

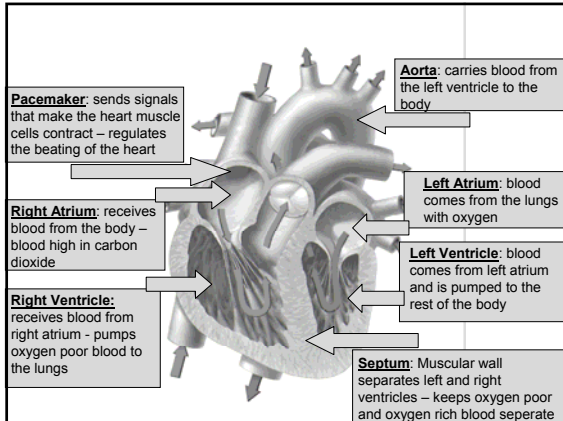
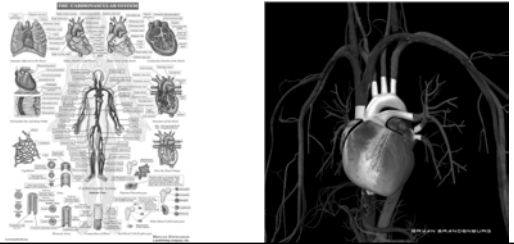
Chapter 17 Circulation



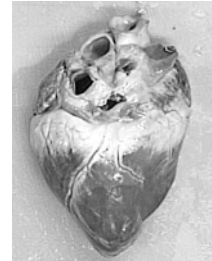
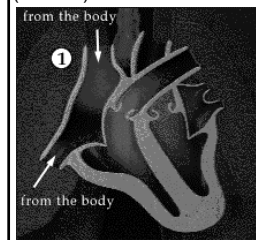
My heart goes all a flutter when I look at my baseball field. That is when you really appreciate your blood circulation.

Section 1 The Body's Transport System

Cardiovascular System = Circulatory System = heart, blood vessels and blood – carries needed substances to cells and carries away waste products from cells – blood also has cells that fight disease (white blood cells and antibodies) – heart is about the size of your fist – each time the heart pumps it moves blood through the cardiovascular system – made of cardiac muscle

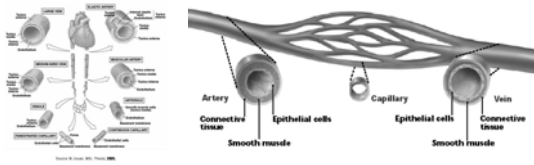


– Blood leaves the heart by arteries – blood returns to the heart by veins – capillaries are between arteries and veins – heart is two pumps – one pump (right side) pumps blood by the lungs – the left side pumps blood to the rest of the body – aorta is the artery that leaves the left ventricle and has the highest blood pressure (thickest)

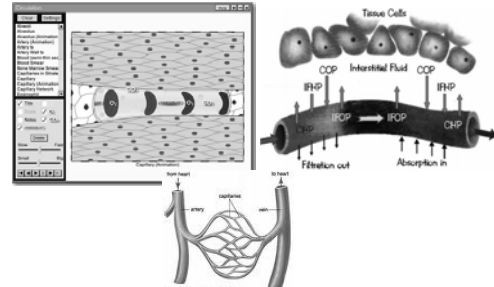


Section 2 A Closer Look At Blood Vessels

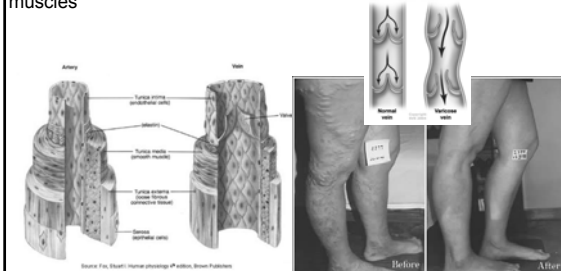
– arteries are thicker than veins because the blood pressure from the pumping of the heart - coronary artery feeds the heart blood for its own use (oxygen and nutrients) – largest artery of the body is the aorta – your pulse is the artery expanding and contracting from the pumping of the heart – usually check your radial artery (wrist) or carotid artery (neck) – muscles in your arteries effect amount of blood flowing through them by expanding or contracting the artery – ex. Get bigger when you exercise because need more blood flow



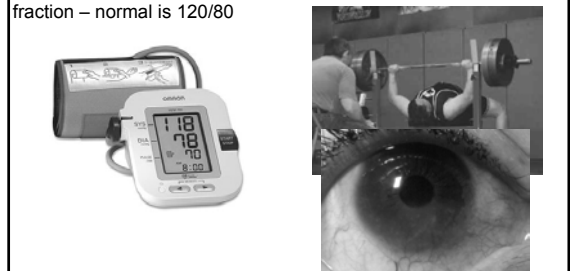
– arteries branch of each other and get smaller and smaller until they become capillaries where they exchange oxygen, nutrients, and absorb waste from cells – exchange happens through diffusion (similar to lungs) – molecules move from areas of high concentration to areas of low concentration



– after capillaries the deoxygenated blood and waste products move from the capillaries to the veins – and back to the heart – blood pressure not as strong in veins because further from the heart – veins are not as thick as arteries – also have valves to not allow the blood to flow backwards – when you use your muscles it helps pump the blood through your veins by contracting your muscles

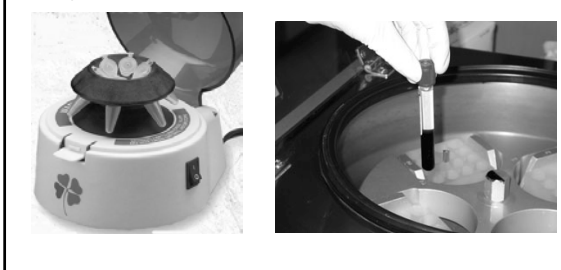


Blood pressure = amount of pressure being pushed by the blood on the sides of the vessels – blood further from the heart has less pressure because the heart is what is pushing the blood – when taking your blood pressure you get two numbers – the first # is from when your ventricles contract and is larger - your second is from when your ventricles relax between beats – express as a fraction – normal is 120/80

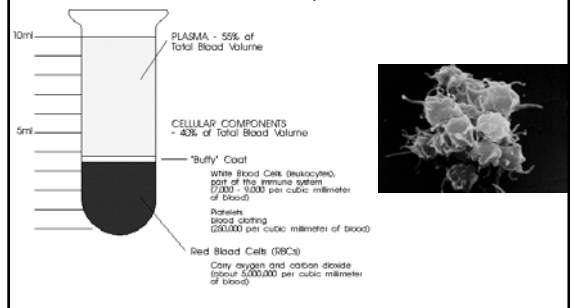


Section 3 Blood and Lymph

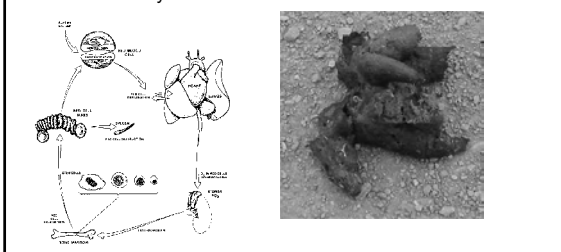
- blood is made up of plasma, red blood cells, white blood cells, and platelets – if you place a tube in a centrifuge is spins the specimen around quickly and pushes the solids to the bottom and liquids go to the top – plasma is the liquid part



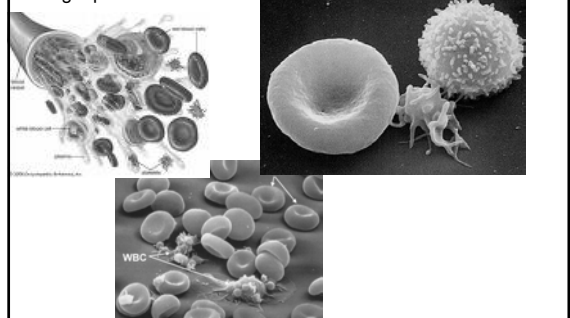
– 90% of the plasma is water and is used to carry materials – protein molecules give it the yellow coloring – 3 types of proteins = one regulates the amount of water in the blood, one produced by white blood cells, one interacts with platelets to form blood clots



- Red blood cells deliver oxygen – mostly made of hemoglobin which is an iron containing protein that binds chemically to oxygen – makes it red when has oxygen – also picks up carbon dioxide which it carries away from cells – red blood cells have no nucleus and live only about 120 days – bone marrow produces new red blood cells – dead red blood cells filtered in the spleen and liver and eliminated in your feces



White Blood Cells = body's disease fighters – fewer in number than red blood cells – white blood cells are larger – do have nuclei – can live for months or years – Platelets are used in blood clotting – produce fibrin –

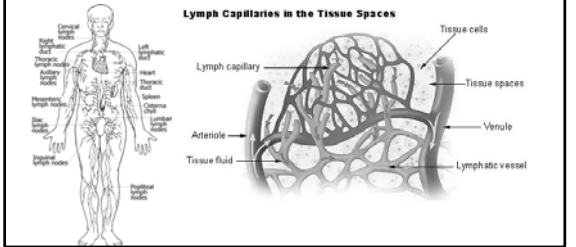


Blood transfusion = transfer of blood from one person to another – must have the same blood type (A, B, AB, O) – determined by a marker on the red blood cell – A = A marker, B = B Marker, AB = both A and B markers and O = neither A or B – O can be used in a blood transfusion for anyone

The ABO Blood System

Blood Type (genotype)	Type A (AA, AO)	Type B (BB, BO)	Type AB (AB)	Type O (OO)
Red Blood Cell Surface Proteins (phenotype)	A, B	B, A	A, B	None
Plasma Antibodies (phenotype)	Anti-B	Anti-A	None	Anti-A and Anti-B

Lymphatic System is a network of veinlike vessels that return fluid to the blood stream – fluid gets into the lymphatic system when blood pumped from arteries into the capillaries - lymph is the fluid inside these tubes – contains water and dissolved materials – no pump so moves very slowly – Lymph Nodes = filter lymph and trap bacteria and other microorganisms that cause disease – enlarge when you are sick



Section 4 Cardiovascular Health

Atherosclerosis = when fatty materials build up on artery walls – restricts the flow of blood – ex. Cholesterol – heart attack occurs when blood flow to the heart is blocked = damages cells in heart – diet, exercise, and medications can be used for mild cases of atherosclerosis –

HOW IT WORKS

1. Suspected heart attack patient is referred to a cardiologist.
2. At the blockage the balloon is inflated, opening up the artery.
3. Balloon is deflated, leaving a hole in place for large artery opens to improve flow of blood.
4. Cells are removed from bone marrow in the patient's hip under local anesthesia.
5. These are taken to a lab where muscle stem cells are separated from red blood cells.
6. They are then injected into artery where they travel to the heart to repair the damaged heart muscle. All this is done within five hours of the attack.

Heart Attack

Labels: Blood clot, Artery, Cholesterol plaque, Coronary arteries, Healthy muscle, Damaged muscle.

hypertension = high blood pressure – greater than 140/90 = makes heart work harder and may damage the walls of the blood vessels – called silent killer because no symptoms – hypertension and atherosclerosis closely related because as arteries narrow the blood pressure increases – people with hypertension need to monitor their diet and salt intake – to maintain cardiovascular health you must exercise, eat a low fat/balanced diet low in cholesterol and sodium, and avoid smoking

