ACTIVITY

4

APPENDICULAR SKELETON AND LONG BONE DISSECTION

OBJECTIVES

1. **How to get ready:** Read CHAPTERS 6 AND 8, MCKINLEY ET AL., *HUMAN ANATOMY*, 5E. All text references are for this textbook.
2. Observe and dissect a fresh cow long bone. **YOU MUST BRING YOUR OWN GLOVES FOR THIS ACTIVITY.** Read dissection instructions **BEFORE** coming to lab.
3. Identify the bones and bone markings from the upper limb and pectoral girdle.
4. Identify the bones and bone markings from the lower limb and pelvic girdle.
5. **Before next class:** Preview Appendicular (and Axial) Muscle terms lists from SLCC Anatomy Laboratory website or your printed laboratory manual and your textbook.

Activity 4

BONE DISSECTION

Dissection Instructions

1. Acquire all dissection materials. (1 set per table)
    - Dissection tray
    - Scalpel
    - Probe
    - Cow bone
    - Gloves (supply your own)
    - Forceps
2. After getting the cow bone back to your table, place it on your tray, cut side up, and begin to examine it closely. Notice that within the compact bone there are red dots, which are blood vessels within the compact bone.

Procedure

3. a. Take probe and carefully dig into the **yellow bone marrow** in an attempt to find a **nutrient artery** (unlikely). Bone is living tissue and is highly vascular. Next, dig out all of the marrow from the cavity to expose the **trabeculae** (spongy bone portions) visible on the side toward the epiphysis. These trabeculae are the network that makes up the spongy bone. Within this spongy bone you will find an area that will be red and bloody, this is the **red bone marrow** and the site of blood cell production (**hematopoiesis**).

   b. Now look toward the outside of the bone to the outer lining of the shaft. Take forceps and peel away the **periosteum**. The periosteum serves as a site of attachment for tendons and ligaments and an anchor for blood vessels.

   c. Now look for cartilage. **Hyaline cartilage** will be located in the **articular cartilage** at the ends where the bone will articulate with another bone. In some cases **fibrocartilage** will be visible in the shape of a 'C' on the end of the cow tibia. Closely look at the difference between the two cartilages.

   d. Identify all of the structures on the following list before properly disposing of your specimen.

You must dispose of the cow bone as instructed, and completely clean, dry, and put away all instruments and trays in order to earn your participation grade for the lab.

STRUCTURES TO IDENTIFY—COW BONE DISSECTION	TEXT REFERENCES AND SKETCH
☐ **diaphysis**	FIG. 6.4, P. 151
☐ **compact bone tissue** (forming most of the diaphysis and the outside of all bones)	
☐ **proximal and distal epiphysis** (form the ends of the long bone)	
☐ **articular surface *with* articular (*hyaline*) cartilage**	
☐ **metaphysis**	
☐ **epiphyseal line *or* epiphyseal (growth) plate**	
☐ **medullary (marrow) cavity**	
☐ **yellow bone marrow**	
☐ **spongy bone tissue**	
☐ **red bone marrow**	
☐ **trabeculae** (thin bony plates running within spongy bone tissue) within spongy bone	
☐ **periosteum** (dense irregular connective tissue covering the outside of all bones)	
☐ **endosteum** (tissue lining the inside of the medullary cavity in the diaphysis)	
☐ **nutrient artery** (if visible)	

Activity 4

TABLE 4-1. Pectoral girdle

BONE	BONE MARKINGS	TEXT REFERENCES, NOTES, AND SKETCH
CLAVICLE	☐ sternal end (medial)	**FIG. 8.2, P. 223**
	☐ acromial end (lateral)	
	☐ conoid tubercle	
SCAPULA	☐ superior border	**FIG. 8.2, 8.3, PP. 223–224**
	☐ suprascapular notch	
	☐ medial (vertebral) border	
	☐ lateral (axillary) border	
	☐ superior angle	
	☐ inferior angle	
	☐ spine	
	☐ acromion	
	☐ coracoid process	
	☐ supraspinous fossa	
	☐ infraspinous fossa	
	☐ subscapular fossa	
	☐ glenoid cavity (fossa)	
	☐ supraglenoid tubercle	
	☐ infraglenoid tubercle	

TABLE 4-2. Upper limb – arm

BONE	BONE MARKINGS	TEXT REFERENCES, NOTES, AND SKETCH
HUMERUS	☐ head	**FIG. 8.4, PP. 226–227**
	☐ greater tubercle	
	☐ lesser tubercle	
	☐ intertubercular sulcus/ groove	
	☐ anatomical neck	
	☐ surgical neck	
	☐ deltoid tuberosity	
	☐ radial groove	
	☐ coronoid fossa	
	☐ olecranon fossa	
	☐ radial fossa	
	☐ medial epicondyle	
	☐ lateral epicondyle	
	☐ trochlea	
	☐ capitulum	

TABLE 4-3. Upper limb – forearm

BONE	BONE MARKINGS	TEXT REFERENCES, NOTES, AND SKETCH
ULNA	☐ olecranon process	**FIG. 8.5, PP. 228–229**
	☐ coronoid process	
	☐ trochlear notch	
	☐ radial notch	
	☐ styloid process	
	☐ head	
RADIUS	☐ head	**FIG. 8.5, PP. 228–229**
	☐ neck	
	☐ radial tuberosity	
	☐ ulnar notch	
	☐ styloid process	

TABLE 4-4. Upper limb – wrist and hand

BONE	INDIVIDUAL BONES	TEXT REFERENCES, NOTES, AND SKETCH
CARPAL BONES (8)	**proximal row (lateral to medial)**	FIG. 8.6, P. 231
	☐ scaphoid bone	
	☐ lunate bone	
	☐ triquetrum bone	
	☐ pisiform bone	
	distal row (lateral to medial)	
	☐ trapezium bone	
	☐ trapezoid bone	
	☐ capitate bone	
	☐ hamate bone	
METACARPAL BONES	**I through V**	
PHALANGES	☐ proximal phalanx	
	☐ middle phalanx	
	☐ distal phalanx	
	☐ pollex (has no middle phalanx)	

TABLE 4-5. Pelvic girdle: Each os coxa (pl., *ossa coxae*) is composed of three fused bones: ilium, ischium, and pubis.

BONE	BONE MARKINGS	TEXT REFERENCES, NOTES, AND SKETCH
OS COXA (2)	❒ acetabulum	**FIG. 8.7, 8.9, 8.10, PP. 232–237, TABLE 8.1**
	❒ obturator foramen	
ILIUM	❒ iliac crest	
	❒ anterior superior iliac spine	
	❒ anterior inferior iliac spine	
	❒ posterior superior iliac spine	
	❒ posterior inferior iliac spine	
	❒ greater sciatic notch	
	❒ iliac fossa	
	❒ auricular surface	
ISCHIUM	❒ body	
	❒ ischial spine	
	❒ lesser sciatic notch	
	❒ ramus *or* ischial ramus	
	❒ ischial tuberosity	
PUBIS	❒ body	
	❒ pubic tubercle	
	❒ superior pubic ramus	
	❒ inferior pubic ramus	

TABLE 4-6. Lower limb – thigh and knee

BONE	BONE MARKINGS	TEXT REFERENCES, NOTES, AND SKETCH
FEMUR	☐ head	FIG. 8.11, 8.12, PP. 238–240
	☐ fovea	
	☐ neck	
	☐ greater trochanter	
	☐ lesser trochanter	
	☐ intertrochanteric crest	
	☐ shaft	
	☐ gluteal tuberosity	
	☐ linea aspera	
	☐ medial condyle	
	☐ medial epicondyle	
	☐ adductor tubercle	
	☐ lateral condyle	
	☐ lateral epicondyle	
	☐ intercondylar fossa	
PATELLA		FIG. 8.12, P. 240

TABLE 4-7. Lower limb – leg and foot

BONE	BONE MARKINGS OR INDIVIDUAL BONES	TEXT REFERENCES, NOTES, AND SKETCH
TIBIA	☐ medial condyle	FIG. 8.13, 8.14, PP. 242–244
	☐ lateral condyle	
	☐ intercondylar eminence	
	☐ tibial tuberosity	
	☐ medial malleolus	
	☐ anterior border (crest)	
FIBULA	☐ head)	
	☐ neck	
	☐ lateral malleolus	
TARSAL BONES (7 bones)	☐ talus bone	FIG. 8.14, 8.15, PP. 244–245
	☐ calcaneus bone	
	☐ navicular bone	
	☐ medial cuneiform bone	
	☐ intermediate cuneiform bone	
	☐ lateral cuneiform bone	
	☐ cuboid bone	
METATARSAL BONES	**I through V**	
PHALANGES	☐ proximal phalanx	
	☐ middle phalanx	
	☐ distal phalanx	
	☐ hallux (has no middle phalanx)	

STUDY AIDS FOR APPENDICULAR SKELETON

Helpful bone marking terms used in Appendicular Skeleton

ANATOMICAL TERMS	DESCRIPTION
acetabulum	small receptacle, vinegar cup
acromion	summit of the shoulder, tip of the shoulder
anatomical neck	area between the head and greater/lesser tubercles of humerus
calcaneus	heel
capitate	having a caput (head)
capitulum	head
clavicle	key (old Roman keys were S-shaped)
conoid	resembling a cone, cone-shaped
coracoid	like a crow's beak
cuboid	cube-shaped
cuneiform	wedge-shaped
deltoid	Greek delta letter, triangular shape
femur	thigh
fibula	a clasp, as in a safety pin
fovea	a pit
glenoid	socket-shaped
hamate	hooked
ilium	bone of the groin or flank
ischium	socket, contributes to most of the acetabulum
linea aspera	rough line
lunate	moon-shaped
malleolus	hammer
navicular	little ship
obturator	a structure which closes a hole
olecranon	upper end of the ulna
os coxae	os=bone, coxae= hip, the hip bone
patella	a small pan
phalanx (pl., *phalanges*)	row of soldiers
pisiform	pea-shaped
scaphoid	boat-shaped
scapula	resembling a spade
sciatic	pertaining to the hips
spinous	sharp process
surgical neck	region distal to the tubercles and continuous with shaft of humerus
talus	ankle-bone
tibia	the shin-bone; flute-shaped
trapezium	a quadrilateral with two sides parallel
trapezoid	resembling a trapezium
triquetrum	three-cornered