



SUBJECT: **ST-ELEVATION MYOCARDIAL INFARCTION (STEMI) RECEIVING CENTER (SRC) STANDARDS** REFERENCE NO. 320

PURPOSE: To establish minimum standards for the designation of a licensed acute care hospital as a ST-Elevation Myocardial Infarction Receiving Center (SRC). These standards were developed to ensure that patients transported by the 9-1-1 system in Los Angeles County who exhibit ST-elevation myocardial infarction (STEMI) on a prehospital 12-lead electrocardiogram (ECG) are transported to a hospital appropriate to their needs.

With the initiation of a 12-lead ECG by paramedics, rapid transport to SRCs with 24-hour cardiac catheterization laboratories (Cath Lab) and cardiovascular surgery capabilities, the goal from first medical contact to an intervention time of 90 minutes, will allow patients to receive an earlier definitive diagnosis and treatment resulting in improved outcomes. Requirements to these Standards will be driven by Los Angeles County Emergency Medical Services Agency SRC Quality Improvement Advisory Committee recommendation, national research and quality improvement findings.

Therapeutic hypothermia equipment is required at all SRCs for the target temperature management (TTM) of the nonresponsive, non-traumatic post cardiac arrest patient with a return of spontaneous circulation (ROSC).

DEFINITIONS:

Board Certified (BC): Successful completion of the evaluation process through one of the Member Boards of the American Board of Medical Specialists (ABMS) including an examination designed to assess the knowledge, skills and experience necessary to provide quality patient care in a particular specialty.

Board Eligible (BE): Successful completion of a residency training program approved by the Accreditation Council for Graduate Medical Education (ACGME) with progression to board certification based on the timeframe as specified by the ABMS for a specific specialty.

Interventional Cardiologist: Physician who has completed a residency in internal medicine, or fellowship in cardiology and/or interventional cardiology, and is BC or BE, and has privileges to perform percutaneous interventions.

Percutaneous Coronary Intervention (PCI): A broad group of percutaneous techniques utilized in the dilation of coronary, heart, or arterial obstructions to diagnosis and treat patients with STEMI.

Promptly Available: Ability to be present in the Emergency Department (ED) or Catheterization Laboratory (CL) within 30-minutes from notification.


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APPROVED: _____


Director, EMS Agency


Medical Director, EMS Agency

Return of Spontaneous Circulation (ROSC): Following cardiopulmonary arrest, ROSC is the restoration of a spontaneous perfusing rhythm. Signs include: palpable pulse, breathing (more than an occasional gasp), a measureable blood pressure and/or a normal to high capnography reading.

ST- Elevation Myocardial Infarction (STEMI): A myocardial infarction that generates ST-segment elevation on a 12-lead ECG identified by software, paramedic, or physician interpretation as STEMI.

STEMI Receiving Center (SRC): A licensed acute care facility with special permit for cardiac catheterization laboratory and cardiovascular surgery by the State of California Department of Health Services, and designated as a SRC by the Los Angeles County EMS Agency.

STEMI Referral Facility (SRF): These are non-PCI capable hospitals that transfer a STEMI patient requiring emergency cardiac intervention to a designated SRC.

Targeted Temperature Management (TTM): An organized approach to strict temperature control to a target between 32 and 36 degrees Celsius for at least 24 hours in the adult non-responsive patient with a return of spontaneous circulation after cardiac arrest. This is an attempt to preserve cerebral function by decreasing cellular metabolism and oxygen demand, reducing production of excitatory neurotransmitters, minimizing disruption of ion homeostasis and reducing free radicals.

POLICY:

I. SRC DESIGNATION / CONFIRMATION AGREEMENT

- A. SRC initial designation is granted after a satisfactory review and approved by the EMS Agency for a period of three years.
- B. SRC confirmation status is granted after a satisfactory review and approved by the EMS Agency for a period of three years based upon maintaining the SRC Standards.
- C. The EMS Agency reserves the right to perform a scheduled on-site survey or request additional data at any time.
- D. The SRC shall immediately provide written notice to the Medical Director of the EMS Agency if unable to adhere to any of the provisions set forth in the SRC Standards.
- E. The SRC shall provide a 90-day, written notice to the EMS Agency Medical Director of intent to withdraw from the SRC program.

II. SRC APPROVAL PROCESS

- A. General Hospital Requirements
 - 1. Licensed by the State of California Department of Public Health (CDPH) as a General Acute Care Hospital, and

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- a. Be accredited by The Joint Commission or any accreditation deemed acceptable by the Centers for Medicare and Medicaid Services (CMS)
 - b. Have a special permit to provide Basic or Comprehensive Emergency Medical Services pursuant to the provisions of Title 22, Division 5, California Code of Regulations, and
 - c. Have a special permit to provide cardiac catheterization laboratory and cardiovascular surgery services pursuant to the provisions of Title 22, Division 5, California Code of Regulations.
2. Submits to the EMS Agency an updated list of interventional cardiologist and cardiothoracic surgeons including board certifications and privileges, for their specialty, minimally, every three years.
 3. Governing board and medical staff commitment to provide necessary resources for the SRC Clinical Director by allocating the appropriate time and personnel necessary to comply with the SRC Standards and development of the SRC program.

B. General SRC Program Requirements

1. Must be a designated Los Angeles County EMS Agency SRC to receive STEMI or ROSC patients via the 9-1-1 system.
2. Maintains current EMS Agency SRC Standards.
3. Maintains an approved SRC Program Plan inclusive of current SRC Standards for STEMI and ROSC care.
 - a. The SRC Program Plan is reviewed and approved every three years, minimally, by the Cardiology Committee.
 - b. The SRC Program Plan is reviewed and signed off annually by the SRC Program Medical and Clinical Directors to assure the program is current with SRC Standards.
4. Maintains an approved TTM plan that is consistent with Ref. No. 320.1, Targeted Temperature Management Guideline.
5. Maintains an interventional cardiology and cardiothoracic surgery on-call panel 24 hours per day/7 days per week.
6. Assures all interventional cardiologists and cardiothoracic surgeons caring for STEMI patients maintain board certifications and privileging according to their specialty.
7. Able to receive transmitted 12-Lead ECGs via the internet, email or FAX.
8. Provides pertinent patient health information for quality improvement purposes to healthcare providers involved in the patient's care.
9. Immediately notifies the EMS Agency, in writing, of any change in status of the SRC Medical Director, Clinical Director, or data entry personnel by submitting Reference No. 621.1, Notification of Personnel Change Form. Including:

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- a. Any change in the Medical Director, Clinical Director, or data entry personnel unable to fulfill their program obligations

OR

 - b. 15 days or greater inability of the previously identified staff to fulfill their program obligations.
10. Collaborates with EMS providers to integrate electronic prehospital patient care (ePCR) records into the hospital electronic medical record.
 11. Establish a Memorandum of Understanding (Reference. No. 320.2 MOU IFT for Acute STEMI) for the timely transfer of STEMI patients for emergent PCI from the SRF to the SRC.
 - a. 9-1-1 transport should be reserved for patients with STEMI requiring immediate PCI and contracted ALS providers should be utilized for less emergent transfers.
 12. Establish collaborative relationships with SRFs and provider agencies for performance improvement to address transfer process, transport modality, quality improvement, and patient care.
 13. SRC participates in the annual Los Angeles County EMS Agency/American Heart Association countywide Sidewalk CPR public education or annually provides a minimum of one public education class on CPR-sign in rosters to be maintained. Classes may be in collaboration with other health care providers.

C. SRC Personnel Requirements

1. Maintain a designated SRC Program Medical Director responsible for the care of STEMI and ROSC patients:
 - a. Interventional Cardiology Board Certified physician.
 - b. Privileged by the hospital and active in performing interventional procedures according to their specialty.
 - c. Responsible for the medical oversight and ongoing performance of the STEMI and TTM quality improvement (QI) programs and adherence to the SRC Program Standards.
 - d. Participates in the hospital Cardiology Committee/or equivalent and other committees associated with STEMI or ROSC care.
 - e. Collaborates with the SRC Clinical Director to ensure adherence to the SRC Standards.
 - f. Liaisons with hospital administration, SRC Clinical Director, Medical and Clinical Staff across the STEMI and ROSC patient's continuums of care.
 - g. Attends 100% of the EMS Agency's QI Meetings. Fifty percent (50%) of meetings may be attended by one of the following:
 - (i) by an alternate interventional cardiologist from the same SRC,

OR

(ii) by call in option when available.

2. SRC Program Physician Participants

a. Interventional Cardiologists performing emergent percutaneous interventions must:

(i) Maintain current board certification or, board eligibility, in interventional cardiology with privileges in PCI procedures, and credentialed by the hospital in accordance with American College of Cardiology/American Heart Association national standards,

OR

(ii) Maintain current board certification in internal medicine or cardiovascular disease with privileges in PCI procedures, and credentialed by the hospital in accordance with American College of Cardiology/American Heart Association national standard.

b. Surgeons performing emergent coronary artery by-pass grafting (CABG) must:

(i) Maintain current board certification or, is board eligible, in emergent Cardiovascular / Cardiothoracic surgery with specific privileges in CABG and credentialed by the hospital in accordance with American College of Cardiology/American Heart Association national standards.

c. On-call interventionalists may only be on-call for **one** facility at a time.

d. On-call physicians should be promptly available for a Cath Lab activation.

3. SRC Program Clinical Director

a. Maintain a designated SRC Program Clinical Director responsible for the care of STEMI and ROSC patients:

b. Licensed RN in the State of California, currently assigned in the Cath Lab, knowledgeable in critical care and interventional cardiac procedures and able to facilitate internal hospital policy and procedure.

- If co-directing, one staff member must be a licensed RN assigned in the Cath Lab

c. Collaborates with the ED Medical and Clinical Directors regarding STEMI and ROSC care in accordance to the SRC Standards.

d. Responsible for maintaining up-to-date continuous STEMI and TTM QI programs and disseminating EMS Agency reports to pertinent program participants.

e. Participates in the hospital Cardiology Committee/or equivalent and other committees associated with STEMI or ROSC care.

- f. Collaborates with the SRC Medical Director to ensure adherence to the SRC Standards.
- g. Responsible in assuring hospital policies adhere to the SRC Standards.
- h. Liaison with hospital administration, SRC Medical Director, Medical and Clinical Staff across the STEMI and ROSC patient's continuum of care.
- i. Attends 100% of the EMS Agency's QI Meetings. Fifty percent (50%) of meetings may be attended by one of the following:
 - (i) *by an alternate Cath Lab RN from the same SRC*
 - OR*
 - (ii) *by call in option when available*
- j. Assures processes are in place to capture patients transported to the SRC by EMS providers or other acute care hospitals.
- k. Responsible for the oversight of accurate and timely data extraction and data entry.
- l. Develops relationships and collaborates with the surrounding SRFs to assist the SRF in meeting a door-in to door-out goal time of 30 minutes which will assist the SRC in meeting a first-door to intervention goal time of 90 minutes.
- m. Assures SRC diversion is appropriate and processes are in place to minimize the need for diversion.

III. SRC HOSPITAL PROCESSES/POLICIES

Hospital policy/processes/guidelines shall include:

- A. Maintaining a concurrent hand-written ED Log to capture patients transported to the SRC Emergency Department (ED) meeting the SRC inclusion criteria for data entry into the EMS Agency SRC database.
- B. A mechanism to receive a 12-Lead ECG via the internet/Cloud, email or FAX.
- C. Obtaining a confirmation 12-Lead ECG within 10 minutes of the patient's ED arrival on patients with chest pain or symptoms cardiac in nature unless, the field ECG is a confirmed STEMI and the patient is being transported emergently to the Cath Lab.
- D. Cath Lab activation guidelines with the ability to track the activation and/or cancelation of the Cath Lab team, including the interventional cardiologist(s).
- E. A means to track and trend all patients requiring emergent PCI, with a first medical contact to intervention goal time of 90 minutes.
- F. Ongoing accurate and timely data entry.

- G. A comprehensive multidisciplinary QI program, including the invitation of paramedics to a non-peer review committee meeting regarding STEMI and ROSC patients that disseminates pertinent information to its stakeholders.
- H. Comprehensive knowledge in other EMS Agency policies affecting the SRC program and processes (i.e., Cath Lab Activation Algorithm, ED Interfacility transfers, and SRC diversion).
- I. A process to receive patients from a SRF with a goal of first door to intervention of 90 minutes.
- J. A process to administer fibrinolytics, move other Cath Lab patients or transfer a STEMI patient to another SRC on the rare occasion the Cath team is occupied with a STEMI patient, there is a mechanical issue in the Cath Lab, or the hospital is on internal disaster.
- K. Assuring SRC diversion is appropriate and processes are in place to minimize the need for diversion.

IV. DATA

- A. Ensure adequate data entry personnel, collaborate with ED personnel to assure capture and entry of patients meeting inclusion criteria, into the Los Angeles County EMS Agency database on an ongoing basis.
 - 1. Back-up data entry personnel should be identified and trained in the event primary data personnel are unable to meet the data entry requirements.
 - 2. Inclusion Criteria
 - a. STEMI Patients meeting at least one of the following criteria:
 - (i) Patients with STEMI identified in the field by:
 - Software ECG interpretation of STEMI
 - OR**
 - Paramedic ECG interpretation of STEMI
 - (ii) Patients transported by 9-1-1 with an ED interpretation of STEMI:
 - Identified by physician over-read of a prehospital ECG
 - OR**
 - Identified on the first ED ECG
 - OR**
 - Identified on a subsequent ED ECG, within 1 hour of arrival
 - (iii) ED inter-facility transfer (IFT) to the SRC via 9-1-1 or other Advance Life Support (ALS) transport for suspected STEMI to be evaluated for emergent PCI (includes Nurse Critical Care IFTs).
 - b. Cardiac Arrest Patients meeting at least one of the following criteria:
 - (i) 9-1-1 ALS, non-traumatic, adult (greater than 14 years of age) patients with out-of-hospital cardiac arrest (OHCA) and a return of spontaneous circulation (ROSC) at any point in the acute phase (field, ED, or Cath Lab).

- (ii) Patients with STEMI complicated by cardiac arrest in the acute phase (field, ED or Cath Lab).

B. Data Fields

- 1. Reference No. 648, STEMI Data Dictionary identifies the current data fields with the associated data definitions to be collected and entered into the LA EMS STEMI Database.
- 2. Data fields are subject to change.
- 3. Data should be reviewed at least monthly for accuracy and blanks.

C. Data Submission Requirements:

- 1. SRC data shall be entered concurrently into the SRC database with all patients entered within 30 days following discharge.
- 2. A monthly tally of STEMI and ROSC patients is to be submitted to the EMS Agency by the 15th of the month for the previous month (For example: January tally is due February 15th).
- 3. SRC quarterly data shall be entered within four weeks from the end of the quarter (For example: 1st quarter's data is due April 30th).

D. SRC must maintain a minimum 90% compliance for:

- 1. Capture of patients meeting the criteria for data entry
- 2. Data field completion
- 3. Data field accuracy
- 4. Timely data entry
- 5. Timely tally submission
- 6. Timely quarterly submission

V. QUALITY IMPROVEMENT

A. SRC Program must include a comprehensive-multidisciplinary SRC QI Meeting:

- 1. Meeting participation should include the SRC Program Medical and Clinical Directors, prehospital care providers/coordinators, SRC/provider educators, interventional cardiologists, ED physicians, ED and Cath Lab personnel, other associated healthcare providers, as well as other healthcare specialties including neurology, thoracic surgery or TTM specialists when applicable.
- 2. Meeting to be held quarterly, at a minimum.
- 3. Meeting minutes and roster must be maintained for each meeting and available for review.

4. SRCs that are also a Base Hospital are encouraged to provide periodic SRC Base Hospital education with the collaboration of the SRC Clinical Director.
- B. Pertinent aspects of care should be tracked and trended with the identification of areas requiring improvement and the action(s) necessary to improve care.
- C. The Hospital Specific SRC QI program shall review the care and outcome on the following, but not limited to:
1. In-hospital mortality
 2. Bleeding complications (per the data definition)
 3. Cerebrovascular accident rate (per the data definition)
 4. ED door to ED ECG greater than 10 minutes, when a confirmation ECG is required
 5. First medical contact-to-balloon times greater than 90 minutes
 6. Any delay in care
 7. All interfacility transfers, to include:
 - a. Ongoing review of process for accepting STEMI patients
 - b. Door to ECG greater than 10 minutes
 - c. Door-in to door-out time, from SRF, greater than 30 minutes
 - d. Use of 9-1-1 for non-STEMI transfers
 - e. Excessive delays of transfers
 - f. Tracking and trending of IFTs requiring emergent PCI versus those not meeting criteria for emergent PCI
 - g. Provide QI follow-up to the referring SRF of the above QI findings on each patient transferred
 8. Other issues, processes or personnel trends identified from hospital specific data (i.e., less than 90% TIMI documentation, increase in fallouts over time and proportion of patients transported to the Cath Lab found not to have a STEMI).
 9. All patients transported to the SRC for cardiac arrest with ROSC. QI on these patients should include TTM.

VI. SRC DIVERSION

- A. SRC hospitals are responsible for updating Reddi-Net diversion status to ensure the most current information is available for patient destination decisions.
- B. The SRC must incorporate into policy, administrative and/or SRC Medical Director's decision to request diversion; to include the name and title of the authorizing party required to complete the diversion request.

C. Diversion may be requested:

1. When the Cath Lab staff is encumbered caring for a STEMI patient, to the extent that the care of additional STEMI patients may be jeopardized.
2. The SRC is on internal disaster.
3. The Cath Lab experiences critical mechanical failure of essential Cath Lab equipment; in this case the SRC must notify the EMS Agency SRC Program Manager directly as to the nature of the failure or equipment issue and the estimated time of the diversion.

D. ED saturation is not a sufficient cause to request SRC diversion.

CROSS REFERENCE

Prehospital Care Manual

Ref. No. 320.1, Target Temperature Management Guidelines

Ref. No. 320.2, Interfacility Transfer Memorandum of Understanding

Ref. No. 321.1, Notification of Personnel Change Form

Ref. No. 502, Patient Destination

Ref. No. 503, Guidelines for Hospitals Requesting Diversion of ALS Patients

Ref. No. 513, ST Elevation MI Patient Destination

Ref. No. 513.1, Interfacility Transfer of Patients with STEMI

Ref. No. 516, ROSC Patient Destination

Ref. No. 624, STEMI Receiving Center QI Committee

Ref. No. 1302, Medical Control Guideline: 12-Lead Electrocardiogram

Ref. No. 1303, Medical Control Guideline: Cath Lab Activation Algorithm

Ref. No. 1308, Medical Control Guideline: Cardiac Monitoring / ECG

Title 22 Code of Regulations Division 5

2015 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care

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