

**4.1 What it is and what it does:**

- Every \_\_\_\_\_ of your body needs certain things to \_\_\_\_\_. They each also produce \_\_\_\_\_ that needs to be taken away. A circulatory system is what does both of these things for each living \_\_\_\_\_.
- Cells can primarily gain \_\_\_\_\_, and excrete \_\_\_\_\_, through \_\_\_\_\_. This must happen over short distances. This means that the majority of your cells all must be within \_\_\_\_\_ cells of a blood vessel.
- Our circulatory system does \_\_\_\_\_ things for us:
  - transports \_\_\_\_\_,
  - transports \_\_\_\_\_,
  - transports \_\_\_\_\_,
  - transports \_\_\_\_\_ throughout the body.
  - regulates \_\_\_\_\_,
  - form \_\_\_\_\_ to prevent blood loss,
  - \_\_\_\_\_ the body against bacteria and viruses.

**4.2 Anatomy**

- Our circulatory system has \_\_\_\_\_ parts:
  - A \_\_\_\_\_ to pump the fluid.
  - Blood \_\_\_\_\_ to carry the fluid.
  - \_\_\_\_\_ to carry the nutrients and waste products.

**Heart:**

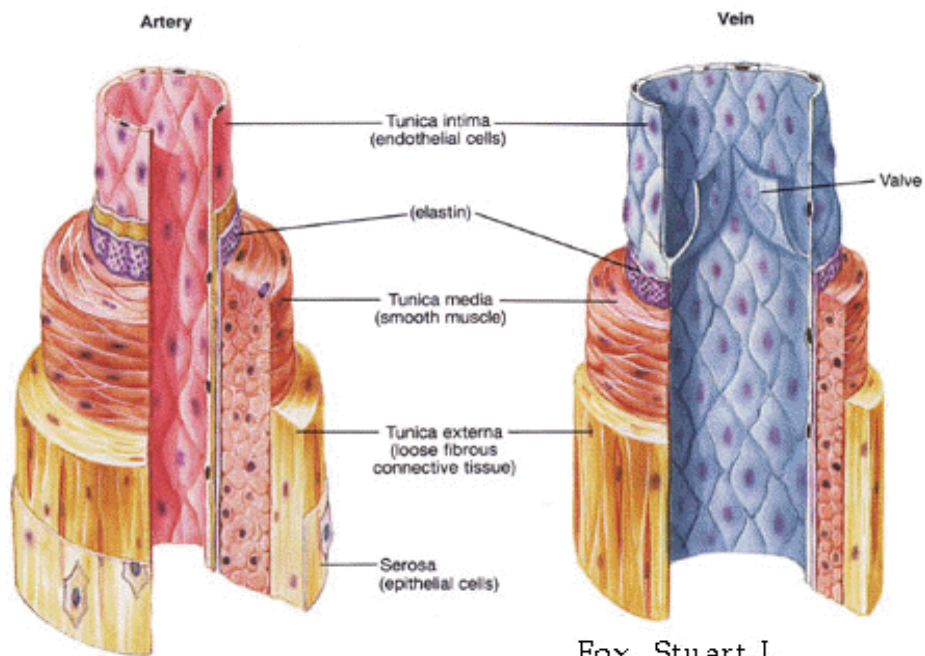
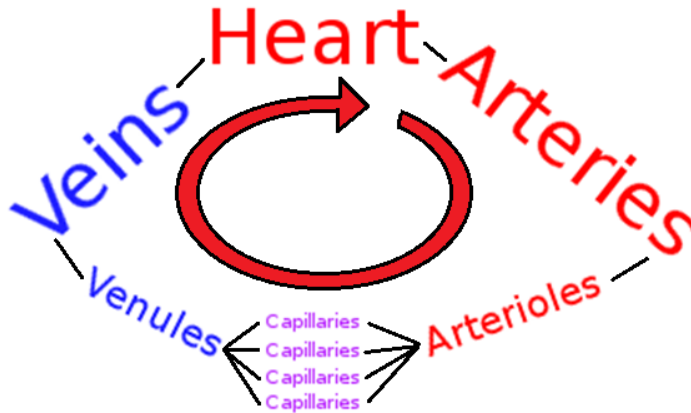
- Our heart is a \_\_\_\_\_ chambered heart. (birds and lizards have 3, fish have 2).
- The four chambers are divided into \_\_\_\_\_ halves. The right side and the left side. Each half also has two parts: an \_\_\_\_\_, and a \_\_\_\_\_.
- The \_\_\_\_\_ of the heart \_\_\_\_\_ blood into the heart. They are \_\_\_\_\_ than ventricles since they just have to pump hard enough to send the blood to the ventricles which are right beside them.
- The \_\_\_\_\_ have to \_\_\_\_\_ the blood out of the heart to the body. As a result they need \_\_\_\_\_ muscles and are bigger than the atriums.
- The path of the blood through the heart is:

- Blood from body → Right \_\_\_\_\_ → Right \_\_\_\_\_ → Send blood to the \_\_\_\_\_ → Blood from the lungs → Left \_\_\_\_\_ → Left \_\_\_\_\_ → blood to the body → repeat.
- There are \_\_\_\_\_ that keep the blood flowing the right direction in the heart.
- Between the atria and the ventricles are the \_\_\_\_\_ valve.
  - The \_\_\_\_\_ valve on the left side, and
  - the \_\_\_\_\_ on the right.
- Leaving the ventricle are the \_\_\_\_\_ valves.
  - The \_\_\_\_\_ valve on the left side
  - the \_\_\_\_\_ valve on the right.
- The heart's beat is controlled by two \_\_\_\_\_ nodes (pacemakers).
- The \_\_\_\_\_ (SA) node is on the atriums and it sends an electric pulse to the atriums causing them to beat.
- They send a signal to the \_\_\_\_\_ node (AV) which then sends an electrical pulse through the \_\_\_\_\_ fibres which causes the ventricles to beat.
- This is why your heart beat has a \_\_\_\_\_ - \_\_\_\_\_ sound.
- See the diagram in the textbook on page 158

### **Blood Vessels:**

- Once the blood leaves the heart it has to get to all of the cells of the body and then back again. It does this in a closed \_\_\_\_\_.
- As the blood \_\_\_\_\_ the \_\_\_\_\_ it is travelling in large, wide vessels called \_\_\_\_\_.
- The arterial walls are \_\_\_\_\_ and \_\_\_\_\_ to accommodate the increase of blood pressure right after the heart beats.
- Arteries means AWAY from the heart
- They branch off into \_\_\_\_\_ vessels called \_\_\_\_\_, which are just smaller arteries.
- Arterioles branch into \_\_\_\_\_ which are smaller (5-10 nm across) than a single red blood cell (7 nm across).
- Capillaries are so \_\_\_\_\_ so that blood cells go through one at a time to increase the rate of diffusion. They also have very \_\_\_\_\_ walls.
- The capillaries then empty into slightly larger vessels called \_\_\_\_\_.

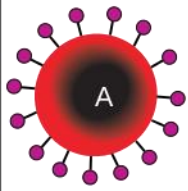
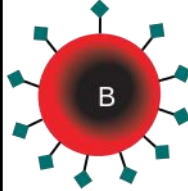
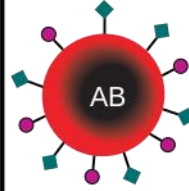
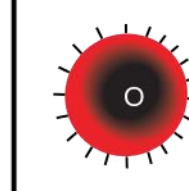
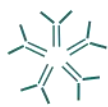

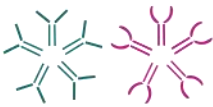



- \_\_\_\_\_ are to veins as arterioles are to arteries. They are just small versions of. Venules then empty into even larger vessels called \_\_\_\_\_ and these empty back into the heart.
- The veins carry blood that is under very lower pressure. So they have \_\_\_\_\_ walls and also have \_\_\_\_\_ in them to keep the blood flowing in the right direction.



Fox, Stuart I.  
Human Physiology 4th  
Brown Publishers

**Blood:**

- Blood is composed of fluid \_\_\_\_\_ (\_\_\_\_\_% ) and \_\_\_\_\_ components (\_\_\_\_\_% ) (\_\_\_\_\_ blood cells, \_\_\_\_\_ blood cells, and \_\_\_\_\_)
- The \_\_\_\_\_ blood cells in the body have a surrounding protein around them called an \_\_\_\_\_. The body uses these to identify the blood as its own. There are two kinds of antigens A, and B. The absence of antigens is called O.
- A and B are \_\_\_\_\_ and O is \_\_\_\_\_.
- There are other kinds of antigens found in blood as well. The next most important kind is called the \_\_\_\_\_ factor or Rh factor. This antigen can either be present (Rh positive) or absent (Rh negative).
- Blood \_\_\_\_\_ are typically listed as these two factors. The \_\_\_\_\_ type and then the \_\_\_\_\_ factor.

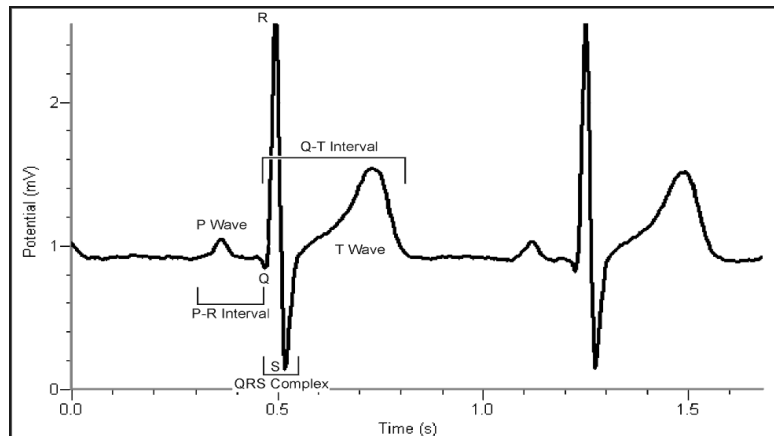
	Group A	Group B	Group AB	Group O
Red blood cell type				
Antibodies in Plasma	 Anti-B	 Anti-A	None	 Anti-A and Anti-B
Antigens in Red Blood Cell	 A antigen	 B antigen	 A and B antigens	None

**4.3 Diseases and Disorders:**

**Heart:**

- What is heart disease? Since your heart is a muscle it needs \_\_\_\_\_ and \_\_\_\_\_ in the same way that any other muscle needs oxygen and nutrients.

- Anything that interferes with your hearts ability to \_\_\_\_\_ blood is considered a heart disease. Sometimes this is caused at the \_\_\_\_\_, other times this is caused by something going wrong with the blood \_\_\_\_\_.
- Some common heart diseases include:
  - Myocardial infarction = ( \_\_\_\_\_ attack) = blood flow to the heart \_\_\_\_\_.
  - Angina = Blood flow to the heart is \_\_\_\_\_ blocked.
  - Coronary Artery disease = when the \_\_\_\_\_ to the heart are blocked.
  - Arrhythmia = This is an \_\_\_\_\_ heartbeat.
  - Atherosclerosis = hardening of the \_\_\_\_\_.
  - Congestive Heart failure = the heart is not \_\_\_\_\_ enough to pump efficiently, the blood starts to \_\_\_\_\_ up.
  - Hypertension = \_\_\_\_\_ blood pressure.
  - Stroke = when a blood vessel gets \_\_\_\_\_.
  - Aneurysm = when a blood vessel \_\_\_\_\_ weakens and it \_\_\_\_\_ outward.

**Blood:**

- Anything that affects the \_\_\_\_\_ of the blood, or how they \_\_\_\_\_ is a blood disease or disorder.
- Some common ones include:
  - Anemia = When the red blood cells do not \_\_\_\_\_ enough \_\_\_\_\_.
  - Hemophilia = When the blood does not \_\_\_\_\_ properly so excessive \_\_\_\_\_ happens.
  - Leukemia = This is a \_\_\_\_\_ of the blood cells.

#### 4.4 Diagnosis

- There are a couple of ways to diagnose heart conditions.
  - Stethoscope – This means we \_\_\_\_\_ to the heart beat to see if it sounds correct.
  - Electrocardiogram – This is an recording of the \_\_\_\_\_ activity in the heart.
  - Symptoms – There are certain symptoms that we \_\_\_\_\_ for with heart conditions.
- For blood conditions we diagnose them by \_\_\_\_\_ the blood, and we typically do this as a result of some \_\_\_\_\_ being present.

#### Electrocardiogram (EKG)

- There are many kinds of \_\_\_\_\_ but the most common is an anterior 12 lead EKG. This means that they record the \_\_\_\_\_ signal with 12 different \_\_\_\_\_ patches.
- Parts of a standard EKG
  - **P Wave** This is the beating of the \_\_\_\_\_.
  - **QRS complex** This is the beating of the \_\_\_\_\_.
  - **T wave** This is the \_\_\_\_\_ of the ventricles electrically.
- When doctors analyze an EKG/ECG they look for the following:
  - Can \_\_\_\_\_ components be \_\_\_\_\_ in each beat?
  - Are the \_\_\_\_\_ between each component and each complex \_\_\_\_\_?
  - Are there clear \_\_\_\_\_ of any of the wave components?

#### Stroke

- Signs of a STROKE to watch for can be remembered using the acronym F.A.S.T.
  - F = \_\_\_\_\_. Is one side drooping?
  - A = \_\_\_\_\_. Do they have arm \_\_\_\_\_?
  - S = \_\_\_\_\_. Is their speech \_\_\_\_\_?
  - T = \_\_\_\_\_. Call 911 immediately.

#### Heart Attack

- We look for symptoms:
  - \_\_\_\_\_ pain or discomfort.
  - Feeling \_\_\_\_\_ or light headed or \_\_\_\_\_.
  - Pain or discomfort in the \_\_\_\_\_, neck, \_\_\_\_\_, arm or shoulders.

- Shortness of \_\_\_\_\_ or nausea.

#### 4.5 Treatment

##### ● Medication

- There are blood \_\_\_\_\_ that people take to make it so that the blood does not \_\_\_\_\_ as easily. This helps prevent clots from happening and may be used if there is a risk of clots forming.
- \_\_\_\_\_ to help regulate the heart beat.
- \_\_\_\_\_ supplements to help with low iron anemia.

##### ● Lifestyle

- Healthy \_\_\_\_\_ with a good balance of \_\_\_\_\_ fat food, and lots of \_\_\_\_\_ and \_\_\_\_\_. The goal is to lower cholesterol.
- More \_\_\_\_\_ to help strengthen the heart, but to also get to a healthier \_\_\_\_\_. It takes more effort for the heart to pump through \_\_\_\_\_ tissue than \_\_\_\_\_ tissue.
- Reduce \_\_\_\_\_.

##### ● Surgery

- If a vessel is blocked surgeons can insert a \_\_\_\_\_. This is basically a small mesh that reinforces the blood vessel's walls and helps hold it \_\_\_\_\_.
- Surgeons can also \_\_\_\_\_ valves inside the heart. This is done with either an \_\_\_\_\_ valve (pig, cow, horse, seal), a \_\_\_\_\_ valve, or a mechanical one.
- Surgeons can also \_\_\_\_\_ parts of blocked coronary arteries by attaching \_\_\_\_\_ vessels that go around the blockage.
- There are also complete heart \_\_\_\_\_ that can be done.

#### 4.6 Careers

- There are many careers that related specifically to the \_\_\_\_\_ system, these listed are just some of the main ones.
- Jobs to do with the heart usually contain the root word \_\_\_\_\_/o:
  - Cardiac Surgeon, \_\_\_\_\_, Cardiovascular Technologist, Echocardiographer, Electrocardiographic Technician.
  - \_\_\_\_\_ Surgeon (they might also operate on the \_\_\_\_\_, trachea, or \_\_\_\_\_)
  - \_\_\_\_\_ (focuses on the internal organs and the diseases that affect them.)

- There are also careers that focus on the \_\_\_\_\_:
  - \_\_\_\_\_, perfusionist, phlebotomist
- Finally, there is also a lot of \_\_\_\_\_ technology involved.
  - Medical Laboratory technologist and technician, \_\_\_\_\_  
technologist, Electrocardiographic Technician, \_\_\_\_\_.