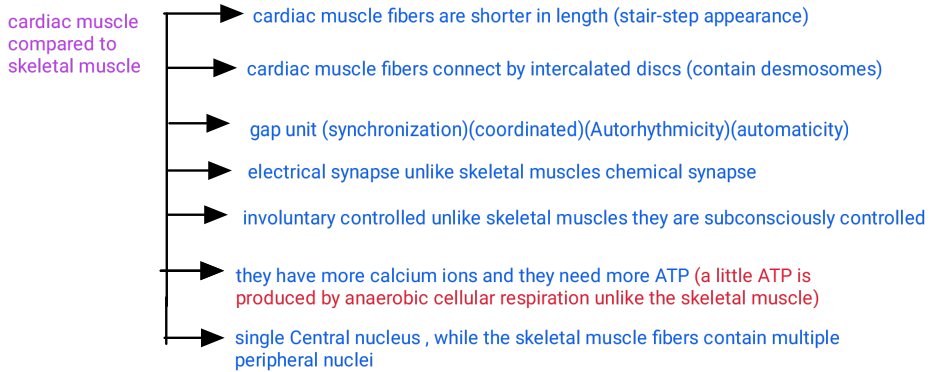
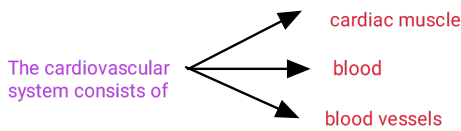
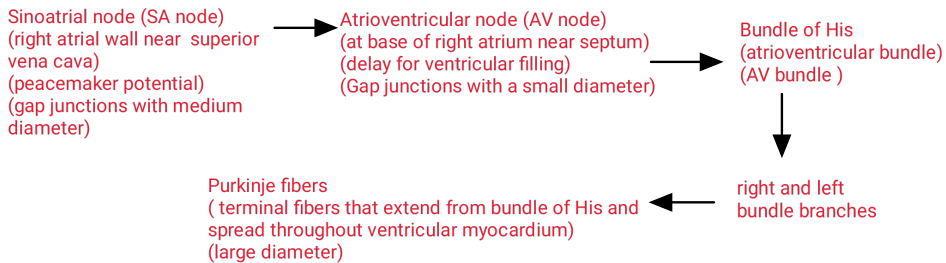


physiology
lecture (8)
part(2)



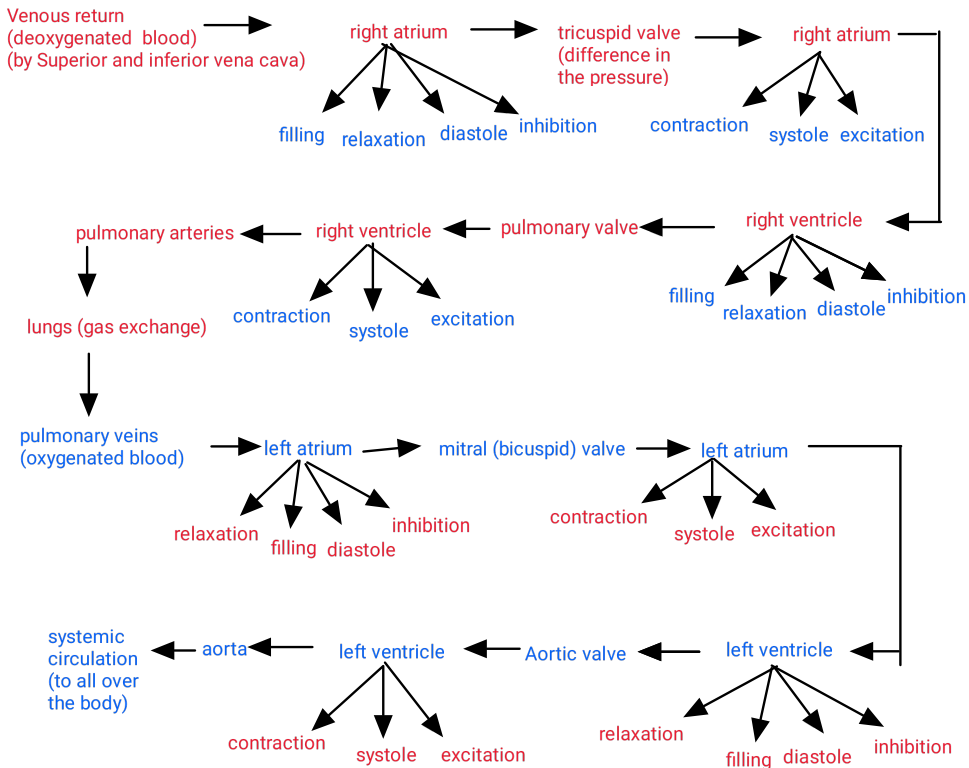
cardiac action potential pathway :



notes about cardiac muscle:

resting membrane potential= -90	threshold= -65 (Na ion channels opens)	depolarization= +20
Plateau: A period of maintained depolarization = +10 (ca ion channels open)(k+ outflow balances ca ²⁺ inflow)		then repolarization until it reaches -90 (more k+ outflow)

blood pathway :



Notes:

contraction of cardiac muscle is the same way of skeletal muscle contraction

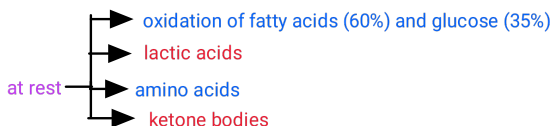
Substances that alter the movement of calcium ions through slow calcium ions channels influence the strength of heart contractions.

Epinephrine increases contraction force by enhancing calcium ions flow into the cytosol

The refractory period of a cardiac muscle fiber lasts longer than the contraction itself.

Their pumping function depends on alternating contraction (when they eject blood) and relaxation (when they refill).

ATP sources :

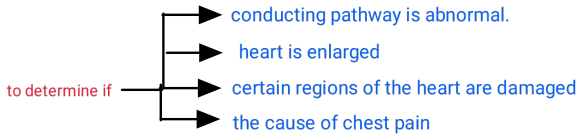


during exercise

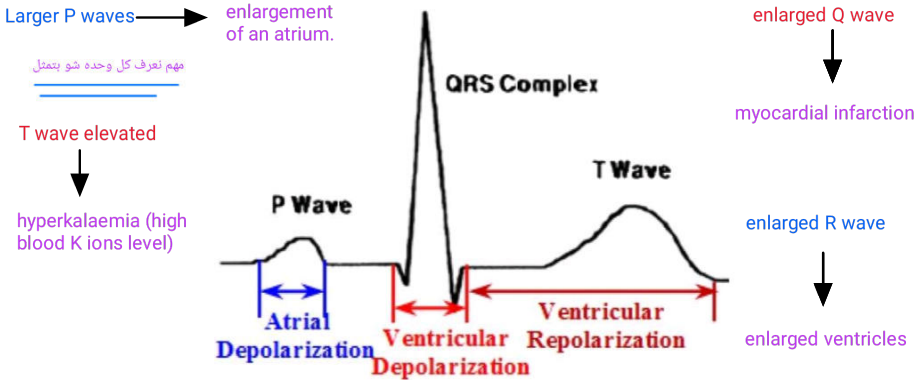
lactic acid using rises (produced by actively contracting skeletal muscles)

electrocardiogram

An electrocardiogram (ECG) or (EKG): (from the German word Elektrokardiogram), is a recording of electrical signals using electrocardiograph .

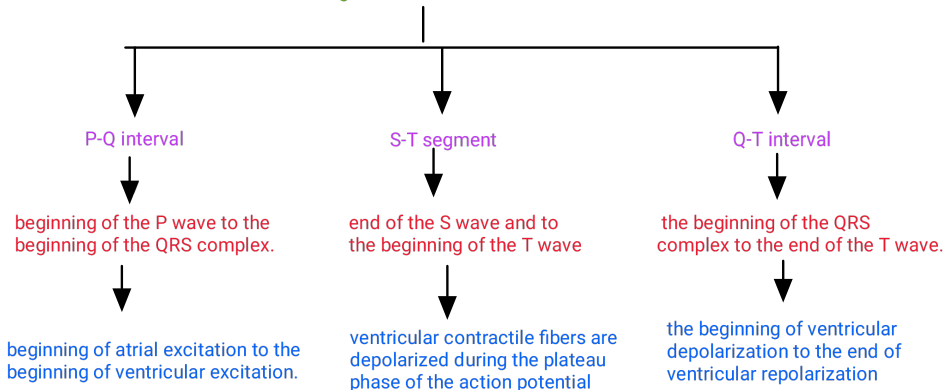


ELECTROCARDIOGRAM

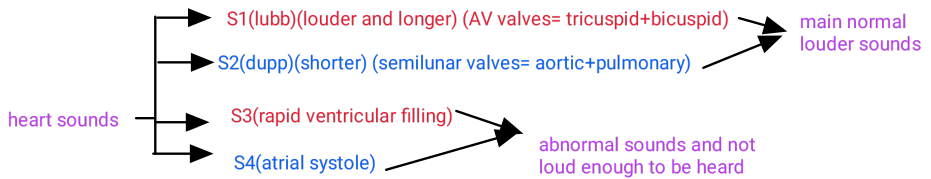
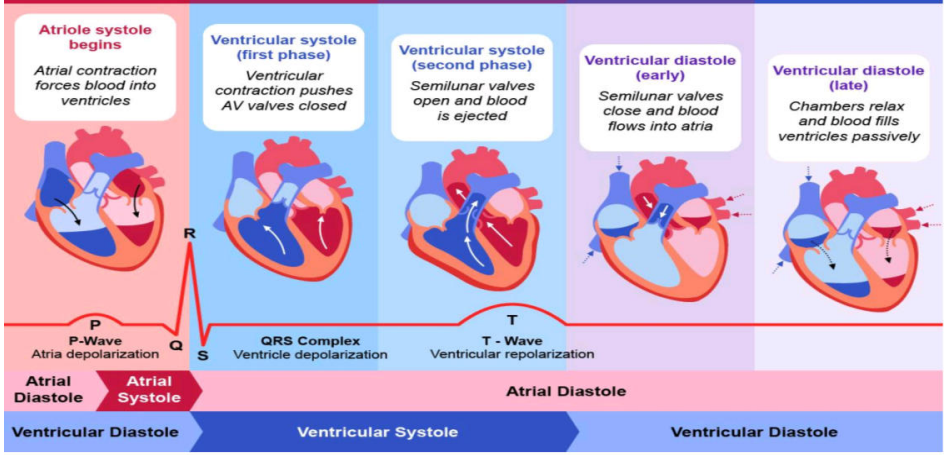


T wave is flatter than normal → receiving insufficient oxygen (coronary artery disease)

segments or intervals of ECG



PHASES OF THE CARDIAC CYCLE



Cardiac output (CO) is the volume of blood ejected from the left ventricle (or the right ventricle) into the aorta (or pulmonary trunk) each minute.

$$CO \text{ (mL/min)} = SV \text{ (mL/beat)} \times HR \text{ (beats/min)}$$

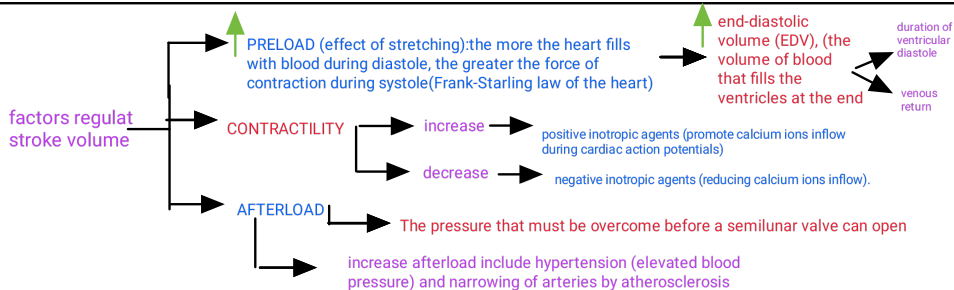
stroke volume

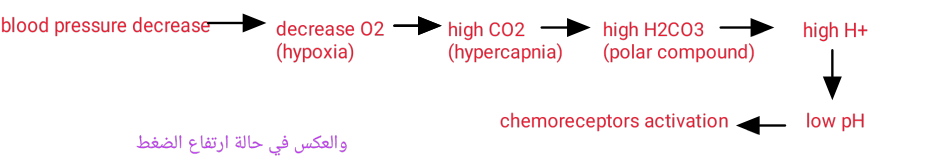
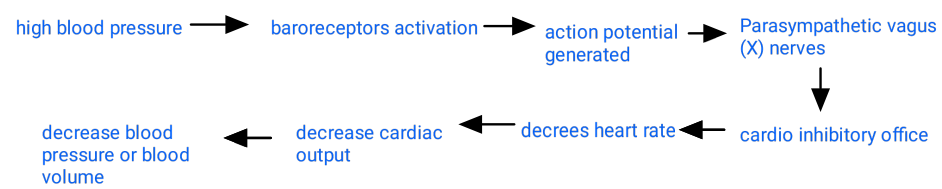
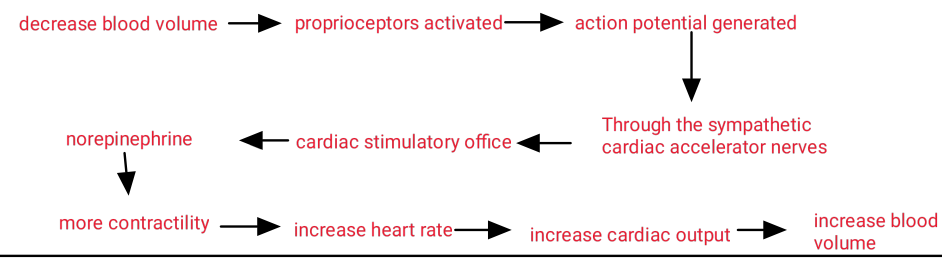
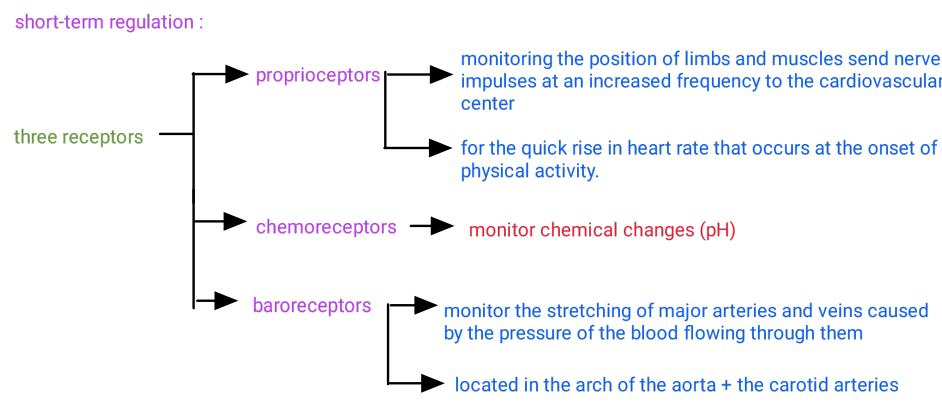
heart rate

من الوحدات بتقدر تعرف تعريف كل وحدة

طبعا اي قانون مذكور بالسلايدات مطلوب كحل وتطبيق عليه لانه الدكتور قالت انه بتجيب اسئلة حل

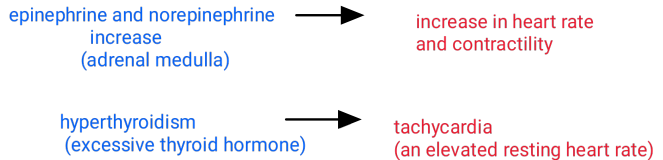
Cardiac reserve is the difference between a person's maximum cardiac output and cardiac output at rest
cardiac reserve for average person = 4 resting value or 5 resting value



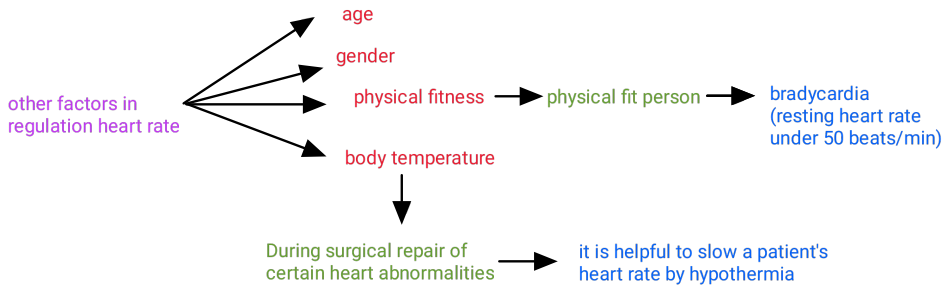
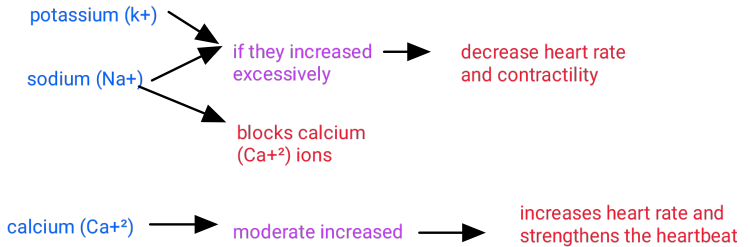


chemical regulation of heart rate

1. Hormones:



2. cations



Cardiac transplantation is the replacement of a severely damaged heart with a normal heart from a brain-dead or recently deceased donor.

