EMC 451 Advanced ECG Interpretation

Electrical Axis and Axis Deviation

Unit Objectives

Upon completion of this unit, the student will be able to:

- Define *mean electrical axis*
- Describe the hexaxial lead diagram
- Calculate the mean electrical axis
- Identify normal axis, left axis deviation, right axis deviation, and extreme axis deviation
- List some of the causes of each type of axis deviation

Mean QRS Electrical Axis

- The mean QRS axis describes the general direction in the frontal plane toward which the QRS comple predominantly points.

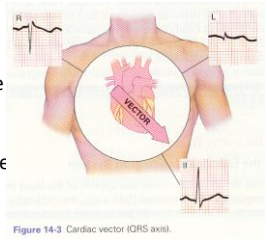
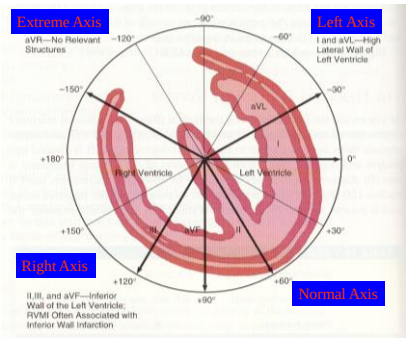


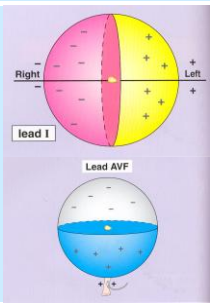
Figure 14-3 Cardiac vector (QRS axis).

Hexaxial Lead Diagram

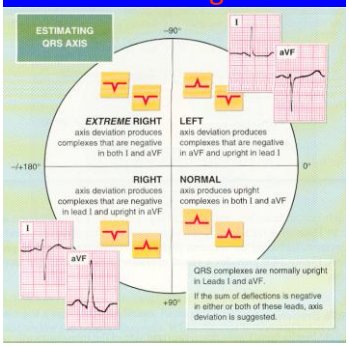


Rapid Axis Determination

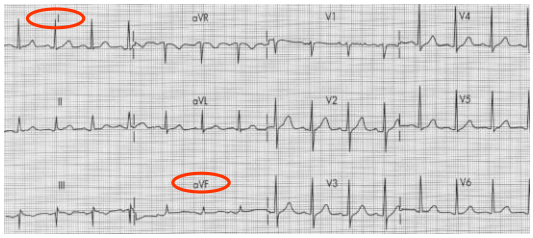
- Lead I determines whether axis is toward the right or left half of the heart. Upright complexes in Lead I indicate axis is toward the left half of the heart.
- Lead AVF determines whether axis is toward the top or bottom half of the heart. Upright complexes in Lead AVF indicate axis is toward the bottom half of the heart.
- Together, Leads I and AVF determine the quadrant in which the axis lies.



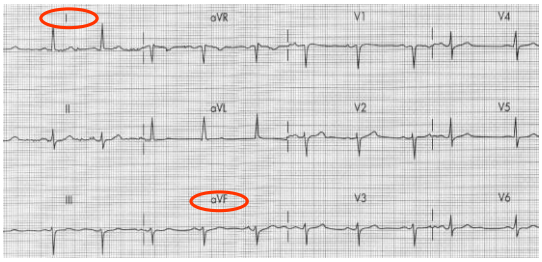
Determining Axis



Normal Axis



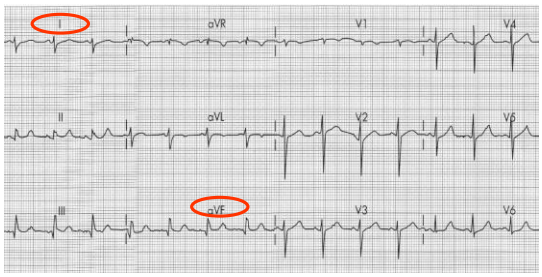
Left Axis Deviation



Causes of Left Axis Deviation

- LVH
- Aortic stenosis
- Hypertension
- Left anterior hemiblock
- Sometimes a normal variant

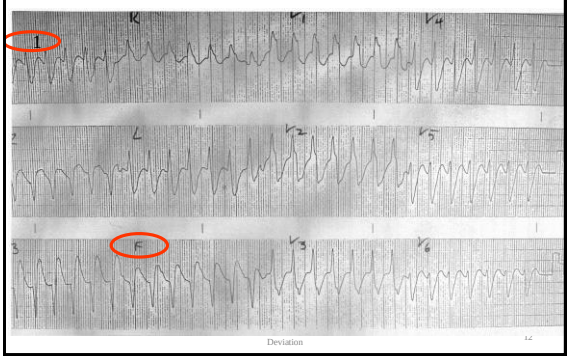
Right Axis Deviation



Causes of Right Axis Deviation

- RVH
- Lateral wall MI
- COPD
- Pulmonary hypertension
- Left posterior hemiblock
- Sometimes a normal variant
- Pulmonary embolism

Extreme Axis Deviation



Causes of Extreme Axis Deviation

- Obesity
- RVH
- Severe pulmonary disease
- Sometimes occurs in Ventricular Tachycardia