

## LAB 4 - MEDICAL IMAGING AND AXIAL SKELETON

**1. MEDICAL IMAGING - CLASS DEMO-** Class will review several types of medical imaging techniques using the computer and the light box. For the lab exam, you will be responsible for recognizing major types of images and understanding some basics.

**2. BONE TISSUE:** Review the microscopic structure of compact bone (p.86), using your ground bone slide. You should be able to identify all structures on page 86, figure 9.3. What goes through the central canal? What is another name for an osteon? What are Sharpey's fibers?

**3. BONE MORPHOLOGY:** Be able to identify all structures in Figure 9.2. Also, review the cut bone, Figure 9.2 (a) on page 85. Match structures to lab specimen.

**4. AXIAL SKELETON: We will concentrate on the anatomy of the skull, vertebrae and vertebral column, and the thoracic cage.**

What three parts make up the axial skeleton? (Fig. 9.1)

**Skull:** Your lab manual has excellent skull descriptions and facial bone illustrations here! Please read the descriptions as you find the structures on the specimens. You should be able to locate these on the actual skull or on a drawing! You should primarily work with Figure 10.1, 10.2, 10.3, 10.4, 10.6, 10.7, and 10.8. Consult your lecture text as well.

*Cranium-* Identify and learn:

1. Frontal Bone – note supraorbital margin
2. Parietal Bone (2) - joined by sagittal suture. Locate coronal suture between frontal and parietal bones
  3. Occipital Bone - Note large foramen magnum (what goes through here?), lambdoidal suture, occipital condyles (what happens here?)
  4. Temporal Bone (2) - Note mastoid, styloid, zygomatic processes
  5. Sphenoid Bone - Note pterygoid processes and sella turcica (what is the importance of this structure?),
  6. Ethmoid Bone – note nasal conchae and sinuses

*Sutures* - coronal, sagittal, lambdoidal, squamosal

*Fontanels* (newborn) – 4 fontanels. Be able to identify the individual fontanels and explain their function. Use your textbook or reference books to look for pictures.

*Facial Bones* - Identify and learn:

1. Mandible - Ramus, condyloid process, coronoid process, alveolar margin, alveolar process (contains sockets for teeth)
2. Maxilla (2) - Palatine process (Fig. 10.2)

*Bones of the orbit*, Figure 10.1, 10.6, 10.7

3. Zygomatic (2)- temporal process
4. Lacrimal (2)
5. Palatine (2) Palatine bone + palatine process of maxilla = hard palate, also part of the orbit
6. Nasal Bone (2)
7. Nasal conchae or turbinates: what are their functions?
8. Vomer
9. Orbit and optic foramen
10. Hyoid- although it does not directly articulate with other bones, we include it here with skull. Fig. 10.8

*Sinuses* –What are sinuses? What is their function? Identify the four main sinuses on Figure 10.9a, c. What changes occur in the sinuses during sinusitis?

*Foramina* -Note that there are many openings (foramina) in the skull bones. What are the functions of these foramina?

**Vertebral Column** - Review and be able to identify figures 10.10, 10.11, 10.12, 10.13, 10.14, 10.15.

*Vertebral Column* - Review p. 98, and Figure 10.10. Use the articulated vertebral column in the lab. Identify the three curvatures.

*Parts of a typical vertebra* (common features)- Review p. 99, 100, also Figure 10.12.

1. Body (centrum)
2. vertebral/neural arch with vertebral foramen/canal
3. spinous process
4. transverse process
5. facets (superior and inferior). What is their function?
6. transverse foramen (cervical vertebrae only)
7. intervertebral foramen (best viewed lateral on whole skeleton or intact column)
8. intervertebral disc (what is a "slipped" disk?)

*Specific Types of Vertebrae:*

1. Cervical (7) Fig. 10.13 – Recognize the following:

C<sub>1</sub> - atlas

C<sub>2</sub> - axis- note the dens (or odontoid process)

bifid spinal process if present

understand the role of the dens in rotation of the head

A "typical" cervical vertebrae

Note the large oval foramen in each transverse process, a distinguishing feature of the cervical vertebrae.

What is the vertebra prominens? Can you locate this structure on your lab partner?

2. Thoracic (12), Fig. 10.14 b, Table 10.1

Note in particular the facets for rib articulation - one on transverse process (facet for tubercle), two on body (costal demifacets). What is a demifacet?

Note that vertebral foramen is rounded

3. Lumbar (5), Fig. 10.14 c, Table 10.1 - Largest and heaviest bodies, triangular vertebral foramen, no rib facets

4. Sacrum (5 fused), Fig. 10.15 - Note sacral foramina - dorsal and pelvic, medial sacral crest.

Can you palpate this structure? (In private ! : ) )

Note the sacral promontory - important landmark. Can you find the two alae?

5. Coccyx (3-5 fused), Fig. 10.15

**Thoracic Cage** - Locate these structures. Figures 10.16, 10.17

1. Sternum - manubrium

jugular notch (palpate on yourself)

clavicular notch

xiphisternal joint

sternal angle

body

xiphoid process

2. Ribs (12 pairs), Fig. 10.15 and 10.16

True Ribs

False Ribs (vertebrochondral)

Floating Ribs

Tubercle and head - facets for articulation- understand how these facets work with thoracic vertebrae

## **5. REVIEW DEMOS ON SIDE BENCH**