Electrocardiograph Review Guide

1. Purpose of an ECG

- Records the electrical activity of the heart.
- Helps identify arrhythmias, heart damage, and abnormalities.

2. ECG Waves & What They Mean

P wave

- Represents atrial depolarization (atria contracting).

QRS complex

- Represents ventricular depolarization.
- Atrial repolarization happens here but is hidden.

T wave

- Represents ventricular repolarization.

U wave (not always seen)

- May represent late repolarization of the Purkinje fibers.

3. Intervals & Segments

PR interval

- Normal: 0.12–0.20 sec
- Time from start of atrial depolarization → start of ventricular depolarization.

QT interval

- Represents total ventricular activity (depolarization + repolarization).

ST segment

- Should be flat (isoelectric).
- Elevation → possible MI
- Depression → possible ischemia

4. Lead Placement

Limb Leads

- RA – right arm
- LA – left arm
- RL – right leg (ground)
- LL – left leg

Lead II setup

- Negative: RA
- Positive: LL

Precordial (Chest) Leads

- V1: 4th ICS, right sternal border
- V2: 4th ICS, left sternal border
- V3: midway between V2 & V4
- V4: 5th ICS, midclavicular line
- V5: level with V4, anterior axillary line
- V6: level with V4, midaxillary line

5. Standard ECG Settings

- Paper speed: 25 mm/sec
- Gain (amplitude): 10 mm/mV
- 12-lead ECG uses 10 electrodes

6. Artifacts

Common Types

- Somatic tremor: muscle movement, shivering
- Wandering baseline: loose electrodes, lotion/oils
- AC interference: electrical equipment, cell phones

How to prevent

- Ask patient to remain still
- Check electrode contact
- Keep wires untangled
- Turn off nearby electronics

7. Heart Conduction System

1. SA Node (natural pacemaker)
2. AV Node (delays impulse)
3. Bundle of His
4. Right & Left Bundle Branches
5. Purkinje Fibers

8. Key Facts to Remember

- ECG records electrical, not mechanical, activity.
- Precordial leads are placed on the chest (V1–V6).
- Limb leads help view the heart in the frontal plane.
- Abnormal intervals can indicate block, ischemia or arrhythmia.