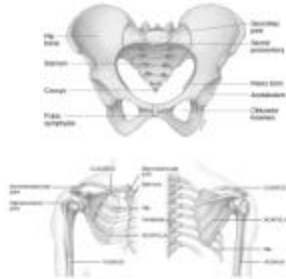


Chapter 8 Skeletal System: Appendicular Skeleton

- Pectoral girdle
- Pelvic girdle
- Upper limbs
- Lower limbs



8-1

Pectoral (Shoulder) Girdle

- Consists of scapula and clavicle
- Clavicle articulates with sternum (sternoclavicular joint)
- Clavicle articulates with scapula (acromioclavicular joint)
- Scapula held in place by muscle only
- Upper limb attached to pectoral girdle at shoulder (glenohumeral joint)

8-2

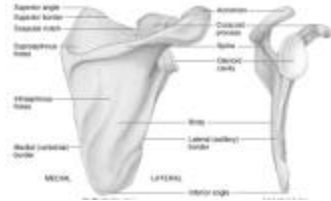
Clavicle (collarbone)



- S-shaped bone with two curves
 - medial curve convex anteriorly/lateral one concave anteriorly
- Extends from sternum to scapula above 1st rib
- Fracture site is junction of curves
- Ligaments attached to clavicle stabilize its position.

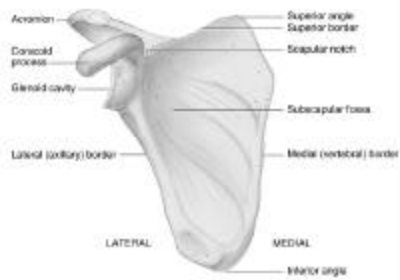
8-3

Posterior Surface of Scapula



- Triangular flat bone found in upper back region
- Scapular spine ends as acromion process
 - a sharp ridge widening to a flat process
- Glenoid cavity forms shoulder joint with head of humerus
- Suprascapular & infraspinous fossa for muscular attachments

Anterior Surface of Scapula



- Subscapular fossa filled with muscle
- Coracoid process for muscle attachment

Upper Extremity



- Each upper limb = 30 bones
 - humerus within the arm
 - ulna & radius within the forearm
 - carpal bones within the wrist
 - metacarpal bones within the palm
 - phalanges in the fingers
- Joints
 - shoulder (glenohumeral), elbow, wrist, metacarpophalangeal, interphalangeal

Humerus --- Proximal End

- Part of shoulder joint
- Head & anatomical neck
- Greater & lesser tubercles for muscle attachments
- Intertubercular sulcus or bicipital groove
- Surgical neck is fracture site
- Deltoid tuberosity
- Shaft



8-7

Humerus --- Distal End

- Forms elbow joint with ulna and radius
- Capitulum
 - articulates with head of radius
- Trochlea
 - articulation with ulna
- Olecranon fossa
 - posterior depression for olecranon process of ulna
- Medial & lateral epicondyles
 - attachment of forearm muscles



8-8

Ulna & Radius --- Proximal End

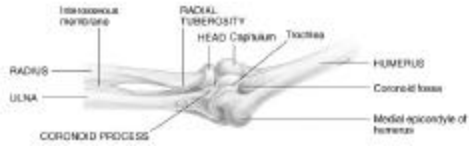
- Ulna (on little finger side)
 - trochlear notch articulates with humerus & radial notch with radius
 - olecranon process forms point of elbow



8-9

- Radius (on thumb side)
 - head articulates with capitulum of humerus & radial notch of ulna
 - tuberosity for muscle attachment

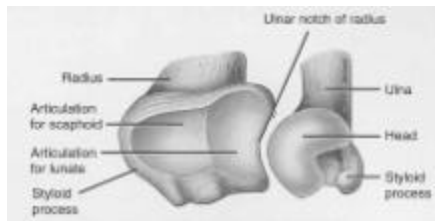
Elbow Joint



- Articulation of humerus with ulna and radius
- Ulna articulates with trochlea of humerus
- Radius articulates with capitulum of humerus
- Interosseous membrane between ulna & radius provides site for muscle attachment

8-10

Ulna and Radius - Distal End



- Ulna –styloid process
 - head separated from wrist joint by fibrocartilage disc
- Radius
 - forms wrist joint with scaphoid, lunate & triquetrum
 - forms distal radioulnar joint with head of ulna

8-11

8 Carpals Bones (wrist)



- Proximal row - lat to med
 - scaphoid - boat shaped
 - lunate - moon shaped
 - triquetrum - 3 corners
 - pisiform - pea shaped
- Distal row - lateral to medial
 - trapezium - four sided
 - trapezoid - four sided
 - capitate - large head
 - hamate - hooked process
- Carpal tunnel—tunnel of bone & flexor retinaculum

8-12

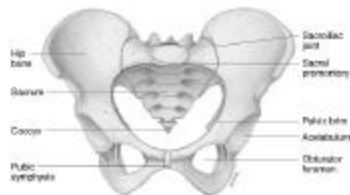
Metacarpals and Phalanges



- Metacarpals
 - 5 total----#1 proximal to thumb
 - base, shaft, head
 - knuckles (metacarpophalangeal joints)
- Phalanges
 - 14 total: each is called phalanx
 - proximal, middle, distal on each finger, except thumb
 - base, shaft, head

8-13

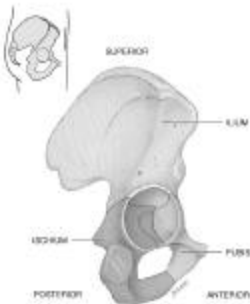
Pelvic Girdle and Hip Bones



- Pelvic girdle = two hipbones united at pubic symphysis
 - articulate posteriorly with sacrum at sacroiliac joints
- Each hip bone = ilium, pubis, and ischium
 - fuse after birth at acetabulum
- Bony pelvis = 2 hip bones, sacrum and coccyx

8-14

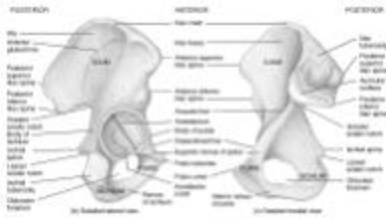
Ischium and Pubis



- Ischium
 - ischial spine & tuberosity
 - lesser sciatic notch
 - ramus
- Pubis
 - body
 - superior & inferior ramus
 - pubic symphysis is pad of fibrocartilage between 2 pubic bones

8-15

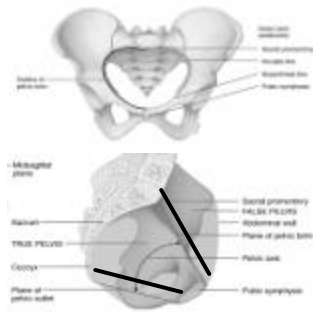
Ilium



- Iliac crest and iliac spines for muscle attachment
- Iliac fossa for muscle attachment
- Gluteal lines indicating muscle attachment
- Sacroiliac joint at auricular surface & iliac tuberosity
- Greater sciatic notch for sciatic nerve

8-16

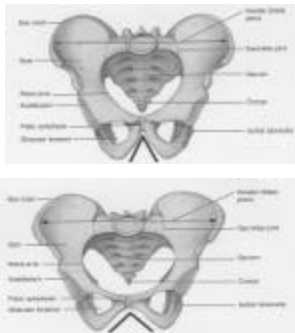
Pelvis



- Pelvis = sacrum, coccyx & 2 hip bones
- Pelvic brim
 - sacral promontory to symphysis pubis
 - separates false from true pelvis
 - false pelvis holds only abdominal organs
- Inlet & outlet
- Pelvic axis = path of babies head

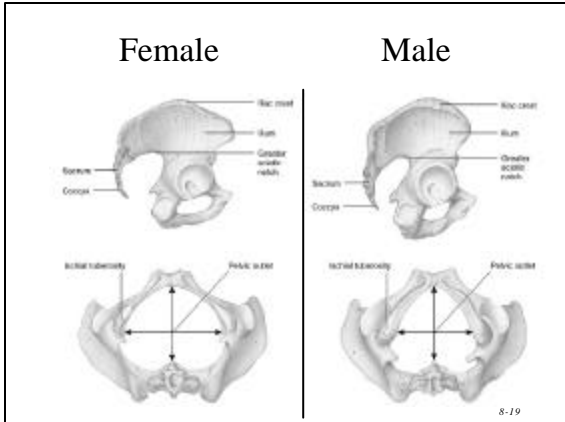
8-17

Female and Male Skeletons



- Male skeleton
 - larger and heavier
 - larger articular surfaces
 - larger muscle attachments
- Female pelvis
 - wider & shallower
 - larger pelvic inlet & outlet
 - more space in true pelvis
 - pubic arch >90 degrees

8-18



Lower Extremity

- Each lower limb = 30 bones
 - femur and patella within the thigh
 - tibia & fibula within the leg
 - tarsal bones in the foot
 - metatarsals within the forefoot
 - phalanges in the toes
- Joints
 - hip, knee, ankle
 - proximal & distal tibiofibular
 - metatarsophalangeal

8-20

Femur and Patella

- Femur (thighbone)
 - longest & strongest bone in body
 - head articulates with acetabulum (attached by ligament of head of femur)
 - neck is common fracture site
 - greater & lesser trochanters, linea aspera, & gluteal tuberosity-- muscle attachments
 - medial & lateral condyles articulate with tibia
 - patellar surface anteriorly between condyles
- Patella
 - triangular sesamoid
 - increases leverage of quadriceps femoris tendon

8-21

Tibia and Fibula



- **Tibia**
 - medial & larger bone of leg
 - weight-bearing bone
 - lateral & medial condyles
 - tibial tuberosity for patellar lig.
 - proximal tibiofibular joint
 - medial malleolus at ankle
- **Fibula**
 - not part of knee joint
 - muscle attachment only
 - lateral malleolus at ankle

8-22

Tarsus



- Proximal region of foot (contains 7 tarsal bones)
- Talus = ankle bone (articulates with tibia & fibula)
- Calcaneus - heel bone
- Cuboid, navicular & 3 cuneiforms

8-23

Metatarsus and Phalanges

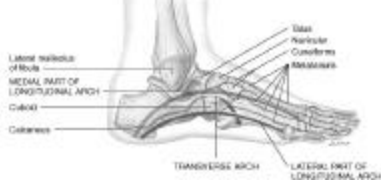


- **Metatarsus**
 - midregion of the foot
 - 5 metatarsals (1 is most medial)
 - each with base, shaft and head
- **Phalanges**
 - distal portion of the foot
 - similar in number and arrangement to the hand
 - big toe is hallux

8-24

Arches of the Foot

- Function
 - distribute body weight over foot
 - yield & spring back when weight is lifted
- Longitudinal arches along each side of foot
- Transverse arch across midfoot region
 - navicular, cuneiforms & bases of metatarsals



8-25

Clinical Problems

- Flatfoot
 - weakened ligaments allow bones of medial arch to drop
- Clawfoot
 - medial arch is too elevated
- Hip fracture
 - 1/2 million/year in US
 - osteoporosis
 - arthroplasty



8-26
