



ECG Morphology Interpretation

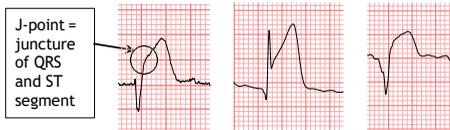
ST Segment Elevation

⚠ Key is to identify STEMI/AMI

ECG ST Elevation Criteria of Acute Myocardial Ischemia:¹

- New ST elevation at J-point in two contiguous leads with cut-points ≥ 0.1 mV above the beginning of QRS complex (use PR as baseline; if PR depressed use TP)
- Leads V2-V3: ST elevation ≥ 0.2 mV in men ≥ 40 y.o., ≥ 0.25 mV in men < 40 y.o. or ≥ 0.15 mV in women

Examples:



Clinical cues:

- Convex shape of elevation is most classic ("tombstone")
- Usually localized/regional rather than widespread
- If suspicious for MI, conduct serial ECG analysis with tabs in same place and correlate with clinical picture. Variations in ST or T-wave morphology strongly suggest ACS

If STEMI or ACS, arrange STAT care

Other Causes of ST Segment Elevation:

Acute Pericarditis - Stage I

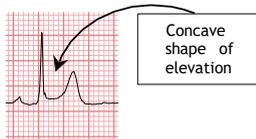
- Clinical Diagnosis with ECG findings²
- Widespread ST-segment elevation
- PR segment depression can be present

Benign Early Repolarization (BER):

Prominent J-point elevation ≥ 1 mm in ≥ 2 contiguous inferior or lateral leads J-point notching/elevation & upward concavity in leads other than V1-V3

Clinical cues:

- Look for historic ECGs with same pattern; no reciprocal depression
- More common in young healthy males; uncommon > 50 y.o.



"fish hook" pattern is classic in BER

ST Segment Depression

ECG ST Depression Criteria of Acute Myocardial Ischemia:¹

- New horizontal or down-sloping ST depression ≥ 0.05 mV in two contiguous leads

Clinical cues:

- If ST segment depression is present in anterior leads, posterior leads should be recorded to investigate possible posterior MI



If STEMI or ACS, arrange STAT care

Important T-wave changes

ECG T-wave changes for acute myocardial ischemia:¹

- T-inversion ≥ 0.1 mV in two contiguous leads
- T-inversion ≥ 0.1 mV with prominent R-wave or R/S ratio > 1



Potassium Abnormalities

ECG is not the diagnostic test of choice for electrolyte abnormalities, but the below morphologies are noted in potassium abnormality

Hypokalemia with flattened T-wave



Hyperkalemia with peaked T-wave



Sine wave in severe Hyperkalemia, e.g.: > 9

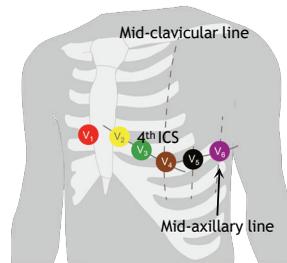
Lead Placement

Use guide at right for precordial leads placement

Leads V1-V2 often misplaced in 2nd ICS vs. 4th ICS!

Clues to limb lead inversions:

- P-wave negative in Lead II
- Global negativity in Lead I
- QRS complex upright in aVR



Landmarking guide of Precordial Leads