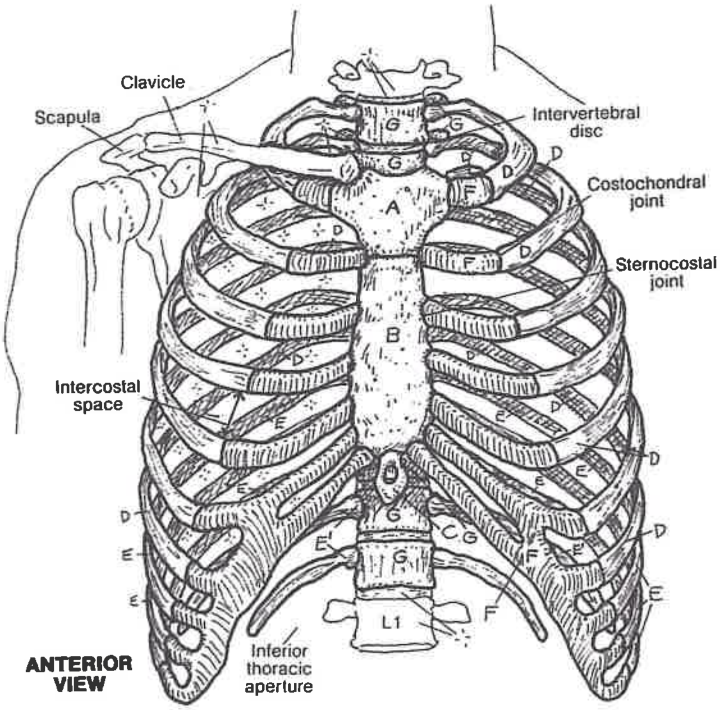
STERNUM *
- MANUBRIUM A
- BODY B
- XIPHOID PROCESS C

12 RIBS *
- 7 TRUE D
- 5 FALSE E
- (2 FLOATING) E'

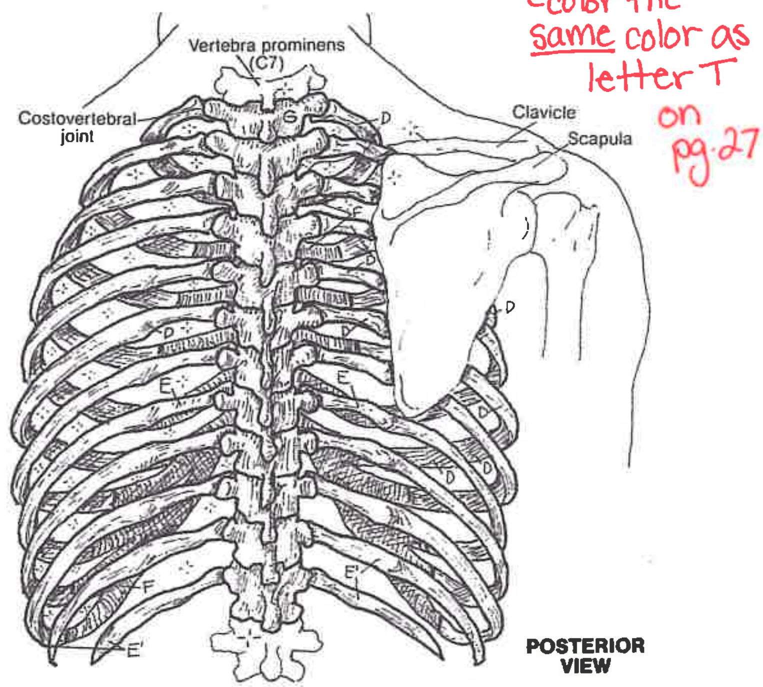
~~COSTAL CARTILAGE (10) F~~

THORACIC VERTEBRA (12) G

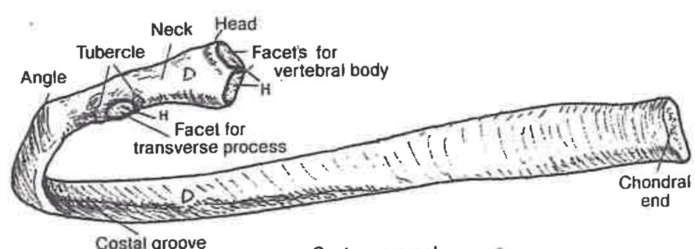
Lcolor the same color as letter T on pg.27

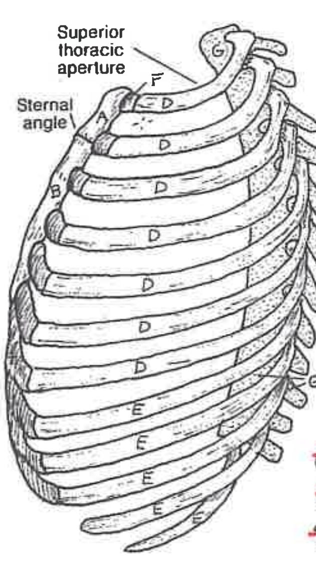


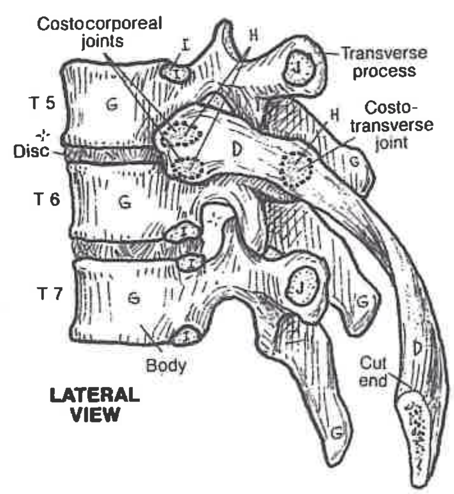
ANTERIOR VIEW



POSTERIOR VIEW







LATERAL VIEW

~~RIB FACET H~~
~~DEMIFACET I~~
~~TRANSVERSE FACET J~~

The bony thorax is the skeleton of the chest, harboring the heart, lungs, and other significant organs. The superior thoracic aperture or thoracic inlet (often called thoracic outlet by surgeons) transmits the esophagus, trachea, nerves, and important ducts and vessels (Plate 104). The inferior thoracic aperture is virtually sealed by the thoracic diaphragm (muscle), through which pass the aorta, inferior vena cava, and esophagus (Plate 50). The region between each pair of ribs is the intercostal space, containing muscle, fasciae, vessels, and nerves (Plate 50). Collective rib movement is responsible for about 25% of the respiratory effort (inhalation, exhalation); the diaphragm does the rest (Plate 135).

The fibrocartilaginous joint between the *manubrium* and the body of the *sternum* (sternal angle, sternomanubrial joint) makes subtle hinge-like movements during respiration. The xiphoid makes a fibrocartilaginous (xiphisternal) joint with the body of the sternum. The sternum is largely cancellous bone containing red marrow. The *costal cartilages*, representing unossified cartilage models of the anterior ribs, articulate with the sternum by gliding-type synovial joints (sternocostal joints, except for the first joint, which is not synovial). All ribs form synovial joints with the thoracic vertebrae (costovertebral joints). Within each of these joints, the rib (2 through 9) forms a synovial joint with a demifacet of the upper vertebral body and with a *demifacet* of the lower body (costocorporeal joints). In addition, the tubercle of the rib articulates with a cartilaginous facet at the tip of the transverse process of the lower vertebra (costotransverse joint). Ribs 1, 10, 11, and 12 each join with one vertebra instead of two; ribs 11 and 12 have no costotransverse joints. *True ribs* (1–7) articulate directly with the sternum. Ribs 8–12 are called *false ribs*; ribs 8–10 articulate indirectly with the sternum (via cartilages connecting to the 7th costal cartilage) and ribs 11 and 12 (*floating ribs*) end in the muscular abdominal wall.

HIP BONE, PELVIC GIRDLE & PELVIS

HIP BONE

ILIUM A

ISCHIUM B

PUBIS C

SACRUM D COCCYX Co

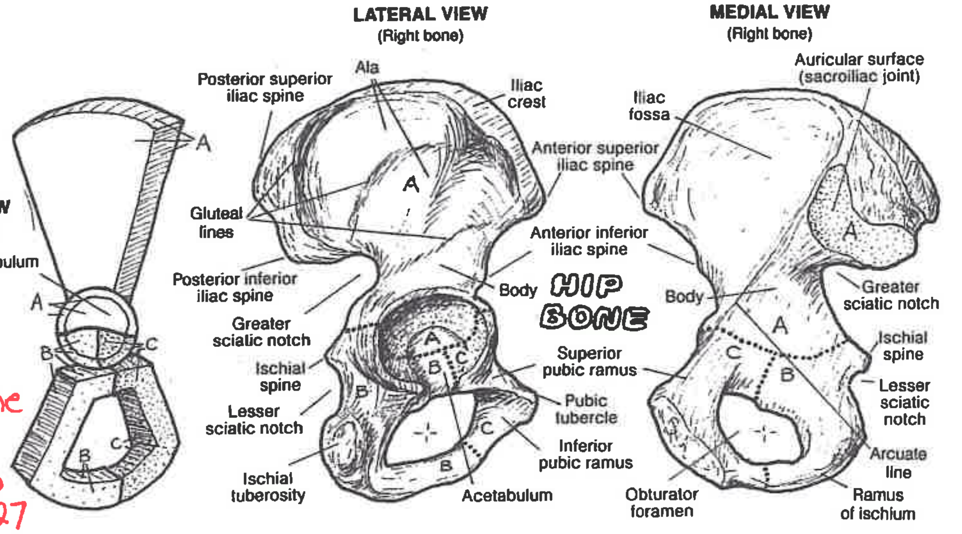
FALSE PELVIS

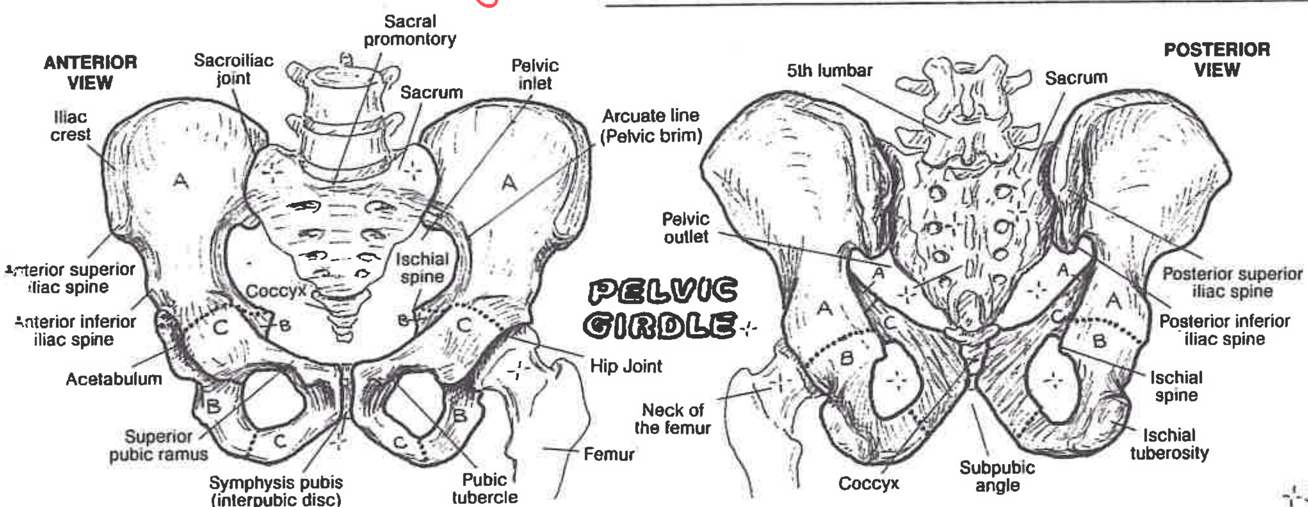
PELVIC INLET

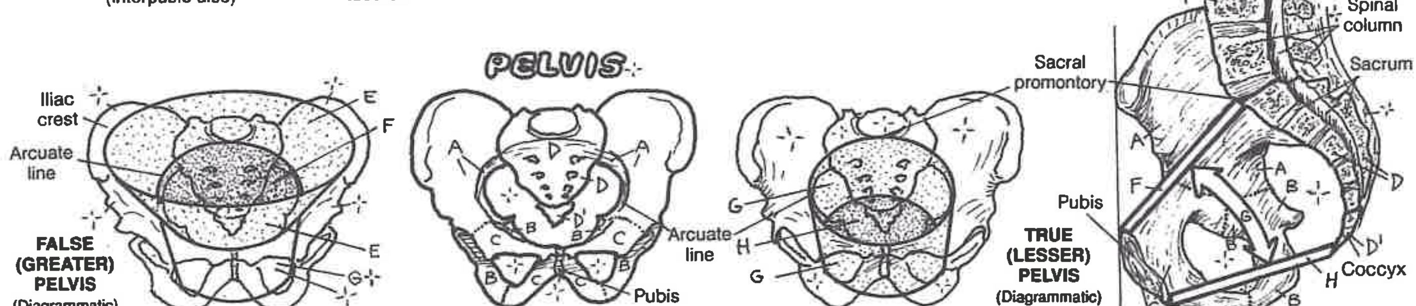
TRUE PELVIS

PELVIC OUTLET

Color the same color as on pg.27







The hip bone (pelvic bone, os coxae) consists of three bones connected by cartilage until the second decade of life, and then bone thereafter: the *ilium*, *ischium*, and *pubis*. The hip bone has been likened to a propeller: the *acetabulum*, the socket for the hip joint where all three bones are fused together, is the hub. The flattened wing (ala) of the ilium would be one blade of the propeller, and the ischiopubic bone would be the other blade. The weight of the torso and upper limbs is transmitted from the sacroiliac joint to the acetabulum through the body of the ilium. The posterior and inferior ischium and the anterior and inferior pubis form a ring of bone with the obturator foramen in the center. The ischium is significant for its ischial tuberosity, upon which one sits. The pubis is easily palpable centrally at the level of the groin.

The two hip bones are connected anteriorly by the *symphysis pubis* (interpubic joint; cartilage/fibrocartilage, with cartilaginous disc). These two bones constitute the pelvic girdle. With respect to the concept of "girdle," the ischiopubic bones are somewhat similar in shape and function to the clavicle, and the iliac bones to the two scapulae. Because of its weight-bearing function, the pelvic girdle is considerably less mobile than its pectoral counterpart, which had a mobility function.

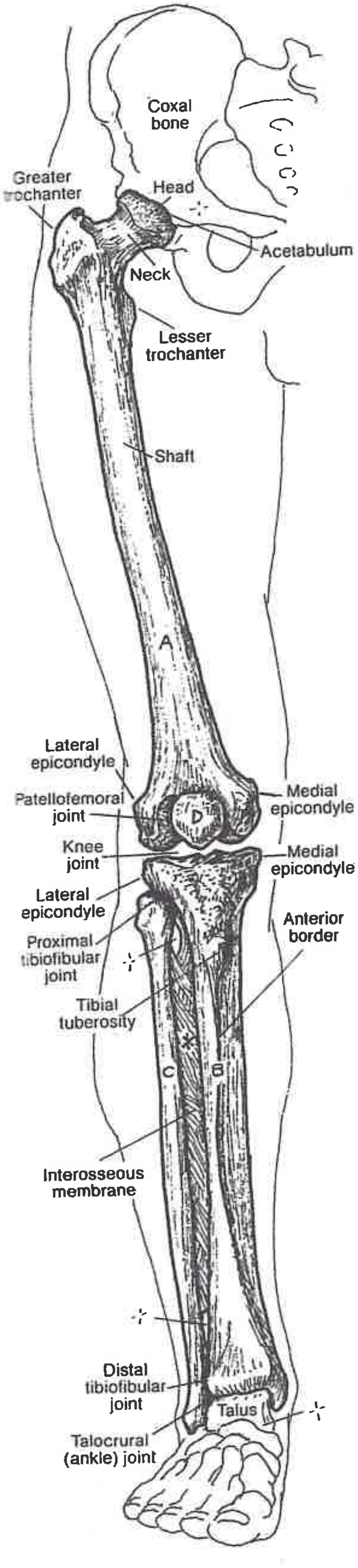
The two hip bones and the sacrum constitute the pelvis. The cavity of the pelvis (basin) consists of a false (greater) and a true (lesser) pelvis. The orientation of the pelvis can be appreciated by placing a bony pelvis in the laboratory/classroom against a vertical wall such that the anterior superior iliac spine and the pubic tubercle are in contact with the wall simultaneously. That part of the pelvis below an oblique line from the *sacral promontory*, forward and downward along the *arcuate lines* of the ilium, to the *pubic crest* (floor of the pubic tubercle) is the true pelvis. The line just described demarcates the *pelvic inlet* (superior pelvic aperture). The pelvic inlet is continuous above with the abdominal cavity, which includes the greater pelvis. The anterior wall of the greater pelvis is entirely muscular; confirm this on yourself. The true pelvic cavity has both bony and muscular walls and contains numerous structures (Plates 157, 160). The plane of the inferior pelvic aperture (*pelvic outlet*), along a line from the inferior aspect of the pubis to the tip of the coccyx, is much more horizontal than that of the inlet; the floor of the outlet is muscular (Plate 52). The pelvic cavity is continuous below with the perineum (Plate 53).

THIGH & LEG BONES -¦-

FEMUR A   TIBIA B
FIBULA C
PATELLA D

Remember, * means color gray. (-¦- still means do not color)

ANTERIOR VIEW
(Right limb)

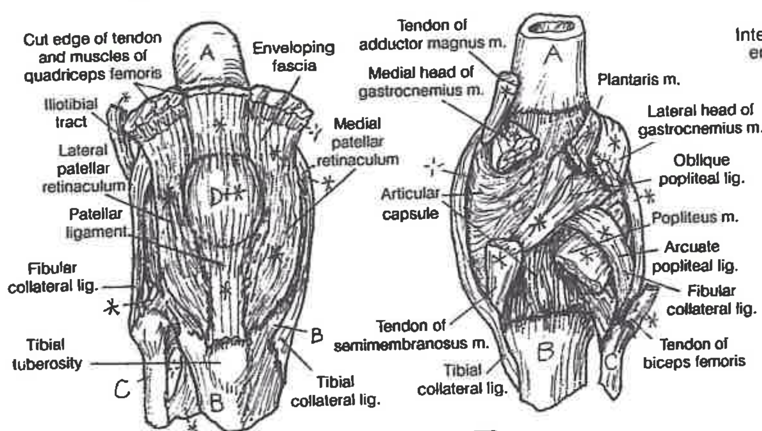


The bone of the thigh is the femur; the bones of the leg are the *tibia* and *fibula*. The *greater* and *lesser trochanters* are the site of insertion of muscles of the hip. The shaft, gently curved anteriorly along its length, is rounded circumferentially, except posteriorly where a ridge (linea aspera) along the long axis of the bone forms the origin and insertions of a number of muscles. Distally, the shaft widens to form the massive *condyles*, which contribute to the knee joint. The patella articulates with the cartilage of the femur between the two condyles. It is a sesamoid bone that is located within the tendon of quadriceps femoris (see next plate).

The major weight-bearing bone of the leg is the tibia. It is the only bone of the leg that contributes to the knee joint. This stout bone has large condyles proximally that articulate with the femoral condyles. The palpable tibial tubercle just distal to the condyles receives the patellar ligament. The tibial shaft is triangular in cross section; the apex is the sharp anterior border (shin), easily palpated. The anteromedial surface is barren of muscle; the anterolateral surface is muscle-covered. The expanded, distal extent of the tibia forms an inverted L (¬); the horizontal surface articulates with the talus of the ankle, and the vertical portion is the quite palpable medial malleolus, which also articulates with the talus (see Plate 42).

Not directly weight bearing, the fibula is a site of muscular attachment along the upper two-thirds of its shaft. Its head joins with the underside of the lateral tibial condyle (proximal tibiofibular joint; synovial, plane type). The shaft of the fibula forms an intermediate tibiofibular joint (interosseous membrane; syndesmosis) with the shaft of the tibia. Distally, the fibula joins with the tibia (distal tibiofibular joint; syndesmosis). The lateral aspect of the fibula is the palpable lateral malleolus, which articulates with the talus. The distal extremities of the fibula and tibia form a joint with the talus (ankle or talocrural joint); see Plate 42.

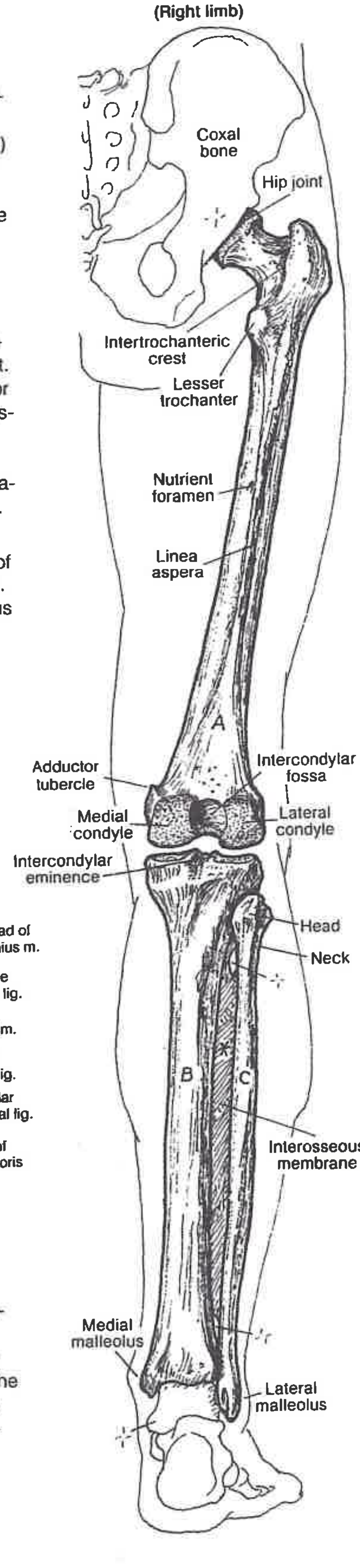
LIGAMENTS/TENDONS/MUSCLES AROUND RIGHT KNEE



LIGAMENT *

The bony parts of the knee joint provide little security during knee movement (see next plate). Tendons and muscles crossing and moving the joint also have the function of reinforcing the ligamentous stabilizers of the knee. Fibrous expansions from the medial and lateral members of the quadriceps muscle merge with the fibrous capsule on each side of the patella to form the medial and lateral retinacula. Muscles/tendons reinforcing knee stability can be seen on this plate and Plates 62–66.

POSTERIOR VIEW
(Right limb)



ANKLE & FOOT BONES

"plate" = page

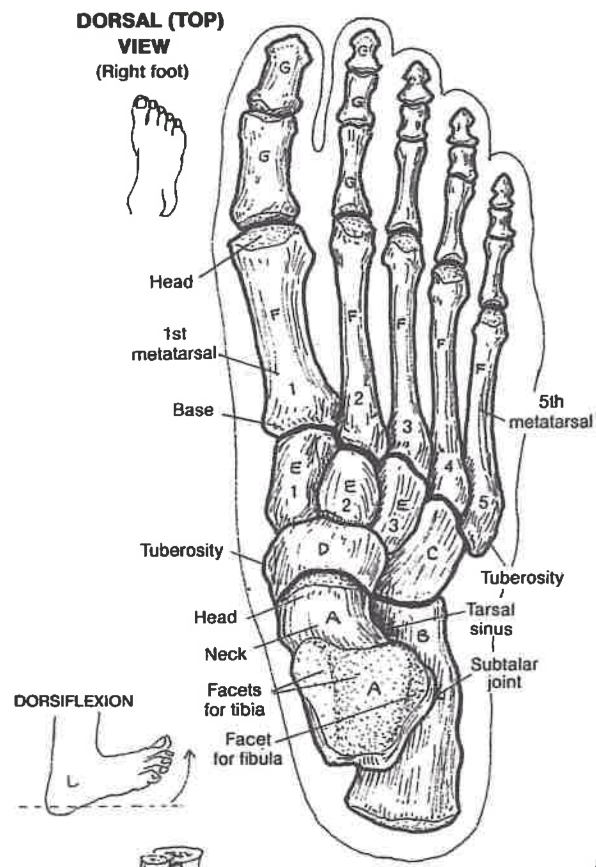
7 TARSALS *

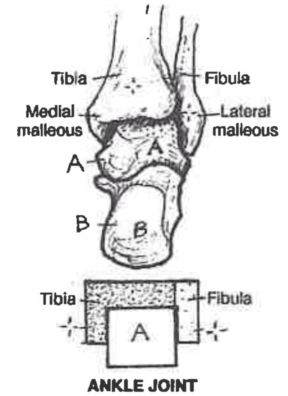
TALUS A CALCANEUS B CUBOID C NAVICULAR D CUNEIFORMS (3) E

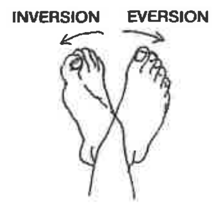
5 METATARSALS F

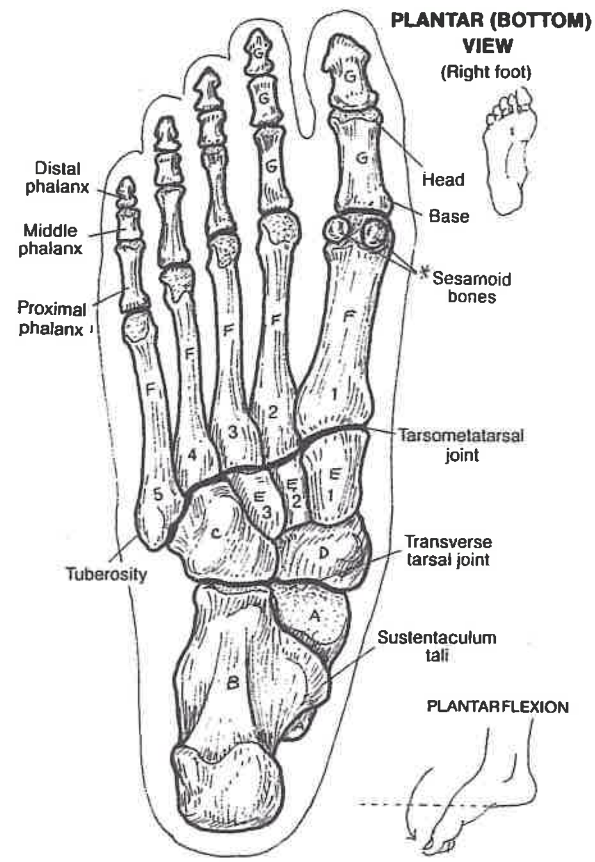
14 PHALANGES G

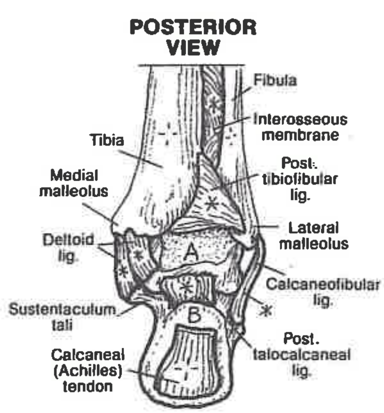
CN: Use different colors from those used for the hip bone on and for the femur, tibia, fibula, and patella on Plate 40. (1) Color the illustration and diagram of the ankle joint. (2) Then start with the talus (A); color that bone wherever it appears on the plate. Follow that procedure with each of the other bones. (3) Color gray all of the ligaments.

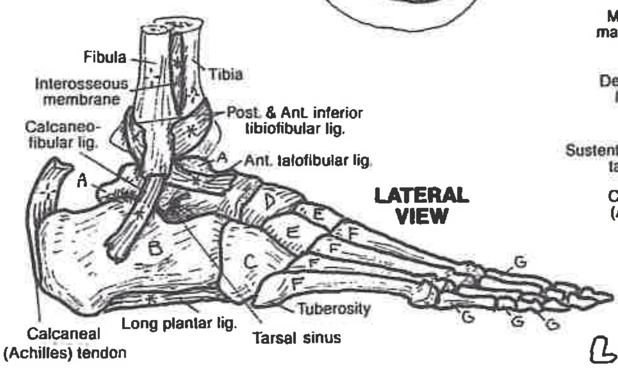


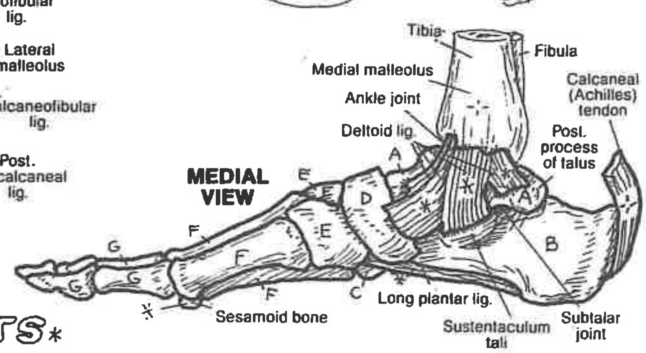








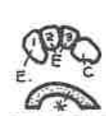




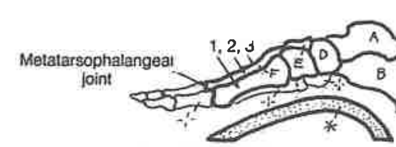
LIGAMENTS *

The foot is a mobile, weight-bearing structure. The *ankle joint* (hinge-type synovial joint) between the *tibia*, *fibula*, and *talus* forms a mortise, permitting only flexion (plantar flexion) and extension (dorsiflexion) here. With excessive rotation of this joint, characteristic fractures and torn ligaments occur. The foot can adjust to walking/running on tilted surfaces by virtue of the *subtalar* (talocalcaneal) and transverse *tarsal* (talocalcaneonavicular and calcaneocuboid) joints. Here inversion and eversion movements occur. The ankle has strong medial ligamentous (deltoid ligaments) and weaker lateral ligamentous support. The relatively high frequency of inversion sprains (tearing the lateral ligaments) over eversion sprains seems to reflect this relative weakness. The bony architecture of the foot includes a number of arches that are reinforced and maintained by ligaments and influenced by muscles. The *medial longitudinal arch* transmits the force of body weight to the ground when standing and to the great toe in locomotion, creating a giant lever that gives spring to the gait. *Both longitudinal arches* function in absorbing shock loads and balancing the body.

LATERAL LONGITUDINAL ARCH *



TRANSVERSE ARCH *

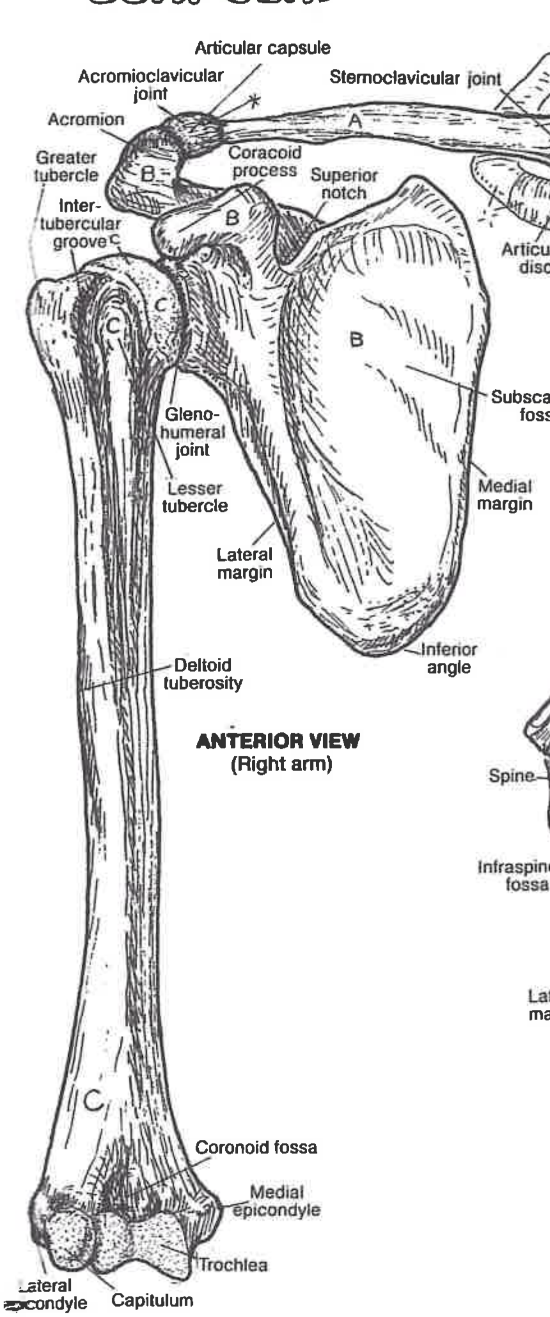


MEDIAL LONGITUDINAL ARCH *

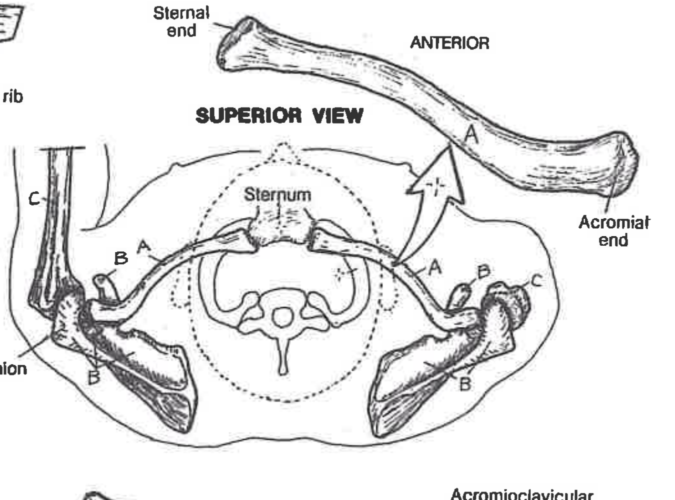
PECTORAL GIRDLE & ARM BONE

CLAVICLE A
SCAPULA B
HUMERUS C

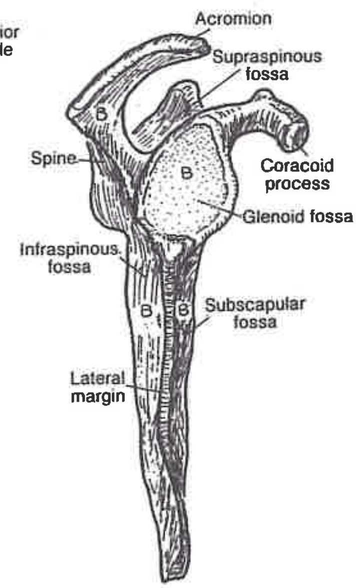
CN: Use very light colors in order to see surface detail. (1) Color each view completely before going on to the next.



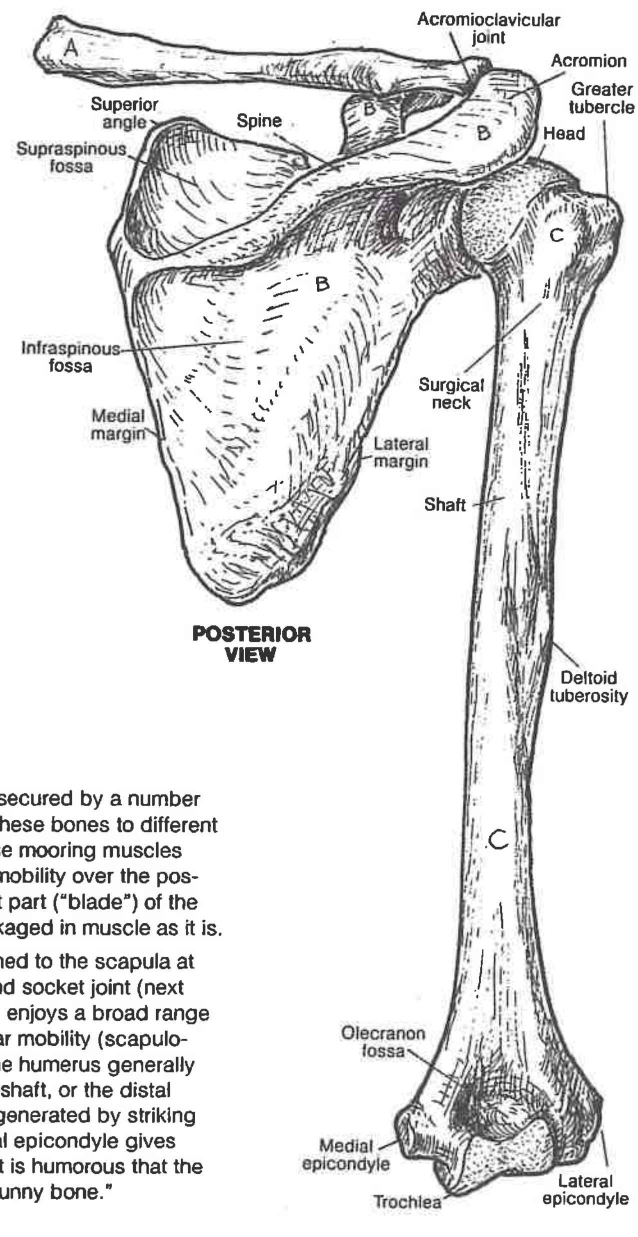
ANTERIOR VIEW
(Right arm)



SUPERIOR VIEW



LATERAL VIEW



POSTERIOR VIEW

The mobility of the upper limb is largely dependent upon the *pectoral girdle*, composed of *two scapulae* and *two clavicles*. This girdle is best appreciated in the view from above. The only bony connection of the girdle to the axial skeleton is by way of the sternoclavicular joint (saddle type, synovial; with articular disc). This disc sustains significant loads with falls on the shoulder. Ligament-bound, the disc is rarely displaced; more likely with such falls, the clavicle will break. The distal extremity of each clavicle articulates with the acromion of the scapula in a gliding type synovial acromioclavicular or AC joint. This joint is commonly disjointed (separated shoulder) with certain activities, an event not to be confused with shoulder joint dislocation.

The scapulae have no direct bony connection to the axial skeleton. Rather, they are secured by a number of muscles that reach out from these bones to different parts of the axial skeleton. These mooring muscles give each scapula remarkable mobility over the posterior thoracic wall. The thin, flat part ("blade") of the scapula is rarely fractured, packaged in muscle as it is.

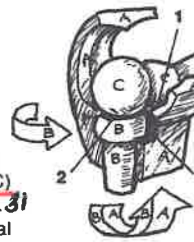
The arm bone or humerus is joined to the scapula at the glenohumeral joint, a ball and socket joint (next plate). At this joint, the humerus enjoys a broad range of motion, enhanced by scapular mobility (scapulothoracic motion). Fractures of the humerus generally occur at the surgical neck, mid-shaft, or the distal extremity. The sharp sensation generated by striking the ulnar nerve under the medial epicondyle gives rise to the name "crazy bone." It is humorous that the humerus also is known as the "funny bone."

FOREARM BONES

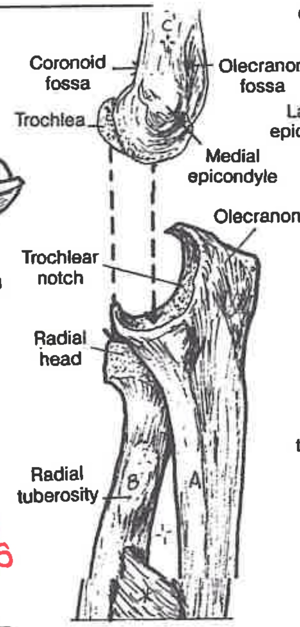
ULNA A
RADIUS B

HUMERUS C

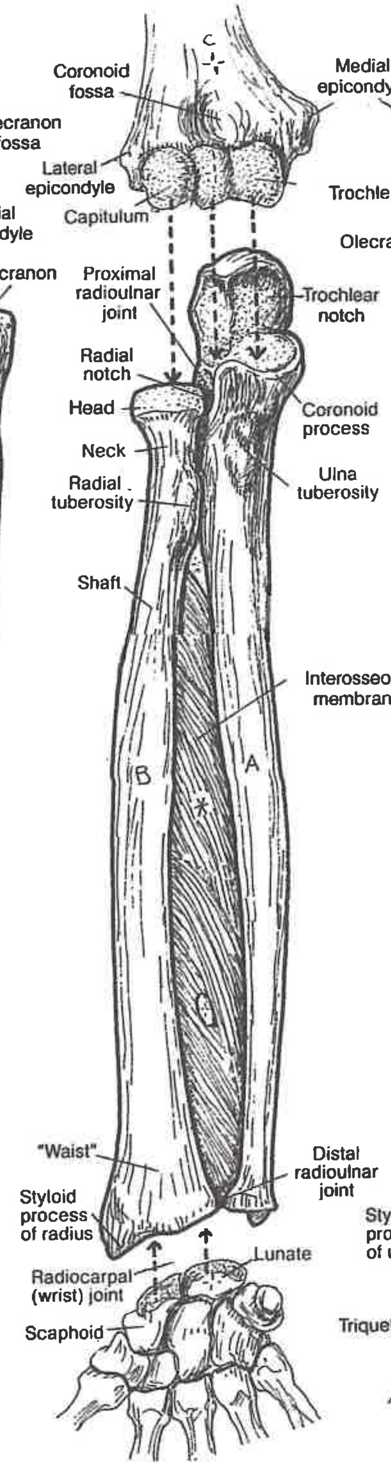
CN: Use very light colors for A and B, and the same color for the humerus (C) that was used on the 31 plate. Note that the distal humerus and carpal bones are left uncolored in the large illustrations. (1) Color the forearm bones in the three views, taking careful note of the callouts referring to surface details. (2) In the supination/pronation diagrams, the thumb and little finger of the hand receive the same colors as the forearm bones to which they relate, regardless of hand position. } to help illustrate the actions



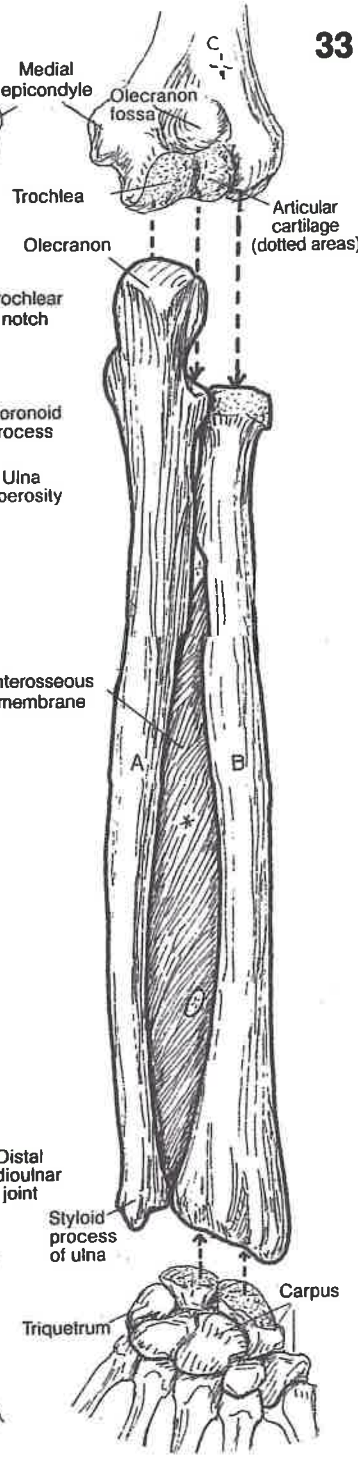
THREE JOINTS (Diagrammatic)



MEDIAL VIEW (Right forearm)

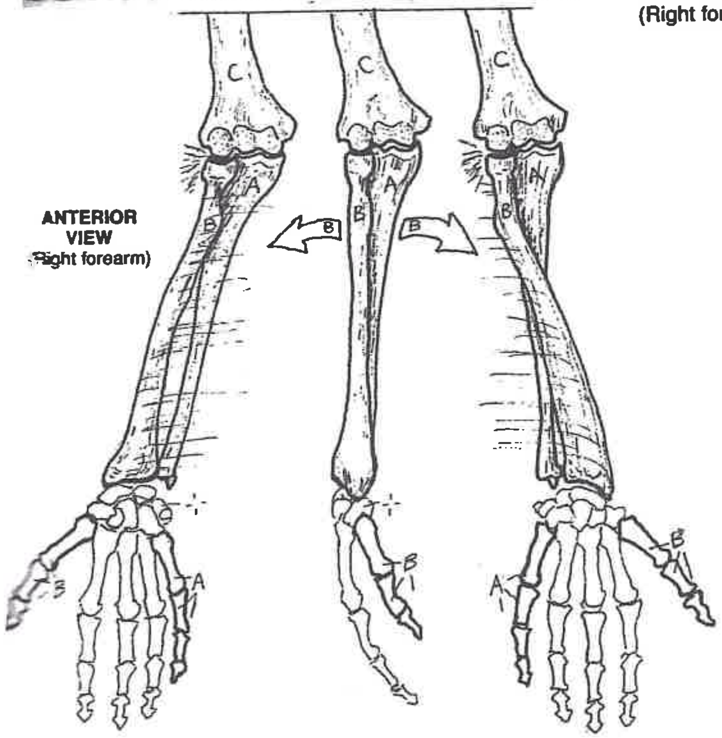


ANTERIOR VIEW (Right forearm)



POSTERIOR VIEW (Right forearm)

RADIUS B / THUMB SIDE B
ULNA A / LITTLE FINGER SIDE A



SUPINATION (Anatomical position) NEUTRAL PRONATION

The two bones of the forearm are quite different from one another. The posterior aspect of the proximal extremity of the *ulna* is characterized by a rather massive bone mass called the *olecranon.* You can feel it easily at the back of your elbow. On the anterior side of the olecranon is the *trochlear notch,* which articulates with the *trochlea of the humerus* at the *humeroulnar joint* (synovial; hinge). A part of this surface turns to face the *radius* (the radial head); this is the radial notch, which contributes to the *proximal radioulnar joint* (synovial; pivot). The ulnar shaft narrows distally to terminate as the head of the ulna. The head forms a pivot-type, synovial joint with the radius (*distal radioulnar joint*). This joint shares an articular disc that fits between the ulnar head and the lunate and trequetral bones of the wrist. This disc contributes to the radiocarpal (wrist) joint, but the ulnar head does not. The shaft of the ulna forms a movable, fibrous joint (syndesmosis) with the shaft of the radius by means of the interosseous membrane.

The radius has a small rounded head proximally, articulating with both the capitulum of the humerus (*radiohumeral joint*; synovial; pivot) and the radial notch of the ulna (proximal radioulnar joint). The shaft of the radius flares distally to form a broad wrist joint with the scaphoid and lunate bones of the carpus. Falls on the hands load the wrist joint and can cause a fracture of the radius at the relatively weak "waist" between the shaft and the flared distal extremity (Colles fracture, Smith fracture).

After coloring and studying the supination/pronation movements, put the palm of your right hand out in front of you, palm down (prone). In this position, the radius and ulna are in parallel. Place the fingers of the left hand on your right olecranon. Now supinate your right hand (to palm up). Notice the olecranon did not move. Thus, the ulna does not move during supination/pronation of the hand. Now find and observe the styloid process of the radius at the right wrist (on the thumb side) as you supinate/pronate the right hand. Note that the styloid process moves with the thumb. You have now demonstrated how the radius moves around the ulna during pronation and supination of the hand.

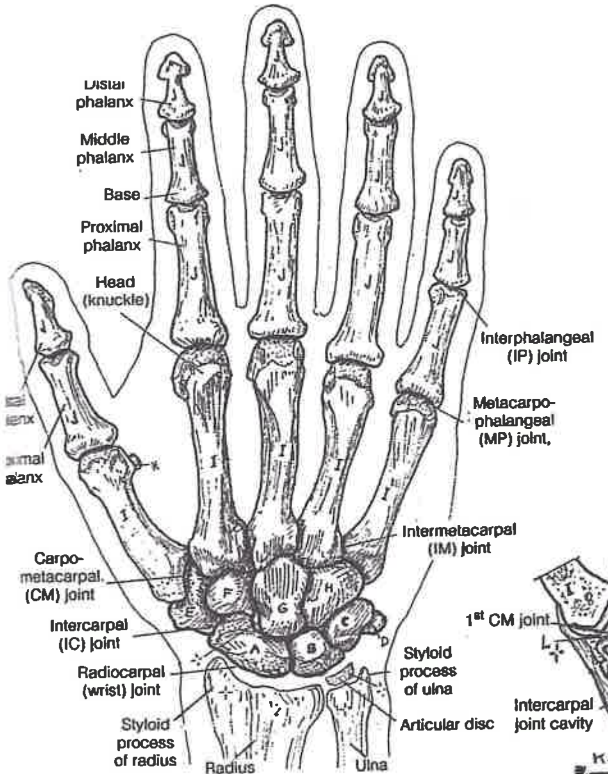
WRIST AND HAND BONES & JOINTS

CN: light blue for K. (1) Color the three views of the hand and wrist: note the callouts identifying the joints that contribute to the movements shown in the satellite sketches. (2) Color the major ligaments of the wrist joints gray. Numerous carpal and phalangeal ligaments are not shown. (3) In the sectional view, color the bones and their articular cartilage. Color the synovial cavities (L with dark outlines) of the wrist black, but not the intercarpal joint cavities. (L·;·)

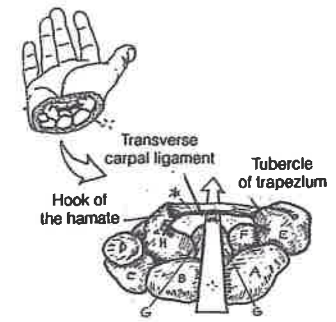
8 CARPALS A-H → color them all the same color (we will not be learning them as individual bones in this course)

SCAPHOID LUNATE TRIQUETRUM PISIFORM
TRAPEZIUM TRAPEZOID CAPITATE HAMATE

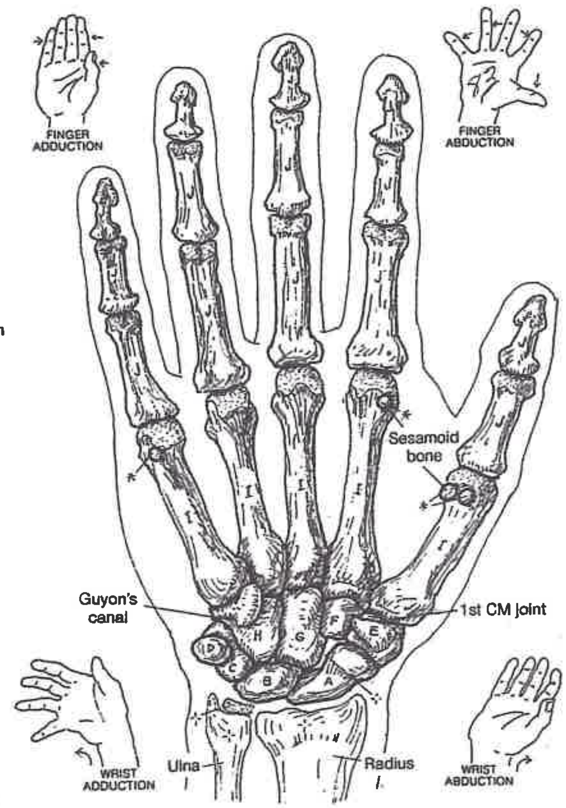
5 METACARPALS I 14 PHALANGES J



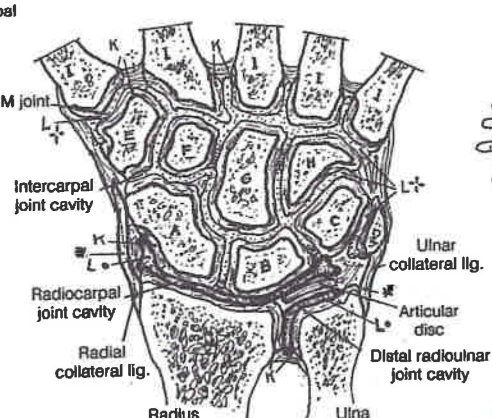
POSTERIOR (DORSAL) VIEW
(Right hand)



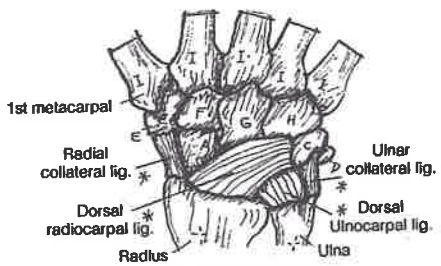
CARPAL TUNNEL



ANTERIOR (PALMAR) VIEW
(Right hand)



JOINTS OF WRIST & CARPAL BONES
(Dorsal view of frontal section)

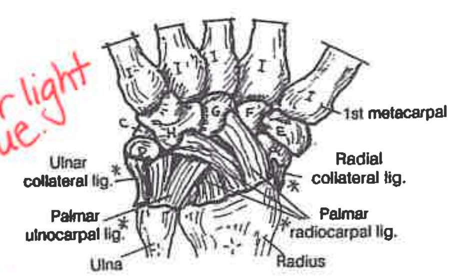


MAJOR LIGAMENTS

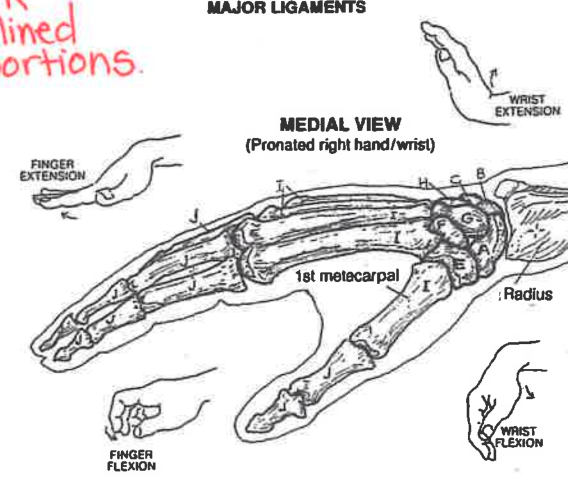
Color light blue.

ARTICULAR CARTILAGE K
SYNOVIAL CAVITY L (•) (÷)
LIGAMENT *

→ Dark outlined portions.



MAJOR LIGAMENTS



MEDIAL VIEW
(Pronated right hand/wrist)

The wrist joint (synovial; biaxial) is formed by the distal articular surface of the radius with the articular surfaces of the *scaphoid* and *lunate bones* primarily, and between the articular disc and the *triquetrum* secondarily. Movements here are flexion, extension, adduction, and abduction. The *wrist joint* and *carpal joints* are secured by palmar and dorsal radiocarpal and ulnocarpal ligaments and by radial and ulnar collateral ligaments. The *intercarpal joints*, between the proximal and distal rows of carpal bones, contribute to wrist movement. The trough between the *hamate* and *trapezium* bones anteriorly provides a carpal tunnel for the passage of the long flexor tendons to the thumb and fingers as well as the median nerve. Compression by the transverse carpal ligament can irritate or depress the function of the median nerve (numbness to three radial fingers; thumb weakness). Guyon's canal transmits the ulnar artery and nerve.

Hand movement involves movements of the metacarpophalangeal (MP) and interphalangeal (IP) joints primarily, and among the carpometacarpal and intermetacarpal joints secondarily—with one exception: the unique first carpometacarpal (CM) joint (synovial; saddle). Notice the mobility it gives the thumb, as in opposing thumb and little finger, and circumduction of the thumb.