Bio 20 IB - Circulatory and Immune System Cheat Sheet

by qazwsxedc via cheatography.com/169258/cs/35881/

Systems

Cardiovascular System	
Systemic Circulation -	LV(ox) --> body tissue -->RA (deox)
Pulmonary Circulation -	RV (deox)--> lungs -->LA (ox)
Coronary Circulation-	LV (ox) --> heart (coronary arteries) -->?
Lymphatic System	
Organ	filters lymph and produces phagocytic lyphocytes(WBC)
Vessels	transport intersitial fluid(in between cells) to cardiovasular system

Heart control

heat = myogenic tissue - creates its own electrical contraction, subconscious (direct innervation)

how the heat beats

1. blood makes **Synoatrial Node (SA node)/Pacemaker** to activate, causing atria to contract, moving blood to ventricles

in top wall of atrium, generates electrical impulses

2.when ventricles fill, **Atrioventricular Node (AV node)**relays impulses to **bundles of Him** and **Purkinje fibres**, causing ventricles to contract, moving blood to arteries

at base of atrium to delay impulse and allow ventricles to fill

Electrical Activity in the Heart

https://www.google.com/url?sa=i&url=https%3A%2F%2Fbiologydictionary.net%2Fp-wave%2F&psig=AOvVaw2OiBJZ6EolO_VqzH8yxTl9&ust=1670283205835000&source=images&cd=vfe&ved=0CA8QjRxqFwoTCNCwoKiQ4fsCFQAAAAAdAAAAABAE

Electrocardigram (EKG/ECG)	impluses of the heart picked up by electrodes on the skin
ECG wave or PQRST wave cycle -ECG pattern	
P	atria starts contraction, AV opens, SL closes
Q	impluse from SA node to AV node is delayed, ventricles fill
R (Lub)	ventricular systole in apex, atrioventricular valves close
S	ventricular systole finishs

Electrical Activity in the Heart (cont)

T (Dub)	ventricular diastole

Indicators of Cardiovascular Health

1. Heart Rate (bpm)

- low resting heart rate = high cardiovasular health

|_> indicates high stoke volume/ stonger pumps

- short recovery time = good

2. Stroke Volume (mL/beat)

- the extent that ventricles can fill (strech) and empty (strength)

- cardiovensular exercise improve ventricular strength and volume

3.Cardiac Output (mL/min)

- heart rate(beats/min) x stroke volume(mL/beat)

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Blood Vessels

aorta, artery, arterioles, cappilaries, venuoles, veins, vena cava

Name	Structure	Function
artery	thick, muscular, elastic walls	withstand high blood pressure/volume
	narrower than veins	recoil to propel blood
	no valves	carry blood away from heart
cappilaries	1 cell thick (diffusion)	easy exchange w/ all tissues
	v narrow, v branched	slows blood flow
	has precapillary sphincter	blood plasma can leak
veins	large internal diameter, w/ valves	lower blood flow pressure

Blood Vessels (cont)

	not elastic/ muscular	valves prevent backflow
	surrounded by skeletal muscle to help push blood	returns blood to heart

cross sectional area of blood vessels

- changes depending on vessel

- regulates local blood flow

high surface area (cappilares = low speed of blood

Pulse Points

arteries can be against bone at these points to feel blood flow

radial	- wrist
caratoid	- neck/treachea
brachial	- bicep
femeral	- crotch
pedal	- foot

Influences on Rhythm of Heart

hormones	- adrenalin, epinphrine, nor...
increases body temp	high bpm
vagus nerve	+blood in aorta ----> inhibitory effect (parasympatheic)

Aorta strech recoptor ---> impluse to medula oblongata ----> vagus nerve ---> decrease SA node activity

accerlerator nerve	+blood in vena canva ------> simulating affect (sympatheric)

Vena Cava strech recoptor ---> impluse to medula oblongata ----> accerator nerve ---> increase SA node activity

high [CO2] in blood	pH 7.35-7.45

$CO2 + H2O \longrightarrow H2CO3 \longrightarrow H^{+} + HCO3^{-}$

Chemical stimuli

+CO	+ heart speed
+O2	- heart speed
nicotine, alcohol, caffeine	+heart speed

Blood Pressure

Factors

(1) Contraction of ventricles	+mL/min = +b.p.

(2) Elasticity of atrerial walls

(3) Ateriole Resistance	- diameter ---> +resistance ----> +b.p.
(4) Smooth muscles in arteries controlled by:	nerves(medulla oblongata), hormones, +CO2, +lactic acid
(5) Blood volume	- blood volume = - b.p.
Regulation	- vasomotor center (unconsious)

high b.p. ----> aorta/cartoid arteries strech receptors ----> vasomotor center(medulla oblongata) ----->increse arteriole diameter ---> low b.p.

- high b.p can cause blood vessels to rupture

Measure

- uses sphygmomanometer to cut off blood flow in brachial artery (x/y)

- x = systolic, sound heard, max pressure during ventricular contraction

- y = diastolic, sound disappear, min pressure during ventriular relaxation

ave: 120/80mmHg

Hypertension

140/90mmHg +

factors responsible:	obesity (+capppilaries to service extra fatty tissue), Stress (arteries contract), +salt(kidneys)
consequences:	
Treatment:	increase urine (-salt, diuretic drugs), drud that dialate arteriole, blood thinnners

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Components of Blood	
Plasma	- suspend blood cells
	- CO_2 dissolves, forms carbonic acid in rbc cytoplasm, out of rbc as bicarbonate ions, to the lungs
Red blood cells	- erythocyte, de-nucleated, contain hemoglobin
	- O + CO_2 transport
	largest %
White blood cells	-leukocyte, colourless,w/nucluei, increase when fighting infection
	--granulocytes: engluf and destroy foreign bodies, Largest
	--monocytes: ^|, also leaves blood stream to destroy macrophages
	--lyphocytes: include B+T cells, formation of antibodies
Platlets	- thrombocytes, no nueclus bc fragment of larger cell from bone marrow, smallest
	- key role in cloting:
	thrombus- clot that seals blood vessel
	embolus- clot that dislodges+ carries through cu=