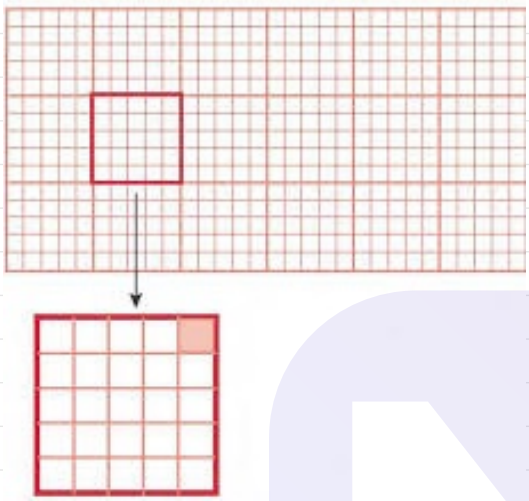
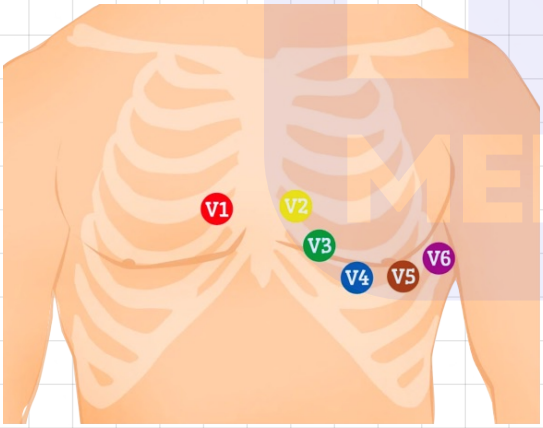
CHAPTER 10
ECG



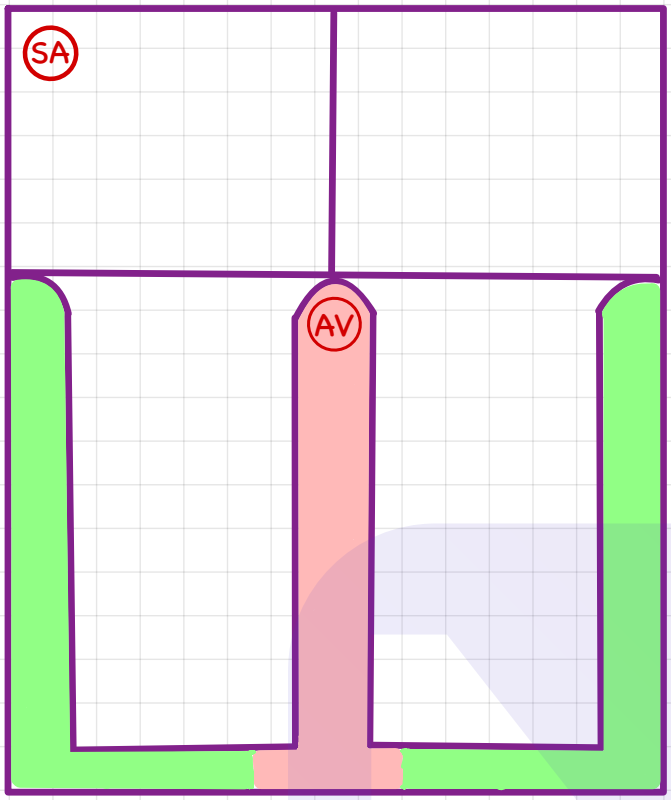
1 Big Box = _____ small box

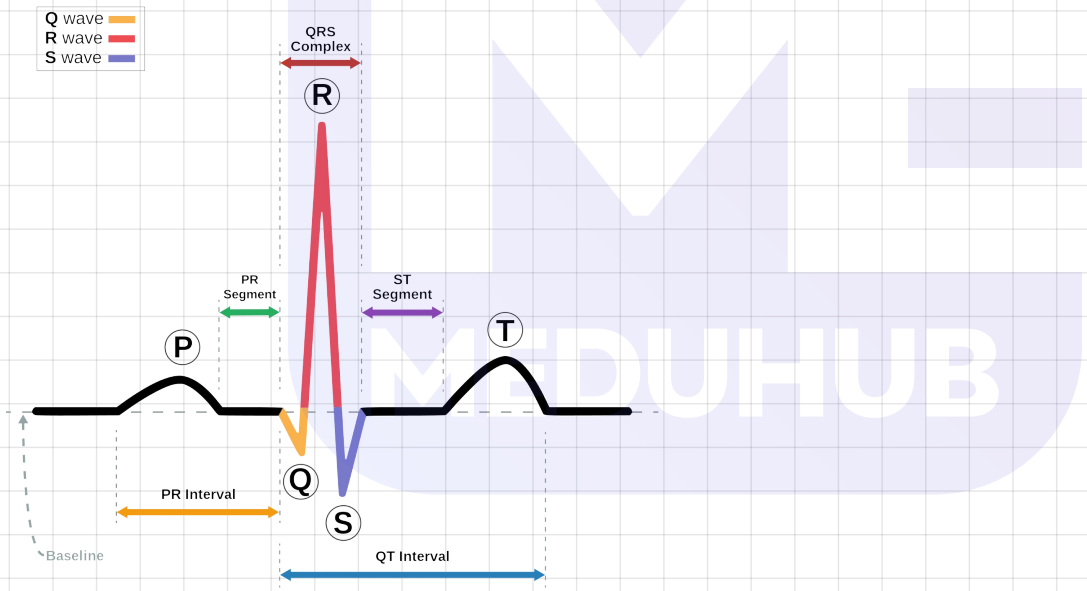
1 Small Box = _____mS.

ECG LEADS



CONDUCTION SYSTEM OF HEART





ECG NORMS

P wave



PR interval



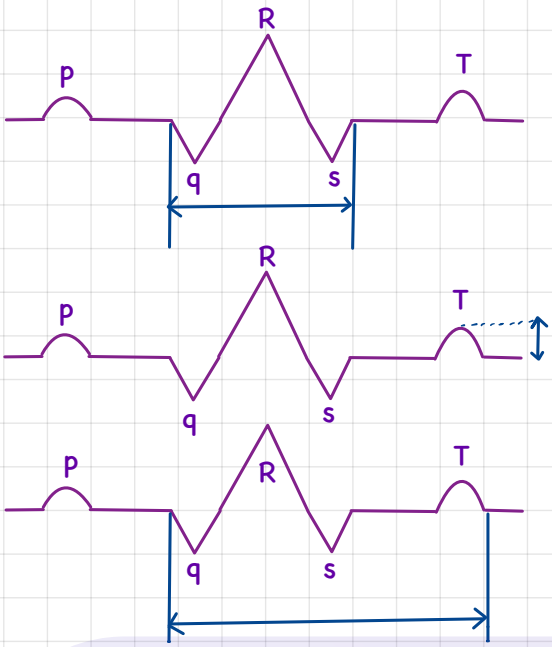
q wave



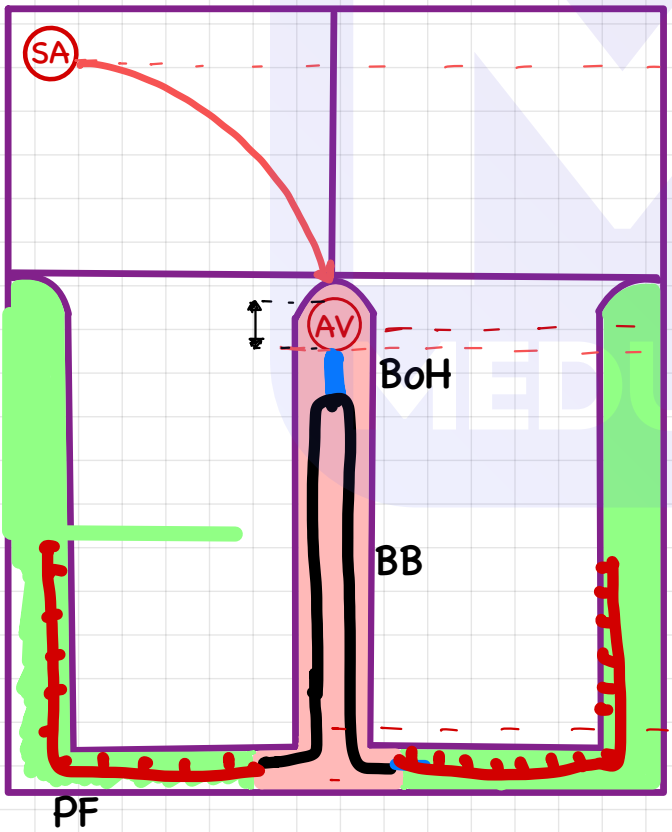
qRS complex

T wave

qT interval



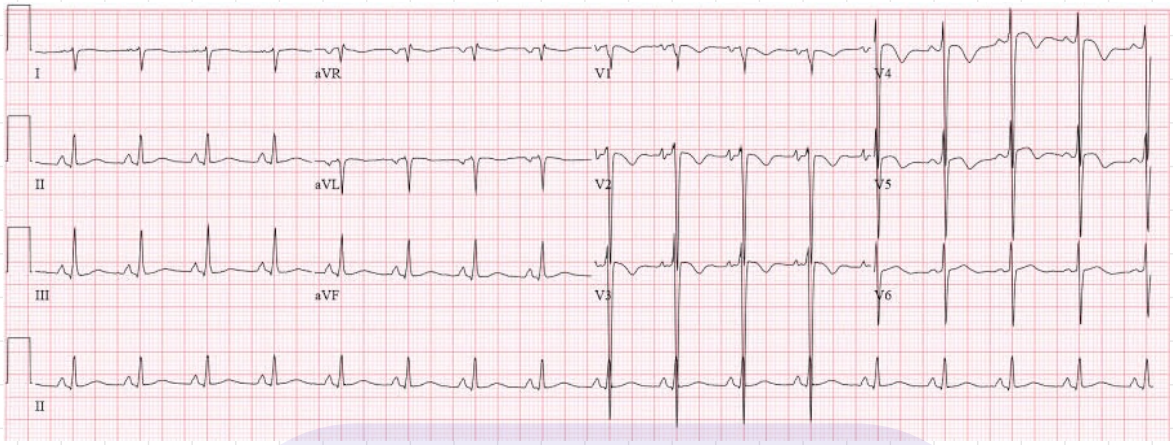
CONDUCTION SYSTEM OF HEART



Conduction from SA node till completion of AV node is callled as …… interval .

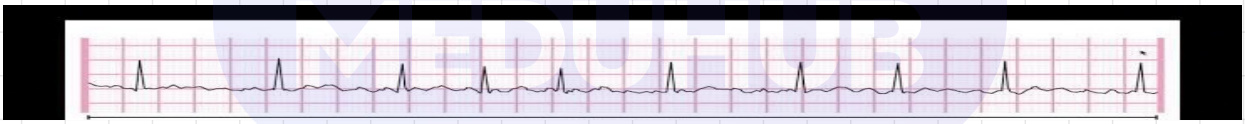
Conduction through bundle of his to Bundle branches is callled as …… interval .

Calculation of Heart Rate



For Regular rythm

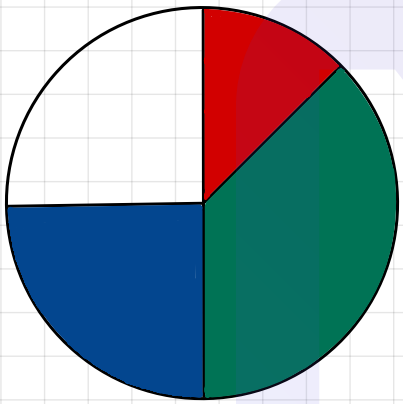
HR =



For IR-regular rythm

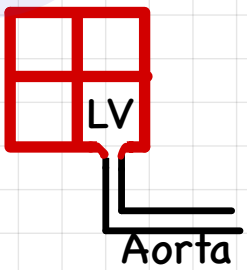
ECG AXIS

	Normal	Left axis	Right axis	Extreme Axis
I				
aVF				

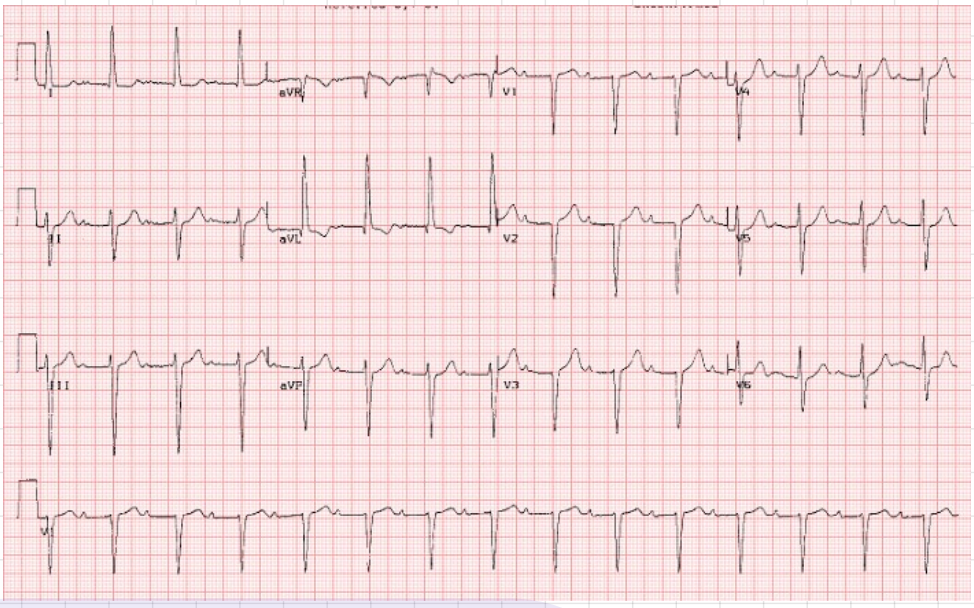


So → RVH →
→ LVH →

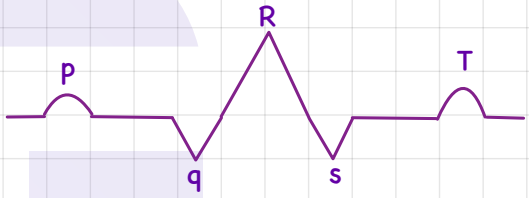
Axis
→ Uncontrolled HTN →
→ Aortic Stenosis →
→ Pw. Artery HTN →
→ Ch. Lung Pathology →
→ Tetrology of Fallot →

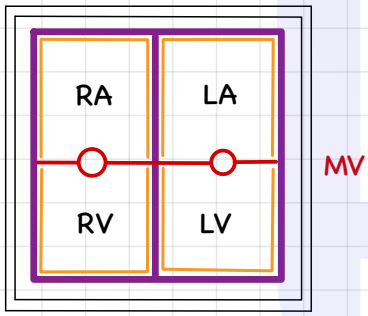


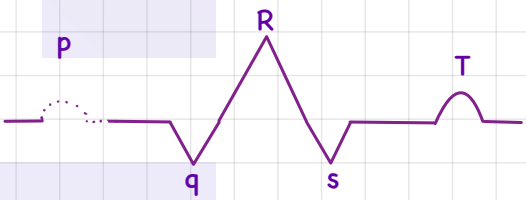
Axis

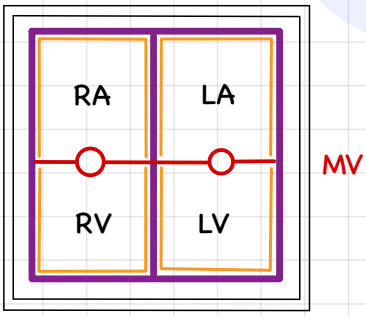


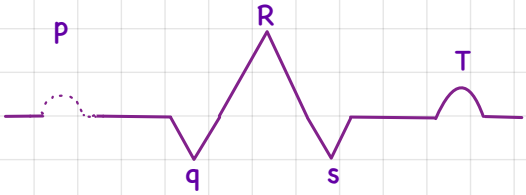
p wave



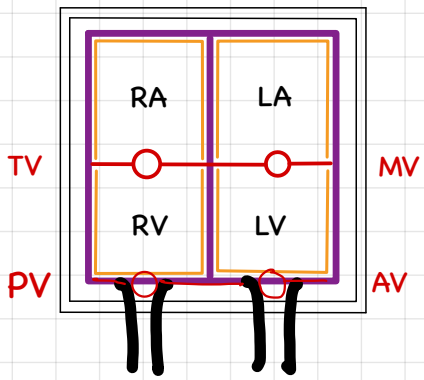








If tall P wave — without RA — c/a → Hypertrophy



Closure of MV + Closure of TV -

In mitral stenosis -

S1 can be - narrow



- single



- Reverse split

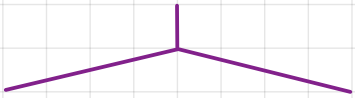


Extra point -
LOUD S1 is seen in - anemia / pregnancy / MS
SOFT S1 is seen in - MR / severe calcified MS

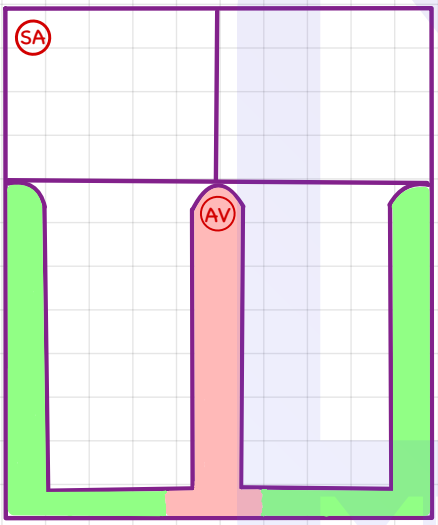
PR INTERVAL



Normal =



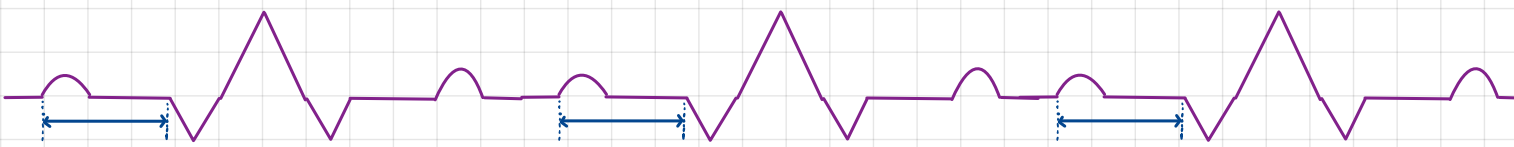
PR interval = >



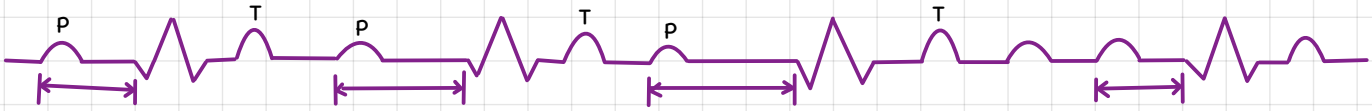
Etiology —

Ist DEGREE HEART BLOCK

→ PR-Interval →

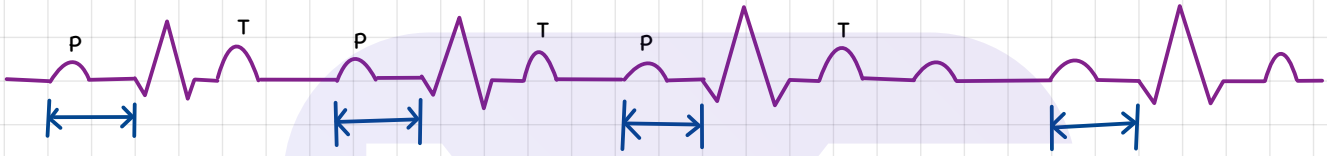


IInd DEGREE → MOBITZ Ⅰ



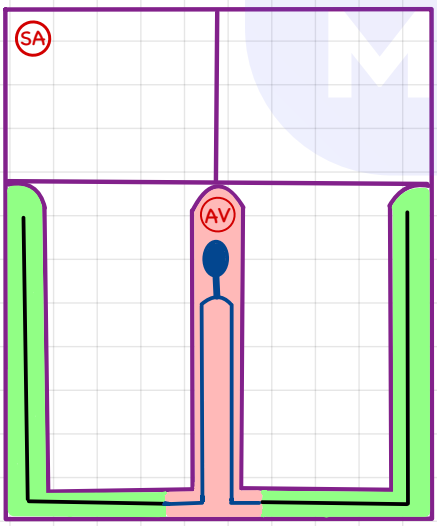
PR-interval =

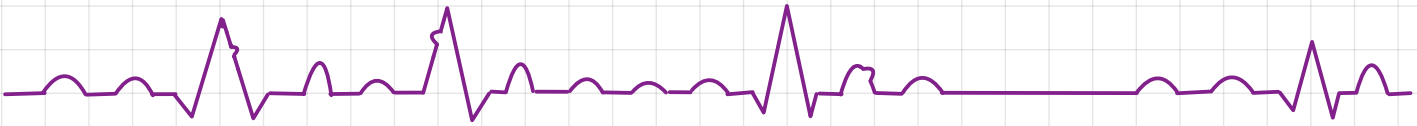
IInd DEGREE → MOBITZ Ⅱ



PR - Interval =

IIIrd DEGREE [COMPLETE HEART BLOCK]





Atrial rate

Ventricular rate

SUMMARY OF HEART BLOCK

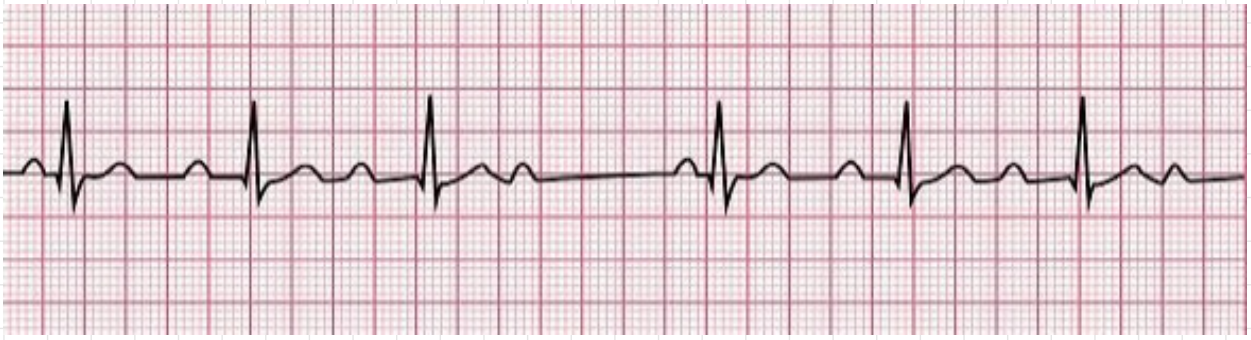
	PR Interval	Drop Beat
Ist Degree		
Mobitz I		
2°		
Mobitz II		
3rd Degree		

EXTRA POINT



Pharma pearl- don't give metoprolol with verapamil as that will increase risk of …… BLOCK hence leads to significant ……

LET'S PRACTICE → 1°/MOBITZ Ⓘ/MOBITZ Ⓘ Ⓘ/3° / 2:1



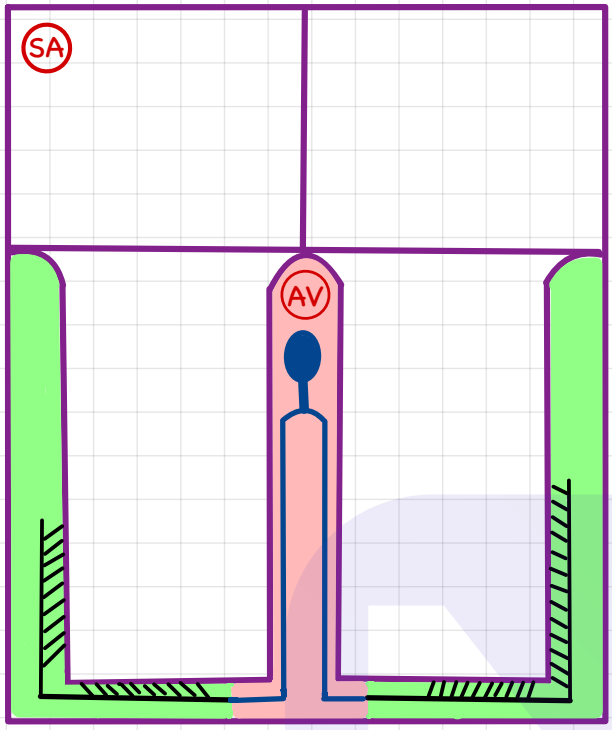




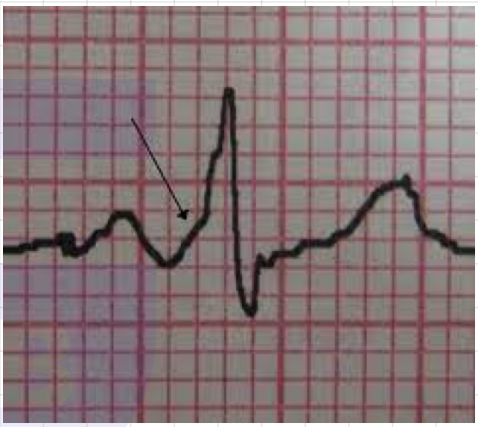




SHORT PR INTERVAL [< _____ mSec]



So, →
-
-
-
-

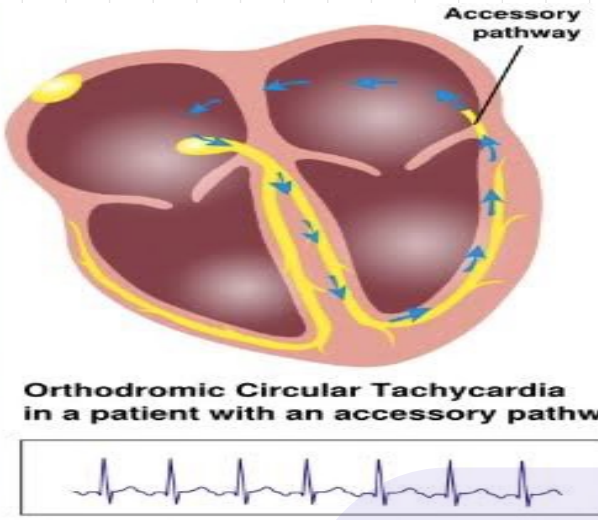


WPW Synd – Between → LA → LV
→ RA → RV

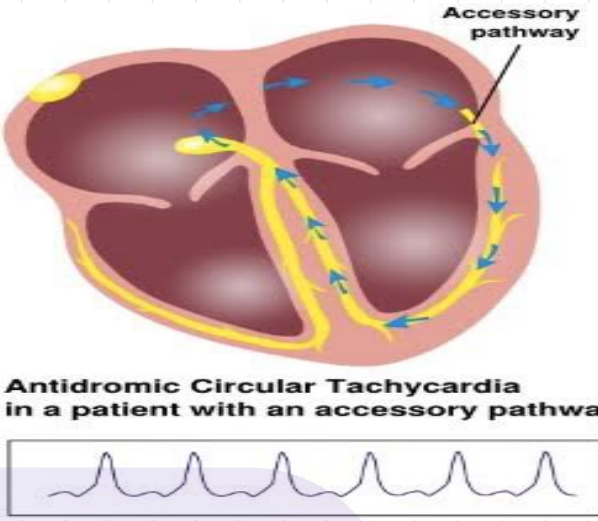
Accessory Pathway

Rx ……. …… or ……

★ TMT in WPW syn is ……



Orthodromic Circular Tachycardia
in a patient with an accessory pathway



Antidromic Circular Tachycardia
in a patient with an accessory pathway

MEDUHUB

q wave – Normally should fit in ___ small box

↓

If bigger

↓

C/a –

↓

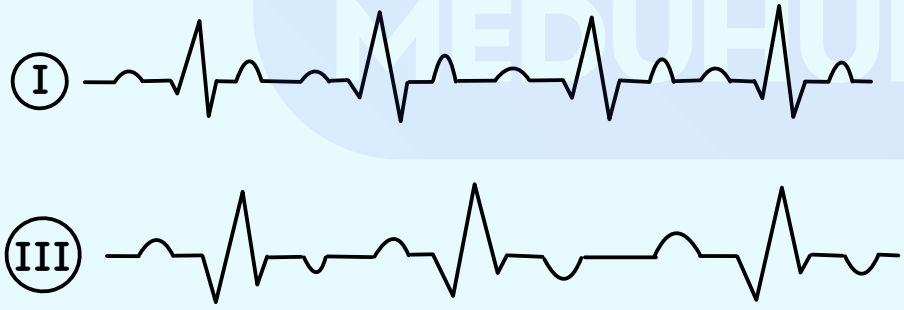
Seen in

↓

EXTRA POINT

Pul. Embolism → Most common → ECG change

Most specific → ECG change



Extra point -
Mostly in fever - HR increases but if there is decrease in HR during fever called as - ……. bradycardia is seen in ……. / ……./…….

qRS COMPLEX PATHOLOGY & ARRYTHMIA

A) Atrial Fibrillation [Af]

B) Atrial Flutter [AF]

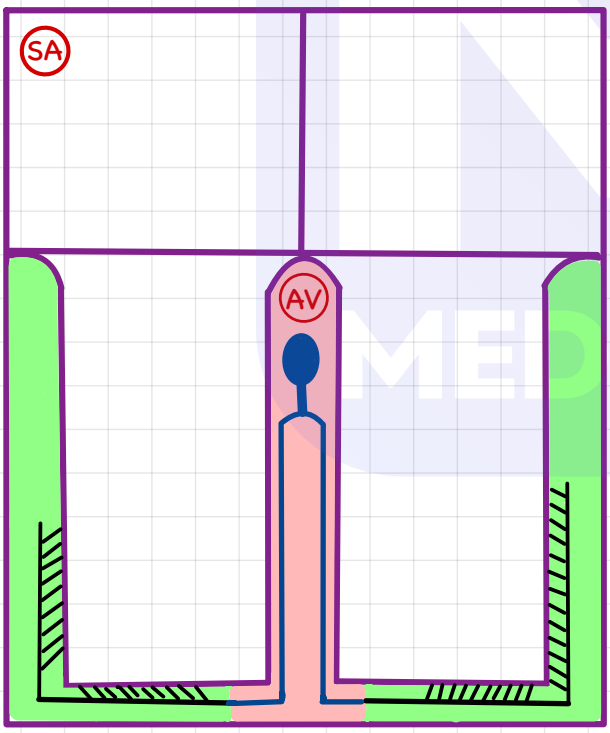
C) Multifocal Atrial Tacchycardia [MAT]

D) Paroxysmal Supraventricular Tachycardia [PSVT]

E) Ventricular Tachycardia [VT]

F) Ventricular Flutter [VF]

G) Ventricular Fibrillation [Vf]



If Arrhythmia originates from here calls as -

……arrythmia.

If Arrhythmia originates from here calls as -

……arrythmia

SV arrythmia - ……qRS

Ventricular arrythmia - ……qRS

A) Atrial Fibrillation

Pathology -



Lead -

qRS -

Rythm- -

HR-

P wave -

C/f - syncope / palpitation

Can be seen with - ……thyroidism.

Kussmaul sign - ……seen .
(on inspiration fall in JVP)

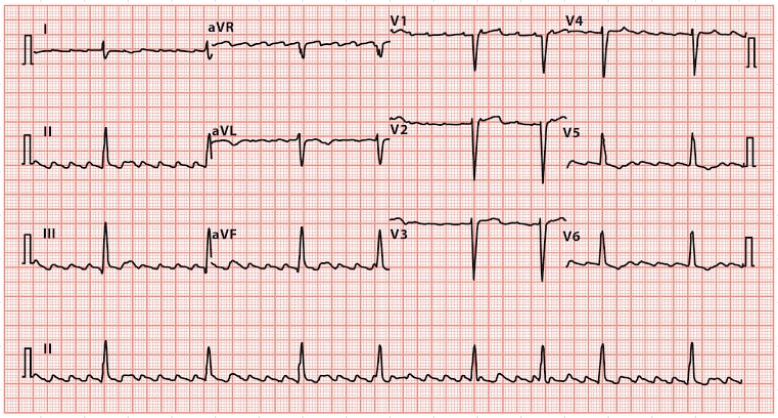


Rx - rate control -
- rythm control - ……./ ……(better)
- if recurrent -then for prophylaxis

B) Atrial Flutter

→ ECG —

→ Leads —



C) MULTI-FOCAL-ATRIAL-TACCHYCARDIA [MAT]

- Hint →
- ECG → Lead ____
- Pulse deficit →

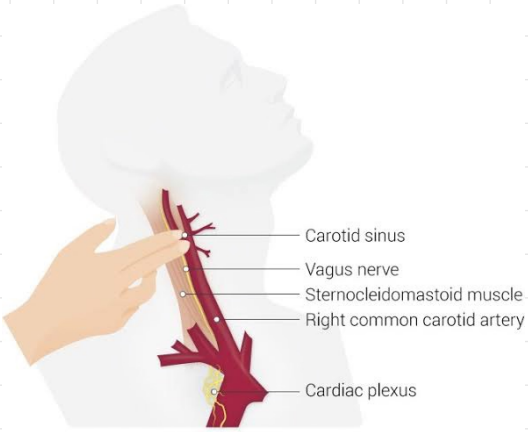
D) PAROXYSMAL SUPRAVENTRICULAR TACHYCARDIA [PSVT]

→ C/F →

→ ECG → Lead →

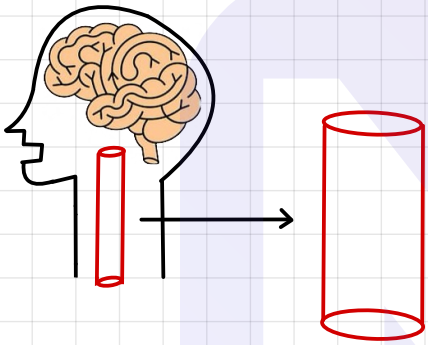


Rx — Ist line



Other management - face ice pack

CAROTID SINUS MASSAGE



Pharma connection

Adenosine is C/I in — _____ _____.

D) VENTRICULAR TACHYCARDIA [VT]

VT= ≥ ____ continuous (VPC) + qRS > ____ mS + HR > ____/min.

If - ≥ ____ continuous (VPC) + qRS > ____mS + HR < ____/min.

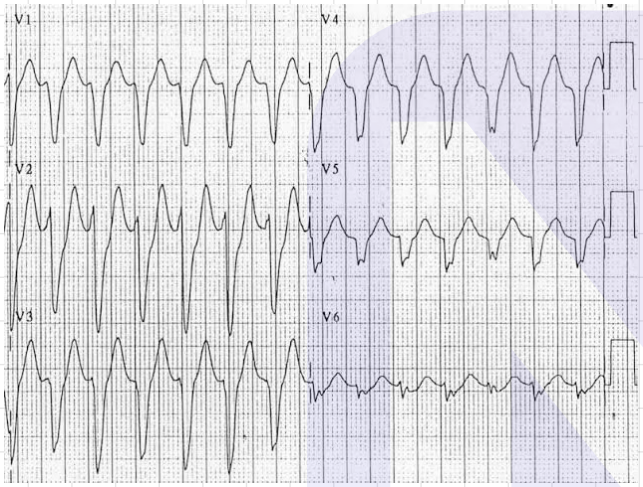
c/a

Ventricular tachycardia

Shape of VPC

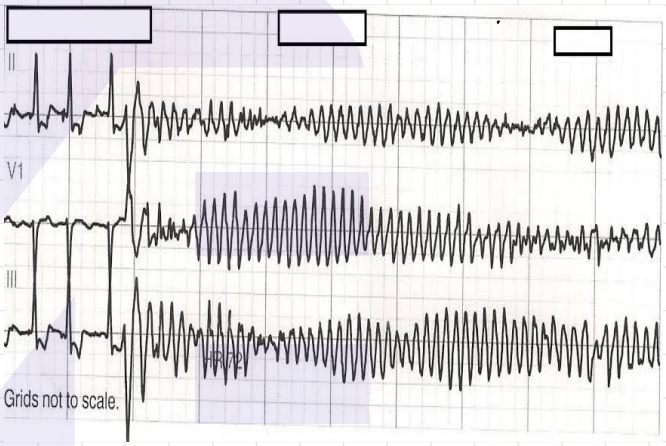
.

.



Rx - unstable

- stable



Rx - unstable

- stable

Trigger of TDP —

(early after depolarisation)

EXTRA POINT

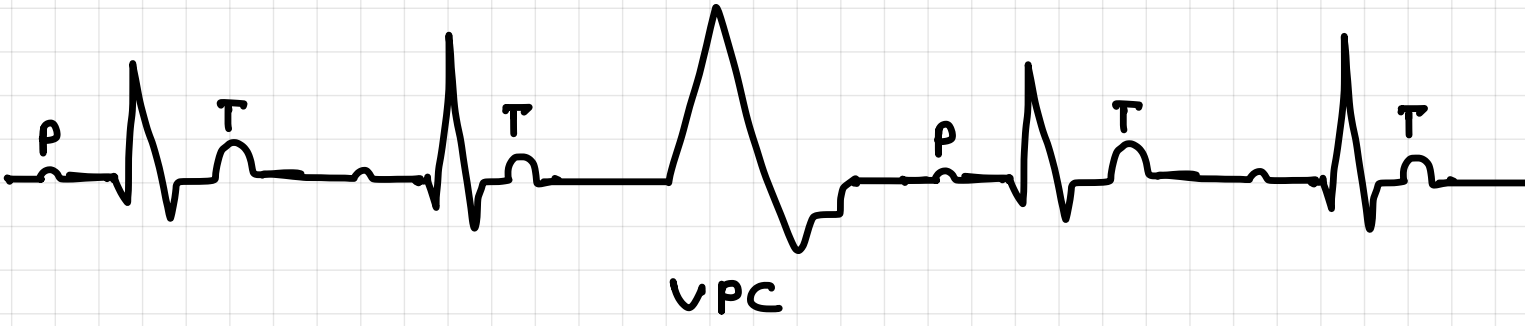
VT ⟶ Lasting
- ↳ <30sec -
- ↳ >30sec -

Arrhythmia ⟶ leading to Hypotension — Rx



- For treatment of digoxin induced arrhythmia - inj ……

- Ventricular premature contraction is also called as extrasystole.



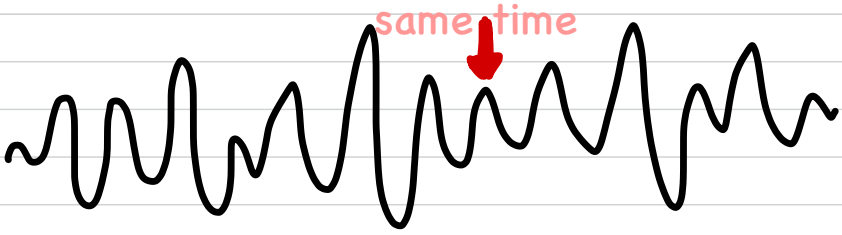
Extra point

DC SHOCK

- Synchronised / cardioversion → DC shock is sync with R wave
- Non -Synchronised / defibrillation → DC shock is NOT sync with R wave

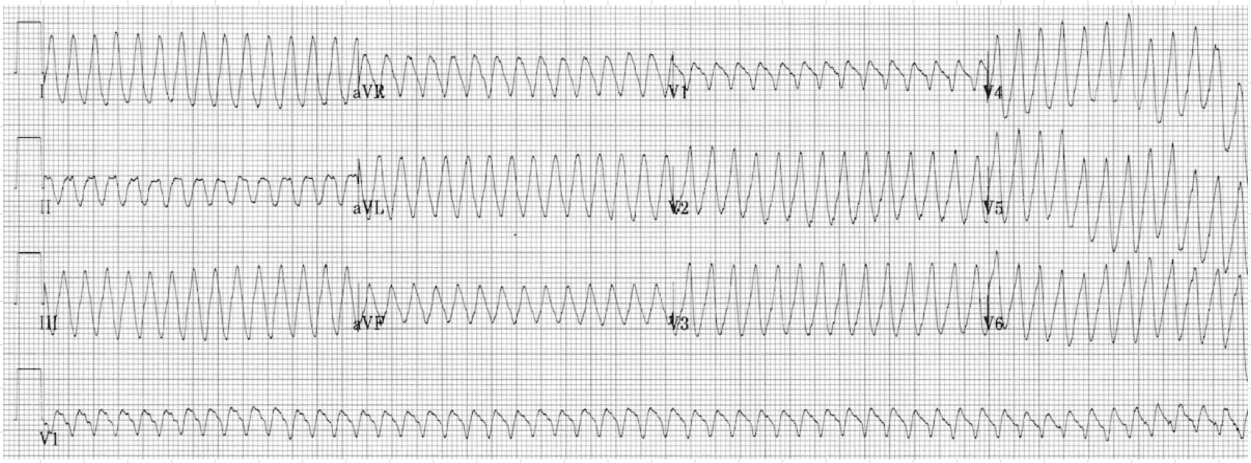


DC SHOCK button press and delivery same time



→ Defibrillation

F) VENTRICULAR FLUTTER [VF]



G) VENTRICULAR FIBRILLATION [Vf]



For management of ASYSTOLE - inj . ……

Blunt trauma to chest leading to arrhythmia - c/a -….

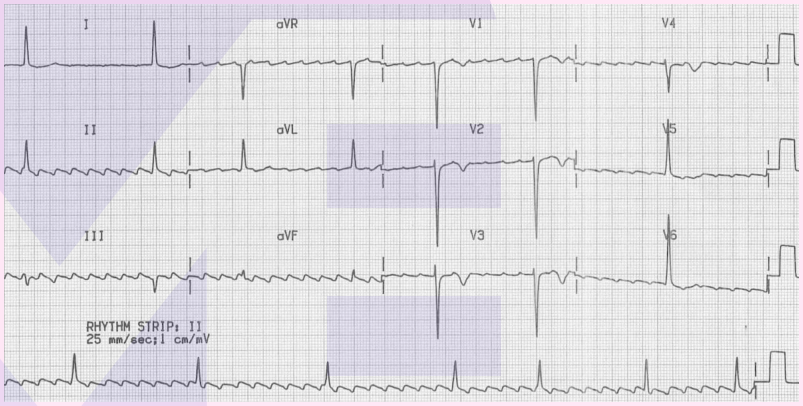
SUMMARY OF ARRYTHMIA

- A. Fibrillation → _____ lead.
  - → __ _____ R-R interval + No Identifiable __ wave.
- A. Flutter ⟶ _____ leads → _____ pattern
- PSVT ⟶ _____ lead →
  - → Rx → Ist –
    - → IInd –

- MAT ⟶ lead ___ → ≥ ___ morphology of ____ wave.
- VT ⟶ ≥ ____ VPC + qRS > ____mS + HR > ____/min.
- 180° Rotation same ⟶ _____ _____.

LET'S PRACTICE

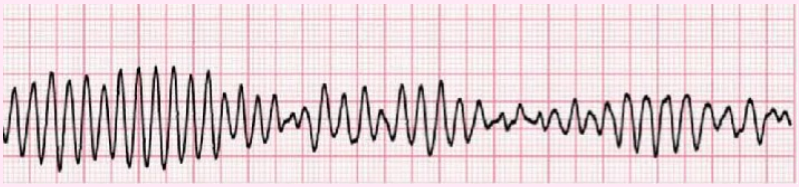
- A. Fibrillation
- A. Flutter
- PSVT
- VT



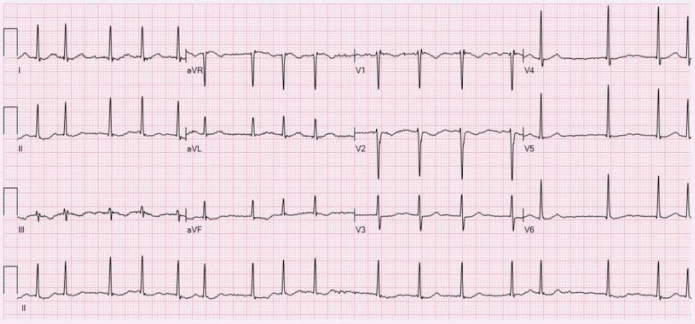
- A. Fibrillation
- MAT
- PSVT
- VT



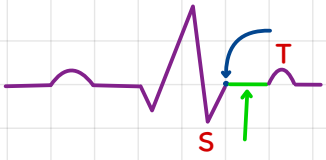
- A. Fibrillation
- Monomorphic VT
- PSVT
- TDP



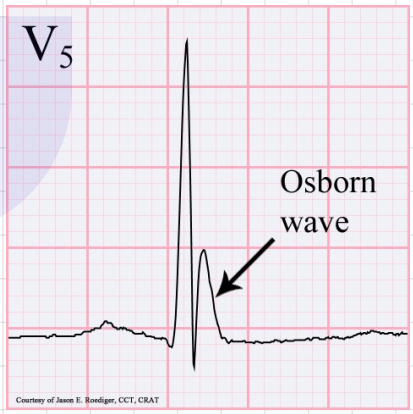
- A. Fibrillation
- MAT
- PSVT
- VT



ST - SEGMENT



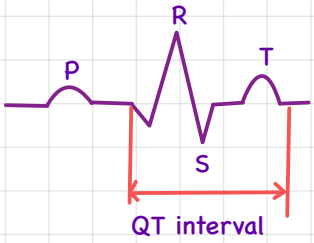
- ST Elevation
  - 1) STEMI
    - V1-V4
    - I/aVL/V5-V6
    - II/III/aVF
  - 2) Acute pericarditis
  - 3)
  - 4)
  - 5)
  - 6)
  - 7)
  - 8)



Osborn wave (J wave) can also be seen in hypercalcemia

ST Depression ⟶

QT INTERVAL



ⓝ QT →

Prolong QT can lead to ⟶

Congenital prolong QT interval
- → with deafness →
- → without deafness →

QT interval ∝

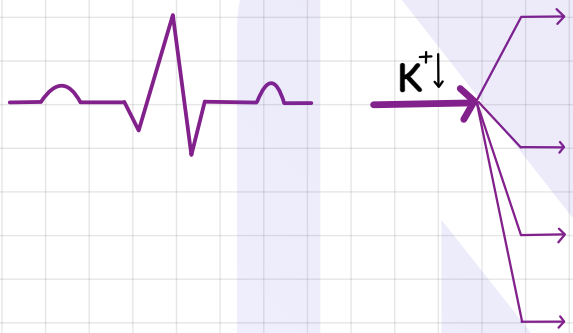
EXTRA POINT
Corrected QT interval [QTc] ⟶

ECG CHANGES OF HYPERKALEMIA [K^+ > _____ mEq]



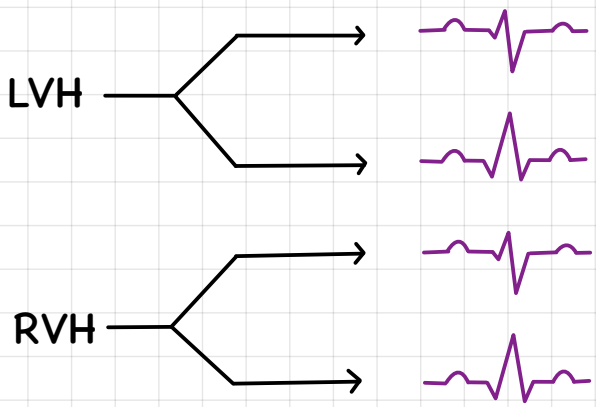
- Risk factor for Hyperkalemia →
- Rx of Hyperkalemia →
  -
  -
  -
  -

ECG CHANGES OF HYPOKALEMIA [K^+ < _____ mEq]

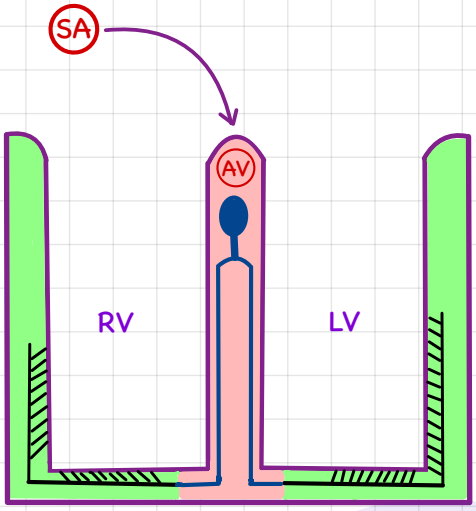


- Risk factor of $K^+\downarrow$ →
- Rx →

CHAMBER HYPERTROPHY

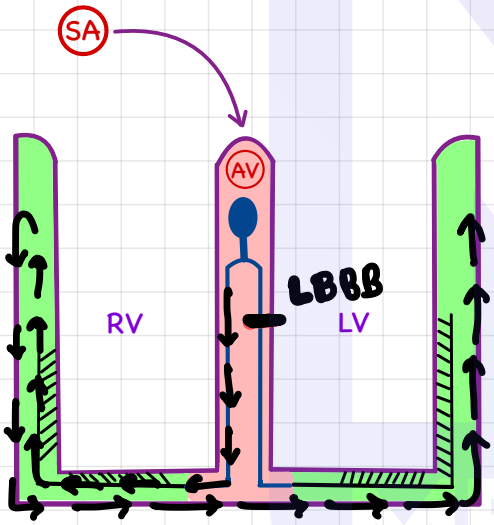


BUNDLE BRANCH BLOCK [BBB]



→ qRS →

→ V1 →

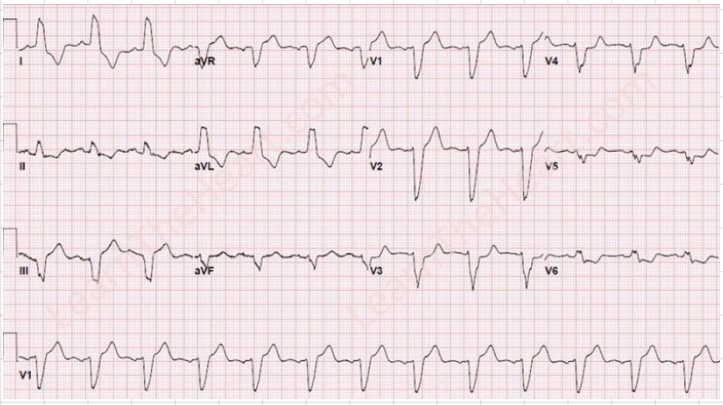


→ qRS →

→ V1 →

Rx - if symptomatic →

a) RBBB b) LBBB



a) RBBB b) LBBB

