

12-LEAD ELECTROCARDIOGRAM

Effective: January 1, 2024
Replaces: February 12, 2015

1. Purpose

The purpose of this policy is to identify patients that require 12-lead electrocardiogram (ECGs) and describe the process of obtaining and identifying the patients that require direct transport to a STEMI receiving facility.

2. Definition

- 2.1. Electrocardiogram's (ECGs) are utilized by prehospital personnel when a patient is suspected of having abnormal cardiac function. The use of a 12-lead ECG is essential to identify a patient experiencing an ST-elevation MI (STEMI).
- 2.2. The criteria for ST elevation is at least 1mm ST segment elevation in inferior lead, or at least a 2mm ST segment elevation in anterior or lateral leads, or 2 or more contiguous leads.

3. Indication

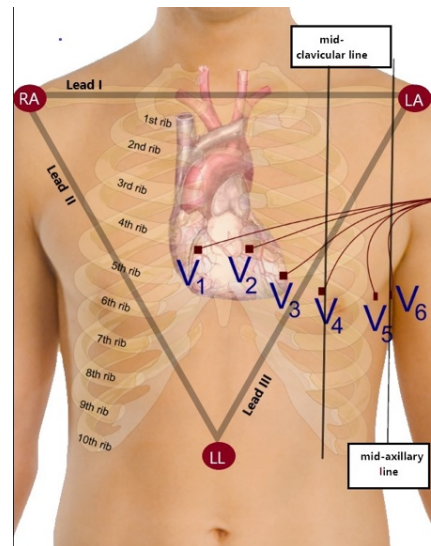
- 3.1. Obtain a 12-lead ECG on any adult patient with one or more of the following findings:
 - 3.1.1. Substernal pain
 - 3.1.2. Discomfort or tightness radiating to the jaw, left shoulder or arm
 - 3.1.3. Palpitations
 - 3.1.4. Symptoms indicating cardiogenic shock
 - 3.1.5. Bradycardia or Tachycardia
 - 3.1.6. Epigastric pain
 - 3.1.7. Diaphoresis
 - 3.1.8. Dyspnea
 - 3.1.9. Pulmonary edema
 - 3.1.10. Anxiety with feeling of impending doom
 - 3.1.11. Syncope/dizziness
 - 3.1.12. Atypical presentation such as generalized weakness, nausea, vomiting especially in women, elderly and diabetics
 - 3.1.13. As identified in another Santa Clara Prehospital Care Policy
 - 3.1.14. Paramedic discretion

4. Procedure

- 4.1. Endotracheal Obtain first ECG prior to leaving scene
- 4.2. The minimum patient information should be entered into the ECG machine, incident number patient first and last initial
- 4.3. Expose chest and prep area ECG electrodes will be applied. Ensure the area is dry, free of jewelry or other items (shaving may be necessary).
- 4.4. Ensure ECG electrodes are not dry and make good contact with skin

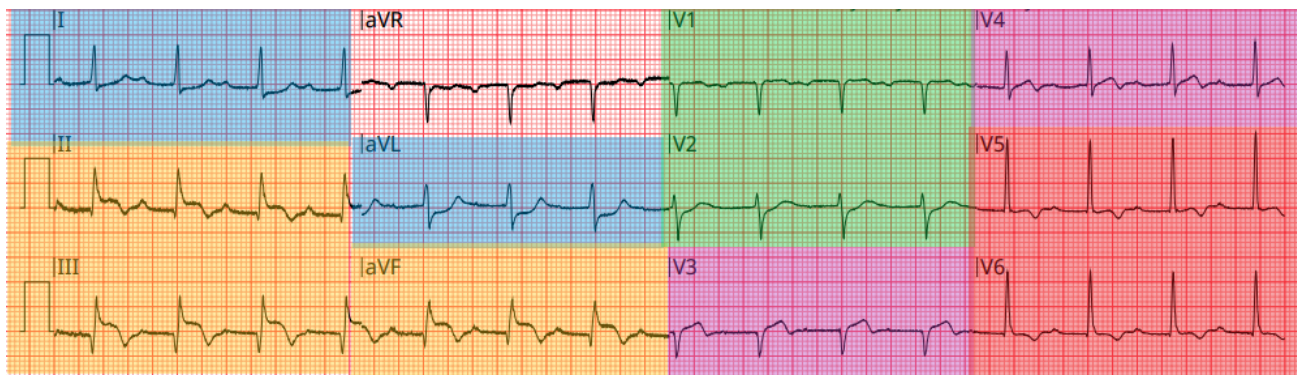


- 4.5. Attach extremity and chest ECG leads to the patient using the following landmarks,
 - 4.5.1. V1: right 4th intercostal space
 - 4.5.2. V2: left 4th intercostal space
 - 4.5.3. V3: halfway between V2 and V4
 - 4.5.4. V4: left 5th intercostal space, mid-clavicular line
 - 4.5.5. V5: horizontal to V4, anterior axillary line
 - 4.5.6. V6: horizontal to V5, mid-axillary line



- 4.6. Ensure the patient holds still to prevent artifact
- 4.7. Review ECG reading to ensure it is good quality with minimal or no artifact
- 4.8. Serial 12-lead EKGs, en-route, are encouraged but do not need to be transmitted once SRC notified
- 4.9. ECG criteria for STEMI Alerts: Please note that depending on the manufacturer of the cardiac monitor, STEMI indicators may vary. Is incumbent on the provider to know what indicators your manufacturer uses. Most manufacturers demarcate STEMI's with three (3) asterisks before and after the text and use capitalized and bolded text.
 - 4.9.1. If the ECG monitor reading identifies a STEMI:
 - 4.9.1.1. Immediately notify the receiving hospital with a **STEMI ALERT** and transmit the 12 lead ECG to the STEMI receiving hospital
 - 4.9.1.2. Transmission of the ECG can dramatically reduce the door to balloon time. Transmission shall be completed as soon as possible

4.10. STEMI Location Interpretation:



Inferior II, III, <u>aVF</u>	Anteroseptal V ₁ - V ₂	ANTEROAPICAL V ₃ - V ₄	Anterolateral V ₅ - V ₆	Lateral I, <u>aVL</u>
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Protocol # 700-M09