Circulatory System- Biology 1H- 2024 Cheat Sheet

by stellaa via cheatography.com/203531/cs/43356/

circulatory system

Brings materials directly to/from cells brings nutrients, Oxygen to cells, removes CO2/wastes from cells, delivers hormones to cells

Open vs Closed

Open System- A circulatory system in which fluid is pumped through open-ended vessels and bathes the tissues and organs directly. In an animal with an open circulatory system, blood and interstitial fluid are the same.

Closed System- A circulatory system in which blood is confined to vessels and is kept separate from the interstitial fluid

Single vs Double

Single circulation- A circulatory system with a single pump and circuit, in which blood passes from the sites of gas exchange to the rest of the body before returning to the heart

Double circulation- A circulatory system with separate **pulmonary** and **systemic** circuits, in which blood passes through the heart after completing each circuit; ensures vigorous blood flow to all organs.

A double circulation is more efficient than a single circulation because there are two pumps, one from each side of the heart as the blood goes through the circut. Because there is an additional pump, the blood gets around faster.

Pulmonary/Systemic Circut

Parts of the heart

Atrium (left/right) - collects blood returning to heart; pumps to ventricles. Thin-walled

Ventricle (left/right) - pumps blood out of heart. Thick-walled, muscular

Arteries – carry blood AWAY from heart Arteries – Thick-walled, muscular - Blood under high pressure - Largest artery: aorta

Arterioles- between artery and capillary bed

Precapillary sphincters - open/close to increase/decrease blood flow to capillary beds in particular regions

Capillaries- allow for exchange of materials – microscopic vessels with thin, porous walls - Net diffusion of substances: capillaries → interstitial fluid

Veins – carry blood BACK TO heart - Less muscle: lower pressure - Skeletal muscle assists blood flow - Contain valves - 2 major veins returning to right atrium: superior and inferior vena cava

Venules – connect capillary bed and veins

Valves

Valves prevent the backward flow of blood

Atrioventricular (AV) valves -

Between atrium and ventricle | tricuspid valve: right | mitral valve: left

Semilunar valves -

Between ventricles and vessels | pulmonary: to pulmonary arteries (from R) | aortic: to aorta (from L)

2 phases

Systole	Diastole
heart contracting	heart resting
Systolic pressure – pressure on artery walls when ventricles contract	Diastolic pressure – pressure on artery walls when heart relaxed
AV valves:open	semilunar valves:open
semilunar valves:closed	AV valves:closed

2 phases (cont)

Heart murmur - a defect in one or more heart valves that permits a backflow of blood and reduces the cardiac output (volume pumped/minute)

Blood pressure = systolic pressure/diastolic pressure

Hypertension – a serious cardiovascular problem in which blood pressure is persistent at or above 140 systolic and/or 90 diastolic

Regulation of Heartbeat

Pacemaker (sinoatrial or SA node)	Atrioventricular or AV node
cells that set rate of heart contraction – self-starting	spread electrical impulse to ventricles
In right atrium | Electrical impulse to atria	Between atria | Electrical impulse to ventricles

Electrocardiogram (EKG) – detects electrical currents; graphed against time

Automated External Defibrillator (AED) - Shocks the heart and resets SA node

Pacemaker - Small battery-powered device that helps the heart beat in a regular rhythm

Chart

	Capillaries	Arteries	Veins
Carry blood from:	Arteries	Heart	Capillaries
Carry blood to:	Veins	Capillaries	Heart
Thickness	Thin	Thick	In-between
Valves?	No	No	Yes

Cellular Elements of Blood:

Red Blood Cells - Transport O2, some CO2 using hemoglobin

White Blood Cells - Defense and immunity; fights infections

Platelets - A pinched-off cytoplasmic fragment of a bone marrow cell. Platelets circulate in the blood and are important in blood clotting.

Pulmonary Circut- The branch of the circulatory system that supplies the lungs.

-> right atrium -> tricuspid valve-> right ventricle -> pulmonary valve -> pulmonary arteries -> lung capillaries -> pulmonary veins -> left atrium ->

Systemic Circut- The branch of the circulatory system that supplies oxygen-rich blood to, and carries oxygen-poor blood away from, organs and tissues in the body.

-> left atrium -> mitral valve -> left ventricle -> aortic valve -> aorta -> arteries -> arterioles -> body capillaries -> venules ->veins -> superior/inferior vena cava -> right atrium ->