

COMMON ECG ABNORMALITIES

Sawa University

جامعة ساوة الاهلية

College of health and medical techniques

كلية التقنيات الصحية والطبية

Department of Anesthesia

قسم تقنيات التخدير

4th Stage

المرحلة الرابعة

محاضرة رقم 3

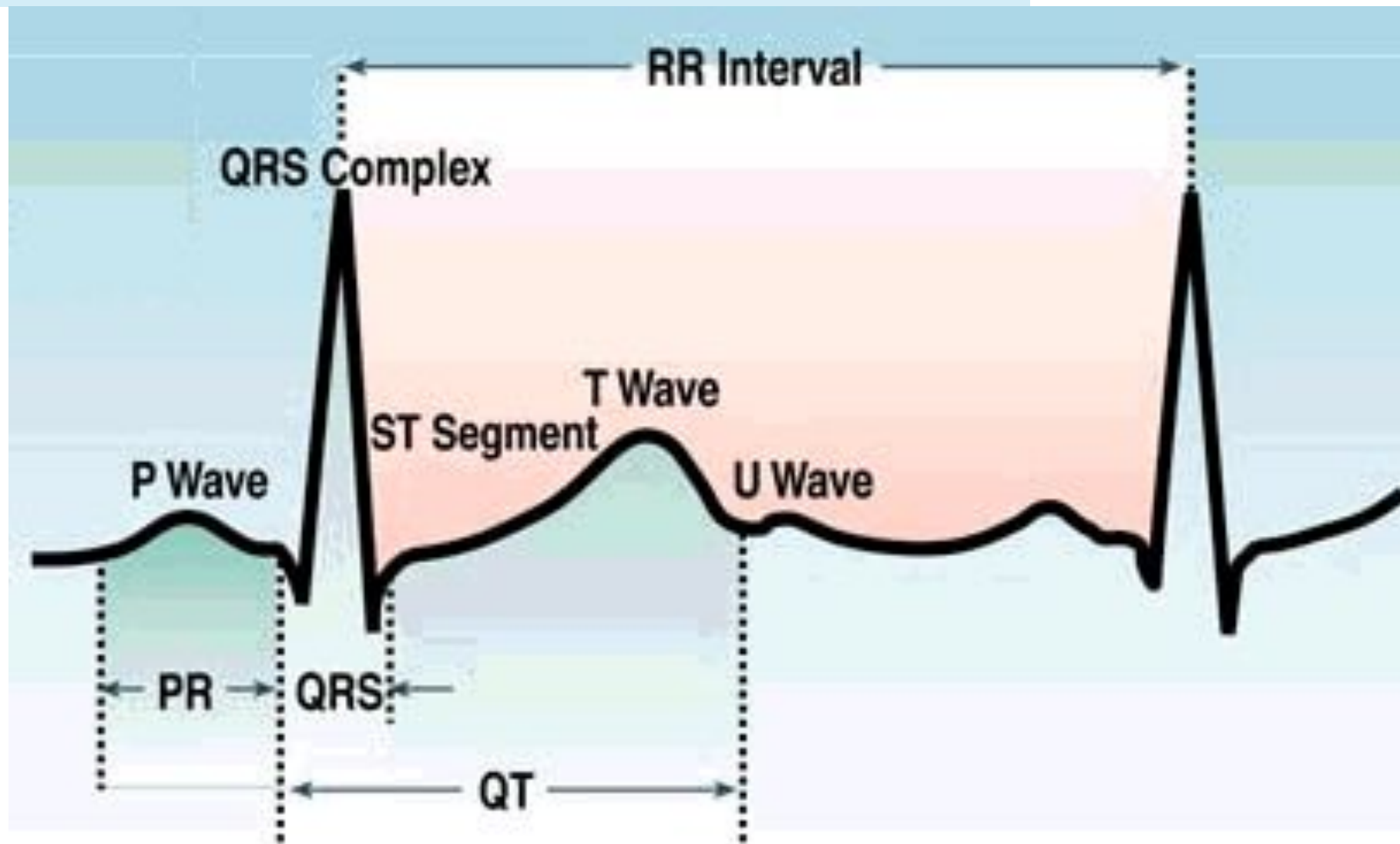
الجانب العملي

Lecture No. 3

Practical

استاذ المادة : د. زهراء زهير تركي

Normal ECG Wave & Interval



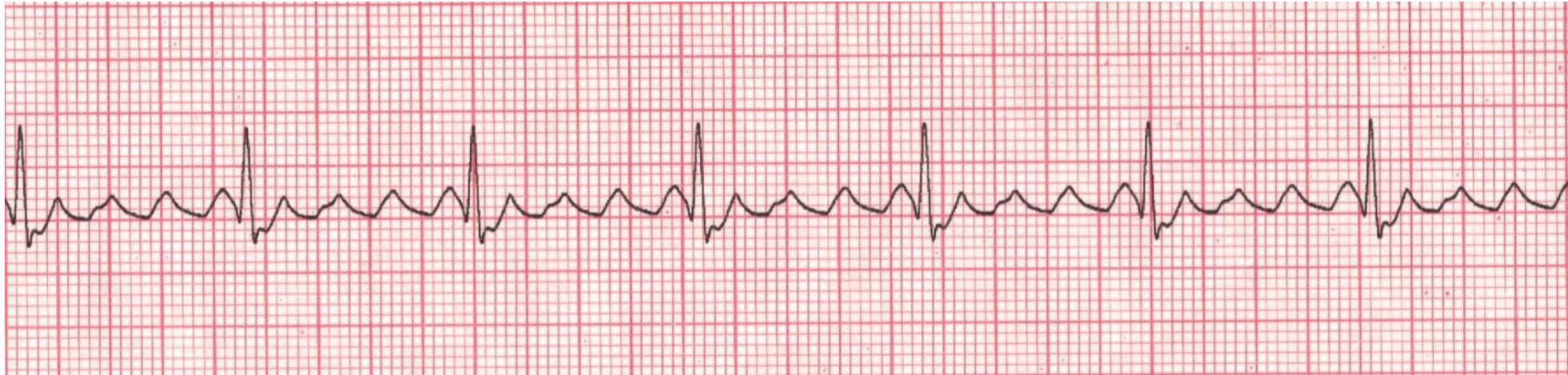
Supraventricular Tachycardia

- Heart rate often $>150/\text{min}$
- P waves present but not always easily visible
- Regular and narrow QRS



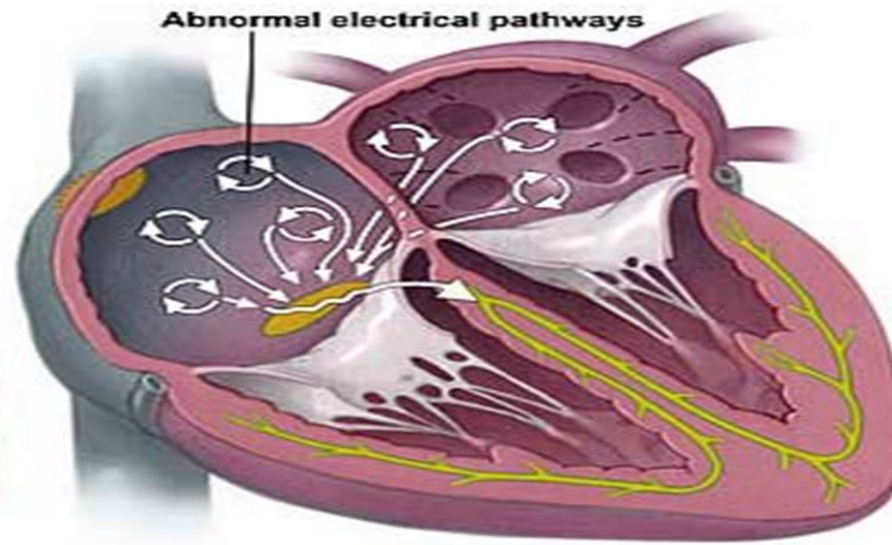
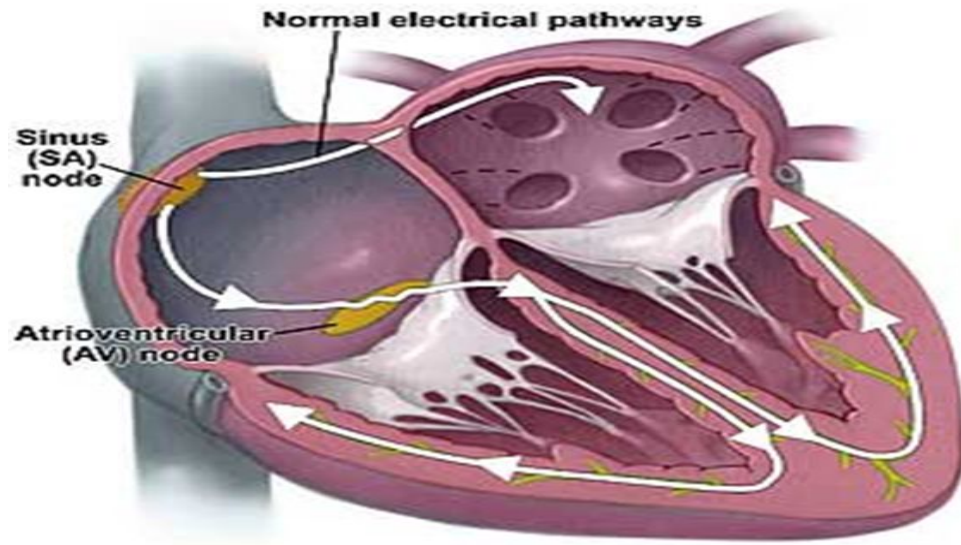
Atrial flutter

- Results from a re-entry circuit around the right atrium
- Atrial rate 250-350/min
- AV block occurs due to failure of AV node to conduct every impulse
- Usually regular block, ie. 2:1, 3:1, 4:1
- Classic 'sawtooth' pattern of flutter waves with regular QRS complexes



Atrial fibrillation

- Rapid, chaotic depolarisation occurring throughout the atria arising from multiple foci



- No P waves
- Fibrillating baseline
- Irregular and narrow QRS



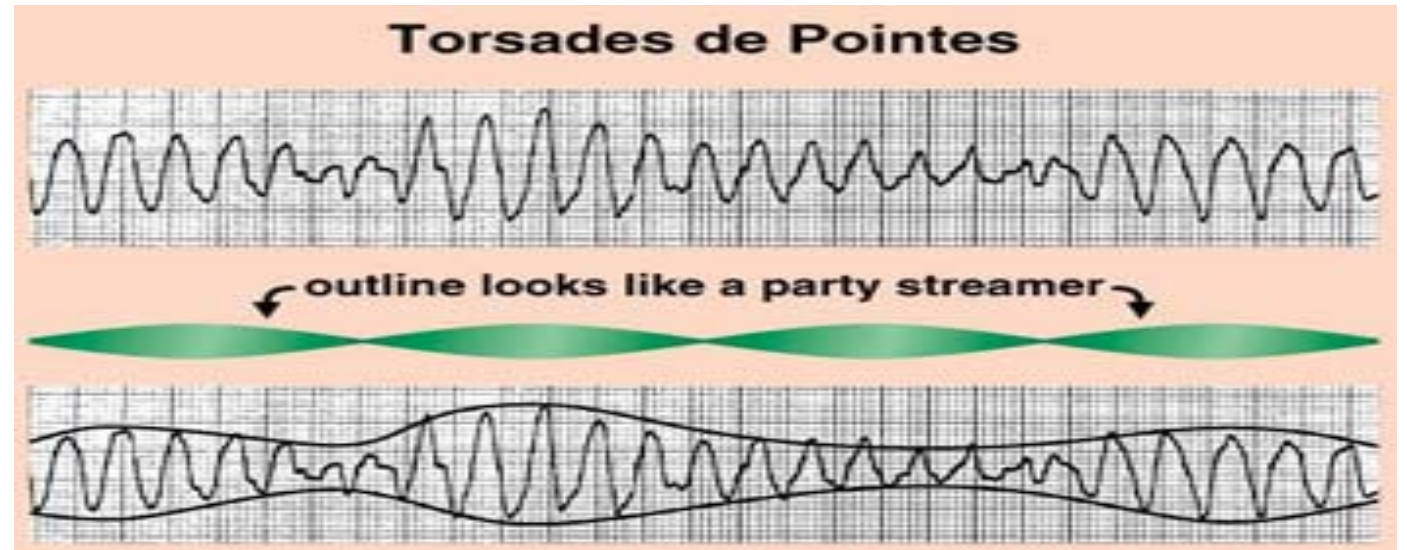
Ventricular tachycardia

- Defined as 3 or more successive ventricular beats at a rate exceeding 120/min
- Arises from either a re-entry circuit or a specific ventricular focus
- Episodes may be non sustained, sustained, or may rapidly degenerate into VF
- No P wave :regular :wide QRS complex
- Hemodynamically stable _amiodarone infusion
- Hemodynamically unstable _DC



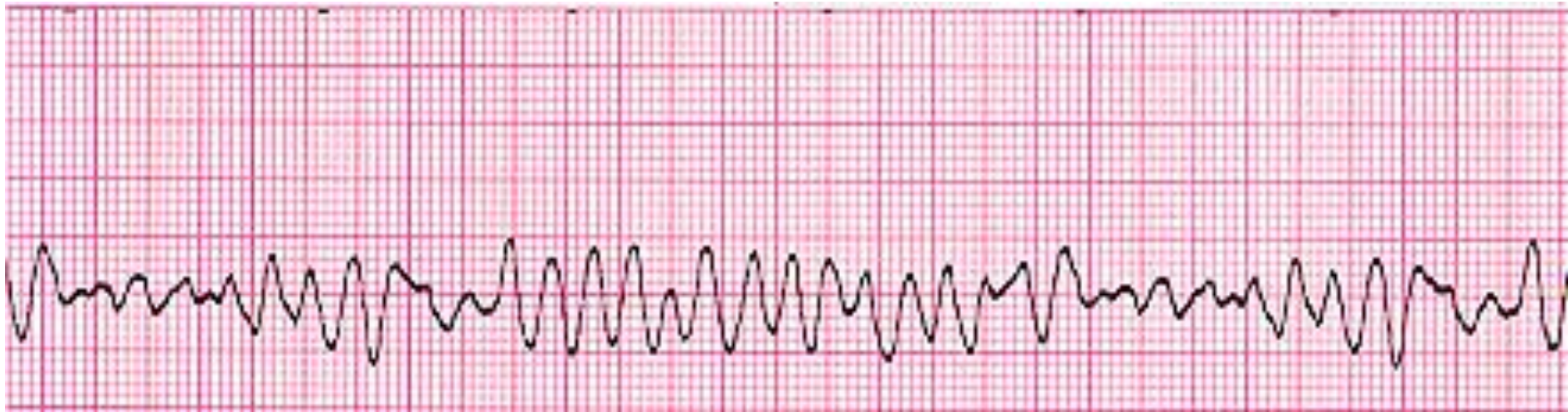
Torsades de Pointes

- Polymorphic VT associated with R on T
- Characteristic undulating pattern on the ECG with 'twisting of the points'
- Risk of precipitating VF
- stable_ MG sulphate infusion
- Unstable _DC



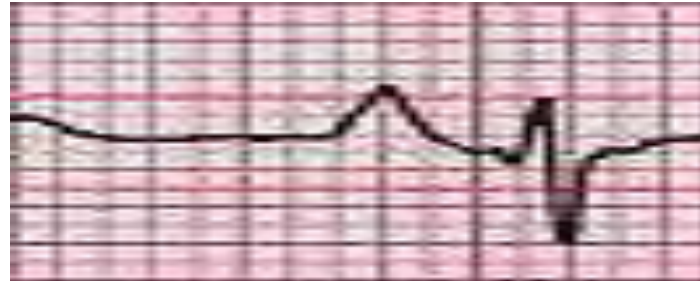
Ventricular fibrillation

- Rapidly fatal arrhythmia
- Most commonly due to MI
- Asynchronize DC cardioversion should be given immediately



P pulmonale

- Peaked P waves $>2.5\text{mm}$
- Right atrial enlargement
 - Pulmonary hypertension
 - Pulmonary stenosis
 - Tricuspid stenosis



P mitrale

- Wide P waves > 0.08 s
- Often bifid appearance
- Left atrial enlargement
- Often due to mitral valve disease



1st degree AV block

- Long but constant PR interval
- Each P wave followed by QRS complex
- Causes
 - IHD
 - $\uparrow K^+$
 - Rheumatic heart disease
 - Drugs, eg. digoxin, β -blockers, Ca-channel blockers



2nd degree AV block

● Mobitz type I

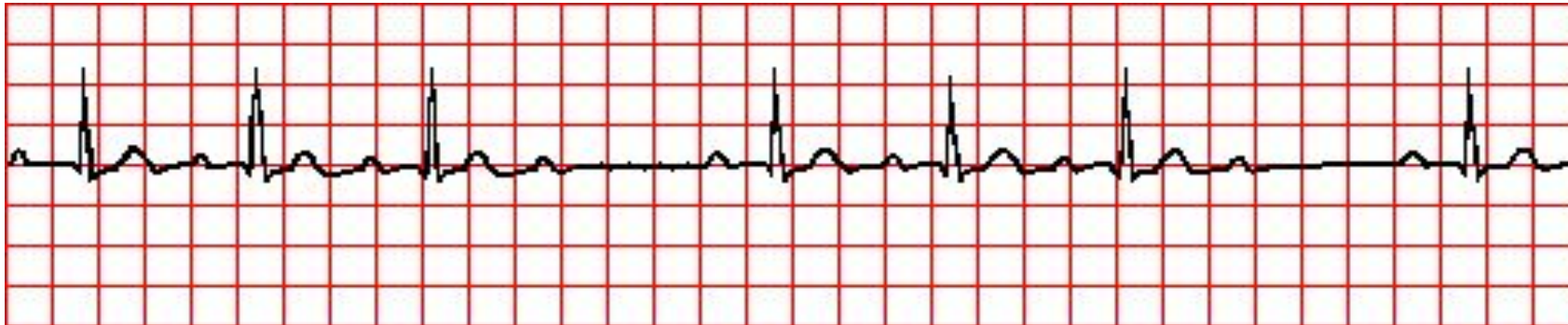
- Wenckebach phenomenon
- PR interval progressively lengthens
- P wave fails to be conducted
- PR interval then resets to normal



2nd degree heart block

● Mobitz type II

- Results from abnormal conduction in bundle of His
- Most P waves are followed by a QRS complex
- PR interval normal and constant
- Occasionally a P wave is not followed by a QRS complex
- May suddenly progress to complete heart block



3rd degree heart block

- P waves have no relationship to QRS complexes
- Broad QRS complexes – ventricular escape rhythm
- Urgent pacing required



Q waves

- Normal Q waves

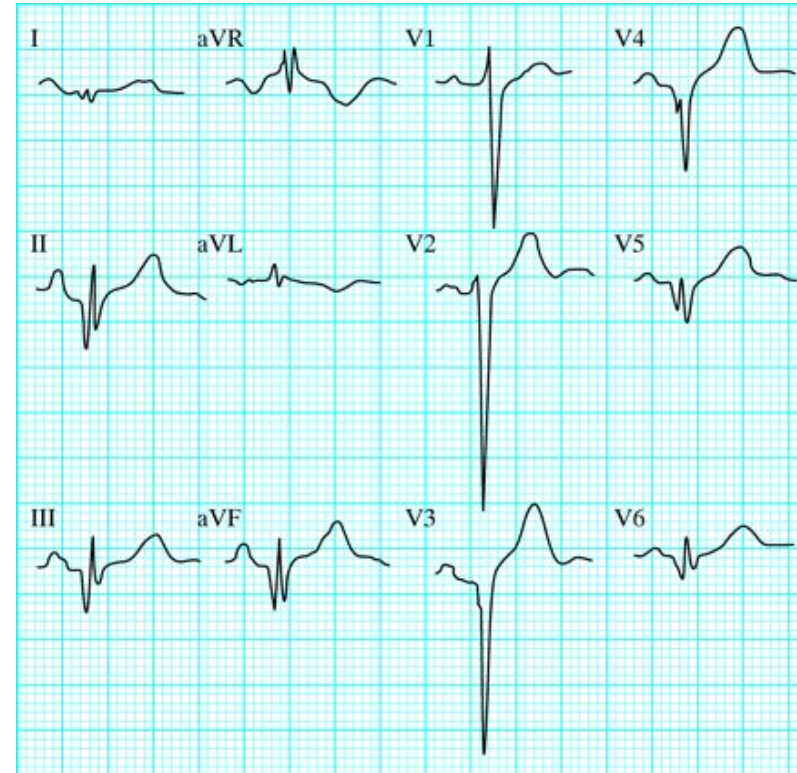
- Small
- Result from septal depolarisation
- I, II, aVL, V5-V6

- Pathological Q waves

- > 2mm deep
- > 25% of height of following R wave
- > 0.04 s wide

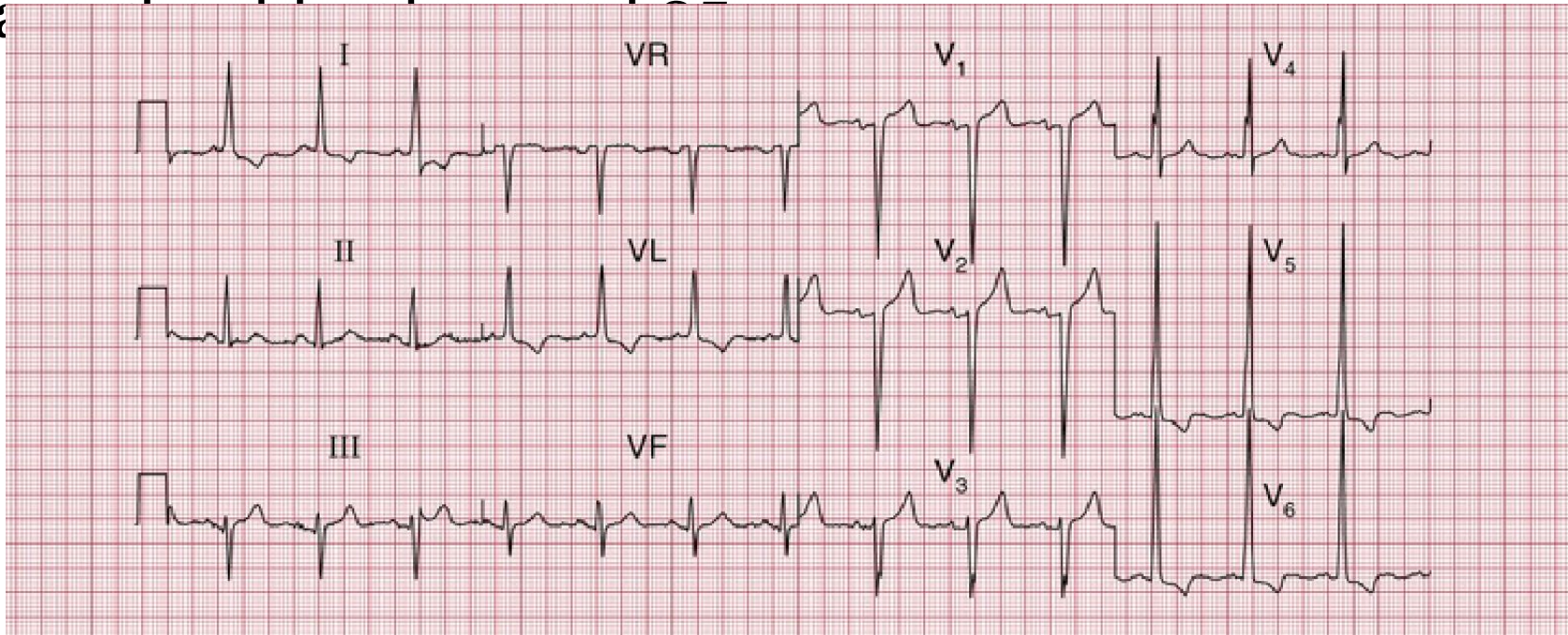
- Caused by

- MI
- LVH
- Bundle branch block



QRS complexes

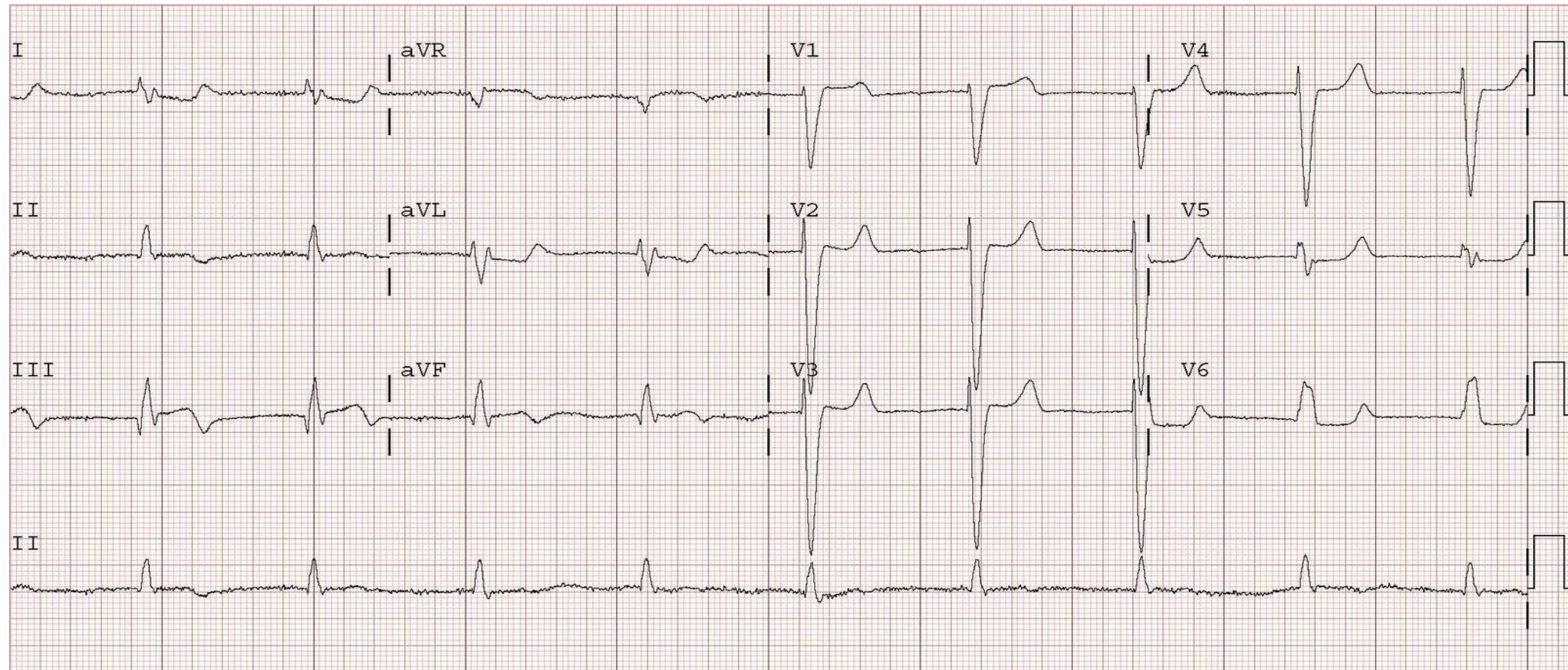
- R wave increases in height from V1-V6
- R wave should be smaller than S wave in V1-V2 and bigger in V5-V6
- Tallest R wave should not exceed 25mm
- Deepest S wave



Left bundle branch block

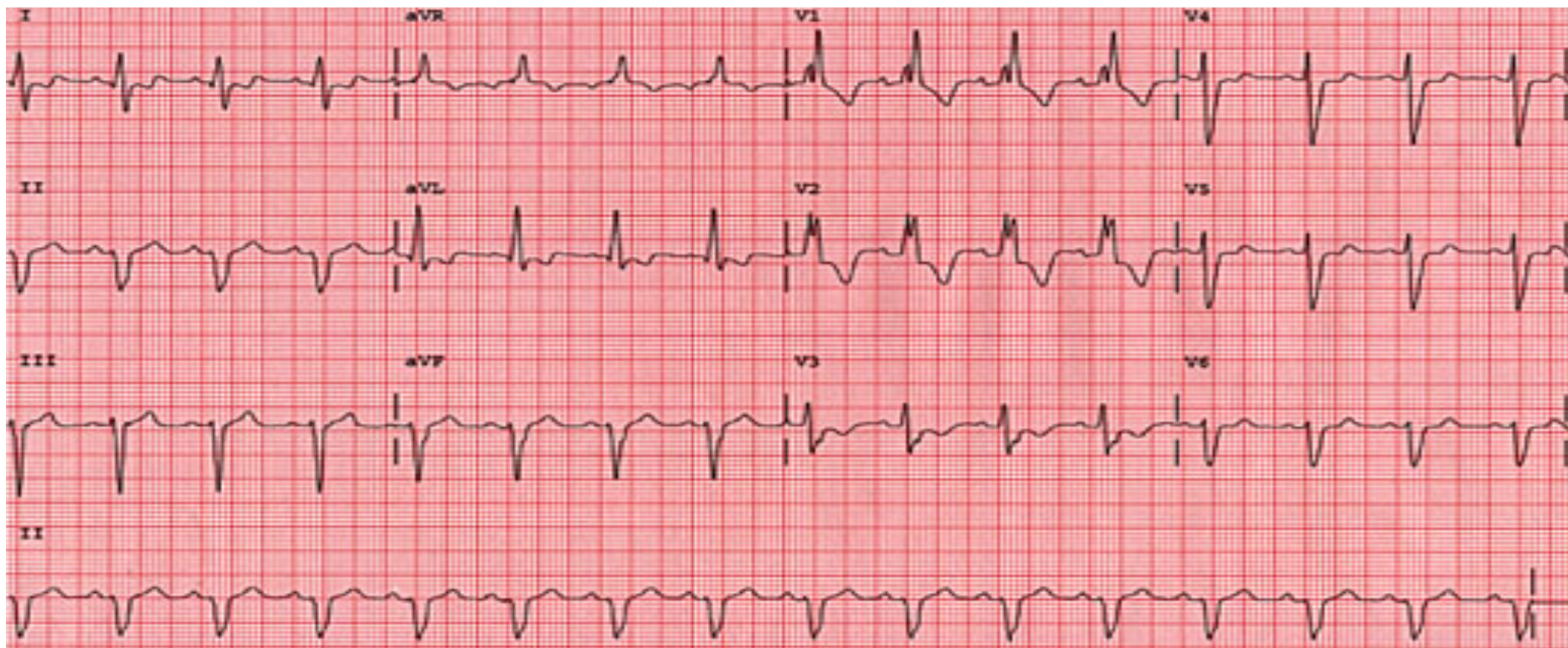
- Wide complex with W pattern in V1 and M pattern in V6(WilliaM)
- Always a sign of pathology
- May be presenting feature of MI

LBBB



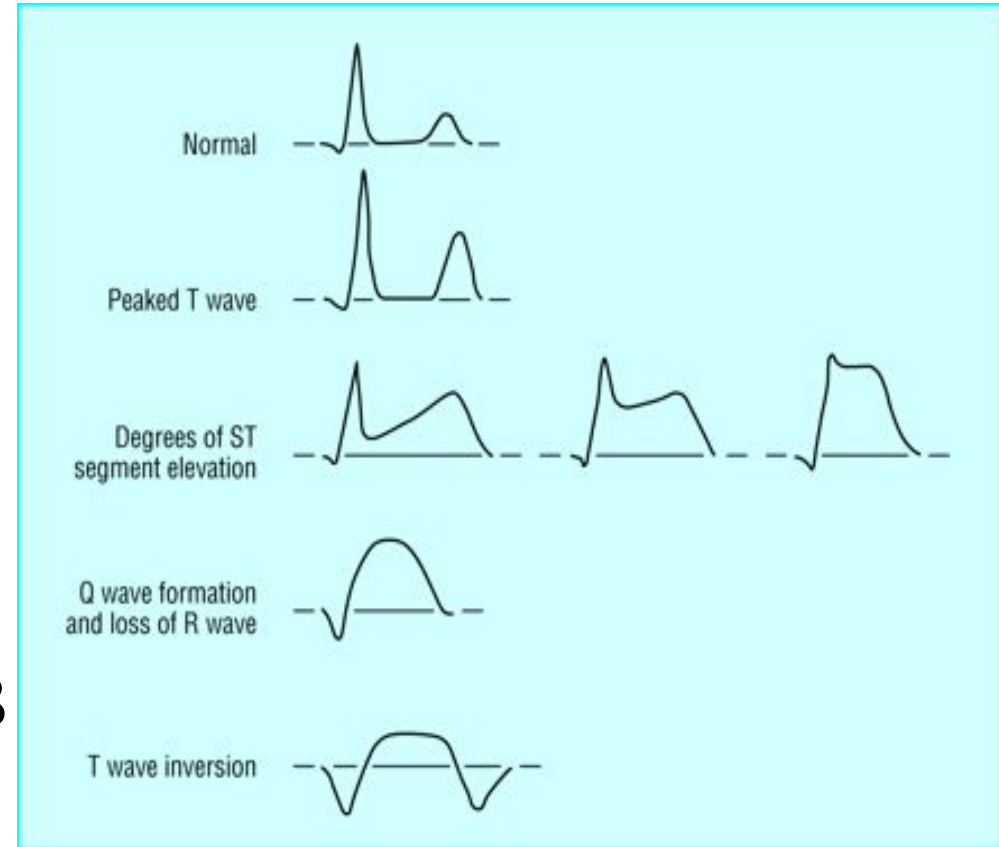
Right bundle branch block

- Wide complexes with M pattern in V1 and W pattern in V6(MarroW)
- May be found in otherwise normal hearts
- Also could be a sign of underlying disease



Myocardial infarction

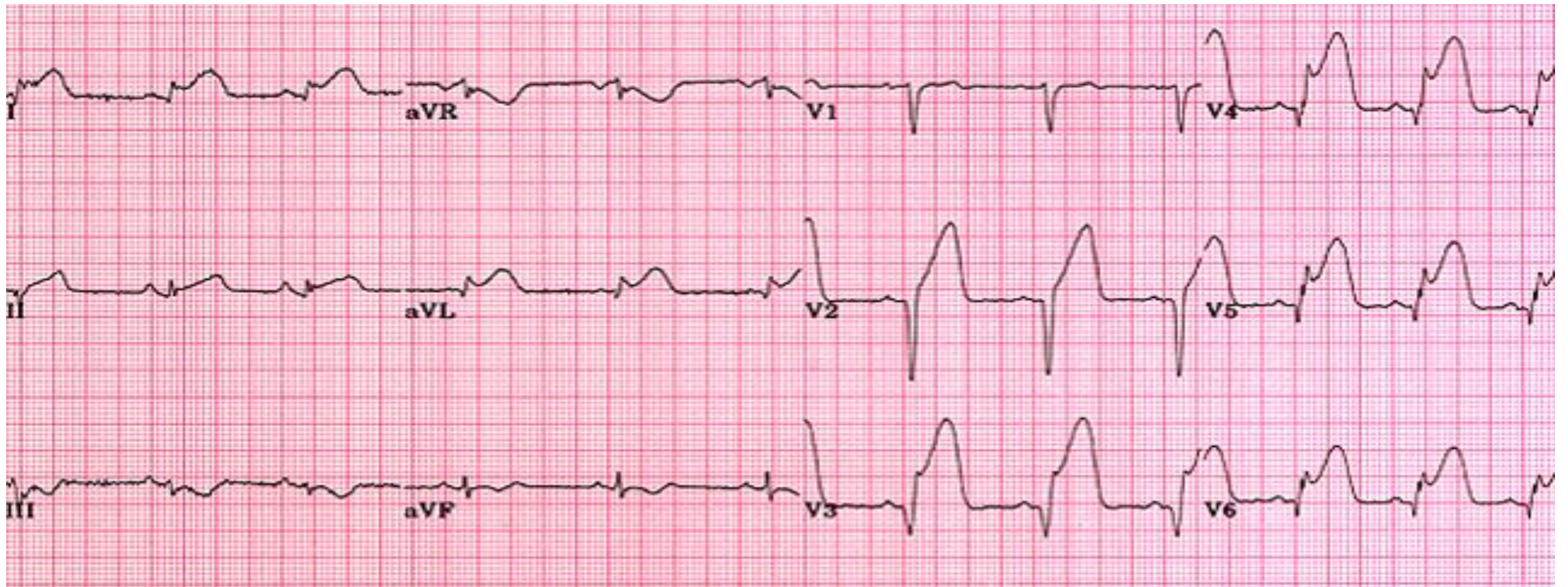
- **STEMI**
- Tall 'hyperacute' T waves
- ST segment elevation
- Q wave formation
- ST segments return to normal
- T waves become inverted
- Q waves persist
- May also present with a new LBBB
- Non STEMI _ST depression
- Unstable angina _ST depression



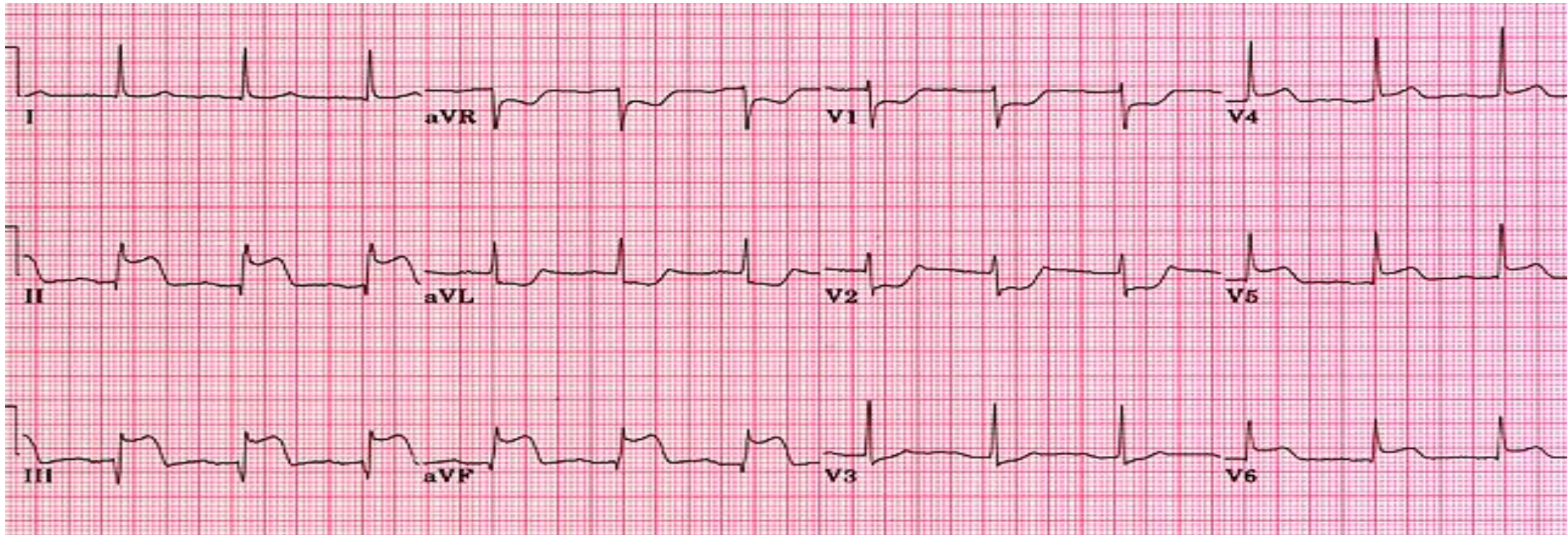
Localisation of MIs

- Anterior
 - V3-V4
- Lateral
 - I, aVL, V5-V6
- Anterolateral
 - I, aVL, V1-V6
- Septal
 - V1-V2
- Inferior
 - II, III, aVF

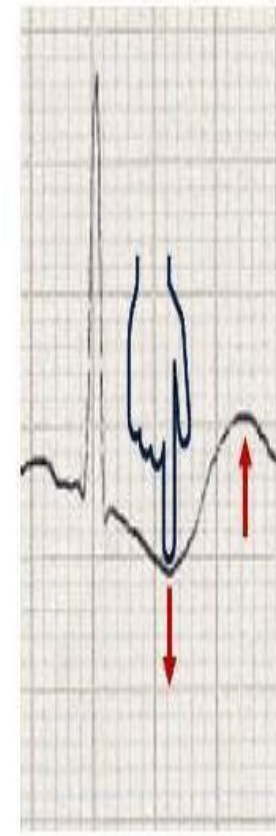
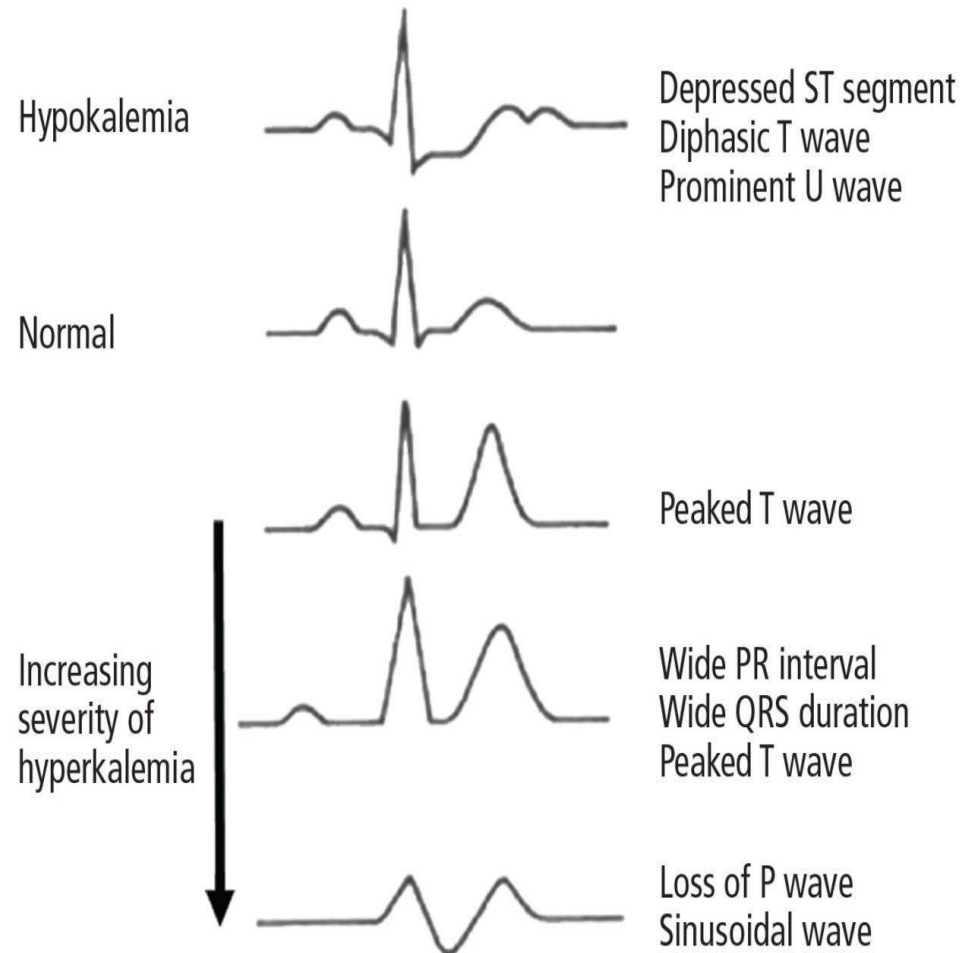
Anterolateral MI



Inferior MI

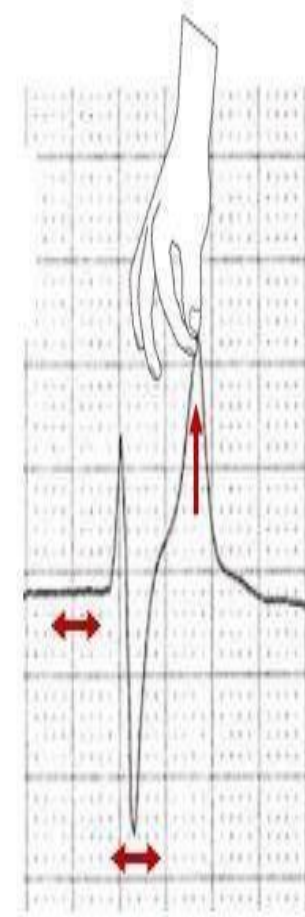


Hyperkalaemia & Hypokalemia



Hypokalaemia

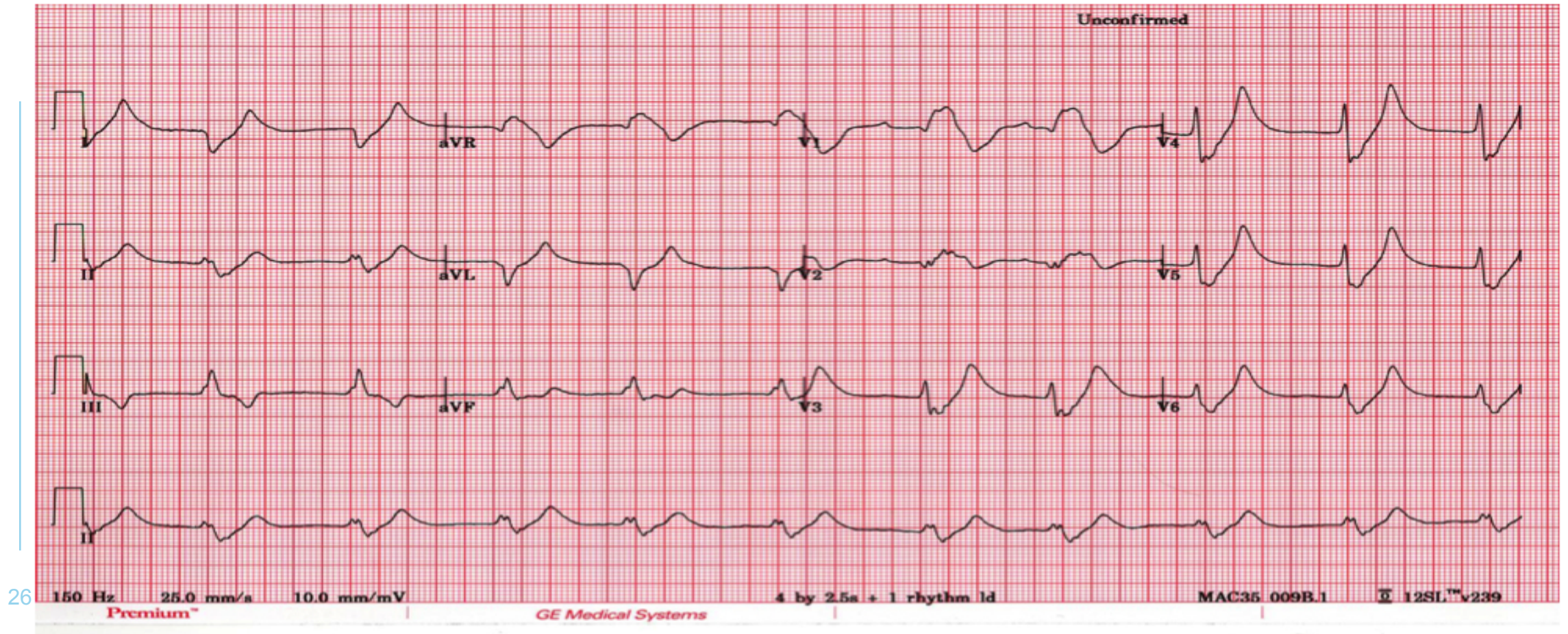
T wave inversion
ST depression
Prominent U wave



Hyperkalaemia

Peaked T waves
P wave flattening
PR prolongation
Wide QRS complex

Hyperkalaemia



Any questions?

*Thank
You*