



EMERGENCY MEDICAL SERVICES

2018
CONTRA COSTA
EMS SYSTEM PERFORMANCE REPORT

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MESSAGE FROM THE DIRECTOR

Sustaining One of the Most Optimized EMS Systems in California

Contra Costa EMS System's public and private partnerships have a legacy of collaborating to provide the best possible outcomes for patients and communities in normal, surge and disaster conditions. In 2018 that collaboration was tested and, time and time again, provided life-saving fire and EMS regional mutual aid, including in responses to the Camp and Butte fires.

This 2018 EMS System Annual Report celebrates the third year of Contra Costa's EMS system modernization plan and Alliance Emergency Ambulance Service delivery model, created through a unique partnership with Contra Costa Fire Protection District and American Medical Response, our legacy ambulance provider. While the Alliance provides over 92% of all emergency ambulance services throughout the county, San Ramon Valley Fire Protection District and Moraga-Orinda Fire Protection District continue to serve their communities with distinction.

The provision of optimized emergency medical services relies on a strong, coordinated EMS community that includes highly trained dispatchers, accredited prehospital community college EMT and paramedic programs and exceptional continuing education opportunities for fire-EMS first responders, as well as strong partnerships with law enforcement and local communities. It also relies on the contributions of emergency medical physician and nurse leaders to achieve the best possible outcomes for patients who rely on 911 for their emergency care.

Contra Costa EMS Agency serves not only as the county's EMS system regulator but, more importantly, as a full partner with its EMS providers and health care systems in facilitating patient-focused solutions and creating a safer, more integrated patient-centric community. In that shared effort we extend our deep appreciation to the dedicated professionals who serve our communities every day.

The EMS system is the ultimate health care safety net. As we work together to navigate the changes in healthcare, your EMS community is at the ready to support, innovate and respond.

The Contra Costa EMS Agency is privileged to be a part of a community of engaged dedicated EMS professionals. Join me in recognizing their collective accomplishments with this 2018 annual report.

Patricia Frost RN, PHN, MS, PNP
Director, Contra Costa EMS

2018 CONTRA COSTA EMS AT A GLANCE

TOP 5 REASONS WHY PEOPLE CALLED 911

105,434 911-TOTAL EMS RESPONSES

81,598 EMS TRANSPORTS TO HOSPITALS

288/223 AVERAGE EMS RESPONSES PER TRANSPORTS A DAY

9.6% (7,832) OF 911 PATIENTS ARE TRANSPORTED TO OUT OF COUNTY HOSPITALS

28-42 MINUTES AVERAGE TRANSPORT TIME FOR A 911 PATIENT TO ARRIVE AT A RECEIVING HOSPITAL

6% CODE 3 (EMERGENT CRITICAL PATIENTS)
94% CODE 2 (NON-URGENT PATIENTS)

- 1 TRAUMA
- 2 PAIN
- 3 BEHAVIORAL PSYCH
- 4 OTHER CONDITIONS
- 5 RESPIRATORY

AVERAGE PATIENT CHARGE FOR 911 SERVICE
\$2,183 TO 2,668
INSURANCE REIMBURSES ONLY 21% TO 35%

DATA SOURCES: CONTRA COSTA EMS FIRST WATCH AND CALIFORNIA OSHPD

2018 EMS COUNTYWIDE HOSPITAL CAPACITY EMERGENCY DEPARTMENT (ED) UTILIZATION



CCHEALTH.ORG/EMS

1. BASE: AN EMERGENCY DEPARTMENT PROVIDING FIELD CONSULTATION BY PHONE.
2. UCSF BENIOFF OAKLAND HOSPITAL.

DATA SOURCES: CONTRA COSTA EMS FIRST WATCH AND CALIFORNIA OSHPD. PREPARED BY CONTRA COSTA EMS.

EMERGENCY MEDICAL SERVICES

Contra Costa's coordinated EMS system began in 1968, when the Board of Supervisors appointed the Contra Costa Emergency Medical Care Committee.

The first EMS System Plan was established in 1975.

MISSION STATEMENT

To ensure that quality emergency medical services are available for all people in Contra Costa County, and that emergency medical care is provided in a coordinated, professional, and timely manner.

CORE VALUES

- ▶ Monitor and ensure patient safety at all times
- ▶ Inspire and emulate professionalism
- ▶ Provide services with a high level of integrity
- ▶ Assure a reliable and high-quality emergency response
- ▶ Support and facilitate emergency and disaster preparedness
- ▶ Integrate with healthcare systems to improve outcomes
- ▶ Promote and support community resiliency

EMS TIMELINE 2018: ACCOMPLISHMENTS AND SIGNIFICANT EVENTS

- ▶ Contra Costa EMS System receives American Heart Association's Highest National Award: Mission Lifeline: Gold Plus Award for outstanding patient care associated with STEMI (High Risk Heart Attack).
- ▶ Contra Costa County-wide Multi-Casualty Incident Response update completed.
- ▶ Approved First Paramedic Advanced Life Support Inter-facility Transfer (ALS-IFT) Program launched by Alliance.
- ▶ Contra Costa County Emergency Medical Services Agency approves California Highway Patrol (CHP) officers to carry and use oropharyngeal airways (OPAs), nasopharyngeal airways (NPAs), and supplemental oxygen.
- ▶ CPR-HD (Highly Defined) pilot adopted as new CPR performance standard to improve chances of return of spontaneous circulation in cardiac arrest victims.
- ▶ Contra Costa EMS and Hospital Council implement operational area emergency communication hospital report card for situational awareness.
- ▶ Contra Costa EMS moves to new location consolidating EMS System Medical Health/Medical Reserve Corps disaster operations, EMT/EMS stakeholder program training and meeting facilities in one location.
- ▶ Contra Costa EMS and Alliance complete pilot of statewide electronic Physician Order for Life Sustaining Treatment (ePOLST) registry in partnership with Alameda Contra Costa Medical Association (ACCMA).
- ▶ Activated Emergency Operations to support Region II medical mutual Aid during July 2018 Mendocino Complex Fires event.
- ▶ Board of Supervisors celebrate May 20–24th as National EMS Week with Contra Costa EMS Community.
- ▶ California EMS Authority approves updates of Contra Costa EMS System Trauma and Quality Improvement Plans.
- ▶ Alta Bates Sutter Health in Alameda County advises of potential closure.
- ▶ EMS hosts 3rd annual Contra Costa Survivors Reunion uniting survivors with their rescuers.

POPULATION USE OF EMS SERVICES

An increase of
1,838
EMS responses
since 2017.

In 2016, Contra Costa County had an estimated population of 1.1 million, making it the ninth most populous county in California. Concord, Richmond and Antioch were the three largest cities in the county, each home to more than 110,000 residents. EMS utilization over the last three years has continued to increase.

CONTRA COSTA COUNTY EMS SERVICE UTILIZATION BY POPULATION			
	2016	2017	2018
Population ²	1,135,127 ¹	1,147,439 ¹	1,150,215 ¹
EMS Responses	98,769	103,596	105,434
EMS Transports	73,987	80,733	81,598
EMS Responses/1000 population ³	87	104	92
Average EMS Responses/day	271	283	288
Average EMS Transports/day	203	221	223
Square Miles EMS Serves	716	716	716
Population per square mile ²	1,585 ¹	1,603 ¹	1,606 ¹
Responses per square mile	138	145	147
County Median Household Income ²	\$80,185 ¹	\$82,881 ¹	\$88,456 ¹
County Population below poverty	10.2% ¹	8.7% ¹	9.1% ¹

¹ Estimated figures as of July 2016

² Source: US Census Bureau.

³ Total includes all responses, including those that did not result in patient transport.

EMS SYSTEM UTILIZATION

TOTAL EMS RESPONSES

Responses By Year

2018

Contra Costa Fire/AMR (Alliance) 94,836

San Ramon Valley Fire Protection District 8,138

Moraga Orinda Fire Protection District 2,460

Total 105,434

Responses By Year

2017

Contra Costa Fire/AMR (Alliance) 93,368

San Ramon Valley Fire Protection District 7,862

Moraga Orinda Fire Protection District 2,366

Total 103,596

Responses By Year

2016

Contra Costa Fire/AMR (Alliance) 89,768

San Ramon Valley Fire Protection District 6,873

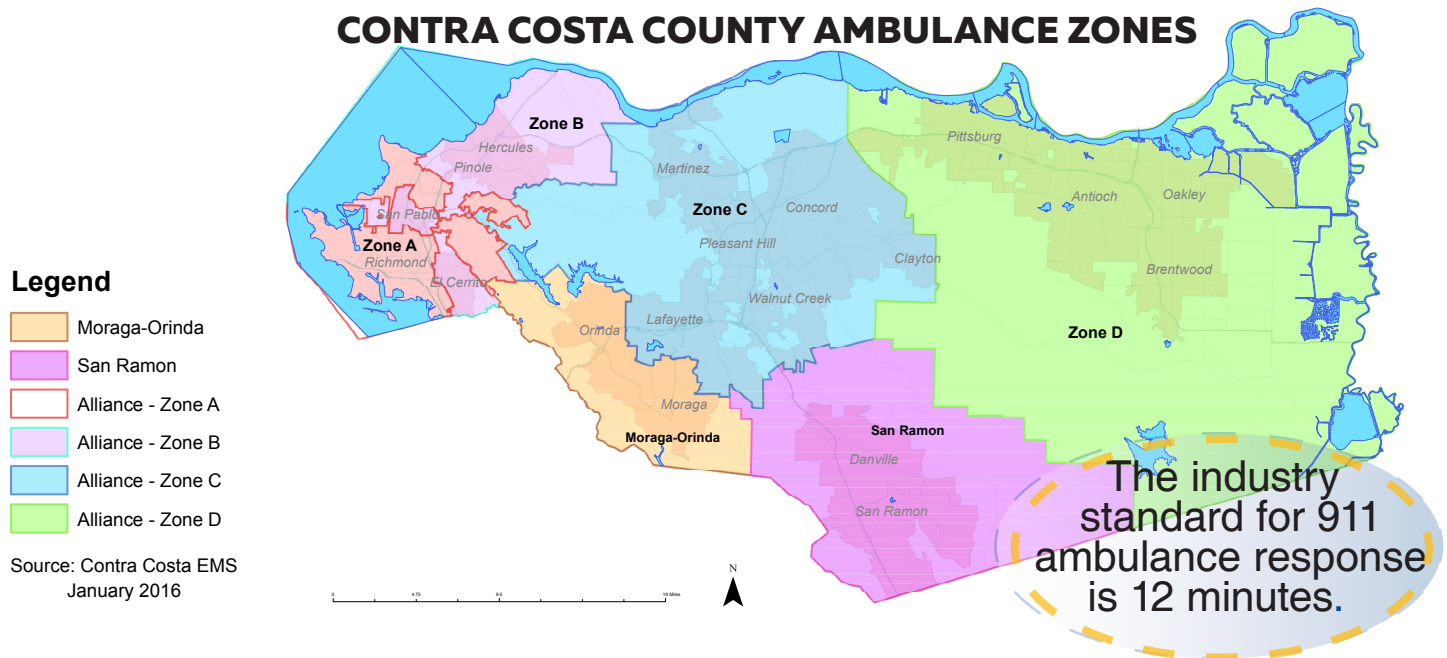
Moraga Orinda Fire Protection District 2,128

Total 98,769

An EMS response typically occurs after a 911 request for emergency medical services.

2018 EMS SYSTEM AMBULANCE RESPONSE REQUIREMENTS

CONTRA COSTA COUNTY AMBULANCE ZONES



GEOGRAPHY

Contra Costa County is located in the San Francisco Bay Area of Northern California, northeast of San Francisco and southwest of Sacramento. The county covers roughly 716 square miles, including 19 cities and numerous unincorporated communities. The county has seven emergency response zones for ambulance-based paramedic service. Each response zone is geographically and demographically diverse, and average response times reported include urban, suburban and rural responses.

AMBULANCE EMERGENCY RESPONSE ZONE (ERZ)		RESPONSE TIME REQUIREMENTS BY MINUTES AND RESPONSE PERCENT ¹		
ERZ Provider	Geographic Area	High Density	Low Density	Response %
ERZ A (Alliance ³)	City of Richmond	10:00	20:00	90%
ERZ B (Alliance ³)	West County (non-Richmond)	11:45	20:00	90%
ERZ C (Alliance ³)	Central County	11:45	20:00	90%
ERZ D (Alliance ³)	East Contra Costa County	11:45 16:45 (in Bethel Island)	20:00	90%
ERZ Moraga Orinda	Moraga Orinda Fire Protection District ²	11:59	20:00	90%
ERZ San Ramon	San Ramon Valley Fire Protection District ²	10:00	20:00	95%

¹ Current ambulance response performance requirements for the contracted ambulance provider

² A fire protection district provides emergency ambulance service in this zone. A fire district board is the local authority for establishing response requirements in this service area.

³ Contra Costa Fire Protection District/American Medical Response Partnership.

EMS AMBULANCE RESPONSE TIME PERFORMANCE

AMBULANCE RESPONSE PERFORMANCE BY ZONE AND SERVICE PROVIDER		
EMERGENCY RESPONSE ZONE (ERA)/PROVIDER	AREA SERVED	2018 AVERAGE CODE 3 (LIGHTS AND SIRENS) RESPONSE TIME IN MINUTES**
ERZ A/Alliance*	City of Richmond	3.36
ERZ B/Alliance*	West County (except the City of Richmond)	4.23
ERZ C/AMR Alliance*	Central County	4.34
ERZ D/Alliance*	East County Antioch/Bay Point/Pittsburg	4:37
Moraga-Orinda ERZ	Moraga-Orinda Fire Protection District	5:03
San Ramon ERZ	San Ramon Valley Fire Protection District	4:28

Source: First watch response zone report time ambulance dispatched to arrive on scene.

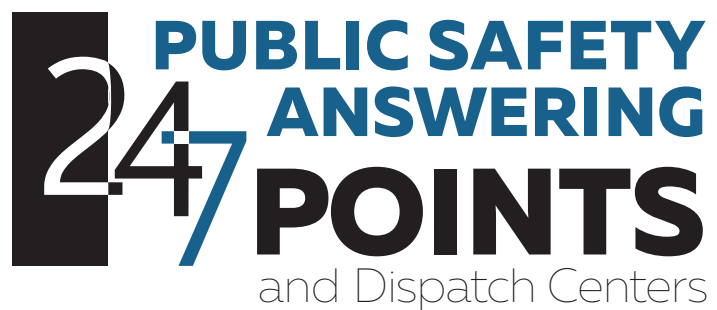
*Alliance: Contra Costa Fire Protection District (contractor) and American Medical Response (AMR) subcontractor.

**Includes all responses.

EMERGENCY SYSTEM DISPATCH

Contra Costa EMS System is composed of several partners working together to bring the highest level of patient care to our constituents.

A PSAP answers emergency calls for police, firefighting and ambulance services.



PUBLIC SAFETY ANSWERING POINTS (PSAPS)

Antioch Police Department
Brentwood Police Department
California Highway Patrol
Concord Police Department
Contra Costa Sheriff's Office
East Bay Regional Park District Police
Martinez Police Department
Pinole Police Department
Pleasant Hill Police Department
Richmond Police Department
San Pablo Police Department
San Ramon Police Department
Walnut Creek Police Department

FIRE/MEDICAL DISPATCH CENTERS

Contra Costa County Fire Protection District
Contra Costa Sheriff's Office (multi-casualty coordination)
Richmond Police Department
San Ramon Valley Fire Protection District

EMERGENCY MEDICAL DISPATCH

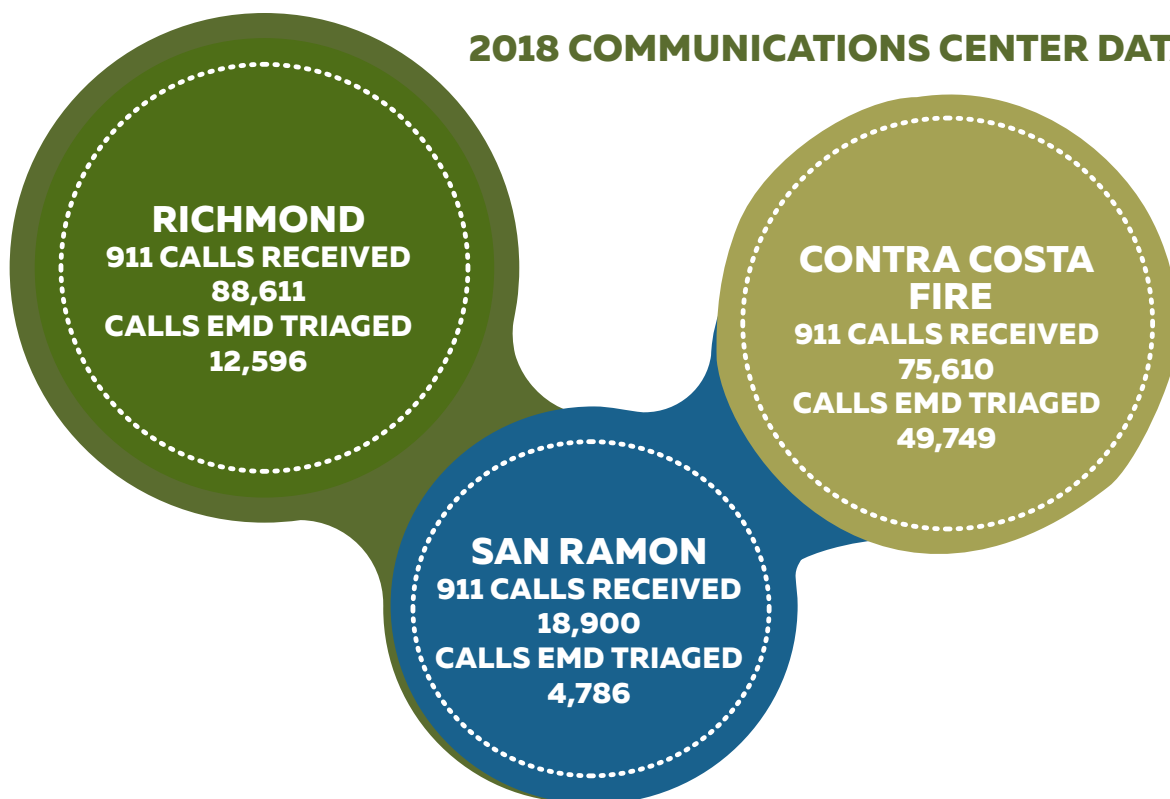
DISPATCH

Contra Costa County is serviced by 13 primary Public Safety Answering Points (PSAPs). These are the communication centers responsible for answering 911 calls. After initial law enforcement triage, medical calls are transferred to secondary PSAPs where Emergency Medical Dispatch (EMD) process takes place, and then an EMS response is dispatched according to emergency medical dispatch protocols.



Contra Costa County has three approved and operational EMD centers that utilize Medical Priority Dispatch System (MPDS), an internationally recognized protocol for rapidly determining what EMS resource is needed. Contra Costa Regional Fire Communications Center, San Ramon Valley Fire and Police Communications Center, and Richmond Police Communications Center. Emergency Medical Dispatchers are trained and certified to International Academies of Emergency Dispatch (IAED) standards and provide potentially life-saving pre-arrival instructions to 911 callers utilizing MPDS. San Ramon Valley Fire is recognized by the IAED as an Accredited Center of Excellence.

2018 COMMUNICATIONS CENTER DATA



EMD instructions are not required for all 911 calls. Example: fire first responders may be “on scene” making a request for EMS resources.



EMERGENCY MEDICAL SYSTEM PARTNERS

FIRE DEPARTMENTS AND DISTRICTS

Contra Costa County Fire
Protection District
Crockett-Carquinez Fire
Protection District
El Cerrito Fire Department
Pinole Fire Department
Richmond Fire Department
East Contra Costa Fire
Protection District
Kensington Fire Protection District
(served by El Cerrito
Fire Department)
Moraga-Orinda Fire
Protection District
Rodeo-Hercules Fire
Protection District
San Ramon Valley Fire
Protection District

EMS PARAMEDIC SERVICE PROVIDERS

American Medical Response
California Highway Patrol
(helicopter unit)
Concord Police Department
(tactical paramedic program)
Contra Costa County Fire
Protection District
El Cerrito Fire Department
Moraga-Orinda Fire
Protection District
Pinole Fire Department
Rodeo-Hercules Fire
Protection District

San Ramon Valley Fire
Protection District

AIR RESCUE AND AMBULANCE

REACH
CALSTAR
California Highway Patrol

PUBLIC SAFETY: LAW DEFIBRILLATION PROGRAMS

Antioch Police Department
Blackhawk Police Department
Brentwood Police Department
Concord Police Department
Contra Costa Sheriff's Office
Clayton Police Department
Danville Police Department
El Cerrito Police Department
Hercules Police Department
Kensington Police Department
Lafayette Police Department
Martinez Police Department
Moraga Police Department
Oakley Police Department
Orinda Police Department
Pleasant Hill Police Department
Pittsburg Police Department
Richmond Police Department
Roundhill Police Department
San Pablo Police Department
San Ramon Police Department
Walnut Creek Police Department

EMS WORKFORCE AND HOSPITALS



EMS

TYPE OF PERSONNEL	2018
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Emergency Medical Dispatchers	52
Emergency Medical Technicians (active)	1,984
Paramedics	466
Mobile Intensive Care Nurses	54
Public safety dispatch centers (PSAPs)	12
Fire and EMS dispatch centers	3
Available emergency ambulance units per day	22–50


HOSPITALS

Base Hospital	1
911 Receiving Hospitals	8

CERTIFICATION AND ACCREDITATION


Paramedics are required to obtain a California paramedic license from the State of California EMS Authority. Once a paramedic has obtained a license to practice as a paramedic, the paramedic must then accredit themselves in the jurisdiction in which they are employed. Accreditation ensures that paramedics meet the county's minimum requirements to practice and have complied with the county's EMS quality improvement plan. Paramedics are required to verify compliance and update their accreditation with the County every two years.

EMT CERTIFICATION AND PARAMEDIC ACCREDITATION



	2017	2018
Accredited Paramedics	547	466
Re-verification of Accreditation	212	230

EMTs are required by state law to possess a State of California EMT certificate before they can practice. An EMT obtains a State of California EMT certificate by applying to one of California's local EMS agencies or a certifying entity. An EMT certificate obtained through the county is valid statewide for two years.



	2017	2018
EMT Certifications processed by Contra Costa EMS Agency	578	733

EMS SYSTEM LICENSING, CERTIFICATION & PERMITS

PROFESSIONAL STANDARDS PROGRAM

The EMS Agency investigates allegations of misconduct against EMTs certified by the Agency. The professional standards program ensures that each EMT certified by the EMS Agency or working within Contra Costa County provides safe, professional and competent clinical care to the county's residents and visitors.

Contra Costa County EMS Agency

	2017	2018
Active Probation	16	25
Denied	2	4
Expired Probation	0	1
Revoked	6	5
Surrendered	2	2



The Contra Costa EMS Agency regulates medical transportation under the County Ambulance Ordinance. The EMS Agency reviews each application and inspects all ambulances to ensure the public health, safety and welfare is protected. The EMS Agency is also responsible for investigating alleged violations of the ambulance ordinance by permit holders and, when necessary, takes enforcement action to suspend or revoke an ambulance permit.

Ambulance Permits

	2018
Ambulance Permits Authorized	7
Ambulance Units Inspected	172



EMT TRAINING PROGRAMS IN CONTRA COSTA COUNTY

The EMS Agency is delegated the regulatory responsibility under the state's EMS regulations for approving EMT and paramedic training programs located in Contra Costa County. The EMS Agency has approved three EMT training programs. Contra Costa Community College San Pablo is currently in the process of establishing Contra Costa's first paramedic program.

EMTs who successfully graduate from an approved EMT program are required to pass the National Registry of Emergency Medical Technicians (NREMT) basic EMT examination before they may apply for a California EMT certificate. The National NREMT pass rate for basic EMT in 2018 was 69%.



2018 NREMT Examination Pass/Fail Rates From Contra Costa County EMT Programs

Attempted the Exam	First Attempt Pass	Cumulative Pass Within 3 Attempts	Eligible for Retest
Contra Costa College			
28	54%	68%	32%
Los Medanos College			
88	50%	61%	38%
Mt. Diablo Adult Ed.			
28	71%	75%	25%
California			
35,825	73%	82%	NA
United States			
275,692	69%	NA	NA

2018 CONTRA COSTA EMS AGENCY STAKEHOLDER TRAINING STATISTICS

Contra Costa EMS hosts Prehospital Orientation and Annual Training to all EMS personnel authorized to work as an EMT or Paramedic in the County.

The Agency also provides training for the Medical Reserve Corps and Contra Costa Medical Health Care Coalition Emergency Preparedness Program.

In 2018
381,575
hours of training
delivered to
20,442
Participants

Contra Costa EMS Agency Sponsored Training

Type of Training	Class Hours	Number of Participants	Total Training Hours Delivered
EMS Orientation	4	402	40,200
Online Training Modules (10 classes) 2018 4 th quarter training	2	18,527	37,054
Train the Trainer Sessions	2	86	172
Medical Reserve Corp Training	867	197	170,799
Health Care Coalition Training	125	990	123,750
Disaster Exercise Drills	40	240	9,600
TOTAL	1,040	20,442	381,575



HOSPITALS AND SPECIALTY CENTERS

EMS Systems are designed to take patients who require emergent and critical intervention to emergency departments designated and prepared to support the best patient outcomes.

EMS

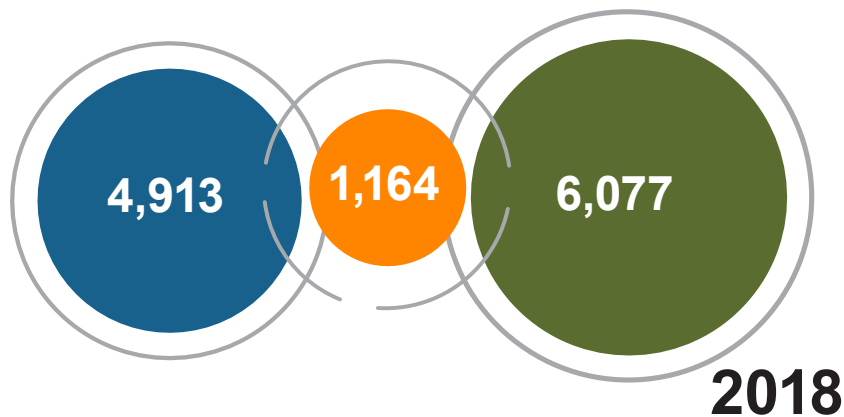
	STEMI	Labor & Delivery	Stroke	Trauma	Behavioral
Contra Costa Regional Medical Center & Health Centers		✓			✓
Sutter Delta Medical Center Antioch	✓	✓			
San Ramon Regional Medical Center	✓	✓	✓		
John Muir Health Concord	✓		✓		
Kaiser Medical Center Walnut Creek	✓	✓	✓		
Kaiser Medical Center Richmond			✓		
Kaiser Medical Center Antioch		✓	✓		
John Muir Health Walnut Creek	✓	✓	✓	✓	

EMS AND HOSPITALS WORKING TOGETHER

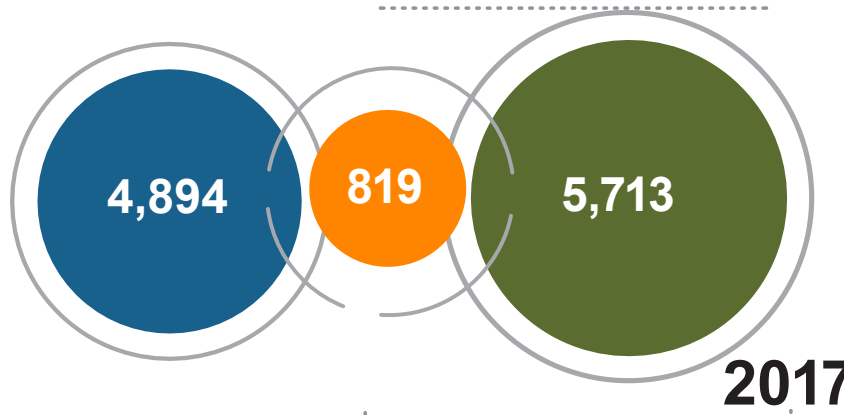
Trauma

Medical

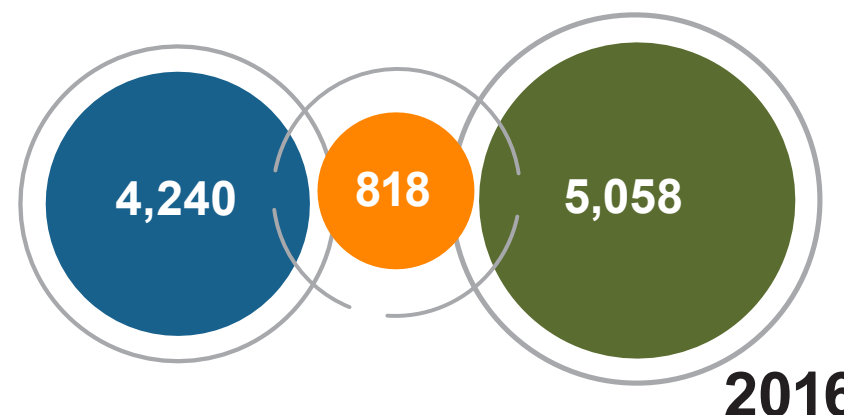
Total



2018



2017



2016

BASE HOSPITAL CALLS BY TYPE

Base hospitals provide medical consultation to EMS personnel in the field when they encounter patients with conditions outside of standardized EMS protocols, or in situations that require real-time medical consultation.

John Muir Medical Center in Walnut Creek serves as the Base Hospital for Contra Costa County.

HOSPITAL EMERGENCY DEPARTMENT 2018 UTILIZATION DATA

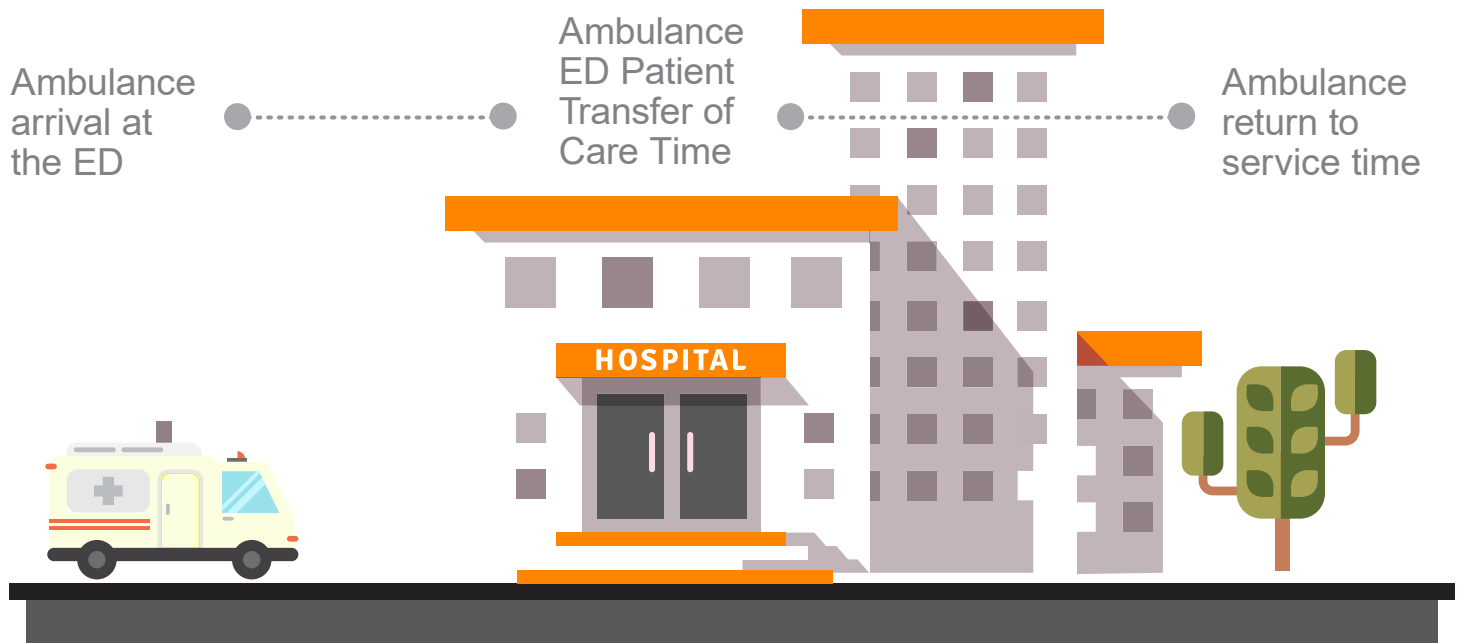


EMS

	Total ED encounters (walk in + EMS)	EMS transports	Percent of all transports to all ED encounters	90% ambulance patient offload time in minutes
Contra Costa Regional Medical Center	40,356	7,315	18%	40
John Muir Health Concord	51,009	10,161	20%	24
John Muir Health Walnut Creek	41,783	11,828	28%	28
Kaiser Medical Center Richmond	65,635	9,595	15%	34
Kaiser Medical Center Antioch	58,639	7,025	12%	40
Kaiser Medical Center Walnut Creek	58,212	9,292	16%	32
Sutter Delta Medical Center Antioch	46,290	9,954	22%	47
San Ramon Regional Medical Center	16,286	2,383	15%	9
Total with PES	388,507	73,262	19%	32
Out of County	NA	7,832	20%	
Psychiatric Emergency Services (PES)*	10,297	5,709	55%	43

*2018 ED Visit Data as reported to California Office of Statewide Health Planning and Development (OSHPD). 20% of all EMS Transports go to hospitals and specialty centers outside of Contra Costa County.

AMBULANCE-EMERGENCY DEPARTMENT PATIENT TRANSFER OF CARE PERFORMANCE



AMBULANCE PATIENT TRANSFER OF CARE

EMS patient transfer of care is known to improve the availability of 911 ambulances and patient safety. All hospitals are expected to transfer patients arriving by EMS within 20 minutes 90% of the time. The time measured is from ambulance arrival at the ED to the patient transferred to the care of the ED staff and report given.

**PATIENT
TRANSFER
OF CARE
OCCURRED
WITHIN
32 MINUTES
9 OUT OF 10
TIMES**

AIR AMBULANCE MEDICAL PROVIDERS



AIR TRANSPORT

Air Medical Transport provides specialized services throughout the county in response to EMS calls where air medical transport is essential to getting a critically ill patient to definitive care. Air transports may occur in rural areas of the county, at the scene of severe traffic accidents during commute hours and when hospitals need to transport a critical patient to another facility. Authorized Air providers REACH and CALSTAR make up less than 1% of emergency patient transport in Contra Costa County annually.

HELICOPTER EMS DESTINATIONS

John Muir Walnut Creek	UCSF Benioff Children's Hospital	Other Trauma Centers
80%	7%	13%

2018

EMS

AIR AMBULANCE TRANSPORT

Transports Originating in Contra Costa County

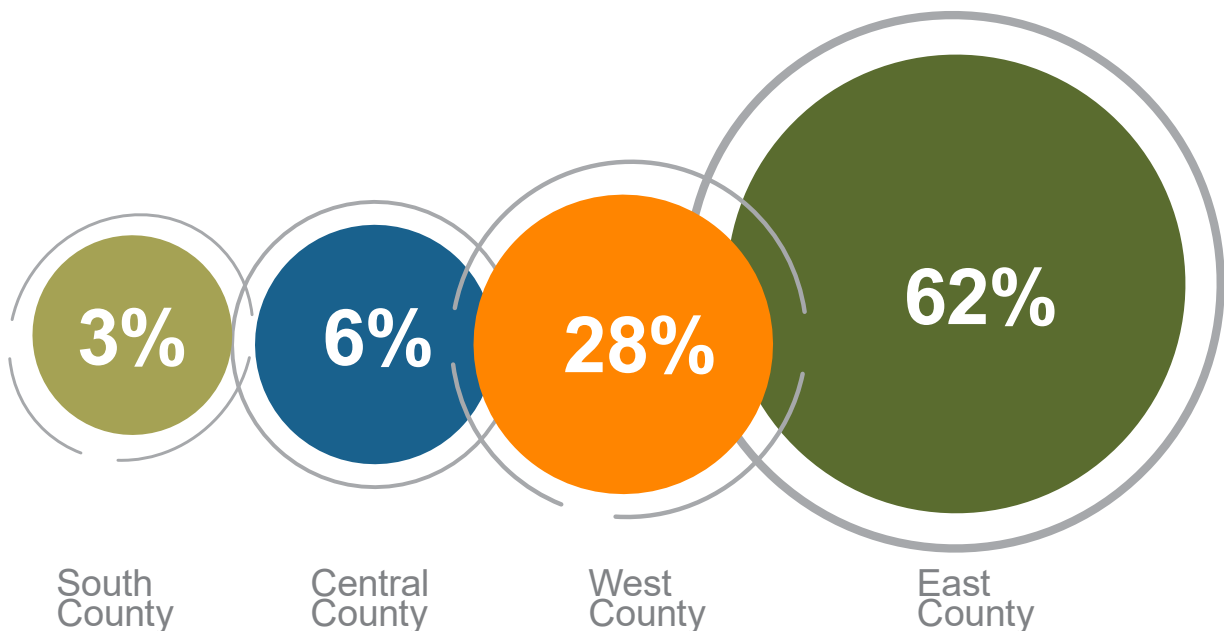
REACH

	2017	2018
911 "Scene" Calls	54	46
Interfacility Transports	100	20
Total Air Transports	154	66

CALSTAR

	2017	2018
911 "Scene" Calls	65	75
Interfacility Transports	31	32
Total Air Transports	96	107

Helicopter Trauma Transport Origins, 2018



QUALITY IMPROVEMENT & PATIENT SAFETY 2018

QUALITY IMPROVEMENT PROGRAMS

Quality Improvement continues to be central to the mission of EMS services in Contra Costa County. EMS activity and patient care outcomes are routinely measured and evaluated by the stakeholders and regulators to assure the system is performing and improving over time. Our measures focus on the quality of our care in the delivery of EMS services.

PATIENT SAFETY EVENTS

The EMS Agency is committed to supporting a culture of safety. In 2018, the patient safety program was supported by the EMS Agency Quality Patient safety and medical oversight review as part of a continued formal effort to monitor, evaluate and act upon EMS system issues. 603 EMS events were reported in 2018. EMS event review is part of a coordinated effort to learn and improve patient safety and clinical outcomes for the benefit of the patient and the communities served.

EMS SYSTEM QUALITY IMPROVEMENT PROGRAM (EQIP)

This program is part of a coordinated system of medical and patient safety oversight facilitated by the Contra Costa EMS Agency. Data is continuously used to improve and support improvements in patient care, ambulance service delivery in collaboration with our hospitals, emergency department physicians and nurses, Specialists in cardiology, neurology, trauma and pediatrics. To learn more about our EMS System and patient care safety initiatives go to www.cccems.org

EMS QUALITY IMPROVEMENT INITIATIVE

High Performance Cardiac Arrest (HPCA) & CPR:

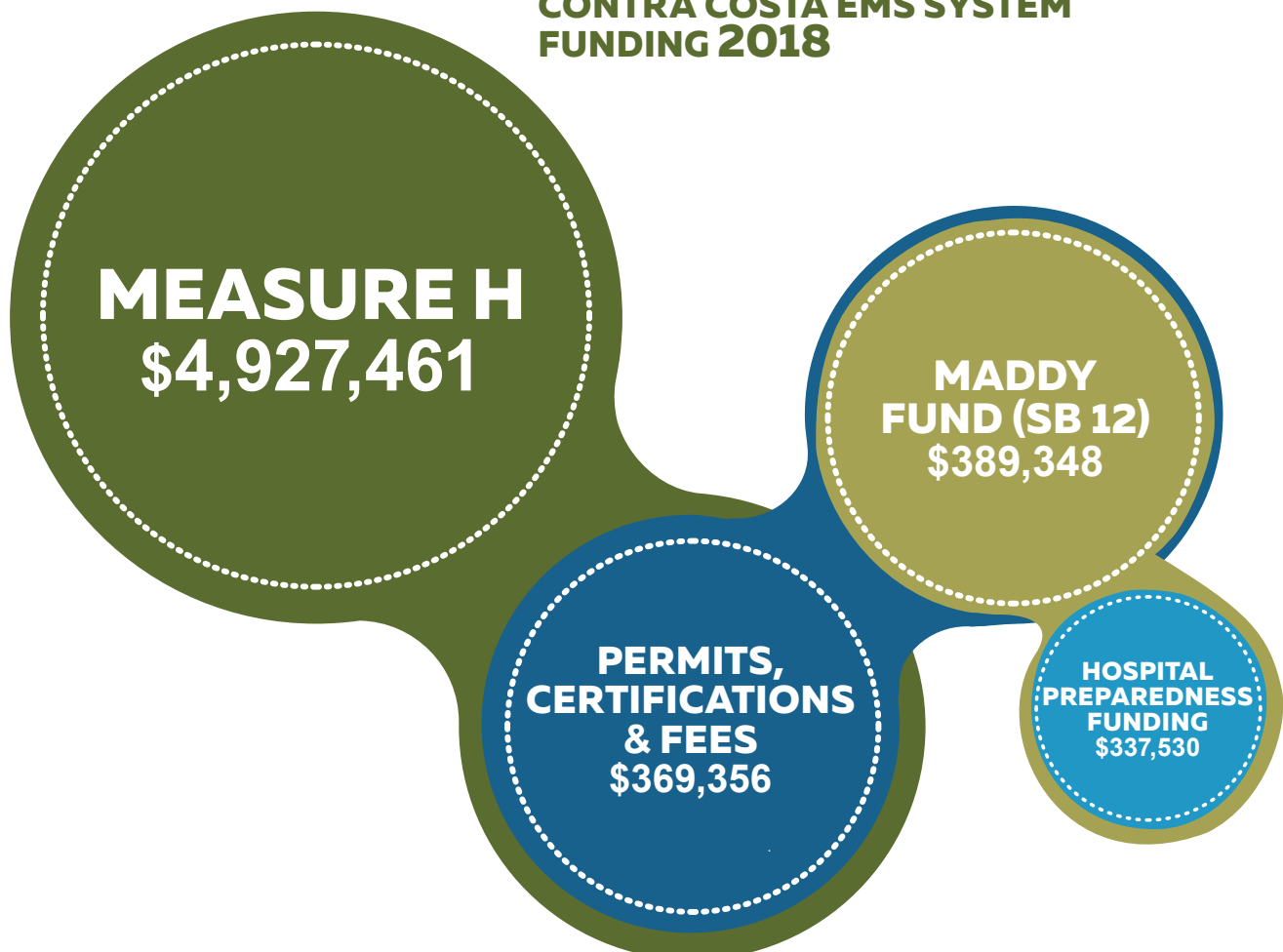
This program is focused on using data collected at the scene, technology to measure the quality CPR and treatment of medical interventions performed in the field. The HPCA Initiative will look at all aspects of the EMS System cardiac arrest response, including bystanders, use of public automated defibrillators, field treatment, transport and intervention at hospital facilities. This is just one more example of how Contra Costa EMS system private and public partners are working together to save lives.

COUNTY EMS SYSTEM FUNDING

The Contra Costa EMS System is supported through state and federal grants, permit and certification fees and County Service Area funds (EM-1) also know as Measure H. Federal and State funding to enhance EMS services decreased substantially in 2018.

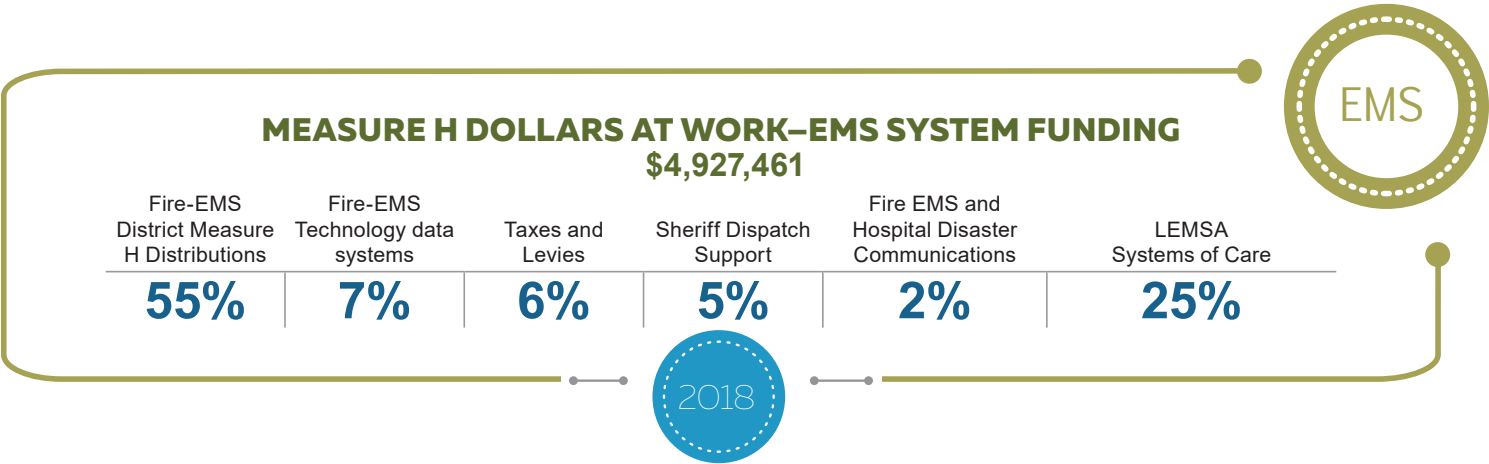
Measure H parcel levies provide limited but important support for the provision and quality of emergency medical services for the residents of Contra Costa County since 1988. Priorities for Measure H funding include: Paramedic first responder and ambulance services, countywide first-responder and public-access defibrillation programs, Fire-EMS training for multi-casualty and disaster response, emergency and disaster communication systems, Fire and ambulance dispatch technology, medical and quality oversight of “systems of care” including Trauma, STEMI, Stroke, Cardiac Arrest and EMS for Children, pre-hospital and law enforcement equipment and training.

CONTRA COSTA EMS SYSTEM FUNDING 2018



TOTAL EMS SYSTEM FUNDING
\$6,023,695

2018 EMS SYSTEM ENHANCEMENT



CARDIAC ARREST SYSTEM OF CARE



EMS

Contra Costa County

	Events	Population	Incidence per 100,000
2018	693	1,150,215	60.2
2017	758	1,147,439	66.1
2016	712	1,135,127	62.7
2015	532	1,126,745	47.2
2014	521	1,071,093	48.6

Contra Costa County participates in a national cardiac arrest survival registry program, which allows for comparative benchmarking and improvement in cardiac arrest emergency care. Through our partnership with the Cardiac Arrest Registry to Enhance Survival (CARES), we collect uniform and reliable outcome information, and made significant changes to enhance the delivery of CPR by bystanders and improve pre-hospital cardiac arrest care in our communities.

We track our progress using the Utstein survival measure, a standardized cardiac arrest reporting tool introduced in 1991. The measure is used nationally by EMS systems to set benchmarks and compare results.

**NATIONAL
INCIDENCE OF
CARDIAC ARREST** **54 PER 100,000**

CARDIAC ARREST SURVIVAL

Survival to Hospital Discharge (Utstein)



2016	2017	2018
32%	29%	39%

Source: Data obtained from the Cardiac Arrest Registry to Enhance Survival (CARES). Inclusion criteria: A witnessed, out-of-hospital cardiac arrest where the patient is found in a shockable rhythm and resuscitation is attempted by an emergency responder.

NATIONAL SURVIVAL TO DISCHARGE RATE **33%**

Cardiac arrest patients who received care that met or exceeded benchmarks found in CARES and the Utstein Uniform Reporting Guidelines were more likely to survive to hospital discharge than patients who did not.

Bystanders Save Lives: Bystander CPR Rate



2016	2017	2018
39%	41%	46%

Source: Data obtained from CARES Registry.

NATIONAL BYSTANDER CPR RATE **40%**

Data show an increase in bystanders initiating CPR on someone in cardiac arrest before emergency medical responders arrive. For more information about this program, visit cchealth.org/ems/cardiac-arrest.php.

STEMI SYSTEM OF CARE



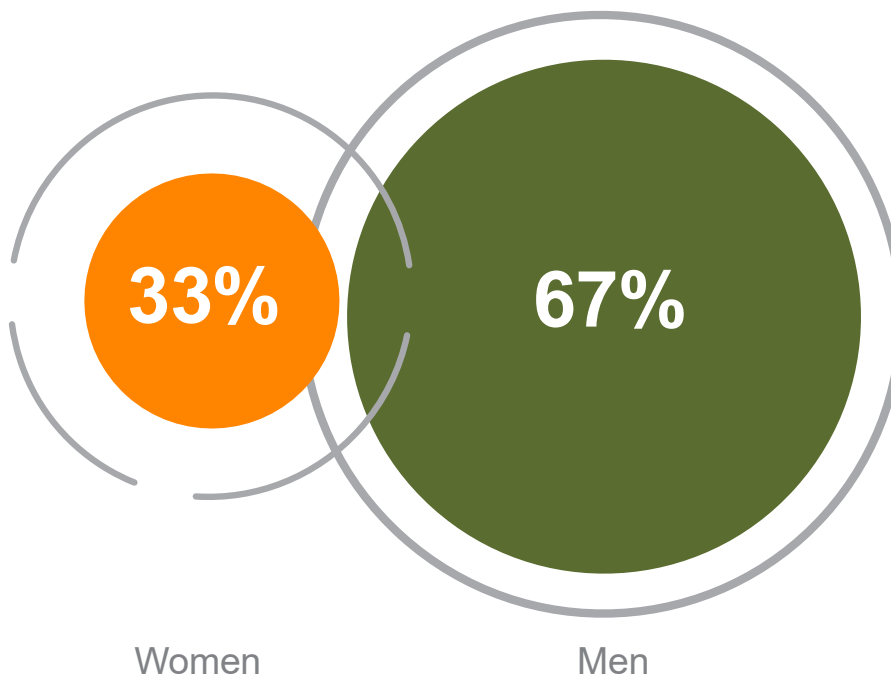
Every 42 seconds, someone in the United States has a heart attack. One deadly type, ST Elevation Myocardial Infarction (STEMI), requires rapid assessment, specialized equipment and specially trained personnel to offer patients the best chance of survival.

Paramedics use field transmission of 12-Lead ECGs and “STEMI Alerts” to provide hospitals with early notification of STEMI cases, which allows emergency departments and cardiac intervention teams time to prepare and immediately treat patients upon arrival.

San Ramon Regional Medical Center, John Muir Medical Centers in Concord and Walnut Creek, Sutter Delta Medical Center in Antioch and Kaiser Permanente Medical Center in Walnut Creek are Contra Costa’s STEMI receiving centers.

For more information about the STEMI System of Care, visit cchealth.org/ems/stemi.php.

2018 Gender of ST-Elevation Alert Patients Total=435



STEMI SYSTEM OF CARE

Annual STEMI Alerts

2016	2017	2018
396	392	435

9.8% Increase Since 2016

EMS

Age Distribution of STEMI Alert Patients

2017

Age	
0–10	0
11–20	0
21–30	3
31–40	7
41–50	32
51–60	81
61–70	93
71–80	93
81–90	83
91–100	21

2018

Age	
0–10	0
11–20	0
21–30	5
31–40	10
41–50	31
51–60	109
61–70	100
71–80	89
81–90	67
91–100	24

STEMI SYSTEM OF CARE

Average First Medical Contact (FMC) and Door to Intervention Times



EMS

	2016	2017	2018
FMC to Intervention (in minutes)	85	82	82
Door to Intervention (in minutes)	58	55	58

First medical contact to intervention national benchmark is 90 minutes.

First medical contact (FMC) is defined as the time that EMS providers make initial contact with a patient. This could be an EMT or a paramedic. FMC to Intervention is the time from initial contact with the patient to the time the patient has their artery open or stent placed. The goal is 90 minutes or less for FMC to time the patient arrives at the hospital to receive intervention.

PREHOSPITAL PERFORMANCE STEMI MEASURES



STEMI Pre-hospital Performance Measure

	2016	2017	2018
Aspirin Administration	88%	88%	84%
12-Lead ECG acquired on STEMI Patients	98%	98%	99%
Patient identified as STEMI and transported to STEMI Intervention Center	99%	100%	100%
Average Scene Time Interval (minutes) Performance Goal =/ \leq 15 minutes	13	15	13

The Contra Costa prehospital performance measures are based on State indicators and the American Heart Associations. Contra Costa EMS continues to meet state and national benchmarks in all areas.

STROKE SYSTEM OF CARE

Stroke is the fifth-leading cause of death nationally, and the leading cause of disability.

Contra Costa's Stroke System of Care facilitates rapid assessment and transport of patients to designated Primary Stroke Centers.

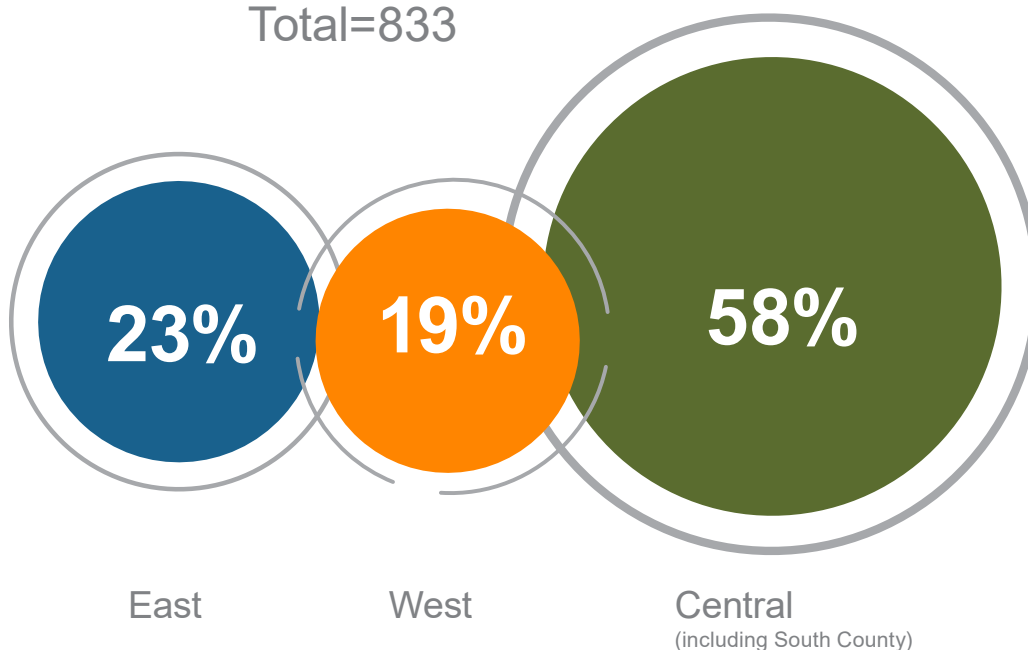
Contra Costa
County had
approximately
833 stroke alerts
in 2018.



STROKE SYSTEM OF CARE

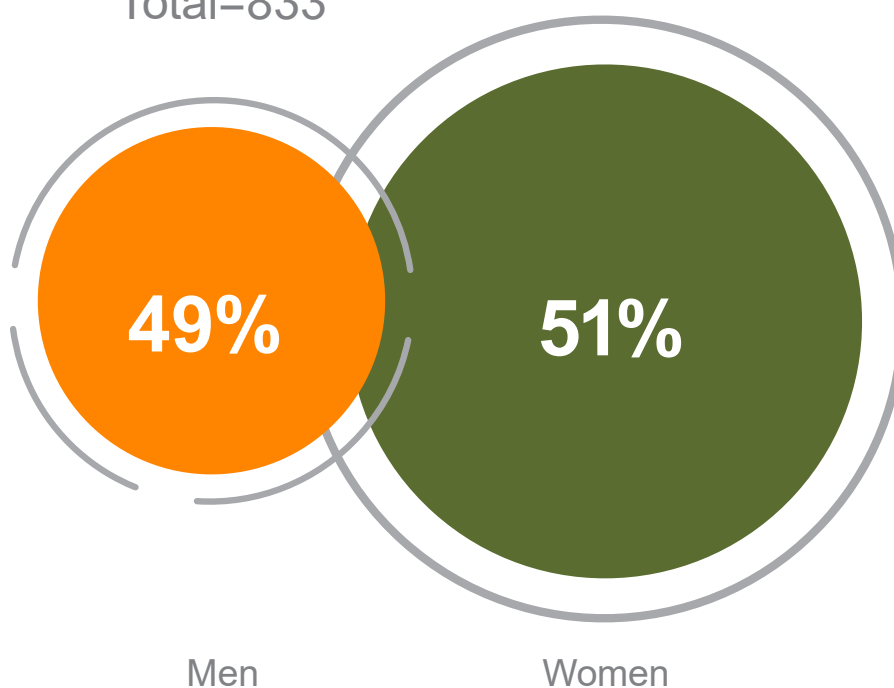
Stroke Alerts by County Region, 2018

Total=833



Gender of Stroke Alert Patients, 2018

Total=833



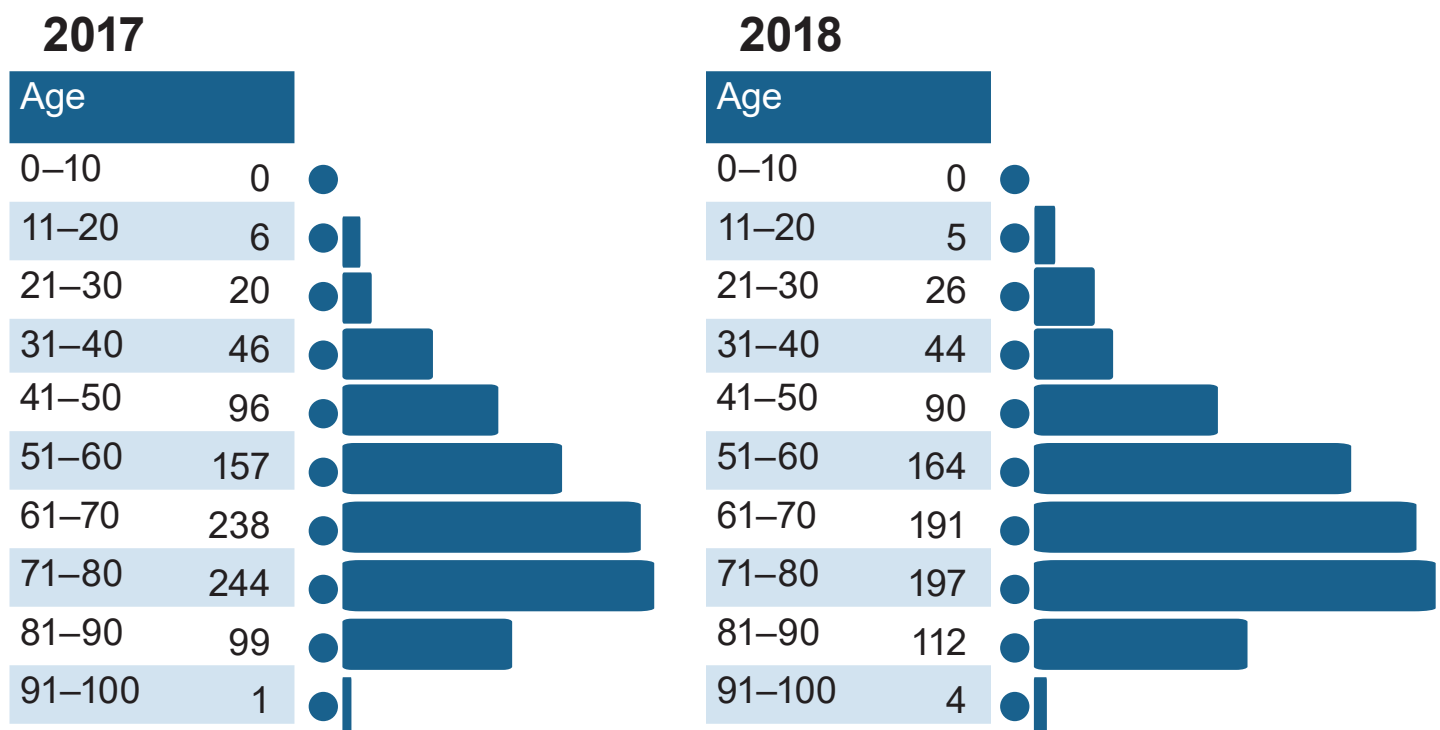
STROKE SYSTEM OF CARE

MEASURING SYSTEM PERFORMANCE

EMS providers rapidly identify patients having stroke symptoms, initiate immediate transport and call a “Stroke Alert” to the closest center. Calling 911 is key in getting patients to treatment quickly.

Our goal is for patients to receive the clot-dissolving drug tPA (Tissue Plasminogen Activator) within 4 1/2 hours of a patient’s first stroke symptoms at the nearest Primary Stroke Receiving Center. Door to tPA shows the time it took for a patient to receive tPA after their ambulance arrived at the hospital.

Stroke Alert Patient Age Distribution



Source: Prehospital electronic data (Meds/Zoll)

STROKE SYSTEM OF CARE

Average Door to Treatment Time (tPA) for EMS patients with Stroke Symptoms

EMS

	2016	2017	2018
Door to tPA time (in minutes)	44	43	44
Number of patients treated	162	152	156



STROKE SYSTEM OF CARE



Stroke Alerts by Hospital

	2016	2017	2018
John Muir Medical Center Walnut Creek	150	152	138
John Muir Medical Center Concord	159	143	131
Kaiser Antioch	179	180	189
Kaiser Richmond	172	209	160
Kaiser Walnut Creek	121	140	141
San Ramon Regional Medical Center	55	83	74

TRAUMA SYSTEM OF CARE

The Board of Supervisors approved a comprehensive trauma system plan for the county in 1986, and the EMS Agency designated John Muir Medical Center, Walnut Creek as the county's sole trauma center.

The trauma system is designed to facilitate rapid identification, management, and transport of critical trauma patients to a trauma center within the "golden hour," the first hour after injury, which is considered the most crucial time for successful treatment and intervention.

Trauma centers are regional assets and work together to provide a network of trauma services to support the Bay Area.



TRAUMA SYSTEM OF CARE

Trauma activations are those patients who are seriously injured and meet activation criteria. Trauma patients are those patients who have been injured but do not meet trauma activation criteria and may be transported to a non-trauma center for care.

Trauma Patients and Trauma Center Activations



	Activations	Patients
2018	2,066	2,271
2017	2,032	2,197
2016	1,615	1,884

TRAUMA SYSTEM OF CARE INJURY STATISTICS

Penetrating Injuries

Gun Shot Wound

2017

48%

2018

45%

Stabbing

42%

48%

Other

10%

7%

Blunt Injuries

Assault

2017

6%

2018

5%

Auto Collision

28%

27%

Auto vs Pedestrian

8%

6%

Bicycle

7%

5%

Motorcycle

8%

9%

Falls

34%

30%

Other

9%

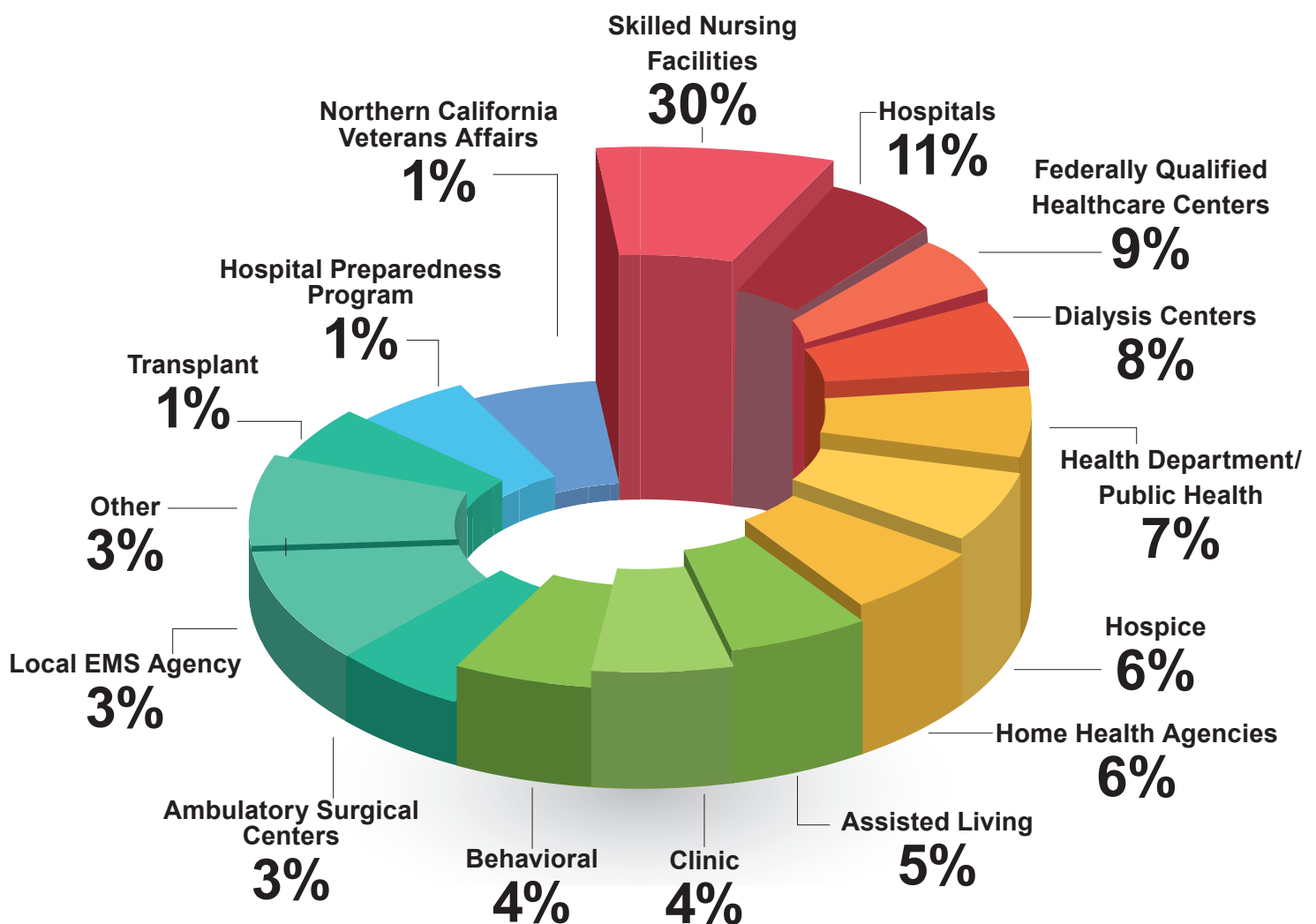
18%



CONTRA COSTA MEDICAL HEALTHCARE COALITION

The Contra Costa County Medical Health Preparedness Coalition (MHCPC) is a collaborative network of healthcare organizations and individuals that provide or support healthcare services in the county. The Coalition meets regularly to share information, coordinate planning and response activities, and build resiliency. Membership in the Forum includes (but is not limited to): hospitals, public and private medical or health services, emergency preparedness agencies, emergency services, and governmental bodies with an interest in the provision of healthcare.

Coalition Membership (N=113)



CONTRA COSTA MEDICAL HEALTHCARE COALITION

8

Disaster
Exercises

240

Participants

33

Training
Events

990

Participants



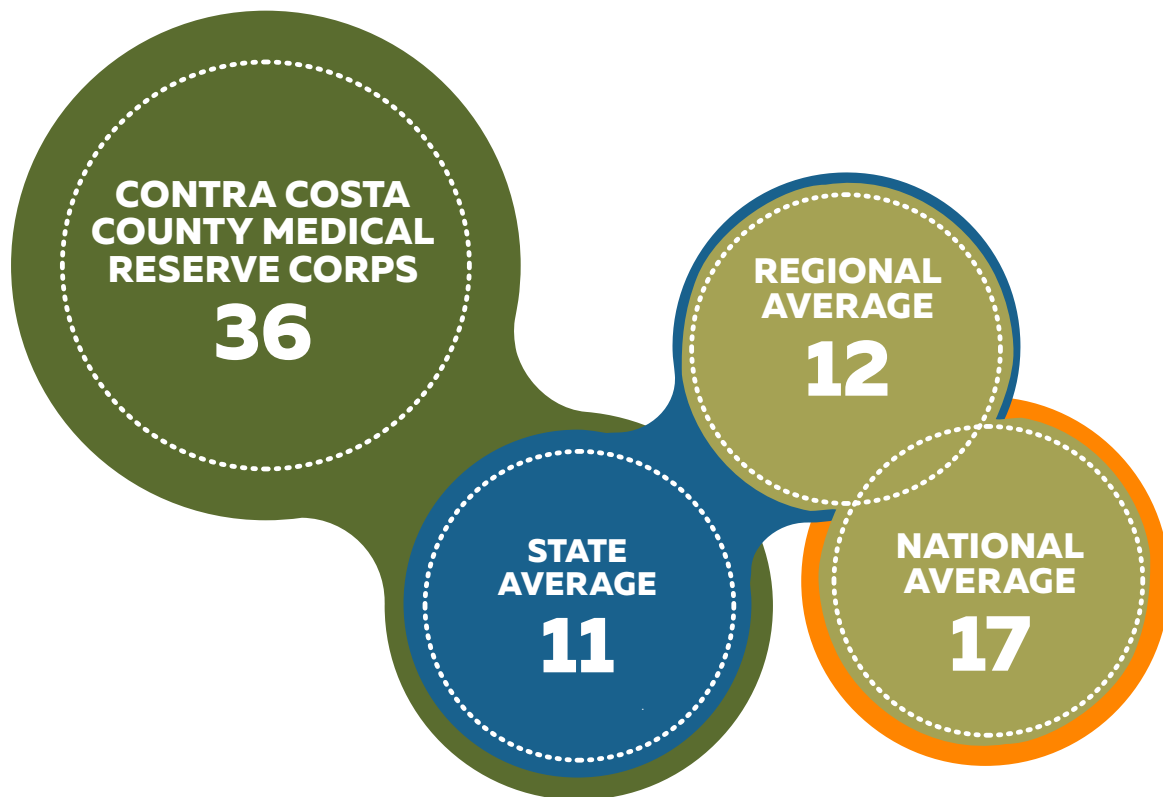
133,350
COALITION TRAINING HOURS

CONTRA COSTA MEDICAL RESERVE CORPS (MRC)

The Contra Costa EMS System MRC provides community outreach during non-emergency events to improve unit capability, enhance community preparedness, and improve public health. The MRC provides first aid stations at community events, medical screenings, conducts influenza vaccine clinics, teaches hands-only CPR,



participates in health and disaster preparedness fairs and participates in drills and exercises. The MRC supports youth engagement and provides career mentorship and disaster education and training through our partnership with Dozier Libbey Medical High School's Health Occupations Students of American (HOSA) organization.



**COMPARISON:
NUMBER OF ACTIVITIES**

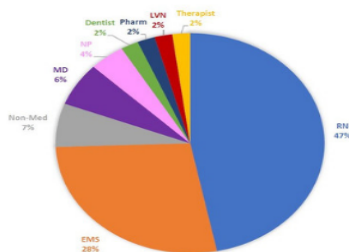
CONTRA COSTA MRC FIRE RESPONSE

CCC MRC volunteers provided medical aid to 2 events 2018: the Lake County Fire and the Camp Fire

NORTHERN CALIFORNIA FIRES OF 2018

The Mendocino complex fire broke the record for California's largest recorded fire complex.

The Camp Fire in Butte County set the record for deadliest and most destructive fire in California history.



TYPES OF VOLUNTEERS

Most of our volunteers were RNs (47%), EMS workers (28%), MDs (6%), NPs (4%), and support staff

TOTAL ECONOMIC IMPACT

The combined work of the MRC volunteers was equivalent to \$50,012 of paid staffing.

\$50,012

1,246

TOTAL HOURS SERVED

Our volunteers served a total of 1,246 hours of shelter operations

36

Total Number
of Activities
Reported

244

Total
Number
of MRC
Participants

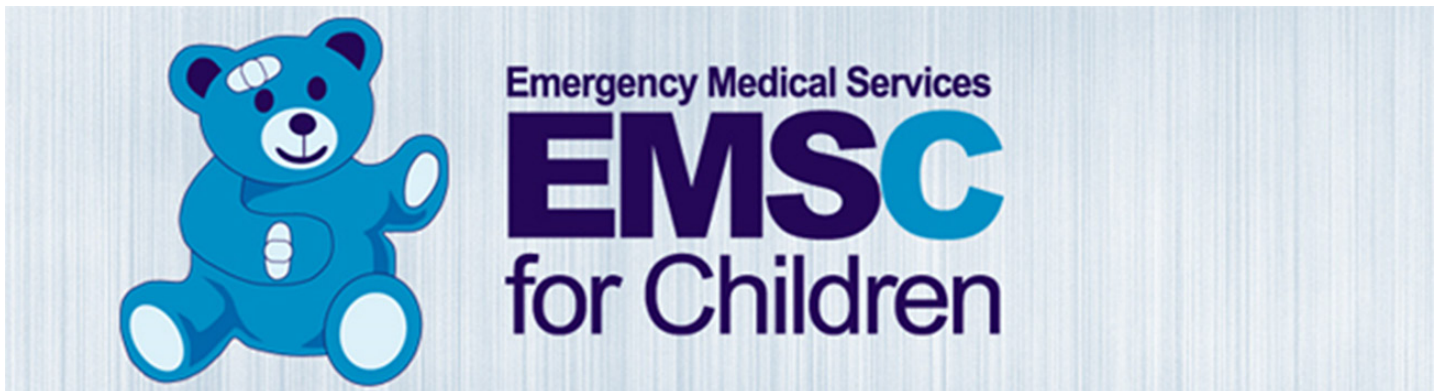
1975

Total
Number
of Hours
Contributed

\$75,662

Economic
Value of
Contributions

DISASTER PREPAREDNESS PROGRAM FOR CHILDREN



NEONATAL AND PERINATAL DISASTER PREPAREDNESS PROJECT

The Neonatal and Perinatal Disaster Preparedness Project supports and prepares for disasters involving newborns and mothers. The EMSC program continues to improve readiness and practice quarterly communication drills as part of its overall preparedness.

Contra Costa EMS plans to update the County EMS for Children Program as a system of care. In preparation for this effort all Contra Costa Community Hospitals will complete the National Pediatrics Readiness Survey. The National Survey assesses the “readiness” of community hospitals for children who require emergency medical services. To learn more, visit www.cchealth.org/ems/feature-emsc.php.

Contra Costa EMS supports and evaluates community hospital emergency departments for pediatric readiness. The Pediatric Readiness Project is a national multi-phase quality improvement and emergency preparedness initiative to ensure that all U.S. emergency departments (ED) have the essential guidelines and resources in place to provide effective emergency care to children. This EMS for Children initiative began in California in 2013 and provides benchmarking to hospitals on their pediatric capability based on national guidelines for care of children in the emergency department. The project continues to provide hospitals an opportunity to review and improve how to properly care for pediatric patients who arrive in their EDs.

EMS for children system of care regulations have recently been passed in California. Contra Costa EMS looks forward to working with countywide EMS and hospital providers to enhance EMS services for children.

EMERGENCY MEDICAL SERVICES FOR CHILDREN

The Emergency Medical Services for Children Program (EMSC) monitors and maintains a coordinated and comprehensive high-quality emergency care for the children of Contra Costa County.

BACKGROUND

The majority of pediatric patients seen in an emergency room do not require hospitalization. Contra Costa County's designated pediatric critical care and trauma center is UCSF Benioff Children's Hospital & Research Center Oakland.

Inpatient pediatric services are provided at John Muir Medical Center in Walnut Creek, Kaiser Permanente Medical Center in Walnut Creek and San Ramon Regional Medical Center. All Contra Costa community hospitals and emergency departments provide care for emergencies involving children. In April of 2015, John Muir Medical Center opened Contra Costa County's first pediatric intensive care unit.

In 2018 there were **76,046** pediatric emergency department visits.

2018 PEDIATRIC EMERGENCY DEPARTMENT VISITS				
	<1 year	1–9 years	10–19 years	Total
Contra Costa Regional Medical Center	463	1,752	3,486	5,701
John Muir Medical Center in Concord	792	5,165	5,227	11,184
John Muir Medical Center in Walnut Creek	1,085	4,354	3,391	8,830
Kaiser Permanente Medical Center in Richmond	86	6,204	4,435	10,725
Kaiser Permanente Medical Center in Antioch	1,096	6,802	6,157	14,055
Kaiser Permanente Medical Center in Walnut Creek	865	4,830	4,703	10,398
Sutter Delta Medical Center in Antioch	1,054	5,643	5,153	11,850
San Ramon Regional Medical Center	197	1,364	1,736	3,297
Total	5,638	36,114	34,288	76,040

*Source: OSPHD



EMS FOR CHILDREN INJURY PREVENTION

CHILDHOOD EMERGENCIES

Most pediatric emergencies are preventable, the EMSC program not only focuses on the coordination of pediatric emergency and critical care services but also focuses on injury prevention. Contra Costa partners with Alameda County on EMSC to support regional injury prevention, promoting pediatric prehospital and emergency care capability, plus statewide neonatal and pediatric disaster and medical surge planning.

Children make up approximately 25% of our county population, 14–27% of all emergency department visits and approximately 10% of our 911 responses. Although life threatening emergencies involving children are rare, specialized pediatric skills and training are required by the EMS Agency to support the care of children in the field. In Contra Costa, the emergency medical response for children is provided by a network of first-rate agencies and hospitals in partnership with child advocacy groups to reduce injury and death to children.

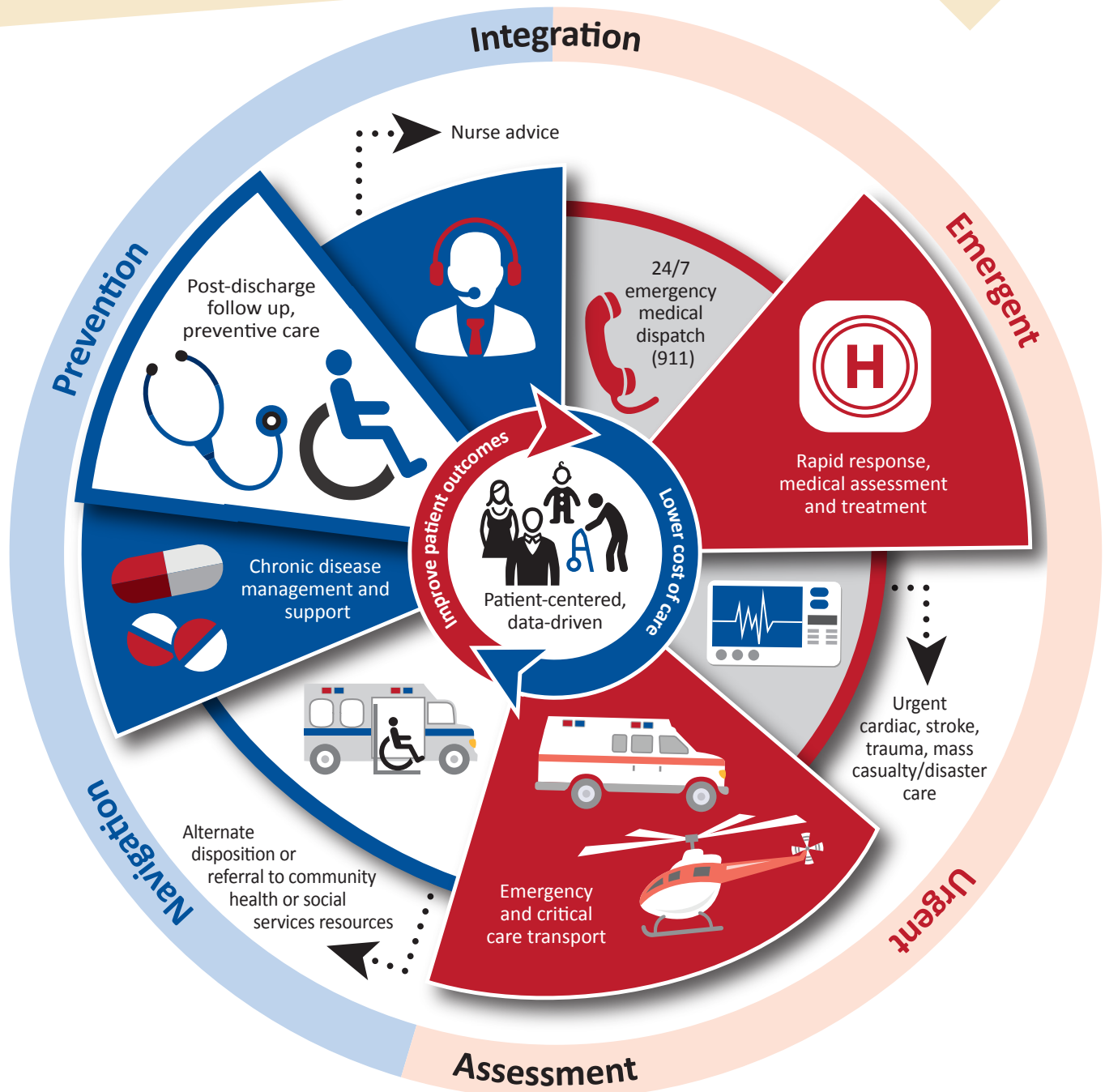
ACCOMPLISHMENTS THROUGH PARTNERSHIP

- ▶ Member of Children's Leadership Council of Contra Costa County.
- ▶ Home of the California Neonatal/Pediatric and Perinatal Disaster Preparedness Coalition, which works to implement recommendations supported by the National Advisory Committee for Children and Disasters.
- ▶ Member of Childhood Injury Prevention Network-Bay Area (CIPN-BA) member. CIPN focus on unintentional injuries for a target population of children 0–14 years of age in the areas of: falls, car and child passenger safety, fire and burns, choking, water and home safety, and poisonings.
- ▶ Partner of Keeping Babies Safe program. Non-profit organization that provides education, assistance, advocacy and leadership in the development of safer children's products and practices.
- ▶ The National Pediatric Readiness Program in Contra Costa County is an integral part of our EMS for Children Program.
- ▶ All Contra Costa Hospitals and Fire Departments are "Safely Surrendered Baby Sites." To learn more about Safely Surrendered Baby go to cchealth.org/ems/baby-safe.php
- ▶ 100% of Contra Costa hospitals participate in the National Pediatric Readiness Project, benchmarking hospital's capability for children.
- ▶ Member of the California State EMSC Technical Advisory Committee: Contra Costa is an active participant in this important state task force dedicated to improving emergency care for children.



EMS 3.0

Our nation's healthcare system is transforming from a fee-for-service model to a patient-centered, and value and outcomes-based model, known as "Healthcare 3.0." Emergency Medical Services (EMS) can contribute to this transformation by filling gaps in the care continuum with 24/7 medical resources that improve the patient care experience, improve population health, and reduce healthcare expenditures – this is "EMS 3.0."



EMS is uniquely positioned to support our nation's healthcare transformation by assessing and navigating patients to the right care, in the right place, at the right time. EMS 3.0 can help our nation achieve its healthcare goals.



CONTRA COSTA EMS STAFF DIRECTORY

Patricia Frost ----- EMS Director
 David Goldstein ----- EMS Medical Director
 Geoff Martin ----- Prehospital Care Coordinator
 Maria Fairbanks ----- Prehospital Care Coordinator
 Aaron Doyle ----- Prehospital Care Coordinator
 Marshall Bennett ----- Prehospital Care Coordinator
 Ben Keiser ----- Prehospital Care Coordinator
 Michelle Voos ----- Prehospital Care Coordinator
 Brandon Rowley ----- Prehospital Care Coordinator
 Lisa Vajgrt-Smith ----- Prehospital Care Coordinator
 JoAnny All ----- Prehospital Care Coordinator
 Rachel Morris ----- Administrative Assistant
 Jeanne Kerr ----- Administrative Analyst
 Patti Weisinger ----- Health Services Admin
 Gia Prado ----- Advanced Secretary



CONTACT INFORMATION

777 Arnold Drive, Suite 110
 Martinez, CA 94553
 925-608-5454 (phone)
cchealth.org/ems



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CONTRA COSTA COUNTY EMS THE SYSTEM OF EMERGENCY MEDICAL SERVICES

STRENGTHEN THE CHAIN OF SURVIVAL



EMS Training Institutions, Administrative Agencies and Regulatory Bodies play a critical role in developing, refining and ensuring a high quality / effective EMS system.



Learning the signs of a heart attack, stroke and sudden cardiac arrest and calling 9-1-1... all of these actions can play a part in saving a life.



Emergency Medical Dispatchers, First Responders (e.g. Firefighters, Law Enforcement), Paramedics, and EMTs respond to over 100,000 emergency calls for service in Contra Costa County each year.



Ambulance Transporting Providers (e.g. Paramedics, EMTs and Nurses) ensure patients are provided treatment and transported to the most appropriate receiving hospital.



Hospitals and Specialty Care Facilities (e.g. Nurses and Emergency Physicians) ensure the continuum of emergency care by treating patients and providing definitive care services.



Quality improvement (QI) is a proactive process, that recognizes and solves problems, and ensures that EMS systems of care are reliable and predictable.



Together, through **collaboration** and **local partnerships (e.g. MRC)**, Contra Costa County residents receive quality, efficient and **highly effective emergency patient care.**

cchealth.org/ems • 925-608-5454

