

Chapter 8 Outline

Note: Please refer to handout [List of Bones and Markings](#) for the anatomy you are responsible for.

I. INTRODUCTION

- A. The *appendicular skeleton* includes the bones of the upper and lower extremities and the shoulder and hip girdles.
- B. The appendicular skeleton functions primarily to facilitate movement.

II. PECTORAL (SHOULDER) GIRDLE

- A. The *pectoral* or *shoulder girdle* attaches the bones of the upper limbs to the axial skeleton
- B. Clavicle
 - 1. The *clavicle* or *collar bone* lies horizontally in the superior and anterior part of thorax superior to the first rib and articulates with the sternum and the clavicle.
 - 2. The clavicle, one of the most frequently broken bones in the body, transmits mechanical force from the upper limb to the trunk. (Clinical Application)
- C. Scapula
 - 1. The *scapula* or *shoulder blade* articulates with the clavicle and the humerus.
 - 2. The scapulae articulate with other bones anteriorly, but are held in place posteriorly only by complex shoulder and back musculature.

III. UPPER LIMB (EXTREMITY)

- A. Each upper limb consists of 30 bones including the humerus, ulna, radius, carpals, metacarpals, and phalanges.
- B. Humerus
 - 1. The *humerus* is the longest and largest bone of the upper limb.
 - 2. It articulates proximally with the scapula and distally at the elbow with both the radius and ulna.

C. Ulna and Radius

1. The *ulna* is located on the medial aspect of the *forearm*.
2. The *radius* is located on the lateral aspect (thumb side) of the forearm.
3. The radius and ulna articulate with the humerus at the elbow joint, with each other, and with three carpal bones.

D. Carpals, Metacarpal, and Phalanges

1. The eight *carpal* bones, bound together by ligaments, comprise the *wrist*.
2. Five *metacarpal* bones are contained in the palm of each hand.
3. Each hand contains 14 *phalanges*, three in each finger and two in each thumb.

IV. PELVIC (HIP) GIRDLE

- A. The *pelvic (hip) girdle* consists of two hipbones (coxal bones) and provides a strong and stable support for the lower extremities, on which the weight of the body is carried.
1. Each *hipbone (coxal bone)* is composed of three separate bones at birth: the *ilium*, *pubis*, and *ischium*.
 2. These bones eventually fuse at a depression called the *acetabulum*, which forms the socket for the hip joint.
- B. The *ilium* is the larger of the three components of the hip bone and articulates (fuses) with the ischium and pubis.
- C. The *ischium* is the inferior, posterior portion of the hip bone.
- D. The *pubis* is the anterior and inferior part of the hip bone.

E. True and False Pelves

1. Together with the sacrum and coccyx, the two hipbones (coxal bones) form the *pelvis*.

2. The *greater (false)* and *lesser (true) pelvis* are anatomical subdivisions of this basin-like structure.

V. COMPARISON OF FEMALE AND MALE PELTS

- A. Male bones are generally larger and heavier than those of the female; the male's joint surfaces also tend to be larger.
- B. Muscle attachment points are more well-defined in the bones of a male than of a female due to the larger size of the muscles in males.
- C. A number of anatomical differences exist between the pelvic girdles of females and those of males, primarily related to the need for a larger pelvic outlet in females to facilitate childbirth
You should know these differences.

VI. COMPARISON OF PECTORAL AND PELVIC GIRDLES

- A. The pectoral girdle does not directly articulate with the vertebral column; the pelvic girdle does.
- B. The pectoral girdle sockets are shallow and maximize movement; those of the pelvic girdle are deeper and allow less movement.
- C. The structure of the pectoral girdle offers more movement than strength; the pelvic girdle, more strength than movement.

VII. LOWER LIMB (EXTREMITY)

- A. Each lower extremity is composed of 30 bones, including the *femur*, *tibia*, *fibula*, *tarsals*, *metatarsals*, and *phalanges*.
- B. Femur
 1. The *femur* or thighbone is the largest, heaviest, and strongest bone of the body.
 2. It articulates with the hip bone and the tibia.
- C. Patella
 1. The *patella* or kneecap is a sesamoid bone located anterior to the knee joint.

2. It functions to increase the leverage of the tendon of the quadriceps femoris muscle, to maintain the position of the tendon when the knee is bent, and to protect the knee joint.

D. Tibia and Fibula

1. The *tibia* or shinbone is the larger, medial, weight-bearing bone of the leg
2. The *fibula* is parallel and lateral to the tibia.

E. Tarsals, Metatarsals, and Phalanges

1. Seven *tarsal* bones constitute the *ankle* and share the weight associated with walking
2. Five *metatarsal* bones are contained in the *foot*. You should know how these bones are numbered.
3. The arrangement of *phalanges* in the *toes* is the same as that described for the fingers and thumb above - fourteen bones in each.