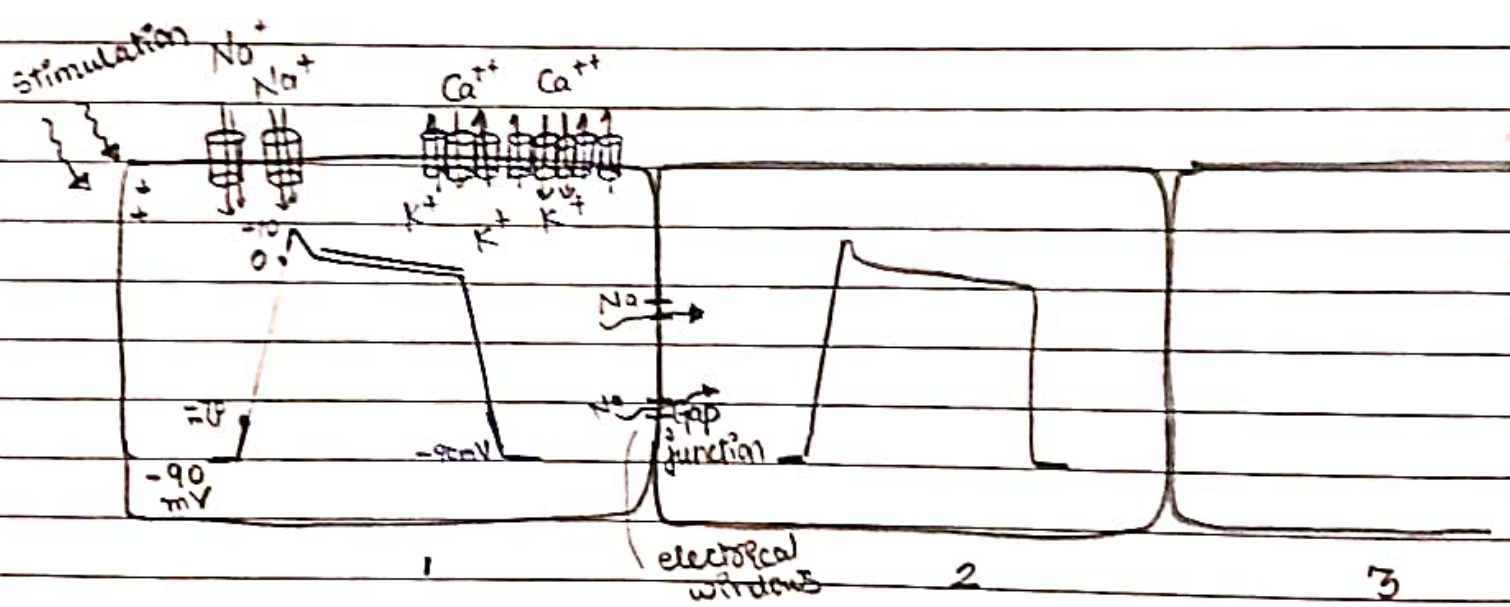


Electrophysiology of Heart

Electrical activity of myocardial cells :-



1. cells are not stimulated
 they have resting memb potential (RMP)
 RMP : it is voltage diff betⁿ inside
 & outside of memb.

"Inside - electrically - " Eg: -90 mV

2. Stimulated by Na^+/K^+
 Reaches to threshold Eg: -70 mV
 Efflux of + charge

3. At threshold potential of cell, memb opens all voltage gated channels. Eg Na channels.

Na channel opens

Membrane is depolarized

4. Depolarization sensitive channels starts to open Ca^{++} & K^{+}

Normal cell Intracellular valves K^{+}
extracellular valves Ca^{+}

5. K^{+} efflux, Ca^{++} influx

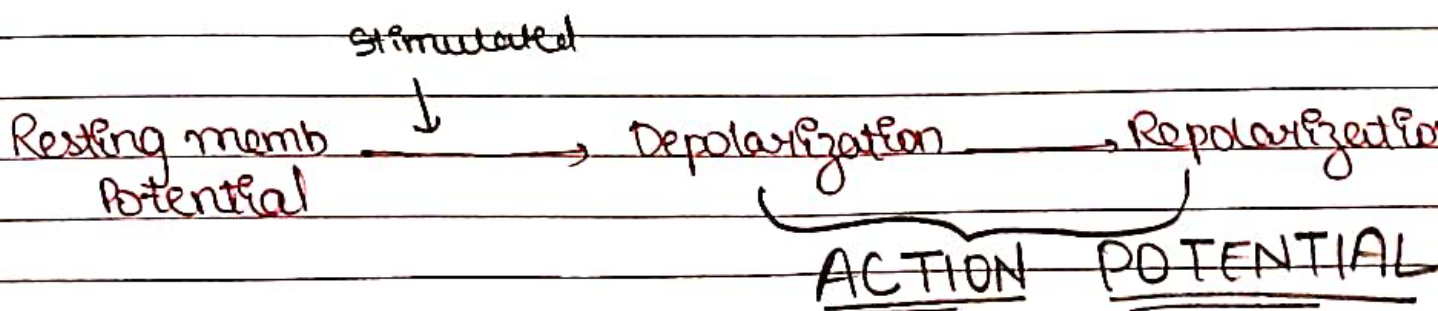
efflux of K^{+} starts the voltage again gets back to 0mV.

Around 0mV Ca^{++} channels also opens.
for some time both channels opens (plateau phase)

∴ There is no Net change in potential.

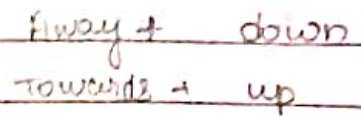
6. Ca^{++} channels close eventually & K^{+} channels becomes more & more active

This leads to repolarized again.

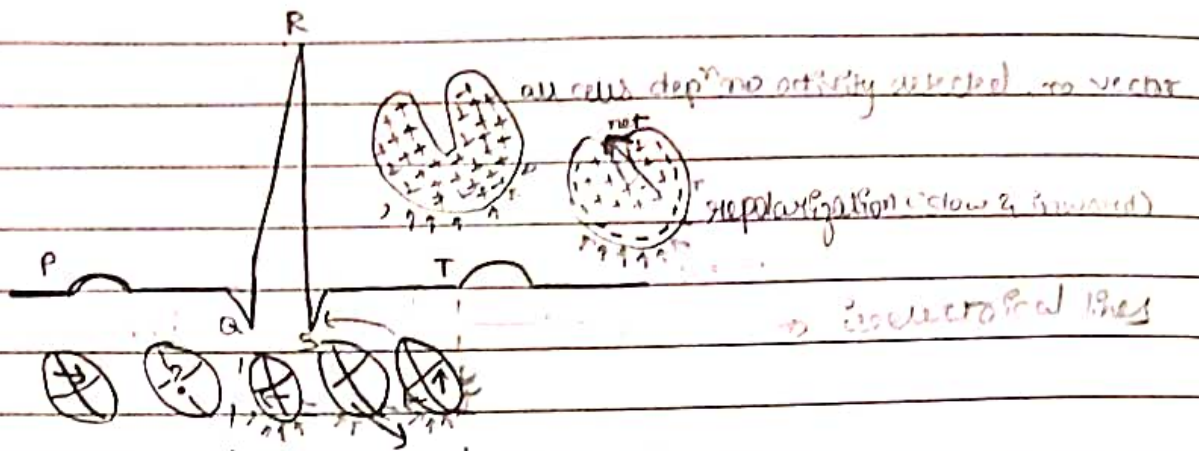


\Rightarrow Cation from the stimulated cells travels through electrical window to the adjacent cell and helps reach the ~~max~~ threshold value (eg: 70mV) hence that cell is also stimulated and goes on.

ECG machine works on
 PRINCIPLE of — galvanometer.

\Rightarrow 

↳ One direction



QRS \rightarrow No channel open (in) (onset of depol)

ST \rightarrow K loss

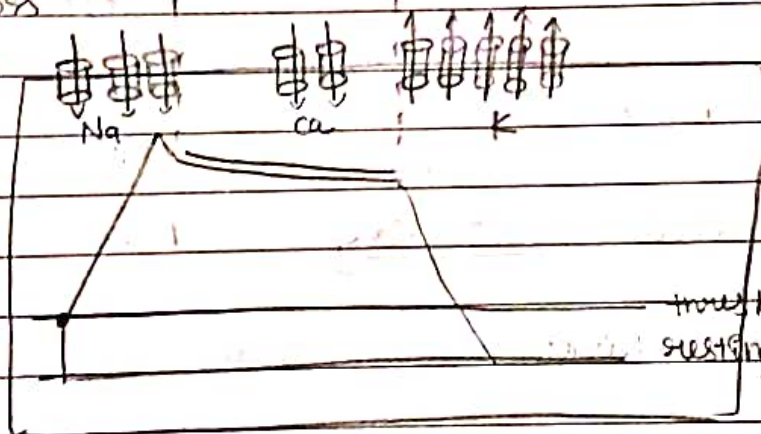
ST \rightarrow Ca gain

End ST \rightarrow Ca close

End ST \rightarrow K open

(K loss)

T \rightarrow repoln

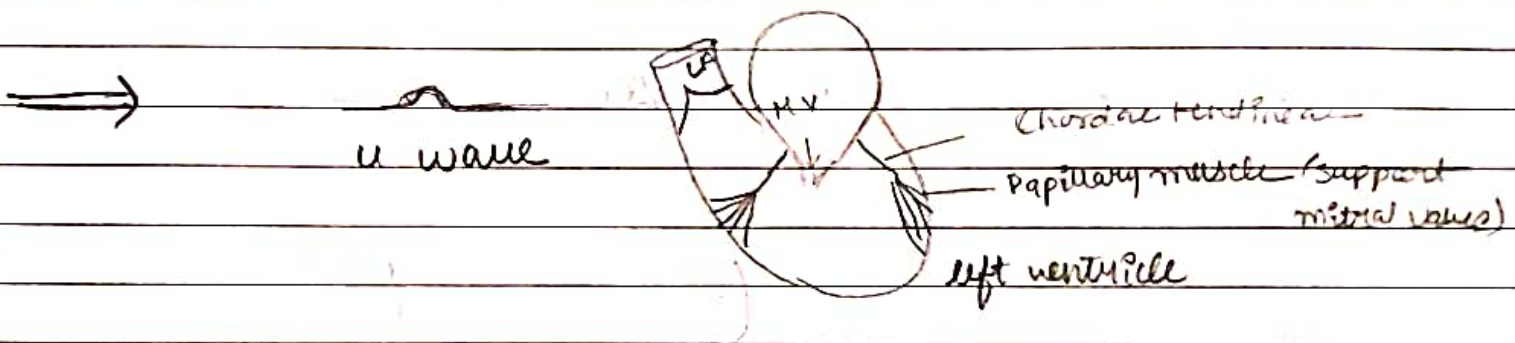
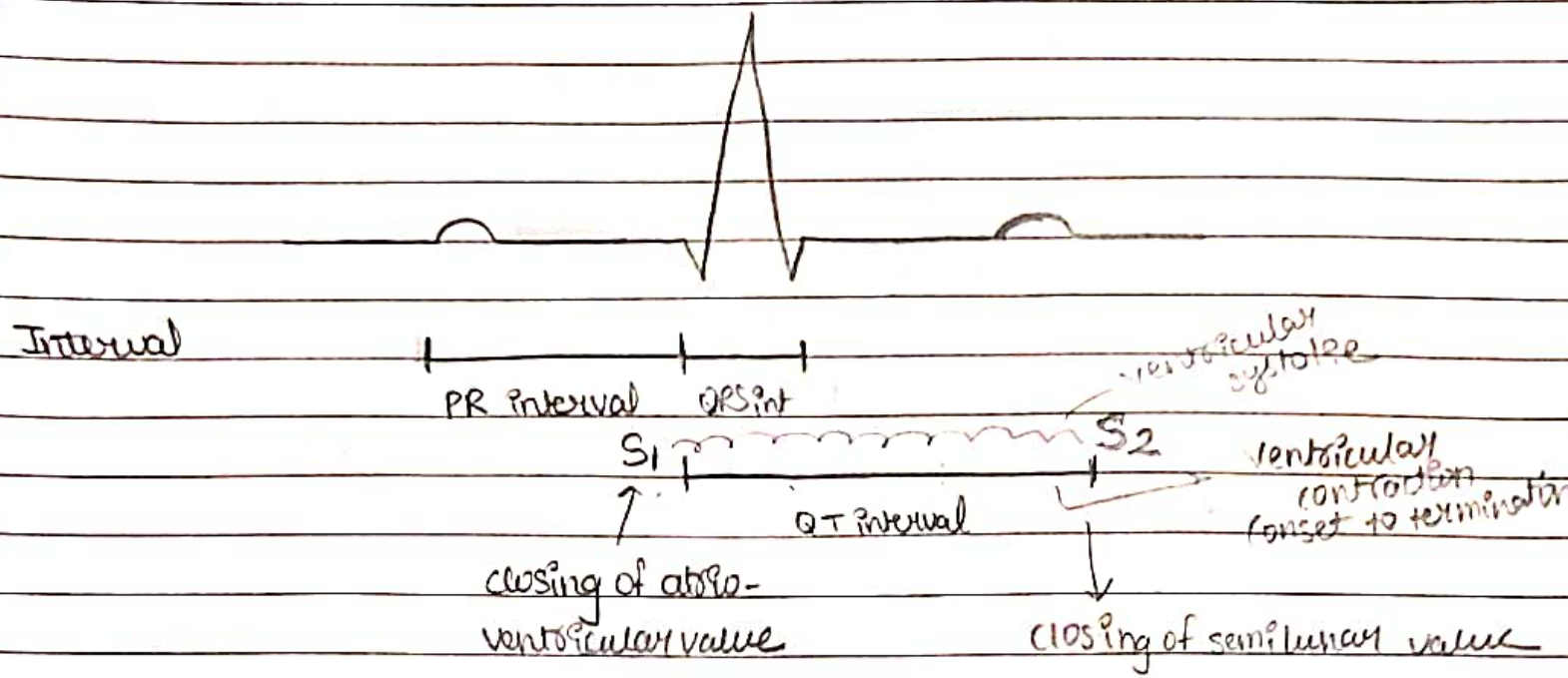


threshold
resting potential



Segment

PR seg ST seg



300 big sq \rightarrow 1 min / 60 sec

1 big sq $\rightarrow \frac{60}{300} = 0.2 \text{ sec}$

1 big sq \rightarrow 5 small sq

1 small sq $\rightarrow \frac{0.2}{5} = 0.04 \text{ sec}$

P - 2.5 small square (0.1) 2 - 0.08

PR - 2.5 " " (0.1) 3 - 0.12

Segment

QRS - 2.5 " " (0.1) depolar (start & terminal)

con

QT interval 10-11 (0.4) \rightarrow 10 (0.44) \rightarrow 11 (0.48)

(dc & rep start terminal)