

SACRAMENTO COUNTY

Department of Health Services
Primary Health Division



OCTOBER
2019

EMERGENCY MEDICAL SERVICES
REPORT 2019



Sacramento County Emergency Medical Services Agency

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Public Counter Hours: Tuesday – Thursday | 8:00 am – 12:00 pm

Message from the EMS Agency

The past several years have been some of the most exciting years for the Sacramento County EMS Agency. Beginning in 2017, all Sacramento County ALS provider agencies were required to use an electronic patient care report (ePCR) platform, vastly improving our data collection and analysis capabilities. This has allowed our Quality Improvement Program to flourish, and we can now use data driven evidence based practices to drive system change and improvements in prehospital care. In the last year, we began the process of implementing new state regulations requiring STEMI (Heart Attack) and Stroke specialty systems of care. We have grown and accomplished a lot in the past year, with more positive change to come in these next few years.

Hernando Garzon, MD, Medical Director & David Magnino, EMT- P, BS, EMS Administrator

OVERVIEW

The Sacramento County Emergency Medical Services (EMS) system is comprised of numerous providers working together in collaboration to provide high quality emergency medical services. This emergency medical system of care is a critical safety network for Sacramento County residents. These safety net providers include first responders such as ambulances (local public fire and private entities – ground and air), law enforcement, local acute care and designated trauma hospitals, and other providers. These providers respond 24 hours a day, seven days a week, serving a diverse geography that includes remote rural areas and large urban centers. System partners are committed to ensuring that quality services are available for all county residents and that emergency medical care is provided in a coordinated, professional, and timely manner.

This report outlines the duties and responsibilities of the local EMS agency and the EMS system's quality improvement data for the past year.



SACRAMENTO COUNTY EMERGENCY MEDICAL SERVICES AGENCY (SCEMSA)

EMS Mission

Our mission is to deliver effective prehospital care to the residents of Sacramento County by coordinating and maximizing EMS resources.

Values

Integrity, Professionalism, Compassion, Honesty, Community

SCEMSA, the EMS Agency, is located within the Department of Health Services, Primary Health Division. There are 7.0 FTE county staff and a part-time contracted Medical Director.

Sacramento County Emergency Medical Services Agency (SCEMSA)	
EMS Administrator	David Magnino, B.S./EMT-P
EMS Medical Director	Hernando Garzon, MD
EMS Coordinator	Ben Merin, B.S./ EMT-P
EMS Specialists	Kathy Ivy, EMT-P, CE and Training Programs Dorthy Rodriquez, Quality Improvement and Trauma Kristin Bianco, EMT-P, ALS Providers
Administrative Staff	Stephanie Mello, Administrative Services Officer II Amanda Morse, Senior Office Assistant

SCEMSA was created through Sacramento County Board of Supervisors Resolution #90-1100 on June 20, 1990. This action separated the County from a regional EMS agency to become a local EMS agency dedicated to Sacramento County.

SCEMSA is a regulatory entity, approved by the State EMS Authority, which implements state mandates to integrate each element of prehospital emergency care from emergency medical dispatch, to ambulance provider response, care, and transport to the emergency department into one system of response. SCEMSA staff provide coordinated and comprehensive oversight of the EMS system, ensuring stakeholder involvement, while monitoring productivity and responding to service issues. The responsibilities and authority of the EMS agency and its medical director are defined in Health & Safety Code, and Title 22, Division 9 of the CA Code of Regulations.

The agency's essential role is to provide medical oversight for all prehospital care delivered by Emergency Medical Technicians (EMTs), Mobile Intensive Care Nurses (MICNs) and Paramedics, and to coordinate the multiple stakeholders involved in the EMS system of care. SCEMSA partners with acute care hospitals, fire departments, Advanced Life Support (ALS) ambulance providers, Basic Life Support (BLS) providers, law enforcement, State Agencies and others in public health to plan, manage, and evaluate the essential components of emergency response. Responsibilities include: credentialing of EMS providers and training institutions; establishing oversight and procedures for emergency medical service calls, and the medical care provided by paramedics and emergency medical technicians at the scene of an emergency; designating emergency and specialty receiving centers; and assuring patients are transported to the most appropriate hospital.



SYSTEM PARTNERS

SCEMSA partners with Advanced Life Support (ALS) providers and their dispatch centers, Basic Life Support (BLS) providers, Prehospital Continuing Education (CE) providers, EMT and Paramedic Training program providers, and hospitals.

ALS PROVIDERS

ALS ground transport providers provide prehospital emergency medical care and patient transport to SCEMSA approved receiving hospitals. Sacramento County ALS providers include four (4) public (fire department) and nine (9) private ALS provider agencies.

ALS air transport providers provide patient transport via medical helicopter when it is critical that the injured patient is transported to the appropriate hospital as quickly as possible. Such incidences include severe traffic accidents, accidents in rural areas, or when a hospital needs to transport a patient to another hospital and time is of the essence. Sacramento County air ALS providers include two (2) private air providers.

ALS non-transport providers provide prehospital emergency care at the scene of an emergency prior to arrival of ALS transport providers. These providers are based in areas that require additional resources due to population or rural locations.

Public ALS Ground Transport Providers	Private ALS Ground Transport Providers
Cosumnes CSD Fire Department Folsom City Fire Department Sacramento City Fire Department Sacramento Metropolitan Fire District	AlphaOne Ambulance Medical Services American Medical Response Bay Medic Transportation Falck Ambulance Medic Ambulance Service NorCal Ambulance ProTransport-1 Sacramento Valley Ambulance Trauma Life Care Medical Transport
Private ALS Air Transport Providers	ALS Non-Transport Providers
CALSTAR REACH	CHP – Capitol Protection Division Wilton Fire Department

BASIC LIFE SUPPORT (BLS) PROVIDERS

BLS providers cover more rural parts of the county, and provide emergency first aid and CPR until the patient can be transported or until advanced life support is available.

BLS Non-Transport Providers
Airport System Aircraft Rescue & Firefighting
CHP – Office of Air Operations Headquarters
Courtland Fire Protection District
Herald Fire Protection District
Isleton Fire Department
River Delta Fire District
VersaCare Emergency Medical Services, Inc.
Walnut Grove Fire Protection District

CONTINUING EDUCATION (CE) PROVIDERS

SCEMSA is the approving authority for EMS CE programs based in Sacramento County. Staff establish CE standards and define roles and responsibilities of CE Providers pursuant to state law, regulations and guidelines. Approved CE providers in Sacramento County are dedicated to providing the highest quality continuing education to prehospital and hospital personnel. CE providers conduct educational courses necessary for EMS personnel to meet certification or recertification requirements.



CE Providers		
AlphaOne Ambulance Medical Services	Dignity Health	NorCal Ambulance
American Medical Response	Disaster Management Assistance Team	NorCal Emergency Medical Training
American River College	Folsom City Fire Department	Sacramento County Department of Airports
California Fire & Rescue Training Authority	International School of Tactical Medicine	Sacramento City Fire Department
California State University, Sacramento	Kaiser Permanente Medical Center - South Sacramento	Sacramento Metropolitan Fire District
CALSTAR	Kaiser Permanente Medical Center - Sacramento	UC Davis Medical Center
Cosumnes CSD Fire Department	Margaret Watson-Hopkins	Walnut Grove Fire District
Cosumnes River College	Mercy San Juan Medical Center	

TRAINING PROGRAM PROVIDERS

Training programs prepare individuals to provide basic, advanced, or intensive prehospital emergency care and transportation of the injured to SCEMSA approved hospitals. SCEMSA is delegated the regulatory responsibility under state regulations for approving Emergency Medical Technician (EMT), Paramedic, and Mobile Intensive Care Nurse (MICN) training programs located in Sacramento County.

SCEMSA approved ten (10) training programs, which include EMT, Paramedic, and MICN training programs. SCEMSA conducts annual site inspections, provides assistance with Committee on Accreditation of Educational Programs for the EMS Professions (CoEMSP) accreditation audits, classroom visits, and/or provides guest speakers regarding accreditation or certification.

Emergency Medical Technician (EMT)	Paramedic	Mobile Intensive Care Nurse (MICN)
American River College	American River College	Mercy San Juan Medical Center
California Regional Fire Academy	California State University, Sacramento	UC Davis Medical Center
California State University, Sacramento		
Cosumnes River College		
Project Heartbeat		
Walnut Grove Fire District		

POPULATION AND SERVICE UTILIZATION

In 2018, Sacramento County had an estimated population of 1.54 million. This is an 8.6% increase from the population census completed in April 2010. Sacramento County is currently the eighth most populous county in California and is growing each year.

The County's largest city is Sacramento. With over 500,000 residents, Sacramento is the sixth most populous city in California and was the fastest growing large city in 2018 (California Department of Finance Demographic Report May 2019). The County includes six additional incorporated cities. Nearly 600,000 residents live in the unincorporated area of the County where services may not be available nearby.

As a result, the County's EMS utilization continues to increase.

Sacramento County	2018
Population (estimated)	1,540,975
Total EMS Responses	276,278
EMS Responses per 1,000 People	179
Average EMS Responses per Day	757
Square Miles EMS Serves	965
Population per Square Mile	1,597
EMS Responses per Square Mile	286
Median Household Income (2017)	\$60,239
Population Below Federal Poverty Level	14.1%

In Sacramento County, significant differences in population density create challenges for the EMS system.

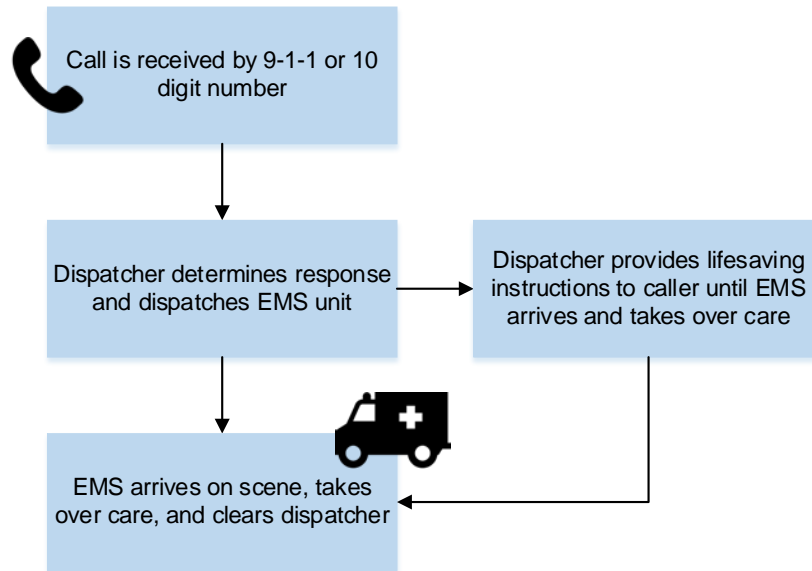
DISPATCH

Calls for emergency medical services are received via 9-1-1 or 10 digit number (direct call to an ambulance provider).

The State EMS Authority designates Sacramento County as a non-exclusive transportation system. Local public fire departments (Sacramento Metropolitan Fire, Sacramento City Fire, Consumes, and Folsom) have a joint powers of agreement and are responsible for central dispatch of all emergency responses to 9-1-1.

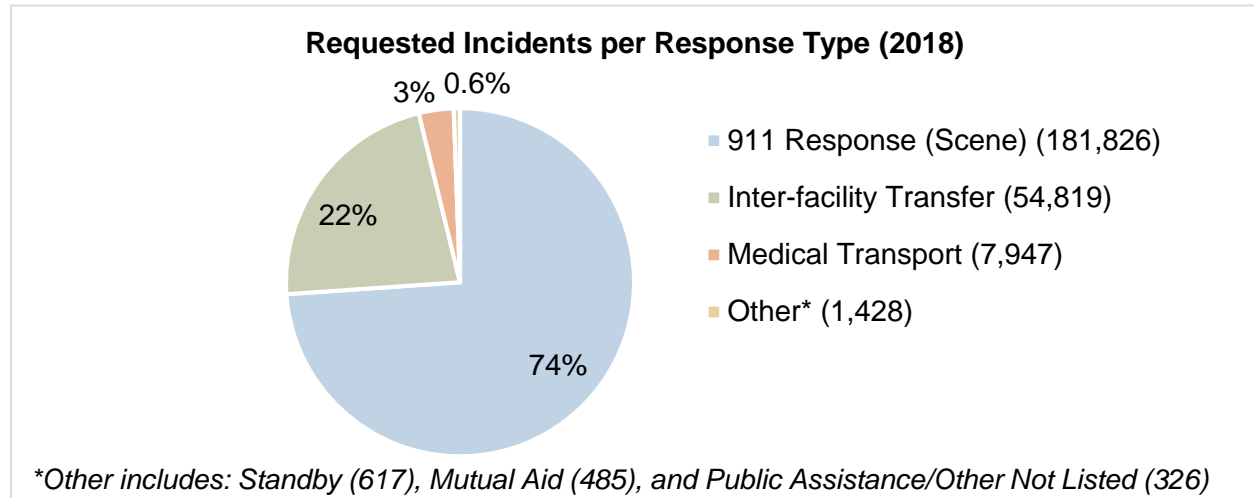
Every ALS provider agency is required to operate or participate in a Public Safety Answering Point (PSAP) in order to receive and process calls for medical assistance. All PSAPs operating in Sacramento County are required to process calls for medical aid using a SCEMSA approved Emergency Medical Dispatch (EMD) System, including a Certified Emergency Medical Dispatcher. The Emergency Medical Dispatcher plays a vital role in the EMS system and is responsible for the following:

<i>Determining response level</i>	Normal, expedient, or lights and siren
<i>Determining response mode</i>	Air transport, ground transport, other AND Dispatch to the closest and most appropriate EMS unit. AND Dispatch additional resources as indicated.
<i>Providing lifesaving instructions as needed</i>	Remain on the phone with the caller until the EMS unit arrives. Examples – CPR, choking, emergency childbirth.



RESPONSE

While the majority of EMS incidents are initiated through the 9-1-1 call system, there are additional response types that are categorized as EMS incidents, as shown below:



Legend:

9-1-1 Response (Scene): The response to a location of a medical emergency where a request for acute medical care is requested by utilizing 9-1-1 or a 10 digit emergency line.

Inter-facility transfer: Patient transfer from one acute hospital to another acute hospital.

Medical transport: Patient transport between an acute hospital and a non-acute setting such as a home or nursing facility.

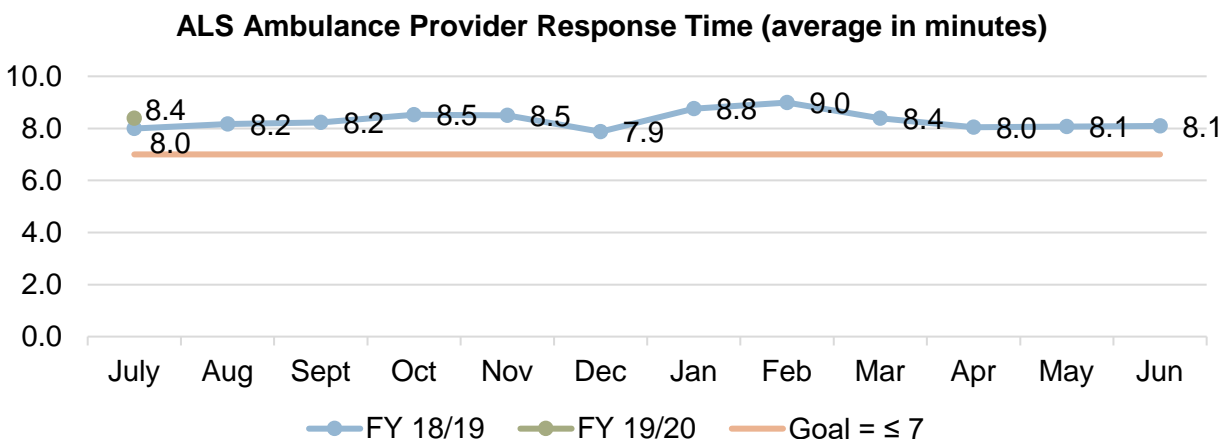
Mutual aid: Response to an incident outside the jurisdiction of the local EMS agency.

Public assistance: Individual needs assistance but not emergency medical care or transport (example: fell and needs help getting up).

Standby: Events where large crowds are expected (example: fair, football game).

PREHOSPITAL PROVIDERS RESPONSE TIMES

The County monitors ALS ambulance provider response times to ensure the closest and most appropriate unit is responding to each call and to enhance health outcomes for patients. The following chart displays the average response time for Sacramento County ALS providers during each month of 2018. Response time is measured from the time a call is received until the ambulance arrives at the patient's side. SCEMSA began monitoring response times in 2017. We will begin comparing the data to State and National benchmarks when that information is readily available.



AMBULANCE INSPECTIONS

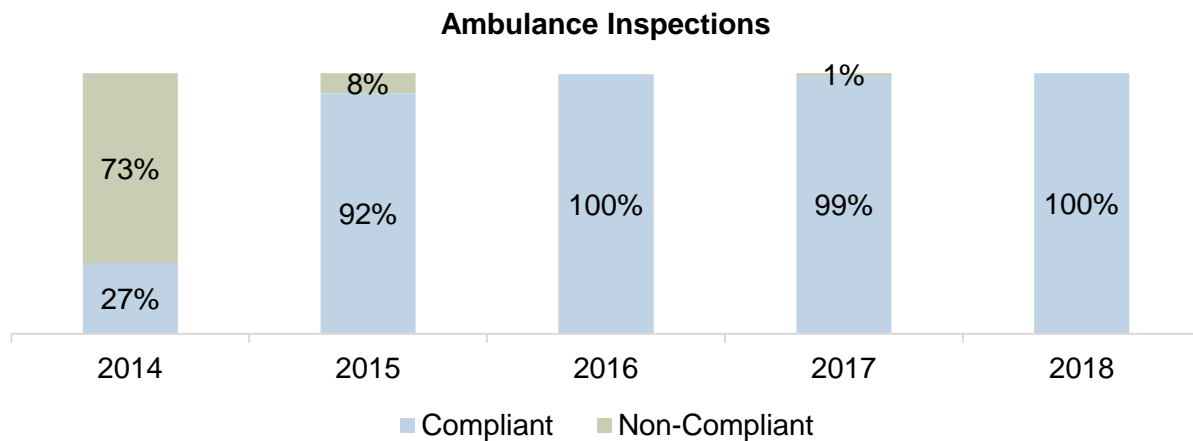
Agency staff are responsible for annual inspections of all ALS vehicles to ensure compliance with policies. ALS vehicles must contain required equipment and medical supplies to provide timely and appropriate prehospital medical treatment. Vehicles include ground and air transports and non-transport vehicles such as fire engines and trucks. Vehicles such as golf carts or bicycles may also be used for special events.

When an emergency medical provider applies in Sacramento County as an ALS provider, all its vehicles (transport or non-transport) are



inspected prior to approval and being placed in service. Staff also inspects new ALS vehicles before they are placed into service by an existing provider.

In 2008, annual inspections were suspended due to decreased staffing as a result of budgetary reductions. In 2014, a position was added and inspections resumed. Staff inspected 202 ALS vehicles in 2014 and found 27% of the vehicles were compliant with policy. Within two years, the rate of compliance improved to over 99%.



CERTIFICATION AND ACCREDITATION

Agency staff process certification and accreditation applications for prehospital emergency medical services personnel (Emergency Medical Technicians, Paramedics, and Mobile Intensive Care Nurses) practicing within the County. Every two years, prehospital providers submit applications including the required Continuing Education (CE) hours, training, and proof of required medical skills necessary to maintain their certification/accreditation.

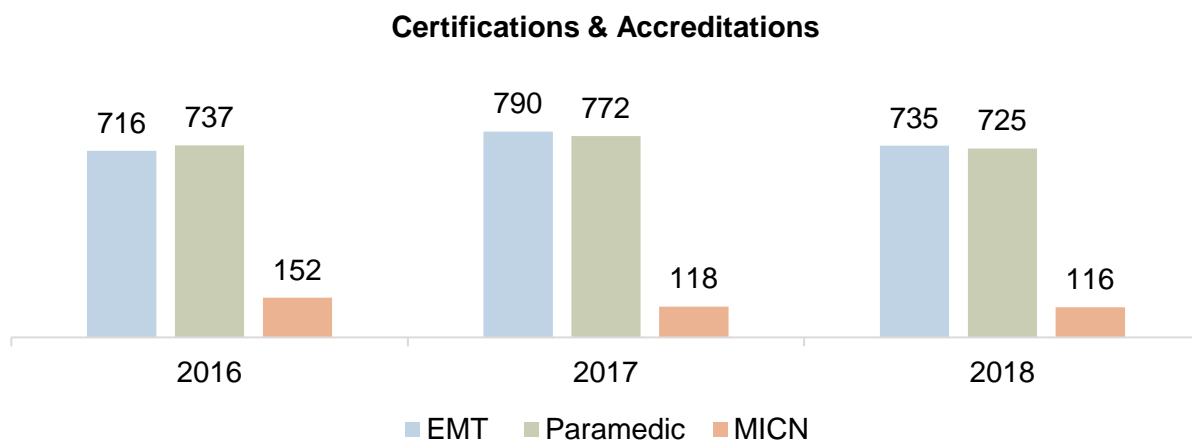
In 2015, the County implemented a web-based application system allowing individuals to submit and pay for Emergency Medical Technician (EMT), Paramedic, and Mobile Intensive Care Nurse (MICN) applications online. Applications for Emergency Medical Responder (EMR) were added to the system in September

2019. Staff is pleased to offer this enhancement enabling EMS personnel to submit applications electronically from any mobile device or computer, eliminating the need for an office visit.



Provider Type	Services Provided	Authorization
Emergency Medical Responder (EMR)	Basic life support	Required to possess a valid Sacramento County certificate (applications processed by county staff).
Emergency Medical Technician (EMT)	Basic life support	Required to possess a valid State of California EMT certificate (applications processed by county staff).
Paramedic	Advanced life support, including administering life-saving medication.	Required to obtain a California paramedic license from the State EMS Authority and apply for accreditation in the county in which they work.
Mobile Intensive Care Nurse (MICN)	Work at a base hospital and provide medical direction to EMS personnel in the field.	Required to apply for certification in the county in which they work.

The following chart summarizes certifications and accreditations (new/renewal) completed over the last three years.



PROFESSIONAL STANDARDS PROGRAM

The Professional Standards Program ensures that each EMT certified by the SCEMSA or working in Sacramento County provides safe, professional, and competent clinical care to the county's residents and visitors. Investigations are initiated based on a complaint from a citizen, provider, or a criminal background report from the Department of Justice. Staff investigates and takes appropriate action for allegations of misconduct.

Investigations Initiated	2018
Citizen Complaints	3
Provider Complaints	8
Personnel Investigations	47
Total	58

Investigation Status	2018
Active Probations	6
Denied	4
Expired Probations	1
Revoked	5
Surrendered	0
Suspended	0
Withdrawn	1
Closed – No Action Taken	33
Open – Pending	8
Total	58

Investigation Count per Year	
2016	39
2017	32
2018	58

HOSPITALS: RECEIVING, BASE, AND SPECIALTY CARE

SCEMSA approves and designates local hospitals as 9-1-1 receiving, base, and specialty care hospitals.

- **Receiving hospitals:** Provide emergency services and receive basic and advanced life support patients from emergency medical system responders.
- **Base hospitals:** While most of the care provided in the field by prehospital personnel is protocol driven, when the need arises, EMS personnel can contact “medical control” (trained nurse or physician) for further instructions. Base hospitals provide this medical direction to prehospital EMS personnel in the field.
- **Specialty care centers:** Hospitals with a nationally recognized certification and approval from the SCEMSA to provide advanced care in designated critical care areas, including: Critical Trauma, STEMI (Heart Attack), and Stroke. In addition, Sacramento County has one Burn Center and one Pediatric Trauma Center recognized by the ACS and Joint Commission, which are recognized by SCEMSA.

STEMI and Stroke hospitals are certified nationally but are not yet designated by SCEMSA.

Staff are in process of obtaining new program approvals by the State EMS Authority. Programs should be approved no later than December 2019. See the following table depicting the hospital specialty care centers.

Hospital	Receiving	Base	Trauma	STEMI Receiving	Stroke Primary	Stroke Comprehensive
Kaiser Permanente Medical Center	✓				✓	✓
Kaiser Permanente South Sacramento	✓	✓	✓	✓	✓	
Kaiser Permanente Roseville	✓			✓	✓	
Mercy General	✓			✓	✓	
Mercy Hospital of Folsom	✓				✓	
Methodist Hospital of Sacramento	✓				✓	
Mercy San Juan Medical Center	✓	✓	✓	✓	✓	✓
Sutter Medical Center Sacramento	✓			✓	✓	
Sutter Medical Center Roseville	✓		✓	✓	✓	
UC Davis Medical Center	✓	✓	✓	✓	✓	
Veterans Affairs Medical Center	✓					

HOSPITAL ADVISORY / DIVERSION

All SCEMSA system partners have continuous awareness of the status of local emergency departments through a common software platform – EMResource. Infrequently, Emergency Departments (ED) may go on “advisory” when certain services are not available (CT scanner, Cath lab, O.R.), or can go on full “diversion” when the Emergency Department is severely overcrowded. An internal disaster can be declared when an event has occurred that substantially inhibits operations within the facility (fire, flood, power loss, etc.). Trauma centers go on a “trauma diversion” when they are caring for patients and immediate trauma services are not available. Hospital agreements and SCEMSA policy define the advisory and diversion criteria and the process followed when these rare events occur.

The County began monitoring Emergency Department status on June 1, 2018, as shown on the following page.

Emergency Department Status 2018 Reported in Hours					
Facility	Advisory	Diversion*	Internal Disaster	Trauma Diversion	Open
Kaiser North	5.3		6.1	N/A	8,746.7
Kaiser South (Level II Trauma)	33.7		0.3	39.6	8,686.3
Mercy Folsom	69.1			N/A	8,690.9
Mercy General	47.8		8.6	N/A	8,703.7
Mercy San Juan (Level II Trauma)	42.5			10.8	8,706.8
Methodist Hospital	6.0			N/A	8,754.0
Sutter Medical Center	21.0		13.6	N/A	8,725.4
UCDMC (Level I Trauma)	0.3				8,759.7
VA Medical Center	12.1		4.0	N/A	8,741.8
TOTAL	237.8	0.0	32.6	50.4	78,515.2

* EMS staff started monitoring diversion hours for emergency departments on June 1, 2019

Emergency Department Status January – June 2019 Reported in Hours					
Facility	Advisory	Diversion	Internal Disaster	Trauma Diversion	Open
Kaiser North		0.8	2.0	N/A	4,340.2
Kaiser South (Level II Trauma)	70.8			19.9	4,252.3
Mercy Folsom	3.3	6.9		N/A	4,332.9
Mercy General	23.5		1.1	N/A	4,318.4
Mercy San Juan (Level II Trauma)	13.3			1.8	4,327.9
Methodist Hospital	2.9			N/A	4,340.1
Sutter Medical Center	3.7		1.4	N/A	4,337.9
UCDMC (Level I Trauma)	6.0	10.5		0.1	4,326.4
VA Medical Center	17.1			N/A	4,325.9
TOTAL	140.7	18.1	4.4	21.8	38,901.9

AMBULANCE PATIENT OFFLOAD TIME (APOT)

In the past ten years, Emergency Department (ED) visits nationally and in Sacramento have increased by approximately 15-18%. With no similar increase in ED beds, this has worsened ED overcrowding in Sacramento. In turn, this has resulted in extended periods between EMS arrival to an ED and the time it takes to transfer care to hospital staff. This period of time is commonly referred to as “wall time,” or Ambulance Patient Offload Time (APOT). When large numbers of ambulances are being held at hospitals, unable to transfer care to hospital staff, and not able to respond to new calls, EMS operations are adversely affected in the community.



In the spring of 2017, SCEMSA began collecting APOT data from Sacramento County hospitals and prehospital providers. The 2017 data established a baseline of APOT throughout the County, with 2018 being the first full year of APOT data. SCEMSA monitors and reports APOT to system stakeholders and to the State EMS Authority. Statute defines APOT as the time it takes from the time an ambulance arrives at a hospital with a patient to the time transfer of care occurs from the Paramedic to the receiving emergency department nurse or doctor. The State EMS Authority established the goal of 20 minutes or less, at least 90% of the time.

SCEMSA shares APOT information with prehospital and hospital stakeholders in an effort to improve the length of time for transfer of care from the ambulance crew to the hospital staff. Improvements in offload time assist the ambulance crews in being available and ready to respond to the next emergency in the community. SCEMSA continues to work with its stakeholders to improve the transfer of care and decrease the APOT to the State standard throughout the entire county.

Below is a table indicating 2018 data for Sacramento County hospitals.

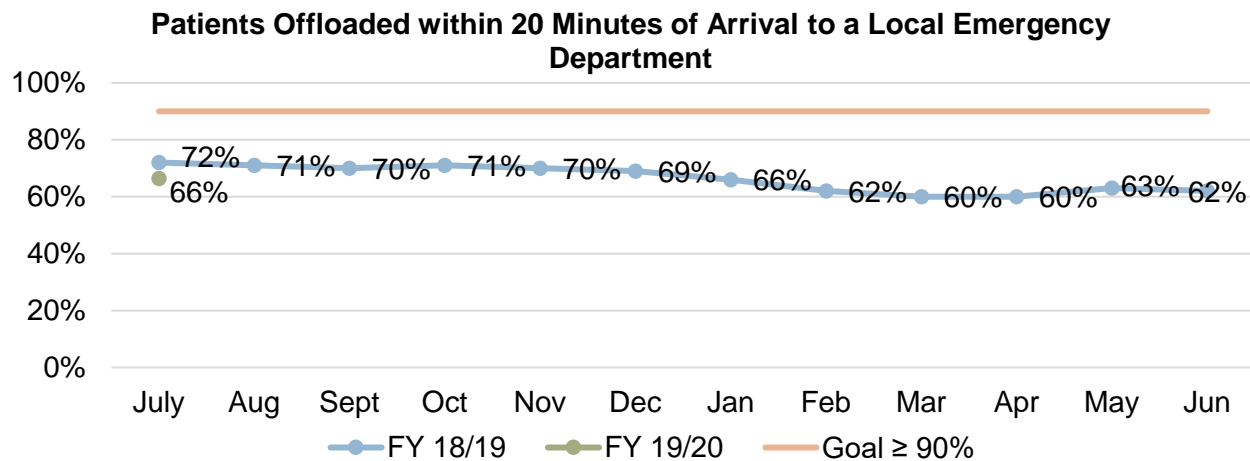
AMBULANCE PATIENT OFFLOAD TIME 2018				
Hospital	Total ED Patients	EMS Patients	Percentage	APOT 90th Percentile (Minutes)
Kaiser Roseville	128,500	7,367	6%	24
Kaiser Sacramento	116,268	16,647	14%	25
Kaiser South	126,938	17,142	14%	27
Mercy General*	40,216	8,253	21%	40
Mercy Methodist*	54,189	9,371	17%	39
Mercy Folsom*	42,398	5,465	13%	19
Mercy San Juan	76,549	18,777	25%	49
Sutter Sacramento	104,200	17,275	17%	59
Sutter Roseville	83,400	4,114	5%	43
UC Davis	83,870	17,073	20%	27
VA Sacramento	27,169	1,635	6%	19
Totals	883,697	123,119	14%	37

Percentage is the amount of Sacramento EMS patients transported to the hospital compared to the hospitals total ED patients.

Roseville hospitals get the minority of their EMS traffic from Sacramento EMS, and the majority of their EMS traffic from the Sacramento-Sierra Valley EMS Agency providers.

*Emergency department data obtained from California Office of Statewide Health Planning and Development (OSHPD) – www.oshpd.ca.gov. Remaining hospitals self-reported emergency department utilization data.

Staff monitors patient offload times for the entire system on a monthly basis to identify system wide issues and trends. The County’s goal is to achieve a rate of 90% of patients offloaded within 20 minutes of arrival to the ED.



SPECIALTY CARE SYSTEMS

Certain critically sick and injured patients have been shown to have improved outcomes when they receive care in medical centers with specialty care services that meet their medical need. EMS systems have adjusted to this by being able to identify these critical patients in the field and taking them to receiving centers that have been certified to provide that specialty care. The SCEMSA developed specialty care systems in three areas: Trauma, STEMI (Heart Attack), and Stroke Care.

TRAUMA SYSTEM OF CARE

Trauma Centers are designated by the American College of Surgeons (ACS) to provide trauma care from level I (highest level) to level V (lowest level). All ACS designated trauma centers in Sacramento are designated by the SCEMSA as trauma receiving hospitals.

Prehospital personnel adhere to SCEMSA protocols, which follow nationally standardized criteria, and transport patients identified as meeting “Critical Trauma Criteria” to a designated, trauma center.

The SCEMSA Trauma System of Care approves Sacramento trauma centers, sets and monitors prehospital trauma care protocols, coordinates prehospital and hospital communication for trauma patients, and conducts SCEMSA Trauma Quality Improvement work.

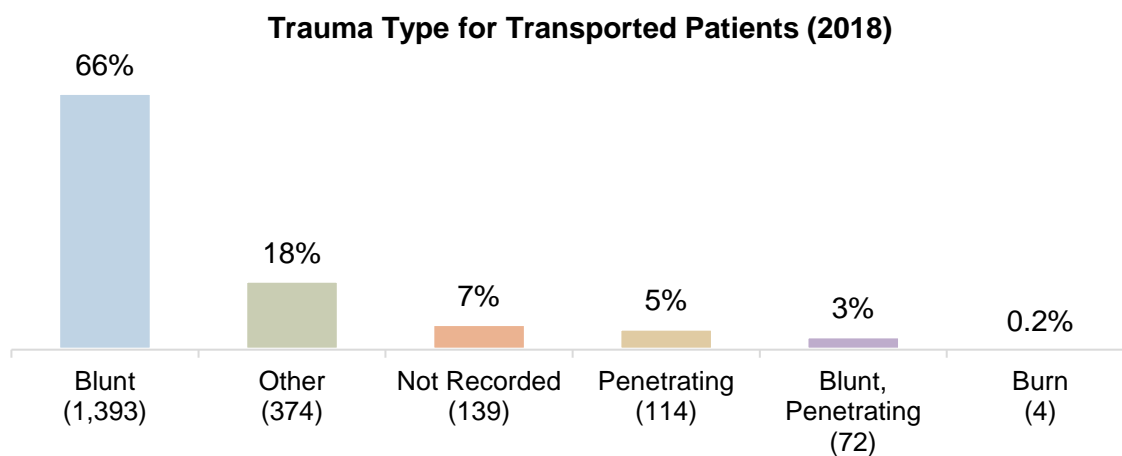
Sacramento County has three (3) in-county trauma care centers, one (1) pediatric trauma care center, and one (1) burn center. Sacramento County uses one (1) out of county trauma center due to its proximity to the northeast portion of the County.

UC Davis Medical Center	Level I Adult & Pediatric, Burn
Mercy San Juan Medical Center	Level II Adult
Kaiser Permanente – South Sacramento	Level II Adult
Sutter Medical Center – Roseville	Level II Adult (Out of County)

The State EMS Authority classifies a trauma incident as any incident with a traumatic injury that activates the EMS system. Sacramento County had 19,832 total trauma incidents in 2018.

Scene time is the period of time between the ambulance crew’s arrival at the patient’s side and the time when they depart to the hospital. For the more severely injured “critical trauma” patients, minimizing the scene time is important to maximize survival. The “90th percentile scene time” represents the maximum scene time for 90 percent of critical trauma cases. In 2018, the SCEMSA 90th percentile scene time was 12 minutes.

In 2018, the number of trauma patients who met trauma triage criteria was 2,096. The following chart depicts the trauma type for patients meeting trauma triage criteria who were transported to a trauma center during 2018.



Blunt injuries: Vehicle collision, falls, assault

Penetrating injuries: Stabbing, gunshot wound

CARDIAC SYSTEM OF CARE

The Cardiac System of Care provides a coordinated approach to both cardiac arrest and heart attacks (STEMI). This system includes both the Cardiac Arrest Registry to Enhance Survival (CARES) and the new SCEMSA STEMI (Heart Attack) Program.

Cardiac Arrest Registry to Enhance Survival (CARES)

Each year, approximately 350,000 persons in the United States experience an out-of-hospital cardiac arrest or sudden death; approximately 90% of persons who experience an out-of-hospital cardiac arrest die. Sudden cardiac arrest is one of the leading causes of death in adults. It is an electrical malfunction in the heart that disrupts the flow of blood to the brain, lungs and other vital organs. Survival depends on receiving immediate CPR and medical attention. CPR performed in the first few minutes of cardiac arrest can double or triple a person's chance of survival.

CARES is a national registry initiated in 2005 to help communities determine standard outcome measures for out-of-hospital cardiac arrest locally. The goal is to promote quality improvement efforts and benchmarking capability to improve care and increase survival. Participating communities enter local data into the CARES secure web-based data management system and generate their own reports. Communities can compare their EMS system performance to de-identified aggregate statistics at the local, state, or national level. These comparisons can help identify opportunities to improve system performance for out-of-hospital cardiac arrest events.

The State EMS Authority recommended a statewide data collection system for CARES and a statewide coordinator. In 2018, the State EMS Authority selected the Coastal Valleys EMS Agency as the CARES Data Coordinator. Since April 2019, thirteen (13) ALS providers completed training to submit prehospital data into the CARES registry with the hospitals entering matching hospital outcome data.

Thirteen (13) of the ALS providers manually submit data into the CARES registry. In August 2019, three fire departments (Sacramento Metropolitan Fire District, Sacramento City Fire Department, and Cosumnes Fire District) started training and testing to upload prehospital data directly from their patient care reports due to the large numbers of patients they treat with cardiac arrest.

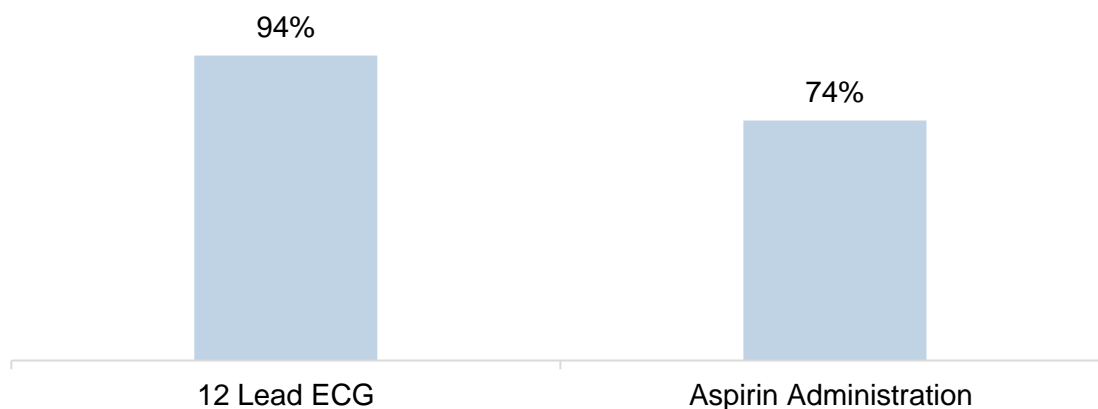
STEMI SYSTEM OF CARE

According to the American Heart Association, an American has a heart attack approximately every 40 seconds (2018 Statistics at a Glance). 12-Lead Electrocardiograms can diagnose certain larger heart attacks known as "ST-Elevation Myocardial Infarction" (STEMI). Rapid assessment, specialized equipment, and specially trained personnel offer patients the best chance of survival.

Paramedics responding to a call of a possible heart attack use a 12-Lead Electrocardiogram (ECG) to diagnose the heart attack. The ECG process records electrical activity of the heart. The ECG also provides early notification to the STEMI hospital through electronic transmission. This

allows the hospital to prepare for and immediately treat patients upon arrival. Aspirin administered early in the course of a heart attack has been shown to decrease mortality, and EMS personnel also administer aspirin to patients with chest pain or discomfort.

Prehospital Performance (2018)

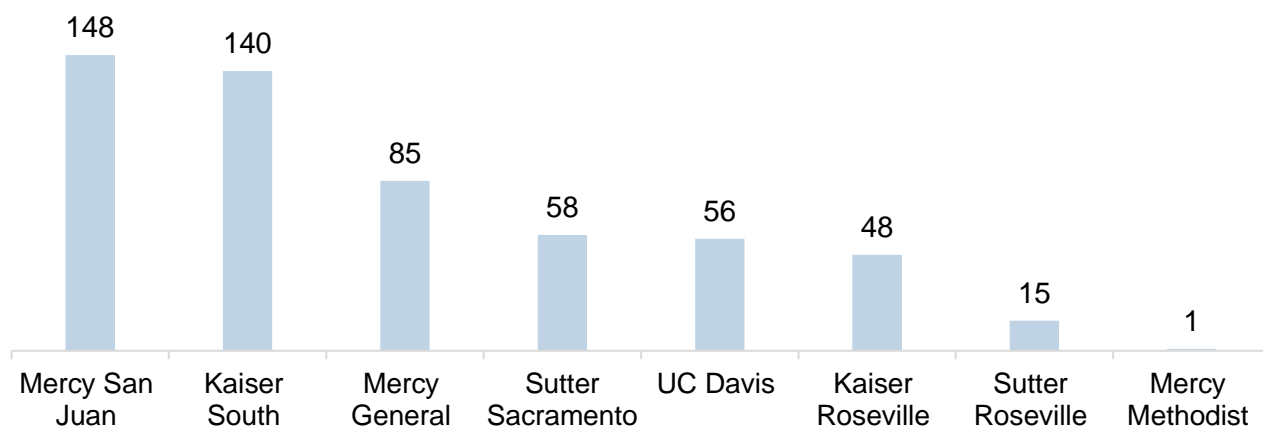


STEMI hospitals have specialized equipment and staff trained to treat patients diagnosed with a heart attack.

In 2018, SCEMSA providers transported 551 STEMI patients to STEMI receiving centers.

The following chart depicts the number of STEMI alerts generated from the prehospital provider ECG to the STEMI specialty care hospitals.

Alerts Generated from Prehospital ECG to STEMI Care Hospital (2018)



STROKE SYSTEM OF CARE

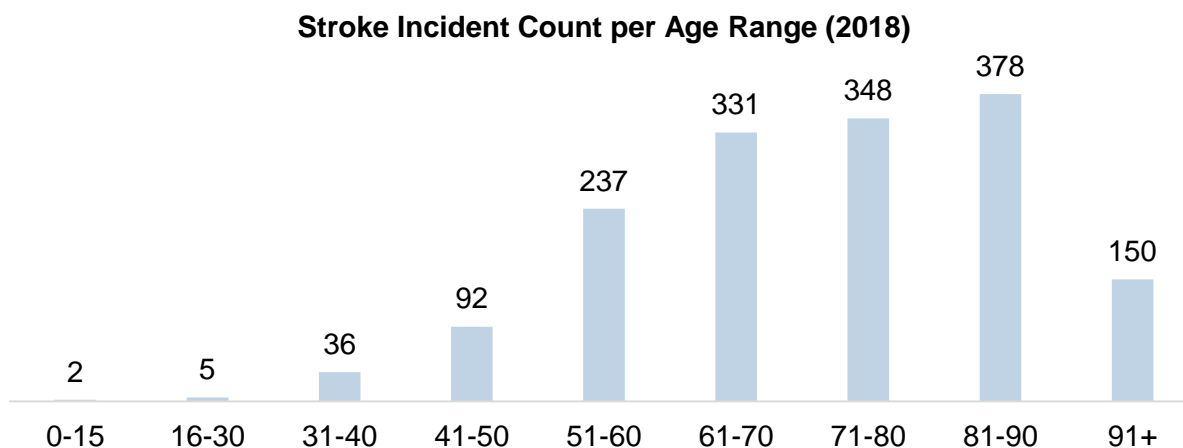
According to the American Heart Association, stroke is the fifth-leading cause of death in the United States, and the leading cause of long-term disability (2018 Statistics at a Glance). A stroke is the sudden death of brain cells due to a lack of oxygen caused by a blockage or ruptured artery. The time period from the onset of the stroke to treatment is critical.

EMS providers rapidly identify patients having stroke symptoms, begin immediate transport, and initiate a stroke alert to the closest designated stroke specialty care hospital. Early recognition by EMS and notification to a stroke specialty care hospital allows the hospital to prepare for immediate diagnosis and treatment.

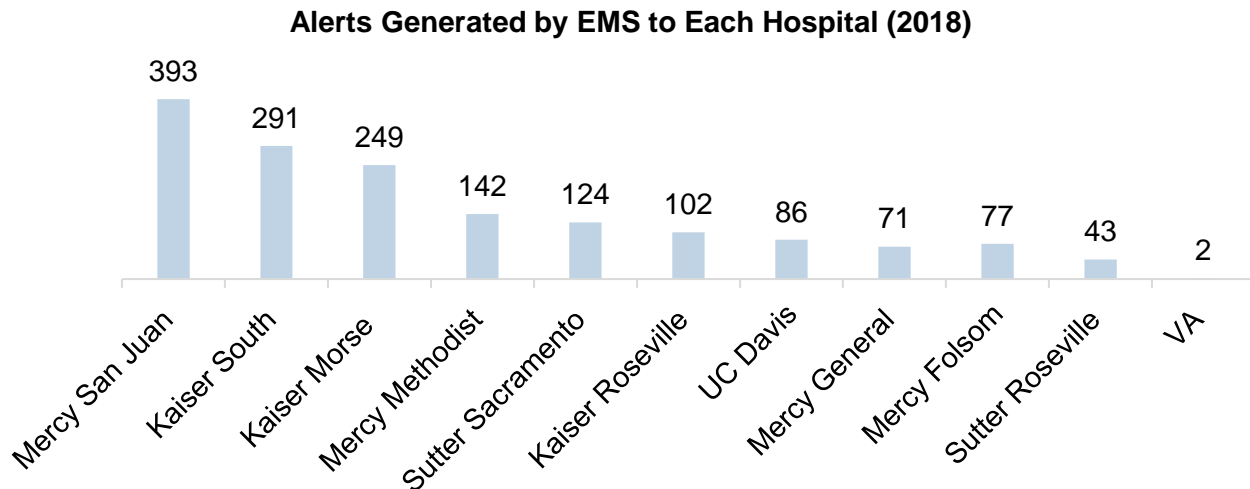
In 2019, the State EMS Authority passed new mandatory regulations requiring stroke hospitals to apply and become designated by the local EMS agency. The new regulations will allow for statewide consistency in the prehospital care of stroke patients. Staff is working with all local hospitals to develop processes and protocols to meet these new state regulations.

In preparation for new regulations, stroke data collection began in 2017. Some, but not all, providers submitted data in 2017, resulting in an undercount of stroke alerts. By early 2018, most providers were submitting stroke alert data. By the end of 2018, all providers were submitting data compliant with the National Emergency Medical Services Information System (NEMSIS). In 2017, EMS providers submitted data for 365 stroke alerts and in 2018, total alerts increased to 1,580 due to more complete data submission. This shows a significant improvement in the data reporting and alert systems. This occurred through the efforts of providers and the SCEMSA staff by implementing a Documentation Improvement Initiative.

The following chart illustrates the age distributions of stroke patients in 2018:



The following chart depicts the number of stroke alerts by all EMS prehospital providers to each hospital.



QUALITY IMPROVEMENT PROGRAM

The SCEMSA Quality Improvement Program uses standard health care quality improvement concepts and processes and involves all stakeholders from patient first medical contact (often through a dispatch center) to patient care sign over from EMS providers to hospital staff.

The quality improvement process continuously measures key performance indicators to evaluate and improve the entire EMS system. This informs opportunities to strengthen or correct processes, provide needed training and education, monitor system design strategies, and recognize excellence and performance improvements. The Technical Advisory Group regularly reviews and discusses data and recommendations.

All prehospital care providers have been reporting electronic patient care reports to a common software platform since 2017, giving the SCEMSA agency access to robust system wide patient care data. In addition, the CARES registry and new STEMI and Stroke programs will allow for patient outcome data for groups of critical patients in a way not previously available to the SCEMSA. This has transformed and vastly improved the SCEMSA QI Program.

QUALITY DOCUMENTATION INITIATIVE

The success of a quality improvement program is dependent on the accuracy and completeness of the data used. In 2017, staff observed wide variations in documentation practices and technical gaps in data reporting. To improve prehospital data quality and accuracy, staff implemented a Quality Documentation Initiative focused on accurate and consistent documentation for core measures data.

Documentation standards established in January 2018 outline required elements for each EMS incident. Staff developed new dashboards to monitor and report system performance. The

dashboards track documentation of primary impressions, medications administered, procedures performed, and other key measures.

The table below illustrates the improvement in documentation of specific activities in December 2018 as compared to December 2017.

Activity	December 2017	December 2018
Primary Impressions	58%	98%
Medications Administered	88%	93%
Procedures Performed	56%	96%
Destination Hospital Entered	98%	99.6%

TRAUMA CARE DASHBOARDS

The trauma dashboard was developed in 2017 to address a deficiency in the number of trauma alerts initiated by prehospital providers to trauma care centers. Trauma alerts are important to ensure the trauma center has appropriate resources ready to provide care immediately upon arrival. In 2017, trauma alert notifications were initiated for only 25% of patients with positive trauma triage criteria.

By 2018, the rate of trauma alert notifications for patients with positive trauma triage criteria improved to 78%, a 393% increase in pre-alert notifications.

STEMI AND STROKE DOCUMENTATION DASHBOARDS

The STEMI and stroke dashboards were developed in 2018. The Technical Advisory Group recommended the dashboards as a means to measure the effect of the Quality Documentation Initiative on capturing STEMI and stroke incidents. Through monitoring of the documentation dashboards, and feedback to provider agencies, there has been a steady and continued improvement in the quality of documentation by prehospital providers.

EMERGENCY PREPAREDNESS

The Sacramento County Office of Emergency Services (OES) coordinates the overall countywide response to large-scale incidents and disasters. OES is responsible for alerting, notifying, and coordinating agencies that respond when disasters occur. The Department of Health Services (Primary Health – EMS Program, Public Health – Emergency Preparedness Program, and Behavioral Health) and the Department of Environmental Management are key partners in emergency preparedness and disaster response. In the event of a large disaster, SCEMSA provides representation for the medical community at the Sacramento County Emergency Operations Center. In that capacity, we can help assure our partners that their needs are addressed.

MEDICAL HEALTH OPERATIONAL AREA COORDINATOR (MHOAC)

The EMS Administrator, or the EMS Coordinator, acts as the Medical Health Operational Area Coordinator (MHOAC). The MHOAC program is part of a network of EMS agencies coordinated by the State. During a disaster, the MHOAC coordinates requests for Sacramento County assistance from Region IV coordinators. There are six regions in California. If the disaster or incident is within Sacramento County, the MHOAC coordinates additional resources either within the County or through the region for outside assistance.

SACRAMENTO COUNTY DISASTER HEALTHCARE VOLUNTEERS

Disaster Healthcare Volunteers register through the State EMS Agency database. These volunteers register to assist during a disaster and include healthcare providers, public health professionals, and medical disaster response team members. They are vetted through an automatic process through licensing agencies and then SCEMSA is notified for final review and approval. Staff oversee the database.

The Sacramento County Office of Emergency Services designated the EMS Administrator and EMS Coordinator as Deputy Disaster Service Workers. This enables staff to quickly credential, activate, and deploy volunteers to a disaster without the need to wait for OES response. In 2018, the County provided staff and volunteer resources to the Lake/Mendocino Complex Fire and Butte County Camp Fire during the emergency and recovery phases.

MOBILE MEDICAL SHELTER

In 2017, SCEMSA secured a fully self-contained 40 bed Mobile Medical Shelter including a generator. The shelter can be used as a mobile field facility, improving the EMS Agency's ability to coordinate disaster medical and health resources and coordinate the establishment of temporary field treatment sites. Potential uses of the medical shelter include field sites for local/regional incidents, triage and treatment during flu season surges, geographically targeted medical clinic services, emergency operations center, staff quarters, and disaster exercises or trainings.



In 2018, staff organized a regional training exercise in the set-up and dismantling of the shelter at the Sacramento Food Bank. The County stores and maintains the medical shelter with the support of the Public Health Emergency Preparedness Grant.

COMMITTEES AND ADVISORY GROUPS

EMS convenes several committees and work groups comprised of EMS stakeholders with subject matter expertise within the scope of the group's work. These forums are essential for communication, collaboration, engagement, education, and input in all areas of the EMS system.

Committee	Purpose
Medical Advisory Committee (MAC) / Operational Advisory Committee (OAC)	Serves to establish and provide operational input into the standard of quality for prehospital care. Provides input and recommendations on education, training, quality improvement, data collection, and the operational impact of policies/protocols.
Technical Advisory Group (TAG)	Provides input and recommendations on system wide quality improvement, performance improvement action plans, and continuing education and training.
Trauma Review Committee (TRC)	Advises the Medical Director on the establishment of trauma related policies, procedures, treatment protocols, education, training, quality improvement, and data collection/review. Serves to establish the standard of quality for trauma care.
STEMI Care Committee	Provides input and recommendations on STEMI policies, procedures, treatment protocols, education, training, quality improvement, and data collection/review to establish the standard of quality for STEMI care.
Stroke Care Committee	Provides input and recommendations on stroke policies, procedures, treatment protocols, education, training, quality improvement, and data collection/review to establish the standard of quality for stroke care.

DHS Primary Health Division convened a new advisory group in August 2019 at the request of stakeholders.

Advisory Group	Purpose
Emergency Medical Advisory Group (EMAG)	To improve the delivery and quality of EMS services by providing input and recommendations on system wide issues such as sustainable funding, planning, quality improvement, and other key issues.

See Board of Supervisors Public Hearing item #41 dated August 6, 2019 (Resolution Nos. 2019-0555, 2019-0556, 2019-0558). The Board report and Attachment 2 (EMS Proposed Prehospital and Hospital Programs & Fees) provides detailed information about programs, revenues, budget, and comparison to other counties.

COUNTY BOARD OF SUPERVISORS

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Dave Magnino, BS, EMT-P, EMS Administrator

Hernando Garzon, MD, EMS Medical Director

MESSAGE FROM THE DEPUTY DIRECTOR

We are fortunate to have such an experienced, dedicated, and compassionate group of EMS professionals and agencies in our County. We dedicate this report to our EMS system providers and professionals. We count on you 24/7 for your expertise and support!

*Sandy Damiano, PhD, Primary Health Division
Department of Health Services*