

# SAN FRANCISCO EMERGENCY MEDICAL SERVICES AGENCY

Effective: 01/07/13

Protocol: P-010.1

Supersedes: New

## 12- LEAD ELECTROCARDIOGRAM PROTOCOL

### INFORMATION NEEDED

- Chest Pain / Discomfort
- Shortness of Breath
- Pain Assessment: OPQRST
- Weakness or Dizziness
- Palpitations
- Nausea / Vomiting
- Indigestion: vague or suspicious symptoms/history
- History of AMI, CAD or CHF
- Drug Overdoes and/or underdose (cardiac medications)

### OBJECTIVE FINDINGS

- General appearance: level of distress, skin color, diaphoresis, altered mental status
- Dyspnea
- Tachycardia, bradycardia, irregular heart rate
- Hypotension
- Syncope
- Signs of CHF (peripheral edema, rales/ronchi, respiratory distress, JVD)
- Return of Spontaneous Circulation (ROSC)

BLS Treatment	ALS Treatment
<ul style="list-style-type: none"><li>• Routine Medical Care.</li><li>• Reassure patient and place in position of comfort.</li><li>• Assist paramedic with lead placement as needed.</li></ul>	<ul style="list-style-type: none"><li>• MINIMIZE ON SCENE TIME. MINIMIZE TIME TO 12 LEAD ECG.</li><li>• Obtain 12 Lead ECG.</li><li>• Repeat 12-Lead every 10" and/or if changes in symptoms or ECG abnormal.</li><li>• If available, transmit 12-lead wirelessly to a STAR center if STEMI is present.</li><li>• If STEMI is present, transport patient per EMS Agency Destination Policy 5000.</li><li>• Hold NTG for patients with known or suspected inferior wall AMI or if patient has taken any erectile dysfunction drug. If inferior wall AMI is suspected, use lead V4R to confirm. DO NOT DELAY TRANSPORT. See CHEST PAIN/ACS PROTOCOL or below in "PRECAUTIONS AND COMMENTS."</li><li>• If chest pain, dysrhythmia, stroke, AMS or shock is present, treat patient with appropriate protocol.</li></ul>

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## **STANDARD 12-LEAD ECG PLACEMENT**

Paramedics should follow a 12 lead ECG training program offered by each pre hospital provider. The following is an example of standard 12-Lead placement:

1. Limb Leads – Upper arms and ankles
2. V1 – Right 4<sup>th</sup> Intercostal Space (ICS), adjacent to sternum
3. V2 – Left 4<sup>th</sup> ICS, adjacent to sternum
4. V3 – Midway between V2 and V4
5. V4 – Left 5<sup>th</sup> ICS, mid-clavicular line
6. V5 – Lateral to V4 in anterior axillary line
7. V6 – Lateral to V5 in mid-axillary line

## **DEFINITION OF ST-ELEVATION MYOCARDIAL INFARCTION (STEMI)**

1. ECG shows ST segment elevation of at least 1 mm in two contiguous leads; AND/OR the ECG Reading is
  - \*\*\*ACUTE MI\*\*\*
  - \*\*\*STEMI SUSPECTED\*\*\*
2. Other similar language; AND/OR
3. Paramedic interprets ECG as a STEMI.

## **NOTIFICATION OF STEMI RECEIVING HOSPITAL**

As soon as possible, notify the STEMI Receiving Facility about an in-coming patient with the following STEMI ALERT:

- 12 Lead-ECG machine interpretation and paramedic interpretation of the 12-Lead ECG.
- Proceed as usual with radio report.
- If available, transmit the 12-lead wirelessly.

## **DOCUMENTATION**

- Cardiac rhythm: Initial baseline and changes along with description of patient signs and symptoms.
- Document on each printed 12-Lead ECG: patient name, age, DOB, time and any patient complaints.
- V4R print out (if done): patient name, age, DOB, time and any patient complaints.

## **PRECAUTIONS AND COMMENTS**

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- Consider other potential causes of chest pain such as pulmonary embolus, pneumonia, aortic aneurysm and pneumothorax.
- Suspicion of Acute Coronary Syndrome (non-STEMI or unstable angina) is based upon patient history. Be alert to patients likely to present with atypical symptoms or “silent” AMIs: women, non-white race, elderly, and diabetics.

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## Using 12 Lead ECG to Determine Safety of Nitroglycerin Administration

1. Determine presence of ST elevation in leads II, III and aVf. Apply V4R lead.
2. If ST elevation in V4R, do not give **NTG** (in order to maintain RV filling pressure)
3. If no ST elevation in V4R, it is safe to give **NTG**.

## Hold Nitroglycerin for Erectile Dysfunction Drugs

Do not administer **NTG** to patients who have taken any erectile dysfunction drug within the following time frames:

- |              |                   |            |
|--------------|-------------------|------------|
| • Sildenafil | (Viagra, Revatio) | < 24 hours |
| • Tadalafil  | (Cialis, Adcirca) | < 72 hours |
| • Vardenafil | (Levitra, Staxin) | < 72 hours |

## ECG is always indicated if:

- Known or Suspected Acute Coronary Syndrome or STEMI Protocol P010
- Post-Cardiac Arrest/Return of Spontaneous Circulation (ROSC) Protocol P009.4

## ECG: Relative Indications

Prehospital 12 Lead ECG may show STEMI if patient has chest pain or dyspnea. ST changes may occur in the presence of other conditions that are not STEMI.

## Consider 12 lead use if:

- |  |                |
|--|----------------|
| • Respiratory Distress of suspected cardiac origin | Protocol P-021 |
| • Known or Suspected Cardiac Dysrhythmia           | Protocol P-014 |
| • Altered Mental Status (especially Syncope)       | Protocol P-006 |
| • Stroke   | Protocol P-024 |
| • Atraumatic shock or hypotension                  |                |
| • Paramedic judgment                               |                |