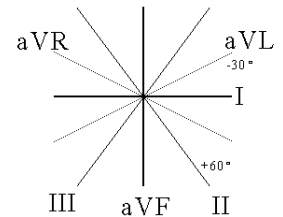


## EKG Interpretation Systematic Guide –

1. **Ventricular Rate:** (\_\_\_\_) \_\_\_Normal \_\_\_Brady (<60) \_\_\_Tachy (>100)
  - a. Atrial Rate (\_\_\_\_) Same as ventricular: \_\_\_ yes \_\_\_ no
2. **Rhythm:** (\_\_\_\_\_)
  - a. Description: \_\_\_Regular \_\_\_Fibrillation \_\_\_Flutter
  - b. Origin: \_\_\_Sinus \_\_\_Atrial \_\_\_Supraventricular \_\_\_Junctional \_\_\_Ventricular \_\_\_Uncertain
  - c. Premature beats? \_\_\_Atrial \_\_\_Ventricular \_\_\_Pattern? (e.g. Bigeminy)
  - d. Rhythm Name: \_\_\_\_\_
3. **Axis\*:** (\_\_\_\_) \_\_\_NI (-30 to +110) \_\_\_Left (<-30) \_\_\_Right (>+110)
4. **Intervals: PR** (\_\_\_\_), **QRSD** (\_\_\_\_), **QT** (\_\_\_\_), **QTc\*\*** (\_\_\_\_)
  - a. PR: \_\_\_Normal (0.12-0.20s) \_\_\_Short(<0.12s) \_\_\_Long (>0.20s) \_\_\_Varies
  - b. QRS: \_\_\_Normal (<=0.10s) \_\_\_Borderline(0.10-0.12s) \_\_\_Long (>0.12s)
  - c. QTc\*: \_\_\_Normal (<0.430sM, <0.450sF) \_\_\_Borderline \_\_\_Long (>0.45s M, >0.47s F)
5. **QRS Morphology**(If widened QRS Rsr'): \_\_\_NI \_\_\_Non-spec block \_\_\_RBBB \_\_\_LBBB
6. **Hypertrophy:** \_\_\_None \_\_\_LVH \_\_\_LAH \_\_\_RVH \_\_\_RAH
7. **Ischemia(q waves, ST/T-wave):** \_\_\_None \_\_\_Inferior \_\_\_Posterior \_\_\_Septal \_\_\_Anterior \_\_\_Lateral
8. **Miscellaneous:** (e.g. low voltage, poor R-wave progression) \_\_\_\_\_
9. **Compare to prior EKG**(Date: \_\_/\_\_/\_\_\_\_): \_\_\_None \_\_\_Changes: \_\_\_\_\_
10. **Impression:** \_\_\_\_\_



\* M-Male, F-Female

\*\* QTc calculation =  $QT / \sqrt{RR}$  (sqrt. RR) (Use Palm- Med Calc)

The ACP/ACC/AHA task force (see overview and justification) published guidelines for clinical competence in electrocardiography. The task force agreed that the following are some of the settings in which an ECG may be indicated:

1. For the diagnosis of overt or suspected cardiovascular disease. Follow-up recordings are indicated when there is a change in clinical status.
2. For assessing the results of therapy.
3. In subjects at risk of heart disease, usually >40 years old, without evidence of cardiovascular disease but with two or more of the following risk factors: (1) hypercholesterolemia; (2) diabetes; (3) obesity; (4) smoking; (5) hypertension; or (6) family history of heart disease. In this group, frequent follow-up recordings are usually not indicated unless signs or symptoms of heart disease appear.
4. In selected subjects with fewer risk factors whose occupations magnify the consequences of a heart attack or arrhythmia (e.g., commercial airline pilots or bus drivers).
5. Before surgical intervention as an aid in the diagnosis and management of preoperative conditions or subsequent postoperative complications. However, it should be emphasized that definitive data regarding the utility of electrocardiography as a routine baseline preoperative procedure are not available.
6. For assessing cardiac effects of systemic diseases or conditions such as renal failure, diabetic acidosis and hypothermia, electrolyte abnormalities and potential cardiotoxic effects of drugs.
7. Electrocardiography is not indicated for screening of healthy subjects without symptoms of heart disease, hypertension or other risk factors for the development of heart disease.

## SYSTEMATIC INTERPRETATION GUIDELINES for *Electrocardiograms*

### RATE Calculation:

Common method: 300-150-100-75-60-50

Mathematical method: 300/# large boxes between R waves  
1500/# small boxes between R waves

Six-second method: # R-R intervals x10 (Rhythm Strip) 25mm/sec

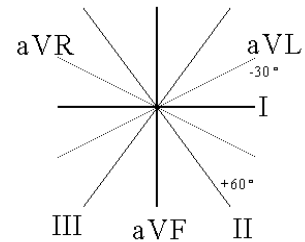
Ten-second method: # R-R intervals x 6 (Standard ECG)

### RHYTHM Guidelines:

1. Check the bottom rhythm strip for regularity, i.e. - regular, regularly irregular, and irregularly irregular.
2. Check for a P wave before each QRS, QRS after each P.
3. Check PR interval (for AV blocks >.20sec) and QRS (for bundle branch blocks >.12sec). Check for prolonged QT.
4. Recognize "patterns" such as atrial fibrillation, PVC's, PAC's, escape beats, ventricular tachycardia, paroxysmal atrial tachycardia, AV blocks and bundle branch blocks.

### AXIS

QRS	Lead I	Lead II/aVF
1. Normal axis (-30 to +90 degrees)	Positive	Positive
2. Left axis deviation (-30 to -90) Also check lead II. To be true left axis deviation, it should also be down in lead II.	Positive	Negative
3. Right axis deviation (+90 to +180)	Negative	Positive
4. Indeterminate axis (-90 to -180)	Negative	Negative



Left axis deviation differential: LVH; left anterior fascicular block, inferior wall MI.

Right axis deviation differential: RVH; left posterior fascicular block, lateral wall MI.

### HYPERTROPHY

1. LVH -- left ventricular hypertrophy = S wave in V1 or V2 + R wave in V5 or V6 > 35mm or aVL R wave > 12mm.
2. RVH -- right ventricular hypertrophy = R wave > S wave in V1 and gets progressively smaller to left V1-V6 (normally, R wave increases from V1-V6).
3. Atrial hypertrophy (leads II and V1)
  - Right atrial hypertrophy* -- Peaked P wave in lead II > 2.5 mm in amplitude. V1 has increase in the initial positive direction.
  - Left atrial hypertrophy* -- Notched wide (> 3mm) P wave in II. V1 has increase in the terminal negative direction.

### INFARCT

Ischemia	Represented by ST Depression >1mm horizontal or down sloping, 60-80 ms after QRS or symmetrical T wave inversion (upside down). Look in leads I, II, V2-V6.
Injury	Acute damage -- look for elevated ST segments.
Infarct	"Pathologic" Q waves. To be significant, a Q wave must be at least one small square (.04sec) wide or one-third the entire QRS height.

### Certain leads represent certain areas of the left ventricle:

V1-V2	anteroseptal wall	II, III, aVF	inferior wall
V3-V4	anterior wall	I, aVL	lateral wall
V5-V6	anterolateral wall	V1-V2	posterior wall (reciprocal)