

ECG Diagnosis: ST-Elevation Myocardial Infarction

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ST-elevation myocardial infarction (STEMI) is a clinical syndrome defined by characteristic symptoms of myocardial ischemia in association with persistent electrocardiographic ST elevation (STE) and subsequent release of biomarkers of myocardial necrosis.¹ STE is the single best immediately available surrogate marker for detecting acute complete coronary artery occlusion without collateral circulation, signifying a significant region of injured myocardium at imminent risk of irreversible infarction, requiring immediate reperfusion therapy.² Diagnostic STE is defined as new STE at the J point in at least 2 contiguous leads ≥ 2 mm (0.2 mV) in men or ≥ 1.5 mm (0.15 mV) in women in leads V_2 - V_3 and/or of ≥ 1 mm (0.1 mV) in other contiguous chest or limb leads.³ The presence of reciprocal changes (manifested as ST depression in a region that approximates the vector 180 degrees opposite the major vessel of injury) increases the specificity of STE caused by STEMI.⁴ New or presumably new left bundle branch block has been considered a STEMI equivalent. Reperfusion therapy should be administered to all eligible patients with STEMI who have experienced symptom onset within the previous 12 hours.¹ Primary percutaneous coronary intervention is the recommended method of reperfusion when it can be performed in a timely fashion by experienced operators, with a goal of first medical contact-to-balloon time of 90 minutes or less.^{5,6} ❖

References

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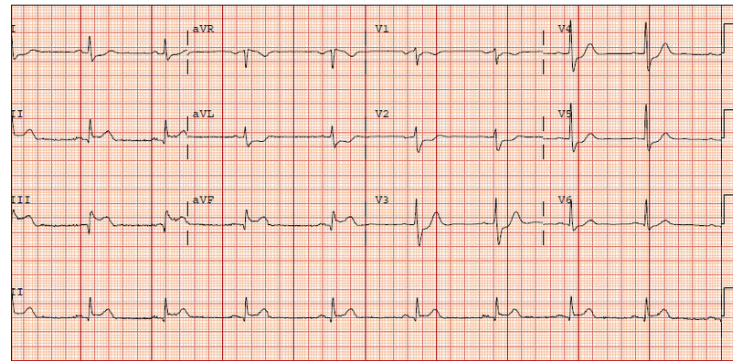


Figure 1. 12-lead electrocardiogram from a 67-year-old man with hyperlipidemia presenting to the Emergency Department with substernal chest discomfort for 90 minutes, which began while walking, demonstrates a normal sinus rhythm, with 2-mm ST elevations in leads II, III, and aVF, and reciprocal ST depressions in leads I, aVL, and V_1 - V_5 . These findings are consistent with an acute inferior wall myocardial infarction.

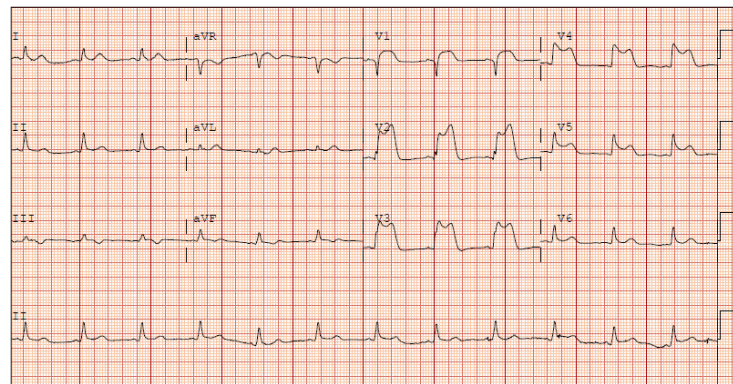


Figure 2. 12-lead electrocardiogram from a 75-year-old man with diabetes, hypertension, and hyperlipidemia presenting to the Emergency Department with substernal chest discomfort for 90 minutes, which began while walking, demonstrates normal sinus rhythm, with ST elevation ("tombstoning") in leads V_1 - V_5 . These findings are consistent with an acute anterior wall myocardial infarction.

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