

Emergency Medical Services Program Policies – Procedures – Protocols

12-Lead EKG (201)

Adults	Pediatrics (13 years and under)
Public Safety First Aid Procedures (ONLY)	Public Safety First Aid Procedures (ONLY)
BLS Procedures: EMT's and Paramedics start here	BLS Procedures: EMT's and Paramedics start here
ALS Prior to Base Hospital Contact: Paramedics only	ALS Prior to Base Hospital Contact: Paramedics only
<ul style="list-style-type: none"> • Patient complaining of chest pain/pressure, upper abdominal pain, syncope or dizziness, shortness of breath? Does patient complain of associated cardiac ischemia pain such as jaw, neck, shoulder, back, left arm that is not associated with Injury? OR nausea/vomiting, diaphoresis, feelings of doom? • Attach monitor and obtain vital signs • If patient is hemodynamically stable conduct 12-lead as soon as possible. • If patient is unstable, enter appropriate protocol and provide treatment, obtain 12-lead once patient is stable, time permitting • If 12-lead indicates ACUTE MI contact STEMI receiving center within 5 minutes of acquisition and advise STEMI ALERT • Consider rapid transport and provide necessary treatment 	<ul style="list-style-type: none"> • Patient complaining of chest pain/pressure, upper abdominal pain, syncope or dizziness, shortness of breath? Does patient complain of associated cardiac ischemia pain such as jaw, neck, shoulder, back, left arm that is not associated with Injury? OR nausea/vomiting, diaphoresis, feelings of doom? • Attach monitor and obtain vital signs • If patient is hemodynamically stable conduct 12-lead as soon as possible. • If patient is unstable enter appropriate protocol and provide treatment, obtain 12-lead once patient is stable, time permitting • If 12-lead indicates ACUTE MI contact STEMI receiving center within 5 minutes of acquisition and advise STEMI ALERT • Consider rapid transport and provide necessary treatment
<u>Base Hospital Contact Required</u>	<u>Base Hospital Contact Required</u>

201 12-LEAD EKG

12-Lead EKG (201)

Purpose: To provide a procedure for the performance of 12-lead EKG monitoring and reporting. This procedure is limited to use by paramedics only.

1. Definitions

- A. **12 Lead EKG** – a transthoracic interpretation of the electrical activity of the heart over a period of time, as detected by electrodes attached to the outer surface of the skin and recorded by a device external to the body.
- B. **STEMI** – ST Elevation Myocardial Infarction - >1mm ST-segment elevation in two contiguous leads (either precordial or limb leads). (ACC/AHA)
- C. **STEMI Alert** – A declaration by prehospital personnel notifying a STEMI Receiving Center (SRC) that a patient has a specific computer-interpreted 12 Lead EKG indicating an Acute MI, allowing the STEMI Receiving Center to initiate the internal procedures to provide appropriate and rapid treatment interventions, or in consultation with the base physician regarding paramedic concern for STEMI not recognized by the machine.
- D. **STEMI Receiving Center (SRC)** – A facility licensed and operating a cardiac catheterization laboratory and designated an SRC by the Kern County Emergency Medical Services Division.
- E. **STEMI Referral Hospital (SRH)** – An acute care hospital in Kern County that is not designated as a STEMI Receiving Center.
- F. **Acute Coronary Syndrome** – Sudden lack of oxygen to the heart muscle.
- G. **Hemodynamically Stable** - Alert, systolic blood pressure of at least 90 mmHg, and cardiac rhythm does not pose an immediate life threat.

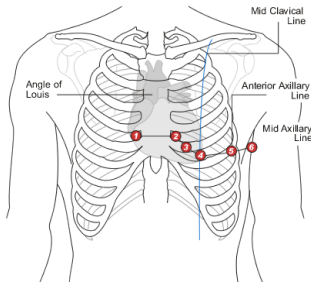
2. Indications

- A. 12 Lead EKG shall be performed on patients exhibiting any of the following signs/symptoms:
 - Chest pain or pressure
 - Upper abdominal pain
 - Syncope or dizziness
 - Shortness of breath
 - Pain/discomfort often associated with cardiac ischemia
 - Jaw, neck, shoulder, back, left arm or other presentation; unless no other symptoms exist, and the cause of the specific pain can be identified with a traumatic or musculoskeletal injury.
 - If there is any doubt about the origin of the pain/discomfort, or the presentation seems atypical for the mechanism, a 12 lead EKG should be performed.
- B. Patients exhibiting the following signs/symptoms should have a 12 lead EKG performed if the etiology of the illness is indicative of an Acute Coronary Syndrome or the etiology of the illness is indeterminate:
 - Nausea
 - Vomiting

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- Diaphoresis
 - Patient expression of “feelings of doom”
 - C. A 12 lead EKG may be performed based on the clinical judgment of the paramedic even in the absence of the above signs/symptoms.
 - D. Consider repeat or serial EKG for any changes in rhythm, ST changes, or C/C and Hemodynamic status.
3. EKG Performance Procedure
- A. Administer oxygen if SpO₂ < 94% or in respiratory distress, titrate oxygen only to use minimal amount needed. In general, O₂ should not be given to chest pain patients unless they are hypoxic or in severe respiratory distress.
 - B. Provide a thorough patient assessment including baseline VS.
 - C. Apply limb leads (I, II and III) to determine rhythm or dysrhythmia.
 - D. If the patient is hemodynamically stable conduct the 12 lead EKG prior to administration of medication.
 - E. If the patient is not hemodynamically stable immediately provide appropriate treatment and perform the 12 lead EKG once the patient’s condition stabilizes or time permits.
 - F. If at any time during the application or performance of the 12 Lead EKG, should the patient’s condition deteriorate, immediately administer appropriate treatment and then proceed to the performance of the 12 lead EKG once the patient’s condition stabilizes or time permits.
4. Lead Placement
- A. Limb leads (at least 10cm from the heart)
 - Black – left shoulder or arm
 - White – right shoulder or arm
 - Red – left leg
 - Green – right leg
 - B. Chest leads
 - V1: Right 4th intercostal space (adjacent to sternum)
 - V2: Left 4th intercostal space (adjacent to sternum)
 - V3: Halfway between V2 and V4
 - V4: Left 5th intercostal space, midclavicular line
 - V5: Horizontal to V4, anterior axillary line
 - V6: Horizontal to V5, mid-axillary line

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Note: To find the 4th intercostal space, first locate the Angle of Louis. This is a hump near the top third of the sternum. Start feeling down the sternum from the top and you will feel it. It is located next to the second rib. The space directly beneath it is the 2nd intercostal space. Count down 2 additional intercostal spaces and place V1 on the right and V2 on the left immediately adjacent to the sternum.

5. STEMI Alert

- A. The monitor's interpretation, on the printed 12 Lead EKG, shall be the trigger for the notification of a "STEMI Alert."
- B. If there is a positive indication of a "Acute MI" on the printed 12 Lead EKG (Ensure that tracing is as clean as possible. Artifact can cause the device to misidentify STEMI)
 - If available patient shall be transported to a "STEMI Receiving Center." Outlying hospitals may be bypassed entirely if total transport time to a "STEMI Receiving Center" is less than one hour either by Air or Ground.
 - Contact the "STEMI Receiving Center" to which the patient will be transported within 5 minutes of 12 lead acquisition and provide a brief report that begins with the phrase "STEMI Alert". The patient's age, gender, duration of symptoms, pertinent presentation symptoms, 12 Lead EKG findings and ETA to the hospital should be reported.
 - If transporting to a "STEMI Receiving Center" and time permits, electronically transmit the 12 Lead EKG for physician verification.
 - Consider establishing a second IV during transport if time permits.
- C. If cardiac monitor does not read STEMI but Paramedic feels that the ECG is consistent the paramedic may transmit the ECG and discuss with base physician to activate. If unable to transmit the paramedic must be able to adequately describe the ECG to the base physician.
 - Do not withhold treatment of chest pain if the 12 Lead EKG does not indicate "Acute MI".
 - Lack of "Acute MI" indication on the 12 Lead EKG does not rule out the possibility of infarct or ischemia.
- D. If a "STEMI Alert" report was called to the "STEMI Receiving Center", an update should be given during transport, time permitting.

6. Documentation

- A. A copy of the 12 lead EKG must be maintained by the transporting agency, a copy given to the hospital ED for inclusion in the patient chart and a copy made available to EMS upon request. The 12 lead EKG print-out shall be presented to hospital staff at the time the patient is delivered.