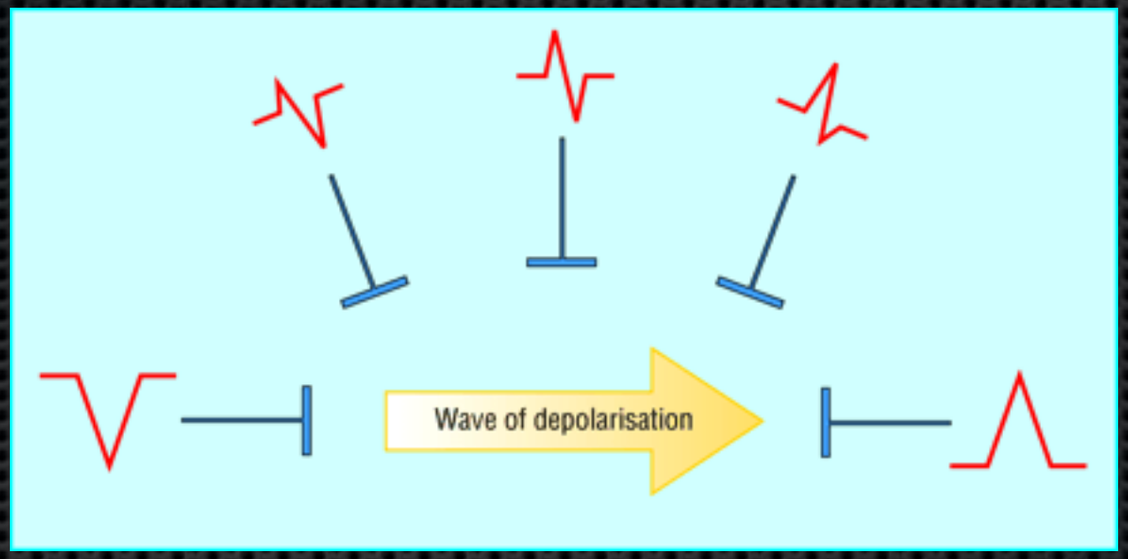
Axis Deviation

Chapter 5

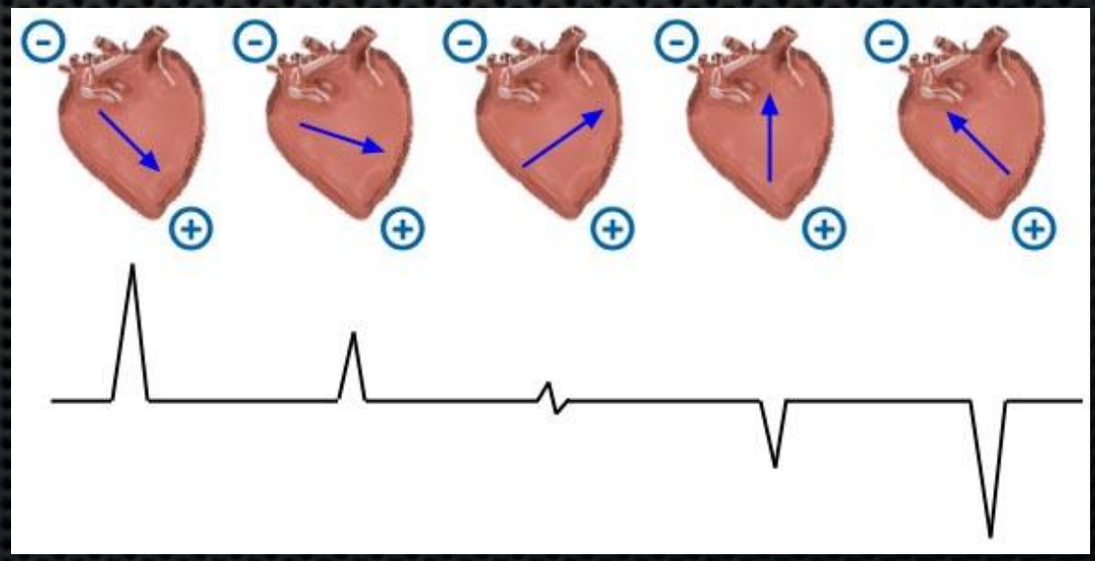
Definition

- Electrical axis…
  - The general direction in the frontal plane or toward which lead the QRS complex is predominately oriented
  - …the mean direction of depolarization through the frontal plane of the heart

Mean QRS Axis Calculation



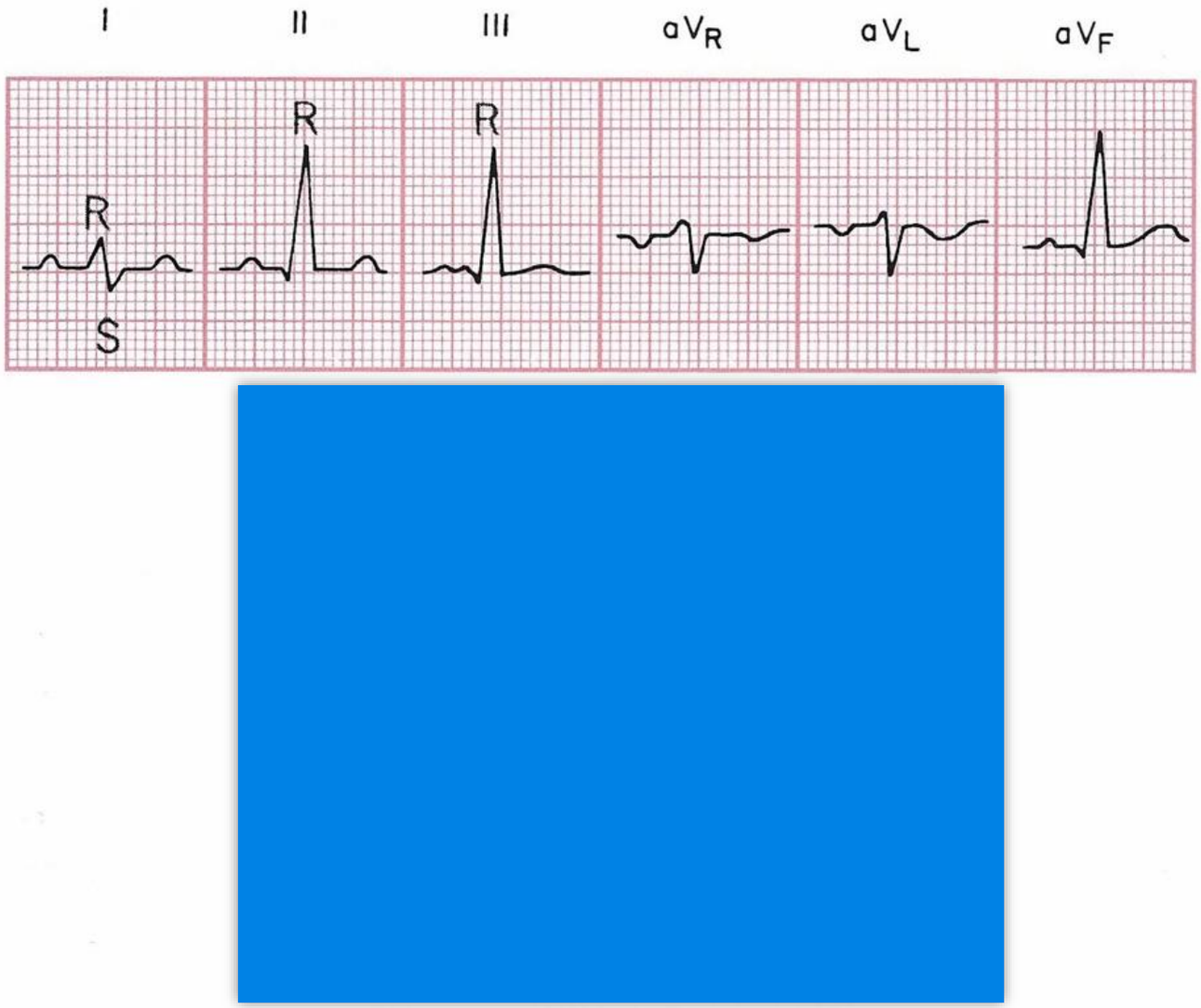
Lead II

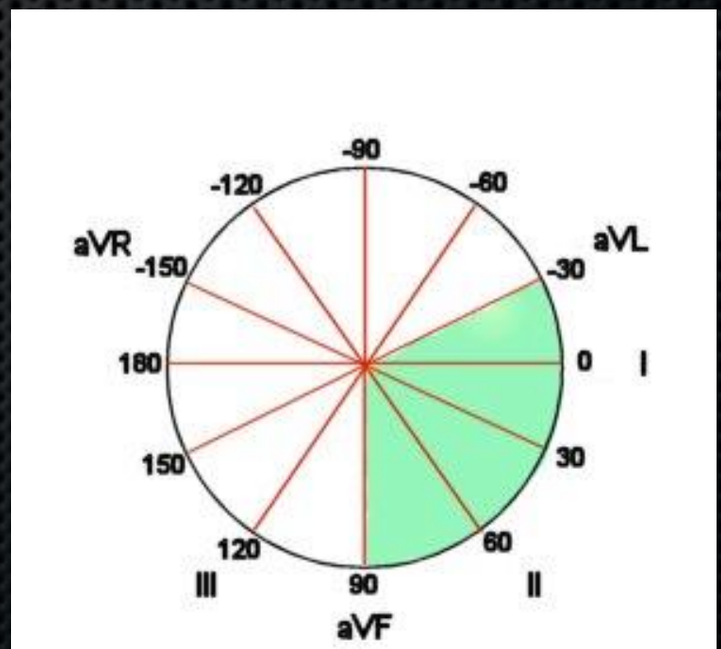


Mean QRS Axis Calculation

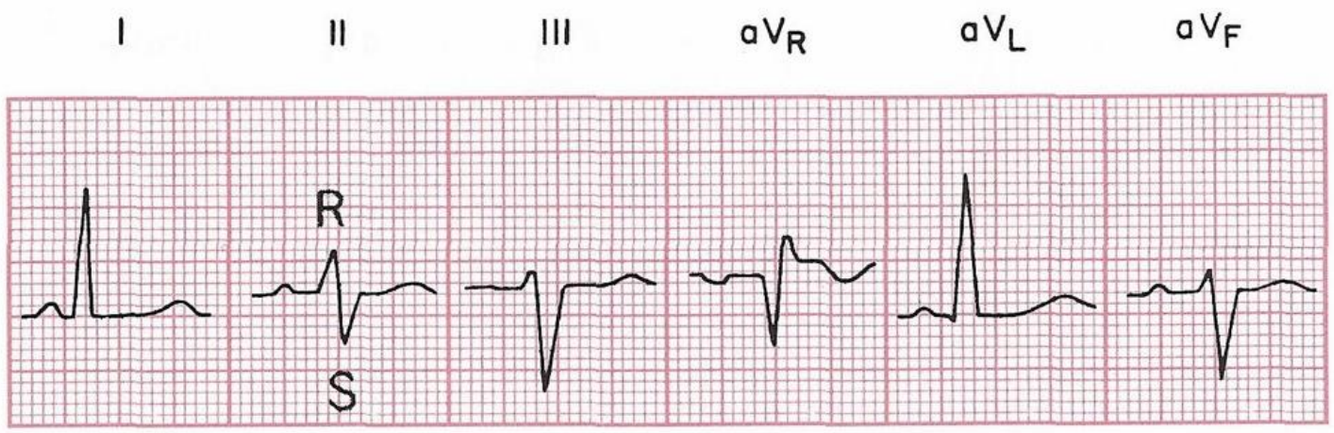
- General rules
  1. the mean QRS axis points midway between any two leads that show tall R waves of equal height
  2. the mean QRS axis is oriented at right angles (90°) to any lead showing a bi-phasic complex

Mean QRS Axis Calculation

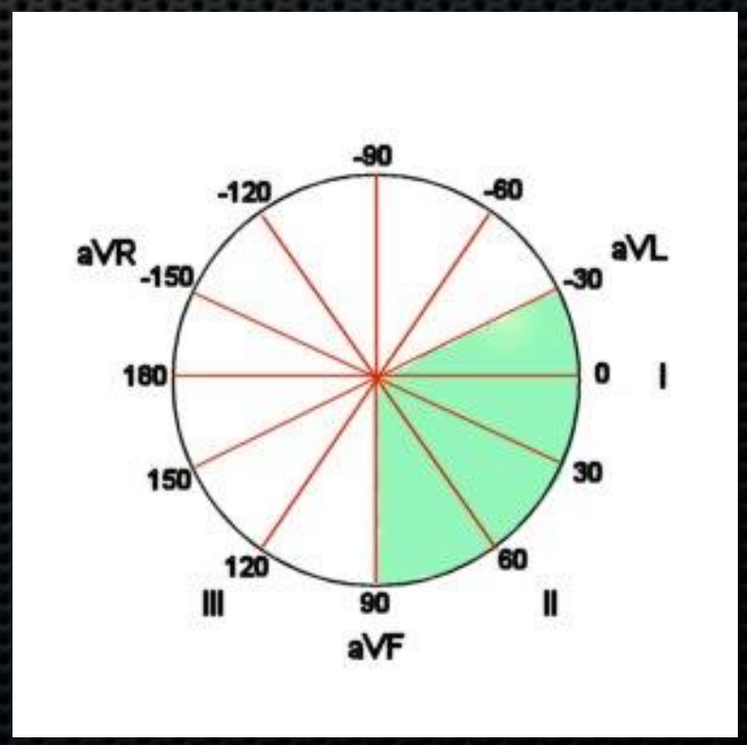




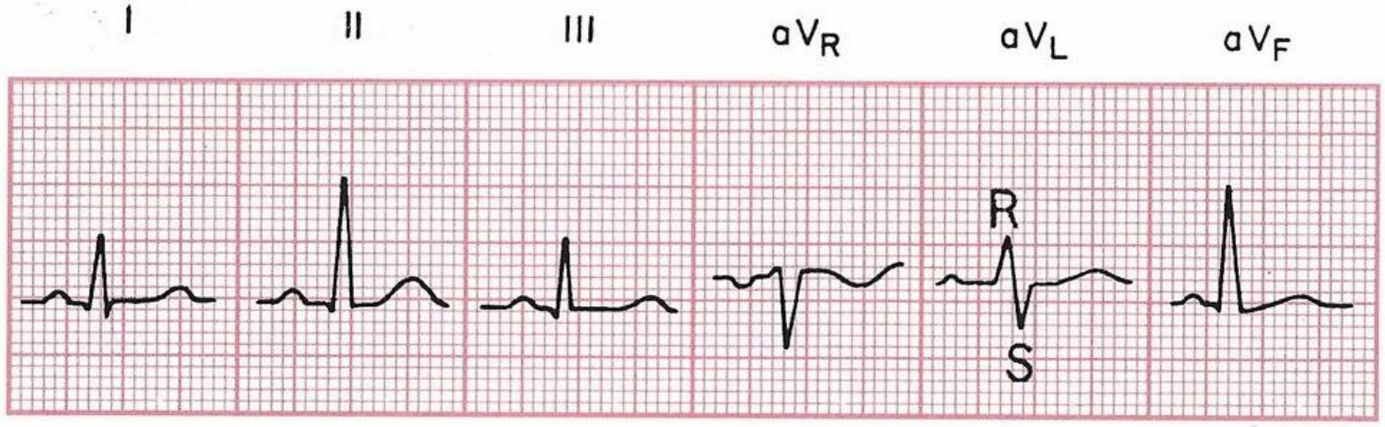
Mean QRS Axis Calculation



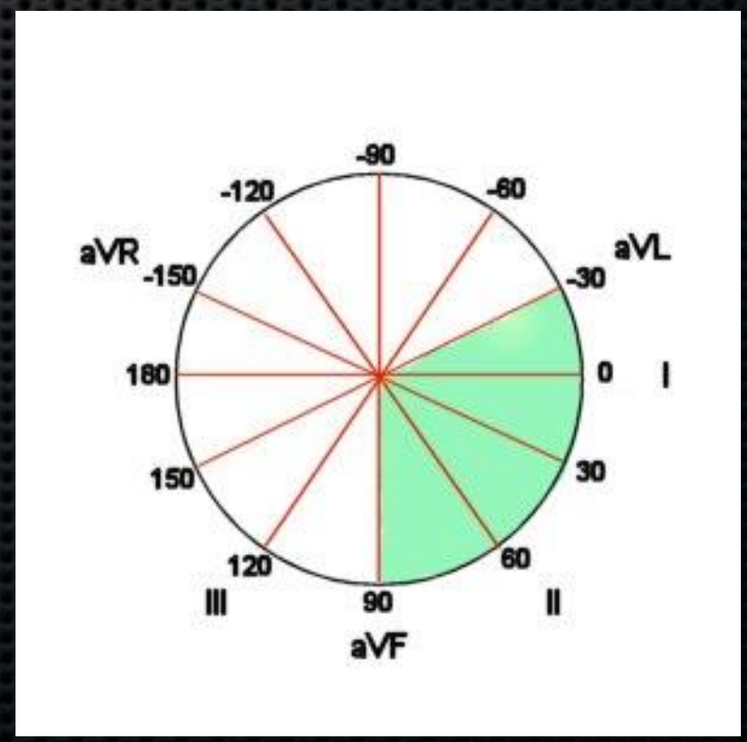




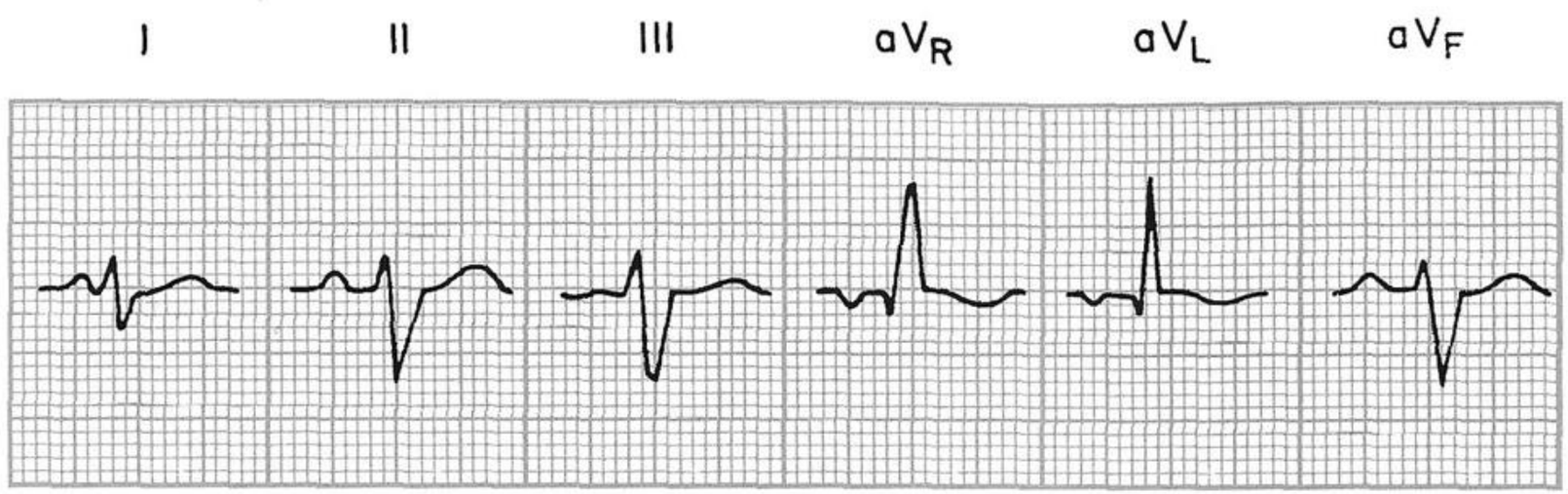
Mean QRS Axis Calculation



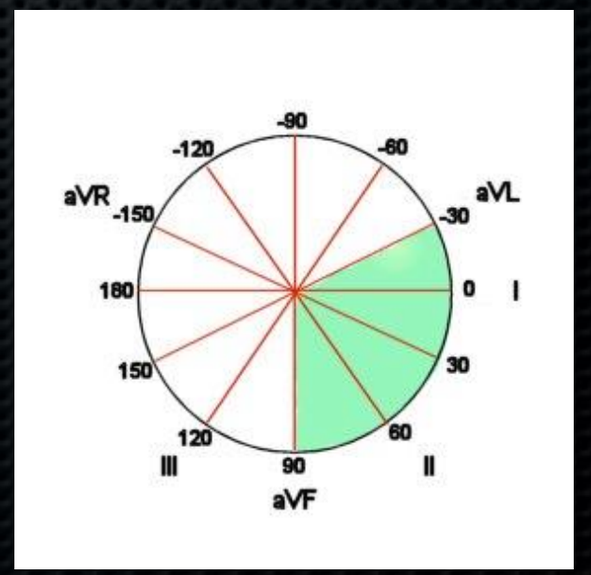




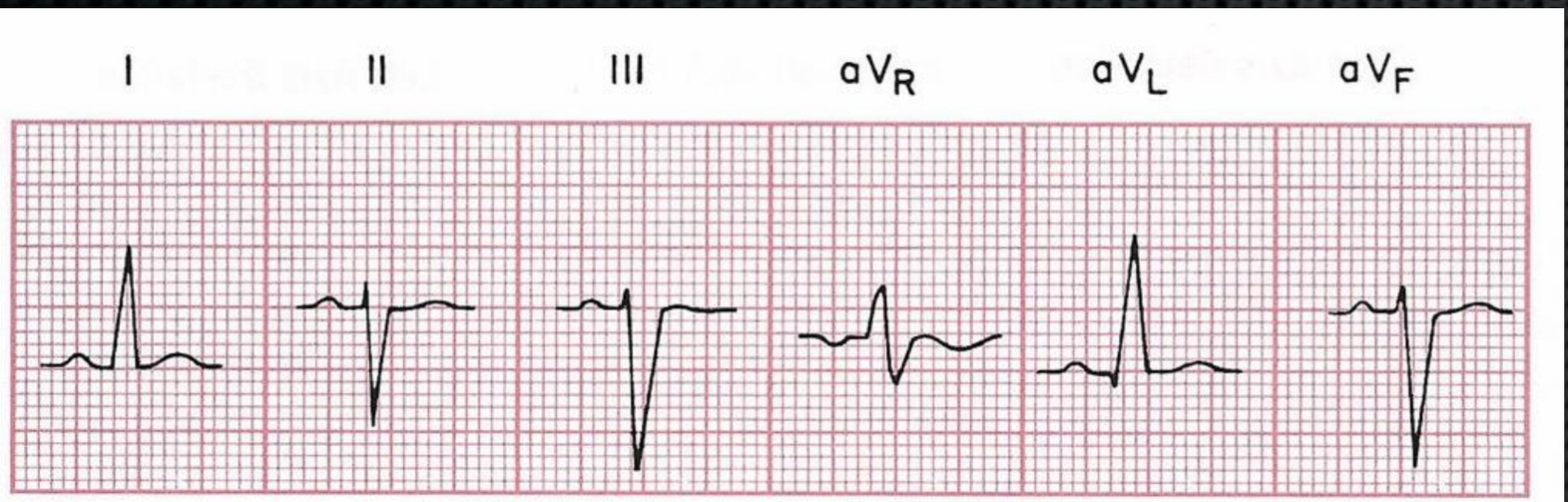
Mean QRS Axis Calculation



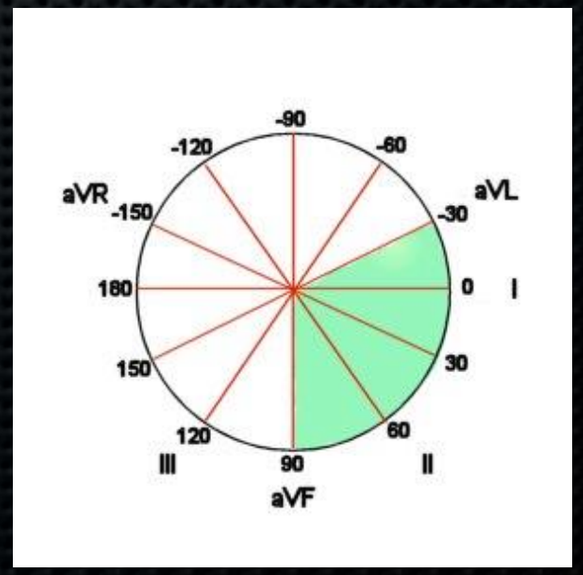




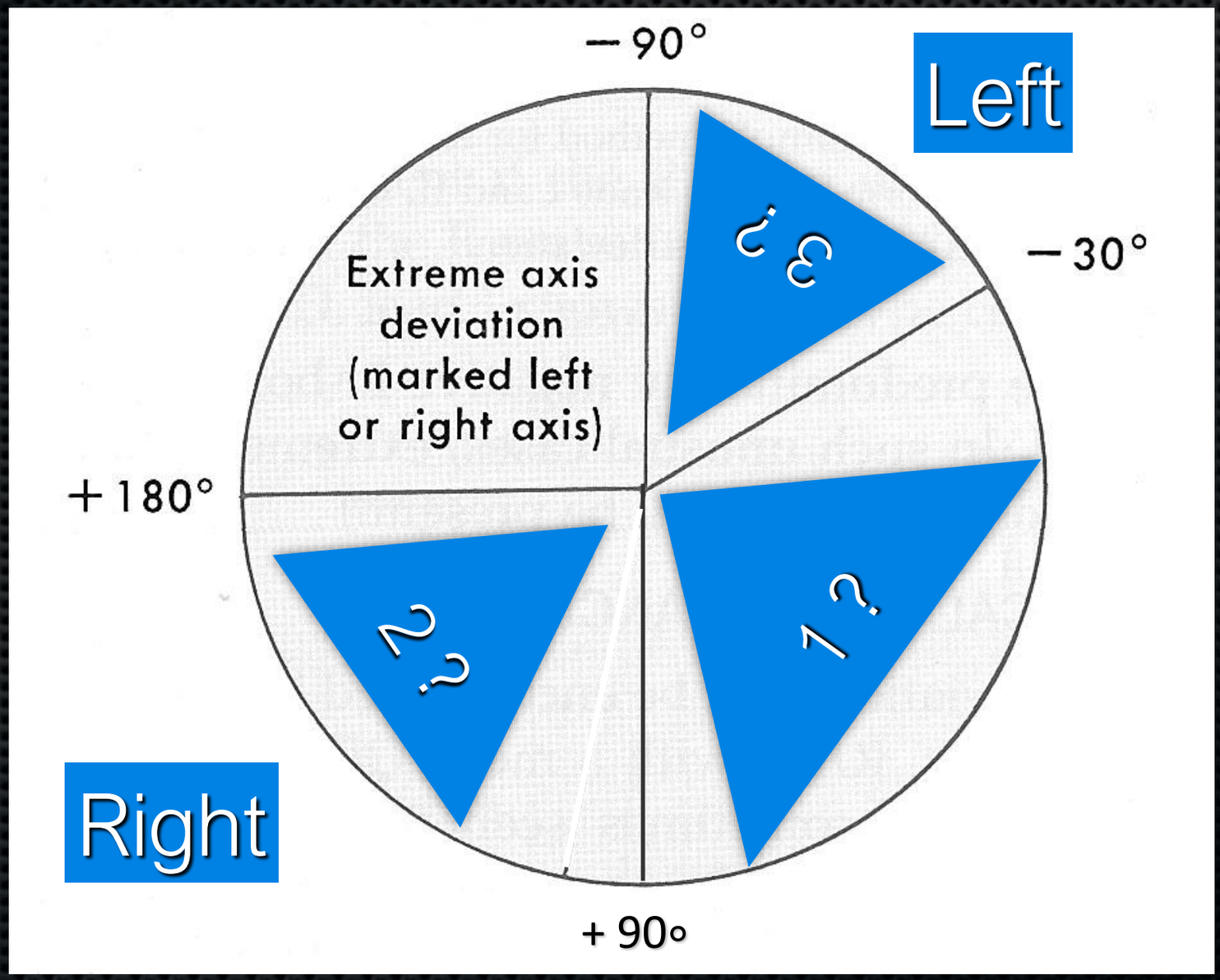
Mean QRS Axis Calculation



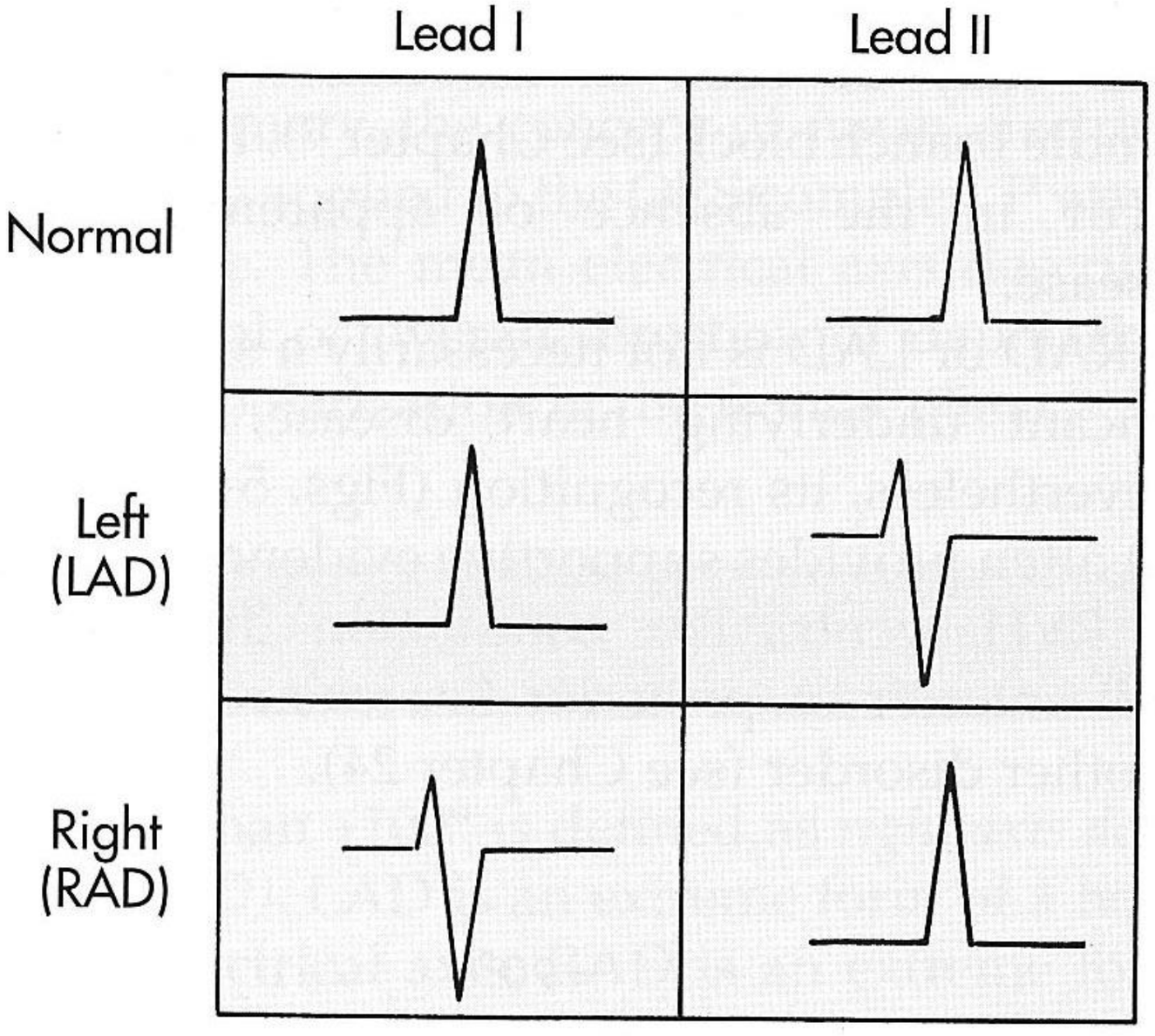




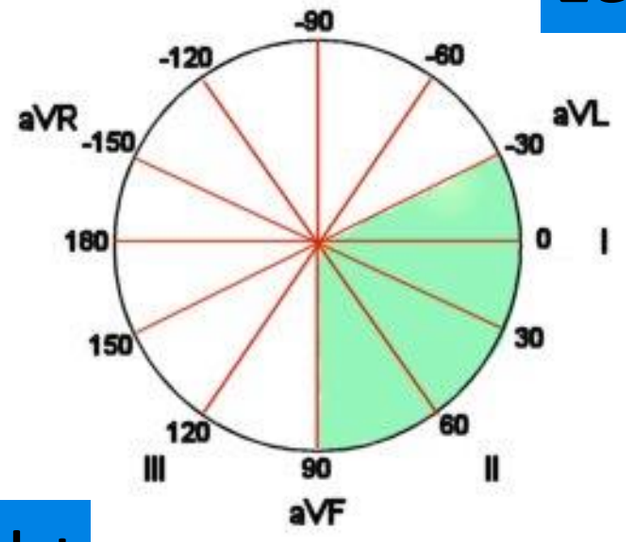
Normal versus *Deviation*



Axis Deviation



Left



Right

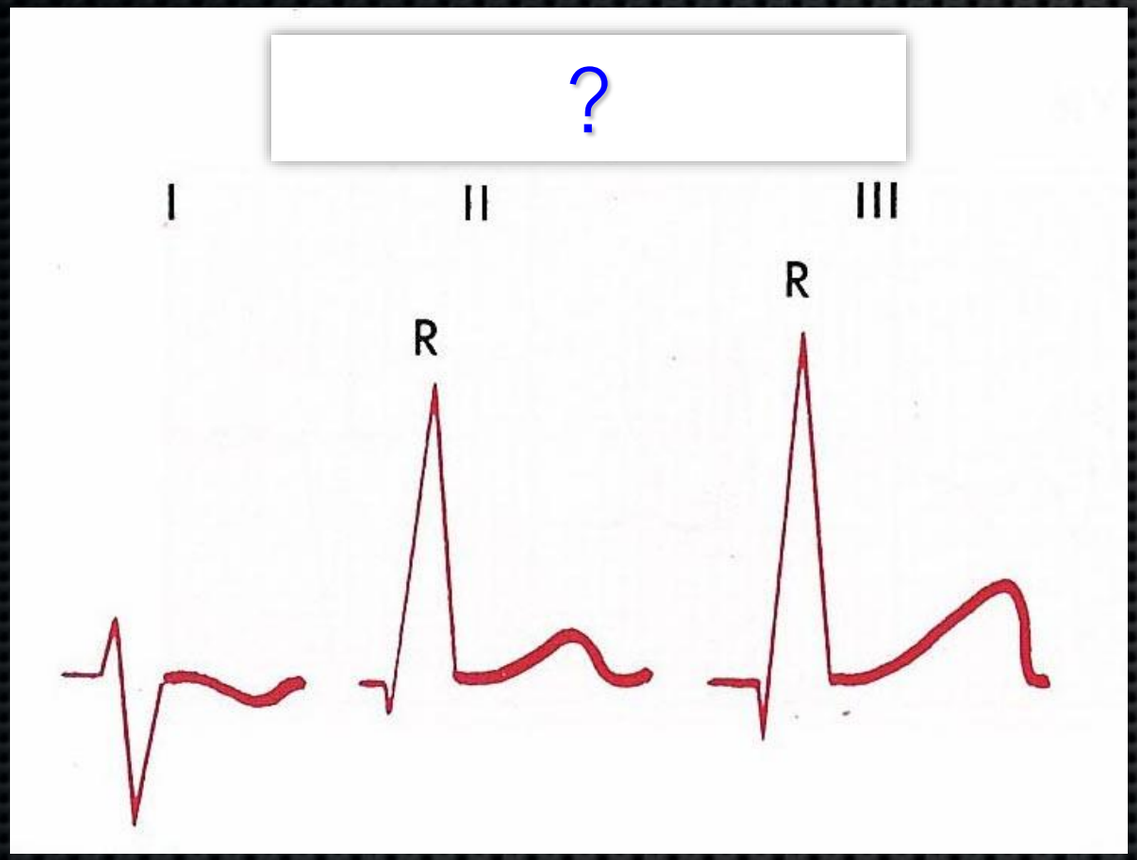
Axis Deviation Criteria

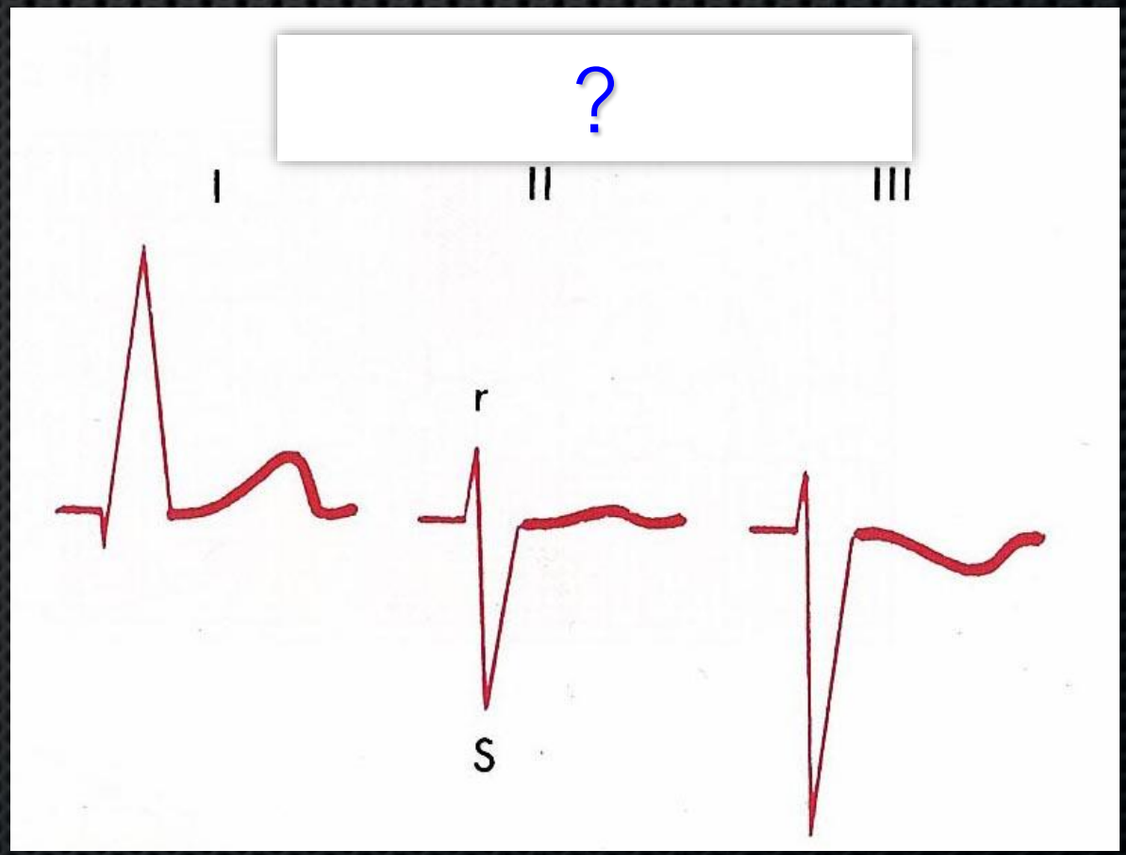
	LEAD I	LEAD II (or Lead aV_F or III)
Normal	Positive	Positive
LAD	Positive	Negative
RAD	Negative	Positive
Intermediate axis	Negative	Negative

Axis Deviation

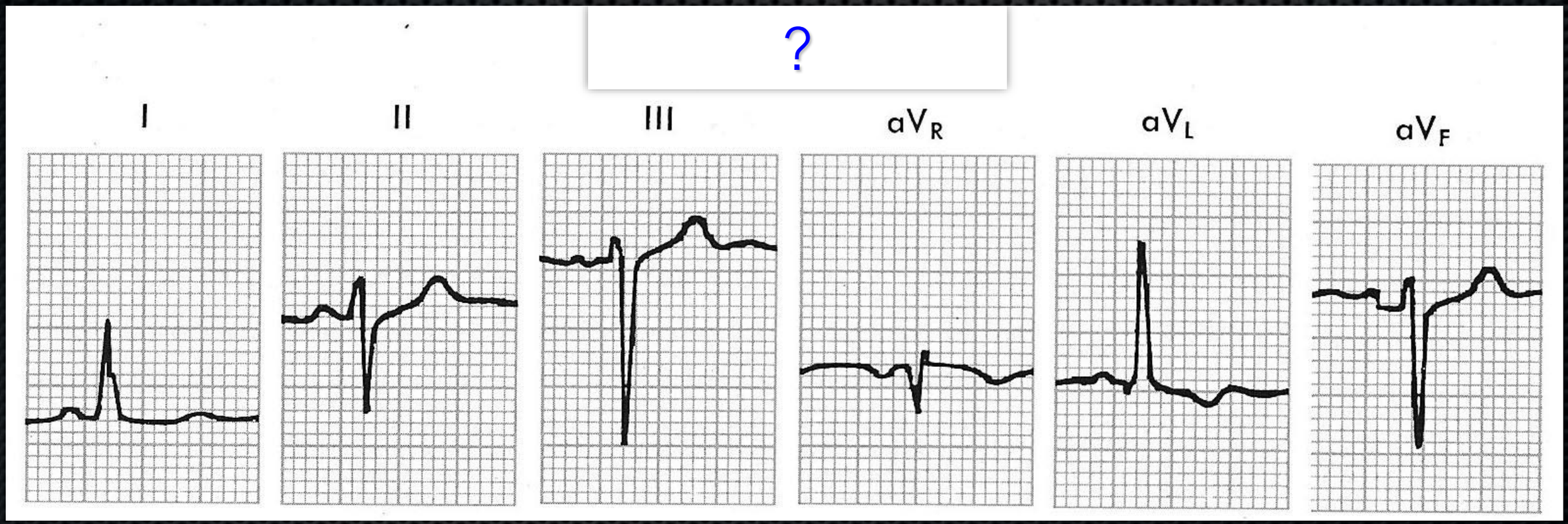
- RAD = If R wave in III > R wave in II
- LAD = If R wave in aV_L > I; and deep S wave in III

Axis deviation



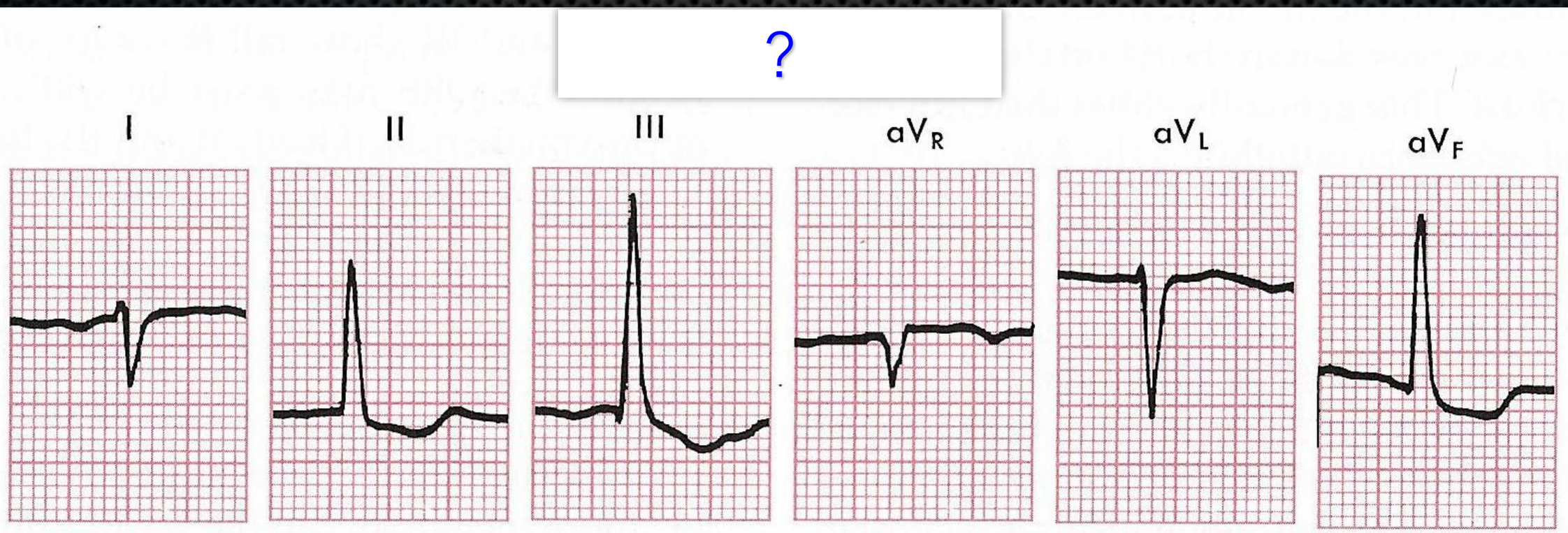


Axis deviation

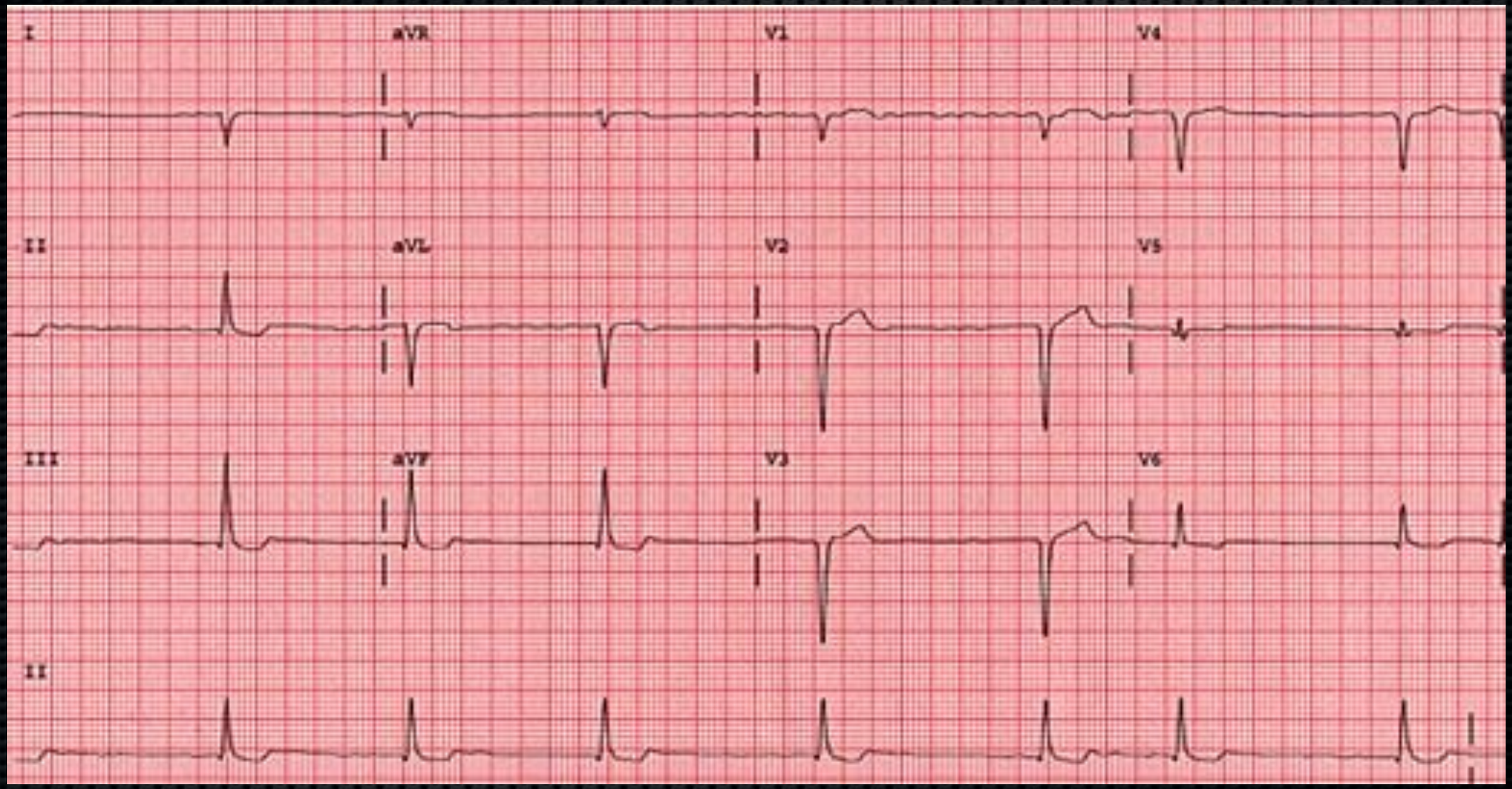


Axis deviation

?

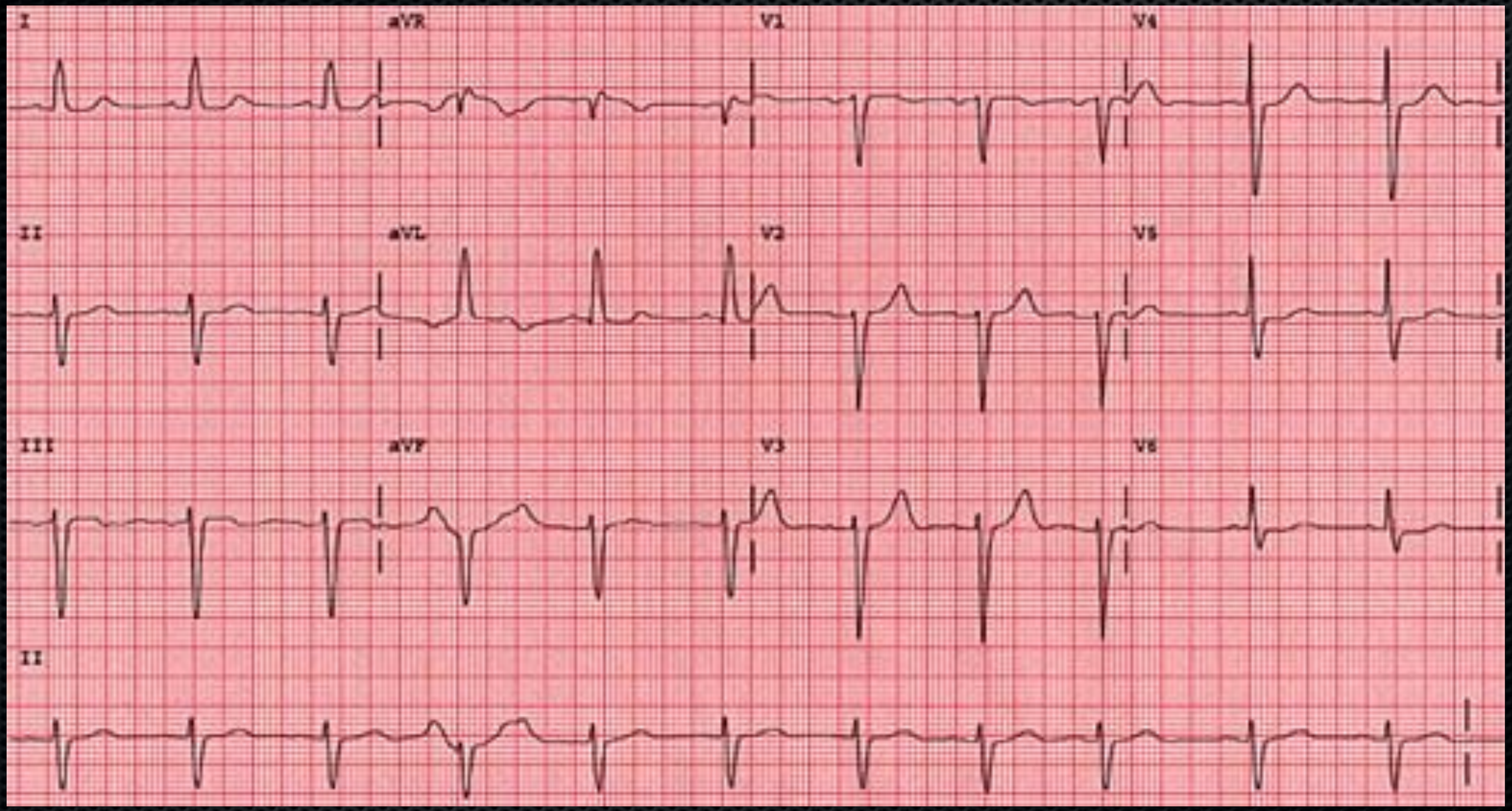


What is the axis?



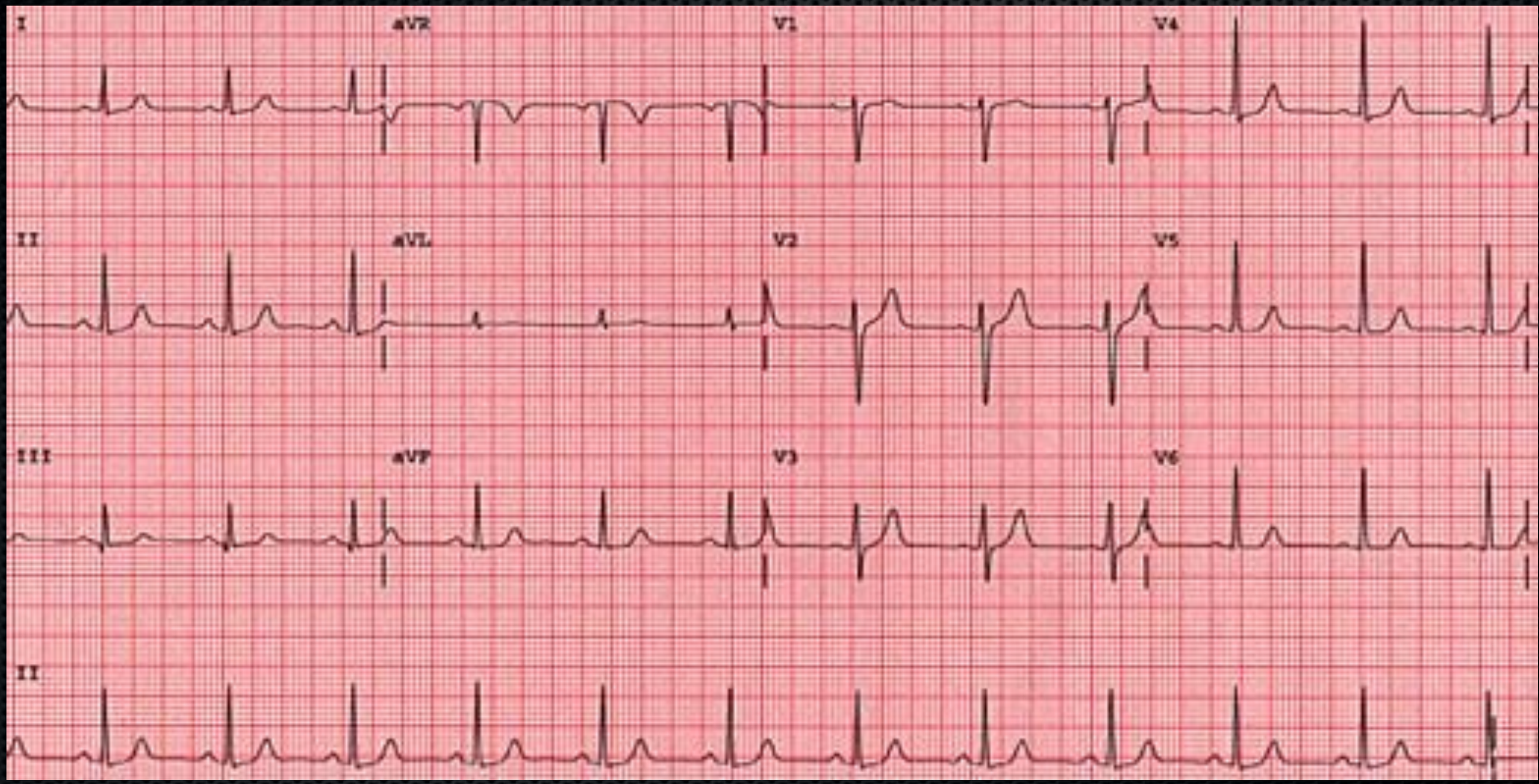
Right

What is the axis?



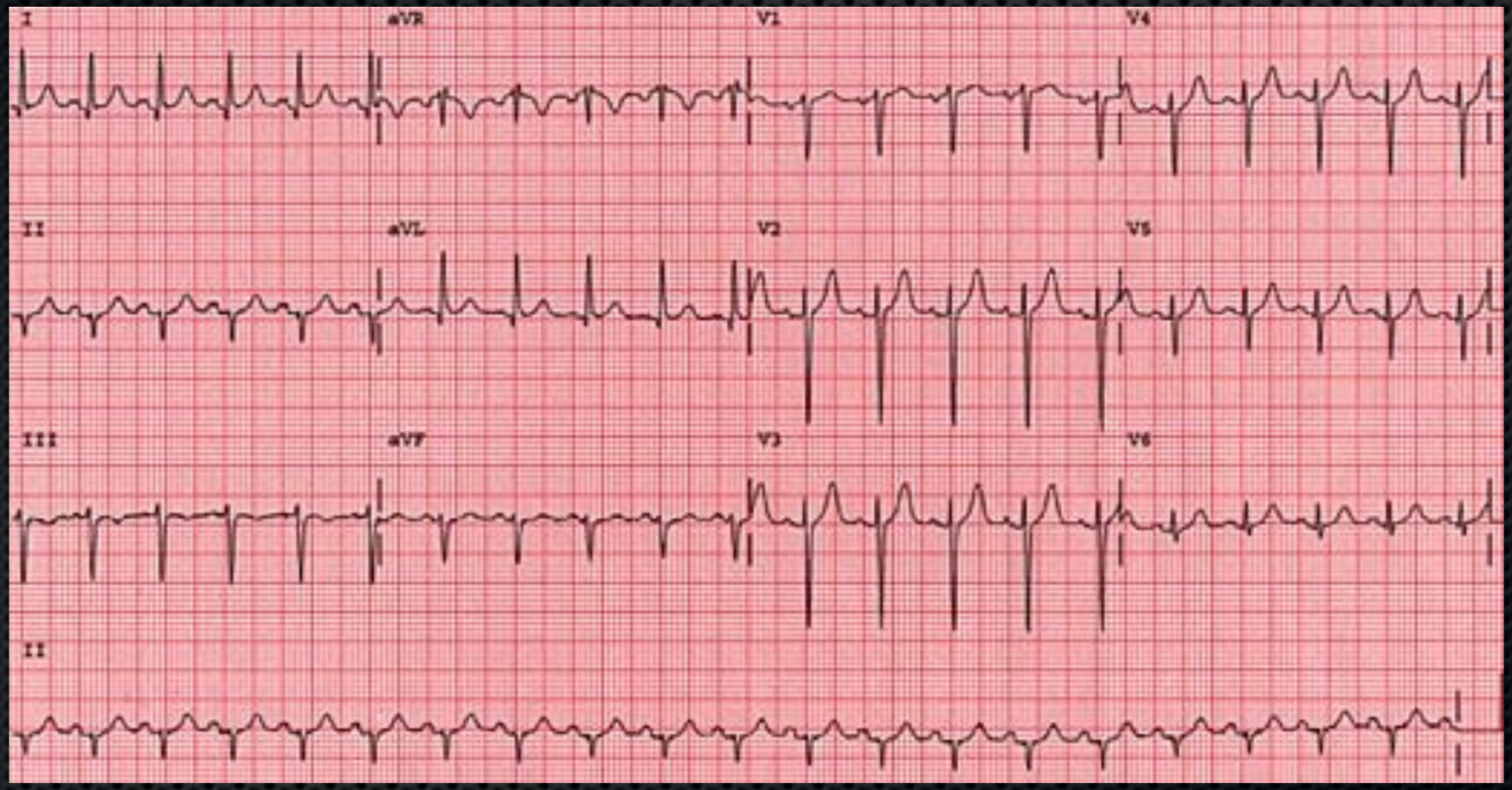
Left

What is the axis?



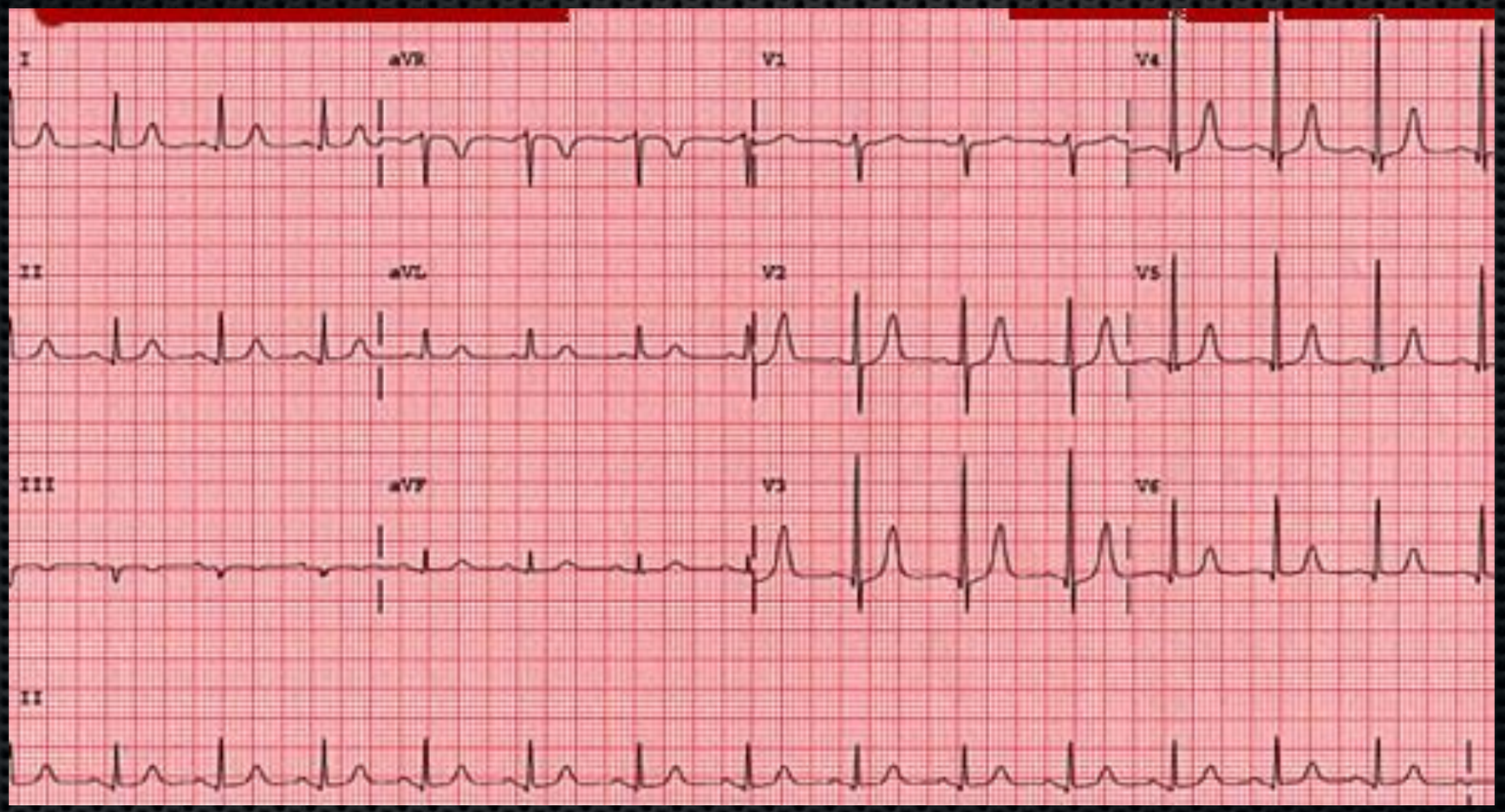
Normal

What is the axis?



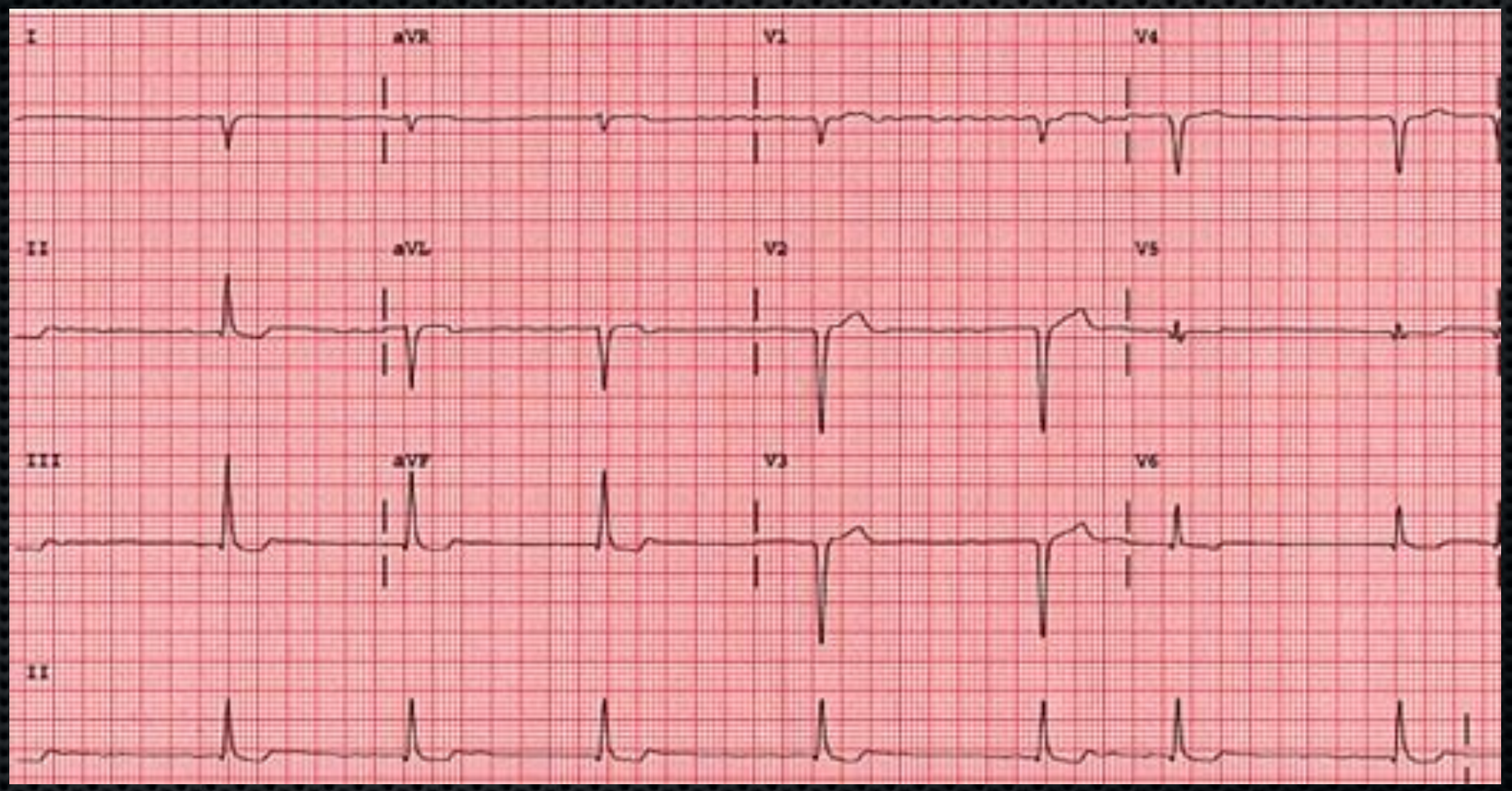
Left

What is the axis?



Normal

What is the axis?



Right

Causes of Left Axis Deviation

FYI

- left anterior hemiblock
- Q waves of inferior myocardial infarction
- artificial cardiac pacing
- emphysema
- hyperkalaemia
- Wolff-Parkinson-White syndrome - right sided accessory pathway
- tricuspid atresia
- ostium primum ASD
- injection of contrast into left coronary artery

note: left ventricular hypertrophy is not a cause left axis deviation

Causes of Right Axis Deviation

FYI

- normal finding in children and tall thin adults
- right ventricular hypertrophy
- chronic lung disease even without pulmonary hypertension
- anterolateral myocardial infarction
- left posterior hemiblock
- pulmonary embolus
- Wolff-Parkinson-White syndrome - left sided accessory pathway
- atrial septal defect
- ventricular septal defect