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EMERGENCY MEDICAL SERVICES POLICIES and PROCEDURES

12-LEAD ECG PROCESS

I. Purpose: To define the indications, procedure and documentation for obtaining 12-lead Electrocardiograms (ECGs) and management ofpatients with a suspected ST-segment Elevation Myocardial Infarction (STEMI).

II. Authority: California Health and Safety Code, Sections 1797.204, 1797.220 and 1798. California Code of Regulations, Title 22, Division 9, Sections 100148, 100169 and 100170.

III. Definitions:

A. *STEMI:* ST-segment Elevation Myocardial Infarction

B. *STEMI Receiving Center (SRC):* an acute care hospital with percutaneous coronary intervention (PCI) services that has been designated according to Santa Barbara County EMS Policy 640 – Cardiac and STEMI Care System Guidelines.

IV. Policy:

A. Paramedics will obtain 12-lead ECGs in patients suspected of having an acute coronary syndrome and provide treatment in accordance with this policy.

V. Procedure:

A. Indications for 12-lead ECG: Medical history and/or presenting complaints consistent with an acute coronary syndrome. Patients will have acute onset (within the previous 12-hours) or acute exacerbation of *one or more* of the following symptoms that have no other identifiable cause:
   1. Chest, upper back, or upper abdominal discomfort;
   2. Generalized weakness;
   3. Dyspnea;
   4. After successful treatment and conversion of cardiac dysrhythmias;
   5. Post-ROSC (Return of Spontaneous Circulation);
   6. Syncope
   7. Symptomatic bradycardia
   8. Paramedic Discretion

B. Contraindications: **DO NOT** perform ECG on these patients:
   1. Trauma: There must be no delay in transport;
   2. Cardiac Arrest (unless return of spontaneous circulation);

C. ECG Procedure:
   1. Attempt to obtain ECG during initial patient evaluation.
   2. Immediate life threats should be addressed per policy prior to ECG (e.g. hypoxemia, hypotension)
   3. When possible, the ECG should be obtained prior to initiating transport
   4. Assure proper skin preparation prior to attaching electrodes. Check for loose electrodes or those with dry gel.
   5. If the ECG is of poor quality (artifact or wandering baseline), or the patient's condition worsens, ECG may be repeated to a total of three (3) times.

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6. Once an acceptable quality ECG is obtained, switch the monitor to the standard 4-Lead function.
7. If the interpretation on cardiac monitor meets your manufacturer guidelines for a POS STEMI ECG, note underlying rhythm, and verify by history and physical exam if the patient has a pacemaker or implantable cardioverter defribillator (ICD).
   a. Communicate any information related to pacemaker or ICD devices to the SRC, especially if 12-Lead returns as POS STEMI ECG.

D. SRC Base Hospital Communication
1. If the interpretation on the monitor meets your manufacturer guidelines for a POS STEMI ECG, notify SRC Base Hospital within 10-minutes of interpretation.
   a. Report POS STEMI ECG to BH along with the heart rate on ECG.
   b. If the ECG is of poor quality, or the underlyign rhythm is paced, or atrial flutter, include that information in the intial report.
   c. All other information, except for that which is listed in items 2, 4, and 5 below are optional and can be given at the paramedic's discretion (or at SRC Base Hospital's request).
2. Paramedics are to ask the patient if they have a cardiologist and report that information to the SRC Base Hospital.
3. If the interpretation on the monitor meets your manufacturer guidelines for a POS STEMI ECG, patients should be transported to the closest and most appropriate SRC.
   a. Any patient requests to be transported to another facility outside of this policy should be immediately communicated to the SRC Base Hospital.
4. If the interpretation on the monitor meets your manufacture guidelines for a POS STEMI ECG, and the underlying rhythm is Atrial Flutter or the rate is above 140, the SRB BH shall be notified at the beginning of the report.
   a. Cath Lab activation will occur at the discretion of the SRC Base Hospital.
5. If the interpretation on the monitor meets your manufacture guidelines for a POS STEMI ECG, and the patient has a pacemaker, ICD, or ECG is of poor quality with a wandering baseline and/or artifact (and all 3 attempts to repeat 12-Lead have been exhausted), then report findings to the SRC Base Hospital.
6. If a first responder paramedic obtains an ECG with a good quality reading, then transporting paramedic will not perform subsequent 12-Lead ECG's unless the patient's condition changes, worsens, or develops any new symptoms as outlined by this policy.
   a. If first responder 12-Lead ECG meets your manufacture guidelines for a POS STEMI ECG, then every attempt to provide a copy of that 12-Lead to the transporting unit (if different then first responder and/or first responder is not riding in to the hospital) must be made.

E. Transportation
1. As referenced in Policy 533-11 Chest Pain, all patients activated as a "STEMI Alert" from the field should consider the following:
   a. Consider Code-2 transport to SRC if patient's condition and/or vital signs are *stable.*
   b. Consider Code-3 transport to SRC if patient's condition and/or vital signs are *unstable.*

F. Patient Treatment
1. Patient Communication
   a. If the interpretation on monitor meets your manufacturer guidelines for a POS STEMI ECG, the patient should be told that "according to the ECG you may be having a heart attack".
   b. If the ECG reads anything other than POS STEMI ECG, then the paramedic must not tell the patient that their ECG is normal or state, "you are not having a heart attack."

i. If patient asks what the ECG shows, tell the patient that it will be read by the emergency physician upon arrival to the Emergency Department.

G. Other ECGs
1. If an ECG is obtained by a physician (or other clinician) and the interpretation on the ECG indicates positive for a STEMI, then the patient will be treated as a positive STEMI.
   a. Any subsequent 12-Lead ECG's are not indicated under these circumstances.
2. If the ECG obtained by a physician (or other clinician) does not indicate a STEMI by interpretation, and the physician is stating that it **IS** a STEMI, perform repeat ECG once the patient is in the ambulance.
   a. If repeat ECG obtained by EMS is positive for a STEMI:
      i. Transport to SRC as a "Code STEMI"
   b. If repeat ECG obtained by EMS is negative for a STEMI:
      i. Transport to SRC, but do not indicate "Code STEMI"
3. If an ECG is obtained by a physician (or other clinician) does not indicate STEMI (via interpretation on ECG or through verbal statement) **AND** EMS ECG is also negative for STEMI, the patient may be transported to the nearest facility.
4. Retain original ECG's obtained by physician/clinician and transport with patient to Emergency Department.

H. Documentation
1. It is the responsibility of all responding agencies to complete the electronic Patient Care Report (ePCR) per Policy 700 – Prehospital Documentation. Any and all 12-Lead ECGs (positive or negative interpretatations) obtained in the field (either by paramedic first responders, paramedic transport personnel, and physician/clinicians) must be attached to the patient care record as a tracing or photographed as an attachment.
2. All notifications, alerts and comments (such as "poor ECG quality," "Atrial Flutter," etc.) made to the Base Hospital should be documented in the ePCR narrative.
3. All original copies of 12-Lead ECG(s) will be turned in to the receiving hospital by handing it directly to the receiving medical practitioner assuming care of the patient.
4. 12-Lead ECG findings must be documented in the appropriate Specialty Care Tab (*Acute Coronary Syndrome (ACS)* or *Cardiac Arrest (ROSC)* as appropriate) within the ePCR.

VI. References:

A. Policy 533-11 Chest Pain
B. Policy 640 – Cardiac and STEMI Care System Guidelines
C. Policy 700 - Documentation of Prehospital Care

VII. Attachments:

A. None

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