Biology 1120

# Laboratory Exercise 1: Anatomical Orientation and Terminology

Work in groups of about 3 or 4, using the human models, skeletons and text diagrams to answer the following questions. Ask each other (including other groups) for help in locating any of the structures that you are unfamiliar with or can't locate.

Orientation terminology, like much of the vocabulary in anatomy and physiology, has originated around the world and from multiple fields of study. In particular, human medicine and zoology have both contributed to the terms commonly used to describe the body. This can cause problems, as many zoological terms were developed to describe animals that aren't bipedal (upright stance) like humans. The result is that the same term can mean different things in different situations. For instance, in zoology, anterior refers to a direction or position towards the front or head end of an animal, while in human anatomy it only refers to the front side of the body. Cranial and caudal mean towards the head or tail, respectively, in both sets of terminology. Superior and inferior refer to higher and lower in both formats. Supine and prone can be confusing as well. Supine typically refers to lying on one's back, while prone is lying belly side down. When referring to the arms, however, the problem is determining which way the arms should be turned. The anatomical position was developed to solve this problem. In this position, the palms of the hands should point to the anterior surface of the body, so that the palmar surface is forward. In the foot, supination has come to describe a complex outward rolling of the foot during walking. It is comprised of multiple changes in orientation. Instead, it is most common to describe foot orientation and bending by dorsiflexion (moving the toes in a superior directions) or plantarflexion (pointing the toes downward).

Use the terms you are learning about to answer the following questions:

A. Assume the anatomical position and describe to your fellow group members how it is defined.

B. Use each of the directional terms once to complete these statements.

Directional terms to use: medial, lateral, distal, proximal, cranial (superior), caudal (inferior), contralateral, ipsilateral, superficial, deep, dorsal, ventral.

1. The lungs are _____Lateral_____ to the heart.
2. The knee is _____Distal_____ to the hip.
3. The thumb is ____Medial_____ to the little finger (5th digit) when the hand is in pronation.
4. The pancreas (upper left quadrant) is _____Ipsilateral_____ to the left arm.
5. The skin is ____Superficial_____ to the muscles.
6. The nose is ____Ventral_____ to the ears.
7. The brachium (upper arm) is _____Proximal_____ to the elbow.
8. The appendix (lower right quadrant) is ___Contralateral___ to the stomach (upper left quadrant).
9. The kidneys are _____Dorsal_____ to the intestines.
10. The stomach is _____Cranial or Superior_____ to the anus.
11. The heart is _____Deep_____ compared to the ribs.
12. The crus (leg) is ____Caudal or Inferior_____ to the buttocks.

C. Some of the following statements are correct, but others don't quite make the grade. Place an X beside the statements that contain errors.

_X__ The armpit is medial to the breast. Lateral

___ The eyes are lateral to the nose.

___ The gallbladder and the ascending colon are ipsilateral.

___ The ascending and descending colons are contralateral.

___ The brain is deep to the skull.

__X_ The lungs are superficial to the ribs. Deep

___ The wrist is proximal to the hand.

___X The ankle is distal to the foot. Proximal

___ The ovaries are posterior to the intestines.

___ The breasts are on the ventral surface of the thorax.

___ The thorax is superior to the abdomen.

__X_ The diaphragm is inferior to the abdomen. Superior

D. On the following diagram, label the 3 most frequently used planes.

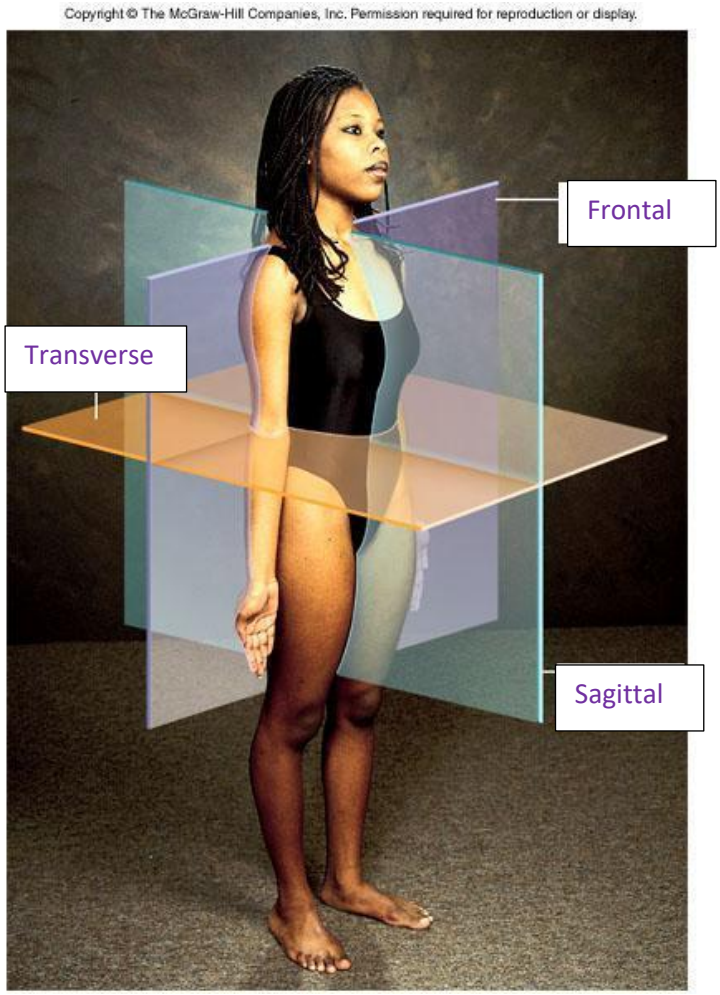


***Figure 1..Three major anatomical planes of reference.(Saladin, 2007)***

E. Label the 4 abdominal quadrants and 9 abdominal regions on these diagrams. Ignore the blank label lines as they are remnants from the textbook images.

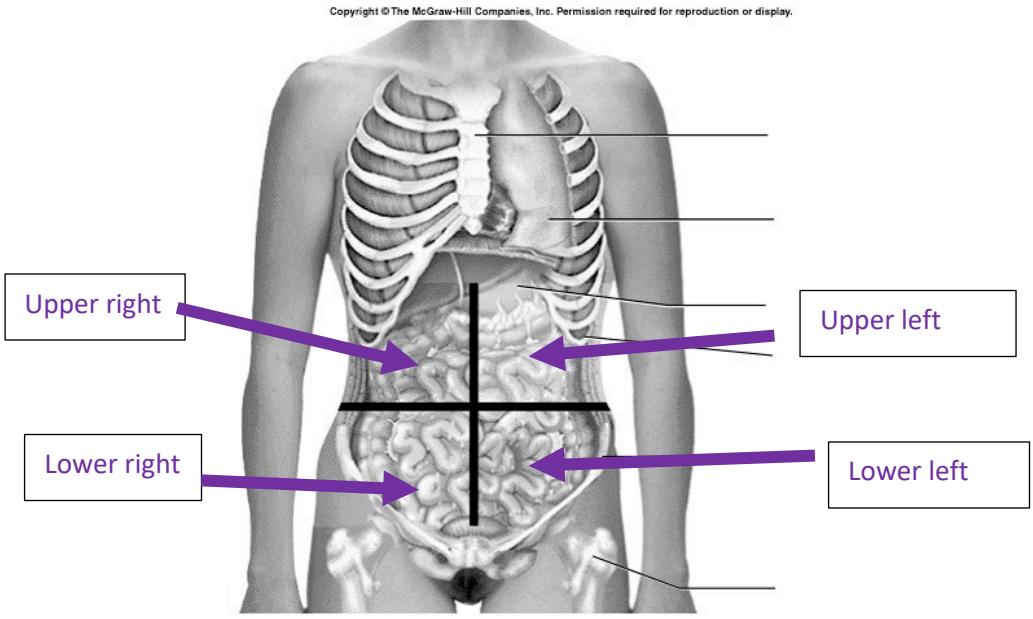


***Figure 2. The four quadrants of the abdominal region (Saladin, 2004)***

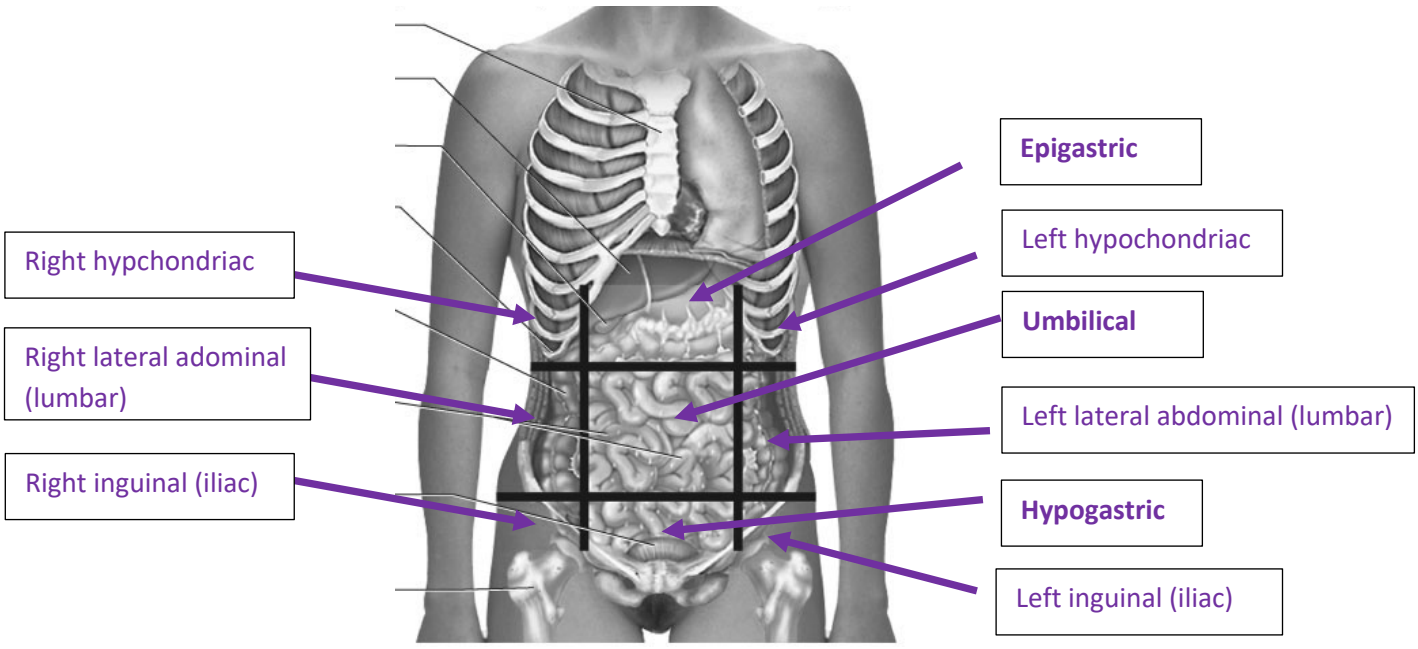


***Figure 3. The nine regions of the abdomen (Saladin, 2004)***

F. Identify the quadrant(s) and region(s) in which you are most likely to find the following structures. Simply identifying the area in which the majority of the structure is located is good enough.

| | Quadrant(s) | Region(s) |
|---|---|---|
| Stomach | Upper left | Epigastric (& left hypochondriac) |
| Appendix | Lower right | Right inguinal (& r. lateral abd) |
| Left kidney | Upper left | Umbilical (& epigastric, L hypo, L lat) |
| Right ovary | Lower right | Right inguinal |
| Ascending colon | Lower right | Right lateral abdominal |
| Urinary bladder | Lower left & right | Hypogastric |
| Hiatus | Upper left | Epigastric |
| Gallbladder | Upper right | Epigastric |

G. Identify the body cavity (dorsal - cranial and vertebral, ventral - thoracic, abdominal and pelvic) in which you would find the following structures. Try to locate the structures themselves on the human models or on diagrams in your texts.

| | |
|---|---|
| Small intestine | Ventral-abdominal |
| Oesophagus | Ventral-thoracic |
| Rectum | Ventral-pelvic |
| Caecum | Ventral-abdominal |
| Lung | Ventral-thoracic |
| Hypothalamus | Dorsal-cranial |
| Trachea | Ventral-thoracic |
| Urethra | Ventral-pelvic |
| Spinal cord | Dorsal-vertebral |