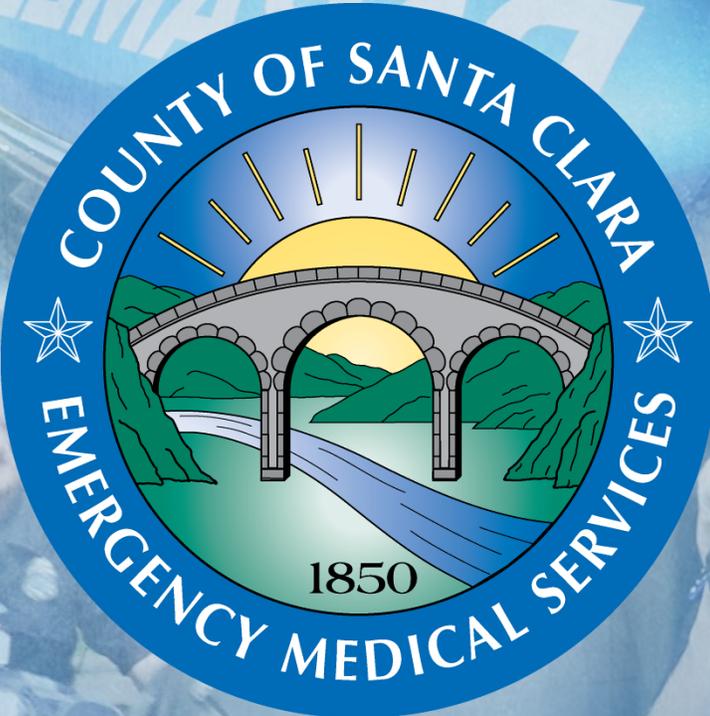


# Santa Clara County Emergency Medical Services



2018 Annual Report



# Our Mission, Values & Vision

## Table of Contents

From the Director	3
Certification, Permitting and Enforcement	4
Communications	9
Response and Transport Performance	10
Data Collection	15
Facilities	16
Quality Improvement	22
Education and Training	33
Disaster Medical Response and Preparedness	36
Summary	39

### Mission

The Santa Clara County Emergency Medical Services Agency is an essential service dedicated to ensuring the provision of quality patient care to the people of Santa Clara County through collaboration, facilitated regulation and system management.

### Values

- **Dignity and Respect:** We treat people with dignity and respect.
- **Progressive Innovation:** We are dedicated to the continuous improvement of our processes and systems, based on science, data, and best practices.
- **Professionalism and Objectivity:** We treat all individuals and organizations professionally, fairly, and without prejudice.
- **Leadership:** We lead through collaboration and facilitation to ensure accountability, the provision of quality patient care, while ensuring fiscal and operational stability.
- **Participation:** We value the contributions of the public, other agencies, and organizations in the development, implementation, and evaluation of the Santa Clara County EMS System.

### Vision

Assuring an EMS system in Santa Clara County that provides safe, quality, and effective prehospital care.

## Message from the Director

The Emergency Medical Services (EMS) Agency is proud to present our 2018 Annual Report to the Santa Clara County Health and Hospital Committee. The EMS Agency is charged with the planning, coordination and evaluation of the County's entire EMS System.

The EMS System is a multi-faceted composition of providers that include, 9-1-1 dispatch centers, law enforcement agencies, park rangers, fire departments, ambulance services, hospitals and specialty centers (trauma, stroke and STEMI). Each day, our providers (stakeholders) routinely respond to, treat and transport hundreds of patients.

The boundaries of prehospital EMS are evolving to meet the needs of our communities. The ideal is for all communities to be served by a well-planned and highly coordinated emergency medical system. Relying on local data to identify system trends and gaps, the EMS Agency has implemented "best practice" protocols to improve the patient's health care experience. The continued use of data will help guide us as we continue to shape our system to meet the ever-changing community needs.

I appreciate the opportunity to share with you the quality of the EMS system and the collective efforts of the EMS Agency and its stakeholders. Only through the cooperative efforts of system stakeholders was it possible to achieve sustained and recognized accomplishments.

*Jackie Lowther*

# Certification, Permitting and Enforcement

The EMS Agency is responsible for the credentialing and permitting of all EMS System personnel, organizations and response vehicles. Should an issue arise with an individual within our EMS System, the EMS Agency has the authority to investigate the incident and impose disciplinary measures as appropriate. These processes are time intensive but extremely important in assuring an EMS system that provides safe, quality and effective prehospital care.

## Certification

Within the EMS System there are Emergency Medical Technicians (EMT), Paramedics, Critical Care Transport Registered Nurses (CCT-RN), Mobile Intensive Care Nurses (MICN), Emergency Field Supervisors (EFS) and EMS Duty Chiefs. The Agency is responsible for assuring that each of these providers meet the minimum training and education standards to perform at their respected position. When a new provider enters the EMS System, they are required to submit an application to the EMS Agency, complete a Department of Justice and FBI background check and submit the required completed training documents. Additionally, applicants are required to pass a 50-question written examination. Once an individual completes the application and examination processes, they are provided an EMS System Identification Badge and are eligible to work in our EMS System. Every two years, EMS personnel must recertify with the EMS Agency by demonstrating they have completed the required continuing education hours (48 hours for paramedics and 24 hours for EMTs), as well as skills verification through direct observation in ten specific areas of patient care (EMT only).

Certifications Processed in 2018	
Initial	566
Renewal	2,711
Total	3,277

In 2018, the EMS Agency also assisted EMT applicants navigating State regulation changes. Effective in mid-2017, the State now requires EMT applicants demonstrate they can competently administered the medications Epinephrine and Naloxone. These additions were placed into the EMT scope of practice and require all EMTs to receive training and demonstrate skills proficiency when renewing their certification.

### EMS Exam

2018 Results	EMT	Pass	Fail	Paramedic	Pass	Fail
First Attempt	510	239	271	105	73	32
Second Attempt	232	196	36	30	27	3
Third Attempt	28	27	1	3	3	0
Fourth Attempt	1	1	0	N/A	N/A	N/A
Totals	510	463		105	103	

## Permitting

The EMS Agency is responsible for the permitting of all organizations and vehicles that operate in our EMS System. This includes the permitting of Education Programs, Ambulance Service Providers and Ambulance Vehicle Permits. All permits are valid for one year, except for Education Programs which are valid for four years.

Under the permitting guidelines the EMS Agency performs inspections on all emergency medical vehicles entering our EMS System as well as random audits of those resources currently in the system. The Agency performs audits on vehicles within the system in one of two ways. If a concern is brought forward to the Agency by a provider, an audit may be conducted. The Agency will also perform random inspections throughout the year. Any vehicle within the EMS System is subject to audit by the EMS Agency at any time.

During 2018, the EMS Agency conducted 62 inspections/audits of EMS vehicles from private ambulance providers and fire departments.

Resource Type	Inspections/ Audits
Ambulances (Fire and private)	55
Fire Apparatus (Non-Transport)	7

*Number of field inspections and random audits of ambulance and fire apparatus during 2018.*

2018 Permitted Providers	Number of Resources
American Medical Response - Sutter	7
Bayshore Ambulance	5
Falck North America	13
Falcon Critical Care Transport	8
Norcal Ambulance	6
Pro Transport-1	31
Royal Ambulance	27
Silicon Valley Ambulance	9
Westmed Ambulance	26
<b>Total Non-911 Ambulances</b>	<b>132 Ambulances</b>
County EOA Ambulances (Rural/Metro 911)	67
Gilroy Fire (Ambulances)	1
Palo Alto Fire (Ambulances)	6
San Jose Fire (Ambulances)	7
Santa Clara Fire Department (Ambulances)	4
<b>Total 911 Ambulances</b>	<b>85 Ambulances</b>
CAL Fire (SCU)	9
Gilroy Fire	9
Palo Alto Fire	11
San Jose Fire	85
Santa Clara Fire Department	17
Milpitas Fire Department	13
Moffett Field Fire Department	3
Morgan Hill Fire Department	6
Mountain View Fire Department	10
Santa Clara County Fire Department	35
South Santa Clara County Fire District	8
Sunnyvale Department of Public Safety	16
<b>Total Fire Apparatus</b>	<b>222 Fire Apparatus</b>

## Permitting (continued)

The EMS Agency is authorized by the California Code of Regulations as an approving authority for permitting Emergency Medical Technician (EMT), Paramedic and EMS Continuing Education (CE) Providers. Providers who wish to be permitted as a training and education program are required to submit an application to the EMS Agency demonstrating they meet the minimum requirements. Education programs are required to re-permit every four years.

Permitted Training Program	EMT	Paramedic	Continuing Education
Foothill College	✓	✓	✓
Gilroy Fire Department			✓
HeartShare Training Services, Inc			✓
Milpitas Fire Department			✓
Mission College	✓		✓
MOF / NASA Aimes Fire Department			✓
Mountain View Fire Department			✓
National University	✓		✓
Palo Alto Fire Department			✓
San Jose City College	✓		✓
San Jose Fire Department			✓
Santa Clara City Fire Department			✓
Santa Clara County Ambulance			✓
Santa Clara County Fire Department			✓
Silicon Valley Ambulance	✓		✓
So. Bay Reg. Public Safety Training Consortium	✓		✓
Stanford University	✓		✓
Sunnyvale Dept. of Public Safety	✓		✓
WestMed College		✓	✓

To ensure the quality and availability of continuing education (CE) courses offered for Emergency Medical Technician and paramedic personnel the EMS Agency randomly audits 10% of all classes.

Classes Offered and Audited in 2018	
Number of Continuing Education Classes	1532
Number of Classes Audited	163
Percentage of Classes Audited	10.64%

Number of Graduates from Santa Clara County Training Programs	
Emergency Medical Technicians (EMT)	308
Paramedics	54

## Investigations and Enforcement

The EMS Agency is responsible for ensuring established laws and regulations are upheld by emergency medical personnel who are credentialed through our Agency and work in our EMS System. Should an issue arise, the EMS Agency will work with the individual's employer to ensure a formal investigation is completed. Depending on the issue, the EMS Agency may be required to refer the case to the State EMS Authority. Upon completion of an investigation, the Santa Clara County EMS Agency's Medical Director (EMS Medical Director) may take action against a holder's certification that may include denial, suspension, revocation, or placing certification on probation.

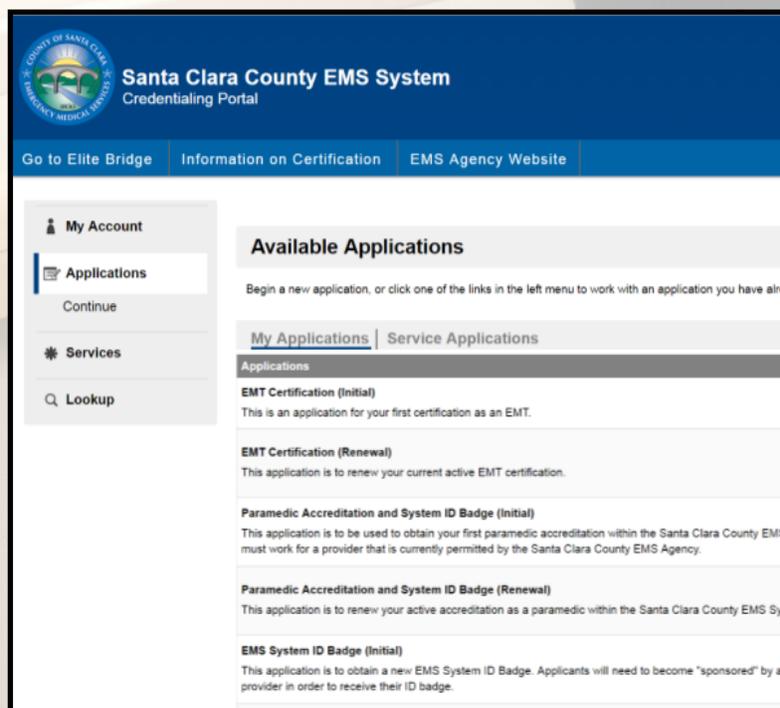
In 2018, the EMS Agency began using a new data management platform to assist in tracking investigations. The new investigation management tool was implemented in late 2017, with 2018 being the first full year of use. During 2018, the EMS Agency logged 256 cases in the new system. The type of investigations the EMS Agency sees can be very broad. Some of the common case categories include vehicle or equipment failure, patient care concern, general complaints, arrest or conviction of a crime, and policy or protocol variance. With the online tracking and management of each item the Agency can manage the investigation seamlessly between EMS Agency staff. The investigation tool allows us to connect personnel, equipment, and programs to have a thorough record of any incident.



## Licensure Solution Updates

In 2018, the EMS Agency set out to create a better means for our customers to pay for their licensing costs. As part of our duties, the EMS Agency processes certifications for EMTs as well as the accreditation of Paramedics. Each of these credentials have an associated cost that is the responsibility of the applicant. Currently these fees are paid for in person through a merchant credit card machine. It is the goal of the EMS Agency to incorporate a solution that will allow for our customers to pay for these services online while they are submitting their application. A potential vendor has been identified and the contracting process is under way.

In 2018, the EMS Agency processed 3,277 certifications. Moving to the online payment platform the first responders renewing their certifications would no longer be required to come to the office and pay in person, saving time and adding convenience. The payment platform would also allow more availability of appointments for the new first responders entering our system. Each new first responder entering the EMS System is required to have an in person appointment and present the required documents.



The screenshot displays the 'Santa Clara County EMS System Credentiaing Portal'. The header includes the county logo and navigation links: 'Go to Elite Bridge', 'Information on Certification', and 'EMS Agency Website'. A left-hand menu contains 'My Account', 'Applications' (with a 'Continue' link), 'Services', and 'Lookup'. The main content area is titled 'Available Applications' and provides instructions to 'Begin a new application, or click one of the links in the left menu to work with an application you have already started'. Below this, there are two tabs: 'My Applications' (selected) and 'Service Applications'. The 'My Applications' section lists several application types with brief descriptions: 'EMT Certification (Initial)', 'EMT Certification (Renewal)', 'Paramedic Accreditation and System ID Badge (Initial)', 'Paramedic Accreditation and System ID Badge (Renewal)', and 'EMS System ID Badge (Initial)'. Each item includes a short paragraph explaining its purpose.

# Communications

In 2010, Santa Clara County entered into a Joint Powers Agreement (JPA) with 14 cities to form the Silicon Valley Regional Interoperability Authority (SVRIA). Through significant collaboration by participating members and stakeholders, SVRIA has developed a regional interoperable communications network known as Silicon Valley Regional Communications System (SVRCS). SVRCS is a digital 700 MHz radio system designed for all agencies in Santa Clara County and, once completed, it is envisioned that both public safety and local government users will migrate to the system.

The EMS Agency purchased 350 radios in Fiscal Year 2017 through the EMS trust fund. The radios were purchased for the non 9-1-1 ambulance and air ambulance providers permitted within Santa Clara County. During 2018 the EMS Agency received these radios and began the programming and distribution of the radios. These radios will replace older and soon to be obsolete communications equipment currently in use by providers. The EMS Agency is also providing training to each of the providers receiving the equipment.



<b>Radio Distribution</b>	
<b>Non-911 Ambulance Provider</b>	<b>Radios Issued</b>
American Medical Response Sutter	10
Falck Northern California	12
Falcon Critical Care	12
NORCAL Ambulance	6
Pro Transport-1	31
Royal Ambulance	25
Silicon Valley Ambulance	9
Westmed Ambulance	31
<b>Air Ambulance Providers</b>	<b>Radios Issued</b>
CALSTAR	3
Stanford Life Flight	1
<b>Total Radios Issued</b>	<b>140</b>

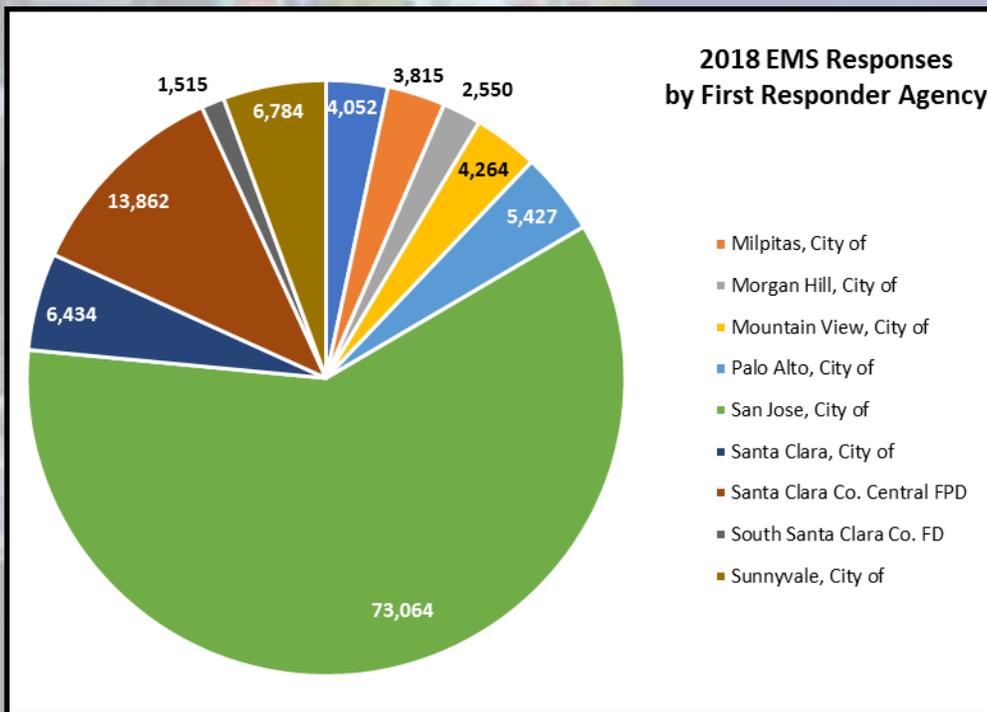
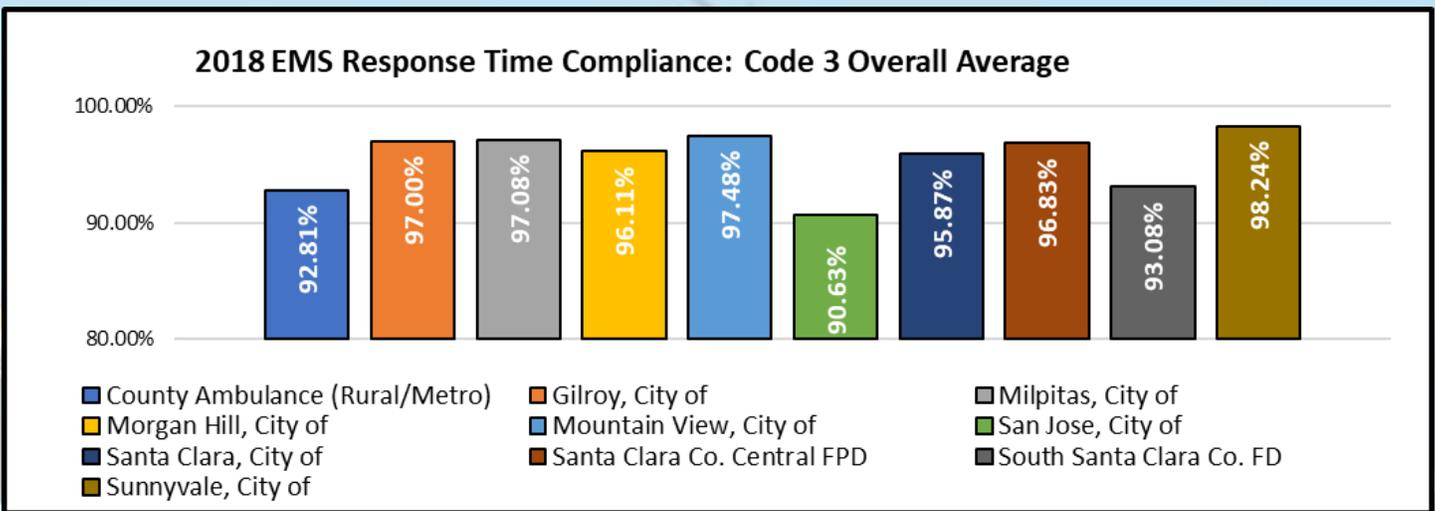
The EMS Agency transferred 150 radios to the Santa Clara County Parks Department to assist with the replacement of obsolete communications equipment.

The EMS Agency has retained 60 of the remaining radios and has established radio caches to be used in a disaster or preplanned large-scale event.

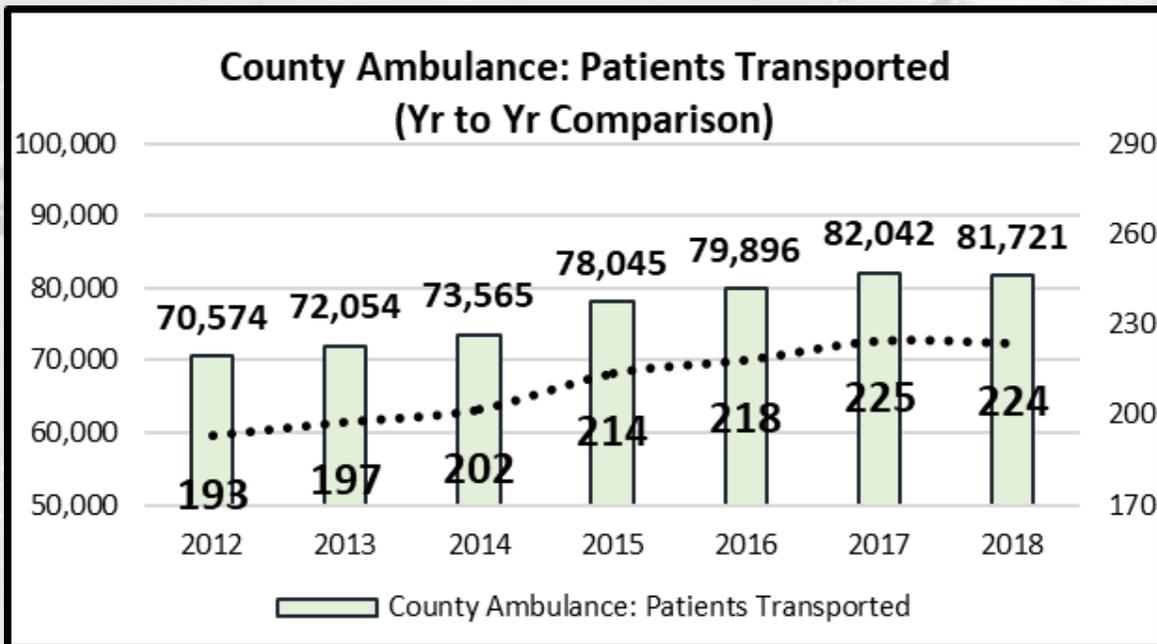
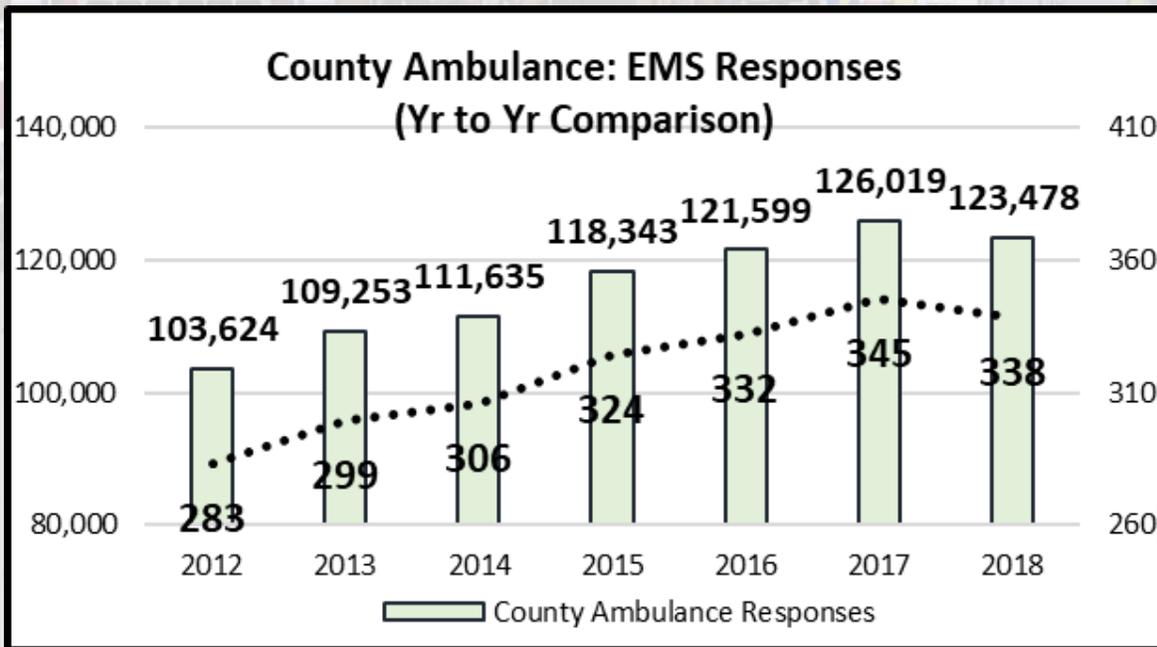
All radios have been issued and all training will be completed in early 2019.

# Response and Transport Performance

The County currently maintains ten agreements for emergency medical services. One of the key performance indicators for assessing compliance with the requirements of those agreements is response time performance. Response time performance is measured on a monthly basis. The minimum performance standards for response time performance is 90.00%. The following chart measured month-to-month average Code 3 (lights and sirens) response performance for 2018.



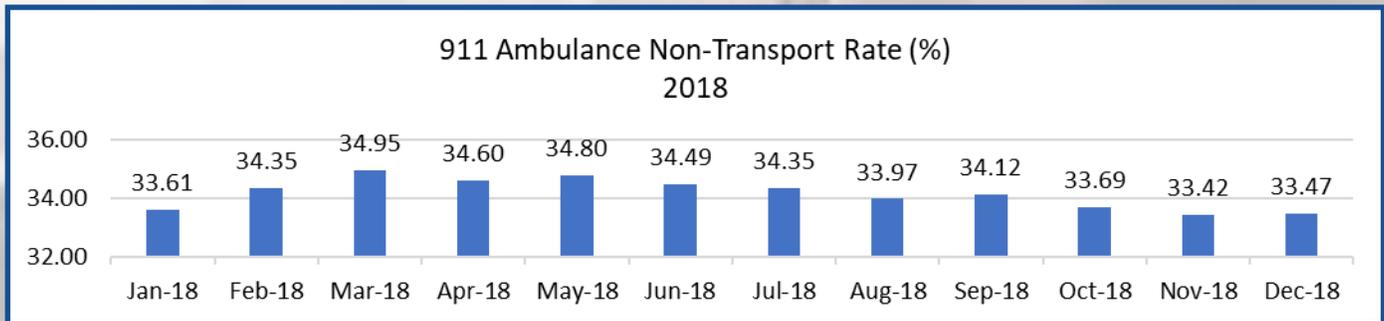
Another key performance indicator used to measure system performance is response and transport utilization. In 2018, the County Emergency Ambulance Provider responded to 123,478 calls for service. Those responses resulted in 81,721 patients being transported to local hospitals, which averaged to 224 transports per day. From an average daily perspective (24 hour), the County Emergency Ambulance Provider responded to 338 calls for service. From a narrower frequency perspective, 14 responses per hour or one response every 4½ minutes. In 2018, responses and transports declined slightly as compared to the previous year. Responses declined by 2% or seven less per day and transports by 0.5% or one less per day.



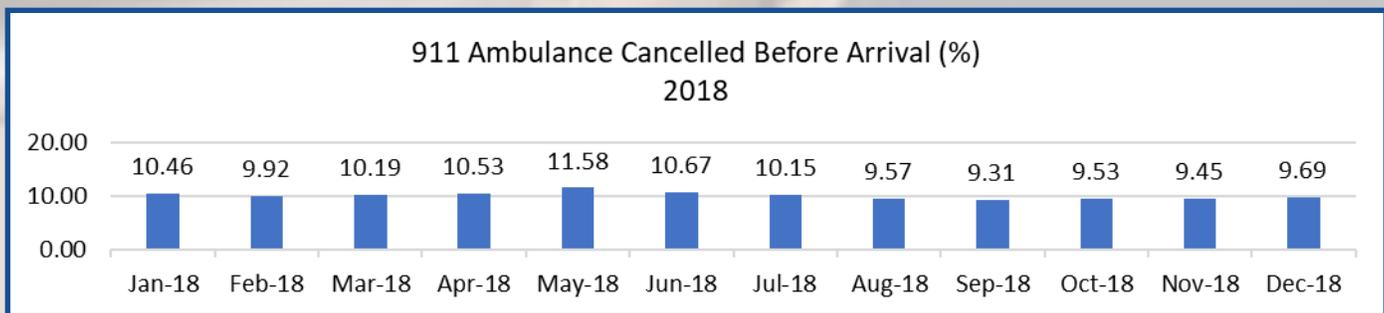
## Emergency Medical Dispatch (EMD)

The Emergency Medical Dispatch Quality Improvement (EMD QI) Committee, now in its second year, is comprised of all Public Safety Answering Points (PSAP) in the County that utilize EMD in any part. This also includes private ambulance dispatch centers and PSAPs that act as the call taker and then subsequently transfers the caller into one of the six EMD Centers in the County.

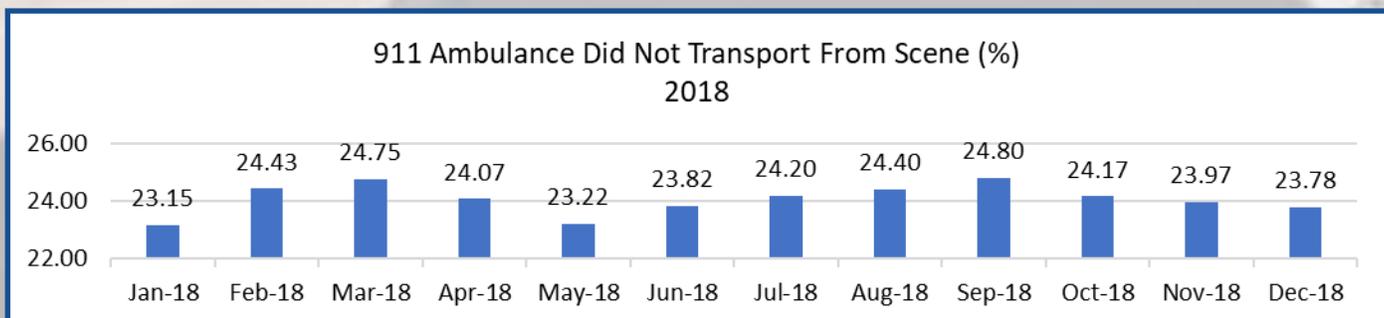
The purpose of the EMD QI Committee is to monitor/trend quality issues, discuss current issues and research in the EMD delivery process. The committee members rotate making case presentations for the group, which serves to provide examples of best practices for all attendees. The EMD QI Committee continues to analyze the selected annual indicators for Cardiac Arrest (as it relates to telephone Cardiac Pulmonary Resuscitation (CPR) recognition and instructions given) and ambulance resource cancellation rates.



*The percentage of calls for EMS that did not result in a patient transport.*

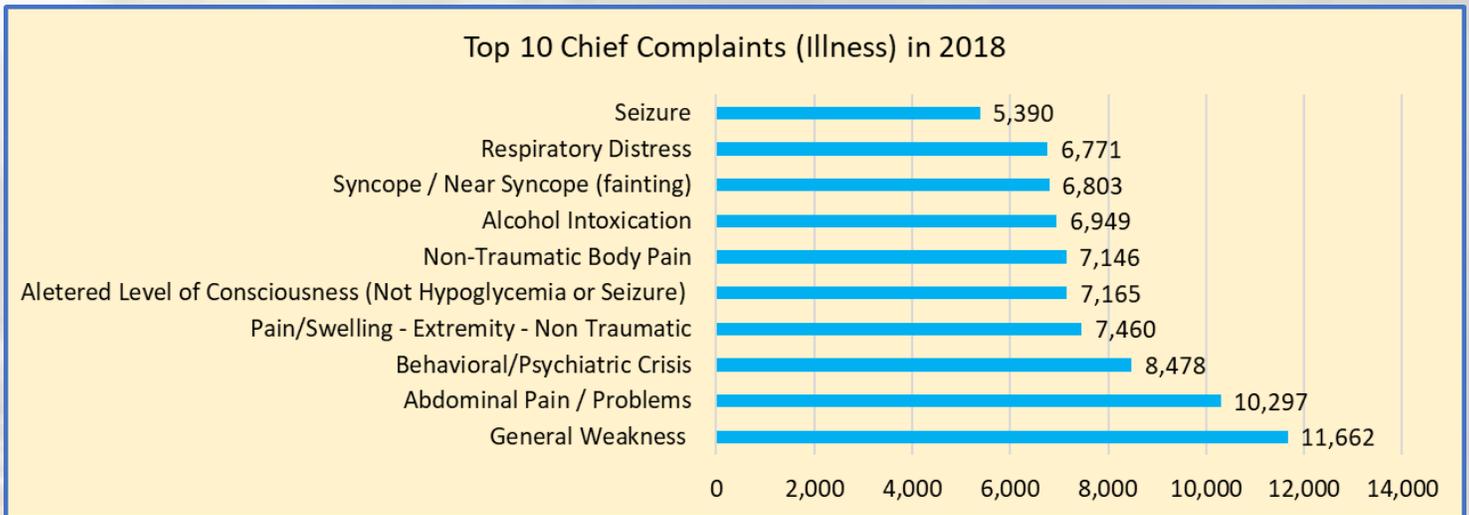


*The percentage of calls for EMS in which the ambulance responding was cancelled prior to arrival*

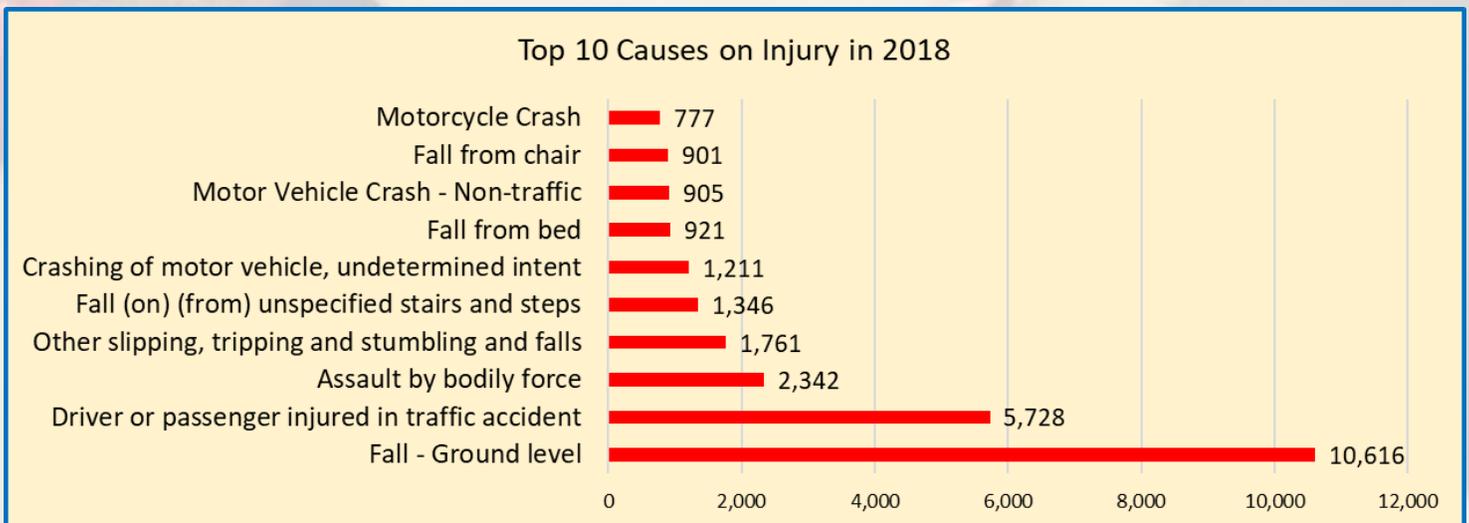


*The percentage of calls for EMS where we arrived on scene but did not transport a patient.*

# Top Injuries and Illness



The EMS System transports and cares for a variety of patient types. The paramedic documents the primary impression (reason why we are there) of the patient’s injury or illness. The graph above shows the top ten chief complaints for patients dealing with illness or non traumatic injury. The graph below shows the top ten causes of traumatic injury. These demonstrate the number of patients in each of the call type categories. The various illnesses and injuries encountered by EMS require our field personnel be trained and competent in a range of emergent treatment modalities. The most frequent reason for an ambulance transport remains traumatic injuries. In 2018, our EMS System treated 26,508 patients with a trauma related injury. It is important to recognize that this number includes everything from minor injuries (ankle injury) to a critically injured multi-system trauma.



## Hospital Reports and Base Contact



**SANTA CLARA VALLEY MEDICAL CENTER**  
Hospital & Clinics

## MICN Training Program



In order to re-vitalize the current Base Hospital, the EMS Agency and Santa Clara Valley Medical Center Emergency Department leadership worked closely to develop a training



course for new Mobile Intensive Care Nurse (MICN). These nurses play a critical role in the EMS System by providing direct online medical direction for paramedics operating in Santa Clara County. The eight hours in class training course covered a multitude of topics, including case scenarios from previous base station contacts. Each nurse then participated in an eight-hour ride along with the EMS Duty

Chief, where they were able to experience firsthand how the EMS system functions by observing fire and ambulance paramedics treating patients in the field. While working in their regular day to day operation, each nurse was observed by a certified MICN during paramedic-initiated phone consult for medical direction. Upon successful completion, each nurse received a course completion certificate as a Santa Clara County MICN. A total of twenty-two (22) MICNs were certified in 2018.



## Data Collection

The EMS Data System is a combination of various solutions used in the daily operations of the EMS 9-1-1 System. Including, an electronic patient care record (PCR), a licensing solution and various patient registries. Each of these solutions is integrated with data shared across the others.



Data that is collected is then used to perform actions such as EMS System quality improvements and required State data reporting. In fact, by combining the data collected from the different aspects of the EMS System, the Agency is able to review EMS calls from the moment 9-1-1 was activated up until the time in which the patient was discharged from the hospital.

## **Patient Care Record Updates**

On the Patient Care Record side, the main focus for 2018 was data submission. The EMS Agency is required to submit patient care data to the California EMS Information System (CEMSIS). The current focus by CEMSIS is for data from the 911 system. The process starts with each patient contact being documented on a PCR by the treating crew member. This is the case for both the fire department first responders, as well as the transport providers. If the patient is transported to an emergency department, the PCR is then shared with that facility through a solution called the “hospital hub”. The current model of sharing with the facility is by a combined PDF of the first responder PCR and the transport PCR.

Once the PCRs have been marked as completed by the author, components of the raw data is then shared with the State’s CEMSIS solution. During the data exchange with the State, the PCR’s data is screened for compliance with the State’s standards. If the PCR meets the standards, it is then accepted. If the PCR does not meet the standards, it is then rejected and the PCR is flagged within the County’s data system. The flagged PCRs are then returned to the authoring crew to be updated to the CEMSIS standards. Once, updated, the PCR is then re-submitted to the State.

Some of the issues noticed in the failed submissions were a result of miss-mapping of data elements, while others were crew omissions. The EMS Agency spent much time in 2018 addressing both of these items and will look at increasing the rules utilized within our local PCR system to better assist users in knowing what required data elements are. Over the next 12 months, our goal will be 100% of all 911 PCRs being submitted to the State’s CEMSIS solution.

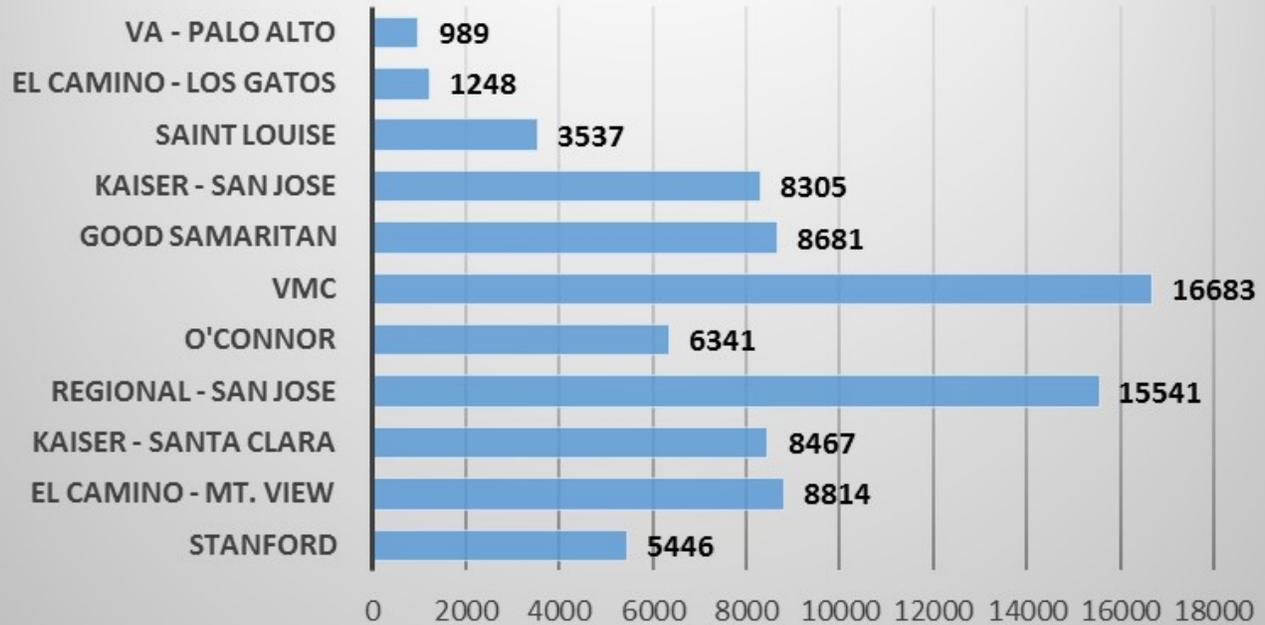
# Facilities

In Santa Clara County, there are 11 hospitals that receive emergency ambulance transports to their emergency department. The EMS Agency has developed guidelines for first responders to follow to ensure that all patients who require emergency ambulance service are transported to the most appropriate facility for their emergency medical condition.

In some circumstances, the most appropriate facility is one that offers specialized services based on the EMS providers primary impression of the patient's condition. When this occurs the first responder may need to take the patient to a hospital that may not be the patients first choice or may be a little further away than another hospital. When patients meet certain criteria the first responders know that the specialty centers are the best destination for the patient. The specialty centers in Santa Clara County include Trauma, Stroke, STEMI (ST Elevation Myocardial Infarction) or Burn. Some hospitals in our EMS System are credentialed in multiple specialties. Below is an overview of the hospitals in our EMS System and the specialty care that each provides.

Permitted Santa Clara County Facilities	Emergency Department	Primary Stroke Center	Comprehensive Stroke Center	STEMI Center	Adult Trauma Center	Pediatric Trauma Center	Burn Center
El Camino Hospital of Los Gatos (LGH)	✓	✓					
El Camino Hospital of Mountain View (ECH)	✓	✓	✓	✓			
Good Samaritan Hospital (GSH)	✓	✓	✓	✓			
Kaiser Foundation San Jose (KSJ)	✓	✓		✓			
Kaiser Foundation Santa Clara (KSC)	✓	✓		✓			
O'Connor Hospital (OCH)	✓	✓		✓			
Palo Alto Veterans Administration Hospital (PAV)	✓						
Regional Medical Center of San Jose (RMC)	✓	✓	✓	✓	✓		
Saint Louise Regional Medical Center (SLH)	✓	✓					
Santa Clara Valley Medical Center (VMC)	✓	✓		✓	✓	✓	✓
Stanford University Medical Center (SHC)	✓	✓	✓	✓	✓	✓	

## Ambulance Destination by Hospital - 2018



## 911 Ambulance Transports by Month 2018



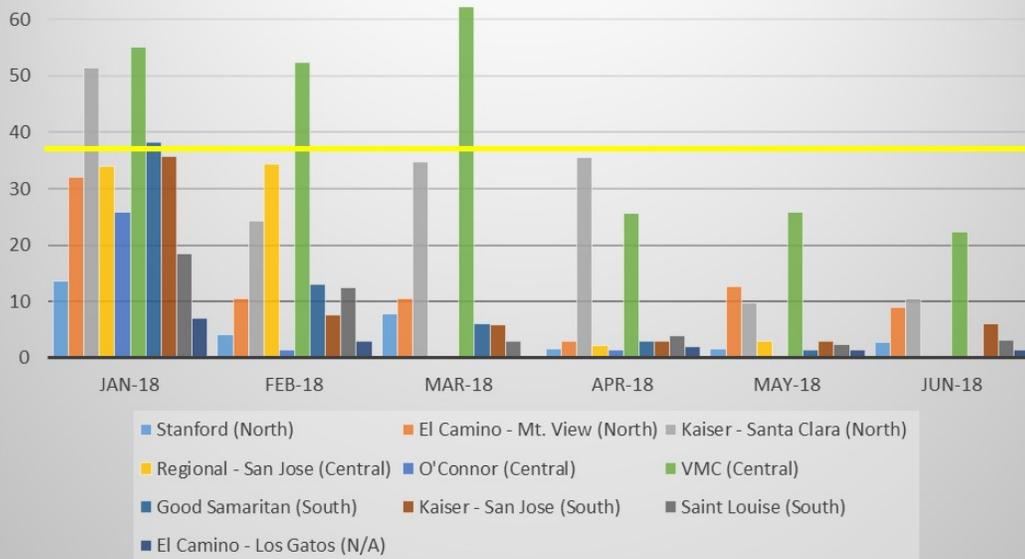
# Hospital Bypass

There are circumstances in which hospitals can request EMS patients to bypass their facility. Facility bypass is a management tool that may be used temporarily by local hospitals when the patient load exceeds emergency department or specialty center resources. When this occurs ambulances will proceed to the next closest or most appropriate emergency department or specialty center. Hospitals may remain on bypass status for no more than sixty

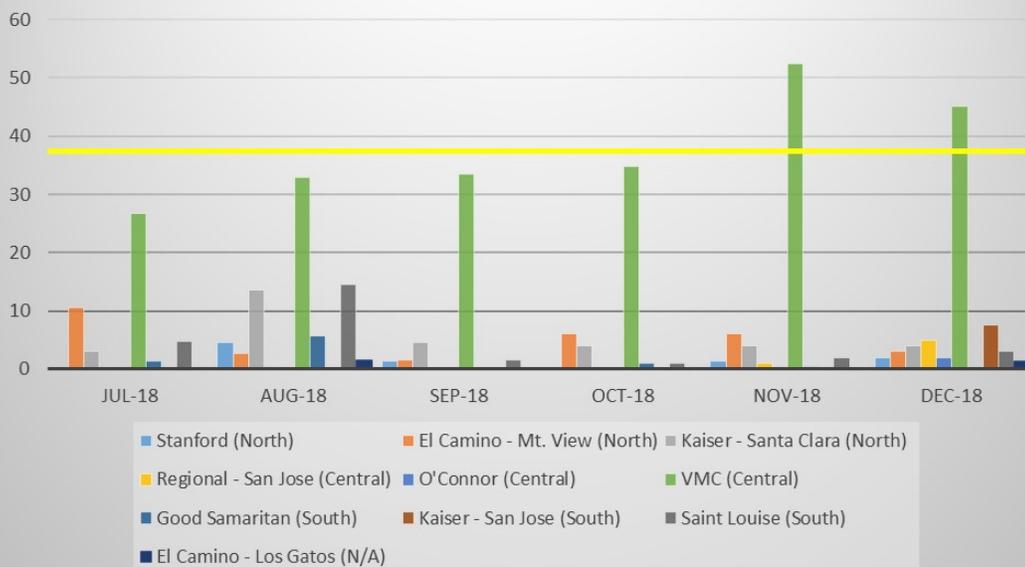
(60) minutes per occurrence. After the hospital has been on bypass they must remain open for at least sixty minutes before being able to be on bypass again. The EMS Agency monitors the use of hospital bypass. If the EMS System is being negatively affected by hospital bypass, the EMS Agency may require all hospitals to open as necessary.

## Ambulance Bypass by Hospital

### January 2018 — June 2018



### July 2018 — December 2018

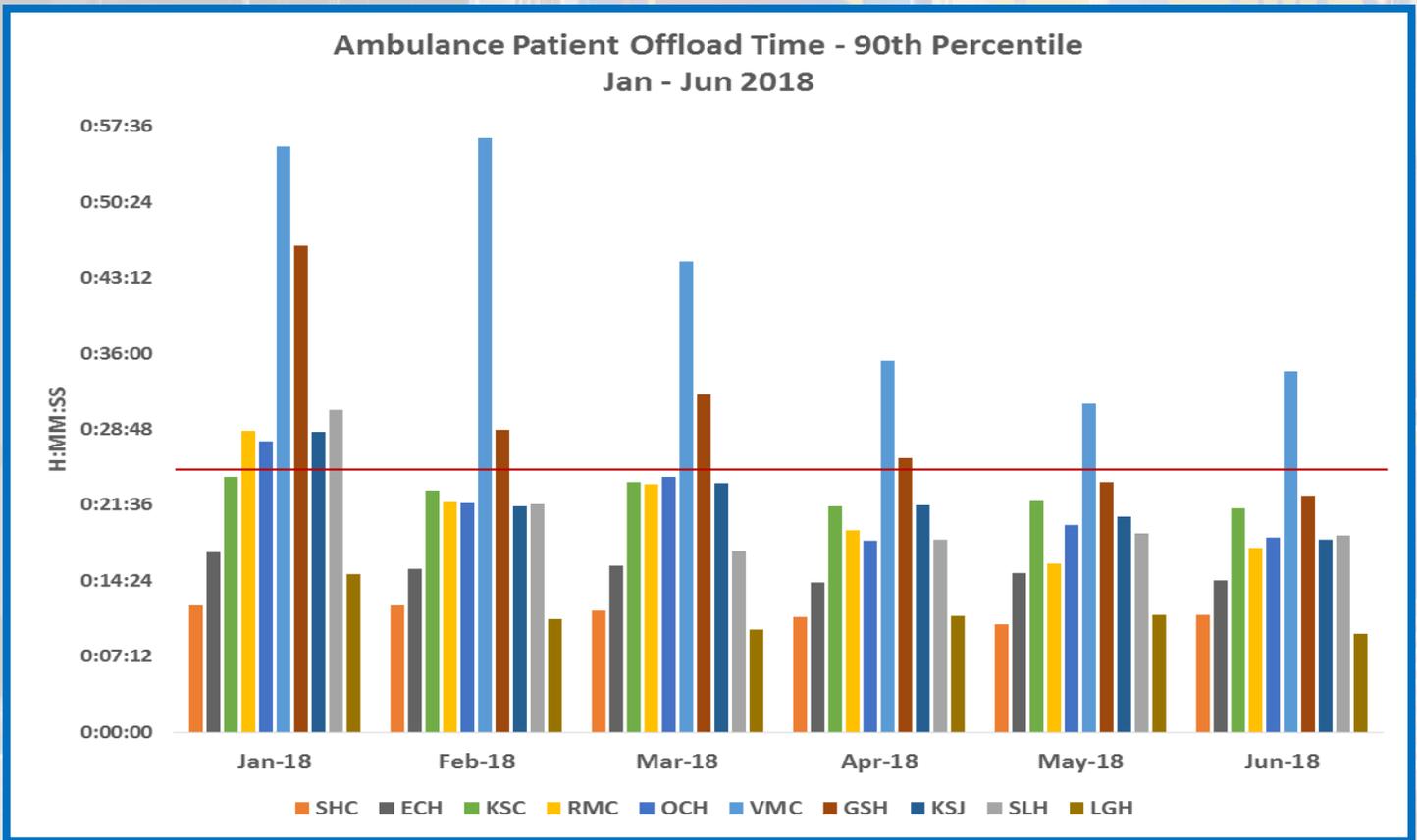


These charts represent the number of hours per month each hospital was on bypass during 2018.

## Ambulance Patient Offload Times

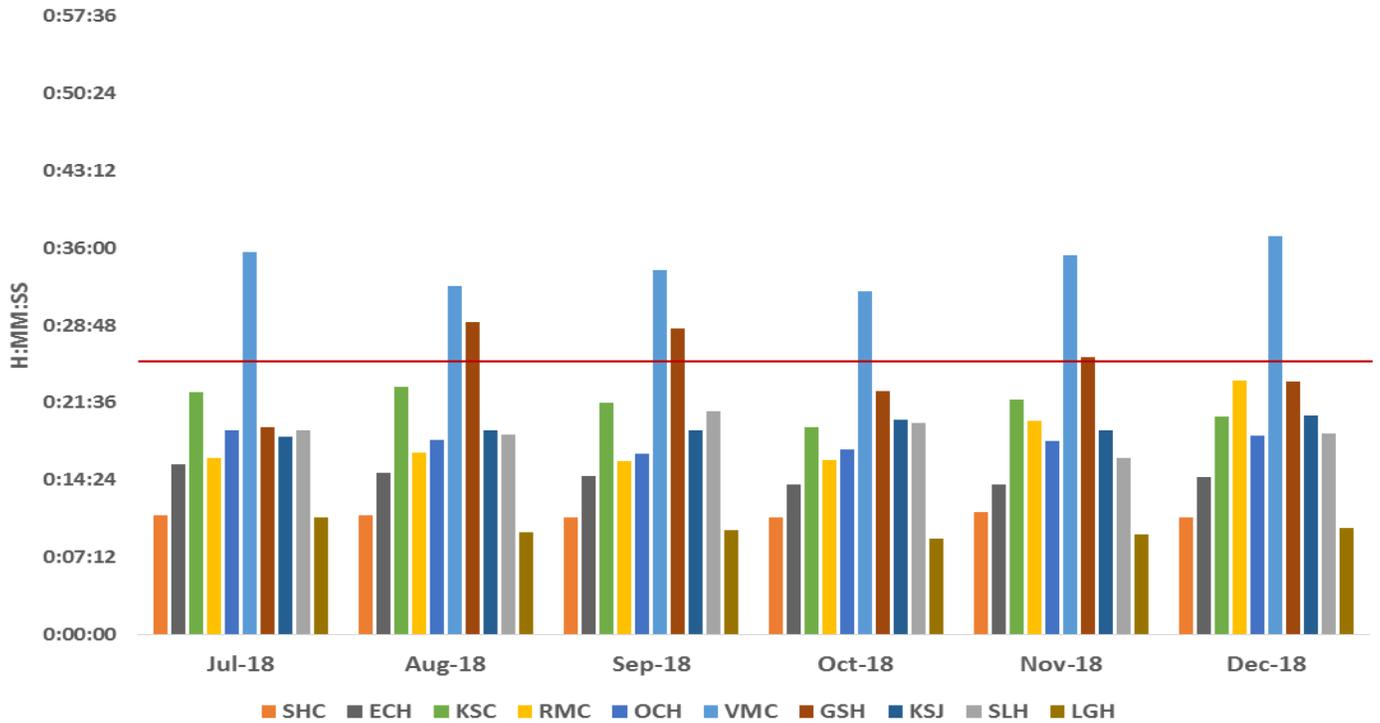
The role hospitals play in assuring that 9-1-1 ambulances are available for the next 9-1-1 call is critical. When an ambulance arrives at a hospital, the time it takes to transfer a patient to an Emergency Department bed for the Emergency Department staff to assume responsibility for the care of the patient, impacts the ambulances ability to be available for another call. The offload time is recorded and tracked due to the significant impact it has on the EMS System. Ambulance Patient Offload Times (APOT) are calculated for all hospitals that receive patients in Santa Clara County. In 2015, the Health and Safety Code (1797.120) required the California Emergency Medical Services Authority to develop a standard methodology for the calculation of, and reporting of this time, by the Local EMS Agency.

The following graphs represent the Ambulance Patient Offload Times by facility for 2018.



	SHC	ECH	KSC	RMC	OCH	VMC	GSH	KSJ	SLH	LGH
<b>Jan-18</b>	0:12:01	0:17:09	0:24:17	0:28:42	0:27:42	0:55:42	0:46:18	0:28:33	0:30:41	0:15:01
<b>Feb-18</b>	0:12:01	0:15:34	0:23:01	0:21:56	0:21:47	0:56:30	0:28:44	0:21:28	0:21:44	0:10:47
<b>Mar-18</b>	0:11:32	0:15:48	0:23:47	0:23:35	0:24:18	0:44:47	0:32:11	0:23:42	0:17:15	0:09:47
<b>Apr-18</b>	0:10:56	0:14:17	0:21:29	0:19:11	0:18:10	0:35:16	0:26:02	0:21:37	0:18:19	0:11:06
<b>May-18</b>	0:10:18	0:15:06	0:22:00	0:16:01	0:19:44	0:31:14	0:23:47	0:20:30	0:18:53	0:11:12
<b>Jun-18</b>	0:11:11	0:14:26	0:21:19	0:17:33	0:18:33	0:34:21	0:22:29	0:18:20	0:18:43	0:09:23

### Ambulance Patient Offload Time - 90th Percentile Jul - Dec 2018



	SHC	ECH	KSC	RMC	OCH	VMC	GSH	KSJ	SLH	LGH
<b>Jul-18</b>	0:11:07	0:15:49	0:22:32	0:16:25	0:19:00	0:35:38	0:19:16	0:18:26	0:19:03	0:10:53
<b>Aug-18</b>	0:11:08	0:15:01	0:23:05	0:16:54	0:18:09	0:32:28	0:29:06	0:18:58	0:18:39	0:09:32
<b>Sep-18</b>	0:10:51	0:14:46	0:21:32	0:16:06	0:16:49	0:33:58	0:28:28	0:18:58	0:20:47	0:09:43
<b>Oct-18</b>	0:10:53	0:13:56	0:19:19	0:16:14	0:17:16	0:32:01	0:22:41	0:19:59	0:19:44	0:08:56
<b>Nov-18</b>	0:11:26	0:13:58	0:21:55	0:19:56	0:17:59	0:35:22	0:25:53	0:19:00	0:16:28	0:09:20
<b>Dec-18</b>	0:10:55	0:14:39	0:20:18	0:23:42	0:18:29	0:37:04	0:23:36	0:20:21	0:18:40	0:09:52

*Time is determined using "Arrived At Destination Time" and "Hospital Receiving Agent Signature Time" (or "Unit Back in Service Time" if unavailable)*

Timely EMS patient transfer of care is known to improve the availability of ambulances and patient safety. The EMS Agency, working with hospital administrators, has placed significant focus on the time it takes to get ambulances back into service once they have arrived in their Emergency Departments. Decreases in offload delays will not only increase availability of resources in the EMS System but it will also decrease the time it takes patients to receive definitive care. This can provide better pain control, stabilization and provide access to medications and antibiotics only available at the hospital. The expectation is that patients are transferred to the care of hospital staff within 25 minutes of ambulance arrival. The Agency has seen considerable improvement throughout the County in ambulance patient offload time over the last two years.

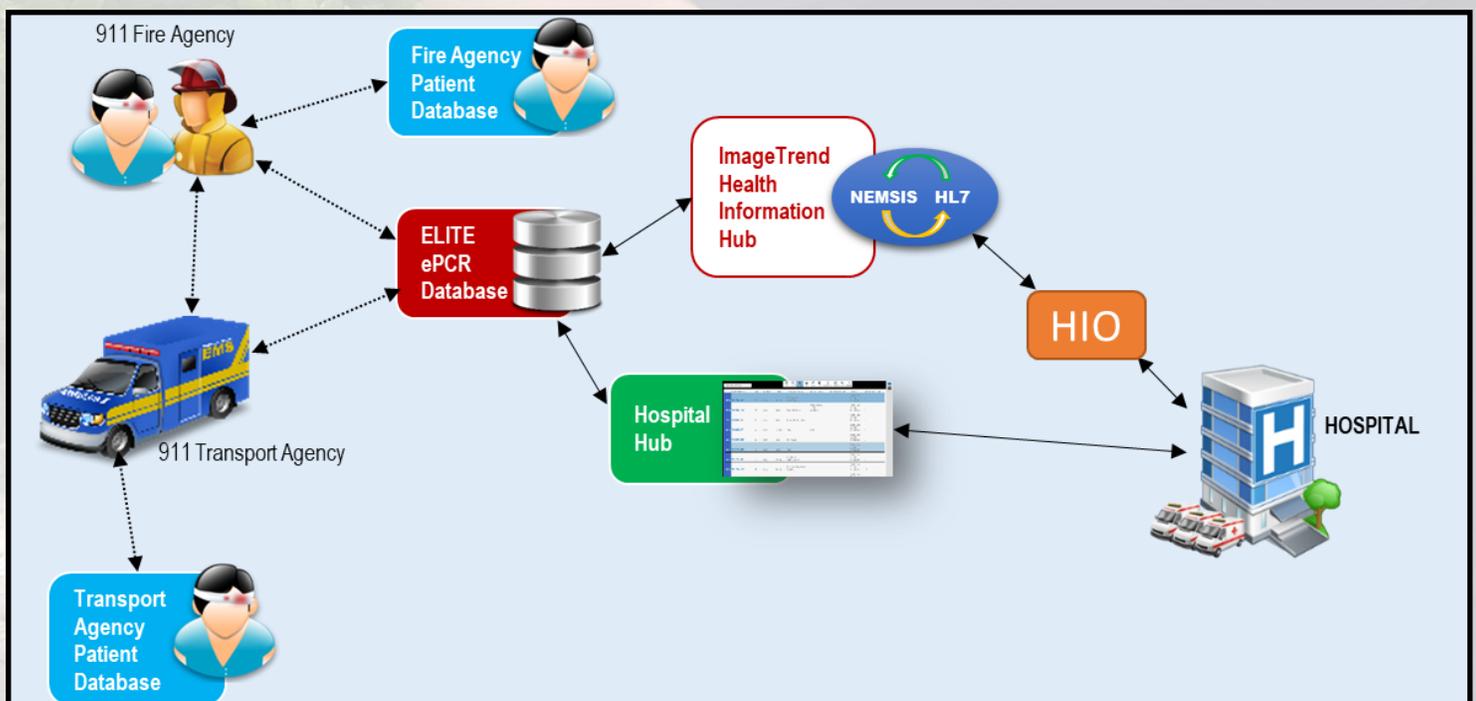
## Hospital Information Exchange

Since 2009, one of the goals of the EMS Agency was to develop an electronic data system that would capture information from the moment that 9-1-1 was called through to when the patient was discharged from the hospital. Having all of these data points would allow us a real look at how care given in the pre-hospital setting affected the patient's outcome. The Agency collects data from the public safety answering points (911 dispatch centers). If that dispatch center performs screening of the call and provides pre arrival instructions, that data is also captured. Then, patient care data is collected by the 911 responders. So, what is left is to collect data from the hospital.

The collection of the outcome data will be performed via a health information exchange (HIE). When the HIE is fully implemented, it will assist in the integration of raw pre-hospital patient care data into the receiving hospital's electronic medical record system. This will be for the documented 911 event that required the patient to be transported. The HIE will then facilitate the exchange of the hospital's outcome data, for the specific event that the patient was transported for, to be returned and associated to the pre-hospital PCR. This will allow for the full patient care picture to be seen.

This project is expected to take between three and four years to complete. Most of this time will be spent on the development of the capability of a hospital to receive the pre-hospital data. The EMS Agency will be seeking out funding sources for participation in a county wide HIE.

*Below is a sample diagram showing how the HIE process would work.*



# Quality Improvement

The Emergency Medical Services Agency pre-hospital Quality Improvement program is responsible for ensuring every patient who enters the emergency medical system receives the same standard of care, whether the patient calls 9-1-1 or is transported between care facilities by one of the county's private ambulance providers. The Quality Improvement program ensures these standards through various mechanisms including authoring of prehospital treatment protocols, collection and analysis of data from the prehospital system in Santa Clara County, dissemination of that data to stakeholders, and chairing various quality improvement committees throughout the county. Through these mechanisms, the standard of care set by prehospital treatment protocols is continuously measured. Areas of deficiency are identified in real time and through protocol changes or system wide education, they are addressed and improved.

Continuous improvement is a system wide focus. Deficiencies and improvements are worked on through the Quality Improvement committees along with every individual stakeholder's quality improvement department. Solutions identified by the quality improvement committees will then be worked into the prehospital treatment protocols during scheduled revisions. The process of ensuring the standard of care will start over, thus completing the circle of quality improvement.

## **2018 Quality Improvement Projects**

- Community Paramedicine Pilot Program (Behavioral Health and Sobering Center alternate destinations)
- The use of intravenous non-opioid pain management (Ofirmev)
- Implementation of video laryngoscopy
- Implementation of laryngeal mask airways (LMA)
- Sudden Cardiac Arrest Survival Rates

In addition to the managing the quality improvement process, the EMS Agency's Quality Improvement program also participates in state sanctioned pilot programs and local trial studies. Participation in such studies ensures that the care delivered to our community is on the cutting edge of science and industry standards.

Continuous data is collected and analyzed for these studies and compared against analyzed data from previous methods or devices used to

ensure that the Paramedics and Emergency Medical Technicians servicing the county have the best tools and methods to care for their patients.

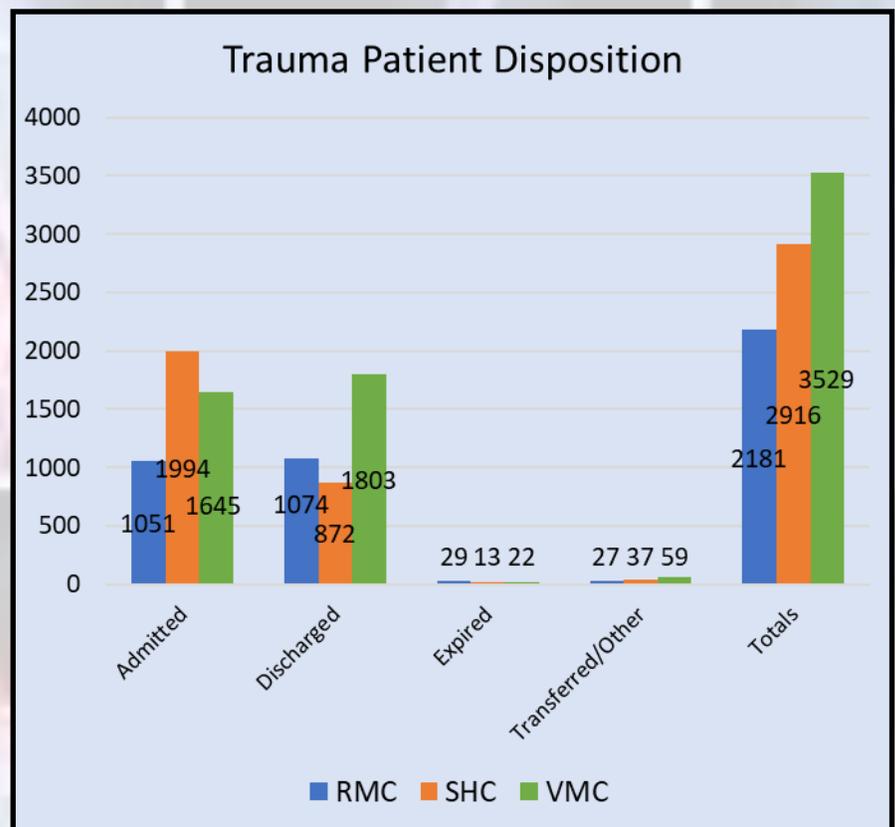
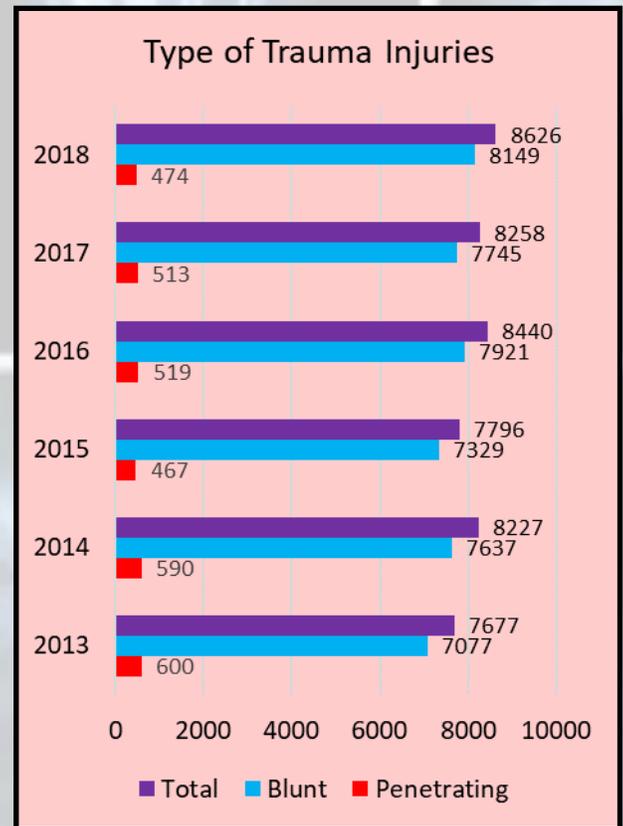
## Trauma

Santa Clara County has a mature trauma system that has been in place since 1986. The system is fortunate that it has three designated trauma centers:

- ◆ Stanford Health Care - Level I adult and pediatric trauma center
- ◆ Santa Clara Valley Medical Center - Level I adult and a level II pediatric trauma/burn center
- ◆ Regional Medical Center - Level II adult trauma center

The system serves a population of close to 2 million residents in Santa Clara County and approximately 1 million residents from adjoining counties: San Mateo, Santa Cruz, San Benito and Monterey. Santa Clara County's geography varies from heavily populated metropolitan areas, to scarcely populated rural agricultural areas and rugged mountainous terrain. The area is served by seven major freeways, an international airport, multiple rail systems, and is the host to many large community and sporting events. This contributes to the system's high volume and array of injuries treated. All of these factors are taken into consideration during the ongoing planning and review of the system's needs.

*These charts portray disposition and types of traumas responded to: Penetrating (when an object pierces the skin i.e. gunshot, stabbing or impaled object) and Blunt (there may be an impact, but the skin is not necessarily broken)*



## STROKE

Few things in medicine, certainly in EMS, have been changing as rapidly as the treatment of acute stroke. Of the 11 hospitals in Santa Clara County, 10 are designated stroke centers with four of those 10 designated as comprehensive stroke centers, the remainder being primary stroke centers. 2018 was the first full year following implementation in December 2017 of a stroke severity scale and the selective triage of suspected stroke patients directly to a comprehensive stroke center. The stroke severity scale used is GFAST; lateralizing Gaze, unilateral Facial weakness, unilateral Arm weakness and abnormal or absent Speech. With all four findings present and the onset of symptoms within 6 hours, the suspected stroke patient would be triaged directly to a comprehensive stroke center (CSC). At the CSC that patient with a diagnosed stroke will receive intravenous clot lysis, available also at primary stroke centers, but also advanced brain and vascular imaging to determine the core volume of survivable brain and consideration for endovascular direct clot removal. Suspected stroke patients in the field not meeting all four GFAST elements or greater than 6 hours since symptom onset are triaged to the closest stroke center, primary or comprehensive. Approximately 11% of suspected stroke patients in the field present with all four GFAST findings within 6 hours of symptom onset.

<b>G</b> Gaze Deviation	(0-1)
<b>F</b> Facial Droop	(0-1)
<b>A</b> Arm Drift	(0-1)
<b>S</b> Speech Abnormalities	(0-1)
<b>T</b> Time Last Seen Normal	(No points)

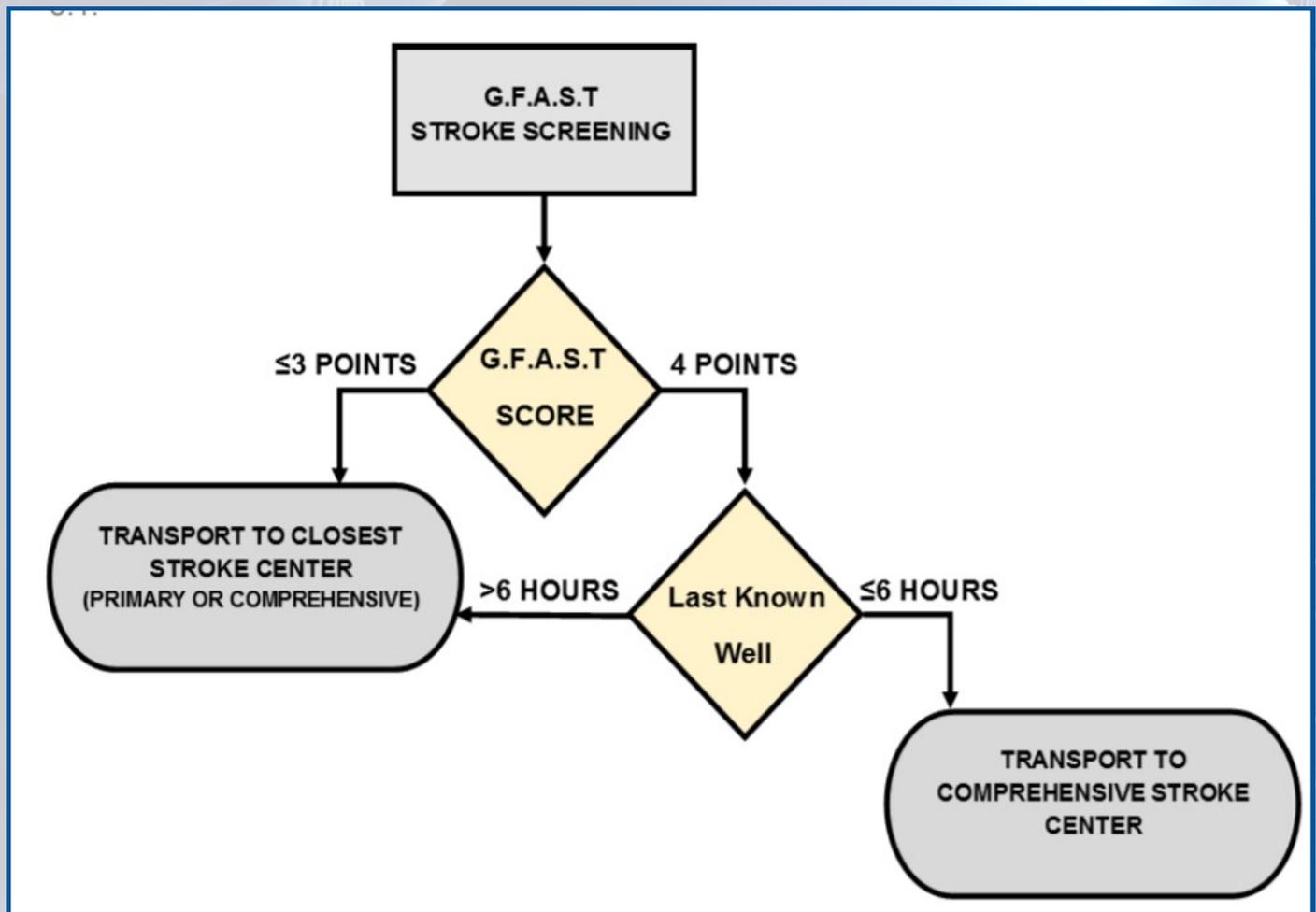
The GFAST stroke severity scale correlates well with the National Institutes of Health Stroke Severity Scale (NIHSS). The NIHSS is a 15-item scale with a score of 0-42. Values of 16 or greater indicate moderate to severe stroke symptoms. When all four findings of the GFAST stroke severity scale are present, the median NIHSS score is 14 with a range of 8-22. When one, two or three of the GFAST findings are present, but not all four, the median NIHSS score is 3 with a range of 1-8. Of patients presenting with all four GFAST findings 63% are found to have a stroke due to small or large blood vessel occlusion. The remainder have one of several forms of intracranial bleeding, transient ischemic attack, or occasionally an encephalopathy, unwitnessed seizure, complex migraine or sepsis. In contrast, of patients presenting with one, two or three, but not all four, GFAST findings 35% are found to have a stroke due to small or large blood vessel occlusion.

The reason for introducing a field expedient stroke severity scale is to identify suspected stroke patients with more severe blood vessel occlusion and transport them to a hospital with resources to provide both intravenous clot lysis as well as evaluate the patient for potential

## STROKE (cont.)

endovascular clot retrieval thereby avoiding the need for an inter-hospital transfer between a primary and comprehensive stroke center. Many factors go into the decision to offer endovascular clot retrieval to a patient with a large blood vessel occlusion stroke. Across all diagnosed strokes approximately 9% go on to endovascular clot retrieval. That proportion increases in patients who present early in the development of their stroke symptoms.

The median door-to-intervention interval for clot lysis across all primary and comprehensive stroke centers are 43 and 41 minutes, respectively. The American Heart Association/American Stroke Association (AHA) guideline is 60 minutes in at least 50% of patients. In patients arriving directly to a comprehensive stroke center and going on to receive endovascular clot retrieval, 63% of patients received that intervention within 120 minutes. The AHA guideline is 120 minutes (with a preferred 90 minutes) in at least 50% of patients. However, when a stroke patient was transferred from a primary to a comprehensive stroke center for endovascular clot retrieval only 2% of patients had a 'first door-to-intervention' interval (arrival at primary stroke center to intervention at comprehensive stroke center) of 120 minutes or less.



## STROKE (cont.)

In late 2017 and early 2018, two studies were published challenging the use of timeframe of stroke symptom onset as the criterion for deciding when to offer endovascular clot retrieval as a treatment option to patients with an acute stroke. Prior to those studies the symptom onset timeframe of under six (6) hours was used as an upper limit to consider endovascular clot retrieval. That criterion was reflected in the Santa Clara County EMS stroke triage protocol by using all four findings of the GFAST stroke severity scale and symptom onset within six (6) hours as the criteria to triage a suspected stroke patient from the field directly to a comprehensive stroke center. Of those patients presenting with all four findings on the GFAST stroke severity scale, 85% did so within six (6) hours of symptom onset. One of those two published studies explored extending the timeframe of symptom onset out to 16 hours and the other to 24 hours for considering endovascular clot retrieval.

Timeframe of symptom onset has been a surrogate indicator of survivable brain following a small or large blood vessel occlusion. Quite reasonably, the longer blood flow is compromised the more brain that will be injured. The principle change in strategy in diagnostic evaluation is the advancement of brain and

blood vessel imaging that measures the volume of injured and survivable brain independent of the timeframe of symptom onset. Of course it remains true that the longer blood flow is compromised the more severe the consequences of stroke can be it has also become true that measuring the volume of survivable brain means that some patients will be candidates for endovascular clot retrieval at longer symptom durations and will not be categorically excluded from that therapeutic option.

As a result of these two studies and the local practice standards of stroke neurologists in Santa Clara County, the EMS Agency will be changing the comprehensive stroke center triage criteria to the presentation of all four GFAST findings regardless of symptom onset timeframe.

### Stroke Center Transport Determination



County of Santa Clara  
Emergency Medical Services System

700-A13

#### 3. Stroke Center Transport Determination

- 3.1. If patient has four (4) points on the G.F.A.S.T stroke screening and a last seen well time of six (6) hours or less, transport the patient to a Comprehensive Stroke Center (Policy 602).
- 3.2. If patient has three (3) or less points on the G.F.A.S.T stroke screening and/or a last seen well time of greater than six (6) hours, transport the patient to the closest Stroke Center (Comprehensive or Primary) (Policy 602).
- 3.3. Transporting crews shall notify the receiving hospital of a "Stroke Alert" when transporting a suspected stroke patient that meets Comprehensive or Primary Stroke Center Criteria.

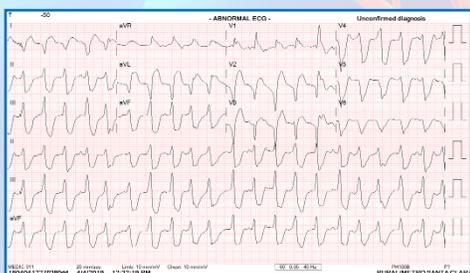
#### 4. Special Considerations

- 4.1. If there is a reliable historian on scene that a  
Well, ensure that their contact

## STEMI

ST-segment elevation myocardial infarction (STEMI) is a type of heart attack that results in clot formation within a coronary artery leading to oxygen and nutrient deprivation of the downstream heart muscle. ST-elevation refers to the characteristic waveform finding on an electrocardiogram. Early recognition of a STEMI should set in motion decision making, drug and procedure preparations for this time-sensitive disease. The sooner blood flow is restored to the affected coronary artery by clot lysis or direct removal the less injury there will be to the downstream muscle and the less likely long-term compromise of heart function will occur.

The STEMI system, part of the Santa Clara County EMS system, is comprised of eight (8) STEMI receiving centers each capable of diagnostic and interventional techniques to restore blood flow to coronary arteries. The prehospital component of the STEMI system includes the acquisition of a 12-lead ECG, interpretation of that ECG, the decision to transport a STEMI



patient to a STEMI center, including bypassing of a closer non-STEMI center emergency department, and the early notification of that center. Aspirin, nitroglycerin and analgesia are provided to patients with cardiac-associated chest pain with or without the finding of STEMI on the 12-lead ECG.

Important metrics to monitor the time-sensitive performance of a STEMI system include the EMS patient contact-to-ECG interval in the field and the door-to-intervention interval once the patient arrives at the STEMI center. The STEMI center intervention can be either intravenous thrombolysis or intra-coronary clot lysis, clot removal and the placement of a stent at the site of the clot. Current practice based upon patient outcomes favors intra-coronary interventions and are measured as a 'door-to-balloon' interval (D2B), referring to the balloon at the end of the intra-coronary catheter used to open the vessel and restore blood flow.

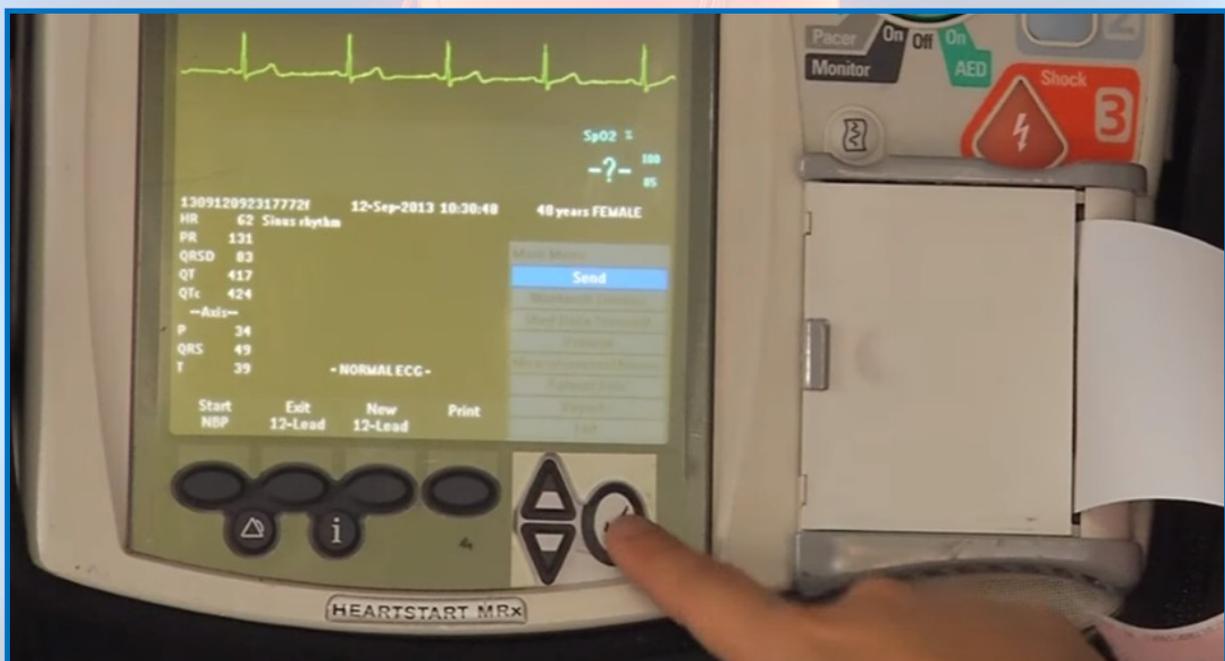
The current median EMS patient contact-to-first 12-lead ECG interval is 18 minutes. The EMS Agency has identified 15 minutes as a reasonable goal for acquiring a 12-lead ECG in patients presenting with chest pain. Occasionally the 12-lead ECG may have to await placing the patient in the ambulance to attend to patient privacy. Other treatment for suspected cardiac-related chest pain can continue since they are not contingent upon the 12-lead ECG findings. AHA recommends the first emergency department 12-lead ECG be within 10 minutes of patient arrival.

## STEMI (cont.)

The AHA recommends a D2B interval of 90 minutes upon arrival at the emergency department of a STEMI center. A more aggressive timeframe is 90 from first EMS patient contact. To achieve these timeframes there needs to be close coordination between the EMS system and the STEMI receiving center. The mean 90th percentile D2B interval is 99 minutes with a range of 84-147 minutes across the 8 STEMI centers. Of interest there is barely a 2-minute difference in the median D2B intervals between patients arriving via EMS and those arriving outside of the EMS system.

The observations of D2B intervals for patients arriving via EMS and those arriving outside of the EMS system may be attributable to irregular 12-lead ECG transmission and connectivity capabilities of the legacy ECG monitor used by the contracted 911 ambulance transport provider. Additionally, the interpretive algorithm used by that ECG monitor tends to alert to STEMI criteria on a 12-lead ECG that are not attributable to a STEMI when read by a physician. The consequence has become that STEMI centers have variably waited until the arrival of the patient and the physician reading of the 12-lead ECG before activating resources toward intra-coronary interventions. That early activation is key in realizing the benefit of EMS field 12-lead ECG acquisition, interpretation and early notification of a STEMI center.

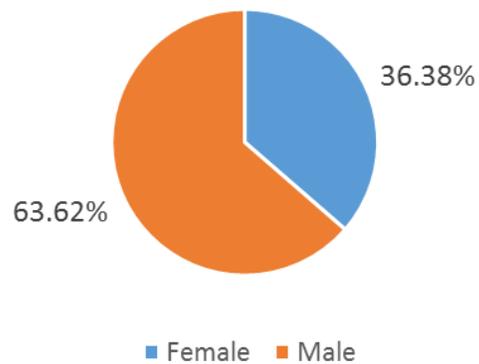
In 2019 the 9-1-1 ambulance transport contract provider will transition to an ECG monitor with superior interpretive software and a more effective means of transmitting a field 12-lead ECG to a STEMI center.



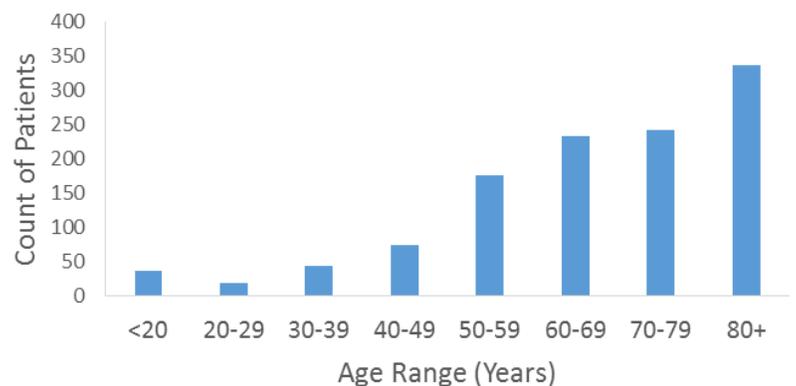
## Sudden Cardiac Arrest

In 2018, the Santa Clara County EMS System cared for 1,161 non-traumatic sudden cardiac arrest (SCA) patients. Of those patients, 36% of arrests attended by 9-1-1 responders were female. The median age was 76 years for females and 68 years for males; 39% of these patients had a bystander on scene who witnessed the event. In 54% of these calls bystander CPR was attempted. The available data on public access automatic external defibrillator (AED) use is limited but suggests an AED was used in approximately 12% of cardiopulmonary arrests prior to the arrival of 9-1-1 responders. Upon arrival of 9-1-1 responders 15% of patients presented with a shockable rhythm (ventricular fibrillation or pulseless ventricular tachycardia). 51% of cardiopulmonary arrests attended by 911 responders were transported to a hospital emergency department. Those who were not met determination of death criteria, had an advanced directive, had family not wishing resuscitation, or met the termination of resuscitation criteria. Of those patients transported to an emergency department, 37% survived to hospital admission and 20% were discharged from the hospital alive.

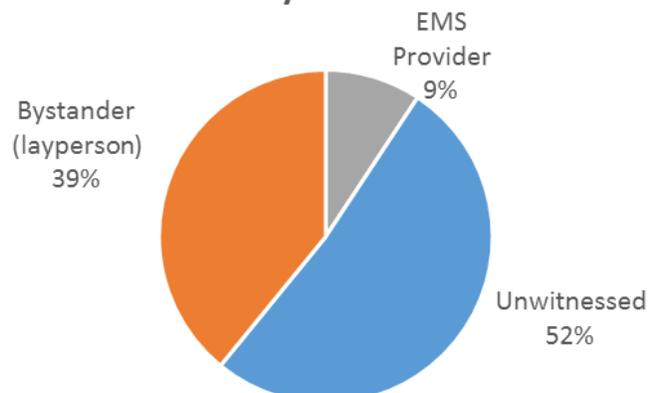
### Cardiac Arrest by Sex 2018



### Cardiac Arrest by Age 2018



### Cardiac Arrest by Witness Status 2018



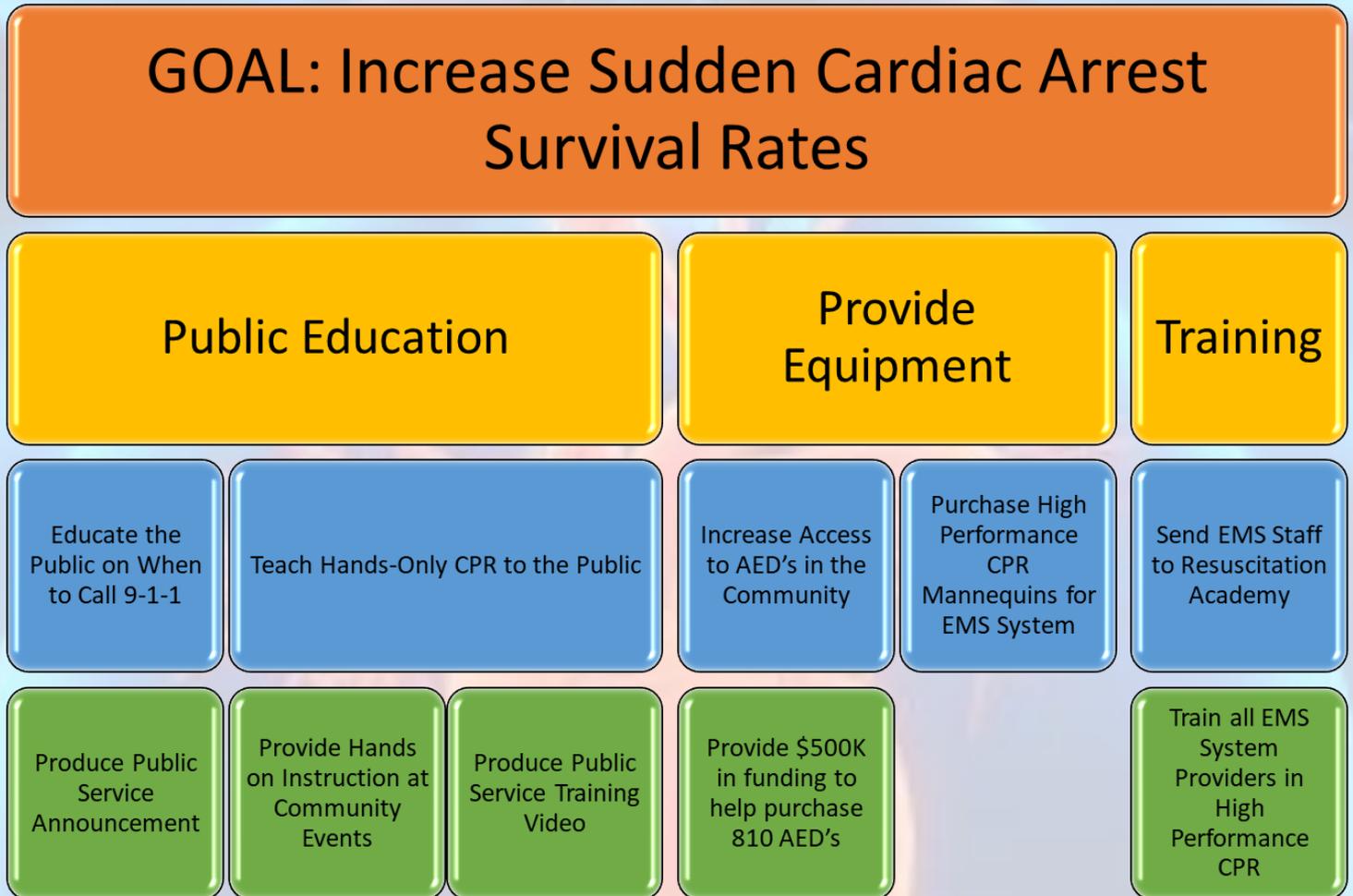
There are two key outcomes monitored for cardiopulmonary resuscitation; return of a pulse in the field (return of spontaneous circulation, ROSC) and favorable neurological survival (cerebral performance category 1 or 2, CPC 1-2; able to perform activities of daily living without assistance and able to engage in activities or employment with minimal impairment). Across all presenting cardiac rhythms in cardiopulmonary arrest, there is ROSC in 27% of patients. That increases to 39% if the cardiopulmonary arrest was witnessed, is 26% if there was bystander CPR and is 64% if a public access AED was used and delivered a shock (although available data is limited). Shockable rhythms are the most survivable of cardiac rhythms in cardiopulmonary arrest and have a ROSC rate of 50%. Of those patients achieving ROSC in the field 64% are admitted to a hospital from the emergency department.

Of all the patients discharged alive from hospitals 10% have favorable neurological survival. That increases to 13% if the cardiopulmonary arrest was witnessed, 13% if there was bystander CPR, 18% if a public access AED was used and delivered a shock (although available data is minimal), and 27% if the initial rhythm was a shockable rhythm. When ROSC is achieved in the field before hospital arrival there is favorable neurological survival on hospital discharge in 20% of patients across all cardiac rhythms but only 1.5% favorable neurological survival if ROSC was achieved in the emergency department but not in the field.

<b>2018</b>	<b>Number of Occurrence</b>	<b>Percentage of Total Occurrences</b>	<b>Return of Spontaneous Circulation</b>
<b>Unwitnessed</b>	599	52%	
Ventricular Fibrillation/ Ventricular Tachycardia		9%	40%
Other Cardiac Rhythm		18%	39%
Asystole (no electrical activity)		73%	17%
<b>Witnessed by Bystander</b>	454	39%	
Ventricular Fibrillation/ Ventricular Tachycardia		27%	57%
Other Cardiac Rhythm		30%	44%
Asystole (no electrical activity)		44%	42%
<b>Witnessed by First Responder</b>	108	9%	
Ventricular Fibrillation/ Ventricular Tachycardia		17%	44%
Other Cardiac Rhythm		59%	56%
Asystole (no electrical activity)		24%	58%

## Quality Improvement Project in Focus

Below is an overview of work that was accomplished in 2018 as part of the quality improvement goal of increasing Sudden Cardiac Arrest survival rates.



On the following pages, several of the items captured in the chart above will be highlighted to provide a better understanding of the work completed. In 2019, the EMS System will continue its efforts to see more patients survive sudden cardiac arrest. Through early recognition of sudden cardiac arrest, activation of the 9-1-1 System, quick access to an Automated External Defibrillator, High Performance CPR by First Responders and rapid transport to the closest appropriate hospital, more patients should survive sudden cardiac arrest.



## High Performance CPR

The treatment of Sudden Cardiac Arrest (SCA) was a focus for the EMS Agency in 2018 in multiple ways. In efforts to see more people survive SCA the EMS Agency researched, developed and implemented significant changes to the EMS System's approach to CPR. The Agency started this process in 2017 by committing staff resources to research best practices and develop an approach to improving our system. Through training and consultation with the Resuscitation Academy, the EMS Agency developed a new treatment protocol for patients suffering from out-of-hospital cardiac arrest. The areas identified for improvement included; the rate at which compressions and each breath is delivered, the depth and release of each compression delivered, and nearly eliminating the interruptions of chest compressions. This training included the use of a sophisticated computerized mannequin that provides live feedback to the first responder.

These significant changes were introduced to each EMS Professional through the EMS Annual Training process. The EMS Agency conducted fifteen training sessions in which 115 first responders attended. These responders represented the training staff from each Fire Department and Ambulance provider who in turn trained over 3,500 personnel from their respected organizations. The system wide training was completed near the end of 2018 and the new High Performance CPR treatment protocol went live in February 2019. Along with the updated protocol for the EMS System the EMS Agency also turned their focus to public education. We know that early recognition of SCA by the public, access to an Automated External Defibrillator (AED), and access to 9-1-1 services make a difference in the outcome of patients in SCA. To increase awareness in the community the EMS Agency created two Public Service Announcements, "When to Call 9-1-1" and "Hands-Only CPR". The EMS Agency also continued to support access to AEDs by providing funding to help place AEDs into every public school in Santa Clara County. By increasing the public's awareness of when to utilize our 9-1-1 services, as well as how to perform the simple yet life saving skills of Hands-Only CPR, patients in SCA can have a higher chance of surviving.

# Education and Training

In 2018, the EMS Agency continued to promote several public education outreach campaigns. Each month, the EMS Agency provides educational campaign materials to every fire department and ambulance service within the Santa Clara County EMS System. These materials include educational flyers, postcards, posters and pamphlets to distribute to the community, and talking points for use during presentations. By coordinating the public education campaigns within the EMS System, the public message is consistent, regardless of which organization provides the message. Education material are also provided in Spanish and Vietnamese. In addition to these outreach campaigns the EMS Agency also created two Public Service Announcements (PSA), “When to call 9-1-1” and “Hands-Only CPR”.

Public Education
<i>Carbon Monoxide Poisoning</i>
<i>Influenza</i>
<i>Santa Clara County Emergency Alert System (AlertSCC)</i>
<i>Pool Safety</i>
<i>Preventing Snake Bites</i>
<i>STROKE Awareness</i>
<i>Heart Attacks, Heart Attacks and Women</i>
<i>Heat Related Illness</i>
<i>Falls and Seniors</i>
<i>“Pull to the Right for Sirens and Lights”</i>

## When to Call 9-1-1 Public Service Announcement



In Santa Clara County, over 10,000 emergency medical calls to 9-1-1 are processed every month. Around 33% of those calls are “cancellation calls”, meaning the police, fire or emergency medical responders were not needed.

In 2018, the Santa Clara County EMS created a PSA to help educate the public on “When to Call 9-1-1”. Knowing when it is appropriate to call 9-1-1 is truly important and through education our community will have a better understanding of the 9-1-1 emergency medical services system, and when to call upon us for help.

## Hands-Only CPR Public Service Announcement

In efforts to educate the public on the important yet simple skill that can help save a life, the EMS Agency produced a PSA on Hands-Only CPR. Hands-Only CPR is CPR without mouth-to-mouth breaths. It is recommended by the American Heart Association for use by people who see a teen or adult suddenly collapse in an “out-of-hospital” setting (such as at home, at work or in a park). It consists of two easy steps:



### Step 1

# 9-1-1

Call 911  
or  
send someone to  
call 911

1. Call 9-1-1 (or send someone to do that).
2. Push hard and fast in the center of the chest.

Knowing and performing these simple steps can help save a life. The PSA created provides this information in a quick and simple way and has been distributed through many avenues including social media. The videos were produced in English, Spanish and Vietnamese and have been viewed by thousands of people since their release. This campaign is also part of the EMS Systems efforts to improve survival rates from sudden cardiac arrest. When people in the community know these simple steps and implement them the chance of survival is greatly increased.



### Step 2

For teens or adults  
push hard and fast  
on the center of the  
chest



Don't stop until  
help arrives

## Automated External Defibrillators

The EMS Agency has provided EMS Trust Fund dollars totaling \$500,000 to the Santa Clara county-wide AED program to help purchase a total of 810 AEDs. This project was undertaken to increase the survival rates of Sudden Cardiac Arrest (SCA) patients which can be improved with access to lifesaving heart defibrillators (AEDs).



*Santa Clara County Park Rangers receiving AEDs through the grant*

## Community Paramedicine—Pilot Project

In 2017, the Santa Clara County EMS Agency along with the Emergency Psychiatric Service (EPS), Mission Street Sobering Center and Gilroy Fire Department applied for a Behavioral Health and Sobering Center Pilot Project through the CA EMS Authority and the CA Office of Statewide Health Planning and Development. The Pilot Project was approved in early 2018 and authorized the development of protocols to assess patients placed on a Welfare and Institutions Code 5150 by law enforcement for consideration of direct transport to Emergency Psychiatric Service. It also authorized the use of a protocol to assess patients for transport directly to Mission Street Sobering Center.

On April 23, 2018, the Pilot Project was implemented with paramedics of the Gilroy Fire Department. Admission criteria for Mission Street Sobering Center require a fairly high level of functionality of an intoxicated client. It became clear early in the Pilot Project that persons for whom law enforcement request the assistance of Fire Department and EMS are too intoxicated and impaired for the Sobering Center to manage. The Sobering Center arm of the Pilot Project remains an option but so far no patients have been transported there by EMS under the Pilot Project.

From the beginning of the Pilot Project through December 2018, a total of 89 patients have been transported directly to EPS; 44% were female. Median age of females was 26 years and the median age of males was 19 years across all transported patients. Median length of stay at EPS across all patients was 11 hours; three (3) patients were transferred to an emergency department for further medical screening, none emergently.

The Agency found that 70% of patients transported to EPS had a discharge diagnosis of adjustment disorder or adjustment disorder with substance use disorder, 9% with schizoaffective disorder and 6% with bipolar disorder. The remainder of discharge diagnoses include depressive disorder, mood disorder and schizophrenia. Median length of stay for patients discharged with a diagnosis of adjustment disorder was 10 hours, schizoaffective disorder was 32 hours and bipolar disorder was 4 hours. Median age of patients diagnosed with adjustment disorder was 19 years, schizoaffective disorder was 38 years and bipolar disorder was 25 years.

Across all discharge diagnoses, 42% of patients transported to EPS were discharged to inpatient or outpatient follow up psychiatric care and 36% of patients with a diagnosis of adjustment disorder were discharged to follow up psychiatric care.

The Pilot Project is anticipated to continue at least through November 2019.

# Disaster Medical Response and Preparedness

The EMS Agency Director and County Health Officer jointly manage the Medical Health Operational Area Coordinator (MHOAC) Program in accordance with the California Health and Safety Code. Under the Health and Safety Code, the MHOAC is responsible for a medical and health disaster plan. The plan is required to cover the provision of medical and health mutual aid within the our county, also known as the Operational Area. This plan includes preparedness, response, recovery and mitigation functions in accordance with the State Emergency Plan. As part of this plan, the EMS Agency staffs a position known as the All Hazards Coordinator. This position serves as the Medical Health Operational Area Coordinator, coordinates and leads the Medical Volunteers for Disaster Response program and provides guidance in the EMS Systems plan for responding to Multiple Casualty Incidents.

## **All Hazards Coordinator (EMS)**

In the past year, the EMS All Hazards Coordinator led Medical-Health planning and operational efforts; increased visibility/knowledge about the Medical Health Operational Area Coordinator Program (MHOAC); developed and submitted requests in response to State Homeland Security Grants Program; conducted equipment training and maintenance; led the weekly development and distribution of a EMS System Action plan that includes planned events occurring in each jurisdiction within the County; and participated in collaborative training. In conjunction with the Fire All Hazards Coordinator and Law Enforcement Mutual Aid Coordinator continued development of protocols to support the deployment and response of a Rescue Task Force model to active shooter and as well as response to a complex coordinated attack.

The EMS All Hazards Coordinator and County Behavioral Health Substance Use Treatment Program were instrumental in working to establish Naloxone Programs with Law Enforcements Agencies. The programs established Departmental policy that were approved by the EMS Agency which included the administration of the medicine, storage, training and quality improvement program. The purpose of these programs was to train peace officers in the administration of Naloxone to a suspected opioid overdose patient in the event that they arrived on scene before Fire or EMS resources therefore decreasing the risk of death by opioid overdose. During the year, over 75% of law enforcement agencies county-wide established programs and now deploy the medication with all officers on patrol. The vision is by Summer of 2019 to have 100% of all Law Enforcement Agencies county-wide to have the medication deployed to its officers.

## Medical-Health Operational Area Coordinator (MHOAC) Program

The Medical-Health Operational Area Coordinator (MHOAC) is a shared role between the County Health Officer/Public Health, EMS Director or assigned designee. The MHOAC in cooperation with local public health, local EMS Agency, local office of environmental health and local department of mental health are responsible for ensuring Medical-Health disaster planning, response, mitigation and recovery for their respective operational area. During the 2018 Mendocino Complex Fires and Butte County Fires, the MHOAC coordinated the response of EMS, Public Health and Environmental Health Resources that responded to help our neighbors in need during these tragic events. Those resources filled roles in field operations with evacuation of patients; managed Ambulance Strike Teams; worked within the respective Department Operations Centers and assisted with recovery efforts.



*EMS Agency Staff leading an Ambulance Strike Team to assist in evacuations from the North Bay Fires*

## Medical Volunteers for Disaster Response (MVDR)

The MVDR Program currently has 980 members, of those 102 are Level 4 (ready to be deployed individually), 259 are Level 3 (ready to deploy to augment operations as a units) and 619 (Level 2) are available for disaster response support. The membership continues to be diverse and span a large range of medical capabilities and support functions including logistics personnel, physicians, pharmacist, nurses, paramedics, EMTs, dispatchers, and allied health personnel.

The MVDR Program current mission focuses on increasing the number of people trained to perform hands only CPR in the County. In 2018, approximately 500 additional people were trained by MVDR members. The program continues to provide support to both the EMS and Medical-Health System; during the year the MVDR provided support to the Annual San Jose Mineta Airport MCI Exercise as well as the BART Active Shooter Exercise in San Jose.

Over the next year the MVDR Program will go through a restructuring in order to increase deployable members, reconcile members who are no longer active and increase core numbers through recruitment outreach.

## 2018 Multiple Casualty Incident Plan

In 2018, the EMS Agency revised what was previously known as the Multiple Patient Management Plan (MPMP). The MPMP provided strategies for the management of multiple concurrent events of various magnitudes during a countywide disaster. The new Multiple Casualty Incident Plan (MCIP), a component of the Santa Clara County Emergency Medical Services (EMS) System, describes how the EMS System responds and facilitates medical operations at single site incidents involving multiple patients within Santa Clara County. The goals of the new MCI plan include ensuring rapid medical assistance is received by victims, and providing assistance through adequate and coordinated efforts to minimize loss of life, disabling injuries, and human suffering. Although the new plan is written to address a single site event managed under one Incident Commander, many of the principles identified in the new MCIP can still be used during a countywide disaster. This plan was developed jointly between the Santa Clara County EMS Agency, county public safety partners, county hospitals, and private transport providers of Santa Clara County.

The new MCIP establishes 5 levels of MCI activation based on anticipated patient counts triggering increased numbers of ambulance response. The plan identifies strategies of care that minimize loss of life by providing prompt medical triage and treatment while ensuring rapid transportation of the injured with a focus on the most severe injuries. Additionally, the plan has developed a patient transportation/destination plan that maximizes the county hospital and trauma system addressing multiple modes of transportation. The new plan incorporates crisis care principles that may be implemented as the scope and nature of an incident grows. Crisis care may provide for the implementation of austere medical care principles to serve the greater needs of numerous patients based on given circumstances and available resources.



*Santa Clara County EMS providers and volunteers participating in an MCI exercise in August 2018.*

# Summary

The EMS Agency views its annual report as the main avenue for keeping the Health and Hospital Committee, as well as our stakeholders well-informed of EMS programs and successes. This year's report offers highlights from the past year, allowing for a more focused review of our operations. Many of our reports and all our policies are on our website for any additional information. This website enables us to share updated information more quickly to all our stakeholders. While our annual report may not be featuring every program, they are equally important and beneficial to the daily operation of our system.

Santa Clara County EMS is guided by its mission: an essential service dedicated to ensuring the provision of quality patient care to the people of Santa Clara County through collaboration, facilitated regulation and system management.

Our EMTs, Paramedics, support staff, and leadership strive to model and support the agencies' core values of dignity, respect, innovation, professionalism, objectivity, leadership and participation in all of their actions. The product being the culmination of a comprehensive vision, assuring an EMS system in Santa Clara County that provides safe, quality, and effective prehospital care.

The past year has allowed the Santa Clara EMS Agency the opportunity to further affirm our commitment and dedication to the community we serve. As a service, we continue to develop deep bonds in the neighborhoods of Santa Clara, not only in the delivery of pre-hospital emergency medical care, but through scientific based protocols and community outreach programs.