Cardiac volumes and ECG Question based

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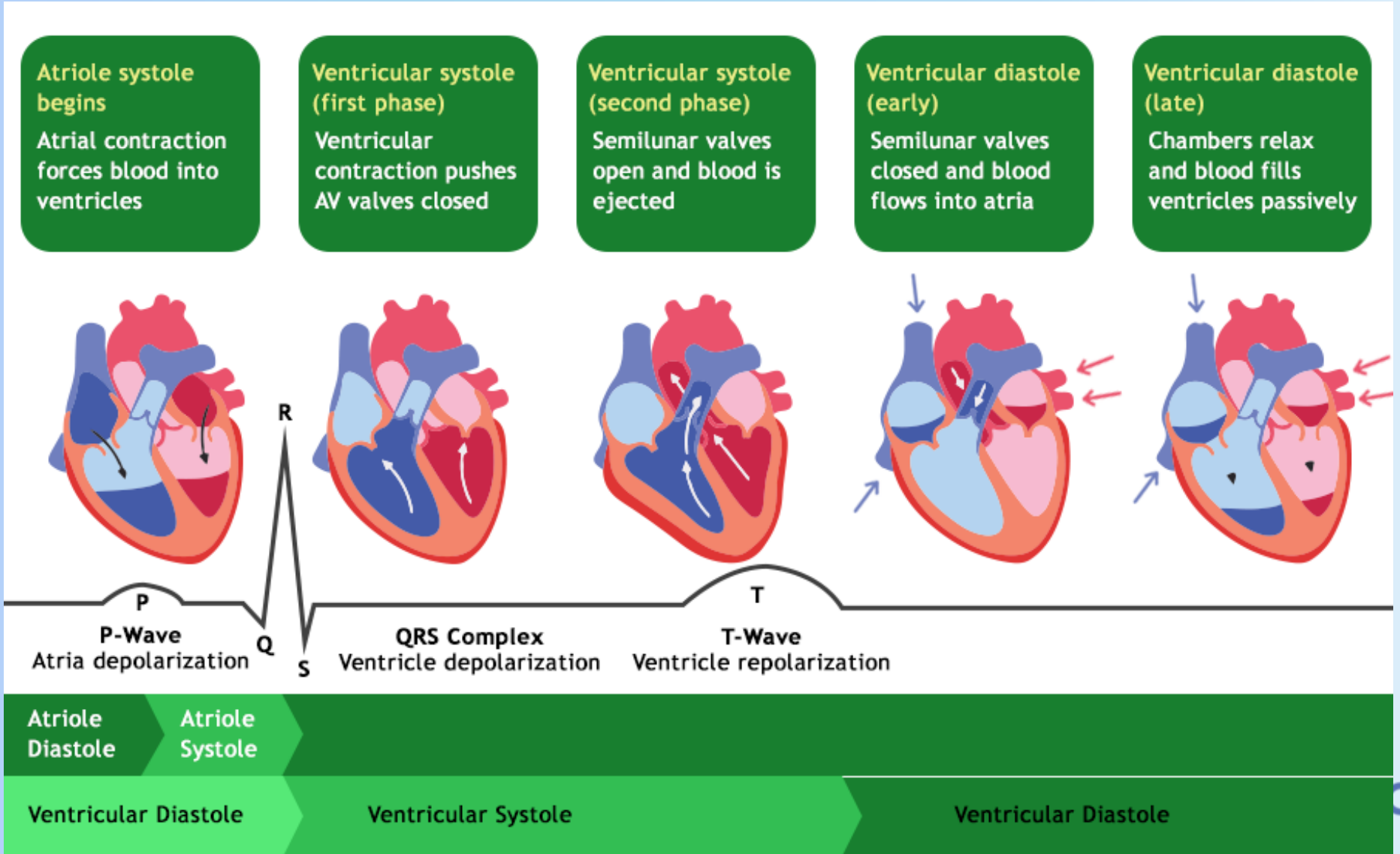
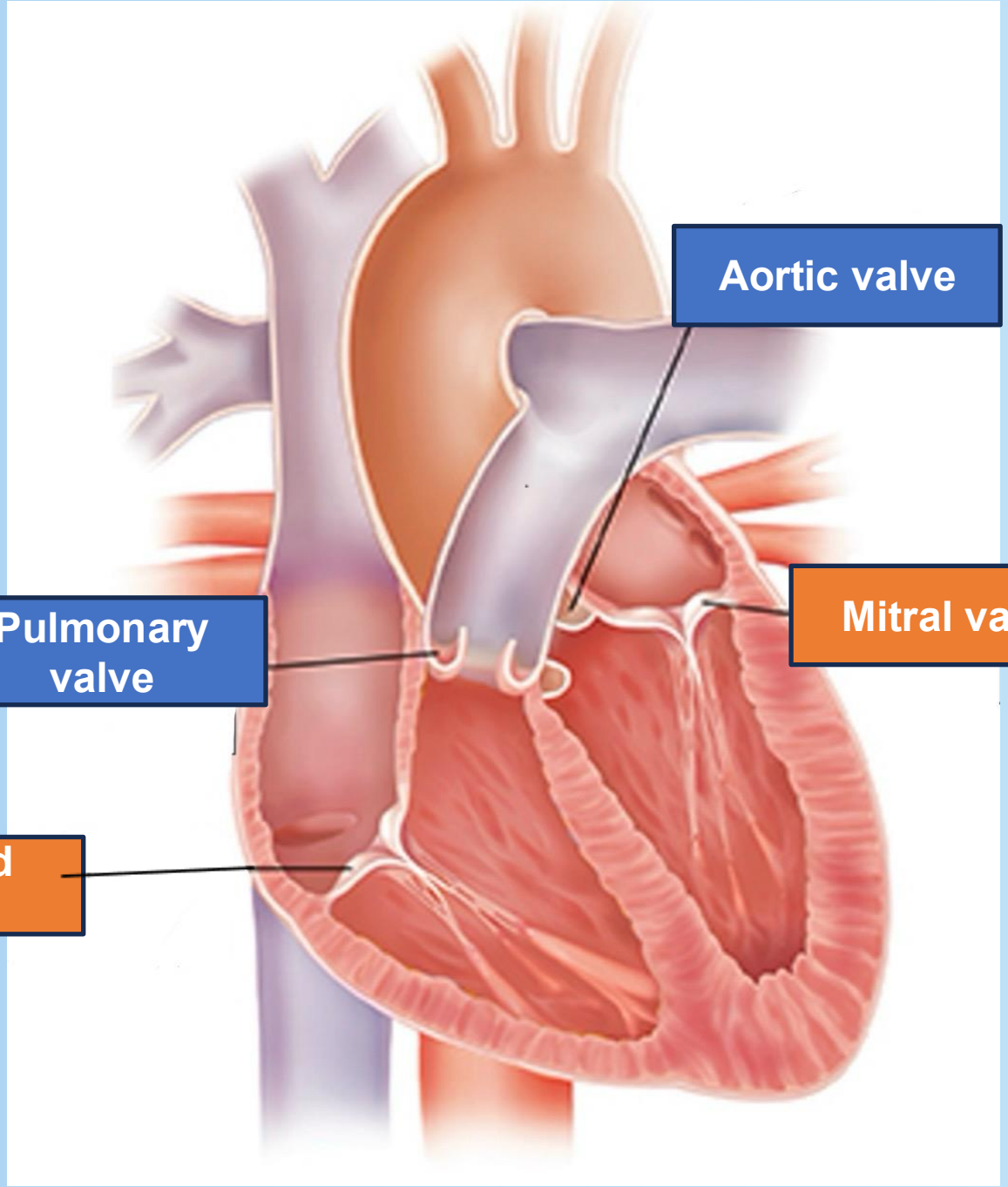
Cardiac cycle

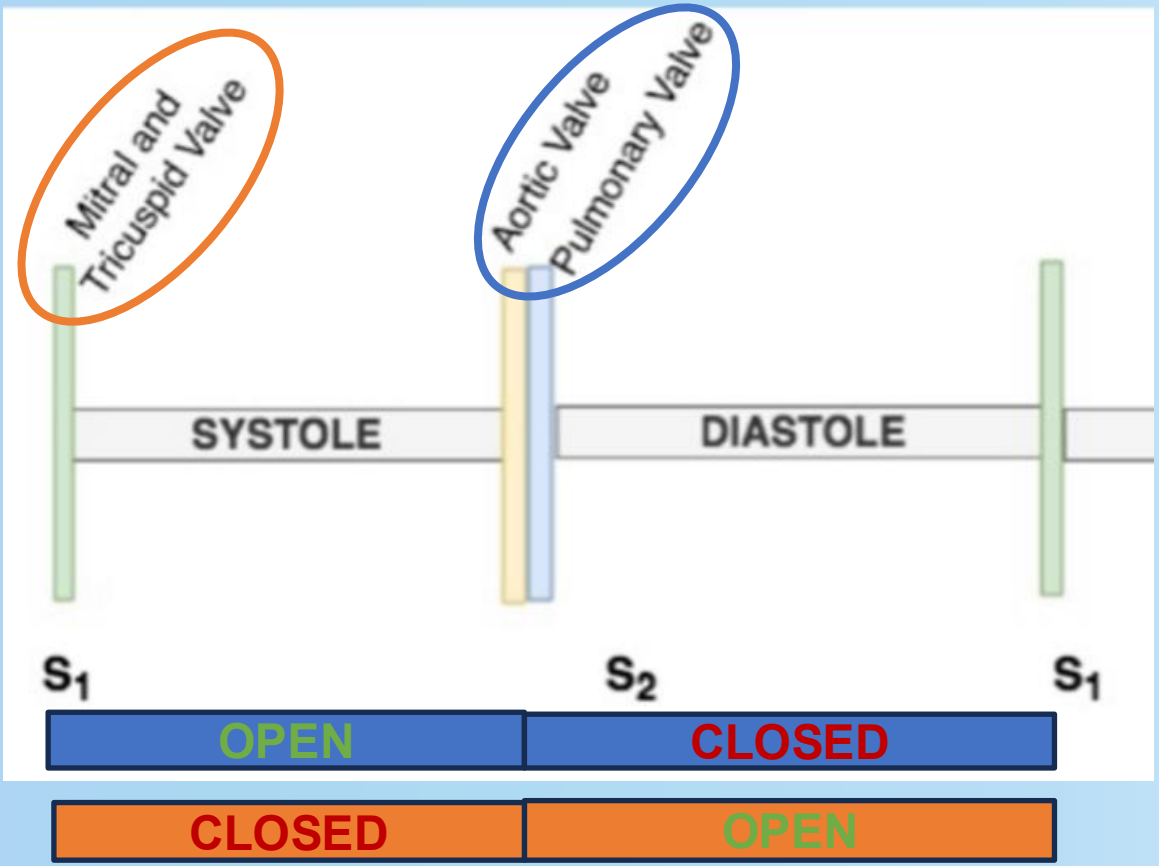


Semilunar valves



Atrioventricular valves

Heart sounds occurs from turbulence in blood flow from the CLOSING of the valves



Morning Time

Work Day
(Systole)

After Party

Sleep
(Diastole)

S1 = Mitral & Tricuspid

S2 = Aortic & Pulmonary

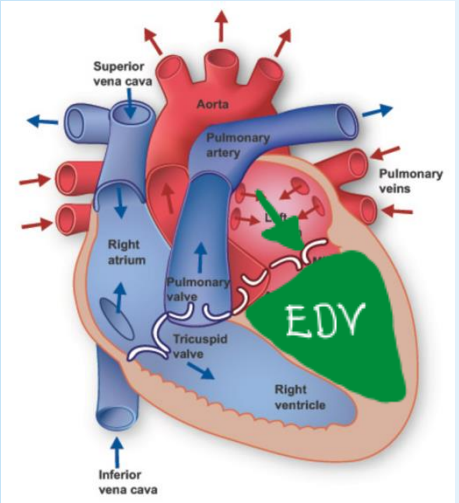
Cardiac Cycle

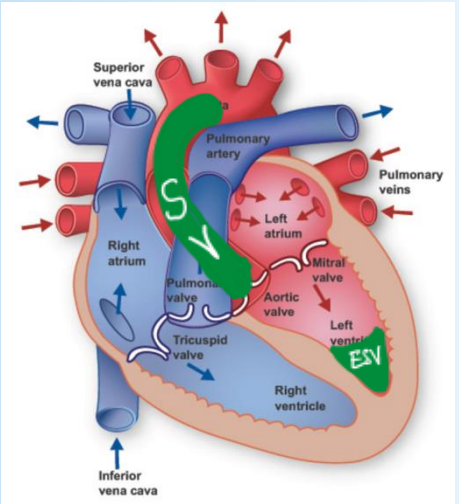
Cardiac volumes

TERM	MEANING	UNITS	WHAT IT TELLS YOU
EDV	**MAX**imum ventricular volume	ml	Represent **preload**
ESV	**MIN**imum ventricular volume	ml	
SV	Volume **ejected** from ventricle during contraction	ml	Efficiency of ejection
CO	Volume per minute	L/min	Output per beat

Cardiac volumes

SV= EDV-ESV





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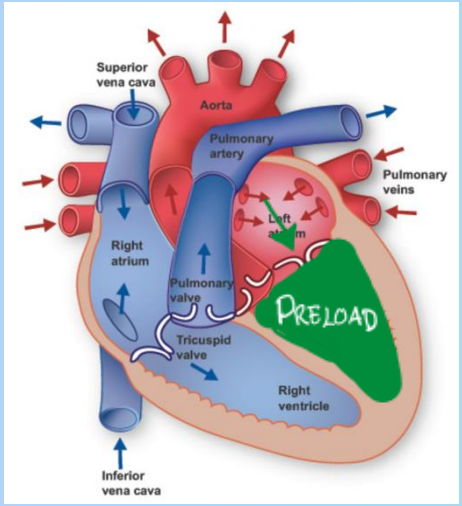
Preload vs Afterload

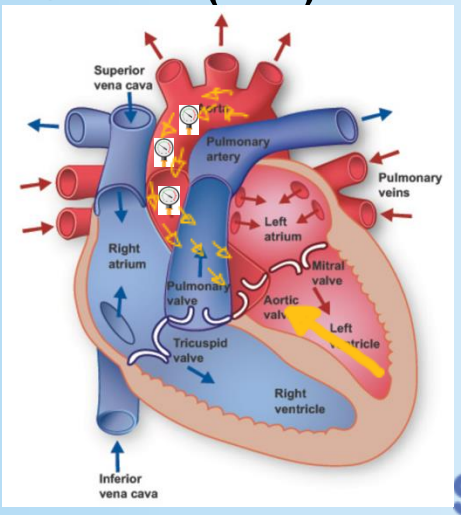
PRELOAD

- Stretch on heart muscle before contraction
- Determined by end diastolic **VOLUME** (EDV)



AFTERLOAD

- The resistance the heart pumps against during contraction
- Determined by arterial **PRESSURE** (BP)



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Electrical events of the cardiac cycle

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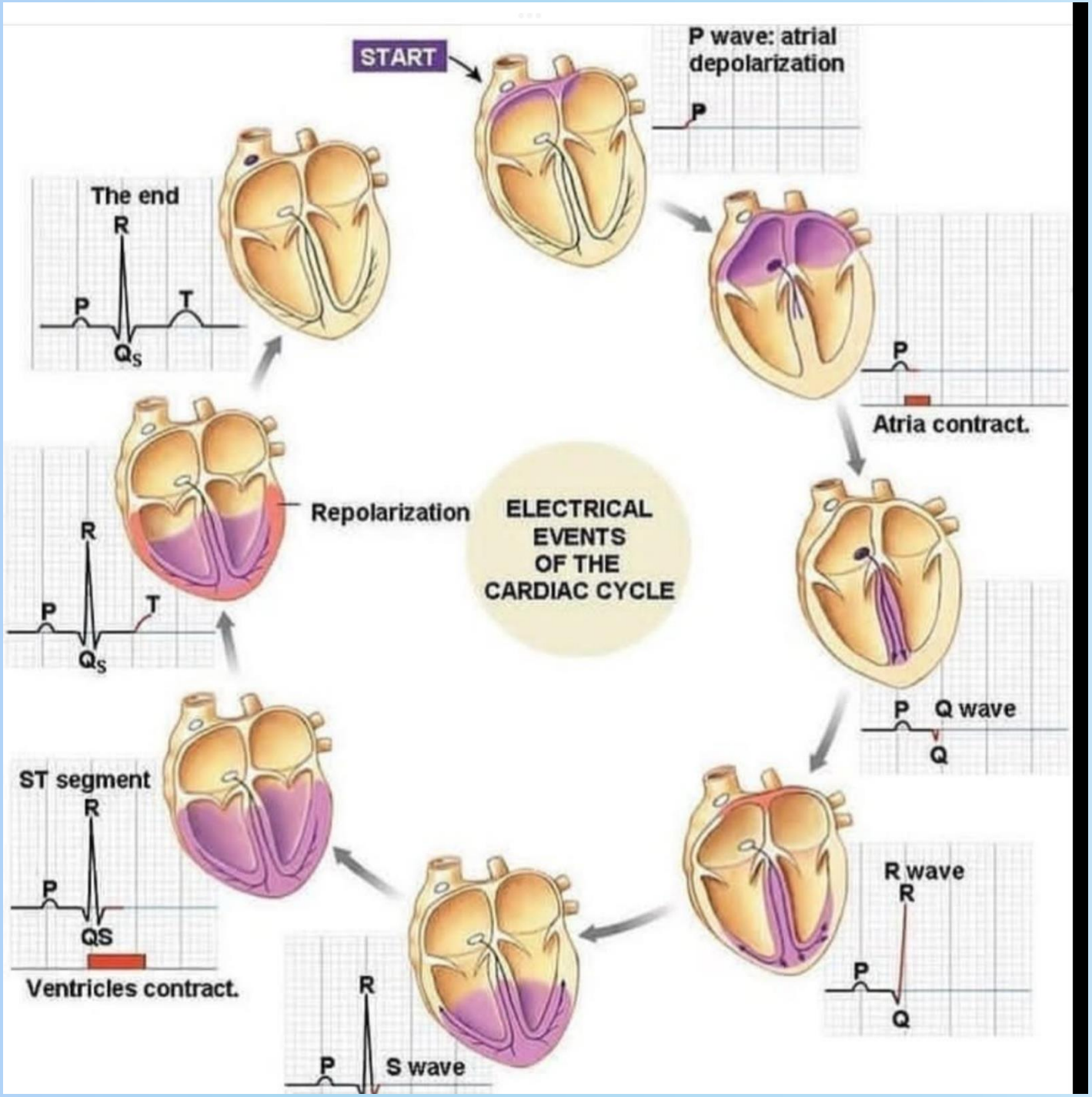
ECG

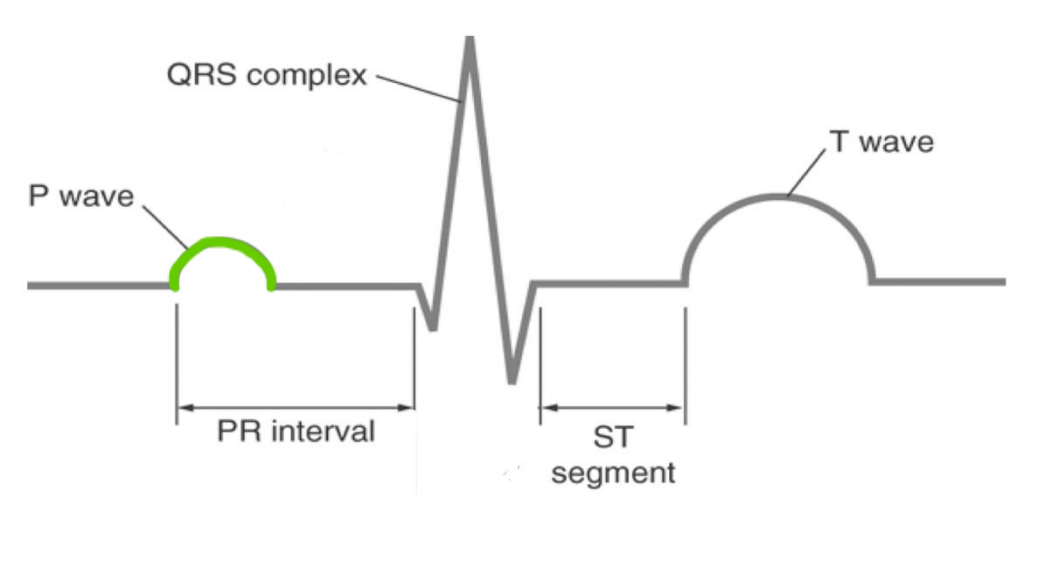

START
P wave: atrial depolarization
P
Atria contract.
P Q wave
Q
R wave
R
P
Q
S wave
P
Ventricles contract.
ST segment
R
P
QS
Repolarization
R
P
T
QS
The end
R
P
T
QS
ELECTRICAL EVENTS OF THE CARDIAC CYCLE

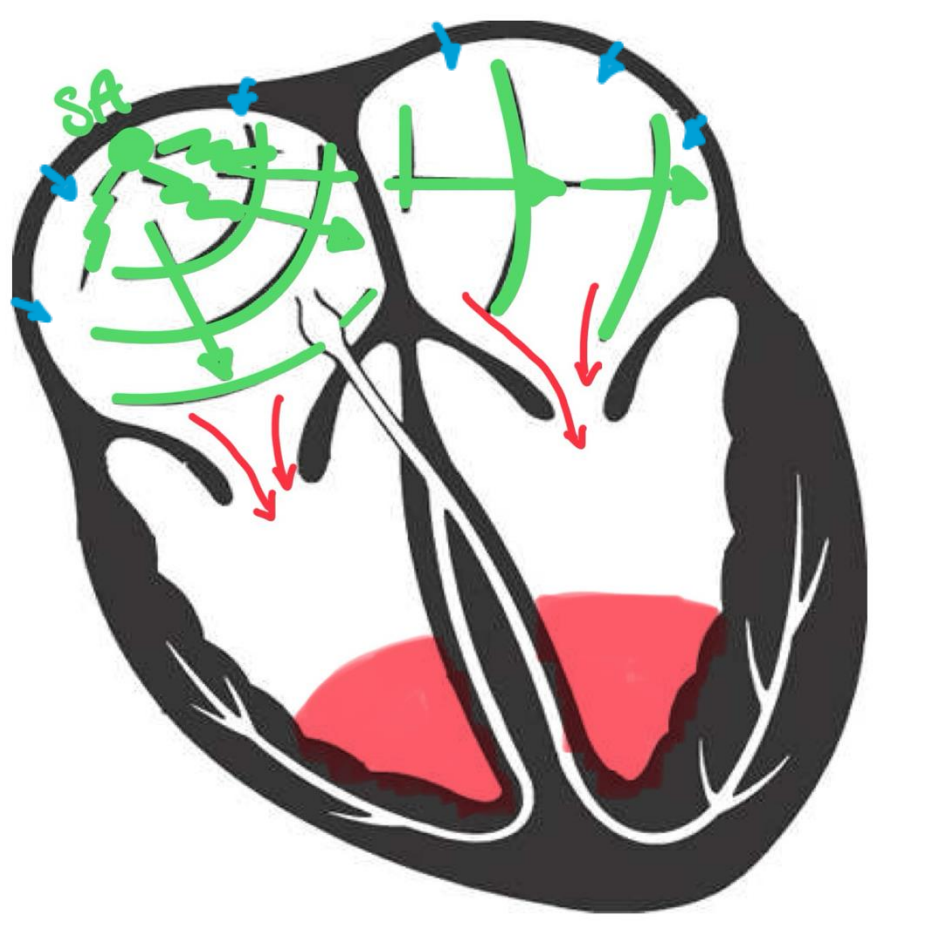
Green = electrical activity
Red = blood flow
Blue = cardiac muscle contracting

P - wave

Atrial depolarisation

Atrial systole begins





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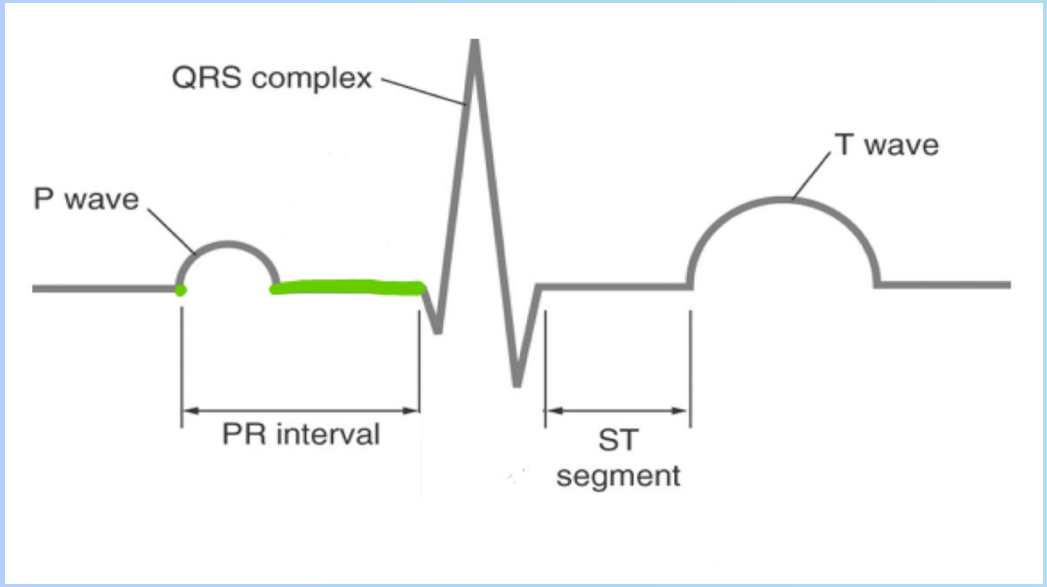
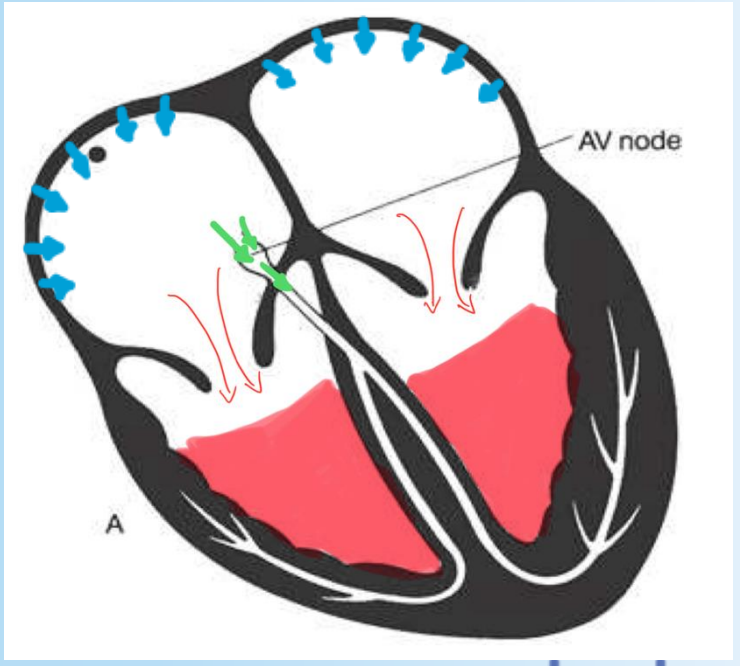
Green = electrical activity
Red = blood flow
Blue = cardiac muscle contracting

PR - interval

- Physiological delayed conduction through **AV-node**
- *Gives the atria enough contraction time to fill the ventricles with blood before ventricular contraction*





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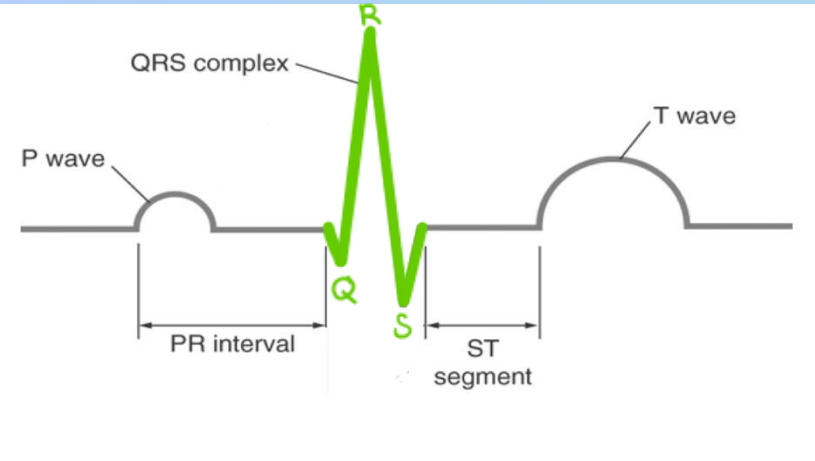
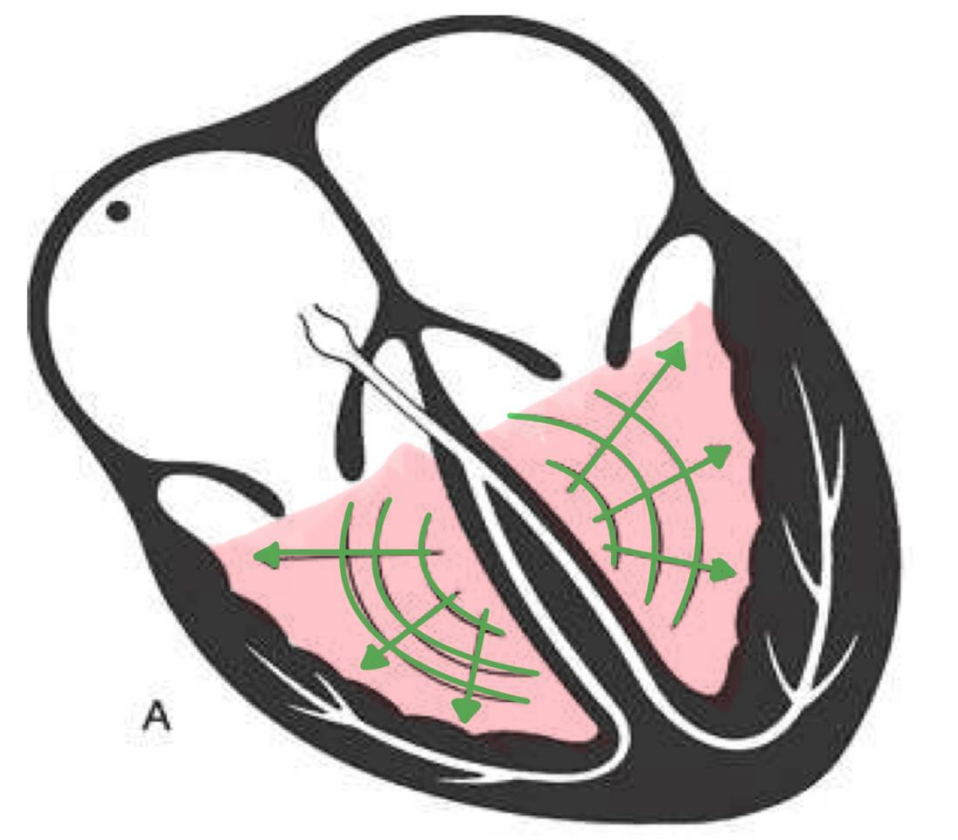
Green = electrical activity
Red = blood flow

QRS

Ventricular depolarisation

Ventricular systole begins





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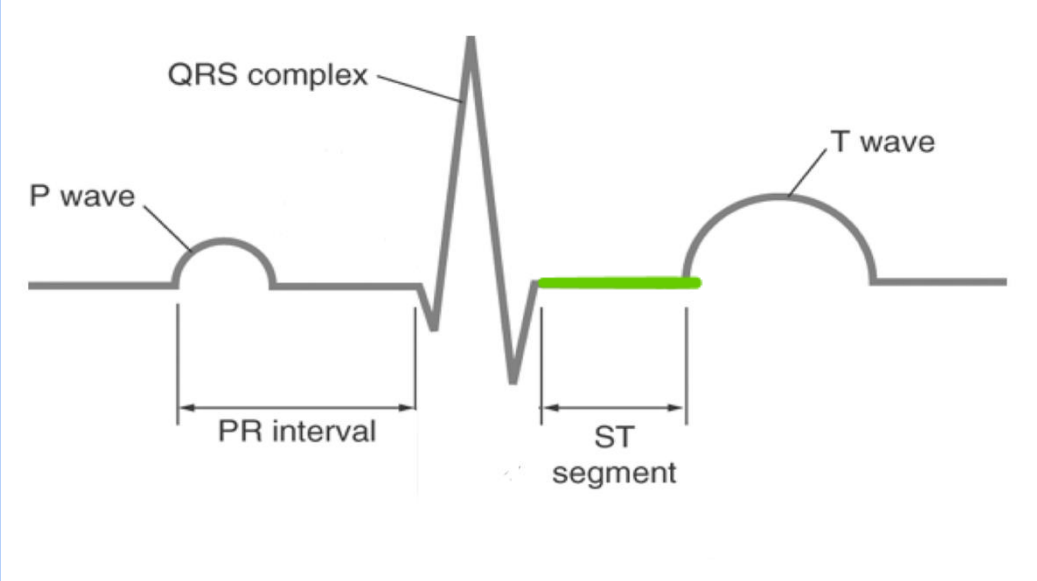
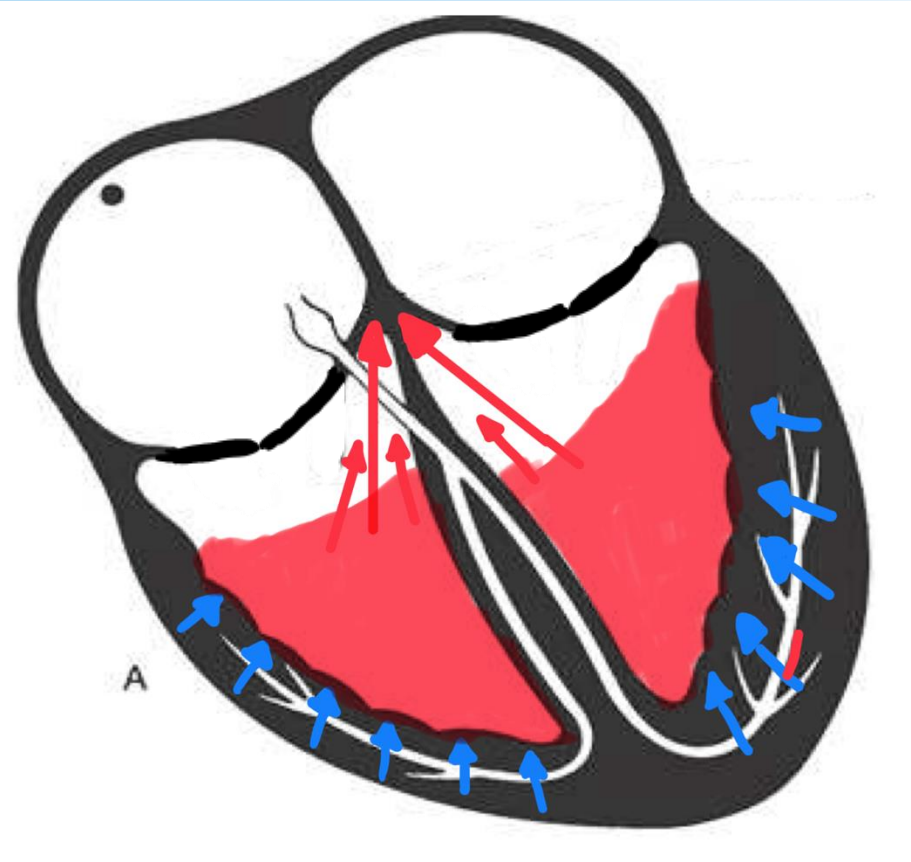
Green = electrical activity
Red = blood flow
Blue = cardiac muscle contracting

ST- segment

Ventricular systole (contraction)

Elevated in STEMI
(heart infarct)





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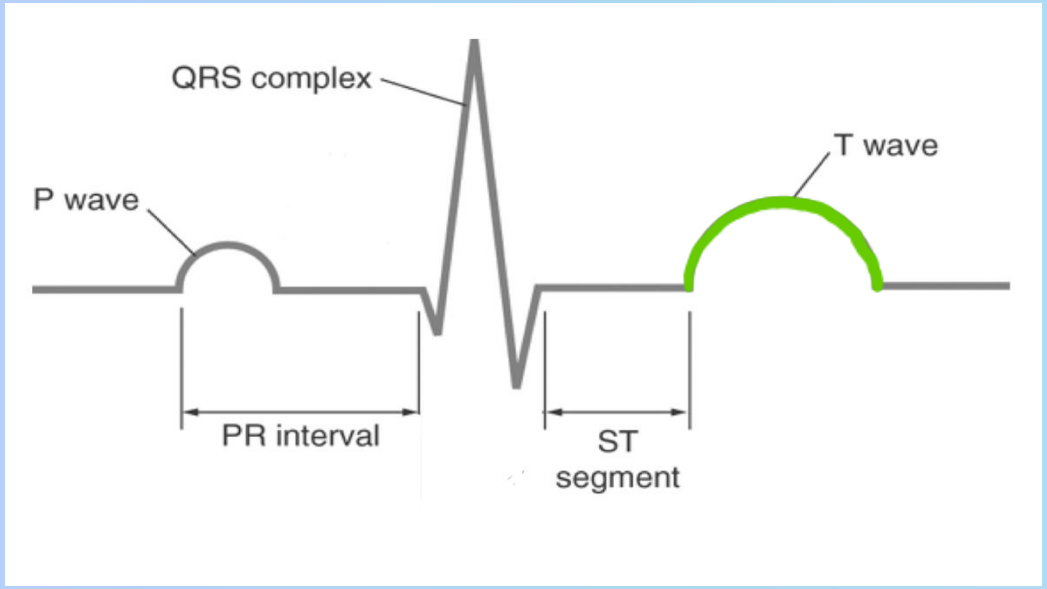
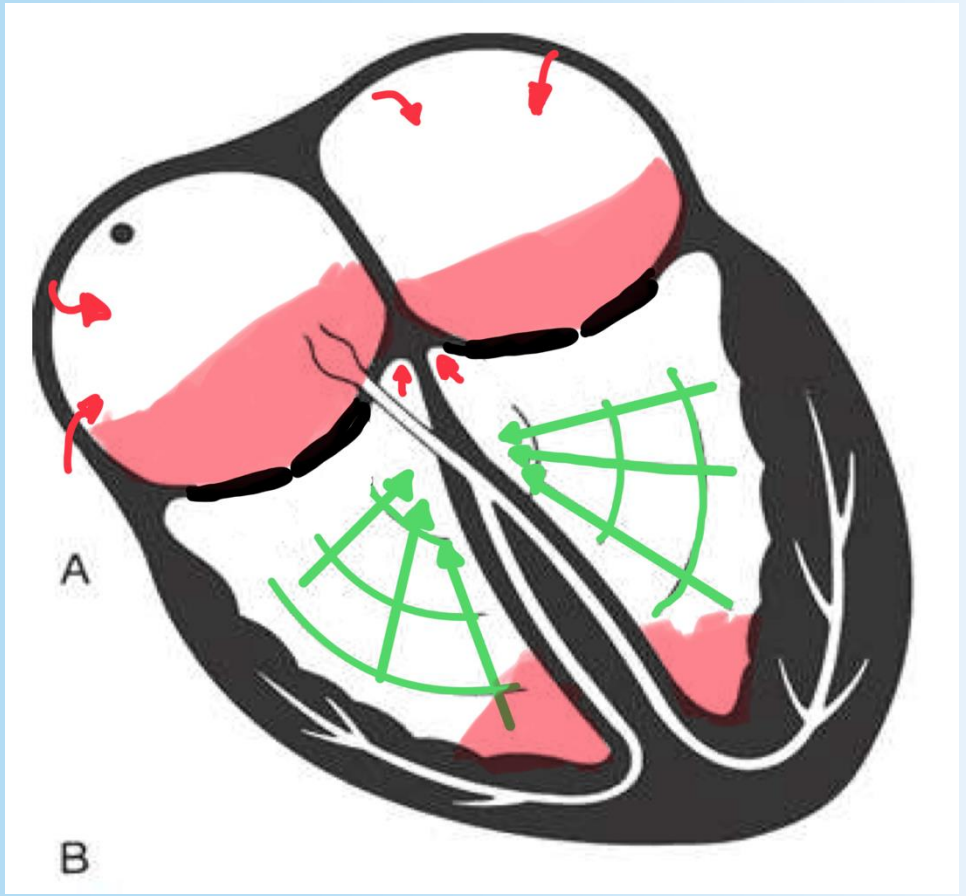
T-wave

Green = electrical activity
Red = blood flow

Ventricular REpolarisation

Ventricular systole ends





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Questions???

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