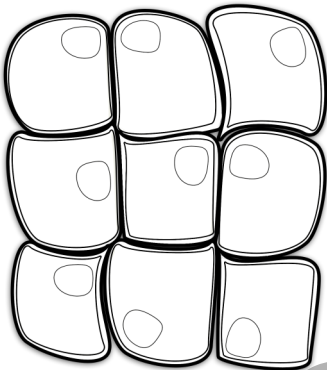


# Human Anatomy and Diseases, Pt. 1

No matter how you feel about it at times, your body is amazing. It is made up of more than 200 bones, over 600 muscles, countless nerve endings, and more than 10 trillion cells. Most of the time, all of these pieces work together and keep things running smoothly without you ever having to think about it. We're going to look at many different parts of the body in this unit and some of the things that can go wrong at times. To do this, we need to get organized first.

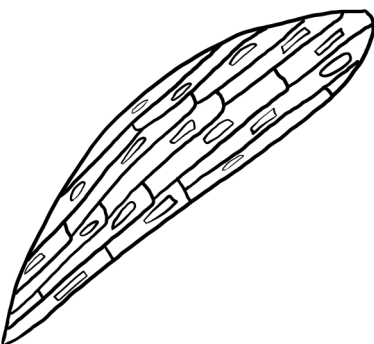
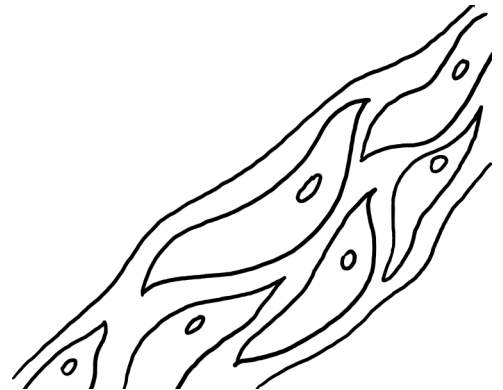


Scientists organize our bodies into **systems** that each include various organs working together to perform one or more functions. Each organ, like your heart, brain, lungs, and kidneys, is made of groups of tissues. Tissues are groups of cells that work together to do one type of job. First we'll look at the four main types of tissues in your body.



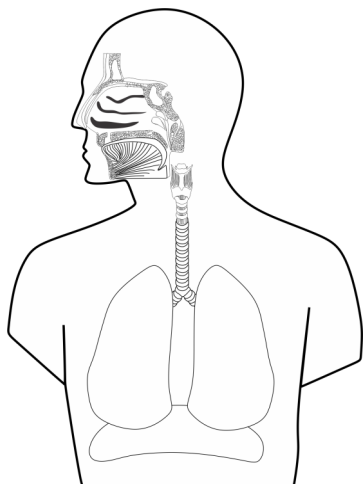
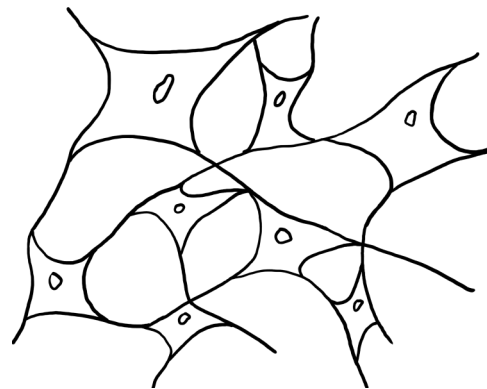
Human beings have epithelial tissue, connective tissue, muscles, and nerve cells. **Epithelial tissue** is a little bit like a wall. There is very little material between the cells because they are tightly packed. They make many of the membranes in our body, including our skin. They also form some of our glands and line certain parts of the body such as the digestive tract and the blood vessels.

**Connective tissue** has a lot of substance between the cells. The substance is usually made of fibers and a clear fluid. Connective tissues do the job of surrounding and connecting tissues and organs. Two examples of connective tissue are bones and cartilage. You can see how your bones work to connect the parts of your body.



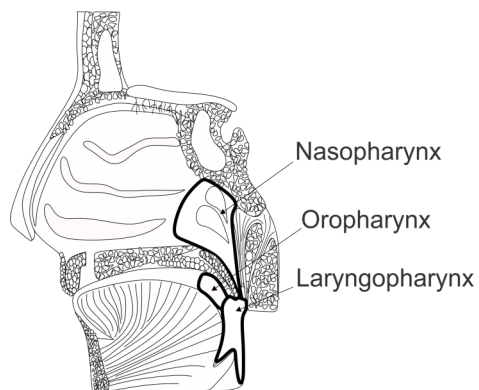
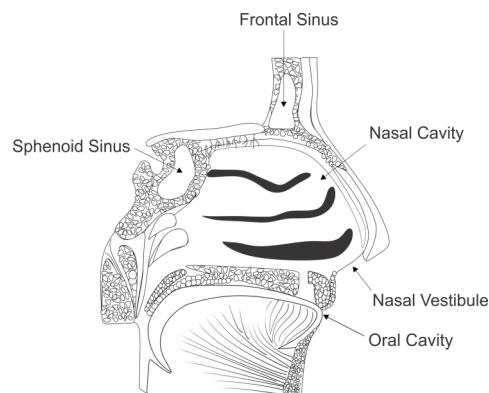
There are several different types of **muscle tissue** in our bodies because of the various jobs they have to do. One characteristic that they all share is the ability to contract and relax, which enables our bodies to move in many different ways.

The last type of tissue in our bodies is **nervous tissue**. This tissue is made of nerve cells that transmit information throughout our bodies, moving countless impulses every second. They transmit both conscious thoughts and commands we give our bodies as well as involuntary ones that we do not have to think about.



The first system we're going to look at is the respiratory system. The main job of the respiratory system is to bring oxygen into the body and get rid of carbon dioxide our bodies do not need. You know we need air to breathe, but have you ever wondered why? The cells in our body need energy. They get this energy from glucose, which is a simple sugar. But to get the energy out of the glucose, they go through a process called cellular respiration. What do you think is a critical component of cellular respiration? Right. Oxygen. Without oxygen, the cells in our bodies couldn't get the energy they need to keep going.

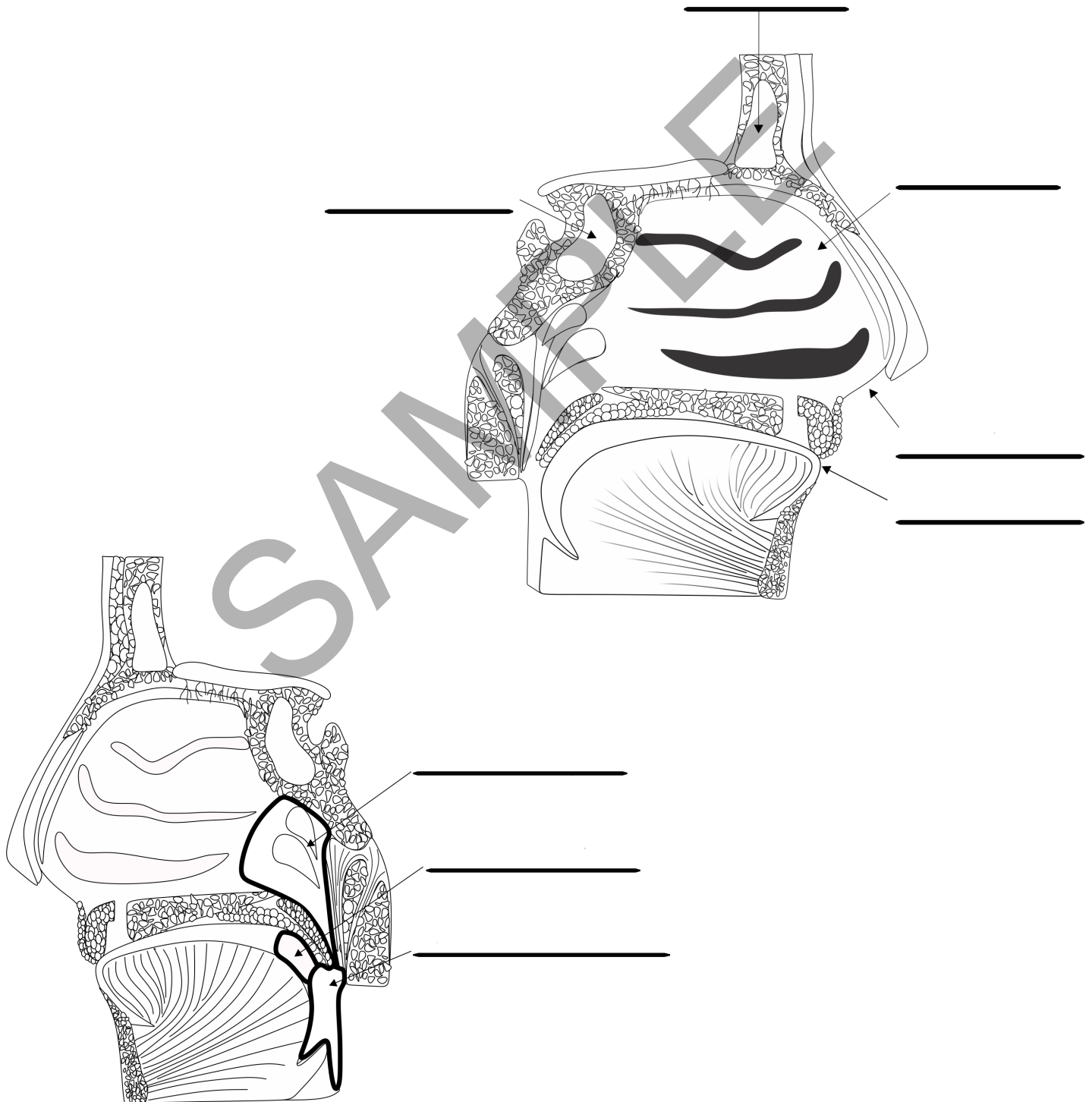
We get that oxygen from the air we breathe. **Inhalation**, or breathing in, starts with our **diaphragm**, a long muscle in the chest and the abdomen. When it contracts, we inhale, or breathe in, pulling air into our bodies through our nose and mouth. The mouth is the **oral cavity**. The very front of the nose is the **nasal vestibule**. Four groups of sinuses connect to our nasal cavity. You can see two of them in the picture on the right, the frontal sinus and the sphenoid sinus. The nasal cavity's job is to warm, moisten, and filter the air we breathe. Once it is through the nasal cavity, it moves on to the pharynx.



The **pharynx**, which comes from the Greek word for "throat" is a muscular funnel. It's made of muscle and connective tissue. It has three main sections called the nasopharynx, the oropharynx, and the laryngopharynx. Those names sound confusing, but they are not hard to tell apart if you look at what each one connects to.

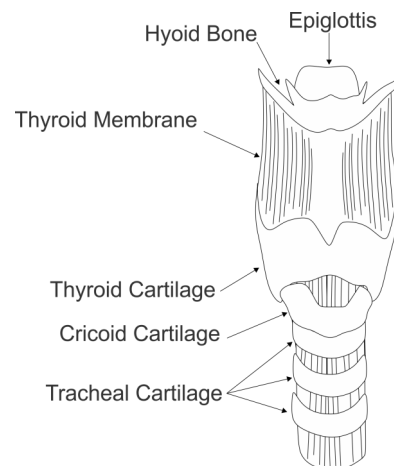
The nasopharynx is the part behind the nose. Since we know the area behind the nose is the nasal cavity, we know the highest part of the pharynx is the *nasopharynx*. The next section of the pharynx begins at the mouth or the *oral cavity*, so the next part of the pharynx is the *oropharynx*. The oropharynx travels down to the epiglottis and *larynx*, which is where the third part of the pharynx gets its name. The *laryngeal pharynx* (or *laryngopharynx*) starts at the epiglottis and goes to the esophagus.

Let's label the parts of the nose, mouth, and pharynx before we move on.



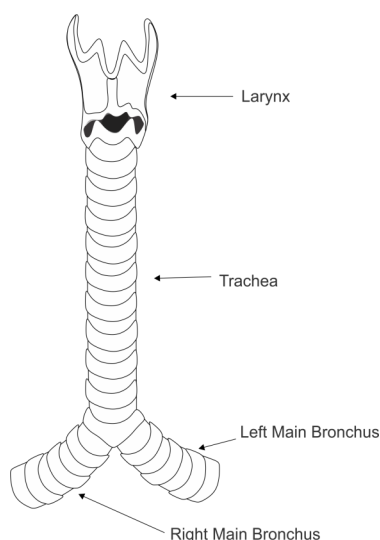
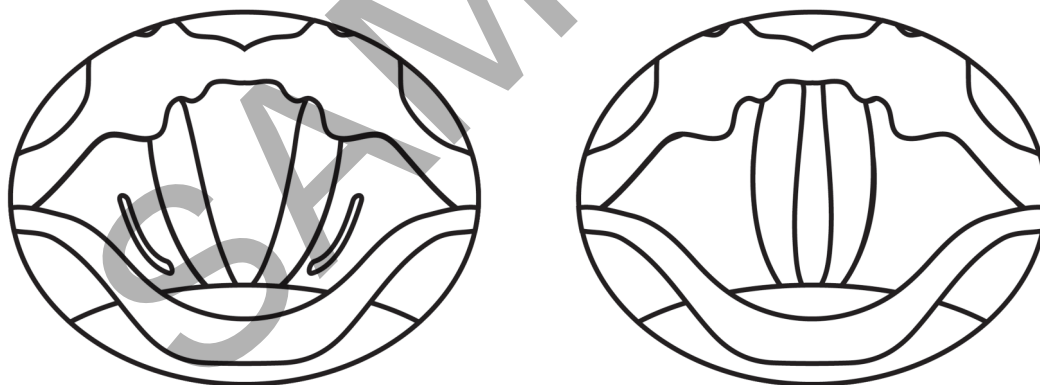
We just mentioned the **epiglottis** and the **larynx**, so let's look at them now in more detail. The epiglottis is at the top of the larynx. It is a flap of cartilage that has the job of "directing traffic." It directs food to the esophagus and keeps it from entering the respiratory tract.

The hyoid bone is a U-shaped bone that serves as an anchor for the tongue. It moves with the larynx and tongue each time you swallow.



The larynx connects the passage between the tongue and the trachea. It houses the vocal cords and is made of nine sections of cartilage. The thyroid membrane connects the hyoid bone to the first set of cartilage, the thyroid cartilage. The thyroid cartilage has two wing-like plates that form the sides of the larynx. Where they meet forms the Adam's apple. Next is a ring-like section of cartilage called cricoid cartilage. The remaining sections of cartilage are called tracheal cartilage because of where the larynx connects to the trachea.

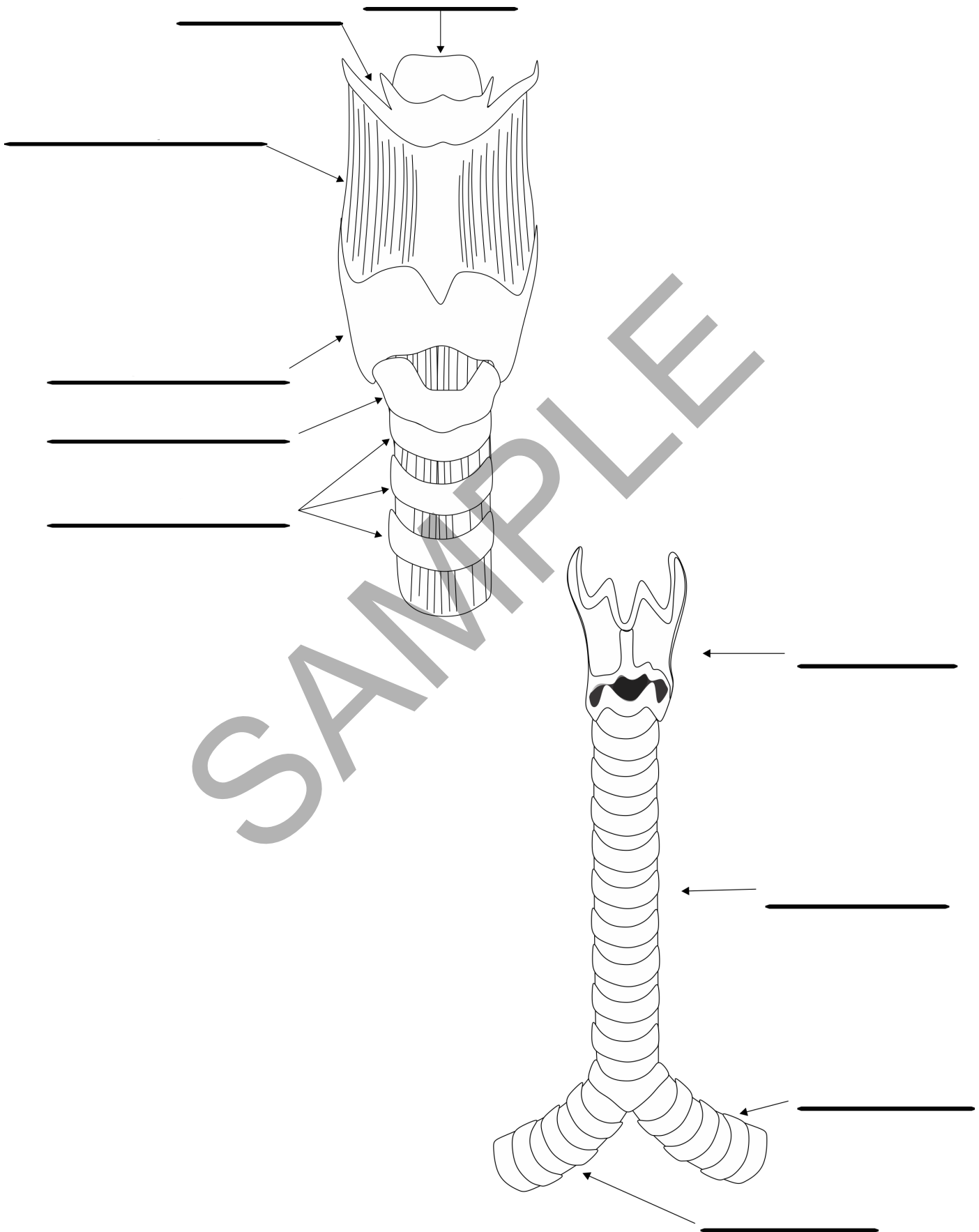
The larynx also houses the vocal cords. These are folds in the mucous membrane that line the larynx. They open for us to breathe and partly close when we talk. The air we breathe out vibrates the vocal cords and produce the sounds we use to speak.



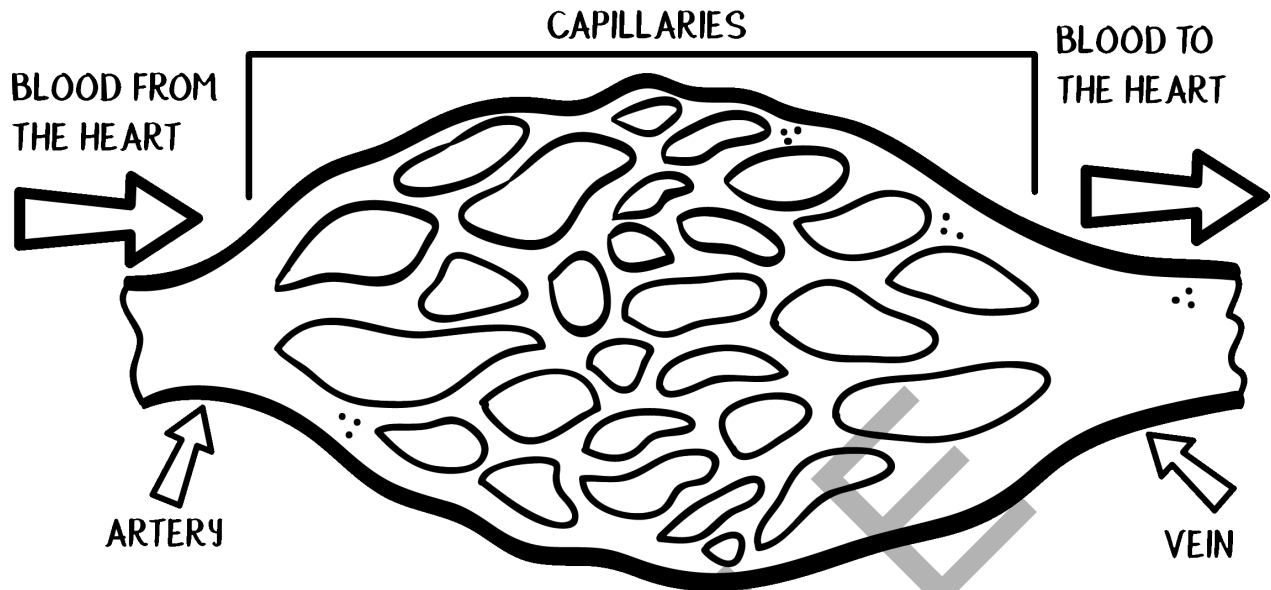
Once air has passed through your larynx, it travels to the **trachea**, which is also called the windpipe. The trachea is about 5 inches (13 centimeters) long and a little less than 1 inch (2.5 centimeters) in diameter in an adult. The trachea is ringed by rows of cartilage that hold it open.

The end of the trachea branches into two **bronchi**, or tubes, that transport the air to our lungs. They are simply called the left main bronchus and the right main bronchus.

Let's label the parts of the larynx and trachea before we move on to the lungs.

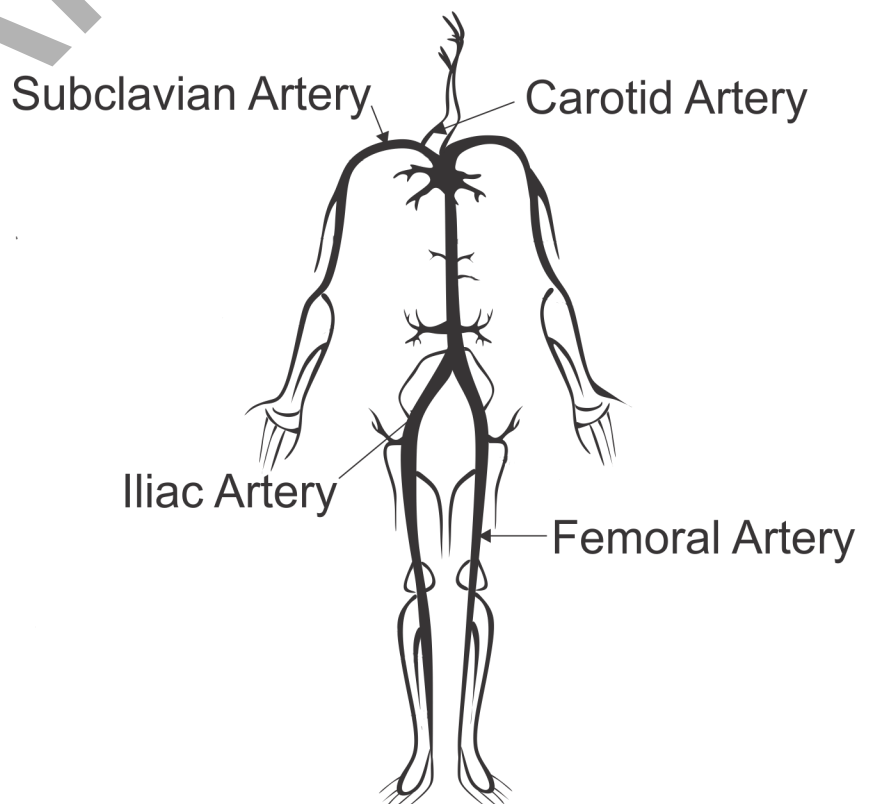


As we've already learned, there are three main types of blood vessels: arteries that carry oxygenated blood, veins that bring the blood back to the heart after it has distributed its oxygen, and **capillaries**.

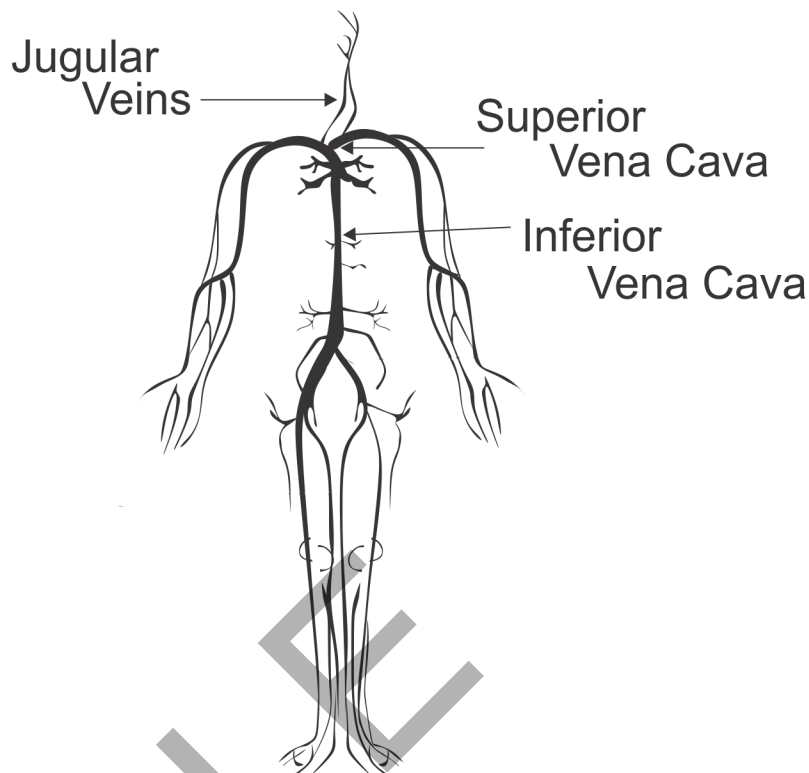


Capillaries are the tiniest blood vessels in our bodies. They connect the veins and arteries, allowing the blood cells to travel through them, though many are so small that the blood cells can only fit through one at a time. They also have thin walls, allowing nutrients to flow through them into the tissues and allowing waste tissue to travel into the blood for disposal.

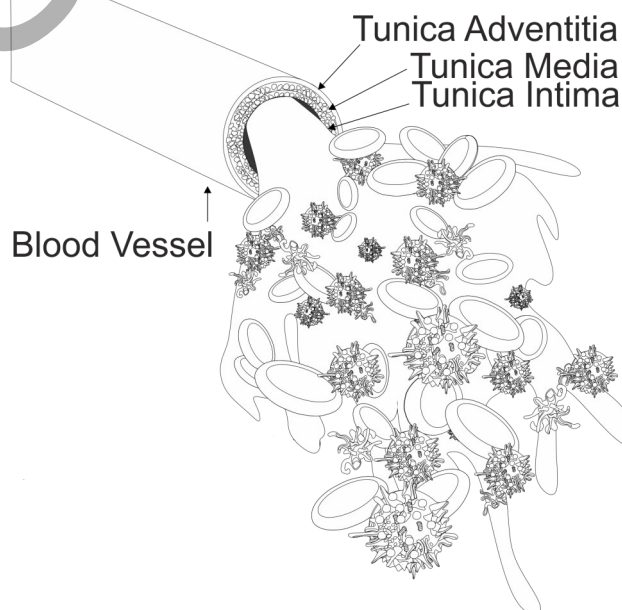
The largest artery in your body is the aorta, which we looked at when we studied the heart. Arteries run through your body, but a few of the most important are the carotid arteries, which carry blood to the head and neck; the subclavian arteries, which carry blood to the shoulders and arms; the iliac arteries, which go through the abdominal area and take blood to the organs in the pelvis; and the femoral arteries, which carry blood through your legs.



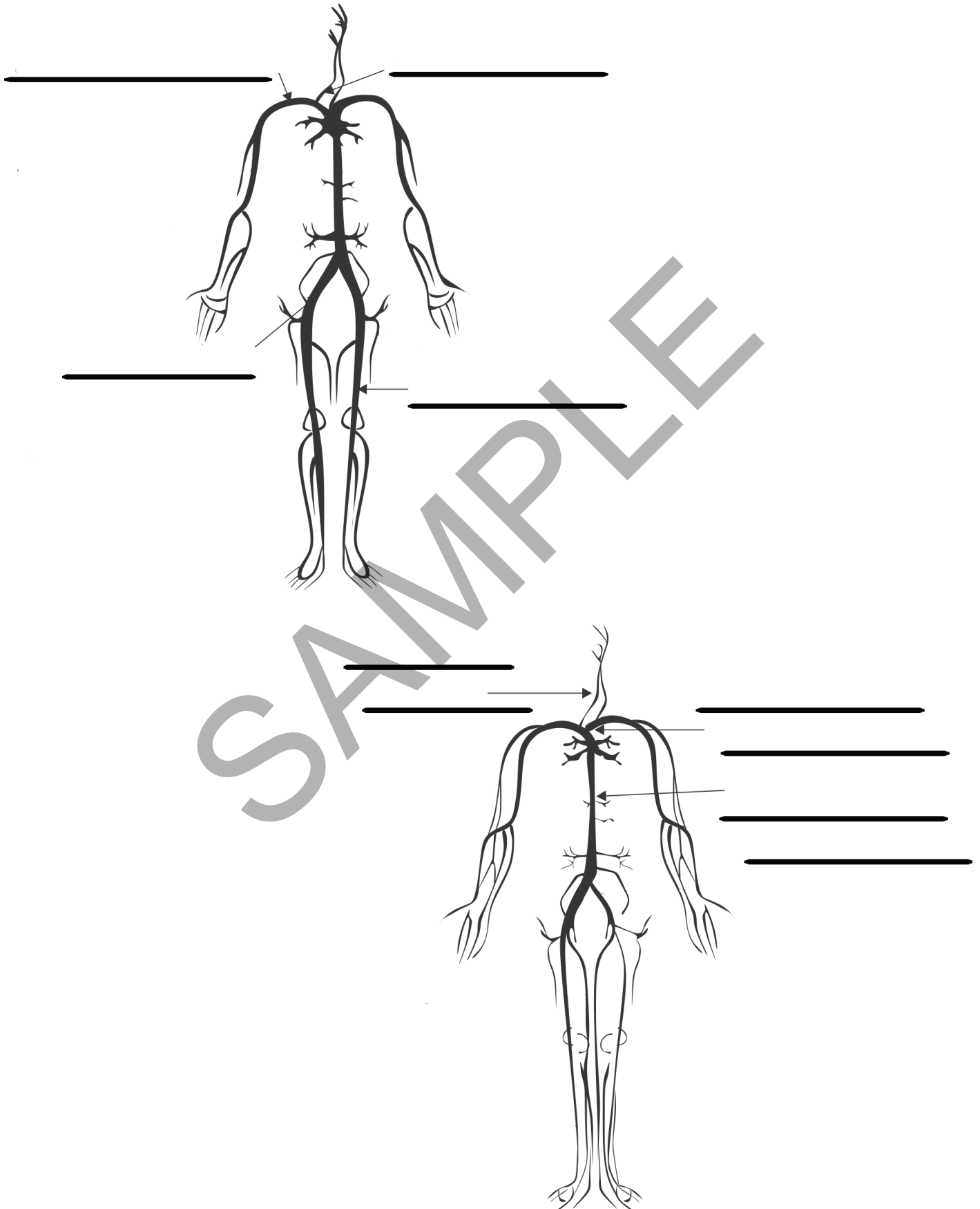
Veins, like arteries, run throughout your body, often running parallel to the arteries. Their destination is always the heart. The superior vena cava carries blood from your head and arms. The inferior vena cava carries it from your legs and trunk (the section of your body in the center, without the head, arms, and legs). The jugular veins carry blood from your brain, face, and neck.



Both the arteries and veins are made of layers. The outermost layer, the tunica adventitia, is made of elastic fibers that expand to allow the blood to travel through. They also contract, pushing the blood further along. This helps the heart not to have to work as hard because the blood vessels themselves are helping to keep the blood moving. The middle layer is made of smooth muscle cells and additional elastic fibers, and it is called the tunica media. The innermost layer, the tunica intima is made of connective tissue and more elastic fibers. To help remember the names, remember that "tunica" is from the Latin word that means "tunic" or "coat." Each tunica is a layer or coat. "Media" means "middle" in Latin, and "intima" means "inmost." "Adventitia" is harder, but it means "arrived from afar" or "foreign."



Before we look at what our blood is made of, let's review the major arteries (the top picture) and veins (the bottom picture) and their layers.



# Terminology

Using what you learned, define these words in the best way you can. Use the back of the page if you need more room.

System: \_\_\_\_\_

Epithelial tissue: \_\_\_\_\_

\_\_\_\_\_

Connective tissue: \_\_\_\_\_

\_\_\_\_\_

Muscle tissue: \_\_\_\_\_

Nervous tissue: \_\_\_\_\_

Inhalation: \_\_\_\_\_

Diaphragm: \_\_\_\_\_

Oral cavity: \_\_\_\_\_

Nasal vestibule: \_\_\_\_\_

Pharynx: \_\_\_\_\_

Epiglottis: \_\_\_\_\_

\_\_\_\_\_

Larynx: \_\_\_\_\_

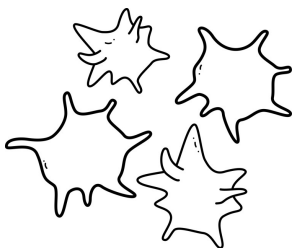
\_\_\_\_\_

Trachea: \_\_\_\_\_

Bronchi: \_\_\_\_\_

Alveoli: \_\_\_\_\_

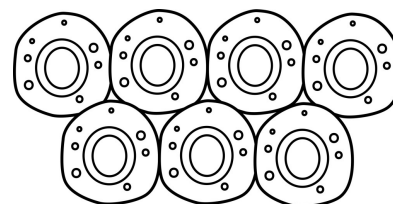
Which of the following is not a type of blood cell? Draw an X through it.



Platelet

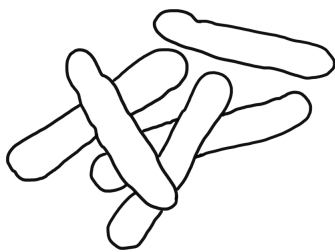


Leukocyte

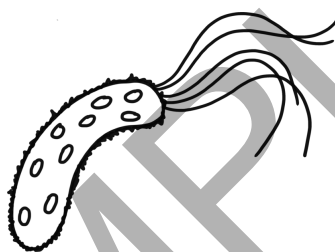


Hepatocyte

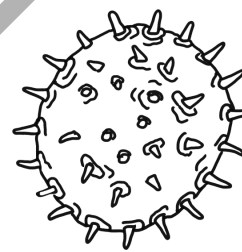
Which of the following viruses or bacteria is responsible for chickenpox? Draw a circle around it.



*Tubercle bacilli*



*Vibrio cholerae*



Varicella-zoster virus

Name six of the major parts of the digestive system:

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |

Describe the three different degrees of burns we discussed.

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