

# **2023 STEMI Critical Care System Plan Update**

**Sierra-Sacramento Valley  
EMS Agency**

Updated: January 2024

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## **S-SV EMS Agency Background**

The Sierra-Sacramento Valley Emergency Medical Services Agency (S-SV EMS) was founded in 1975 and is a regional multi-county Joint Powers Agency that serves as the local EMS Agency for the counties of Placer, Nevada, Sutter, Glenn, Yuba, Colusa, Butte, Shasta, Siskiyou, and Tehama. S-SV EMS has been delegated planning, development and implementation authority for all EMS components including regional STEMI system planning. The S-SV EMS region covers approximately 21,000 square miles and has an approximate population of 1.3 million residents.

The service area is diverse, and includes both remote rural areas, and large population centers. Within the S-SV EMS region, EMS services are provided by both public and private providers. Hospitals providing STEMI services within the S-SV EMS region are well distributed into both rural and urban areas, and well serve the needs of STEMI patients. The S-SV EMS region is currently served by the following EMS system resources:

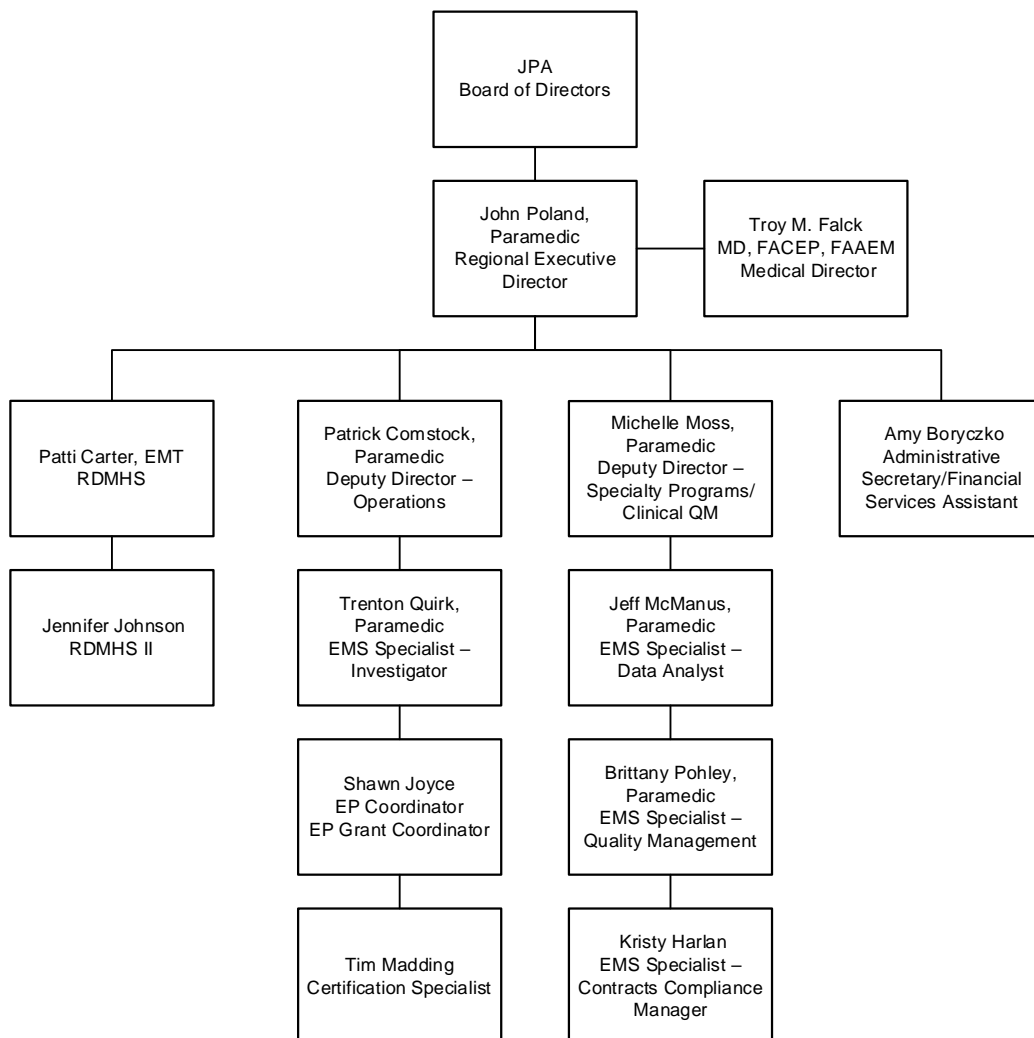
- 96 BLS first responder agencies
- 9 ALS first responder agencies
- 30 BLS/ALS ground ambulance providers
- 8 EMS aircraft providers (6 air ambulance and 2 ALS rescue aircraft providers)
- 17 acute care hospitals, 6 of which are S-SV EMS designated STEMI Receiving Centers

The S-SV EMS STEMI system is continually reviewed/evaluated for quality performance through the following S-SV EMS committees:

- S-SV EMS Regional STEMI Quality Improvement Committee
- S-SV EMS Regional EMS Aircraft Committee
- S-SV EMS Regional Emergency Medical Advisory Committee

## S-SV EMS Agency Personnel and Organizational Chart

Michelle Moss, Deputy Director – Specialty Programs/Clinical Quality Management, is primarily responsible for managing/monitoring the S-SV EMS STEMI System. Troy Falck, MD, Medical Director, and John Poland, Regional Executive Director, assist in providing clinical and administrative oversight of the S-SV EMS STEMI System and Jeff McManus, EMS Specialist - Data Analyst and other S-SV EMS staff assist with various S-SV EMS STEMI System related duties as necessary/appropriate. In addition, George Fehrenbacher, MD, Sutter Roseville Medical Center Interventional Cardiologist serves as the S-SV EMS STEMI QI Committee Chairperson,



## **S-SV EMS STEMI System Changes**

There were no significant changes to the S-SV EMS STEMI system in 2023.

## **Number and Designation of Designated STEMI Receiving Centers**

As of January 2024, there are 6 designated STEMI Receiving Centers within the S-SV EMS region. As an agency, we have worked diligently to assist these centers with obtaining and reporting quality data. We have developed an internal assessment tool for ongoing performance evaluation and quality improvement of our STEMI system. The following facilities are currently designated as STEMI Receiving Centers (SRCs) by the S-SV EMS Agency:

<b>Facility</b>	<b>Location</b>	<b>SRC Contract Expiration</b>
Adventist Health +Rideout	Marysville, CA	12/31/2024
Enloe Medical Center	Chico, CA	12/31/2024
Kaiser Roseville Medical Center	Roseville, CA	12/31/2024
Mercy Medical Center Redding	Redding, CA	12/31/2024
Shasta Regional Medical Center	Redding, CA	12/31/2024
Sutter Roseville Medical Center	Roseville, CA	12/31/2024

## **S-SV EMS STEMI System Data Collection**

S-SV EMS has been collecting comprehensive STEMI patient data from the regional SRCs since 2010. S-SV EMS has been utilizing the AHA GWTG-CAD registry for SRC reporting since January 2020. All S-SV EMS designated SRCs are users within the system and S-SV EMS accesses the data as a super-user.

## **S-SV EMS STEMI System Public Education**

All S-SV EMS designated SRCs are required to provide public education about STEMI warning signs and the importance of early utilization of the 911 system. This public education information is reported by the SRCs to S-SV EMS on an annual basis. In addition, multiple EMS prehospital agencies provide EMS public education in various settings on an ongoing basis (health fairs and other similar events). This public education information is reported by

EMS prehospital provider agencies to S-SV EMS as part of their annual EMSQIP reports/updates.

## **S-SV EMS STEMI System Quality Improvement**

The S-SV EMS Regional STEMI QI Committee meets twice per year. A comprehensive review of STEMI patient data and case reviews are discussed during these meetings, as well as reviews of S-SV EMS policies and protocols which direct care and management of STEMI patients in the S-SV EMS region. The S-SV EMS region 2023 SRC reporting metrics are included on the following page.

## **S-SV EMS STEMI System Policies/Protocols**

The following S-SV EMS policies/protocols are currently utilized to direct the prehospital care and management of STEMI patients in the S-SV EMS Region:

- Chest Discomfort/Suspected Acute Coronary Syndrome (ACS) (C-6)
- STEMI Receiving Center Designation Criteria, Requirements & Responsibilities (506)
- Rapid Re-Triage & Interfacility Transport of STEMI, Stroke & Trauma Patients (510)
- 12-Lead EKG Procedure (1107)

Copies of these current policies/protocols are included on the following pages.

# S-SV EMS STEMI System 2023 SRC Reporting Metrics

SRC		
#	Measure	Population
1	STEMI Patient volume by SRC (EMS, WI, IFT)	All patients with a cardiac diagnosis of: Confirmed AMI - STEMI
2	Average ED time (EMS/WI)	All patients with a cardiac diagnosis of : Confirmed AMI-STEMI.
3	Average FMC to PCI (EMS/WI)	All patients with a cardiac diagnosis of: Confirmed AMI - STEMI, AND STEMI or STEMI Equivalent on First ECG, AND no EMS transports >45 minutes, AND PCI was performed, AND no lytics prior to PCI, AND no Non-System reasons for delay
4	Average Time from EMS Pre-Alert to Cath Lab Activation	All patients who are transported directly to the SRC by EMS, AND have STEMI or STEMI on EMS EKG.
5	% EMS First Medical Contact to PCI <= 90 minutes or <= 120 minutes if transport is > 45 minutes	All patients for whom PCI is the primary reperfusion strategy AND who have STEMI or STEMI equivalent first noted on first ECG, AND who arrive at the SRC via ambulance, AND essential calculation data not missing, AND time from FMC to first device activation is not > 12 hours. EXCLUDES TRANSFERS AND PATIENTS RECEIVING LYTICS.
EMS		
#	Measure	Population
1	Median FMC to 12 lead, by provider	All patients who are transported from scene to SRC by EMS, AND 1st 12 Lead is performed prior to arrival at SRC. EXCLUDES TRANSFERS
2	Median time from FMC to destination alert for STEMI patients	All patients who are transported from scene to SRC by EMS, AND 1st 12 Lead is performed prior to arrival at SRC, AND prehospital EKG indicates STEMI or STEMI equivalent. EXCLUDES TRANSFERS
3	Median Scene time, by provider	
4	Over-Under triage, by provider	All patients with a STEMI indicated on PCR by way of Primary/Secondary Impression, STEMI alert or STEMI on ECG prior to hospital arrival. EXCLUDES TRANSFERS.
IFT		
#	Measure	Population
1	Transfer patient volume	All AHA-GWTG patients who were transferred from a SRH.
2	Average door to 12 lead, by SRH	
3	# Receiving thrombolytics at SRH	All AHA-GWTG patients who were transferred from a SRH and received thrombolytics.
4	Average time to thrombolytics, by SRH	
5	Average SRH arrive to transfer time, by SRH	All AHA-GWTG patients who were transferred from a SRH.
6	Average SRH arrive to PCI	All AHA-GWTG patients who received primary PCI.



**Chest Discomfort/Suspected Acute Coronary Syndrome (ACS)**

Approval: Troy M. Falck, MD – Medical Director

Effective: 06/01/2022

Approval: Victoria Pinette – Executive Director

Next Review: 05/2025

- Common symptoms associated with ACS include, but are not limited to:
  - Dyspnea/SOB
  - Palpitations
  - Diaphoresis
  - Nausea/vomiting
  - Lightheadedness/near-syncope/syncope
  - Upper abdominal pain or heartburn unrelated to meals
  - Discomfort in the throat or abdomen may occur in pts with diabetes, women & elderly pts
- Fleeting or sharp chest pain that increases with inspiration & lying supine is unlikely to be ACS related.
- Pt assessment, treatment & transport destination determination should occur concurrently.

**BLS**

- Assess V/S, including SpO<sub>2</sub>
- O<sub>2</sub> at appropriate rate if hypoxemic (SpO<sub>2</sub> <94%), short of breath, or signs of heart failure or shock
- P-Q-R-S-T

**Aspirin**

- 160 - 325 mg chewable PO (anticoagulant use is not a contraindication to administration)

**ALS**

- Cardiac monitor
- 12-lead EKG as soon as possible (prior to nitroglycerin administration)
  - Criteria for ST Elevation Myocardial Infarction (STEMI):
    1. Machine readout: 'Meets ST Elevation MI Criteria', 'Acute MI', 'STEMI' (or equivalent)
    2. ST elevation in 2 or more contiguous leads
  - For pts with suspected ACS, serial 12-lead EKGs should be obtained if the pt's clinical status changes or if EKG changes are noted on the monitor, and every 15 mins if transport times are long

- IV/IO at appropriate time during treatment
  - Administer 250 mL NS fluid boluses to maintain SBP >90
  - Do not administer fluid if signs of heart failure

**If discomfort persists following initial 12-lead acquisition:**

**Nitroglycerin**

- 0.4 mg SL (tablet or spray), repeat every 5 mins if discomfort persists
- Do not administer if SBP <100,
- Use with caution for pts with suspected inferior MI (establish vascular access prior to administration)
- Consult with base/modified base hospital prior to administration if pt takes erectile dysfunction or pulmonary hypertension medication

**SEE PAGE 2 FOR ADDITIONAL ALS TREATMENT & PT DESTINATION**



**Chest Discomfort/Suspected Acute Coronary Syndrome (ACS)**

**ADDITIONAL ALS TREATMENT & PT DESTINATION**

**If discomfort persists following one or more EMS administered nitroglycerine doses:**

**Fentanyl**

- 25 mcg slow IV/IO
- May repeat every 5 mins if discomfort persists (maximum cumulative dose: 200 mcg)

**Morphine Sulfate**

- 2 mg slow IV/IO
- May repeat every 5 mins if discomfort persists (maximum cumulative dose: 20 mg)

- Ⓜ Do not administer fentanyl or morphine to pts with any of the following contraindications:
  - Systolic BP <100
  - Hypoxia or RR <12
  - ALOC or evidence of head injury
- Ⓜ If administering fentanyl & morphine to the same pt, maximum cumulative dose: 100 mcg fentanyl & 10 mg morphine

**For current or potential nausea/vomiting:**

**Zofran (Ondansetron)**

- 4 - 8 mg slow IV/IO, IM or ODT
- May be administered concurrently with fentanyl or morphine to reduce potential nausea/vomiting

STEMI Criteria Met?

NO

Transport to Closest Facility

YES

Both STEMI Criteria Met?

NO

Contact closest facility for destination consultation

- Transmit 12-lead to closest facility if able

YES

≤45 min to STEMI Receiving Center (SRC)

NO

YES

Any of the following criteria met?

- CPR in progress
- Unmanageable airway
- Unstable v-tach

YES

NO


Transport Directly to SRC

- Transmit 12-lead to SRC if able
- Advise SRC of "STEMI ALERT"

**STEMI Pt Notes**

- When possible, any 12-lead meeting STEMI criteria shall be transmitted within 10 mins of first STEMI positive 12-lead.
- Scene time for STEMI pts should be ≤10 mins.
- When possible, obtain & relay to the receiving hospital the name/contact information of an individual who can make decisions on behalf of the pt.
- Always relay pertinent medical directives (DNR, POLST, etc.) to the receiving hospital.



Sierra – Sacramento Valley EMS Agency Program Policy			
<b>STEMI Receiving Center Designation Criteria, Requirements &amp; Responsibilities</b>			
	Effective: 06/01/2022	Next Review: 01/2025	<b>506</b>
	Approval: Troy M. Falck, MD – Medical Director		SIGNATURE ON FILE
	Approval: Victoria Pinette – Executive Director		SIGNATURE ON FILE

**PURPOSE:**

To establish STEMI receiving center (SRC) designation criteria, requirements and responsibilities.

**AUTHORITY:**

- A. California Health and Safety Code, Division 2.5, Chapter 2 § 1797.67 & 1797.88, Chapter 6 § 1798.102, 1798.150, 1798.170 and 1798.172.
- B. California Code of Regulations, Title 13, § 1105 (c).
- C. California Code of Regulations, Title 22, Division 9, Chapter 7.1.

**DEFINITIONS:**

- A. **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.
- B. **Primary PCI** – Urgent balloon angioplasty (with or without stenting), without the previous administration of fibrinolytic therapy or platelet glycoprotein IIb/IIIa inhibitors, to open the infarct-related artery during an acute myocardial infarction with ST-segment elevation.
- C. **ST-Elevation Myocardial Infarction (STEMI)** – A clinical syndrome defined by symptoms of myocardial infarction in association with ST-segment elevation on EKG.
- D. **STEMI Receiving Center (SRC)** – A licensed general acute care facility that has emergency interventional cardiac catheterization capabilities, meets the minimum STEMI care requirements contained in California Code of Regulations (Title 22, Division 9, Chapter 7.1, § 100270.124), and is designated as a SRC by S-SV EMS.
- E. **STEMI Referring Hospital (SRH)** – A licensed general acute care facility that does not have emergency interventional cardiac catheterization capabilities, and transfers STEMI patients to SRCs for PCI services when necessary.

<b>STEMI Receiving Center Designation Criteria, Requirements &amp; Responsibilities</b>	<b>506</b>
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**POLICY:**

- A. Criteria for assessment, identification, treatment and transport of prehospital suspected STEMI patients shall be based on S-SV EMS Chest Pain/Suspected Symptoms of Cardiac Origin Protocol (C-6).
- B. The following shall be met for a hospital to be designated as a SRC by S-SV EMS:
1. Be licensed by the California Department of Public Health Services as a general acute care hospital.
  2. Have a special permit for basic or comprehensive emergency medical service pursuant to the provisions of California Code of Regulations Title 22, Division 5.
  3. Be accredited by a Centers for Medicare and Medicaid Services approved deeming authority.
  4. Have a cardiac catheterization laboratory (cath lab) license.
  5. Have intra-aortic balloon pump capability.
  6. Have cardiovascular surgical services available on site. If cardiovascular surgical services are not available on site, the SRC must have a rapid transfer plan and written agreement in place with a facility that provides cardiovascular surgical services. The expectation is that for emergency cases, the patient will arrive at the cardiac surgical hospital within one (1) hour of the decision to operate.
  7. 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.
  8. Have a communication system for notification of a prehospital suspected STEMI patient, including 12-lead EKG receiving capabilities.
  9. Have established protocols for triage, diagnosis, and cath lab activation following notification of a prehospital suspected STEMI patient.
  10. Maintain a STEMI team call roster (including a cardiologist with PCI privileges and other appropriate cath lab team members).
  11. Have a single call activation system to activate the cath lab team directly.
  12. Ensure the cath lab team is available within 30 minutes of call activation.
  13. Have written protocols in place for the identification of STEMI patients.

<b>STEMI Receiving Center Designation Criteria, Requirements &amp; Responsibilities</b>	<b>506</b>
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14. Have a process in place for the treatment and triage of simultaneously arriving STEMI patients.
15. Agree to accept all prehospital suspected STEMI patients according to applicable S-SV EMS policies/protocols.
16. Agree to accept all STEMI patients from adjacent SRHs, and have transfer plans/agreements in place to ensure rapid transport of these patients to the SRC.
17. Perform a minimum of 36 Primary PCI and 200 total PCI procedures annually.
18. Have the following STEMI Program oversight staff:
  - One STEMI Program Medical Director who is a physician board certified/eligible in interventional cardiology with active PCI privileges at the SRC, and one STEMI Program Medical Co-Director who is a physician board certified/eligible in emergency medicine with active privileges to practice in the emergency department at the SRC.
    - STEMI Program Medical Director/Co-Medical Director responsibilities:
      - Oversight of STEMI program patient care.
      - Participation in development of STEMI Program clinical practice guidelines/protocols.
      - Coordination of STEMI program staff and services.
      - Authority/accountability for STEMI Program quality and performance improvement.
      - Establish and monitor STEMI Program quality control.
      - Regular participation in S-SV EMS Regional STEMI QI Committee activity.
  - One STEMI Program Manager who is an RN trained/certified in critical care nursing and affiliated with the cardiac catheterization laboratory at the SRC, and one STEMI Program Co-Manager who is an RN trained/certified in critical care nursing and affiliated with the emergency department at the SRC.
    - STEMI Program Manager/Co-Manager responsibilities:
      - Support the STEMI Program Medical Director/Co-Medical Director functions.
      - Acts as the STEMI Program EMS liaison.
      - Assures EMS-SRC STEMI data sharing.
      - Manages EMS-SRC STEMI QI activities.
      - Authority/accountability for STEMI Program quality and performance improvement.
      - Regular participation in S-SV EMS Regional STEMI QI Committee activity.


<b>STEMI Receiving Center Designation Criteria, Requirements &amp; Responsibilities</b>	<b>506</b>
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19. Have job descriptions and an organizational structure clarifying the relationship between the STEMI medical directors, STEMI program manager, and the STEMI team and hospital administration.
20. Have a quality improvement (QI) process in place to track and improve treatment (acutely and at discharge) with American College of Cardiology (ACC) and American Heart Association (AHA) guidelines-based Class 1 therapies. At a minimum, this process will evaluate performance in meeting the following AHA/ACC STEMI Receiving Center Achievement Measures:
  - Fibrinolysis within 30 minutes of ED arrival, if administered.
  - SRC Arrival to PCI  $\leq 90$  minutes for patients arriving by non-EMS modes of transport.
  - EMS First Medical Contact (FMC) to PCI  $\leq 90$  minutes, or  $\leq 120$  minutes when transport time is prolonged ( $\geq 45$  minutes).
21. Have a QI process in place to provide ongoing feedback to adjacent SRHs on patients transferred for STEMI services. At a minimum, this QI process shall evaluate and provide SRH feedback of the following:
  - SRH STEMI patient door-to-first ECG time (goal  $< 10$  minutes).
  - SRH STEMI patient door-to-transfer time (goal  $< 30$  minutes).
  - SRH STEMI patient door-to-fibrinolysis time, if applicable (goal  $< 30$  minutes).
  - Operational issues related to STEMI patient transfer delays.
  - Proportion of STEMI patients receiving fibrinolysis prior to transport when the system cannot achieve times consistent with ACC/AHA guidelines for primary PCI.
  - Proportion of STEMI-eligible patients receiving any reperfusion (PCI or fibrinolysis) therapy.
22. Conduct regularly scheduled multidisciplinary team meetings to evaluate outcomes and quality improvement data. Operational issues should be reviewed, problems identified, and solutions implemented.
23. Provide CE opportunities, minimum of four (4) hours per year, for EMS personnel in areas of 12-lead EKG acquisition and interpretation, as well as assessment and management of STEMI patients.
24. Provide public education about STEMI warning signs and the importance of early utilization of the 9-1-1 system.
25. Comply with all data collection, QI and performance standards as defined in S-SV EMS SRC contracts.

- C. SRC diversion of STEMI patients shall only occur during times of an internal disaster or when the cath lab is otherwise unavailable.
1. Notification shall be made to the following entities at least 24 hours prior to any planned event, or as soon as possible for any unplanned event, resulting in the cath lab being unavailable:
    - S-SV EMS.
    - SRC emergency department – to include a status posting on EMResource indicating that the cath lab is unavailable.
    - Appropriate adjacent SRC(s).
    - Appropriate prehospital provider agencies.
  2. All appropriate entities shall be notified as soon as possible when the cath lab is subsequently available.
  3. An S-SV EMS ambulance patient diversion form describing such events shall be submitted to S-SV EMS by the end of the next business day.

**PROCEDURE:**

- A. The SRC applicant shall be designated after satisfactory review of written documentation and an initial site survey conducted by S-SV EMS representatives or designees and completion of a contract between the hospital and S-SV EMS.
- B. Designated SRCs shall have verification reviews by S-SV EMS representatives or designees conducted every three (3) years.
- C. Failure to comply with the criteria and performance standards outlined in this policy and/or SRC contracts may result in probation, suspension or rescission of SRC designation. Compliance will be solely determined by S-SV EMS.

Sierra – Sacramento Valley EMS Agency Program Policy		
<b>Rapid Re-Triage &amp; Interfacility Transport Of STEMI, Stroke &amp; Trauma Patients</b>		
	Effective: 12/1/2023	Next Review: 7/2026
	Approval: Troy M. Falck, MD – Medical Director	<b>510</b>
	Approval: John Poland – Executive Director	SIGNATURE ON FILE

**PURPOSE:**

To establish the procedures for rapid re-triage and interfacility transport (IFT) of acute STEMI, stroke, and trauma patients whose clinical condition requires a higher level of care than can be provided at the sending facility. This process involves direct ED to ED transfer of patients that have not been admitted to the hospital.

**AUTHORITY:**

- A. HSC, Division 2.5, Chapter 2, § 1797.67 and 1797.88, Chapter 6 § 1798.102, 1798.150, 1798.170, and 1798.172.
- B. CCR, Title 22, Division 9, Chapter 7, 7.1 & 7.2

**DEFINITIONS:**

- A. **STEMI Patient Rapid Re-Triage** – The rapid evaluation, resuscitation, and transfer of a STEMI patient from a STEMI Referral Hospital (SRH) to a STEMI Receiving Center (SRC).
- B. **Stroke Patient Rapid Re-Triage** – The rapid evaluation, resuscitation, and transfer of an acute stroke patient from a non-stroke facility to a stroke receiving center.
- C. **Trauma Patient Rapid Re-Triage** – The rapid evaluation, resuscitation, and transfer of a seriously injured patient from a non-trauma facility, or a lower-level Trauma Center, to a Trauma Center that can provide a higher level of trauma care.

**POLICY:**

- A. STEMI patients from a hospital within the S-SV EMS region shall be accepted for transfer by a SRC unless the SRC is on STEMI diversion or internal disaster.
- B. Acute stroke patients requiring a higher level of care than can be provided at the sending facility, should be accepted for transfer by a stroke receiving center unless the stroke receiving center is on stroke diversion or internal disaster.

<b>Rapid Re-Triage &amp; Interfacility Transport Of STEMI, Stroke &amp; Trauma Patients</b>	<b>510</b>
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- C. Trauma patients from a hospital within the S-SV EMS region meeting 'Emergency' ("Red Box") or 'Urgent' transfer re-triage criteria shall be accepted for transfer unless the Trauma Center is on trauma diversion or internal disaster.

**RAPID RE-TRIAGE AND IFT PROCEDURES:**

A. STEMI Patients:

1. A 12-lead EKG should be obtained within ten minutes of patient arrival at a SRH.
2. Immediately after a STEMI is identified, contact the SRC to arrange transfer. Contact the SRC interventional cardiologist as needed.
3. If SRH arrival to PCI at the SRC is anticipated to be >90 minutes, administration of lytic agents should be considered in patients that meet thrombolytic eligibility criteria. Contact the SRC early to discuss coordination of care. The goal for door to thrombolytics is <30 minutes.
4. Patients with an SRH identified STEMI should be transferred within 45 minutes utilizing the most appropriate transport resources based on patient condition and needs.

B. Acute Stroke Patients:

1. Evaluate patients with signs/symptoms of an acute stroke as soon as possible.
2. Acute stroke patients requiring a higher level of clinical care than can be provided at the sending facility should be transferred as soon as possible.
3. Contact the closest most appropriate stroke receiving center to discuss patient status and request transfer. If transfer is accepted, arrange for appropriate transport resources based on patient condition and needs.

C. Trauma Patients:

1. Rapid re-triage and transfer of trauma patients shall be based on the North Regional Trauma Coordinating Committee Guidelines for Transfer to a Trauma Center Criteria (incorporated into this policy for reference).
2. Emergency Transfer ("Red Box") Trauma Patients:
  - The goal is to transfer patients meeting any 'Emergency Transfer' ("Red Box") Trauma Re-Triage Criteria within one (1) hour of arrival at the sending facility.

<b>Rapid Re-Triage &amp; Interfacility Transport Of STEMI, Stroke &amp; Trauma Patients</b>	<b>510</b>
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- Contact the closest appropriate Trauma Center as soon as possible and identify the patient as meeting “Red Box” criteria.

3. Urgent Transfer Trauma Patients:

- The goal is to transfer patients meeting any ‘Urgent Transfer’ criteria within four (4) hours of arrival at the transferring facility.
- Contact the closest most appropriate Trauma Center to discuss patient status and request transfer. If transfer is accepted, arrange for appropriate transport resources based on the patient’s condition and needs.

D. IFT Procedures:

1. Unless medically necessary, avoid using medication drips that are not in the paramedic scope of practice to avoid transfer delays.
2. If patient care has been initiated that exceeds the paramedic scope of practice, the sending hospital may consider sending a nurse or other qualified medical staff with the ground ambulance. Air ambulances or nurse staffed ground critical care transport (CCT) units may also be utilized if necessary and their response time is appropriate.
3. The patient should be ready for transport and records/staff should be prepared and available for EMS transport personnel upon arrival at the sending facility. Availability of records should not delay the transport of patients in need of emergency transfer. If complete documentation is not sent with the ambulance, it should be faxed/electronically transmitted to the receiving hospital in sufficient time that it will arrive prior to the patient if possible.
4. For patients requiring emergency transfer, contracted advanced life support (ALS) transport providers should be utilized when agreements are in place and the transport unit is available within ten (10) minutes of the initial request. The jurisdictional ALS transport provider may be requested via 9-1-1 when the contracted ALS provider is not readily available.



**Guidelines for Transfer to a Trauma Center**  
North Regional Trauma Coordinating Committee

**Emergency Transfer:** Call the Trauma Center for immediate consult and/or acceptance. Avoid unnecessary studies that would delay the transfer. The goal is transfer within 1 hour of arrival.

- Systolic blood pressure <90 mm Hg
- Labile blood pressure despite 2L of IV fluids or requiring blood products to maintain blood pressure
- GCS ≤8 or lateralizing signs
- Penetrating injuries to head, neck, chest or abdomen
- Fracture/dislocation with loss of distal pulses &/or ischemia
- Pelvic ring disruption or unstable pelvic fracture
- Vascular injuries with active arterial bleeding


**URGENT TRANSFER:** Call the Trauma Center and initiate transfer as soon as any of the following are identified. Avoid unnecessary studies. The goal is transfer within 4 hours of arrival.

Physiologic	Extremity Injuries
<ul style="list-style-type: none"> <li>• For a child, labile blood pressure despite 20 ml/kg of fluid resuscitation</li> <li>• Patients requiring blood products to maintain their blood pressure</li> </ul> <p>Note:</p> <ol style="list-style-type: none"> <li>1. For pediatric patients, systolic blood pressure &lt;70 plus 2 times the age should suggest hypotension</li> <li>2. Systolic blood pressure &lt;110 may represent shock in patients &gt;65 years of age</li> </ol>	<ul style="list-style-type: none"> <li>• Amputation of extremity proximal to wrist or ankle</li> <li>• Open long-bone fractures</li> <li>• Two or more long-bone fracture sites*</li> <li>• Crush injury/mangled extremity</li> </ul> <p>*A radius/ulna fracture or tibia/fibula fracture are considered one site</p>
Neck & Thoracic Injuries	Neurological Injuries
<ul style="list-style-type: none"> <li>• Tracheobronchial injury</li> <li>• Esophageal trauma</li> <li>• Great vessel injury</li> <li>• Major chest wall injury with ≥3 rib fractures &amp;/or pulmonary contusion</li> <li>• Pneumothorax or hemothorax with respiratory failure</li> <li>• Radiographic evidence of aortic injury</li> <li>• Known or suspected cardiac injury</li> </ul>	<ul style="list-style-type: none"> <li>• GCS deteriorating by 2 points during observation</li> <li>• Open or depressed skull fracture</li> <li>• Acute spinal cord injury</li> <li>• Spinal fractures, unstable or potentially unstable</li> <li>• Neurologic deficit</li> </ul>
Abdominal Injuries	Pelvic/Urogenital
<ul style="list-style-type: none"> <li>• Evisceration</li> <li>• Free air, fluid or solid organ injury on diagnostic testing</li> </ul>	<ul style="list-style-type: none"> <li>• Bladder rupture</li> </ul>
Burn Injuries	Co-Morbid Factors
<ul style="list-style-type: none"> <li>• Second or third-degree thermal or chemical burns involving &gt;10% of total body surface area in patients &lt;15 years or &gt;55 years of age</li> <li>• Second or third-degree thermal or chemical burns involving the face, eyes, ears, hands, feet, genitalia, perineum, and major joints</li> <li>• Third-degree burns &gt;5% of the body surface area in any age group</li> <li>• Electrical burns, including lightning injury</li> <li>• Burn injury with inhalation injury</li> </ul>	<ul style="list-style-type: none"> <li>• Adults &gt;55 years of age with significant trauma</li> <li>• Significant torso injury with advanced co-morbid disease (cardiac or respiratory disease, insulin-dependent diabetes, morbid obesity, immunosuppression or End Stage Renal Disease requiring dialysis)</li> <li>• Patients taking anti-coagulant medication or platelet inhibitors</li> <li>• Children &lt;14 years of age with significant trauma</li> <li>• Traumatic injury and pregnancy &gt;20 weeks gestation</li> </ul>

**Note: All transfers must be in accordance with both state and federal EMTALA laws**  
Reference: American College of Surgeons, Committee on Trauma, Interfacility Transfer of Injured Patients: Guidelines for Rural Communities, 2002

Sierra – Sacramento Valley EMS Agency Program Policy

**12-Lead EKG Procedure**

	Effective: 06/01/2021	Next Review: 05/2024	<b>1107</b>
	Approval: Troy M. Falck, MD – Medical Director		SIGNATURE ON FILE
	Approval: Victoria Pinette – Executive Director		SIGNATURE ON FILE

**PURPOSE**

To establish indications and requirements for performing 12-lead electrocardiogram (EKG) procedures in the prehospital setting.

**AUTHORITY**

- A. HSC, Division 2.5, § 1791.220.
- B. CCR, Title 22, Division 9, Chapters 3 & 4.

**POLICY**

12-lead EKG procedures shall be performed on patients who present with one or more of the following:

- A. Signs/symptoms suggestive of acute coronary syndrome (ACS) such as:
  - 1. Non-traumatic chest or upper abdominal discomfort.
  - 2. Syncope or near-syncope.
  - 3. Acute generalized weakness.
  - 4. Dyspnea.
- B. Cardiac dysrhythmias on 4-lead EKG.
- C. ROSC following cardiac arrest.

**PROCEDURE**

- A. Packaged electrodes designed for single patient use (not bulk) shall be utilized for 12-lead EKG procedures.
- B. The patient's skin shall be adequately prepared (wiped utilizing a 4x4 gauze pad and shaved if required) prior to electrode placement.

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- C. A minimum of the patient's age, gender, last name and first initial shall be entered into the cardiac monitor prior to 12-lead EKG acquisition.
  - D. Obtain an initial 12-lead EKG as soon as possible/practical, and prior to EMS nitroglycerin administration.
  - E. 12-lead EKG criteria for ST Elevation Myocardial Infarction (STEMI) includes either of the following:
    - 5. Machine read out indicating **\*\*\*Meets ST Elevation MI Criteria\*\*\***, **\*\*\*Acute MI\*\*\***, **\*\*\*STEMI\*\*\*** (or equivalent).
    - 6. EMS personnel interpretation consistent with a STEMI (e.g. ST segment elevation in two or more contiguous leads).
  - F. Bundle branch blocks, atrial fibrillation, artifact, poor lead placement and/or poor skin preparation can result in STEMI false positive 12-lead EKGs. Consider 12-lead re-acquisition if significant artifact is observed or 12-lead EKG machine read out indicates "poor data quality" (or equivalent).
  - G. Any 12-lead EKG meeting STEMI criteria shall be transmitted to the appropriate facility (closest hospital or STEMI Receiving Center depending on incident specific circumstances) as soon as possible if transmission capabilities are available.
  - H. For patients with suspected acute coronary syndromes (ACS), serial 12-lead EKGs should be obtained if the patient's clinical status changes or if EKG changes are noted on the cardiac monitor, and every 15 minutes if transport times are long.
  - I. Copies of prehospital 12-lead EKGs shall be provided to the receiving hospital physician upon EMS arrival, left at the receiving hospital at time of patient delivery and attached to the EMS patient care report.