



Emergency Medical Services District

1000 San Leandro Blvd, Suite 200
San Leandro, CA 94577

Lauri McFadden, EMS Director
Karl Sporer, MD, Medical Director
Main: (510) 618-2050
Fax: (510) 618-2099

September 30, 2019

David Duncan, MD
Director
California Emergency Medical Services Authority
10901 Gold Center Drive, Suite 400
Rancho Cordova, California 95670

Dear Dr. Duncan,

Attached please find the 2019 Alameda County EMS STEMI Critical Care System Plan (Plan). This Plan depicts the robust STEMI System of Care that began 2004 with prehospital providers capturing 12-lead electrocardiograms and transporting to one PCI-capable facility. Now we have seven STEMI/Cardiac Arrest Receiving Facilities which are geographically spread and offer broad coverage for our communities. We are proud to share the work we have been doing through this Plan.

Thank you in advance for your review of this Plan. As always, please do not hesitate to contact me if you have any questions or require additional information.

Respectfully,

A handwritten signature in blue ink that reads 'Lauri McFadden'.

Lauri McFadden
Director, Emergency Medical Services

Attachment

cc: Colleen Chawla, HCSA Director
Karl Sporer, EMS Medical Director
William McClurg, EMS Deputy Director

**ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY
EMERGENCY MEDICAL SERVICES**



**2019
STEMI CRITICAL CARE SYSTEM
PLAN**



September 2019

DEFINITIONS AND ACRONYMS

AED	Automated External Defibrillator
AICD	Automated Implantable Cardioverter-Defibrillator
ALCO	Alameda County
BHDE	Bidirectional Healthcare Data Exchange
CABG	Coronary Artery Bypass Graph
CARC	Cardiac Arrest Receiving Center: A comprehensive cardiac care center that is able to offer needed basic and advanced life support: Cardiopulmonary Resuscitation and Post Resuscitation Care: Therapeutic Hypothermia, Emergent Primary Coronary Interventions (PCI), Metabolic Support and Rehabilitation to patients suffering from Cardiopulmonary arrest.
CARES	Cardiac Arrest Registry to Enhance Survival
§ 100270.101. Cardiac Catheterization Laboratory	The setting within the hospital where diagnostic and therapeutic procedures are performed on patients with cardiovascular disease. Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code. Reference: Sections 1797.103 and 1797.176, Health and Safety Code
§ 100270.102. Cardiac Catheterization Team	The specially-trained health care professionals that perform percutaneous coronary intervention. It may include, but is not limited to, an interventional cardiologist, mid-level practitioners, registered nurses, technicians, and other health care professionals.

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	Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code. Reference: Sections 1797.103 and 1797.176, Health and Safety Code.
CCU	Coronary Care Unit
CCT	Critical Care Transport
§ 100270.103. Clinical Staff	Individuals that have specific training and experience in the treatment and management of ST-Elevation Myocardial Infarction (STEMI) patients. This includes, but is not limited to, physicians, registered nurses, advanced practice nurses, physician assistants, pharmacists, and technologists. Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code. Reference: Sections 1797.103 and 1797.176, Health and Safety Code.
CPC	Cerebral Performance Category
ECMO	Extracorporeal Membrane Oxygenation
ECG	Electrocardiogram
EEG	Electroencephalogram
ED	Emergency Department
§ 100270.104. Emergency Medical Services Authority	The department in California responsible for the coordination and integration of all state activities concerning EMS. Note: Authority cited: Sections 1797.1, 1797.107 and 1797.54, Health and Safety Code. Reference: Sections 1797.100, and 1797.103, Health and Safety Code.
HIPAA	Health Insurance Portability and Accountability Act
HITECH	Health Information Technology for Economic and Clinical Health Act
ICD	Implantable Cardiac Defibrillator

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ICU	Intensive Care Unit
§ 100270.105. Immediately Available	<p>(a) Unencumbered by conflicting duties or responsibilities. (b) Responding without delay upon receiving notification. (c) Being physically available to the specified area of the hospital when the patient is delivered in accordance with local EMS agency policies and procedures.</p> <p>Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code. Reference: Sections 1797.103 and 1797.176, Health and Safety Code.</p>
§ 100270.106. Implementation	<p>The development and activation of a STEMI Critical Care System Plan by the local EMS agency, including the prehospital and hospital care components in accordance with the plan.</p> <p>Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code. Reference: Sections 1797.103 and 1797.176, Health and Safety Code.</p>
§ 100270.107. Interfacility Transfer (IFT)	<p>The transfer of a STEMI patient from one acute general care facility to another acute specialty care facility.</p> <p>Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code. Reference: Sections 1797.103, 1797.176 and 1798.170, Health and Safety Code</p>
IRB	Internal Review Board
§ 100270.108. Local Emergency Medical Services Agency (LEMSA)	<p>The agency, department, or office having primary responsibility for administration of emergency medical services in a county or region and which is designated pursuant Health and Safety Code commencing with section 1797.200.</p> <p>Note: Authority cited: Sections 1797.107, 1797.200 and 1798.150, Health and Safety Code. Reference: Sections 1797.103 and 1797.176, Health and Safety Code.</p>
MOU	Memorandum of Understanding
NCDR	National Cardiovascular Data Registry
§ 100270.109. Percutaneous Coronary Intervention (PCI)	A procedure used to open or widen a narrowed or blocked coronary artery to restore blood flow supplying the heart, usually done on an emergency basis for a STEMI patient.

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	Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code. Reference: Sections 1797.103 and 1797.176, Health and Safety Code.
PHI	Protected Health Information
§ 100270.110. Quality Improvement (QI)	<p>Methods of evaluation that are composed of structure, process, and outcome evaluations that focus on improvement efforts to identify root causes of problems, intervene to reduce or eliminate these causes, and take steps to correct the process, and recognize excellence in performance and delivery of care.</p> <p>Note: Authority cited: Sections 1797.103, 1797.107, 1797.174, 1797.176 and 1798.150 Health and Safety Code. Reference: Sections 1797.174, 1797.202, 1797.204, 1797.220 and 1798.175, Health and Safety Code.</p>
RH	Referring Hospital
RN	Registered Nurse
ROSC	Return of Spontaneous Circulation
SCA	Sudden Cardiac Arrest
§ 100270.111. ST-Elevation Myocardial Infarction (STEMI)	<p>A clinical syndrome defined by symptoms of myocardial infarction in association with ST-segment elevation on Electrocardiogram (ECG).</p> <p>Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code. Reference: Sections 1797.103 and 1797.176, Health and Safety Code.</p>
§ 100270.112. STEMI Care	<p>Emergency cardiac care, for the purposes of these regulations.</p> <p>Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code. Reference: Sections 1797.103 and 1797.176, Health and Safety Code.</p>
§ 100270.113. STEMI Medical Director	<p>A qualified board-certified physician by the American Board of Medical Specialties (ABMS) as defined by the local EMS agency and designated by the hospital that is responsible for the STEMI program, performance improvement, and patient safety programs related to a STEMI critical care system.</p> <p>Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code. Reference: Sections 1797.103 and 1797.176, Health and Safety Code.</p>
§ 100270.114. STEMI Patient	A patient with symptoms of myocardial infarction in association with ST-Segment Elevation in an ECG.

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	Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code. Reference: Sections 1797.103, 1797.176 and 1797.220, Health and Safety Code.
§ 100270.115. STEMI Program	An organizational component of the hospital specializing in the care of STEMI patients. Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code. Reference: Sections 1797.103 and 1797.176, Health and Safety Code.
§ 100270.116. STEMI Program Manager	A registered nurse or qualified individual as defined by the local EMS agency, and designated by the hospital responsible for monitoring, coordinating and evaluating the STEMI program. Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code. Reference: Sections 1797.103 and 1797.176, Health and Safety Code.
§ 100270.117. STEMI Receiving Center (SRC)	A licensed general acute care facility that meets the minimum hospital STEMI care requirements pursuant to Section 100270.124 and is able to perform PCI. Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code. Reference: Sections 1797.103, 1797.176 and 1797.220, Health and Safety Code.
§ 100270.118. STEMI Referring Hospital (SRH)	A licensed general acute care facility that meets the minimum hospital STEMI care requirements pursuant to Section 100270.125. Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code. Reference: Sections 1797.103, 1797.176 and 1797.220, Health and Safety Code.
§ 100270.119. STEMI Critical Care System	A critical care component of the EMS system developed by a local EMS agency that links prehospital and hospital care to deliver treatment to STEMI patients. Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code. Reference: Sections 1797.103 and 1797.176, Health and Safety Code.
§ 100270.120. STEMI Team	Clinical personnel, support personnel, and administrative staff that function together as part of the hospital's STEMI program. Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code. Reference: Sections 1797.103 and 1797.176, Health and Safety Code.
TTM	Targeted Temperature Management (FKA: Therapeutic Hypothermia)

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V/F	Ventricular Fibrillation: life-threatening cardiac rhythm
V/T	Ventricular Tachycardia: life-threatening cardiac rhythm

This document is the STEMI Critical Care System Plan intended for submission to the EMS Authority for approval and in accordance with California Code of Regulations Title 22, Social Security Division 9, Prehospital Emergency Medical Services Chapter 7.1 ST-Elevation Myocardial Infarction Critical Care System: ARTICLE 2. LOCAL EMS AGENCY STEMI CRITICAL CARE SYSTEM REQUIREMENTS, § 100270.121. STEMI Critical Care System Plan.

NOTE: § 100270.121 (a) LEMSAs implementing a STEMI System of Care (b) develop a written STEMI System of Care plan. (c) A STEMI Critical Care System Plan submitted to the EMS Authority shall include, at a minimum, all of the following components:

- (1) The names and titles of the local EMS agency personnel who have a role in a STEMI critical care system.
- (2) The list of STEMI designated facilities with the agreement (MOU) expiration dates.
- (3) A description or a copy of the local EMS agency's STEMI patient identification and destination policies.
- (4) A description or a copy of the method of field communication to the receiving hospital specific to STEMI patient, designed to expedite time-sensitive treatment on arrival.
- (5) A description or a copy of the policy that facilitates the inter-facility transfer of a STEMI patient.
- (6) A description of the method of data collection from the EMS providers and designated STEMI hospitals to the local EMS agency and the EMS Authority.
- (7) A policy or description of how the local EMS agency integrates a receiving center in a neighboring jurisdiction.
- (8) A description of the integration of STEMI into an existing quality improvement committee or a description of any STEMI specific quality improvement committee.
- (9) A description of programs to conduct or promote public education specific to cardiac care.
- (f) The local EMS agency currently operating a STEMI critical care system implemented before the effective date of these regulations, shall submit to the EMS Authority a STEMI Critical Care System Plan as an addendum to its next annual EMS plan update, or within 180-days of the effective date of these regulations, whichever comes first.
- (g) After approval of the STEMI Critical Care System Plan, the local EMS agency shall submit an update to the plan as part of its annual EMS update, consistent with the requirements in §100270.122.

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STEMI SYSTEM OF CARE SUMMARY

Section 1. Introduction/Background/MOU

Alameda County EMS began to establish a countywide STEMI System of Care in 2004 by implementing 12-lead electrocardiograms by paramedics in the out-of-hospital setting. In 2005, with only one PCI-capable hospital located in the north of Alameda County, paramedics recognizing a possible STEMI patient by 12-lead ECG acquisition, transported to the geographically desirable and only STEMI Receiving Center (SRC) at that time which only served approximately 25% of the county's EMS catchment. In 2006, three more receiving hospitals within the county became PCI capable and by January of 2007 ALCO EMS was transporting ALL suspected STEMI patients too one of the four designated SRCs.

The first MOUs were executed between ALCO EMS and the four existing SRCs in 2012 and by 2013; two more SRCs were designated as specialty centers of care for STEMI. 2013 also marked the beginning of the STEMI/Cardiac Arrest Receiving Center (SRC/CARC). This model was developed and contractually executed by ALCO EMS, since many STEMI patients also suffer out-of-hospital cardiac arrest (OHCA) and others suffering cardiac arrest require the same specialty services offered by the SRC. Currently, seven high performing SRC/CARCs exist by contractual agreement as an important part of ALCO EMS's integrated specialty system of care for STEMI and Cardiac Arrest today.

The initial purpose of developing a STEMI system was to ensure preparation, timely response and definitive care for people that present with STEMI in Alameda County. A decade and a half later, the goal and objectives remain unchanged. The many changes influencing the health care delivery systems in the United States over the years have not had any negative impact on the STEMI system within the County. The fact is, the desire of hospitals and geographic needs of the community have supported the increase for more STEMI Receiving Centers over the past fifteen years. The fundamental components of the STEMI system design remain intact and continue to improve performance and meet the needs of the residents and visitors to Alameda County.

Section 2. ALCO EMS Design/Administration

Alameda County is approximately 739 square miles of land and 82 of water, located in the center of the San Francisco Bay Area, with a diverse demographic and socioeconomic population of 1.6 million. The EMS system design and configuration consists of a countywide Advanced Life Support (ALS) model for first responders and transport: five First Responder ALS (FRALS) Fire Departments, four ALS Transport

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Fire Departments with FRALS, one private ALS transport provider agency and one Basic Life Support (BLS) First responder Fire Department.

Within the county, currently thirteen hospitals exist as emergency receiving centers for ambulance transport: 12 adult and 1 pediatric. Of the twelve adult hospitals, seven are LEMSA designated SRC/CARCs with three having Cardiovascular Surgical Services but none being ECMO capable at this time.

The EMS Agency is responsible for oversight of the countywide STEMI System of Care including operations, performance, quality improvement, administration and compliance monitoring of designated SRC/CARC MOUs. ALCO EMS leadership consists of the Director – Lauri McFadden, Deputy Director – William McClurg, Medical Director – Karl Sporer MD and EMS Coordinator (Specialty Systems of Care) – Michael Jacobs, Paramedic.

Section 3. ALCO EMS Designated STEMI Receiving Centers/MOU

Currently Alameda County EMS has designated seven STEMI Receiving Centers (SRC) that also function as Cardiac Arrest Receiving Centers (CARC) under the existing MOU:

• Alameda Health System Highland Hospital -(Oakland)	MOU Expiration-12/31/2019
• Alta Bates Summit Medical Center -(Oakland)	MOU Expiration-12/31/2019
• Kaiser Permanente -(Fremont)	MOU Expiration-12/31/2019
• Kaiser Permanente -(Oakland)	MOU Expiration-12/31/2019
• St. Rose Hospital -(Hayward)	MOU Expiration-12/31/2019
• Stanford Health Care Valley Care Medical Center -(Pleasanton)	MOU Expiration-12/31/2019
• Washington Hospital Health System -(Fremont)	MOU Expiration-12/31/2019

Section 4. STEMI Identification and Destination Policy/Protocol

The identification of a suspected STEMI starts in Dispatch: below are both Medical Priority Dispatch CARD 10 for Chest Pain / Discomfort and ALCO EMS Field Assessment / Treatment Protocol for Chest Pain Suspected Cardiac/STEMI. These decision pathways and protocols address and comply with § 100270.123. EMS Personnel and Early Recognition.

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1. Is s/he **completely alert** (responding appropriately)?
2. Is s/he **breathing normally**?
 - a. **(No and Alert)** Does s/he have **difficulty** speaking/crying **between** breaths?
3. **(Not 1st party)** Is s/he **changing color**?
 - a. **(Yes)** Describe the color change.
4. Is s/he **clammy** or having **cold sweats**?
5. Has s/he ever had a **heart attack** or **angina** (heart pains)?
6. Did s/he take any **drugs** or **medications** in the **past 12 hours**?

Cocaine (or derivative)
Medications

- a. I'm sending the **paramedics** (ambulance) to help you now. **Stay on the line** and I'll tell you **exactly** what to do next.
- b. **(≥ 1 + D-1, 2, 3)** If there is a **defibrillator** (AED) available, **send** someone to get it **now** in case we need it later.
- c. **(Patient medication requested and Alert)** Remind her/him to do what her/his **doctor has instructed** for these situations.

* **Stay on the line** with the caller if her/his condition seems **unstable** or is **worsening**.
* Utilize the Aspirin Diagnostic & Instruction Tool – **if authorized** by local Medical Control **and** the chest pain/discomfort (Heart Attack Symptoms) patient is **alert**, **≥ 16 years old**, and has **no reported STROKE symptoms**.

DLS * Link to ☎ X-1 unless: ↩

Unconscious — NABC-1
INEFFECTIVE BREATHING and Not alert — NABC-1

LEVELS	#	DETERMINANT DESCRIPTORS	CODES	RESPONSES	MODES
D	1	Not alert	10-D-1		
	2	DIFFICULTY SPEAKING BETWEEN BREATHS	10-D-2		
	3	CHANGING COLOR	10-D-3		
	4	Clammy or cold sweats	10-D-4		
	5	Heart attack or angina history	10-D-5		
C	1	Abnormal breathing	10-C-1		
	2	Cocaine	10-C-2		
	3	Breathing normally ≥ 35	10-C-3		
A	1	Breathing normally < 35	10-A-1		

- Unable to **complete a full sentence** without taking a breath
- Only able to **speak a few words** without taking a breath
- Breathing attempts that **severely hinder** crying in infants and small children

CHANGING COLOR

Changing colors of **clinical significance** include:

- Ashen/Gray
- Blue/Cyanotic/Purple
- Mottled

(Pale, pink, and red are not colors of clinical significance in the dispatch environment and will not, alone, change the dispatch priority. Callers failing to initially identify a listed color should not be coached by asking unlisted clarifiers such as "Well, is s/he gray?")

Rules

1. Patients with a history of **angioplasty, coronary artery stents, or bypass surgery** are considered to have a **history of heart attack or angina** in the dispatch environment.
2. When the complaint description involves **both NON-TRAUMATIC chest pain/heart attack symptoms and breathing problems**, choose the Chief Complaint Protocol that best fits the patient's **foremost symptom**, with **ECHO-level conditions** taking precedence. **(≥ 16, alert, no reported STROKE symptoms)** Use the Aspirin Diagnostic & Instruction Tool on either protocol as appropriate.
3. A patient having a **heart attack may worsen at any time**. Always advise to call back if condition worsens.

proven otherwise.

5. If the **caller asks** whether the patient should be given their medication now, the EMD should **only give instructions included in the protocol**.
6. Chest pain **due to trauma** (current or non-recent) should be **handled on Protocol 30**.
7. If the complaint description involves **both chest pain and STROKE symptoms**, go to **Protocol 10** but **do not utilize** the Aspirin Diagnostic & Instruction Tool.

First Law of Chest or Back Pain

"Hurts to breathe" is not considered difficulty or abnormal breathing.

Second Law of Chest Pain

A little chest pain may be as bad as a lot.

Axioms

1. Patients with a history of **angioplasty, coronary artery stents, or bypass surgery** may **not** have actually had a **heart attack** (myocardial infarction). However, since these patients suffer from coronary artery disease, they have a **greater risk of a heart attack** than the general population.
2. True heart attacks are **uncommon in females < 45 and males < 35**.
3. Medical Dispatch may consider heart attack (and an ALS CHARLIE response) in certain patients < 35 when the **symptoms listed in Heart Attack Symptoms strongly suggest** the possibility.
4. Automated external defibrillators (AEDs) might also be called **"shock boxes."** Other local names may be used.

accompanied by STROKE symptoms due to the possibility of acute aortic dissection involving concurrent coronary and carotid artery damage.

Heart Attack Symptoms

EMDs may initially receive non-specific complaints in heart attack cases. Due to patient denial or caller confusion, the following **symptoms may not be recognized as a heart attack**:

- Aching pain
- Chest pain/discomfort (now gone)
- Constricting band
- Crushing discomfort
- Heaviness
- Numbness
- Pressure
- Tightness

While these symptoms are most common in the **chest**, they may also (or only) be present in the **arm(s), jaw, neck, or upper back**. These symptoms should be considered **equivalent to chest pain** and **handled on Protocol 10**.

Thrombolytic and PCI Therapy

Thrombolytic therapy is the use of drugs such as tissue Plasminogen Activator (t-PA) and Streptokinase to break down blood clots.

Percutaneous Coronary Intervention (PCI) therapy is an invasive technique to reopen blocked arteries. These are **critical, time-dependent therapies** for patients suffering from a developing heart attack. EMD is a vital first link in the chain of survival for these patients, as early recognition and rapid treatment are essential.

Procedures: EKG - 12 LEAD Modified May 26, 2016

INTRODUCTION: 12-lead electrocardiograms (EKGs) are used with a variety of patients and should be used with a number of patient care policies (e.g., ALOC ([page 33](#)), Chest Pain/MI ([page 37](#)), and CHF/ Pulmonary Edema ([page 43](#)). Treatment under these policies should proceed in conjunction with the application of the 12-lead EKG. Our goal is to incorporate the 12-lead EKG into our destination decision-making process with regard to the ST-elevation MI (STEMI) patient. The transmission or reporting of the ST-elevation MI should decrease “door-to-intervention” times in our community hospitals.

Approved STEMI Centers are:

STEMI Centers	ED Phone Number
Kaiser Walnut Creek(Out of County)	(925) 939-1788
Kaiser Fremont	(510) 248-5011
Kaiser Oakland	(510) 752-8869
Alameda Health System-Highland	(510) 535-6000
San Ramon MC (Out of County)	(925) 275-8338
St. Rose Hospital	(510) 264-4251
Summit Medical Center	(510) 869-8797
Valley Care Medical Center	(925) 416-6518
Washington Hospital	(510) 608-1367

Only ALS personnel who are employed by an agency with an approved 12-lead EKG program and who have received the required training may perform a 12-lead EKG. [See 12-LEAD EKG PROGRAM (#4210) in the Administrative Manual for training and program requirements]. 12-lead EKG is required for ALS transport providers.

1. INDICATIONS: Any patient with known or suspected Acute Coronary Syndrome (ACS)

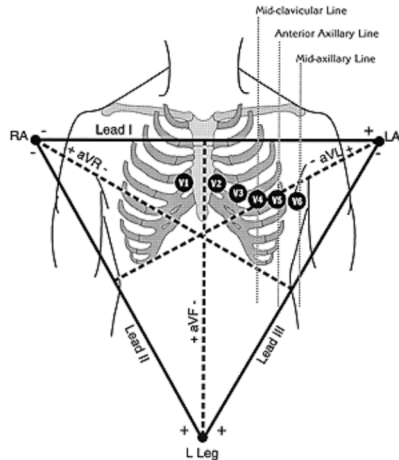
- ▶▶ chest pain
- ▶▶ discomfort or tightness radiating to the jaw, shoulders or arms
- ▶▶ nausea
- ▶▶ ROSC
- ▶▶ diaphoresis
- ▶▶ dyspnea
- ▶▶ anxiety
- ▶▶ syncope/dizziness
- ▶▶ other “suspicious symptoms”
- ▶▶ known treatment for ACS

2. EKG CRITERIA FOR STEMI: convex, “tombstone,” or flat ST segment elevation in two or more contiguous leads. Use the machine reading “acute MI” or the equivalent, as the principal determinant for STEMI assessment.

3. PROCEDURE:

3.1 Attach EKG leads to the patient (limb leads to the upper arms and Ankles, and six chest leads). Perform an EKG as indicated.

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- ▶▶ V1: right 4th intercostal space
- ▶▶ V2: left 4th intercostal space
- ▶▶ V3: halfway between V2 and V4
- ▶▶ V4: left 5th intercostal space, mid-clavicular line
- ▶▶ V5: horizontal to V4, anterior axillary line
- ▶▶ V6: horizontal to V5, mid-axillary line
- ▶▶ V4R: right 5th intercostal space, mid-clavicular line (use in all suspected inferior MIs)

3.2 If the EKG machine is reading “Acute MI” or the equivalent, or definite new left bundle branch block, immediately transmit the EKG and notify the STEMI Receiving Center. Use the machine reading as the principal determinant for STEMI assessment. Use your clinical judgment for situations outside of those listed above

3.3 Include the following information in your report:

- ▶▶ Age and sex
- ▶▶ Interpretation of the 12-lead EKG (leads, amount of ST elevation in millimeters, “confidence” in your 12-lead assessment)
- ▶▶ Location of reciprocal changes (if applicable)
- ▶▶ Symptoms (including presence or absence of chest pain)
- ▶▶ Presence of new left bundle branch block. Presence of imposters (early repolarization left bundle branch block, left ventricular hypertrophy, pericarditis or paced rhythms).
- ▶▶ Significant vital signs and physical findings
- ▶▶ Time of onset
- ▶▶ Estimated time of arrival to receiving STEMI Receiving Center

3.4 Transport patients with ST elevation in two or more contiguous leads and symptoms of ACS to the closest, most appropriate STEMI Receiving Center. Personnel should consider traffic and weather conditions, as well as the patient’s choice of facility or physician

3.5 Attach a copy of the EKG to the hospital copy and the file copy of the PCR

3.6 Serial 12-lead EKGs, en route, are required in patients with strong symptomology and are encouraged in all other patients

3.7 Follow your agency’s procedure for QI purposes

Section 5. Field Electrocardiogram (ECG) Transmission/Communication to SRC

The below technologies address and comply with § 100270.123. EMS Personnel and Early Recognition.

- 5.1 All ALS Paramedic units are equipped with a cardiac monitor that is 12-lead and transmission capable. Early 12-lead acquisition, identification and transmission of a suspected STEMI to a SRC is strongly encouraged and re-enforced to EMS field personnel through education and training. The early transmission allows for further scrutiny by the SRC ED Physician and on-call cardiology if needed. The early notification by 12-lead transmission also allows the SRC time to mobilize and or re-appropriate resources for patient flow.
- 5.2 An ALCO EMS designated SRC shall have the electronic ability (computer and software) to receive diagnostic quality 12-lead ECG's transmitted by prehospital personnel prior to suspected STEMI patient arrival at that SRC/CARC (not to be used for consult, unless SRC/CARC is an approved EMS Base Station).
- 5.3 Radio ring down from transporting ambulance as soon as possible for early PSRC notification.
- 5.4 Designated priority telephone line to be used by prehospital personnel to contact the SRC/CARC regarding patients with suspected STEMI that are being transported to that facility for potential intervention.

Section 6. STEMI Inter-Facility Transfer (IFT) Policy/Protocol

ALCO EMS designated SRC/CARC shall have a plan for emergency transport to a facility capable of ECMO and or Cardiovascular Surgery (cardiopulmonary bypass) that describes steps for timely transfer. A paramedic-staffed ALS ambulance using the 911 system for emergent transfers is strongly recommended, even for patients that require interventions that are out of scope of practice for paramedics. In these cases, a nurse from the transferring center shall accompany the patient and manage the intervention/therapy that is out of paramedic scope of practice: tpA/tnK infusion, infusion for blood pressure control or IABP. A non-911 Critical Care Transport (CCT) ambulance can also be used if appropriate and timely. If 911 EMS ALS ambulance is used, the ALCO EMS Policy shall apply:

Operations: INTERFACILITY TRANSFERS, Modified On: July 24, 2018

Note: This policy pertains to emergency transfers to a higher level of care that come through the 9-1-1 system. See "Scheduled Interfacility Transfers Using Paramedic Personnel" (policy #4605 Administration Policy Manual) for more information.

1. All patient care rendered by prehospital care personnel must be within the defined scope of practice according to Title 22 and Alameda County EMS protocols
2. A paramedic may only take orders from a base hospital physician. (See 5.2 below) There are no provisions for an EMT to take orders from a physician
3. EMT-Bs may only transfer a patient without an emergency medical condition; or, with an emergency medical condition that has been stabilized and has no potential (within reasonable probability) to deteriorate en route
4. Paramedics (in addition to 3) may only transport a patient who has not been stabilized to a facility that provides a higher level of care. The transferring physician must determine if the care that may be required during transport is within the scope of practice of a paramedic. If not, appropriate hospital staff and/or equipment should be sent with the patient
5. Base Contact by Paramedics
 - 5.1 Base Contact is required prior to transport if the transferring physician orders any ALS treatment and/or the patient has not been stabilized

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5.2 Paramedics may follow transferring physician's written orders ONLY when 1) the transferring physician speaks to the Base Physician, and they mutually agree on the course of treatment; 2) the proposed treatment plan is within the paramedic's scope of practice

5.3 Base Physician contact shall be made:

►► When there is a request to transfer a patient to a higher level of care facility that is not the "closest, most appropriate" higher level of care facility.

5.4 Base Contact is not required if the patient is stable and no ALS treatment has been ordered by the transferring physician. If the patient's condition changes during transport, see the appropriate patient care policy and treat accordingly

6. Base Contact may be made anytime a paramedic has a question regarding patient condition, destination and/or the appropriateness of the transfer

7. An Alameda County Unusual Occurrence (U.O.) form should be completed for any problem-oriented interfacility transfers. The U.O. form should be sent to the EMS office for review. [See Administration Manual UNUSUAL OCCURRENCES (#2300)]

8. Refer to "Interfacility Transfer Guidelines" [see Administration Manual INTERFACILITY TRANSFER GUIDELINES (# 5600)] for transfer approval process

Section 7. EMS/SRC Data Collection, Analysis and Reporting

(a) ALCO EMS agency implemented a standardized data collection and reporting process for a STEMI critical care system over a decade ago.

(b) The STEMI Critical Care System includes the collection of both prehospital and hospital patient care data, as determined by ALCO EMS agency and complies with § 100270.126.

(c) The prehospital STEMI patient care elements selected by ALCO EMS are compliant with the most current version of the California EMS Information Systems (CEMSIS) database, and the National EMS Information System (NEMSIS) via ESO Electronic Patient Care Report (ePCR).

(d) All SRCs that receive STEMI patients via ALCO EMS currently participate in the data collection process in accordance with ALCO EMS policies and procedures.

(e) The prehospital care record and the hospital data elements are collected by the ALCO EMS agency, and are subsequently submitted to the California EMS Authority. This will be on no less than a quarterly basis and shall include, but not be limited to, the following:

(1) The STEMI patient data elements:

- (A) EMS ePCR Number
- (B) Facility
- (C) Name: Last, First
- (D) Date of Birth
- (E) Patient Age
- (F) Patient Gender
- (G) Patient Race
- (H) Hospital Arrival Date
- (I) Hospital Arrival Time
- (J) Dispatch Date
- (K) Dispatch Time
- (L) Field ECG Performed
- (M) 1st ECG Date
- (N) 1st ECG Time
- (O) Did the patient suffer out-of-hospital cardiac arrest

ALCO EMS STEMI CRITICAL CARE SYSTEM PLAN

- (P) CATH LAB Activated
- (Q) CATH LAB Activation Date
- (R) CATH LAB Activation Time
- (S) Did the patient go to the CATH LAB
- (T) CATH LAB Arrival Date
- (U) CATH LAB Arrival Time
- (V) PCI Performed
- (W) PCI Date
- (X) PCI Time
- (Y) Fibrinolytic Infusion
- (Z) Fibrinolytic Infusion Date
- (AA) Fibrinolytic Infusion Time
- (BB) Transfer
- (CC) SRH ED Arrival Date
- (DD) SRH ED Arrival Time
- (EE) SRH ED Departure Date
- (FF) SRH ED Departure Time
- (GG) Hospital Discharge Date
- (HH) Patient Outcome
- (II) Primary and Secondary Discharge Diagnosis

(2) The STEMI System data elements:

- (A) Number of STEMI treated
- (B) Number of STEMI patients transferred
- (C) Number and percent of emergency department STEMI patients arriving by private transport (non-EMS)
- (D) The false positive rate of EMS diagnosis of STEMI, defined as the percentage of STEMI alerts by EMS that did not show STEMI on ECG reading by the emergency physician

(3) In addition and further specified in Exhibit A, an SRC shall collect on-going aggregate data (de-identified) for patients below, submit and present to Alameda County Emergency Medical Services for quarterly and annual review:

- a) Number of patients identified with possible STEMI transported from the field by EMS for intervention
- b) Number of patients who received primary PCI
- c) Number of patients identified with possible STEMI, transferred (IFT) by EMS from another acute care hospital ED (RH) to SRC for intervention
- d) Number of patients who received primary PCI (IFT)
- e) Number of SRC walk-in patients identified in ED with possible STEMI
- f) Number of patients (walk-in) who received primary PCI
- g) For ALL STEMI patients door-to-infusion time (median) for fibrinolysis; and, door-to-intervention time (median) for primary PCI. (EMS, IFT by EMS, SRC walk-in)
- h) Provide data to the National Cardiovascular Data Registry (NCDR) using CathPCI and or American Heart Association (AHA) Get with the Guidelines Coronary Artery Disease (GWTG CAD) database
- i) Provide ALCO EMS non-specific, de-identified, aggregate NCDR rolling quarterly data via Executive Summary report
- j) PCI volumes (number)/year by Cardiologist (de-identified)

Section 8. Regional SRC Integration

ALCO EMS includes surrounding county representatives from both EMS and SRCs to Alameda County's STEMI/Cardiac Arrest System QI Meetings and attends out-of-county STEMI System meetings.

ALCO EMS supports the transport of suspected STEMI patients to out-of-county SRCs if appropriate:

"Consider transport to one of the following out-of-county centers, if appropriate. Contact the STEMI center prior to transport."

San Ramon Medical Center, San Ramon (925) 275-8338
Kaiser Hospital, Walnut Creek (925) 939-1788

Section 9. Continued Quality Oversight and Improvement Strategies

The STEMI system quality improvement process was established by Alameda County EMS and includes contractual participation of ALL seven currently designated SRC/CARCs:

(a) ALCO EMS STEMI Critical Care System shall have a quality improvement process that complies with § 100270.127. Quality Improvement and Evaluation Process and includes, at a minimum but not limited to:

- (1) Evaluation of program structure, process, and outcome
- (2) Review of STEMI-related deaths, major complications, and transfers
- (3) A multidisciplinary STEMI Quality Improvement Committee, including both prehospital and hospital members
- (4) Participation in the QI process by all designated STEMI centers and prehospital providers involved in the STEMI critical care system
- (5) Evaluation of regional integration of STEMI patient movement
- (6) Compliance with the California Evidence Code, Section 1157.7 to ensure confidentiality, and a disclosure-protected review of selected STEMI cases

(b) ALCO EMS agency is responsible for on-going performance evaluation and quality improvement of the STEMI critical care system by continuing the following strategies that satisfy (1-6) in this section. Criteria for reviews, evaluations and benchmarking are referenced and compared to current evidence-based guidelines and recommendations for recognized standards in STEMI care: the American Heart Association (AHA) and the American College of Cardiology (ACC) described and detailed in EXHIBIT A.

9.1 STEMI/Cardiac Arrest Receiving Center Program staff shall participate in Alameda County EMS quarterly SRC/CARC QI Committee meetings, with a minimum attendance requirement of two/year.

9.2 Hospital shall maintain a written internal quality improvement plan for STEMI, Cardiac Arrest and Post Cardiac Arrest patients that includes, but is not limited to the determination and evaluation of:

- a) Death rate
- b) Complications
- c) Sentinel events

- d) System issues
- e) Organizational issues and resolution processes

9.3 Hospital shall support EMS Agency QI activities including educational activities for prehospital personnel.

Section 10. Cardiovascular (CV) Public Education/Awareness Strategies

For the past five years, the ALCO EMS STEMI system has worked collaboratively with the Via Heart Project in an effort to improve public awareness in both adolescent and adult populations, regarding the signs and symptoms of Acute Coronary Syndromes. The strategy used for this community outreach initiative has been through co-sponsoring "Screen a Teen" heart screening. These events use personnel from fire, EMS and SRCs to take and review medical histories, measure height and weight, take blood pressures, teach CPR and AED, acquire and review 12-lead electrocardiograms, acquire and review echocardiograms as well as help identify any electrical and/or structural abnormalities found. ALCO EMS also offers a monthly new provider orientation as a venue for SRC staff to provide EMS STEMI education to field personnel.

EXHIBIT- A

**Emergency Medical Services
STEMI/Cardiac Arrest Receiving Center
Agreement**

County of Alameda

And

“STEMI/Cardiac Arrest Receiving Center”

Effective Date: January 1, 2017

Alameda County STEMI/Cardiac Arrest Receiving Center Agreement

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DEFINITIONS AND ACRONYMS

AED	Automated External Defibrillator
AICD	Automated Implantable Cardioverter-Defibrillator
ALCO	Alameda County
BHDE	Bidirectional Healthcare Data Exchange
CABG	Coronary Artery Bypass Graph
CARC	Cardiac Arrest Receiving Center: A comprehensive cardiac care center that is able to offer needed basic and advanced life support: Cardiopulmonary Resuscitation and Post Resuscitation Care: Therapeutic Hypothermia, Emergent Primary Coronary Interventions (PCI), Metabolic Support and Rehabilitation to patients suffering from Cardiopulmonary arrest.
CARES	Cardiac Arrest Registry to Enhance Survival
CCU	Coronary Care Unit
CCT	Critical Care Transport
CPC	Cerebral Performance Category
ECMO	Extracorporeal Membrane Oxygenation
ECG	Electrocardiogram
EEG	Electroencephalogram
ED	Emergency Department
EMS	Emergency Medical Services
HIPAA	Health Insurance Portability and Accountability Act

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HITECH	Health Information Technology for Economic and Clinical Health Act
ICD	Implantable Cardiac Defibrillator
ICU	Intensive Care Unit
IFT	Interfacility transfer
IRB	Internal Review Board
NCDR	National Cardiovascular Data Registry
PCI	Percutaneous Coronary Interventions encompasses a variety of procedures used to treat patients with diseased arteries of the heart, most commonly called angioplasty.
PHI	Protected Health Information
QI	Quality Improvement
RH	Referring Hospital
RN	Registered Nurse
ROSC	Return of Spontaneous Circulation
SCA	Sudden Cardiac Arrest
STEMI	An acronym meaning "ST segment Elevation Myocardial Infarction," which is a type of heart attack. This is determined by an electrocardiogram (ECG) test. In a STEMI, the coronary artery is completely blocked off by the blood clot, and as a result virtually all the heart muscle being supplied by the affected artery starts to die.
SRC	STEMI Receiving Center (<i>formerly Cardiac Receiving Center</i>)- designation by Alameda County for patients transported via the 9-1-1 system with ST-elevation myocardial infarction (STEMI) who may benefit by rapid assessment and percutaneous coronary interventions (PCI)
TTM	Targeted Temperature Management (FKA: Therapeutic Hypothermia)

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V/F	Ventricular Fibrillation: life threatening cardiac rhythm
V/T	Ventricular Tachycardia: life threatening cardiac rhythm

Section 1 - Introduction

- 1.1 Alameda County is designated as the Local Emergency Medical Service Agency (LEMSA) as defined in the California Health and Safety Code Division 2.5, Section 1797.94 responsible for establishing policies and procedures within its jurisdiction.
- 1.2 This Agreement, dated as of the first day of January, 2016, is by and between the COUNTY OF ALAMEDA, hereinafter referred to as the "COUNTY", and Alameda County SRC/CARC, hereinafter referred to as the "Contractor".
- 1.3 Whereas, COUNTY, in consideration of the County's designation of Contractor as a STEMI (S-T Elevation Myocardial Infarction) and Cardiac Arrest Receiving Center (SRC/CARC) as described in this document. Contractor shall perform the services identified in this agreement without interruption, 24 hours per day, 7 days per week, 52 weeks per year for the full term of this Contract, as set forth in Exhibit A. Exceptions would include, the lack of technology (equipment) available to perform the procedure: catastrophic plant failure or pre-planned scheduled maintenance.
- 1.4 Whereas, Contractor is professionally qualified to provide such services and is willing to provide same to COUNTY.
- 1.5 Now, therefore it is agreed that COUNTY does hereby designate Contractor to provide STEMI and Cardiac Arrest Resuscitation and Post-Resuscitation Services, and Contractor accepts such designation as specified in this Agreement, and the following described exhibits, all of which are incorporated into this Agreement by this reference:
- Exhibit A
- Exhibit B
- Exhibit C
- 1.6 The parties hereby execute this single agreement which will constitute formal designation of Contractor as a STEMI/Cardiac Arrest Receiving Center within the Alameda County EMS system under Health & Safety Code Sections 1797.67 and 1798.170 et seq.

Section 2 - Term

- 2.1 The term of this Agreement shall be from January 1, 2016 through December 31, 2019.

- 2.2 Designation will be for a three-year period of time. The current designation period expires December 31, 2019, at which time contractor shall submit a new SRC/CARC application and provide supporting documentation that reflects compliance with current requirements as approved by ALCO EMS.

Section 3 - Services

- 3.1 Contractor shall provide hospital and personnel services as described in Exhibit A, data collection and reporting requirements, as described in Exhibits A and B, quality improvement requirements as described in Exhibit A. Contractor shall participate in an annual review and adhere to compliance standards as described in Exhibit A. For initial EMS approval, Contractor shall complete and submit a SRC/CARC Application as described in Exhibit C. (EMS Policies and protocols for the ALCO SRC/CARC programs will be reviewed and revised as needed).

Section 4 - Required Reports

- 4.1 Contractor shall provide identified data (performance and clinical outcome), specified in Exhibit B (B3-4), for individual EMS transported patients with suspected STEMI and or Cardiac Arrest and Post Cardiac Arrest. Patient specific EMS STEMI and Cardiac Arrest Activation / IFT Follow-Up data must be sent to ALCO EMS and CARES as soon as possible or within 30 calendar days of receipt of request , and must include ALL:
- EMS transported STEMI patients
 - EMS transferred patients from RH for STEMI and or Post-Cardiac Arrest care.
 - EMS Cardiac Arrest and Post Cardiac Arrest patients
- 4.2 Contractor shall submit aggregate data reports (performance and clinical outcome) in the format and timeline established by the EMS Agency in Exhibit B (B1-2)

Section 5—Notices

Alameda County STEMI/Cardiac Arrest Receiving Center Agreement

Contract No. _____

All notices regarding this Agreement shall be in writing and correspondence shall be addressed as follows:

To the EMS Agency: Alameda County Emergency Medical Services (EMS)

Attention: EMS Director

1000 San Leandro Blvd. #200

San Leandro California, 94577

To the Contractor: SRC/CARC

Attention: *Insert Contact (s)*

Contract No. _____

Section 6 - Signatory

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

COUNTY OF ALAMEDA

By: _____

Signature

Name: _____

(Printed)

Title: _____

Approved as to Form:

By: _____

Scott Dickey, Deputy County Counsel

CONTRACTOR

By: _____

Signature

Name: _____

(Printed)

Title: _____

Date: _____

By signing above, signatory warrants and represents that he/she executed this Agreement in his/her authorized capacity and that by his/her signature on this Agreement, he/she or the entity upon behalf of which he/she acted, executed this Agreement.

EXHIBIT A – SCOPE OF SERVICES

1. SCOPE OF SERVICES

Contractor shall:

- 1.1 Provide all services, equipment, and personnel including maintenance of adequate staffing levels, equipment, and facilities according to STEMI/Cardiac Arrest Receiving Center designation criteria which is described in Exhibit A.
- 1.2 Accept all Alameda County EMS patients triaged as having a suspected STEMI and or suffer from Cardiac Arrest and transported to Contractor's facility and provide appropriate medical management for said patients without regard to the race, color, national origin, religious affiliation, age, sex, or ability to pay.

2. HOSPITAL SERVICES

Contractor shall keep in effect the following:

- 2.1 Licensure under California Health and Safety Code Section 1250 et seq.
 - 2.2 Permit for Basic or Comprehensive Emergency Medical Services pursuant to the provisions of Title 22, Division 5, of the California Code of Regulations,
 - 2.3 Cardiac Catheterization Laboratory as a supplemental service pursuant to the provisions of Title 22, Division 5, of the California Code of Regulations,
 - 2.4 Intra-aortic balloon pump capability with necessary staffing available,
 - 2.5 Electronic ability (computer and software) to receive diagnostic quality 12-lead ECG's transmitted by prehospital personnel prior to suspected STEMI patient arrival at that SRC/CARC (not to be used for consult, unless SRC/CARC is an approved EMS Base Station),
 - 2.6 Designated priority telephone line to be used by prehospital personnel to contact the SRC/CARC regarding patients with suspected STEMI that are being transported to that facility for potential intervention,
 - 2.7 Cardiovascular Surgery availability.
 - 2.7.1 California permit for cardiovascular surgery; or,
 - 2.7.2 A plan for emergency transport to a facility with cardiovascular surgery available that describes steps for timely transfer (within 1 hour).
 - 2.8 Equipment and staffing to provide:
 - 2.8.1 Resuscitation for cardiopulmonary arrest including mechanical options.
 - 2.8.2 Targeted Temperature Management (TTM) in ED and ICU 24/7.
 - 2.8.3 Emergent PCI 24/7.
 - 2.8.4 Post-resuscitation care for cardiac arrest (uniform approach).
 - 2.8.5 Ventilator support/strategies.
-

Alameda County STEMI/Cardiac Arrest Receiving Center Agreement

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- 2.8.6 EEG monitoring.
- 2.8.7 Cardiac arrest consultation service (to be determined).
- 2.8.8 Neurology Consultation (automatic/uniform).
- 2.8.9 Neurosurgical Consultation (automatic/uniform).
- 2.8.10 Organ Bank consultation (uniform approach);
- 2.8.12 Electrophysiology Consultation (automatic/uniform).
- 2.8.13 Social Work Consultation (automatic/uniform).
- 2.8.14 Inpatient physical and or occupational therapy (automatic/uniform).
- 2.8.15 Outpatient physical and or occupational therapy (patient specific).
- 2.8.16 Outpatient neurological rehabilitation.
- 2.8.17 Outpatient psychological services
- 2.8.18 CPR training: Professional, community and patient's family on discharge.

3. HOSPITAL PERSONNEL

Contractor shall provide program oversight staff and shall have available all staff necessary to perform optimal care for patients with STEMIs, including the following:

3.1 SRC Program Medical Director

3.1.1. Qualifications:

- Board Certified in Cardiology or Cardiothoracic Surgery,
- Board Certified in Interventional Cardiology (desired),
- Credentialed member of medical staff with privileges for primary percutaneous coronary intervention (PCI).

3.1.2. Responsibilities:

- Oversight of STEMI program patient care,
- Coordination of staff and services,
- Authority and accountability for quality and performance improvement,
- Participation in protocol development,
- Establish and monitor quality control, including Mortality and Morbidity, and,
- Participation in County STEMI QI Committee.

3.2 SRC Program Manager

3.2.1. Qualifications:

- STEMI patient / program experience (ED, ICU, CCU, Cath. Lab.).

3.2.2. Responsibilities:

- Supports SRC Medical Director Functions
- Acts as EMS-STEMI Program Liaison
- Assures EMS-Facility STEMI data sharing

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- Manages EMS-Facility STEMI QI activities
- Authority and accountability for QI/PI

3.3 CARC Program Medical Director

3.3.1 Qualifications:

- Board Certified in Emergency Medicine; or,
- Board Certified in Cardiology; or,
- Board Certified in Intensive Care / Critical Care, or Pulmonology.

3.3.2 Responsibilities:

- Oversight of CARC program patient care,
- Coordination of staff and services,
- Authority and accountability for quality and performance improvement,
- Participation in protocol development,
- Establish and monitor quality control, including Mortality and Morbidity, and,
- Participation in County SRC/CARC QI Committee.

3.4 CARC Program Manager

3.4.1 Qualifications:

- Cardiac Arrest and Post Cardiac Arrest patient experience (ED, ICU, CCU).

3.4.2 Responsibilities:

- Supports CARC Medical Director Functions
- Acts as EMS-CARC Program Liaison
- Assures EMS-Facility CARC data sharing
- Manages EMS-Facility CARC QI activities
- Authority and accountability for QI/PI

3.5 Physician Consultants - Hospital shall maintain a daily on-call roster of:

- 3.5.1 Cardiologist(s) with PCI privileges and evidence of training/experience in PCI including primary PCI.
- 3.5.2 Cardiovascular Surgeon(s) if cardiovascular surgery is a service provided by Hospital.
- 3.5.3 Intensivist(s) / Critical Care
- 3.5.4 Neurologist(s)
- 3.5.5 Neurosurgeon (s) if Neurosurgery is a service provided by Hospital.

3.6 Additional personnel:

- 3.6.1 Intra-aortic balloon pump technician(s) / staff,
- 3.6.2 Cardiac catheterization lab manager/coordinator
- 3.6.3 Appropriate cardiac catheterization nursing and support personnel.

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4. PERFORMANCE STANDARDS

- 4.1 Contractor shall strive to meet the following goals in caring for patients who present to Hospital with identified STEMI; Current evidence based recommendations regarding:
- Fibrinolysis within 30 minutes of ED arrival if administered.
 - PCI “Door-to-Intervention” time ≤90 minutes of ED arrival.
 - Facilitate emergent interfacility transfer (IFT) via 911 or Critical Care Transport (CCT) to next closest SRC, for those patients that can’t get to the cath-lab within 30 minutes of arrival or receive intervention ≤90 minutes.
- 4.2 Contractor shall strive to meet the current evidence-based recommendations in caring for patients who present to Hospital with Cardiac Arrest or Post-Cardiac Arrest:
- a) Resuscitation for cardiopulmonary arrest.
 - b) Post-resuscitation TTM.
 - c) Emergent cardiac catheterization for persistent/recurrent cardiac arrest and post cardiac arrest.
 - d) Hemodynamic/metabolic support and monitoring post cardiac arrest.
 - e) Prognostication post cardiac arrest interventions. This should include EEG monitoring for comatose patients.
 - f) Electrophysiology testing and AICD placement as appropriate.
 - g) Organ procurement/donation.
 - h) Rehabilitation: cardiac, physical, speech, occupational and others needed.
 - i) CPR training: Professional, community and hospital discharge (patient’s family).

5. HOSPITAL POLICIES AND PROCEDURES

Contractor shall develop and implement policies and procedures designed to see that patients presenting to Hospital with possible STEMI and or Cardiac Arrest/ Post cardiac Arrest receive appropriate care in a timely manner. Such internal policies shall include:

- 5.1 Definition of patients who shall receive emergent angiography and patients who shall receive emergent fibrinolysis, based on physician decision for individual patients.
- 5.2 Processes by which fibrinolytic therapy and PCI (including prompt activation of personnel) can be delivered rapidly to meet Performance Standards identified in this Contract:

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- 5.3 For hospitals without cardiovascular surgery services, written arrangements with a tertiary institution that provides for rapid transfer of patients for any required additional care, including elective or emergency cardiac surgery or PCI.
- 5.4 Standardized written agreements with referral hospitals by which the expeditious transfer and acceptance of STEMI and or Post-Cardiac Arrest patients can occur.
- 5.5 Development of a consistent TTM program with guidelines for patient selection within one year of the start of this contract.
- 5.6 Development of a consistent protocol for the appropriate use of emergency PCI for patients post cardiac arrest within one year of the start of this contract.
- 5.7 Development of a standardized order set or protocol for ED and ICU care for post ROSC patients within one year of the start of this contract.
- 5.8 Development of internal guidelines for an appropriate process and timing for neurologic prognostication of post cardiac arrest patients within one year of the start of this contract.
- 5.9 Development of the appropriate use of electrophysiology testing and placement of AICD for post cardiac arrest patients within one year of the start of this contract.
- 5.10 Sharing of EMS patient specific cardiac arrest outcome data with the Alameda County EMS Agency by participating in CARES at the start of this contract.
- 5.11 Required availability of at least ONE mechanical CPR device (preferably LUCAS device with radiolucent back plate to be used in Cath-lab if needed) in within six months of the start of this contract.
- 5.12 Development of a comprehensive cardiac arrest consultation service (for patient and family) within one year of the start of this contract.
- 5.13 During the term of this contract, a written agreement shall be established by the Contractor with at least one Bay Area hospital that agrees to provide ECMO service with timely response, treatment and transfer for patients that require this level of specialty critical care. This requirement shall terminate at such time as Contractor independently provides said service.

6. DATA COLLECTION AND REQUIRED REPORTS

- 6.1 As further specified in Exhibit B, Contractor shall collect on-going aggregate data (de-identified) for patients below, submit and present to Alameda County Emergency Medical Services for quarterly and annual review:
 - a) Number of patients identified with possible STEMI transported from the field by EMS for intervention.
 - b) Number of above patients who received primary PCI.

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- c) Number of patients identified with possible STEMI, transferred (IFT) by EMS from another acute care hospital ED (RH) to SRC for intervention.
 - d) Number of above patients who received primary PCI (IFT)
 - e) Number of SRC walk-in patients identified in ED with possible STEMI.
 - f) Number of above patients (walk-in) who received primary PCI.
 - g) For ALL STEMI patients door-to-infusion time (median) for fibrinolysis; and, door-to-intervention time (median) for primary PCI. (EMS, IFT by EMS, SRC walk-in)
 - h) Participate by providing data to the National Cardiovascular Data Registry (NCDR) using CathPCI or Action data bases.
 - i) Provide ALCO EMS non-specific, de-identified, aggregate NCDR rolling quarterly data via **Executive Summary** report.
- 6.2 Facilitate implementation of future data elements related to STEMI and Cardiac Arrest Resuscitation and Post-Resuscitation system performance improvement activities.
- 6.3 PCI volumes (number)/year by Cardiologist (de-identified).
- 6.4 Provide data for individual EMS transported patients with suspected STEMI and or Cardiac Arrest. Patient specific Follow-Up data must be sent to ALCO EMS as soon as possible or within 30 calendar days of previous months end, and must include ALL
- EMS transported STEMI patients
 - EMS transferred patients from RH for STEMI and or Post-Cardiac Arrest care.
 - EMS Cardiac Arrest and Post Cardiac Arrest patients
- 6.5 As further specified in Exhibit B, Contractor shall collect and provide CARES with the following cardiac arrest hospital outcome data that includes but not limited to current CARES hospital specific data elements:
- a) Emergency Department outcome
 - b) Was hypothermia care initiated/continued in the hospital?
 - c) Hospital outcome
 - d) Discharge from the hospital
 - e) Neurological outcome at discharge from hospital
 - f) Was final diagnosis acute myocardial infarction?
 - g) Coronary Angiography performed?

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- h) Was a cardiac stent placed?
 - i) CABG performed?
 - j) Was an ICD placed and/or scheduled?
- 6.6 Contractor shall allow the use of provided data for IRB approved clinical research without hospital identifiers.
- 6.7 The data further specified in Exhibits B1-4 shall be provided to the EMS Agency in the timeline and manner defined, until such time as a Bidirectional Healthcare Data Exchange (BHDE) network is established between County EMS and the SRC/CARC Contractor.
- 6.8 At some specific point in time (to be determined at the discretion of EMS) during the term of this MOU, the contractor will establish a Bidirectional Healthcare Data Exchange (BHDE) network with County EMS.
- 6.9 The cost to establish the BHDE network between County EMS and the Contractor shall be fairly shared by apportionment as agreed upon by both parties.
- 6.10 The BHDE network established between County EMS and the Contractor must be interoperable with other data systems, including the functionality to exchange electronic patient health information in real-time with other entities in an HL7 format.
- 6.11 The minimum requirements and capability of the BHDE network established between County EMS and the Contractor shall include but are not limited to:
- 6.11.1 Search a patient's health record for problems, medications, allergies, and end of life decisions to enhance clinical decision making;
 - 6.11.2 Alert the receiving hospital regarding the patient's status directly onto a dashboard in the emergency department to provide decision support;
 - 6.11.3 File the EMS Patient Care Report data directly into the patient's electronic health record for timely and longitudinal patient care documentation;
 - 6.11.4 Reconcile the electronic health record information including diagnoses and disposition back into the EMS patient care report for use in ensuring timely provider feedback and enhanced quality improvement strategies for the County EMS system.
- 6.12 Any access to, or exchange of, individually identifiable health information or protected health information shall comply with the requirements of the Health Insurance Portability and Accountability Act (HIPAA) and the Health Information Technology for Economic and Clinical Health Act (HiTECH).

7. QUALITY IMPROVEMENT

- 7.1 STEMI/Cardiac Arrest Receiving Center Program staff shall participate in Alameda County EMS quarterly SRC/CARC QI Committee meetings, with a minimum attendance requirement of two / year.

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- 7.2 Hospital shall maintain a written internal quality improvement plan for STEMI, Cardiac Arrest and Post Cardiac Arrest patients that includes, but is not limited to the determination and evaluation of:
- a) Death rate
 - b) Complications
 - c) Sentinel events
 - d) System issues
 - e) Organizational issues and resolution processes
- 7.3 Hospital shall support EMS Agency QI activities including educational activities for prehospital personnel.

8. COMPLIANCE

- 8.1 Contractor shall provide continuous Oversight for ALL sections as described in Exhibit A
- 8.2 Contractor shall advise/up-date EMS promptly regarding any changes to any section as described in Exhibit A.
- 8.3 Contractor shall participate in an annual review regarding modifications of any and compliance with ALL sections as described in Exhibit A.
- 8.4 Contractor shall comply with ALL sections as described in the Scope of Services (Exhibit A):
- Scope of services
 - Hospital services
 - Hospital personnel
 - Performance standards
 - Hospital policies and procedures
 - Data collection and required reports
 - Quality improvement
 - Compliance
- 8.5 Material failure by Contractor to comply with any section(s) as described in Exhibit A or B may result in the loss of EMS STEMI and or Cardiac Arrest/Post-Cardiac Arrest patients transported to contractor's SRC/CARC for potential intervention until compliance issue(s) is resolved.

9. COUNTY OBLIGATIONS

COUNTY agrees to:

- 9.1 Make electronic prehospital patient care records available to Contractor via computer for all STEMI and/or Cardiac Arrest patients taken by 911 ambulance to Contractor's facilities.

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9.2 Maintain the confidentiality of all patient information and data (includes de-identified data) provided by Contractor and use such information solely for the local EMS Agency's internal quality improvement, peer review and oversight functions as mandated/authorized by law. County also agrees to not identify Contractor by name in any aggregate report of the data or release any reports or data showing individual hospital performance unless agreed to by contractor or required by law. Notwithstanding anything in this Agreement to the contrary, the parties acknowledge and agree that Contractor shall not be required to disclose any patient information or other data to the COUNTY to the extent not otherwise permitted or required by law.

9.3 Provide to Contractor and/or the STEMI/CARC Quality Improvement Committee prehospital system data, including patient destination data, related to STEMI and Cardiac Arrest/Post- Cardiac Arrest care.

9.4 Meet and consult with Contractor prior to the adoption of any policy or procedure that concerns the administration of the STEMI and Cardiac Arrest/Post-Cardiac Arrest Care System, STEMI/Cardiac Arrest public education efforts or the triage, transport and treatment of STEMI/Cardiac Arrest/Post-Cardiac Arrest patients.

9.5 In order to improve quality of care, direct 911 ambulance transport providers to inform hospital of identification of patients determined to have STEMI and/or have experienced Cardiac Arrest prior to the patient's arrival at hospital.

9.6 Bring STEMI/Cardiac Arrest/Post-Cardiac Arrest patients to Contractor in accordance with County policies and procedures.

EXHIBIT B – DATA ELEMENTS

As set forth in Section 4 of the Agreement, Contractor shall provide the specified data elements in the formats established by the EMS Agency and included in this Exhibit B: (B-1, B-2, B-3, B-4, etc.)

As specified in Section 6 of Exhibit A to the Agreement:

B-1

Contractor shall collect continuous aggregate (de-identified) performance measures using data elements below, submit and present to Alameda County Emergency Medical Services on an annual basis at ALCO SRC/CARC meeting: (6.1.1-6.1.7)

B1

Alameda County EMS SRC Annual Performance Data (20??)

1. # of patients identified by EMS STEMI ALERT and transported to SRC?
 - 1a # of patients identified by EMS STEMI ALERT and transported to SRC who received primary PCI?
 - 1b. Median time to PCI for patients identified by EMS STEMI ALERT and transported to SRC who received primary PCI?

2. # of patients identified by from another acute care hospital ED with possible STEMI and transferred (IFT) to SRC?
 - 2a. # of patients identified by from another acute care hospital ED with possible STEMI and transferred (IFT) to SRC who received primary PCI?
 - 2b. Median time to PCI for patients identified by from another acute care hospital ED with possible STEMI and transferred (IFT) to SRC who received primary PCI?

3. # of walk-in SRC patients identified in ED with possible STEMI?
 - 3a. # of walk-in SRC patients identified in ED with possible STEMI who received primary PCI?
 - 3b. Median time to PCI for walk-in SRC patients identified in ED with possible STEMI who received primary PCI?

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B-2

Contractor shall collect continuous aggregate (de-identified) performance measures using NCDR data elements from either CathPCI or Action data bases, and submit to Alameda County Emergency Medical Services for quarterly review via NCDR CathPCI "EXECUTIVE SUMMARY": (6.1.8-6.1.9)

B-3

Contractor shall provide SRC performance and clinical outcome data for individual EMS patients transported with suspected STEMI (PHI patient list to be provided via SECURE email by EMS). Patient specific Follow-Up data shall include but not be limited to data elements listed below and shall be collected and sent to ALCO EMS ASAP or within 30 calendar days of receipt of request by EMS: (6.4)

B3

STEMI Activation / IFT Follow-up

- Was an EMS 12-lead transmission received at your SRC?
- Was the patient transported by EMS to your SRC and not recognized by EMS as a STEMI?
- Was STEMI confirmed at SRC ED?
- What were ECG findings at SRC ED?
- Was patient an out-of-hospital cardiac arrest (OHCA)?
- Was the patient transferred from another acute care hospital ED to your SRC?
- Time STEMI transfer arranged with SRC by referring hospital?
- Time of patient arrival in ED at SRC?
- Was PCI performed?
- If PCI NOT performed (reason)
- Was a Fibrinolytic administered?
- If patient received a Fibrinolytic, was it administered within 30 minutes of ED arrival?
- Was the patient transferred from your SRC to another SRC for PCI?

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- **If yes: reason, time and by what transport entity, 911 or CCT?**
- **Time of 1st device activation?**
- **Exceptions for delay to PCI:**

(V-Fib/D-Fib, Cardiac arrest/CPR, Intubation, CT r/o head bleed, TEE r/o aortic dissection)

- **Findings / Interventions / Outcome / Comments:**

EMS Patient Inclusion Criteria (STEMI Activation / ITF follow-up)

All patients who:

have a prehospital ECG interpreted by EMS as suspected STEMI/equivalent and transported to a PCI capable hospital (SRC) for potential intervention; **OR,**

are in the ED of an acute care hospital without PCI capability (RH), have an ECG interpreted as STEMI/equivalent and are transferred by EMS to a PCI-capable hospital (SRC) for potential intervention; **OR,**

have experienced witnessed out-of-hospital sudden cardiac arrest (SCA) of suspected cardiac etiology, or with an initial EMS ECG rhythm of V/F or V/T, or were shocked by AED prior to EMS arrival, or have return of spontaneous circulation with an ECG interpreted as STEMI/equivalent following SCA and transported to a PCI capable hospital (SRC) for potential intervention.

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B-4

Contractor shall provide clinical outcome data for individual EMS patients transported with suspected Cardiac Arrest and or Post Cardiac Arrest (PHI patient list provided via SECURE email by EMS or via SECURE website by CARES). Patient specific Follow-Up data shall include but not be limited to data elements listed below and shall be collected and sent to CARES via designated SECURE website ASAP or within 30 calendar days of receipt of patient follow-up list sent by CARES.: (6.5)

HOSPITAL DATASET FOR CARDIAC ARREST / POST CARDIAC ARREST

EMERGENCY Department OUTCOME

Description

- The final disposition of the patient from the emergency department.
- This variable will be used to quantify the outcome of the patient from emergency department specifically. It will be used to differentiate the outcome in the field (EMS resuscitation) and the outcome from the hospital (hospital survival) from the outcome in the emergency department.

Instructions for Coding

- This variable should not be left blank. All the information from the EMS trip sheet and patient medical record should be used to complete this data field.
- If “Transferred to another acute care facility from the emergency department” (Code 4) is selected, the destination hospital should be documented using the corresponding drop-down menu. If a transfer hospital is not selected, CARES will prompt the user to choose one from the drop-down menu or to type the name of the facility (if not listed) in the comments box.
- Codes for hospitals receiving transfers are established through the CARES registry for each particular EMS Agency. Contact the CARES Coordinator if the correct hospital is not located on the drop-down menu.

Field Values:

Code	Definition
1	Resuscitation terminated in ED

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2	Admitted to hospital
3	Transferred to another acute care facility from the emergency department

Examples:

Example	Appropriate Code/Value
Patient was received in the ED after successful resuscitation in the field by EMS personnel. Patient blood pressure was labile upon receiving in the ED and continued to deteriorate.....Patient was pronounced dead in the ED 20 minutes after arrival.	1 – Resuscitation terminated in ED
Patient was received in the ED after successful resuscitation in the field by EMS personnel. Patient blood pressure was adequate upon receiving in the ED and continued to improve after the addition of Dopamine...Patient was transported to the CCU.	2 – Admitted to hospital
Patient was received in the ED with ongoing resuscitation by EMS personnel. Patient was stabilized in the ED after the addition of Dopamine.....Patient was transported to Pine Valley Tertiary Care Hospital for further intervention.	3 – Transferred to another acute care facility from the emergency department

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WAS HYPOTHERMIA CARE INITIATED/CONTINUED IN THE HOSPITAL

Description

- Hypothermia care is provided in the hospital if measures were taken to reduce the patient's body temperature by either non-invasive means (administration of cold intravenous saline, external cold pack application to armpits and groin, use of a cooling blanket, torso vest or leg wrap devices) or by invasive means (use of a cooling catheter inserted in the femoral vein).

Instructions for Coding

- Indicate "Yes" or "No"
- Indicate whether hypothermia procedures (e.g. external cooling-ice packs or cooling blankets/pads and internal cooling – cold IV fusion or invasive catheter lines for internal cooling) were performed in ED.
- If the patient is admitted or transferred, then this field is required.
- This field should not be left blank, even if a facility is not providing hypothermia. If hypothermia is not being provided, then "No" should be selected.
- In the case of a transfer, this field should be completed by the original destination hospital.

Field Values:

Code	Definition
1	Yes
2	No

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HOSPITAL OUTCOME

Description

- The final disposition of the patient from the hospital.
- This variable will be used to quantify the outcome of the patient from the hospital.

Instructions for Coding

- This variable should not be left blank. All the information from patient medical record and discharge summary should be used to complete this data field.
- If “Transferred to another acute care facility” (Code 4) is selected, the destination hospital should be documented using the corresponding drop-down menu. If a transfer hospital is not selected, CARES will prompt the user to choose one from the drop-down menu or to type the name of the facility (if not listed) in the comments box.
- If “Patient has not been disposed” (Code 8) is selected, the patient will remain in the hospital’s inbox until the patient has been discharged and a final outcome has been selected.
- Codes for hospitals receiving transfers are established through the CARES registry for each particular EMS Agency. Contact the CARES Coordinator if the correct hospital is not located on the drop-down menu.

Field Values:

Code	Definition
1	Died in the Hospital
2	Discharged Alive
3	Patient made DNR
	If yes, choose one of the following:
	<input type="radio"/> Died in the hospital
	<input type="radio"/> Discharged alive
	<input type="radio"/> Transferred to another acute care hospital
	<input type="radio"/> Not yet determined
4	Transferred to another acute care hospital
8	Not yet determined

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Examples:

Example	Appropriate Code/Value
Patient was admitted to CCU after successful resuscitation from sudden cardiac arrest. Patient became unstable after 2 days in the CCU. Blood pressure could not be maintained after pharmacological support. Patient arrested at 04:30 after being admitted to the CCU Resuscitation attempts were unsuccessful and patient was pronounced dead at 6:00.	1 – Died in the Hospital
Patient was received in the ED after successful resuscitation in the field by EMS personnel. Patient blood pressure was adequate upon receiving in the ED and continued to improve after the addition of Dopamine.....Patient was transported to the CCU.....Patient remained stable and Dopamine was weaned off in 12 hours. Patient was transferred to the floor and discharged home after one week in the hospital.	2 – Discharged Alive
Patient was admitted to CCU after successful resuscitation from sudden cardiac arrest. Patient is still in the CCU and has not yet been discharged from the hospital.	8 – Patient has not been disposed

DISCHARGE FROM THE HOSPITAL

Description

- This variable will be used to determine the type of destination and the frequency of each destination type for discharged patients.

Instructions for Coding

- If the field “Hospital Outcome” has a value of “Discharged Alive,” this variable should not be left blank. All the information from patient medical record and discharge summary should be used to complete this data field.
- Rehabilitation facility is defined as an establishment for “treatment or treatments designed to facilitate the process of recovery from injury, illness, or disease to as normal a condition as possible.”
- Skilled nursing facility is defined as “an establishment that houses chronically ill, usually elderly patients, and provides long-term nursing care, rehabilitation, and other services. Also called *long-*

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term care facility, nursing home. Hospice facility is defined as a providing special care for people who are near the end of their life. Note: If a patient is discharged home with hospice care, this should be coded as "Home/residence."

Field Values:

Code	Definition
1	Home/residence
2	Rehabilitation facility
3	Skilled nursing facility/Hospice

Examples:

Example	Appropriate Code/Value
After two weeks in the CCU following sudden cardiac arrest, and a week on the floor, the patient was discharged home with follow up orders.	1 – Home/residence
After 3 weeks in the CCU and 5 weeks on the floor patient was transported to Sunshine Rehabilitation Hospital for further treatment.	2 – Rehabilitation facility
After an extensive stay at Memorial Hospital, the patient was discharged home with severe cerebral disability in hospice care.	3 – Skilled nursing facility/Hospice

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NEUROLOGICAL OUTCOME AT DISCHARGE FROM HOSPITAL

Description

- Survival without higher neurological outcome is suboptimal; therefore it is important to attempt to assess neurological outcome at discharge.
- This variable will be used to determine the frequency of neurological outcome in resuscitation survivors at the time of discharge.

Instructions for Coding

- The level of cerebral performance of the patient at the time of discharge from the hospital. The following simple, validated neurological score is referred to as the Cerebral Performance Category, CPC.
- 1 = Good Cerebral Performance – Conscious, alert, able to work and lead a normal life.
- 2 = Moderate Cerebral Disability – Conscious and able to function independently (dress, travel, prepare food), but may have hemiplegia, seizures, or permanent memory or mental changes.
- 3 = Severe Cerebral Disability – Conscious, dependent on others for daily support, functions only in an institution or at home with exceptional family effort.
- 4 = Coma, vegetative state.
- If the field “Hospital Outcome” has a value of “Discharged Alive,” this variable should not be left blank. All the information from patient medical record and discharge summary should be used to complete this data field.
- If a record is coded as discharged to a 'Rehabilitation Facility' or 'Skilled Nursing Facility/Hospice' with 'Good Cerebral Performance' at time of discharge, CARES will prompt the user to clarify in the comments box.
- If a record is coded as discharged to 'Home/residence' with 'Severe Cerebral Performance' or 'Coma, vegetative state' at time of discharge, CARES will prompt the user to clarify in the comments box.

Field Values:

Code	Definition
1	Good Cerebral Performance; CPC 1
2	Moderate Cerebral Disability; CPC 2
3	Severe Cerebral Disability; CPC 3
4	Coma, vegetative state; CPC 4

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Examples:

Example	Appropriate Code/Value
At discharge, patient was conscious, alert, and able to work and lead a normal life.	1 – Good Cerebral Performance
At discharge, patient was conscious and able to function independently but had some permanent memory changes.	2 – Moderate Cerebral Disability
At discharge, patient was unable to function independently with severe cognitive disability,	3 - Severe Cerebral Disability
Patient was in a vegetative state at time of discharge.	4 - Coma, vegetative state

WAS FINAL DIAGNOSIS ACUTE MYOCARDIAL INFARCTION?

Description

- Determine the number of cardiac arrests that were eventually confirmed as a myocardial infarction.

Instructions for Coding

- Indicate “Yes” or “No”
- In the case of a transfer, this field should be completed by the destination hospital.

Field Values:

Code	Definition
1	Yes
2	No

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CORONARY ANGIOGRAPHY PERFORMED?

Definition:

- Coronary Angiography is a therapeutic procedure used to treat the stenotic (narrowed) coronary arteries of the heart.
- Indicate whether emergency coronary angiography was performed after patient has ROSC

Coding Instruction:

- If yes, please provide date and time of the coronary angiography

Code	Options
1	Yes
2	No
3	Unknown
	If yes, provide date and time

Examples:

Example	Appropriate Code/Value
Coronary Angiography was performed on the patient.	1 – Yes; provide date and time
Coronary Angiography was not performed on the patient.	2 – No

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WAS A CARDIAC STENT PLACED?

Definition:

- A cardiac stent is a small mesh tube that is introduced into the coronary artery and is used to prop it open during a PCI procedure

Coding Instruction:

Code	Options
1	Yes
2	No
3	Unknown

Examples:

Example	Appropriate Code/Value
A cardiac stent was placed.	1 – Yes
A cardiac stent was not placed.	2 – No

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CABG PERFORMED?

Definition:

- CABG is defined as a coronary artery bypass graft

Coding Instruction:

- Indicate whether CABG was performed after patient has ROSC.

Code	Options
1	Yes
2	No
3	Unknown

Examples:

Example	Appropriate Code/Value
CABG was performed on the patient.	1 – Yes
CABG was not performed on the patient.	2 – No

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WAS AN ICD PLACED AND/OR SCHEDULED?

Definition:

- ICD - An implantable cardioverter-defibrillator (ICD) is a small battery powered electrical impulse generator which is implanted in patients who are at risk of sudden cardiac death due to vfib and vtach.

Coding Instructions:

- Indicate “yes” if ICD was placed and/or scheduled.

Code	Options
1	Yes
2	No
3	Unknown

Examples:

Example	Appropriate Code/Value
ICD was placed.	1 – Yes
ICD was not placed.	2 – No

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EXHIBIT C – SRC/CARC APPLICATION

HOSPITALS _____ January 1, 2016

STEMI/CARDIAC ARREST RECEIVING CENTER (SRC/CARC) APPLICATION (# 5501)

Hospital Name:

Date: ____/____/____

Dedicated phone number for paramedic call-ins:

(____) ____ - ____

Does your hospital have a special permit for cardiac catheterization?

☐ Yes ☐ No

Number of percutaneous coronary interventions (PCI)¹ per year:

Does your hospital have a special permit for cardiovascular surgery?

☐ Yes ☐ No

Name of proposed SRC program Medical Director:

Meets the requirements for SRC Medical Director in section 3.1?

☐ Yes ☐ No

Name of proposed SRC Program Manager:

Meets the requirements for SRC Program Manager in section 3.2?

☐ Yes ☐ No

Catheterization lab contact: Name:

Phone: (____) ____ - ____

Name of proposed CARC program Medical Director:

Meets the requirements for CARC Medical Director in section 3.3?

☐ Yes ☐ No

Name of proposed CARC Program Manager:

Meets the requirements for CARC Program Manager in section 3.4?

☐ Yes ☐ No

CARDIOLOGISTS PROPOSED FOR ON-CALL LIST

Name:

Number of PCIs per year²:

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Does your hospital participate in the ACC NCDR? ☐ Yes ☐ No, if yes, ☐ CathPCI ☐ ACTION

Does your hospital have a cardiovascular surgical on-call staff available 24/7? ☐ Yes ☐ No

Does your hospital have the capability to place an intra-aortic balloon pump? ☐ Yes ☐ No

Does your hospital have Intra-aortic balloon pump staff on-call 24/7? ☐ Yes ☐ No

Does your hospital have a policy on the treatment of ST-elevation myocardial infarction that emphasizes rapid treatment and meets the requirements of sections 4 and 5? ☐ Yes ☐ No

Does your hospital collect data and have quality improvement policies that meet the requirements of sections 6 and 7? ☐ Yes ☐ No

Does your hospital have a data system that identifies the time the cath lab team was notified and time of first device deployment? ☐ Yes ☐ No

Does your hospital have the electronic capability to receive diagnostic quality ECG's transmitted by prehospital personnel? ☐ Yes ☐ No

Does your hospital have a designated priority phone line for use by prehospital personnel to contact your facility regarding suspected STEMI patients prior to arrival? ☐ Yes ☐ No
(____)____-____

CARDIAC ARREST AND POST CARDIAC ARREST CARE:

Does your hospital have the capability to provide resuscitation for cardiopulmonary arrest with an ALCO EMS approved radiolucent mechanical CPR device? ☐ Yes ☐ No

Does your hospital have the capability and standardized protocol to provide Targeted Temperature Management in ED and ICU 24/7? ☐ Yes ☐ No

Does your hospital have the capability to provide emergent PCI 24/7? ☐ Yes ☐ No

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- Does your hospital have the capability to provide post-resuscitation care for cardiac arrest? ☐ Yes ☐ No
- Does your hospital have the capability to provide ventilator support? ☐ Yes ☐ No
- Does your hospital have the capability to provide EEG monitoring? ☐ Yes ☐ No
- Does your hospital have the capability to provide cardiac arrest consult service? ☐ Yes ☐ No
- Does your hospital have the capability to provide Neurology Consultation? ☐ Yes ☐ No
- Does your hospital have the capability to provide Neurosurgical Consultation? ☐ Yes ☐ No
- Does your hospital have the capability to provide Organ Bank consultation? ☐ Yes ☐ No
- Does your hospital have the capability to provide Electrophysiology Consultation? ☐ Yes ☐ No
- Does your hospital have the capability to provide Social Work Consultation? ☐ Yes ☐ No
- Does your hospital have the capability to provide Inpatient physical and or occupational therapy? ☐ Yes ☐ No
- Does your hospital have the capability to provide Outpatient physical and or occupational therapy? ☐ Yes ☐ No
- Does your hospital have the capability to provide Outpatient neurological rehabilitation? ☐ Yes ☐ No
- Does your hospital have the capability to provide Outpatient psychological services? ☐ Yes ☐ No
- Does your hospital have the capability to provide CPR training: Professional, community and patient's family on discharge? ☐ Yes ☐ No
- Is your hospital currently participating in the Cardiac Arrest Registry to Enhance Survival (CARES)? ☐ Yes ☐ No
- Does your hospital have the capability to provide ECMO? ☐ Yes ☐ No
- If not, does your hospital have an agreement with one that does? ☐ Yes ☐ No

¹ PCI is defined as a therapeutic coronary intervention such as angioplasty, stent placement etc.

² Total personally performed PCIs per year at all institutions, not just this center.

This would include any PCI as defined above and not restricted to acute myocardial infarction.

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EXHIBIT- B

California Code of Regulations
Title 22. Social Security
Division 9. Prehospital Emergency Medical Services
Chapter 7.1 ST-Elevation Myocardial Infarction Critical Care System

ARTICLE 1. DEFINITIONS

§ 100270.101. Cardiac Catheterization Laboratory

“Cardiac catheterization laboratory” or “Cath lab” means the setting within the hospital where diagnostic and therapeutic procedures are performed on patients with cardiovascular disease.

Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code.
Reference: Sections 1797.103 and 1797.176, Health and Safety Code.

§ 100270.102. Cardiac Catheterization Team

“Cardiac catheterization team” means the specially trained health care professionals that perform percutaneous coronary intervention. It may include, but is not limited to, an interventional cardiologist, mid-level practitioners, registered nurses, technicians, and other health care professionals.

Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code.
Reference: Sections 1797.103 and 1797.176, Health and Safety Code.

§ 100270.103. Clinical Staff

“Clinical staff” means individuals that have specific training and experience in the treatment and management of ST-Elevation Myocardial Infarction (STEMI) patients. This includes, but is not limited to, physicians, registered nurses, advanced practice nurses, physician assistants, pharmacists, and technologists.

Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code.
Reference: Sections 1797.103 and 1797.176, Health and Safety Code.

§ 100270.104. Emergency Medical Services Authority

“Emergency Medical Services Authority” or “EMS Authority” or “EMSA” means the department in California responsible for the coordination and integration of all state activities concerning EMS.

Note: Authority cited: Sections 1797.1, 1797.107 and 1797.54, Health and Safety Code.
Reference: Sections 1797.100, and 1797.103, Health and Safety Code.

§ 100270.105. Immediately Available

“Immediately available” means:

- (a) Unencumbered by conflicting duties or responsibilities.
- (b) Responding without delay upon receiving notification.
- (c) Being physically available to the specified area of the hospital when the patient is delivered in accordance with local EMS agency policies and procedures.

Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code.
Reference: Sections 1797.103 and 1797.176, Health and Safety Code.

§ 100270.106. Implementation

“Implementation,” “implemented,” or “has implemented” means the development and activation of a STEMI Critical Care System Plan by the local EMS agency, including the prehospital and hospital care components in accordance with the plan.

Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code.
Reference: Sections 1797.103 and 1797.176, Health and Safety Code.

§ 100270.107. Interfacility Transfer

“Interfacility transfer” means the transfer of a STEMI patient from one acute general care facility to another acute general care facility.

Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code.
Reference: Sections 1797.103, 1797.176 and 1798.170, Health and Safety Code.

§ 100270.108. Local Emergency Medical Services Agency

“Local emergency medical services agency” or “local EMS agency” means the agency, department, or office having primary responsibility for administration of emergency medical services in a county or region and which is designated pursuant Health and Safety Code commencing with section 1797.200.

Note: Authority cited: Sections 1797.107, 1797.200 and 1798.150, Health and Safety Code. Reference: Sections 1797.103 and 1797.176, Health and Safety Code.

§ 100270.109. Percutaneous Coronary Intervention (PCI)

“Percutaneous coronary intervention” or “PCI” means a procedure used to open or widen a narrowed or blocked coronary artery to restore blood flow supplying the heart, usually done on an emergency basis for a STEMI patient.

Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code.
Reference: Sections 1797.103 and 1797.176, Health and Safety Code.

§ 100270.110. Quality Improvement

“Quality improvement” or “QI” means methods of evaluation that are composed of structure, process, and outcome evaluations that focus on improvement efforts to identify root causes of problems, intervene to reduce or eliminate these causes, and take steps to correct the process, and recognize excellence in performance and delivery of care.

Note: Authority cited: Sections 1797.103, 1797.107, 1797.174, 1797.176 and 1798.150 Health and Safety Code. Reference: Sections 1797.174, 1797.202, 1797.204, 1797.220 and 1798.175, Health and Safety Code.

§ 100270.111. ST-Elevation Myocardial Infarction (STEMI)

“ST-Elevation Myocardial Infarction” or “STEMI” means a clinical syndrome defined by symptoms of myocardial infarction in association with ST-segment elevation on Electrocardiogram (ECG).

Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code.

Reference: Sections 1797.103 and 1797.176, Health and Safety Code.

§ 100270.112. STEMI Care

“STEMI care” means emergency cardiac care, for the purposes of these regulations.

Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code.

Reference: Sections 1797.103 and 1797.176, Health and Safety Code.

§ 100270.113. STEMI Medical Director

“STEMI medical director” means a qualified board-certified physician by the American Board of Medical Specialties (ABMS) as defined by the local EMS agency and designated by the hospital that is responsible for the STEMI program, performance improvement, and patient safety programs related to a STEMI critical care system.

Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code.

Reference: Sections 1797.103 and 1797.176, Health and Safety Code.

§ 100270.114. STEMI Patient

“STEMI patient” means a patient with symptoms of myocardial infarction in association with ST-Segment Elevation in an ECG.

Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code.

Reference: Sections 1797.103, 1797.176 and 1797.220, Health and Safety Code.

§ 100270.115. STEMI Program

“STEMI program” means an organizational component of the hospital specializing in the care of STEMI patients.

Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code.

Reference: Sections 1797.103 and 1797.176, Health and Safety Code.

§ 100270.116. STEMI Program Manager

“STEMI program manager” means a registered nurse or qualified individual as defined by the local EMS agency, and designated by the hospital responsible for monitoring, coordinating and evaluating the STEMI program.

Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code.

Reference: Sections 1797.103 and 1797.176, Health and Safety Code.

§ 100270.117. STEMI Receiving Center (SRC)

“STEMI receiving center” or “SRC” means a licensed general acute care facility that meets the minimum hospital STEMI care requirements pursuant to Section 100270.124 and is able to perform PCI.

Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code.
Reference: Sections 1797.103, 1797.176 and 1797.220, Health and Safety Code.

§ 100270.118. STEMI Referring Hospital (SRH)

“STEMI referring hospital” or “SRH” means a licensed general acute care facility that meets the minimum hospital STEMI care requirements pursuant to Section 100270.125.

Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code.
Reference: Sections 1797.103, 1797.176 and 1797.220, Health and Safety Code.

§ 100270.119. STEMI Critical Care System

“STEMI critical care system” means a critical care component of the EMS system developed by a local EMS agency that links prehospital and hospital care to deliver treatment to STEMI patients.

Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code.
Reference: Sections 1797.103 and 1797.176, Health and Safety Code.

§ 100270.120. STEMI Team

“STEMI team” means clinical personnel, support personnel, and administrative staff that function together as part of the hospital’s STEMI program.

Note: Authority cited: Sections 1797.107 and 1798.150, Health and Safety Code.
Reference: Sections 1797.103 and 1797.176, Health and Safety Code.

ARTICLE 2. LOCAL EMS AGENCY STEMI CRITICAL CARE SYSTEM REQUIREMENTS

§ 100270.121. STEMI Critical Care System Plan

- (a) The local EMS agency may develop and implement a STEMI critical care system.
- (b) The local EMS agency implementing a STEMI critical care system shall have a STEMI Critical Care System Plan approved by the EMS Authority prior to implementation.
- (c) A STEMI Critical Care System Plan submitted to the EMS Authority shall include, at a minimum, all of the following components:
 - (1) The names and titles of the local EMS agency personnel who have a role in a STEMI critical care system.
 - (2) The list of STEMI designated facilities with the agreement expiration dates.

- (3) A description or a copy of the local EMS agency's STEMI patient identification and destination policies.
- (4) A description or a copy of the method of field communication to the receiving hospital specific to STEMI patient, designed to expedite time-sensitive treatment on arrival.
- (5) A description or a copy of the policy that facilitates the inter-facility transfer of a STEMI patient.
- (6) A description of the method of data collection from the EMS providers and designated STEMI hospitals to the local EMS agency and the EMS Authority.
- (7) A policy or description of how the local EMS agency integrates a receiving center in a neighboring jurisdiction.
- (8) A description of the integration of STEMI into an existing quality improvement committee or a description of any STEMI specific quality improvement committee.
- (9) A description of programs to conduct or promote public education specific to cardiac care.
- (d) The EMS Authority shall, within 30-days of receiving a request for approval, notify the requesting local EMS agency in writing of approval or disapproval of its STEMI Critical Care System Plan. If the STEMI Critical Care System Plan is disapproved, the response shall include the reason(s) for the disapproval and any required corrective action items.
- (e) The local EMS agency shall provide a corrected plan to the EMS Authority within 60 days of receipt of the disapproval letter.
- (f) The local EMS agency currently operating a STEMI critical care system implemented before the effective date of these regulations, shall submit to the EMS Authority a STEMI Critical Care System Plan as an addendum to its next annual EMS plan update, or within 180-days of the effective date of these regulations, whichever comes first.
- (g) After approval of the STEMI Critical Care System Plan, the local EMS agency shall submit an update to the plan as part of its annual EMS update, consistent with the requirements in Section 100270.122.
- (h) No health care facility shall advertise in any manner or otherwise hold itself out to be affiliated with a STEMI critical care system or a STEMI center unless they have been so designated by the local EMS agency, in accordance with this chapter.

Note: Authority cited: Sections 1797.107, 1797.103, 1797.105, 1797.250, 1797.254 and

1798.150, Health and Safety Code. Reference: Section 1797.176 and 1797.220, Health and Safety Code.

§100270.122. STEMI Critical Care System Plan Updates

(a) The local EMS agency shall submit an annual update of its STEMI Critical Care System Plan, as part of its annual EMS plan submittal, which shall include, at a minimum, all the following:

(1) Any changes in a STEMI critical care system since submission of the prior annual plan update or a STEMI Critical Care System Plan addendum.

(2) The status of a STEMI critical care system goals and objectives.

(3) The STEMI critical care system quality improvement activities.

(4) The progress on addressing action items and recommendations provided by the EMS Authority within the STEMI Critical Care System Plan or status report approval letter if applicable.

Note: Authority cited: Sections 1797.103, 1797.107, 1797.176, 1797.250, 1797.254, 1798.150, and 1798.172, Health and Safety Code. Reference: Section 1797.176, 1797.220, 1797.222, 1798.170, Health and Safety Code.

ARTICLE 3. PREHOSPITAL STEMI CRITICAL CARE SYSTEM REQUIREMENTS

§ 100270.123. EMS Personnel and Early Recognition

(a) The local EMS agency with an established STEMI critical care system shall have protocols for the identification and treatment of STEMI patients, including paramedic performance of a 12-lead ECG and determination of the patient destination.

(b) The findings of 12-lead ECG shall be assessed and interpreted through one or more of the following methods:

(1) Direct paramedic interpretation.

(2) Automated computer algorithm.

(3) Wireless transmission to facility followed by physician interpretation or confirmation.

(c) Notification of prehospital ECG findings of suspected STEMI patients, as defined by the local EMS agency, shall be communicated in advance of the arrival to the STEMI centers according to the local EMS agency's STEMI Critical Care System Plan.

Note: Authority cited: Sections 1797.103, 1797.107, 1797.114, 1797.176, 1797.206, 1797.214 and 1798.150, Health and Safety Code. Reference: Section 1797.176,

1797.220, 1798, 1798.150 and 1798.170, Health and Safety Code.

ARTICLE 4. STEMI CRITICAL CARE FACILITY REQUIREMENTS

§ 100270.124. STEMI Receiving Center Requirements

(a) The following minimum criteria shall be used by the local EMS agency for the designation of a STEMI receiving center:

(1) The hospital shall have established protocols for triage, diagnosis, and Cath lab activation following field notification.

(2) The hospital shall have a single call activation system to activate the Cardiac Catheterization Team directly.

(3) Written protocols shall be in place for the identification of STEMI patients.

(A) At a minimum, these written protocols shall be applicable in the intensive care unit/coronary care unit, Cath lab and the emergency department.

(4) The hospital shall be available for treatment of STEMI patients twenty-four (24) hours per day, seven (7) days per week, three hundred and sixty-five (365) days per year.

(5) The hospital shall have a process in place for the treatment and triage of simultaneously arriving STEMI patients.

(6) The hospital shall maintain STEMI team and Cardiac Catheterization Team call rosters.

(7) The Cardiac Catheterization Team, including appropriate staff determined by the local EMS agency, shall be immediately available.

(8) The hospital shall agree to accept all STEMI patients according to the local policy.

(9) STEMI receiving centers shall comply with the requirement for a minimum volume of procedures for designation required by the local EMS agency.

(10) The hospital shall have a STEMI program manager and a STEMI medical director.

(11) The hospital shall have job descriptions and organizational structure clarifying the relationship between the STEMI medical director, STEMI program manager, and the STEMI team.

(12) The hospital shall participate in the local EMS agency quality improvement processes related to a STEMI critical care system.

(13) A STEMI receiving center without cardiac surgery capability on-site shall have a written transfer plan and agreements for transfer to a facility with cardiovascular surgery capability.

(14) A STEMI receiving center shall have reviews by local EMS agency or other designated agency conducted every three years.

(b) A STEMI center designated by the local EMS agency prior to implementation of these regulations may continue to operate. Before re-designation by the local EMS agency at the next regular interval, STEMI centers shall be re-evaluated to meet the criteria established in these regulations.

(c) Additional requirements may be stipulated by the local EMS agency medical director.

Note: Authority cited: Sections 1797.103, 1797.107, 1797.176, 1797.220, and 1798.150 1798.167 and 1798.172, Health and Safety Code. Reference: Section 1797.176, 1797.220, 1798, 1798.150 and 1798.170 Health and Safety Code.

§ 100270.125. STEMI Referring Hospital Requirements

(a) The following minimum criteria shall be used by the local EMS agency for designation of a STEMI referring hospital:

(1) The hospital shall be committed to supporting the STEMI Program.

(2) The hospital shall be available to provide care for STEMI patients twenty-four (24) hours per day, seven (7) days per week, three hundred and sixty-five (365) days per year.

(3) Written protocols shall be in place to identify STEMI patients and provide an optimal reperfusion strategy, using fibrinolytic therapy .

(4) The emergency department shall maintain a standardized procedure for the treatment of STEMI patients.

(5) The hospital shall have a transfer process through interfacility transfer agreements, and have pre-arranged agreements with EMS ambulance providers for rapid transport of STEMI patients to a SRC.

(6) The hospital shall have a program to track and improve treatment of STEMI patients.

(7) The hospital must have a plan to work with a STEMI receiving center and the local EMS agency on quality improvement processes.

(8) A STEMI referring hospital designated by the local EMS agency shall have a review

conducted every three years.

(b) A STEMI center designated by the local EMS agency prior to implementation of these regulations may continue to operate. Before re-designation by the local EMS agency at the next regular interval, STEMI centers shall be re-evaluated to meet the criteria established in these regulations.

(c) Additional requirements may be stipulated by the local EMS agency medical director.

Note: Authority cited: Sections 1797.103, 1797.107, 1797.176, 1797.220, and 1798.150 1798.167 and 1798.172, Health and Safety Code. Reference: Section 1797.176, 1797.220, 1798.150 and 1798.170 Health and Safety Code.

ARTICLE 5. DATA MANAGEMENT, QUALITY IMPROVEMENT AND EVALUATIONS

§ 100270.126. Data Management.

(a) The local EMS agency shall implement a standardized data collection and reporting process for a STEMI critical care system.

(b) The system shall include the collection of both prehospital and hospital patient care data, as determined by the local EMS agency.

(c) The prehospital STEMI patient care elements selected by the local EMS agency shall be compliant with the most current version of the California EMS Information Systems (CEMSIS) database, and the National EMS Information System (NEMSIS).

(d) All hospitals that receive STEMI patients via EMS shall participate in the local EMS agency data collection process in accordance with local EMS agency policies and procedures.

(e) The prehospital care record and the hospital data elements shall be collected and submitted to the local EMS agency, and subsequently to the EMS Authority, on no less than a quarterly basis and shall include, but not be limited to, the following:

(1) The STEMI patient data elements:

- (A) EMS ePCR Number.
- (B) Facility.
- (C) Name: Last, First.
- (D) Date of Birth.
- (E) Patient Age.
- (F) Patient Gender.
- (G) Patient Race.
- (H) Hospital Arrival Date.
- (I) Hospital Arrival Time.

- (J) Dispatch Date.
- (K) Dispatch Time.
- (L) Field ECG Performed.
- (M) 1st ECG Date.
- (N) 1st ECG Time.
- (O) Did the patient suffer out-of-hospital cardiac arrest.
- (P) CATH LAB Activated.
- (Q) CATH LAB Activation Date.
- (R) CATH LAB Activation Time.
- (S) Did the patient go to the CATH LAB.
- (T) CATH LAB Arrival Date.
- (U) CATH LAB Arrival Time.
- (V) PCI Performed.
- (W) PCI Date.
- (X) PCI Time.
- (Y) Fibrinolytic Infusion.
- (Z) Fibrinolytic Infusion Date.
- (AA) Fibrinolytic Infusion Time.
- (BB) Transfer.
- (CC) SRH ED Arrival Date.
- (DD) SRH ED Arrival Time.
- (EE) SRH ED Departure Date.
- (FF) SRH ED Departure Time.
- (GG) Hospital Discharge Date.
- (HH) Patient Outcome.
- (II) Primary and Secondary Discharge Diagnosis.

(2) The STEMI System data elements:

- (A) Number of STEMIs treated.
- (B) Number of STEMI patients transferred.
- (C) Number and percent of emergency department STEMI patients arriving by private transport (non-EMS).
- (D) The false positive rate of EMS diagnosis of STEMI, defined as the percentage of STEMI alerts by EMS which did not show STEMI on ECG reading by the emergency physician.

Note: Authority cited: Sections 1791.102, 1797.103, 1797.107, 1797.176, 1797.204, 1797.220, 1798.150, and 1798.172, Health and Safety Code. Reference: Section 1797.220, 1797.222, 1797.204, Health and Safety Code.

§ 100270.127. Quality Improvement and Evaluation Process

(a) Each STEMI critical care system shall have a quality improvement process that shall include, at a minimum:

- (1) Evaluation of program structure, process, and outcome.
 - (2) Review of STEMI-related deaths, major complications, and transfers.
 - (3) A multidisciplinary STEMI Quality Improvement Committee, including both prehospital and hospital members.
 - (4) Participation in the QI process by all designated STEMI centers and prehospital providers involved in the STEMI critical care system.
 - (5) Evaluation of regional integration of STEMI patient movement.
 - (6) Compliance with the California Evidence Code, Section 1157.7 to ensure confidentiality, and a disclosure-protected review of selected STEMI cases.
- (b) The local EMS agency shall be responsible for on-going performance evaluation and quality improvement of the STEMI critical care system.

Note: Authority cited: Sections 1797.102, 1797.103, 1797.107, 1797.176, 1797.204, 1797.220, 1797.250, 1797.254, 1798.150, and 1798.172, Health and Safety Code.
Reference: Section 1797.104, 1797.176, 1797.204, 1797.220, 1797.222, 1798.170, Health and Safety Code.