Anatomy and Physiology Class Notes (0-2)—Orientation to the Class: Basic Anatomic Terminology

Introduction

By far, one of the most difficult things about anatomy is the seemingly endless list of anatomic terms. A few of these terms have crept into usage in everyday life and a few more have roots with connections to words you know and so will have at least a vague familiarity, but most are unfamiliar and have no real connection to anything you've heard about before. This means that we will have to work hard to try find connections between these words and something you know about, or at least provide a framework to place these terms on that will allow you to more easily remember them in some logical fashion. However, as much as I hate to admit it, there will be some terms that you are just going to have to memorize. Good luck! I think you can do this!

Preassessment:

_____*Which of the following is an incorrect feature of the anatomical position?*
a. Body erect
b. Palms facing toward the midline
c. Feet parallel
d. Arms hanging at side

Learning Target

what: *the student will be able to provide a correct statement of the anatomical position*

why: *the anatomical position is the frame of reference from which all other statements of anatomical position and relationship are taken*

how: *the student will state or write a correct statement of the features of the standard anatomical position*

The Standard Anatomical Position

One of the reasons we have so many specialized terms is so that we can be very precise. Imagine trying to describe to someone that "large triangular shaped bone that sits on the back off to either side of the upper part of the spinal column that attaches to the collar bone near the shoulder . . . ." A much easier thing to do is use the word "scapula" and anyone who knows something about anatomy instantly gets a visual picture of what you're talking about.Although it's difficult, in the end the

language of anatomy saves extraordinary amounts of time and confusion.

Just as with any field of study, it is useful to start off with a reference point on which you can build your knowledge. We have already created a framework for all of the major functions and body systems of the human body—now we need to create the reference point on which we will hang all of these anatomical terms. Having such a reference point will make it easier to avoid confusion when describing anatomic structures will depend on how a particular body part is held in space.

For example, the term used to describe the "back" surface of an anatomic structure is _____. Now, stand up and simply hold your arms loosely at your sides, with your hand in a natural, comfortable position. Which surface of your hand would be considered the posterior surface? _____

Now stand with your palms facing toward the front. Which surface of the hand would be considered the posterior surface? _____

Now with your palms facing backward? _____

Notice that the posterior surface changes depending on how you hold your hand and that could lead to extreme confusion, especially if a physician said something about an abnormality on the posterior surface of the hand.

So, we define a _____ _____ _____, and make it so our terms are defined by this reference. Which of the three hand positions do you think it would make the most sense to use as the standard position? _____

So, no matter what position we hold our hand in, the back surface of it will always be considered the _____ surface.

The standard anatomical position is defined as:

-body erect
-feet parallel
-arms hanging at side
-palms facing forward

(**Drawings**: We will make many drawings in this class. Making and labeling drawings and practicing making these drawings from a blank sheet of paper is one of the best ways to incorporate these terms and their meanings into your memory. These will not need to be high quality art drawings and in fact, it's better if you don't waste a lot of time making them perfect—just "good enough" to help you learn. When we are making these drawings I will give you a blank sheet of paper,

demonstrate what I'm looking for, then ask you to draw it, and then we will label the drawing as we learn the terms.)

Directional Terms

Preassessment:

Complete the following statements of anatomic relationships by selecting the correct directional or landmark term—assume the standard anatomical position.

The wrist is _____ to the shoulder.
a. medial b. superior c. distal d. posterior

The umbilicus is _____ to the sternum.
a. lateral b. dorsal c. cephalic d. inferior

The _____ region is superior to the thoracic region.
a. cervical b. umbilical c. carpal d. pelvic

The _____ region is lateral to the scapular region.

a. vertebral b. umbilical c. deltoid d. pubic

Learning Target

what: *the student will correctly be able to use the following pairs of directional terms: posterior/anterior, dorsal/ventral, superior/inferior, cephalic/caudal, medial/ lateral, superficial/deep, proximal/distal*

why: *directional terms provide a precise and concise means to convey information about internal and external anatomical relationships*

how: *the student will be able to create labeled drawings of the body showing the correct use of directional terms; the student will correctly apply directional terms to statements of anatomical relationships*

You have already seen how difficult it might be to describe the relationship of one part of the body to another without a very precise way of describing things. **_____ _____ are terms used to indicate the where one body structure is in relationship to another body structure (vocab).** You are used to this kind of terminology in everyday life—describing where a restaurant is you might say that it's just slightly to the east of and around the corner from that one 7-11, near the Tosoro gas station. We use anatomical directional terms in a very similar fashion.

While many of these terms will not be familiar to you, some of them you have at least a vague idea of or the words themselves will suggest a direction to you. We will use this previous knowledge to connect your thinking to other terms that are unfamiliar, and hopefully organize our thinking with the use of drawings that will also help you remember.

The first thing we will do is draw **lateral and anterior views** of the body.

We will find out that _____ is a term that means "from the side of," or "toward the side of," so the lateral view of the body is the view that looks at the body from the side. (Those interested in football may have heard the term lateral before—a lateral is a toss of the football to a player off to the side of the quarterback.)

We will find out that _____ is a term that means "from the front of" or "toward the front of," so the anterior view of the body is the view that looks at the body from the front. You may be familiar with words that have the prefix "ante-." (antecedent, antebellum, antechamber, anteroom—in all of these the prefix is from the Latin word "ante" which means "before" or "in front of.")

So, with our drawings "anterior" to us (in front of us) to label and refer to, the first thing you need to know about these terms is that there are 7 pairs of them which essentially represent opposite concepts, or directional "opposites." (there are more directional terms than this but these are the ones on which we will focus).

Lets start with the lateral view drawing.

There are two pairs of terms that refer to front and back surfaces of the body or of other structures. The first pair of terms, _____ and _____ you may have some familiarity with. Most people have heard of their back side, or their behind, referred to as their posterior. As suggested above, you also likely have heard the prefix "ante-" in several words, where it means "before" or "in front of."

<u>Anterior</u>—a directional term indicating "the front surface of", "in front of", "toward the front of" or "in a forward direction". (vocab)

<u>Posterior</u>—a directional term indicating "the back surface of", "in back of", "toward the back of" or "in a backward direction." (vocab)

The second pair of terms, _____ and _____ are probably less familiar or are totally unfamiliar. You do probably know that dorsal is a term used for the fin on the back of fish—the dorsal fin. Dorsal also refers to the back surface of the human. However, ventral probably has no connection with anything you are familiar with and you will likely have to memorize it.

<u>Ventral</u>—a directional term indicating "the front surface of," "in front of," "toward the front of" or "in a forward direction." (vocab)

<u>Dorsal</u>—a directional term indicating "the back surface of," "in back of," "toward the back of" or "in a backward direction." (vocab)

If the first two pairs of oppositional directional terms refer to the front and back of structures, what might the next pair of directional terms indicate?

The third pair of terms, _____ and _____ are terms that you at least have probably heard. You can probably guess the nature of these terms from past knowledge.

<u>Superior</u>—a directional term indicating "the top surface of," "on top of," "toward the top of" or "in an upward direction." (vocab)

<u>Inferior</u>—a directional term indicating "the botton surface of," "at the bottom of," "toward the bottom of" or "in an downward direction." (vocab)

The fourth pair of terms, _____ and _____ are terms that you are almost certainly not familiar with. The only instance I can think of where you might have heard of the term cephalic is in the term hydrocephalus, which means "water on the brain," an uncommon condition seen in infants in which, because of a blockage to the flow of cerebrospinal fluid, this fluid collects within the central cavity in the brain and compresses the brain tissue. The opposing term, caudal, refers to the tail region, and is from the Latin word "cauda," which means tail. For the human body, caudal therefore refers to the region of the behind.

<u>Cephalic</u>—a directional term indicating "the region of the head," or "in the direction of the head." (vocab)

<u>Caudal</u>—a directional term indicating "the tail region" (region of the bottom), or "in the direction of the tail" (bottom). (vocab)

Now lets move to the drawing of the anterior view. It will be come obvious that some of the directional terms are best illustrated on one or the other drawings and some are equally well illustrated on either.

The fifth pair of terms, _____ and _____ should be fairly easy to remember. First, draw a dotted line straight down the middle of the anterior drawing. Label this the midline—this should make sense—it's the line in the middle. For medial, think of the word median—this is either the "middle value" in a series of values, or the strip that separates and runs through the middle of an interstate highway. As stated above, lateral refers to "the side of."

<u>Medial</u>—a directional term indicating "closer to the midline than" or "in a direction toward the midline." (vocab)

<u>Lateral</u>—a directional term indicating "farther from the midline than" or "in a direction away from the midline." (vocab)

The sixth pair of terms, _____ and _____, should also be fairly easy to remember. You are probably aware of their meanings in a social context. Superficial means to be shallow and only concerned with things that don't have real meaning, whereas deep means to be complex and serious. In a physical context superficial means to be near the surface and deep means to be further under the surface.

<u>Superficial</u>—a directional term indicating "at or near the surface of the body." (vocab)

<u>Deep</u>—a directional term indicating "away from or beneath the surface of the body." (vocab)

The final pair of terms, _____ and _____, may be a little more difficult. These terms refer to how close a part of the body is to the origin (the beginning point) of that body part, or to a point of attachment of that body part. For example, on our drawing we will use the left leg. Distal refers to being distant or further away from the point of attachment of the leg to the body than another point. "Being in close proximity to" means "being close by," so it should make sense that proximal refers to being closer to the point of attachment than another point.

<u>Proximal</u>—a directional term indicating "a closeness to the origin or point of attachment of a body part, especially compared to another point." (vocab)

<u>Distal</u>—a directional term indicating "a greater distance from the origin or point of attachment of a body part, especially compared to another point." (vocab)

External Landmarks

Preassessment: see above preassessment for Directional Terms

Learning Targets

what: *The student will correctly be able identify and use the following external landmark terms: abdominal, axillary, carpal, cervical, digital, nasal, oral, orbital, patellar, pelvic, pubic, sternal, thoracic, umbilical, cephalic, cranial, gluteal, deltoid, lumbar, scapular, vertebral*

why: *external landmark terms provide a precise and concise means to convey locational anatomical information about the external surface of the body*

how: *the student will be able to correctly identify all external landmarks on diagrams of the body; the student will be able to correctly apply external landmark terms in a variety of question types requiring knowledge of these terms*

In addition to directional terms, we give special names to various visible points or regions on the surface of the body. There is a very long list of anterior and posterior landmarks. For now, we will focus on those that will potentially be most familiar to you, and again, we will create drawings to help us. Also, don't worry, I will not ask you to write these in your vocabulary list.

For these landmarks we will use drawings of anterior and posterior views of the body.

For anterior landmarks you may have some connection to the following terms:

Abdominal— *the anterior body trunk inferior to the ribs.* Most are familiar with where the abdomen is.
Axillary— *the armpit*. The axillary region is important in women's health. The lymph nodes in this region are where cancer will spread to first in patients with breast cancer.
Carpal— *the wrist.* You may have heard of carpal tunnel syndrome—this is numbness of the hand due to entrapment of nerves going to the hand in scar tissue related to long term vibrational trauma to the wrist, often occurring in those who type a lot.
Cervical—*the neck region*. On medical programs you may have heard of a paramedic placing a cervical collar or a c-collar on someone with a neck injury (note-this is a different location than the uterine cervix, which is where cervical cancer occurs).
Digital—*fingers, toes.* Fingers and toes are called digits.

Nasal—*region of the nose.*
Oral—*region of the mouth.*
Orbital—*region of the eye—the orbit*
Patellar—*region of the knee-cap.* You may have heard the knee-cap referred to as the patella or the ligament that attaches it to the lower leg as the patellar ligament.
Pelvic—*region of the pelvis.*
Pubic—*genital region.*
Sternal—*region of the breastbone.* You may have heard the breastbone referred to as the sternum.
Thoracic—*chest*. You probably know that the thorax is the "chest" region of insects and you have already learned about the thoracic cage in your first musculoskeletal quiz.
Umbilical—*region of the navel.* This is where your umbilical cord attaches.

For posterior landmarks you may have some connection to the following terms:

Cephalic—*region of the head.* You already know this as a directional term.
Cranial—*region of the head*. You are probably aware that this refers to the cranium or the skull. This can also be used as a directional term.
Gluteal—*region of the buttock.* Most of you have heard of the gluteus maximus muscle.
Deltoid—*the curve of the shoulder.* Those of you who work out know that the deltoids are the large muscles that allow you to raise your shoulders.
Lumbar—*the lower back.* You may be aware that a lower back support is also called a lumbar support.
Scapular—*region of the shoulder blade*. Some of you may have heard the shoulder blade referred to as the scapula.
Vertebral—*region of the spine*. Many of you know that the bones of the spine are called vertebrae.

Postassessment: Question of the day next class period—draw anterior and lateral body diagrams and label with the seven pairs of directional terms; on a diagram illustrating anterior and posterior external landmarks, match landmark terms in a word bank with corresponding regions on the diagram.

Inside the Body—Planes, Quadrants and Body Cavities

Preassessment:

Match the following planes of the body with the correct description:

A. Sagittal B. Coronal C. Transverse

_____ *Any plane from left to right that divides the body into anterior and posterior portions*
_____ *Any plane that cuts horizontally through the body*
_____ *Any plane from anterior to posterior, dividing the body into left and right portions*

List one organ that is present in each of the following abdominal quadrants

Left Upper Quadrant _____
Left Lower Quadrant _____
Right Upper Quadrant _____
Right Lower Quadrant _____

_____*Which of the following structures is not contained in the dorsal body cavity?*

A. Dura mater
B. Cerebrum
C. Spinal cord
D. Sub-arachnoid space
E. Oculomotor nerve

_____ *Which of the following structures is not contained the ventral body cavity?*

A. Diaphragm
B. Lungs
C. Spleen
D. Stomach
E. Urinary bladder

Learning Target

what: *The student will be able to describe the sagittal, coronal and transverse body planes, and use these to help identify internal anatomical relationships;*

the student will be able to describe the division of the abdomen into quadrants using planes and state the major anatomic structures within each quadrant

the student will be able to describe the location of the dorsal and ventral body cavities and their basic contents;

the student will be able to use standard anatomic terminology related to the visceral and parietal surfaces of the body cavities and relate these to associated medical signs and symptoms

why: *visualization of the internal body structures is difficult without a series of external references to aid the visualization;*

knowledge of body cavity anatomy is important in understanding the origin of signs and symptoms related to the body cavities

how: *the student will be able to correctly identify body planes on diagrams and demonstrate this knowledge by identification of planes that pass through specific structures;*

the student will be able to correctly identify abdominal quadrants and the dorsal and ventral body cavities on diagrams;

the student will be able to identify anatomic structures as belonging to an abdominal quadrant or body cavity

Planes

It is ultimately not that difficult to look at a human body and give names to and remember with some accuracy what and where those anatomic locations are. But, this is only because you can see the outside of the body in detail. It is much more difficult to visualize the inside of the body. In particular, surgeons must have an exact image in their mind of where everything inside of the body is and how each part relates to the other. Not only that, they have to have a good knowledge of how these relationships can vary, because not everyone's anatomy is exactly the same. (http://www.anatomyatlases.org/AnatomicVariants/Cardiovascular/Images0400/0436.shtml --this is a link to a page that shows a large number of variations on how the blood vessels that supply the head and neck can arise from the large vessel that leaves the heart, the aorta.)

One of the ways we can help is to create an internal frame of reference using imaginary geometric **planes** that cut through the body at various points. These planes are also referred to as **sections** through the body. Your book shows three such standard planes or sections. It is exceedingly difficult (at least for me) to draw the body in three dimensions and I'm not going to attempt drawings for this. I would encourage you to review the images in your book (p. 19), or here is a link –

(http://en.academic.ru/dic.nsf/enwiki/1105495)

to an image that works well showing all three planes at once.

Sagittal plane: Sagittal is from the Latin word sagitta which means "arrow." This comes from appearance of the suture that holds the midline of the skull together (it looks like a feathered arrow-more later) but for our purposes, you can think of an arrow piercing the body from anterior to posterior in the midline. **Any plane from**

anterior to posterior, dividing the body into left and right portions is called a sagittal plane (vocab)—it doesn't have to pass through the midline—the one that does pass through the midline is called the _____ or _____ _____ **plane.**

Coronal plane: Coronal is from the Latin word corona which means "crown." A coronal plane is any plane from left to right that divides the body into anterior and posterior portions. A coronal plane is also called a _____ plane. **A coronal plane that divides the body equally into anterior and posterior portions is called a _____ plane. (vocab)**

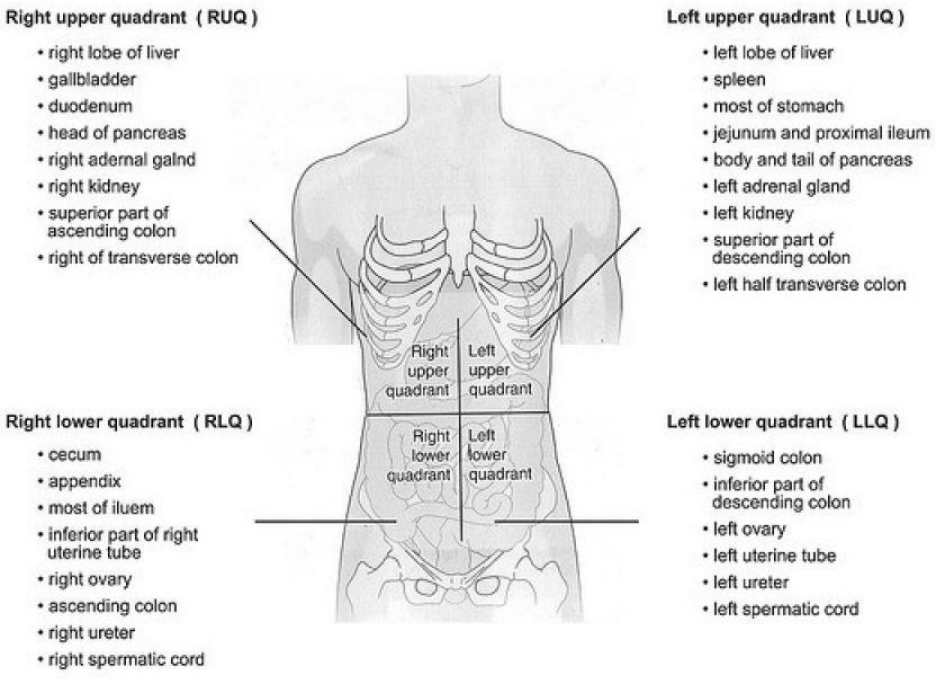
Transverse plane: Trans is a prefix from the Latin trans which means "across." Verse is from the Latin word vertere which means "to turn." **A transverse plane is any plane that cuts horizontally through the body. (vocab)**

<u>Abdominal Quadrants</u>

Another useful division of the internal body structures is the dividing of abdominal contents into one of four quadrants by picturing intersecting planes passing vertically and horizontally through the umbilicus. The resulting quadrants are designated the _____, _____,

_____, and _____ quadrants.

This is useful because certain anatomic structures lie specifically within certain quadrants making it more likely that symptoms and signs in one or another quadrant are more likely associated with certain organs. Although you will not know many of these structures for a while, I have given you the following diagram illustrating the specific associations—eventually you will need to know that these organs are located in their respective quadrants.



Body Cavities

You are probably aware that your internal organs just don't sit inside the body encased inside solid tissue.

In particular, your heart and lungs are in constant motion and need to reside within a space in which they can expand and contract. Likewise, organs of the digestive tract expand and contract as material moves and is moved through them.

As fluid is not really all that compressible, the fluid within the spaces surrounding the internal organs also acts as kind of a shock absorber to cushion the organs from everyday impact and vibrational trauma.

The presence of discrete cavities also provides defined spaces around which defined bony structures can be present in order to further protect the contents of the contained vital organs.

Additionally, the linings of the body cavities allow for flow through the cavity of a controlled amount of low viscosity fluid that coats the surfaces of the organs and allows for them to move against each other and against the lining of the cavity without being ripped to shreds by friction's forces.

An advantage of this is that the presence of the lungs inside a closed cavity, with the outer surface of the cavity separated from the surface of the lungs only by a thin layer of fluid, allows for the creation of a vacuum in the lung cavity such that when chest expands, it literally pulls the lungs open drawing air into them. The presence of the fluid in that cavity allows for the uniform generation of forces on all surface of the lung and the uniform surface tension pulling on the lungs prevents ripping of the lung tissue by excessive force created at any point on the lung surface (huh? I'll explain it better later on.)

So, to summarize, body cavities have many functions—at least:

1) To provide space to move for those organs that need the room because they are in motion.

2) Fluid provides cushion against mechanical trauma.

3) Provide defined spaces around which protective bony structures are formed.

4) Fluid creates low friction surfaces to prevent frictional damage.

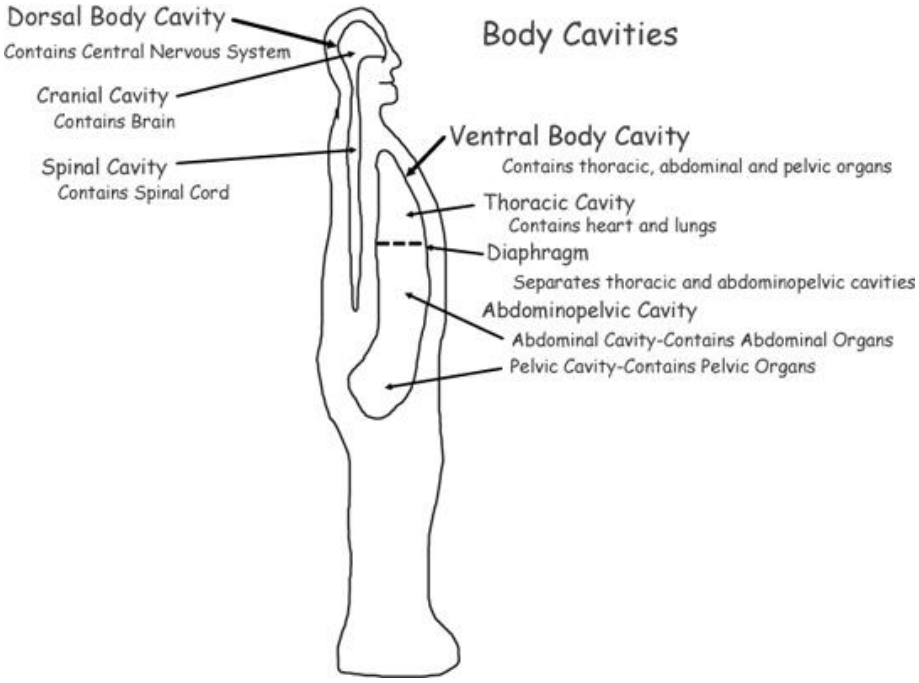
5) Uniform development of vacuum (in thoracic cavity) for expansion of lungs.

There are probably other lesser-known functions that don't come to mind right now.

Anatomists recognize two main body cavities:

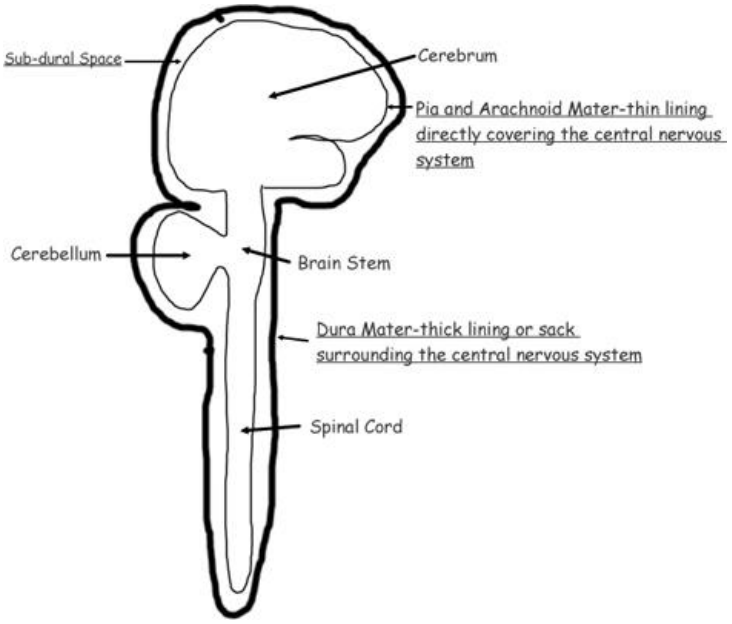
A _____ body cavity, which houses the thoracic, abdominal and pelvic organs, and a

A _____ body cavity, which contains the central nervous system.



The dorsal body cavity (dorsal meaning toward the back) refers to the cavity which contains the brain and spinal cord. (vocab) We will not go into any great detail at this point but we will point out a couple of big picture features.

Picture the entirety of the central nervous system (the brain and attached spinal cord) as being contained within a close-fitting sack composed of a thick, dense, tough tissue. (Think of a bunch of books fitting snugly into a nylon backpack.)



The above diagram shows the four main parts of the central nervous system, the _____, the _____, the _____ _____, and the _____ _____.

Surrounding it is the thick, dense, tough sac referred to above—the _____ _____. Dura means "tough" and mater means "mother." This sack, the **dura mater**, fits closely around the parts of the nervous system and also lines the **dorsal body cavity.** Providing the shape of and protection for the dorsal body cavity are the _____ (for the brain region) and the canal formed by bodies and arches of the _____ bones (for the spinal cord region). The two portions of the dorsal body cavity are continuous with each other and are sometimes called the **cranial cavity** and the **spinal cavity**.

The **dura mater** is attached directly to the underneath (deep) surfaces of the bones that form the shape of the cavity but can easily be peeled off the bone. It is also separated from the underlying nervous system by narrow space called the _____ _____ _____. (sub means "under," so "the space under the dura mater.") This is an exceedingly important space medically because head injuries can cause bleeding into this space. Such a "bleed" is called a **sub-dural hematoma** (hematoma means collection of blood). Because it is a closed space accumulating blood quickly causes increased pressure in the cranium and on the surface of the brain with resulting brain injury.

If the skull is fractured blood can also collect between the bone of the skull and the outside of the **dura mater**—this is called an **epidural hematoma** (epi- is a prefix meaning "next to")—so, a collection of blood next to the dura mater. This can also cause increased pressure inside the cranium.

Directly attached to the surface of the brain is a thinner layer of tissue called the _____-_____ _____. Within this layer of tissue is a collection of fluid called the _____-_____ fluid which further helps protect the brain.

So, from the outside to inside of the dorsal body cavity—that is from **superficial to deep**—we have:

-the bone forming the shape of the cavity
-the dura mater
-the sub-dural space
-the pia-arachnoid mater
-then the structures of the central nervous system themselves

Learn how to view "big picture" structures like the dorsal body cavity from this "outside-in" or superficial-to-deep perspective. It will help you organize your thinking and allow you to be able to better remember things.

The ventral body cavity (ventral meaning toward the belly or toward the front) refers to the body cavity that contains the thoracic, abdominal and pelvic organs. (vocab)

This body cavity is further divided into the _____ and _____ cavities by the _____.

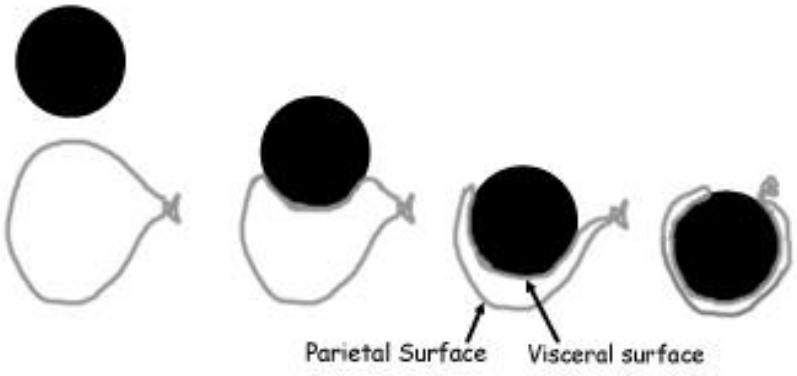
The **thoracic cavity** is itself divided into three separate cavities, one for each of the lungs and one for the heart. The **abdominopelvic cavity** can be separated into two cavities for the abdominal and pelvic organs, but it is actually one continuous cavity—the distinction being that the portion called the pelvic cavity is surrounded by the pelvic girdle.

Before we discuss the structure and terminology of these cavities, lets first consider the following illustration of a heavy ball of some type dropping into a balloon. Notice that as the ball "falls" deeper into the balloon, the "pushing in" of the ball into the balloon creates two layers of the balloon that become wrapped around the ball—

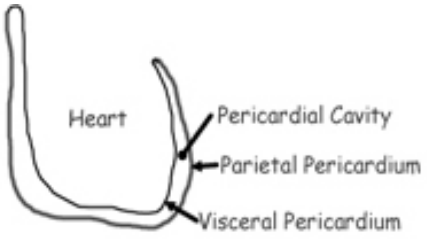
-the inner layer is wrappped tightly around and is closely applied to the ball itself. In anatomical terms, a general term for "organs" is _____. Because of this, we will say that this inner layer is called the **visceral surface.**

-the outer layer is separated from the inner layer by a thin cushion of air. Think of this outer layer as forming a wall around the viscera, or forming the wall of the cavity. The anatomical term_____

literally means "wall." We call this outer layer the **parietal surface.**



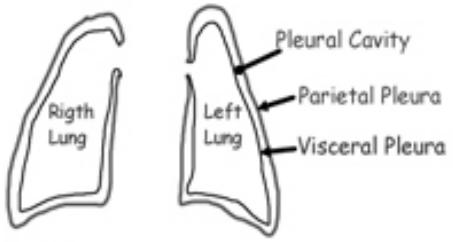
Now envision the heart, lungs and abdominopelvic organs "pushing into" their respective cavities in much the same way as illustrated below (recognizing that I'm using relatively formless shapes to represent these organs).
The names of the three cavities in which the heart, lungs, and abdominopelvic organs are contained are the _____, _____, and _____ cavities, respectively.



The cavity in which the heart resides is the pericardial cavity

The parietal surface (the outer surface), which is the surface that lines the wall of the cavity, is the parietal pericardium.

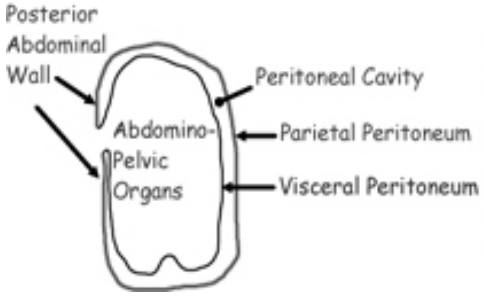
The visceral surface (the inner surface), which is the surface that directly covers the surface of the heart, is the visceral pericardium.



The cavities in which the lungs reside are the pleural cavities.

The parietal surface (the outer surface), which is the surface that lines the wall of the cavity, is the parietal pleura.

The visceral surface (the inner surface), which is the surface that directly covers the surfaces of the lungs, is the visceral pleura.



The cavity in which the abdominopelvic organs reside is the peritoneal cavity.

The parietal surface (the outer surface), which is the surface that lines the wall of the cavity, is the parietal peritoneum.

The visceral surface (the inner surface), which is the surface that directly covers the surfaces of the organs, is the visceral peritoneum.

Also, we create names for the **visceral and parietal surfaces** of these cavities by using the name of specific body cavity—

For the **pericardial cavity**:

> The **parietal surface** (the outer surface)**,** which is the surface that lines the wall of the cavity, becomes the **parietal _____.**
> The **visceral surface** (the inner surface), which is the surface that directly covers the surface of the heart, becomes the **visceral _____.**

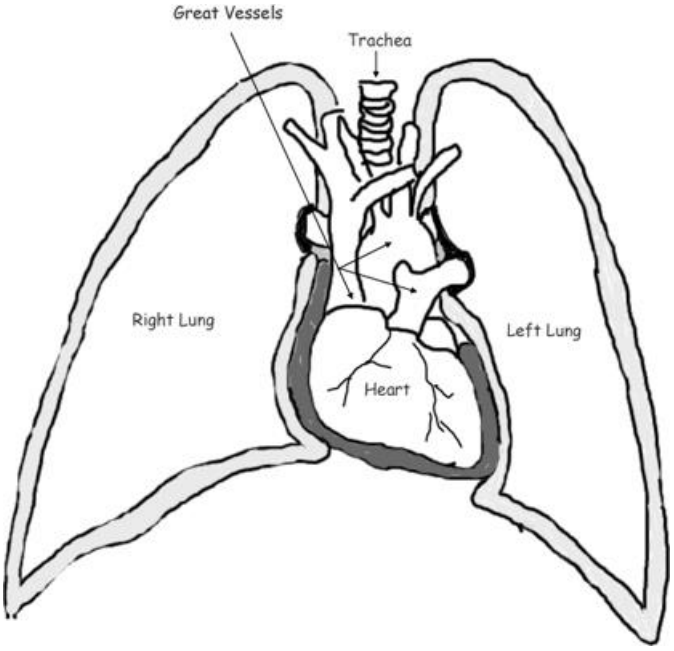
For the left and right **pleural cavities**:

> The **parietal surface** (the outer surface)**,** which is the surface that lines the wall of the cavity, becomes the **parietal _____.**
> The **visceral surface** (the inner surface), which is the surface that directly covers the surface of the lungs, becomes the **visceral _____.**

For the **peritoneal cavity**:

> The **parietal surface** (the outer surface)**,** which is the surface that lines the wall of the cavity, becomes the **parietal _____.**
> The **visceral surface** (the inner surface), which is the surface that directly covers the surface of the abdominalpelvic organs, becomes the **visceral _____.**

The following diagram illustrates the relationship between the pericardial and pleural cavities.



For now these diagrams will suffice—we will go into more detail regarding the

linings of these cavities when we talk about the specific body systems contained in these cavities.

Vocabulary—please write definitions for the following in your vocabulary journal.

Directional terms	Cranial	Distal
Anterior	Caudal	Sagittal plane
Posterior	Lateral	Coronal plane
Dorsal	Medial	Transverse plane
Ventral	Superficial	Dorsal body cavity
Superior	Deep	Ventral body cavity
Inferior	Proximal	