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I. INTRODUCTION
A. Overview of EMS

Emergency Medical Services (EMS) is a system of services organized to provide rapid response to out-of-hospital medical emergencies. The goal of EMS is to respond with the appropriate resources quickly to the scene of the medical emergency, to provide the patient appropriate field treatment and stabilization, and to transport the patient expeditiously to an appropriate hospital emergency department or specialty care center. An effective EMS system involves a variety of agencies and organizations working together to accomplish this goal. While most EMS responses are day-to-day emergencies, EMS agencies also plan and prepare for disaster medical response.

The EMS system includes:
- Public safety dispatch centers
- Fire services
- Ground and air ambulance services
- Law enforcement agencies
- Hospitals and specialty care centers
- Training institutions and organizations
- Citizen, professional, and technical advisory groups
- Local and State EMS Agencies
- Other governmental and voluntary organizations

In California, EMS systems are organized on a county or multi-county regional basis. Local EMS Agencies (LEMSAs) are designated by county boards of supervisors as the lead agencies responsible for coordinating EMS services at the county or regional level consistent with State law and regulations.

The California Emergency Medical Services Authority (EMSA) approves local EMS system plans, provides guidance to local EMS agencies, develops EMS regulations, administers the Regional Poison Control Center program, and carries out other EMS activities. EMSA is the lead agency for coordinating the State response to medical disasters. The State EMS Commission, with members appointed by the Governor and certain other State officials, is advisory to the EMSA and reviews and approves all EMS regulations.

In Contra Costa County, the Board of Supervisors has designated Contra Costa Health Services as its Local EMS Agency. The EMS Director, EMS Medical Director, and staff carry out the EMS functions of Health Services. The EMS Medical Director has statutory responsibilities to oversee medical aspects of the EMS program. The Contra Costa Emergency Medical Care Committee (EMCC) provides advice regarding EMS matters to the Board of Supervisors and to the EMS Agency.

B. Local EMS Agency Functions

Principal functions of a local EMS agency as specified in the Health & Safety Code include:
- Planning, implementing, and evaluating emergency medical services.
- Monitoring and approving EMT-I, paramedic, and Mobile Intensive Care Nurse (MICN) training programs.
- Conducting credentialing programs for EMT-Is, paramedics and MICNs.
- Authorizing advanced life support (ALS) programs.
Establishing policies and procedures for EMS system medical control, including those for dispatch, patient destination, patient care, and quality improvement.

Establishing ordinances and/or exclusive operating areas for regulation of ambulance services.

Approving and monitoring Prehospital Continuing Education Providers.

Developing and implementing a trauma system plan.

Conducting an impact evaluation when notified that an acute care hospital plans to downgrade or cease providing emergency medical services.

The County Board of Supervisors has further charged the Health Services Department as the local EMS Agency with the following responsibilities:

- Implementing EMS program enhancements funded by County Service Area EM-1 (Measure H).
- Tracking and monitoring hospital emergency and critical care capacity.

Additionally, the EMS Agency is the lead agency responsible for:

- Procuring and monitoring emergency ambulance services countywide.
- Planning for and coordinating disaster medical response at local and regional levels.
- Implementing and monitoring an Emergency Medical Services for Children Program countywide.

To accomplish these functions, the EMS Agency employees a staff of 11, including an EMS director, EMS medical director, EMS assistant director, Health Services disaster preparedness manager, five RN or paramedic prehospital care coordinators, an administrative services assistant, and a clerk.

C. Emergency Medical Care Committee

Each county may, under the California Health & Safety Code, establish an Emergency Medical Care Committee (EMCC) with membership prescribed and appointed by the county board of supervisors. A county EMCC acts as an advisory body to its board of supervisors and to its local EMS agency on all matters relating to EMS.

The Contra Costa EMCC consists of five consumer representatives and five consumer alternate representatives, one representative and alternate representative from each of the five supervisorial districts, and representatives and alternate representatives of the following groups and organizations:

- Alameda-Contra Costa Medical Association
- American Heart Association
- American Red Cross
- California Highway Patrol
- Contra Costa Contract Ambulance Provider
- Air Medical Transportation Provider
- Emergency Department Physicians
- Emergency Nurses’ Association
- Contra Costa Fire Chiefs’ Association
- Field Paramedic (1 private/1 public)
- County Health Services
- Hospital Council – Bay Area Division
- Contra Costa EMS Training Institution
Contra Costa Police Chiefs’ Association
Contra Costa Public Managers’ Association
Contra Costa Sheriff-Coroner
Base Hospital
Trauma Center
Community Awareness and Emergency Response (CAER)
Communications Center Managers’ Association
EMS Director

The EMCC meets quarterly and all meetings of the EMCC are open to the public. EMCC staff will provide reasonable accommodations for persons with disabilities planning to attend EMCC meetings.

D. County Service Area EM-1 (Measure H) Funding

County Service Area EM-1 provides major funding for enhancements made to the County’s EMS system since the passage of Measure H in 1988. Measure H parcel levies have been used to provide full or partial funding for the following EMS enhancements:

- Increased numbers of paramedic ambulance units available to respond to 9-1-1 calls.
- A countywide firefighter first responder defibrillation program including automated external defibrillators purchased and maintained for all fire response units.
- Fire first responder paramedic services.
- First responder training, equipment, and supplies.
- Medical supply caches purchased and maintained for multicasualty/disaster response.
- An upgrade to the MEDARS radio system used for ambulance-to-hospital communications.
- Radios for ambulances to communicate with fire first responders.
- An upgraded ambulance dispatch system and dispatcher preparedness.
- Enhanced response to hazardous materials incidents.
- Upgrades to fire dispatch and alerting systems to provide faster and more reliable fire dispatch for all calls.
- An electronic patient care record system for use by fire paramedic units.

E. Delivery of EMS Services

EMS services are typically provided in response to a medical emergency reported through the 9-1-1 emergency telephone system. A 9-1-1 call placed from any telephone is automatically routed to the appropriate designated primary Public Safety Answering Point (PSAP) usually located at the dispatch center for the law enforcement agency in whose jurisdiction the 9-1-1 call is placed. (Calls placed from cell phones are generally initially routed to a California Highway Patrol (CHP) dispatch center, although new technology when fully implemented will enable most 9-1-1 cell phone calls to be routed to the appropriate local law enforcement PSAP.) At the PSAP, whether local or CHP, a complaint operator determines the nature of the emergency and, transfers medical emergencies to the appropriate fire/medical dispatch center. In some cases, Richmond for example in Contra Costa County, primary PSAP and fire/medical dispatch center are part of the same facility. A dispatcher at the fire/medical dispatch center obtains details of the caller’s medical emergency and initiates dispatch of appropriate EMS resources.

The three fire/medical dispatch centers include the San Ramon Valley Fire Communications Center, which dispatches fire and ambulances units within that jurisdiction, the Richmond Police Communications Center, which dispatches fire units in Richmond and El Cerrito, and the Contra
Costa County Fire Communications Center, which dispatches fire units throughout the rest of the county and dispatches ambulance units operated by Moraga-Orinda Fire. Dispatchers at each fire/medical dispatch center are trained in Emergency Medical Dispatch and are able to provide instructions to assist a caller in providing first aid or CPR while EMS responders are en route. Each of the three fire/medical dispatch centers employs standard algorithms (ProQA) for interrogating 9-1-1 callers, assigning appropriate response resources and priorities, and providing over-the-telephone first aid instructions.

AMR operates a dispatch center located in Burlingame to dispatch AMR ambulance units on requests received from the Contra Costa Fire or Richmond communication centers. These requests are handled through a seamless CAD-to-CAD linkage known as the EMS Message Transmission Network (MTN).

The initial response to a potentially life threatening incident generally includes both a non-transporting fire first responder unit and an emergency ambulance. Most fire fighters are trained and certified as an Emergency Medical Technician I (EMT-I) to provide Basic Life Support (BLS) and, regardless of EMT-I certification, all fire fighters in Contra Costa County are able to provide first aid, CPR and defibrillation. Most fire engines in the County are staffed with at least one paramedic able to initiate Advanced Life Support (ALS) prior to arrival of an ambulance. Crockett-Carquinez Fire, East Contra Costa County Fire, and Richmond Fire provide first responder service at the BLS level only. In areas covered by non-paramedic fire services, the EMS Agency has put in place alternative solutions to assure timely arrival of an ALS-capable responders and the availability of at least two paramedics when needed as the scene of a medical emergency. In areas served by Crockett-Carquinez and by East Contra Costa County Fire, single-paramedic-staffed, non-transporting “Quick Response Units” are operated by AMR to augment the fire BLS first response and paramedic ambulance response. In Richmond, the EMS Agency has set
ambulance response time and staffing standards to assure a 10-minute, two-paramedic response on most calls.

Emergency ambulance response throughout Contra Costa County is provided by private or fire district ambulance services operating under exclusive operating area (EOA) agreements with the County. San Ramon Valley Fire and Moraga-Orinda Fire provide emergency ambulance services within their respective districts. AMR is the County’s emergency ambulance provider covering all other areas of the County. Emergency ambulances are staffed with one paramedic and one EMT-I or with two paramedics depending on the area served. BLS ambulance staffed with two EMT-Is may be used to respond to calls that have been determined through the Emergency Medical Dispatching system not to require paramedic response.

Patient treatment and transport are carried out under State and local EMS agency policies and procedures. These policies include, in the case of paramedics, making contact with a mobile intensive care nurse (MICN) or physician at the designated base hospital for medical consultation in patient management according to County EMS treatment guidelines.

Patients are transported to hospitals able to provide needed services. Hospital destination is determined based upon patient preference and County EMS protocols. Critical patients may be directed to the nearest emergency department, STEMI Receiving Center, or to the trauma center. Non-critical patients may be transported to hospitals of choice within reasonable travel time. Medical helicopter service is available to transport critical patients when ground ambulance transport time would be excessive. Two medical helicopter services, CALSTAR and REACH, are authorized to respond to local EMS calls on a daily rotation schedule. Both agencies provide advanced life support services and maintain 24-hour helicopter unit availability based at Buchanan Field in Concord. Other helicopter services are available to respond from neighboring counties if both CALSTAR and REACH are unavailable.
II. LIST OF MAJOR ACCOMPLISHMENTS
EMS Major Accomplishments
2009

- Provided ongoing oversight to the Countywide emergency medical services and trauma system, which included 77,872 responses to emergency medical calls made by County-contracted ambulance services, 257 medical helicopter transports by County-designated air ambulance services, 1,018 serious trauma patients treated at John Muir Medical Center, the County-designated trauma center, 132 verified STEMI heart attacks identified by paramedics.

- Dr. Joseph Barger recognized as California State EMSA Medical Director of the Year - December 2009.

- Successfully completed LUCAS chest compression system trial for patients with cardiac arrests.

- Implemented Zoll electronic patient care record (ePCR) upgrade with end user rollout December 2009.

- Developed and implemented a Contra Costa County Medical Reserve Corps (CCCMRC) was formed, registering and training over 90 individuals. The CCCMRC is listed on the federal website as well as in Disaster Healthcare Volunteers of CA.

- Established partnership for regional pediatric surge planning with Alameda County EMS.

- Contra Costa EMS QI Plan and Toolkit listed on the National Association of State EMS Officials website as a resource.

- Produced and disseminated five issues of EMS Best Practices newsletter and three issues of STEMI System newsletter “STEMI NEWS.”

- Celebrated year one STEMI system performance showing first EMS provider at patient-to-hospital cardiac intervention times of 74 minutes, and hospital door-to-cardiac intervention times of 48 minutes. National benchmark is 90 minutes for door-to-intervention making Contra Costa EMS a “high performance STEMI System.”

- Full implementation of CARES data registry with generation of quarterly and annual reporting enabling comparison with national benchmarks.

- Reorganized prehospital care guidelines to eliminate redundancy and support field operations.

- Established new behavioral emergency guidelines with enhanced guidance on chemical sedation. Updated prehospital treatment guidelines to reflect best practice management of CPR, restraints, pediatric assessment, altered levels of consciousness and use of Narcan. System-wide CPAP and King tube implementation among ALS stakeholders.

- Developed H1N1 provider vaccination availability process and Prehospital Infection Control Officer H1N1 provider exposure decision tree and guidance in collaboration with Contra Costa Public Health.

- Implementation of federally-mandated HAvBED H1N1 Assessment Polls as of September 2009. Established local pediatric H1N1 situational report addressing potential pediatric surge risks and consequences.
Provided pediatric simulator (PediaSim) for integration into Fire EMS Mobile Simulation Training Program. Supported the Fire EMS Training Consortium in producing four standardized curriculums for system wide prehospital training.

More than 100 prehospital QI studies completed over the last year in prehospital care including chest pain, STEMI, advanced airway, trauma, scene times, drop times, helicopter utilization, patient satisfaction, ePCR completion, infrequent skills success, pain assessment, and prehospital vascular access.

Participated in EMS Event quarterly reporting and root cause analysis identifying gaps in training, procedure and inconsistencies in performance of protocols generating EMS System QI alerts.

Implemented new prehospital care guidelines and protocols developed and recommended by Helicopter Task Force in 2008.

EMS for Children (EMSC) Program Plan recognized as one of the first updated EMSC plans submitted to EMSA in the last four years.

Developed and implemented a compact, easy to use EMS Field Manual.

100% Compliance with National EMSC Performance Measures Survey for Prehospital Medical Direction and Prehospital Pediatric Equipment.

Expanded EMS stakeholder participation in Child Injury Prevention Network-Bay Area activities, e.g. injury prevention, calendar distribution, car seat checkups.

Developed prehospital recognition programs for EMSC champions, STEMI Stars, Cardiac Arrest Saves and EMS Best Practice Quality Improvement.

Distribution of numerous pediatric disaster resources, e.g. DVDs, CDs, training materials, best practice documents supporting hospital pediatric disaster planning.

EMS agency initiates public education program targeting CPR training for 7th-9th graders, using American Heart Association’s “Family and Friends, CPR Anytime” personal learning system.

EMS agency adopts American Heart Association “Hands-Only CPR” for lay public.

As of December 31, 2009 there were 355 public access defibrillators registered in the EMS Agency database.

Contra Costa County Medical Reserve Corps (CCCMRC) became official in May 2009! It was registered with the US Citizen Corp, interviewed and listed on the federal website as an official MRC as well as in Disaster Healthcare Volunteers of CA. In less than one year the CCCRMC was formed, and registered and trained over 90 individuals. CCCMRC newsletters, webpage and marketing material developed and distributed. Over 50 CCCMRC volunteers participated in the fall Flu Vaccine Community Clinics. Other collaborations included participated in DMAT, CERT & Urban Shield exercises and Community Health Fairs.
III. Issues in the Forefront
A. Sudden Cardiac Arrest and HeartSafe Communities: Advances Through Community and National Partnerships

The EMS System continues its emphasis on response to Sudden Cardiac Arrest (SCA) through Public Access Defibrillation or “PAD” programs. These programs are supported by the EMS Agency in partnership with the American Heart Association to make automated external defibrillators or “AEDs” available in public places for use by laypersons. The number of defibrillators accessible by the public has increased throughout the county, with the reported placement of 70 additional AEDs. California Health & Safety Code section 104113, which became effective July 1, 2007, is partially responsible for this significant increase of AEDs as it mandates that all “health studios” have an AED available onsite.

The EMS Agency has seen, along with the increase in number of public access defibrillators, an increase in the number of sudden cardiac arrest victims that have had a return of pulse prior to the first responders arriving on scene. Public Access Defibrillation programs are required by law to notify the EMS Agency if they use the AED. Because of this notification we are now able to determine the outcome of the use of the AED.

An unfortunate lesson learned this year is that a defibrillator in place does not save a life if the public does not know that an AED is available onsite or is afraid to use it. It is our belief that in order to significantly change the survival rate from sudden cardiac arrest a campaign to increase awareness and provide immediate response to these victims is imperative. The EMS Agency has worked in partnership with the American Heart Association (AHA) to develop a program to do just that – the “HeartSafe Community.”

Sudden Cardiac Arrest strikes people of all ages and degrees of fitness. It usually strikes without warning. Currently nationwide only five to six percent of victims of SCA survive. Many more lives could be saved if bystanders would quickly phone 9-1-1, begin CPR, and apply and use an available AED. For every minute that passes without CPR and defibrillation the chance of survival decreases 7 to 10 percent. Placing AEDs in key locations and, more importantly, making sure people are comfortable using them can make the difference between life and death.

We know that victims who survive sudden cardiac arrest typically have four things in common. First, someone witnessed the event, recognized the emergency, decided to help, confirmed unresponsiveness and called 9-1-1. Second, someone started CPR immediately - compressions hard and fast. Next, someone arrived quickly with a defibrillator and placed it on the victim. And then, professional emergency medical services (EMS) paramedics provided advanced life support, including airway and breathing support and medications. In other words, the community had a strong “Chain of Survival.”
A “HeartSafe Community” is a community where all elements of the Chain of Survival are in place - “Early Access,” “Early CPR,” “Early Defibrillation,” and “Early Advanced Care.” The EMS Agency and the American Heart Association are partnering with communities in Contra Costa County to improve the cardiovascular health of the citizens of that community and to increase the chances that anyone suffering a cardiovascular emergency - heart attack, stroke, or cardiac arrest - would have the best possible chance for survival.

All cities and towns in Contra Costa County have enhanced 9-1-1. Emergency medical dispatchers, working in our accredited medical dispatch centers, provide instructions on how to handle an emergency before police, fire and EMS arrive. They provide dispatch life support while responders are on their way helping citizens to care for victims of an emergency. Emergency medical dispatchers instruct the caller in CPR, in the use of the AED on site, as well as gathering valuable information about the victim of a heart attack or stroke that can be save time to treatment on arrival at the hospital.

The emphasis of the “HeartSafe Community” for Early Access is encouraging citizens of these communities to decide to help and call 9-1-1 when they witness an event and recognize that there is an emergency. Recognizing the importance of citizen CPR training and public access defibrillation, many of the EMS System participants offer CPR training classes. American Medical Response (AMR) offers a minimum of 25 free CPR classes to the public annually. Private companies and cities also offer CPR classes throughout Contra Costa County.

In order to promote the availability of Early CPR, the EMS agency maintains a phone number, 1-800-GIVE CPR, to provide information to the public on where CPR training can be obtained. This information is available in local telephone books, is also available on our website – cccems.org, and is contained in Section XII of the Contra Costa EMS Annual Report. Since any individual with a CPR instructor certification can give CPR instruction, there may be other resources not included on these lists.

In addition to group classes the EMS agency supports the use of the American Heart Association’s “Family and Friends, CPR Anytime” program. Personal learning programs for CPR, “CPR Anytime” can be completed in less than 30 minutes. The inexpensive kit (available from AHA for $30) includes a manual, video and practice manikin that can be used to train one individual or passed on for training of any number of people. These learning programs are available for adult, child, and infant CPR. The American Heart Association and the EMS agency are encouraging schools to use these kits to train students in the 7th or 9th grades who have health in their curriculum currently in hopes that not
only will the student learn CPR, but perhaps for extra credit, they could take the kit home and train the remainder of their family, and even friends, in CPR.

We expect that lay people will provide CPR more often for victims of SCA with the recent introduction of “Hands Only CPR” by the American Heart Association. When the collapse of an adult victim of SCA is witnessed, compression-only CPR by the lay public can make a big difference. In addition to CPR training, “HeartSafe Communities” are encouraged to provide cardiovascular-related education and/or awareness activities.

**Early Defibrillation** is accomplished by adding additional AEDs and increasing the awareness of and community preparedness for SCA. It is imperative that the locations of public access defibrillators are clearly marked and that citizens of the community(ies) are educated to the importance of using an AED. California regulations require a minimum of four hours of training for first responder rescue personnel approved to use AEDs. However, there is no specific requirement for lay personnel to have training in order to use an AED.

As of December 31, 2009 there are 355 public access defibrillators registered in our database. The goal is to provide defibrillation to a victim of sudden cardiac arrest within three minutes of collapse. We and our EMS partners are interested in working with communities to assure that AEDs are placed in any locations where people gather such as schools, manufacturing plants, public buildings, fitness and recreation facilities, or public transportation.

AEDs intended for lay use are automated and very easy to use. Easy-to-follow instructions and voice prompts guide the user through the process. An internal computer analyzes the heart rhythm and assures that a shock is delivered only when appropriate. The use of an AED is included in most CPR classes. When an AED is placed in the community the information is passed on to the appropriate emergency medical dispatch center. The information is placed in the computer and should a 9-1-1 call come in from that location reporting a sudden cardiac arrest the dispatcher will notify the caller of the AED and request that the caller use it, assisting him/her with instructions as needed. All first out fire apparatus have been equipped with AEDs and the personnel trained in CPR and the use of the AED. Nine police agencies have equipped and trained their personnel with AEDs and an additional agency is training its personnel to use AEDs in April 2008. The EMS System has a strong **Early Advanced Life Support** component.

Contra Costa County saw an expansion of the 12-lead EKG program in place in Moraga-Orinda Fire and San Ramon Valley Fire to include American Medical Response, Contra Costa County Fire Protection District, Rodeo Hercules Fire, and Pinole Fire. The major advantage of the 12-lead EKG in the field is that it enables the identification, in many cases, of acute myocardial infarction (MI) prior to arrival at the hospital. Early identification of an ST elevation MI or STEMI and notification of the receiving facility can reduce the time to definitive care, potentially saving heart muscle and lives.

In 2008 Contra Costa EMS designated STEMI hospital receiving centers and implemented EMS policy altering hospital destination for patients identified to have a
STEMI. (See Section B. Identification and Patient Management of “STEMI” Heart Attacks below for more information.)

Data on sudden cardiac arrest, using the Utstein template (a special cardiac arrest scoring system), is being collected and evaluated. Contra Costa EMS has joined the CARES (Cardiac Arrest Registry to Enhance Survival) Program, a collaborative effort of the Centers for Disease Control and Prevention (CDC), the American Heart Association, and the Emory University Department of Emergency Medicine, Section of Prehospital and Disaster Medicine. The goal of the CARES program is to establish a model of unifying all essential data elements from three independent sources, which currently record fractured data of a single, cardiac arrest event. The CARES system builds this model by establishing a relationship with emergency medical services agencies, hospitals, and computer-aided dispatch (CAD) systems. Involvement with the CARES program will enhance the data collected, streamline the collection of outcome data, identify who is affected, when and where cardiac arrest events occur, which elements of the system are functioning properly and which elements are not, and how changes can be made to improve cardiac arrest outcomes as well as allowing for external benchmarking with similar systems across the United States. Partnering to develop “HeartSafe Communities” is just one way the EMS Agency is preparing for emergencies.

B. North American LUCAS Evaluation (NALE)

The intent of the North American LUCAS Evaluation project sponsored by Jolife AB of Sweden and managed by Resurgent Biomedical Consulting, LLC. was to place 66 LUCASTM Chest Compression System devices in four Emergency Medical Services (EMS) sites in the United States to collect data on 300 sudden cardiac arrest (SCA) victims over a six-month time frame. An evaluation was performed that included gathering basic user data including opinions regarding ease of use, fit, and application time in order to gain a better understanding of the use of the device in the United States medical systems compared to the European medical systems.

Contra Costa County EMS was chosen to be one of the four EMS sites. A LUCAS Chest Compression System device was placed on twelve of the busiest first responder units in five fire agencies (Contra Costa County Fire, East Contra Costa Fire, Moraga-Orinda Fire, El Cerrito Fire, and Richmond Fire) in Contra Costa County.

While there was some resistance from the line personnel initially, primarily around where to store one more piece of equipment on their apparatus, that quickly faded. The device, once used, was felt to provide effective chest compressions. The average rating when asked, “How well you believe LUCAS provided effective chest compressions,” was 8.98 on a scale of 0 to 10 with 0 being Not Effective and 10 being Very Effective. The overall ease of operation of the LUCAS rated 8.40.

The final report on this evaluation reflects that the LUCAS Chest Compression System worked well in several EMS settings in the United States. EMS personnel at all levels easily operated the LUCAS device allowing for effective chest compressions. The device fit 95.34% of the evaluation population.

The twelve LUCAS Chest Compression devices continue to be used on sudden cardiac arrest victims seen providing hard, fast, uninterrupted compressions as required.
by the current American Heart Association guidelines. We look forward to participating in future evaluations of this type.

C. Pandemic H1N1 Influenza

In March 2009, a novel influenza A (nH1N1) virus was reported in Mexico. While the outbreak had apparently been going on without official recognition for several months, large numbers of reported hospitalizations and deaths led the Mexican government to close most public and private buildings facilities in Mexico City. The virus, initially dubbed the “swine flu” because it was thought to have originated in pigs, quickly spread to the United States and other countries leading, in some cases, to advisories or restrictions against travel to and from Mexico and the United States. On May 7, 2009, the World Health Organization issued a statement that containment of the nH1N1 virus was not feasible and, on June 11, 2009, declared the outbreak of a new pandemic labeled Pandemic H1N1/09 Influenza. Worryingly, unlike seasonal influenza that tends to be most severe in the elderly, this virus seemed to have a propensity for producing severe illness and mortality among young persons and pregnant women. Fortunately, as the outbreak continued to spread, most cases were mild and most severe illness and mortality seemed to involve persons with underlying morbidity. Still, some cases of rapid onset of severe illness and death in otherwise healthy children and young adults were being reported. By the end of 2009 or early 2010, the numbers of reported new cases in the United States and elsewhere had fallen off sharply, and concerns of a 1918-like pandemic had largely waned. Vaccine against the new influenza, originally unavailable or in short supply was being shipped in quantities to meet or exceed demand.

In Contra Costa County, not unlike the rest of California and the United States, the outbreak occurred in two waves, the first peaking in June and early July and the second peaking in October and November. By the end of 2009, there had been about 330 hospitalizations and 14 deaths related to the H1N1 in Contra Costa. Speculation remained that there might be a third wave of H1N1 or a reemergence of the seasonal influenza, which had been virtually displaced by the H1N1, but, based on experience in the southern hemisphere and the widespread availability of vaccination, that appeared unlikely.

The initial outbreak in Contra Costa County led to some school closures in accordance with early guidelines from the U.S. Centers for Disease Control and Prevention (CDC). The resulting public concern led to hundreds of persons seeking testing or treatment for flu-like symptoms at hospital emergency departments. Several hospitals erected “surge tents” that had been acquired under the federal Hospital Preparedness Program grants to train and equip hospitals and other health facilities to respond to bioterrorism or other health emergencies.

Contra Costa Health Services (CCHS), under the leadership of its Public Health division, did a low-level activation of its emergency Departmental Operating Center (DOC). The EMS Agency provided guidance to EMS responders on infection control measures and conducted surveillance of hospital emergency departments and EMS response. A major issue for EMS responders and hospitals was a shortage of N95 respirators recommended for use by healthcare workers exposed to persons with flu-
like symptoms. Eventually, in November 2009, the State began releasing supplies of the State stockpiles of N95 respirators to requesting counties. EMS handled requests for N95 respirators from the State stockpile to those hospitals meeting State requirements.

Other issues for EMS included return-to-work policies for ill or possibly exposed healthcare workers, prophylactic use of antivirals for healthcare workers, potential workforce impacts of the pandemic. These issues were of high concern during the early period of the outbreak while the disease was less well understood, treatment uncertain, and no vaccine available. EMS conducted weekly conference calls with hospitals, conducted surveillance for EMS responses on calls involving respiratory problems via FirstWatch, conducted some surveillance of hospital patient loads related to influenza, provided support to CCHS’s DOC, and several EMS staff provided support at three large-scale community vaccination clinics conducted by Public Health.

As it became apparent that H1N1 was having a disproportionate impact on the young, Contra Costa EMS embarked on development of a pediatric surge plan. Working jointly with Alameda County EMS, Children’s Hospital Oakland, and hospitals in Contra Costa County, Contra Costa EMS is developing a plan under which hospitals in Contra Costa can surge their capacities to care for moderately ill pediatric patients freeing resources for Children’s Hospital Oakland to care for the most seriously ill patients.

While there were a number of tragic deaths from the nH1N1, fears of a 1918-like pandemic were not realized. The outbreak did provide invaluable experience to local and state agencies and healthcare providers and to divisions within Contra Costa Health Services in working together during a sustained emergency.

D. Expanding the EMS Role in the Implementation of Integrated Systems of Patient Care

Evidence-based patient care studies demonstrate that prehospital providers play a significant role in reducing morbidity and mortality. Trauma systems have clearly demonstrated this for many years and more recently the role of EMS in STEMI and Stroke Systems is being integrated. Along with the development of these systems of care comes the responsibility and demand to continuously measure, analyze and monitor prehospital and system performance based on national indicators. Contra Costa has had tremendous success in this area due to the strong support of our STEMI System stakeholders and the future is very exciting indeed.

The Contra Costa STEMI System, launched in September 2008, has grown into a high-performance program with performance measures that are some of the best in the country. However the program is still in its early phases of development and has many more challenges ahead. Interfacility patient transfer protocols will be changing in 2010 to enhance the ability of Non-STEMI Centers to rapidly transfer walk-in STEMI patients utilizing the 9-1-1 system. These protocols will also benefit the rapid transport of other critically ill patients who require timely rapid intervention or specialty evaluation at another facility when those services are not available at the ambulance receiving hospital. Successful implementation will greatly enhance our EMS System ability to care for high-risk Trauma, STEMI, Stroke and OB patients.
Contra Costa is in the preliminary design phase of our Stroke system and will be working to bring that to fruition by 2012. The minimum criteria to qualify as a Contra Costa designated stroke receiving facility will be JCAHO accreditation as a Primary Stroke Center. Currently there are three local facilities meeting those criteria and several others who are in various stages of their application process. Stroke system best practices, workflow processes, and performance measures are being evaluated in preparation for pulling together an advisory group to assure appropriate oversight and support for a stroke center program.

EMS continues to play an increasingly frequent and important role in facilitating the development of specialty systems of care e.g. Trauma, STEMI and Stroke. Our early participation in the National Institute of Health and CDC-supported Cardiac Arrest Registry to Enhance Survival (CARES) has allowed us to essentially use data to evaluate the performance of the entire EMS system in cardiac arrest. The result has been a greater understanding of the role of protocols, equipment, training, cardiac arrest best practices, and technological enhancement on the outcome of patients throughout our EMS system.

The EMS role in the enhancement of patient outcome is being established with prehospital data analysis designed to determine how patient condition and populations benefit from prehospital care. Contra Costa is well positioned to be successful with development of future systems of care. On the horizon is prehospital management of the septic patient along with the ongoing refinement of our current head trauma triage and destination protocols, and STEMI program.

E. Pediatric Surge Capacity Expansion

In 2008 Contra Costa EMS completed a review and re-evaluation of our EMS for Children’s (EMSC) program implemented in 2000. The results of this review concluded the following:

- 250,000 children <18 years old currently live in Contra Costa County.
- There is enhanced compliance of prehospital provider agencies and emergency departments with national standards for equipment, training and medical control.
- Pediatric patients made up 18-25% of emergency department volume.
- There is a reduction of pediatric inpatient capacity with the closures of three pediatric units including Doctors San Pablo, Contra Costa Regional Medical Center and John Muir Health Concord.
- There is strong reliance on pediatric referral hospitals to manage children for both routine general care and critical care.
- All Contra Costa Hospitals reported that they had significant gaps in their ability to surge in the event of a pediatric mass casualty or disaster.

Resources, tools, training and pediatric EMSC physician and nurse liaisons were identified to improve communication and competency in these areas based on these results. During 2009 H1N1 disproportionately affected hospitals throughout the country. Over 91 Contra Costa children with H1N1 were sent to Children’s Hospital Oakland severely straining pediatric referral center inpatient capacity. Twenty-five percent of children hospitalized with H1N1 required ICU care putting further stress on resources.
The impact of increased volume on Children’s Hospital Oakland prompted a re-assessment of pediatric bed capacity which revealed that local inpatient capacity had been further reduced to only 15 licensed pediatric beds. This loss of licensed pediatric general care beds resulted in Contra Costa having one of the highest ratios of children to pediatric bed capacity in California.

Similar experiences in numerous counties and pediatric regional centers have opened a “window of opportunity” to address the significant and growing gaps in in pediatric inpatient surge capabilities and preparedness. Contra Costa and Alameda Counties have joined together to help lead this effort in the region while working on our local efforts with Hospital Leadership and Disaster Managers. Our goal is for each of our community hospitals to expand the Contra Costa EMS System pediatric surge capacity by 25-50% over the next three years.

F. 12 Lead ECG Transmission Pilot

The use of the 12-lead ECG in the prehospital setting is fundamental to the management of the patient with chest pain especially if that patient has an ST-Elevation Myocardial Infarction (STEMI), the deadliest form of heart attack requires rapid transport and intervention at a STEMI Receiving Center. However many factors make reliable prehospital 12-lead acquisition challenging especially in a moving ambulance traveling to the hospital. While poor quality prehospital 12 leads can be substantially reduced with training and practice other factors are beyond the paramedics’ control and require further analysis by a physician. Prehospital 12-lead ECG transmission from the field to the STEMI receiving facility has been shown to significantly reduce false STEMI activations and conserve valuable resources from being mobilized for patients who do not need them.

Contra Costa County EMS, John Muir Medical Center Concord and Physio-Control will be conducting a 12-lead transmission trial to fully assess the feasibility, costs and efficacy of 12-lead transmissions to hospitals as an enhancement to our STEMI system. Implementation of the trial is anticipated in 2010 and the findings will be presented to our STEMI Oversight Committee to determine whether or not expansion of the program to the entire EMS System is appropriate. Costs for the technology are significant and would be shared by the STEMI Receiving Centers if they choose to participate.

Contra Costa County EMS anticipates that the program will be successful and cost effective. Costs associated with false activations of STEMI patients are significant and should offset the costs of implementation. The technology uses software, modems and a web-based solution called the LifeNet STEMI Management System. The LIFENET system also provides new mechanisms to enhance 12-lead data capture in conditions such as cardiac arrest and non-STEMI chest pain. We look forward to the results of this exciting 12-lead ECG transmission trial.
IV. EMS SYSTEM PARTICIPANTS
A. Advisory Committees

Emergency Medical Care Committee (EMCC)

The EMCC is a multidisciplinary committee appointed by the County Board of Supervisors, to provide advice and recommendations on EMS-related matters to the Board, Health Services Director and its EMS Agency. Membership consists of consumer representatives, and representatives of EMS-related organizations and groups. The EMCC meets quarterly (March, June, September, December), and meetings are open to the public. Specific meeting information is available through the EMS Agency offices or website at www.cccems.org.

Medical Advisory Committee (MAC)

The MAC provides advice and recommendations to the EMS Agency and EMS Medical Director on medically-related topics. Examples include ALS/BLS medical treatment guidelines; new prehospital skills and medications; and prehospital policies/procedures related to patient medical management. Membership consists of base coordinator/liaison physician and representatives of ALS provider agencies, and receiving hospital emergency physicians. MAC meets bimonthly.

Trauma Audit/Pre-Trauma Audit Committees (TAC/Pre-TAC)

Pre-TAC and TAC membership evaluates trauma system care and monitors compliance to trauma system standards established according to provisions of State trauma regulations in the County Trauma System Plan. TAC is held quarterly in conjunction with Alameda County providing monitoring for two separate trauma systems. Pre-TAC meets monthly, includes participation by trauma center and base hospital staff, ambulance and fire providers, EMS Agency staff, and others. County EMS Medical Directors appoint members of these confidential committees.

EMS Quality Improvement Committee (QI)

The QI Committee’s mission is to ensure that quality emergency medical services are available for all people in Contra Costa County and that the medical care is consistent with best practices and evidence-based medicine. It relies on quality improvement partnerships with all EMS providers. The QI Committee meets monthly and membership includes representatives from fire agencies, emergency ambulance providers and base hospital.

EMS Facilities/Critical Care Committee

The Facilities and Critical Care Committee reviews, discusses and makes recommendations to the EMS Agency on EMS system issues that impact acute care hospitals. Membership includes emergency department nurse directors/managers or designates. During 2009 efforts were made to redesign the workflow of the group to facilitate participation. A survey was conducted and results supported a strong desire for the forum to be continued in support of networking and collaboration among the facilities within the EMS system. A Facilities and Critical Care Committee listserve was created and meetings were enhanced with conference call options to enhance participation.

Med/Health Preparedness Forum

The Med/Health Preparedness Forum provides a venue for discussion of issues of mutual concern regarding the disaster preparedness of medical centers and the local medical health system. The Med/Health Preparedness Forum meets monthly and membership
includes representatives of hospital preparedness coordinators, clinics, cities, ambulance, fire, Office of Emergency Services (OES), EMS, and Contra Costa Health Services.

**STEMI System CQI Oversight Group**

The STEMI System CQI group is a subcommittee of the Quality Improvement Committee charged with the oversight of Contra Costa EMS STEMI System. Membership consists of designated STEMI Center leadership and Prehospital stakeholders directly participating and supporting the STEMI System. The group meets quarterly to review STEMI System performance.

**EMSC Advisory Committee**

The EMS for Children (EMSC) Advisory Committee consists of representatives from the EMS and pediatric communities. This group reviews relevant issues electronically and feedback is appropriately addressed and integrated. EMS work groups include Quality Improvement, Medical Advisory Committee, East Bay Child Injury Prevention Network, Child Death Review, Fire EMS Training Consortium and Emergency Medical Care Committee of Contra Costa County. This committee was instrumental in supporting the evaluation and update of Contra Costa EMS for Children Program Plan implemented January 1, 2009.

**Contra Costa County Medical Reserve Corp (MRC) Advisory Committee**

Contra Costa County Medical Reserve Corp (CCCMRC) oversight is provided by Contra Costa County Health Services Department, Emergency Services (EMS) Agency as the lead agency with support from Public Health. An Advisory Committee continues to provide input into the development, mission, goals and objectives of the team and consists of representatives from Public Health, EMS, Office of Emergency Services/Sheriff’s Office Emergency Management (OES/SO-EM) and CCCMRC volunteers.

**Multicasualty Advisory Committee (MCAC) – ad hoc**

The ad hoc multidisciplinary MCAC was originally organized by the EMS Agency in 1978 to develop an integrated emergency response plan for multicasualty incidents. The current Multicasualty Incident Plan that was implemented on July 1, 2007.

**Data Advisory Group**

The Data Advisory Group is a subcommittee of the Quality Improvement Committee with the charge of analyzing current quality improvement data process on a countywide basis and providing recommendations. Membership consists of interested individuals and agency experts with the knowledge and skills in data collection.

**B. PSAPs and Dispatch Centers**

**Public Safety Answering Points**

- Antioch Police Department
- California Highway Patrol
- Concord Police Department
- East Bay Regional Park Police
- Martinez Police Department
- Pinole Police Department
- Pleasant Hill Police Department
Richmond Police Department
Sheriff's Communications
Walnut Creek Police Department

Fire/Medical Dispatch Centers
- Contra Costa County Fire Dispatch
- West County Consolidated Communications Operations (Richmond Police)
- San Ramon Valley Fire Dispatch
- Sheriff's Dispatch (multicasualty coordination)

Ambulance Dispatch Centers
- American Medical Response
- San Ramon Valley Fire
- Contra Costa County Fire (Moraga-Orinda only)

C. First Responders

County Fire Protection Districts
- Contra Costa County Fire Protection District (30 stations)
- Crockett-Carquinez Fire Protection District (2 stations)
- East Contra Costa County Fire Protection District (8 Stations)
- Pinole Fire Protection District (served by Pinole Fire Department)

Municipal Fire Departments
- El Cerrito Fire Department (3 stations)
- Pinole Fire Department (2 stations)
- Richmond Fire Department (7 stations)

Independent Fire Protection Districts
- San Ramon Valley Fire Protection District (28 full-time/2 reserve stations)
- Rodeo-Hercules Fire Protection District (3 stations)
- Moraga-Orinda Fire Protection District (5 stations)
- Kensington Fire Protection District (served by El Cerrito Fire Department)

Paramedic First Responder Programs
- Moraga-Orinda Fire Protection District - Paramedic Engine (5 units)
- American Medical Response - Byron/Discovery Bay, Bethel Island, Oakley and Crockett areas – ALS Quick Response Vehicles - QRVs (4 units)
- Contra Costa Fire Protection District - Paramedic Engine (30 full-time units).
- San Ramon Valley Fire Protection District - Paramedic Engine/Ambulance (5 staffed/3 backup)
- El Cerrito Fire Department – Paramedic Engine (3 units)
- Rodeo-Hercules Fire Protection District (2 units)
- Pinole Fire Department (2 full-time units)
- California Highway Patrol - Helicopter Unit
- East Bay Regional Park - Helicopter Unit
Public Safety Defibrillation Programs

- Antioch Police Department
- Brentwood Police Department
- Crockett-Carquinez Fire District
- Danville Police Department
- East Contra Costa Fire Protection District
- Hercules Police Department
- Kensington Police Department
- Lafayette Police Department
- Moraga Police Department
- Orinda Police Department
- Pittsburg Police Department
- Richmond Fire Department
- San Ramon Police Department
- State Park Service, Mt. Diablo
- Blackhawk (Sheriff)

Other First Responders

- East Bay Regional Parks
- California Division of Forestry
- Private and military fire services

D. Emergency Ambulance Providers

- American Medical Response (flex deploys 15 – 48 ambulances)
- San Ramon Valley Fire (5 ambulances/2 reserve ambulances)
- Moraga-Orinda Fire (2 ambulances/1 reserve ambulance)

E. EMS Helicopters

Air Ambulances

- CALSTAR Buchanan Field in Concord. (Additional helicopters based in northern California. Fixed wing base in Sacramento.)
- REACH Buchanan Field in Concord. (Additional helicopters based in northern California. Fixed wing bases in Santa Rosa and Sacramento.)
- Helicopter services available in surrounding counties include Stanford Life Flight, Palo Alto; Medi-Flight, Modesto; Air Med Team, Stanislaus County

Rescue Aircraft

- California Highway Patrol (ALS helicopter, including hoist ability)
- East Bay Regional Parks (ALS helicopter)
- U.S. Coast Guard (BLS rescue capabilities, including hoist ability)

F. Hospitals

Receiving Hospitals

- Contra Costa Regional Medical Center, Martinez
- Doctors Medical Center, San Pablo
- John Muir Health, Walnut Creek Campus
- John Muir Health, Concord Campus
Kaiser Medical Center, Antioch
Kaiser Medical Center, Richmond
Kaiser Medical Center, Walnut Creek
San Ramon Regional Medical Center, San Ramon
Sutter Delta Medical Center, Antioch

**Base Hospital**
- John Muir Health, Walnut Creek Campus

**Trauma Centers**
- John Muir Health, Walnut Creek Campus
- Children’s Hospital and Research Center (regional trauma center for pediatric patients)

**STEMI Receiving Centers**
- Doctors Medical Center, San Pablo
- John Muir Health, Concord Campus
- John Muir Health, Walnut Creek Campus
- Kaiser Medical Center, Walnut Creek
- San Ramon Regional Medical Center, San Ramon
- Sutter Delta Medical Center, Antioch
- Valley Care Medical Center, Pleasanton (out-of-county STEMI Center)
- Alta Bates Summit Medical Center, Oakland (out-of-county STEMI Center)

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1 STEMI Receiving Centers are County-designated hospitals that are staffed and equipped to provide specialized care to patients suffering from a particular type of heart attack called a S-T Elevation Myocardial Infarction.
V. EMS SYSTEM ACTIVITIES
A. Emergency Ambulance Services

Emergency ambulance services are provided Countywide under performance-based contracts in each of three exclusive operating areas. The County currently contracts with American Medical Response, San Ramon Valley Fire Protection District and Moraga-Orinda Fire Protection District. Contracts are awarded on a competitive basis, as required by law, except for Moraga-Orinda Fire, which is exempt from the competitive bid requirement under Health & Safety Code provisions.

<table>
<thead>
<tr>
<th>Provider</th>
<th>Description</th>
<th>1st Response and Ambulance</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Medical Response</td>
<td>ERAs 1, 2, and 5</td>
<td></td>
</tr>
<tr>
<td>ERZ A</td>
<td>Territory of the City of Richmond</td>
<td>BLS 2 paramedics</td>
</tr>
<tr>
<td>ERZ B</td>
<td>El Cerrito, Kensington, Pinole, Rodeo-Hercules, Crockett-Carquinez, San Pablo, El Sobrante, North Richmond, other areas of West County</td>
<td>ALS 1 paramedic/1 EMT-I</td>
</tr>
<tr>
<td>ERZ C</td>
<td>Concord, Clayton, Lafayette, Martinez, Pleasant Hill, other areas of Central County</td>
<td>ALS 1 paramedic/1 EMT-I</td>
</tr>
<tr>
<td>ERZ D</td>
<td>Antioch, Oakley, Pittsburg, Bay Point and surrounding areas of East County</td>
<td>ALS 1 paramedic/1 EMT-I</td>
</tr>
<tr>
<td>ERZ E</td>
<td>Brentwood, Byron, Bethel Island, Discovery Bay, and other areas of far East County</td>
<td>ALS 2 paramedics</td>
</tr>
<tr>
<td>Moraga-Orinda Fire</td>
<td>ERA 3 - Moraga-Orinda Fire Protection District</td>
<td>ALS 1 paramedic/1 EMT-I</td>
</tr>
<tr>
<td>San Ramon Valley Fire</td>
<td>ERA 4 - San Ramon Valley Fire Protection District</td>
<td>ALS 1 paramedic/1 EMT-I</td>
</tr>
</tbody>
</table>
Maximum Response Time Requirements in Minutes and Percentile

<table>
<thead>
<tr>
<th>Provider</th>
<th>Code 3</th>
<th>Code 2</th>
<th>Rural Code 3</th>
<th>Code 2</th>
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<tbody>
<tr>
<td></td>
<td>Code 3</td>
<td>Code 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ERZ A</td>
<td>10:00</td>
<td>95%</td>
<td>30:00</td>
<td>90%</td>
</tr>
<tr>
<td>ERZ B</td>
<td>11:45</td>
<td>90%</td>
<td>30:00</td>
<td>90%</td>
</tr>
<tr>
<td>ERZ C</td>
<td>11:45</td>
<td>90%</td>
<td>30:00</td>
<td>90%</td>
</tr>
<tr>
<td>ERZ D</td>
<td>11:45</td>
<td>90%</td>
<td>30:00</td>
<td>90%</td>
</tr>
<tr>
<td>ERZ E</td>
<td>11:45</td>
<td>90%</td>
<td>30:00</td>
<td>90%</td>
</tr>
<tr>
<td>Moraga-Orinda Fire</td>
<td>10:00</td>
<td>95%</td>
<td>15:00</td>
<td>n/a</td>
</tr>
<tr>
<td>San Ramon Valley Fire</td>
<td>10:00</td>
<td>95%</td>
<td>15:00</td>
<td>n/a</td>
</tr>
</tbody>
</table>

EMS Responses by Emergency Response Area with Average Code 3 Response Times – 2009
(includes QRV responses)

<table>
<thead>
<tr>
<th>Response Area*</th>
<th>Total Responses</th>
<th>Code 3</th>
<th>Code 3 Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERAs 1, 2, 5(AMR)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ERZ A</td>
<td>9,768</td>
<td>7,863</td>
<td>6.08 min</td>
</tr>
<tr>
<td>ERZ B</td>
<td>10,579</td>
<td>7,984</td>
<td>6.69 min</td>
</tr>
<tr>
<td>ERZ C</td>
<td>26,187</td>
<td>19,140</td>
<td>7.05 min</td>
</tr>
<tr>
<td>ERZ D</td>
<td>15,595</td>
<td>11,076</td>
<td>6.97 min</td>
</tr>
<tr>
<td>ERZ E</td>
<td>8,704</td>
<td>6,693</td>
<td>8.72 min</td>
</tr>
<tr>
<td>ERA 3 (Moraga Orinda Fire)</td>
<td>1,962&lt;sup&gt;3&lt;/sup&gt;</td>
<td>1,468</td>
<td>6.36 min&lt;sup&gt;4&lt;/sup&gt;</td>
</tr>
<tr>
<td>ERA 4 (San Ramon Valley Fire)</td>
<td>5,060&lt;sup&gt;5&lt;/sup&gt;</td>
<td>3,795</td>
<td>6.92 min&lt;sup&gt;6&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Source: EMS Agency based on data provided by American Medical Response, San Ramon Valley and Moraga-Orinda Fire Protection Districts.

The EMS system received 77,872 requests for emergency ambulance response in 2009. Of these, 58,032 (74.5%) were considered to involve potentially life-threatening situations to which a Code 3 (red lights and siren) ambulance response was necessary. The remaining 19,840 (25.5%) ambulance responses were dispatched Code 2 (immediate response without lights and siren).

The level of ambulance response - ALS (paramedic) or BLS (EMT or paramedic) - to emergency medical requests is determined by the Fire/Medical Dispatch Center based on emergency medical dispatch protocols. BLS units are occasionally dispatched on Code 3 calls if paramedic units are not available. Of 58,032 Code 3 dispatches, a paramedic unit was dispatched on 57,999 (99.9%), and an EMT-I unit, on 33 (0.1%). Of the total responses, AMR ran 70,914 (91.1%), San Ramon Valley Fire Protection District, 5,021 (6.4%) and Moraga-Orinda Fire Protection District, 1,937 (2.5%).

<sup>1</sup> AMR must respond within 10:00 minutes to calls within non-rural designated areas of ERZ E either by ambulance or Quick Response Vehicle (QRV).

<sup>2</sup> Priority 1 calls in rural-designated areas of Bethel Island & Discovery Bay have 16:45 minute or less response times.

<sup>3</sup> Includes 25 responses into ERA 3 by AMR.

<sup>4</sup> Includes the Code 3 response times for the 11 AMR responses into ERA 3.

<sup>5</sup> Includes 39 responses into ERA 4 by AMR.

<sup>6</sup> Includes the Code 3 response times for the 28 AMR responses into ERA 4.
Not all ambulance responses result in patient transport. Of the 74,653 emergency ambulance responses (does not include QRV data) by American Medical Response, Moraga-Orinda Fire Protection District and San Ramon Valley Fire Protection District during the year, 58,292 (78.1%) resulted in patient transport to an emergency receiving hospital. Ambulances responding to the remaining requests were canceled either enroute or at the scene without the need for patient transport. Reasons for cancellation vary from poor information regarding patient severity, to the patient having been transported by other means such as private auto, to the patient refusing ambulance transport. In many instances a situation that was initially perceived to be a medical emergency has been resolved or stabilized by the time the transport ambulance arrives.

Of the 53,932 patients transported by AMR, 3,804 (7.1%) were transported Code 3, lights and siren and 50,128 (92.9%) were transported Code 2. Of the 3,106 patients transported by San Ramon Valley Fire, 214 (6.9%) were transported Code 3, lights and siren and 2,286 (73.6%) were transported Code 2.⁷

### 5-Year Emergency Ambulance Dispatch Summary

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
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<tbody>
<tr>
<td>All Ambulance Dispatches</td>
<td>70,867</td>
<td>72,849</td>
<td>75,209</td>
<td>69,473</td>
<td>77,872</td>
</tr>
<tr>
<td>Code 3 (lights/siren)</td>
<td>54,737</td>
<td>55,946</td>
<td>58,692</td>
<td>51,580</td>
<td>58,032</td>
</tr>
<tr>
<td>Code 2 (no lights/siren)</td>
<td>16,130</td>
<td>16,903</td>
<td>16,517</td>
<td>17,893</td>
<td>19,840</td>
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<tr>
<td>American Medical</td>
<td>63,406</td>
<td>68,392</td>
<td>68,209</td>
<td>67,585</td>
<td>70,914</td>
</tr>
<tr>
<td>Response</td>
<td>68,392</td>
<td>55,946</td>
<td>58,692</td>
<td>51,580</td>
<td>58,032</td>
</tr>
<tr>
<td>San Ramon Fire</td>
<td>5,815</td>
<td>4,457</td>
<td>5,516</td>
<td>6,785</td>
<td>5,021</td>
</tr>
<tr>
<td>Moraga-Orinda Fire</td>
<td>1,646</td>
<td>1,484</td>
<td>1,888</td>
<td>1,937</td>
<td>1,937</td>
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<tr>
<td>Transport</td>
<td>n/a</td>
<td>54,170</td>
<td>58,213</td>
<td>54,692</td>
<td>58,292</td>
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<tr>
<td>No Transport</td>
<td>n/a</td>
<td>18,679</td>
<td>20,025</td>
<td>14,781</td>
<td>16,361</td>
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<tr>
<td>Avg. Code 3 Response</td>
<td>n/a</td>
<td>7.45 minutes</td>
<td>7.40 minutes</td>
<td>7.12 minutes</td>
<td>7.11 minutes</td>
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<tr>
<td>Code 3 Responses Not</td>
<td>n/a</td>
<td>66</td>
<td>69</td>
<td>50</td>
<td>50</td>
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<tr>
<td>Meeting Staffing Standard</td>
<td></td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Source: EMS Agency based on data from American Medical Response and Moraga-Orinda Fire Protection Districts.

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⁷ Transport Code not available from Moraga-Orinda Fire Protection District
⁸ Less than 6 months data available from San Ramon Fire Protection District so data not included.
⁹ Data not available from Moraga/Orinda Fire Protection District.
B. First Responder Services

Most EMS responses involve dispatch of both first responder and ambulance units. Historically fire services have provided first response to medical emergencies. All firefighters are required by law to be trained in emergency first aid. Most fire services have implemented paramedic programs where firefighters licensed as paramedics respond on first responder units along with EMT-I's. Firefighters generally respond from the nearest fire station and are normally the first on the scene of a medical emergency. Eleven County-governed, independent district and municipal fire departments respond from a total of 69 fire stations within the County. Fire first responder services are now augmented in some remote areas of the County with four paramedic-staffed quick response vehicles (QRVs) deployed by American Medical Response.

First Responder Programs

Fire first responder paramedics provide a method for combining early advanced life support care with generally shorter response times provided by first responder units. Several models of paramedic first responder service are provided in Contra Costa. All first Responder Paramedic programs operate under base hospital medical direction as well as EMS Agency policies and procedures.

- Moraga-Orinda Fire Protection District

Moraga Fire Protection District has provided paramedic ambulance services since 1977. In 1988, the Moraga Fire District implemented an ALS Engine program, to back up the Moraga paramedic ambulance. An ALS Engine, staffed with at least one paramedic and one EMT-I and stocked with ALS equipment, is dispatched simultaneously with an ALS transport unit to emergency medical requests.

In 1997, Moraga Fire Protection District merged with Orinda Fire Protection District to form the Moraga-Orinda Fire Protection District. By 1999 all first responder units were staffed to provide paramedic advanced life support care.

- San Ramon Valley Fire Protection District

San Ramon Valley Fire Protection District has provided paramedic ambulance services since 1984. In 1997, San Ramon Valley Fire Protection District implemented a program under which minimum ambulance staffing was dropped from two paramedics to one paramedic and 1 EMT-I. This enabled the District to increase the number of stations with paramedic staffing and provided flexibility for responses of paramedic ambulances and paramedic engines for critical patients. A dispatch plan, based on Priority Dispatch Corporation’s Medical Priority Dispatch System, assures two paramedics are on scene when needed for certain categories of patients. In addition to the ambulances essentially all fire apparatus is stocked with advanced life support equipment and staffed with at least one paramedic.

- Contra Costa County Fire Protection District

In 1997, Contra Costa County Fire Protection District implemented a pilot first responder paramedic program in the Walnut Creek area with two engines staffed with one paramedic and two firefighters, and a “Medic Unit,” a non-transport vehicle staffed with one paramedic. Contra Costa County Fire has fully expanded its first responder paramedic program with 30 full-time paramedic units.
El Cerrito Fire Department
In 2001, El Cerrito Fire Department implemented an ALS program by providing a paramedic engine to cover the Kensington and El Cerrito hills where ambulance response times are typically over 10 minutes. An additional paramedic engine went into service on July 1, 2007 making a total of three paramedic engines in El Cerrito.

Pinole Fire Department
In 2005, Pinole Fire Department implemented a first responder paramedic program by providing a part-time paramedic-staffed engine. Both Pinole fire stations are paramedic-staffed full time.

Rodeo Hercules Fire Protection District
In 2004, Rodeo Hercules Fire Protection District implemented a first responder paramedic program by providing a part-time paramedic-staffed engine. As of January 2006, Rodeo Hercules is fully implemented with two full-time paramedic engines.

Crockett Carquinez Fire Protection District
Crockett Carquinez Fire Protection District offers a basic life support fire first responder program. American Medical Response provides paramedic first responder services within the District with a QRV.

East Contra Costa County Fire Protection District
The East Contra Costa County Fire Protection District offers a basic life support fire first responder program. American Medical Response provides paramedic first responder services within the District with three QRVs.

Richmond Fire Department
Richmond Fire Department offers a basic life support fire first responder program. To meet the countywide standard of assuring a paramedic to provide advanced life support on-scene within 10 minutes, American Medical Response responds with two paramedic-staffed ambulances within a 10-minute response time standard in the Richmond area.

Paramedic Quick Response Vehicles (QRVs)
The first paramedic-staffed non-transport QRV, funded by Measure H and provided by American Medical Response (AMR), was stationed in the Byron-Discovery Bay area in 1992 to provide timely paramedic response in a remote county area where response times could be extended. AMR assumed responsibility for the QRV program in 2004 and stationed four paramedic-staffed QRVs to provide a timely paramedic response in remote areas where fire services have not implemented paramedic first responder programs. Three QRVs are stationed throughout East County (Byron/Discovery Bay, Bethel Island and Oakley areas) and one QRV is stationed to augment paramedic first responder services in the Crockett, Rodeo-Hercules, and Pinole areas.
Public Safety Automated External Defibrillator (AED) Program

The first responder defibrillation program, established on a countywide basis in 1992, provides rapid access to life-saving care for patients with cardiac arrest. Initially the program was implemented in fire services, but many police departments have equipped squad cars with defibrillators, and as fire first responder units are enhancing their services with paramedics that carry manual defibrillators, AEDs are being moved to police agencies. AEDs are currently being carried on police units in Antioch, Brentwood, Danville, Hercules, Kensington, Lafayette, Moraga, Orinda, Pittsburg, San Ramon, Pleasant Hill, and Blackhawk. AEDs are also carried by fire services in Crockett-Carquinez, Richmond and East Contra Costa County.

Emergency Medical Guidelines for Law Enforcement Agencies

Emergency Medical Guidelines For Law Enforcement Agencies were first developed and implemented in 1992 following approval by the County Police Chiefs' Association and the Emergency Medical Care Committee. These guidelines, updated in 2002, provide direction to law enforcement personnel when they are the first to arrive on the scene of a medical emergency. The guidelines address the medical aspects of the officer's responsibility.

C. Dispatch and Communications

Medical Emergency & Disaster Ambulance Radio System (MEDARS)

MEDARS is the County radio system used for ambulance-to-hospital and for Sheriff's Dispatch-to-ambulance communications. This radio system includes four channels. XCCEMS1 is used for communications between ambulances and Sheriff’s Dispatch. XCCEMS2, XCCEMS3, and XCCEMS4 are for ambulance-to-hospital communications.

Priority Dispatching

Emergency Medical Dispatch (EMD) is a process where EMS dispatchers screen calls to provide appropriate EMS first responder and ambulance response, and provide emergency medical instructions for the caller to initiate prior to arrival of EMS personnel. In 1993, Medical Priority's ProQA Dispatch System was piloted in the San Ramon Valley Fire Protection District's dispatch center. By 2000, all fire/medical dispatch centers provided fire/ambulance dispatch utilizing this system. The National Academy of Emergency Medical Dispatch accredits dispatch agencies that use the Medical Priority Dispatch System and meet high standards of utilization, evaluation and education as “Centers of Excellence.” All three public safety medical dispatch centers within Contra Costa County have achieved the “Center of Excellence” accreditation.

Fire Radios

Hi-band mobile radios, programmed with existing fire service radio channels, have been installed in most paramedic units to facilitate communication among paramedics, fire dispatch centers, and fire first responders.

Message Transmission Network (MTN)

MTN is a computer network designed to interconnect County's fire/medical dispatch centers, Sheriff's dispatch, and AMR dispatch. Currently, the MTN system is in use at Contra Costa Fire Dispatch and AMR Dispatch and in 2005 handled about 70% of all EMS dispatches countywide. Richmond Police Dispatch implemented the MTN system in June 2006. By establishing a direct data link among the computer-aided dispatch systems, MTN decreases dispatch time, reduces dispatch errors, and provides system response data. MTN uses the All
County Criminal Justice Information Network (ACCJIN), which provides an existing linkage among 9-1-1 answering points using similar protocols (TCP/IP) to those used on the Internet.

**ReddiNet**

The ReddiNet system, implemented locally in 2001, is a proprietary system for networking hospitals and county central points for the purpose of sharing information of hospital status and other important information related to the EMS system, multicasualty incidents, and disasters. The system, initially designed as a microwave communications link between hospitals, is now also available on the Internet. Hospitals and EMS Agencies in Contra Costa, Alameda, Solano, Marin, Lake, Humbolt, San Luis Obispo, Santa Barbara, Venture, Kern, Los Angeles, Orange, San Bernadino, Riverside, and Imperial counties are now using the ReddiNet system. ReddiNet implemented a new version of its system in early 2009. This new system has improved functionality, increased bed capacity assessment, a modified assessment screen, and will use an information-secure satellite for continuous and improved communications.

In Contra Costa County, Sheriff’s Dispatch is the coordination point, and dispatch centers for all three emergency ambulance providers participate. On a day-to-day basis, hospitals can receive alert notices and timely incident updates from EMS and Sheriff’s Dispatch, can post hospital CT or internal “physical plant casualty” diversion and “census alert” status, and can send any important message to other hospitals individually or as a group. During multicasualty incidents, ReddiNet facilitates reporting of hospital information, tracking of ambulance assignments, and patient information. During a major disaster, ReddiNet is designed to provide a reliable communication path between hospitals and the counties’ disaster operation centers. Periodic drills with the hospitals using ReddiNet provide practice in using this important communications tool.

**D. Helicopter Transport**

Operational Procedures for patient transport by helicopter were originally developed during trauma system planning in 1985/1986. Most local helicopter transports are for trauma patients from distant areas of Contra Costa County to John Muir Trauma Center in Walnut Creek. Doctors San Pablo has a helipad that may be used as an ambulance/helicopter rendezvous point. The County’s standard of care for emergency patients transported by air is by "air ambulance" staffed with two ALS care providers. Rescue aircraft are also requested for special resources. As an example, a California Highway Patrol helicopter has been used for its hoist capability. Additionally, a formal procedure for access of military aircraft has been adopted.

In 2009 there were 257 transports of local patients by helicopter, almost exclusively to trauma centers. CALSTAR transported 163 patients (63.4%); REACH 86 patients (33.5%); CHP 7 (2.7%) and other providers 1 (0.4%). John Muir Trauma Center was the major receiving facility for 209 patients (81.3%), Children’s Trauma Center received 30 patients (11.7%), and 18 patients (7.0%) were transported by helicopter to other out-of-county trauma centers.

Local authorized air ambulance helicopter providers, CALSTAR and REACH, are dispatched on a daily rotation schedule and perform nearly all helicopter transports in the County.
E. Hospital Emergency Services

The nine California licensed acute care hospitals located in Contra Costa have emergency departments that provide service 24-hours/day, seven-days/week, and serve as receiving facilities for patients transported by emergency ambulance. The emergency department staffs include at least one physician, trained and experienced in emergency medicine, one or more specialized registered nurses, plus clinical and clerical support staff. Specialty physicians are generally available for consultation on patients in the emergency department “on-call,” from their offices or home.

<table>
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<tr>
<th>Hospital Name</th>
<th>Address</th>
<th>Acute Care Beds</th>
<th>Intensive Care Beds</th>
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<tr>
<td>Contra Costa Regional Medical Center</td>
<td>2500 Alhambra Avenue Martinez, CA 94553 925-370-5000</td>
<td>164</td>
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</tr>
<tr>
<td>Doctors San Pablo</td>
<td>2000 Vale Road San Pablo, CA 94806 510-235-7000</td>
<td>232</td>
<td>29</td>
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<tr>
<td>John Muir Health, Walnut Creek</td>
<td>1601 Ygnacio Valley Road Walnut Creek, CA 94598 925-939-3000</td>
<td>321</td>
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<tr>
<td>John Muir Health, Concord</td>
<td>2540 East Street Concord, CA 94524 925-682-8200</td>
<td>254</td>
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<tr>
<td>Kaiser Medical Center, Antioch</td>
<td>4501 Sand Creek Road Antioch CA 94531</td>
<td>130</td>
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</tr>
<tr>
<td>Kaiser Medical Center, Richmond</td>
<td>1330 So. Cutting Blvd. Richmond, CA 94801 510-307-1500</td>
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<tr>
<td>Kaiser Medical Center, Walnut Creek</td>
<td>1425 South Main Street Walnut Creek, CA 94596 925-295-4000</td>
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<tr>
<td>San Ramon Regional Medical Center</td>
<td>6001 Norris Canyon Road San Ramon, CA 94583 925-275-9200</td>
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<tr>
<td>Sutter Delta Medical Center</td>
<td>3901 Lone Tree Way Antioch, CA 94509 925-779-7200</td>
<td>111</td>
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</table>

Annual Hospital Capabilities and Resources Assessment

During 2009 Contra Costa EMS identified significant reductions in our county-licensed pediatric general care capacity resulting in the availability of 15 beds. With over 250,000 children < 18 years of age, this leaves Contra Costa County with one of the highest ratios of children to licensed pediatric hospital beds in the state. Dramatic reductions in pediatric bed capacity have occurred throughout Northern California resulting in community hospitals placing a heavy reliance on major pediatric referral centers. Contra Costa and Alameda County EMS agencies are working to address these resource issues and support a regional approach to improving pediatric inpatient capabilities in our community hospitals.
Internal Hospital Status Assessment and H1N1 HAvBED reporting

At the end of 1997, and into the first quarter of 1998, Contra Costa experienced an acute shortage of ED and critical care resources. This phenomenon was felt in surrounding counties and throughout much of the State. As a result, in 1998 Contra Costa hospitals worked in conjunction with the Hospital Council and EMS Agency to develop a framework for hospital response to scarcity in staffing, equipment, and/or bed capacity. Each hospital has internally integrated the Hospital Census Alert System for shortages in its facility. Starting in 2001, hospitals report their census alert status daily on the ReddiNet system. In September of 2009 this system was adapted to deal with the H1N1 pandemic. The State EMS Authority and the California Department of Public Health (CDPH) rolled out federally-mandated HAvBED assessment polling that was conducted weekly during periods of intense H1N1 activity in the county. This mandate required all facilities to comply using the ReddiNet system. The process and participation was supported and monitored by local EMS Agency personnel. The majority of our facilities successfully participated with the weekly reporting.

Results from the HAvBED assessment reports demonstrated that all facilities experienced periodic emergency department surge up to 30% of normal emergency department volumes at intervals but remained open accepting patients. To accomplish this, many facilities deployed triage tents outside of emergency departments to accommodate the surge of patients. Significant gaps in pediatric inpatient capacity were also identified. Contra Costa’s pediatric referral hospital, Children’s Hospital Oakland in Alameda County, was severely impacted numerous times during H1N1 pandemic in the fall of 2009. Phone triage protocols were reviewed and enhanced. The EMS Agency coordinated H1N1 communications and guidelines as part of a strong strategy of consistent community messaging orchestrated between Contra Costa Public Health and Contra Costa Acute Care Hospitals.

Patient Handoff at Hospital

Quarterly reporting of “drop time” or prehospital to emergency department handoff was established to provide hospital specific data. The local system performance trigger measures patient drop times greater than 45 minutes. This trigger is designed to measure significant patient drop time delays with the highest potential to impact patient safety and/or EMS system response. Data measured represents calculations between prehospital arrival time at the facility and the time the unit is available. This is a limited and imperfect measure that is most valuable in measuring trends (overall increases and decreases over time).
Offload or drop times are influenced by many factors, some outside of control of the providers immediately involved. Fundamental to the objective of decreasing offload/drop times is the ability for the inpatient areas to admit emergency department patients in a timely manner. All hospitals have JCAHO-mandated programs in place to improve Emergency Department patient throughput/admission which based on our data has had a positive effect on reducing emergency department offload times even during the peak of H1N1 season, which is remarkable. Contra Costa County EMS is committed to provide more accurate data points to measure the exact time of patient handoff to the emergency department providers in the future.

F. STEMI System

On September 9, 2009 Contra Costa EMS celebrated its first anniversary of the launch of its STEMI (ST-Elevation Myocardial Infarction) Program. This program provides enhanced ability of paramedics to identify high-risk heart attack in the field using a 12-lead ECG device and triaging patients to STEMI receiving centers for life-saving cardiac catheterization interventions.

Initially five hospitals implemented STEMI programs: Doctors Medical Center San Pablo, John Muir Health in Concord and in Walnut Creek, Kaiser Permanente Medical Center Walnut Creek, and San Ramon Regional Medical Center. On August 17, 2009 Sutter Delta Medical Center became a STEMI Receiving Center filling an important gap in the demographics of the Contra Costa STEMI System. The Contra Costa STEMI System is further enhanced with the recognition of two out-of-county STEMI Centers. These are ValleyCare in Pleasanton and Alta Bates Summit Medical Center in Oakland. Both facilities are Alameda County approved STEMI Receiving Centers.

The challenges of managing a STEMI System are many as numerous providers must act in a coordinated way to have the best outcomes. The national goal for door-to-intervention for walk-in emergency department patients is 90 minutes. During 2009, 117 out of 200 patients traveled through the Contra Costa STEMI System, and of those 88 cases went to immediate cardiac intervention (PCI) with field activation. STEMI systems facilitate field activation of emergency department and cardiac intervention personnel essentially giving them a “heads-up” and saving precious heart muscle saving time. “Time is Muscle” is the bottom line in all STEMI Systems.

Data on sudden cardiac arrest, using the Utstein template (a special cardiac arrest scoring system), is being collected and evaluated. Contra Costa EMS has joined the CARES (Cardiac Arrest Registry to Enhance Survival) Program, a collaborative effort of the Centers for Disease Control and Prevention (CDC), the American Heart Association, and the Emory University Department of Emergency Medicine, Section of Prehospital and Disaster Medicine. The goal of the CARES program is to establish a model of unifying all essential data elements from three independent sources, which currently record fractured data of a single, cardiac arrest event. The CARES system builds this model by establishing a relationship with emergency medical services agencies, hospitals, and computer-aided dispatch (CAD) systems. Involvement with the CARES program will enhance the data collected, streamline the collection of outcome data, identify who is affected, when and where cardiac arrest events occur, which elements of the system are functioning properly and which elements are not, and how changes can be made to improve cardiac arrest outcomes as well as allowing for external benchmarking with similar systems across the United States.
Contra Costa STEMI System performance in 2009 has been outstanding based on all current performance measures. In particular are the system door-to-intervention (PCI) times which average 54 minutes, with 100% meeting of patients meeting the less than 90-minute performance measure. When field activation is compared to emergency department walk-in activation our third quarter 2009 data demonstrated that field activation resulted in 17 minutes faster cardiac intervention times compared to patients walking into the emergency department.

In April 2009 a national study of STEMI systems was published (Rokos, et. al). Contra Costa benchmarked itself against all performance indicators measured in this study and found that we excelled in all areas further validating the significant accomplishments of our strong team of stakeholders supporting the Contra Costa STEMI System.
However, in spite of this outstanding performance local data demonstrates that >60% of Contra Costa STEMI patients take themselves to an emergency department instead of calling 9-1-1. One of the key missions of STEMI System’s is to build a strong public education component supporting awareness of heart attack signs and symptoms and the importance of early access of 9-1-1. Contra Costa STEMI System will be working in collaboration with the American Heart Association, Mission Lifeline to meet the challenge of improving community use of 9-1-1 whenever chest pain occurs.

The Contra Costa County EMS Agency participated in the successful Society of Chest Pain Accreditation Site Visit of John Muir Medical Center Concord and Walnut Creek Campuses in July of 2009. During the visit the Society of Chest Pain Accreditation director commented that our STEMI System had “some of the best metrics in the country.” Contra Costa STEMI System has become a “high performance STEMI system” which is a credit to each provider involved in the care of these high-risk patients throughout our community.

For more information on Contra Costa STEMI System visit the STEMI webpage at www.cccems.org.

G. Trauma System

In 1986, the Board of Supervisors approved a comprehensive Trauma System Plan for the County and designated John Muir Medical Center (Walnut Creek) as the County's Level II Trauma Center, and in June of that year, ambulance personnel began transporting critical trauma patients directly to John Muir, Walnut Creek. Ambulance and base hospital personnel use triage protocols, which include evaluation of mechanisms of injury and anatomic factors as well as a physiologic trauma scoring system to identify critical trauma patients. In 2001, a revised trauma system plan was developed to meet new State trauma system planning requirements.

In 2009, 2,381 patients were identified as requiring trauma triage, 1,108 of which were transported directly to John Muir Trauma Center. One hundred eight patients were transported to Children’s Hospital Oakland, and 29 to out-of-county adult trauma centers, primarily Eden Hospital, Castro Valley and Highland Hospital, Oakland. Patients in traumatic full arrest or whose airway cannot be managed are triaged to the closest basic
emergency department for resuscitation. During the past 23.5 years of operation, more than 64,000 patients have been triaged through the County trauma system.

In 2009, the definition of “Major Trauma Victim” (MTV) was modified in the system to include only patients with an Injury Severity Score (ISS) of greater than 15. Injury Severity Score is a standardized retrospective assessment of the level of severity of injury. Previously, patients with ISS score of 10-14 with length of stay of three days or more were also considered MTV’s. This new definition is the one utilized by most trauma systems across the nation.

Critically injured patients who arrive at non-trauma center hospitals may be transferred to trauma centers. Ninety-two of 214 injured patients transferred to John Muir, Walnut Creek from within Contra Costa were retrospective MTVs per the new definition.

John Muir Trauma Center also received 329 trauma patients from surrounding counties, generally by air transport. One hundred thirty-one of the injured out-of-County patients were retrospective MTVs.- In particular, John Muir Trauma Center receives a significant number of trauma victims from neighboring Solano County as triaged pursuant to Solano County EMS policy. In 2009, Solano County patients comprised 17.6% of trauma patients transported to John Muir Trauma Center.

Patients with more serious injuries increasingly have been noted to be in older age groups (65 and over). Triage of elderly patients is more difficult and remains a problem throughout the nation because their presentation is frequently much more subtle, with more minor mechanisms of injury (primarily falls). Many have overlying medical issues that cloud the ability to determine if their symptoms and findings are truly related to trauma. With increasing aging of the populations, this issue will likely become more prominent and is a focus for ongoing study and improvement in our system. In 2009, 208 patients age 65 and older were transported and treated at John Muir Trauma Center as part of the trauma system. From 2000 through 2007, patients 65 and older represented 10.4% of trauma patients. This increased to 11.2% in 2008 and to 13.3% in 2009. Mortality in patients 65 and older is more than four-fold greater than in patients under 65 (17.1% versus 3.7% from 2000 to 2009) and these patients clearly represent a high-risk group.

Appropriate triage of patients who merit call-in to the base hospital for triage continues to occur in the overwhelming majority of cases (only 28 undertriage cases of 1,097 that were triaged in 2009). However, there is an increasing trend of undertriage among patients, particularly the elderly, who are transported to receiving facilities without a base call for triage. From 2007-2009, 22% of undertriages in patients age 65 and older had base call-in, whereas 78% were transported to receiving facilities without a base call, supporting the concept that detection of significant injury in the field is more challenging in elderly patients. For patients under 65, 45% of undertriages occurred following a base call, while 55% occurred without a base call.

Head injury triage also represents a significant challenge for accurate triage. Undertriage cases involve head injury more than any other organ system (68% of all undertriages from 2005-2009). Further study of these cases is occurring and potential improvements are also being planned.

If trauma center resources are temporarily overwhelmed, the trauma center may consider “Trauma Center Bypass,” directing any critical trauma patients to out-of-County trauma...
centers until resources are again available. In 2009 John Muir Trauma Center bypass rate was 0.9%.

**Trauma System Evaluation**

A major aspect of the trauma system is an extensive trauma system and trauma center monitoring program. Part of this program is a unique, bi-county audit system called the Trauma Audit Committee (TAC) held in conjunction with Alameda County EMS and Alameda County trauma centers. This review process has been in place since the inception of the County trauma system. Trauma surgeons from other California trauma systems also participate in the trauma system evaluation and monitoring process, bringing outside perspectives and the additional expertise from teaching facilities.

Historically, selection of cases to be presented at TAC meetings was done through the Pre-Trauma Audit Committee (PreTAC) meetings. Trauma Surgeon Directors on a rotating basis traveled to another of the four trauma centers to review care (chart review) provided trauma patients. In 2005 a new case review selection process was implemented which provided for Trauma Surgeon Director case review off site. The PreTAC continues to review EMS system issues related to trauma care.

John Muir Trauma Center also has its own internal monitoring and evaluation systems coordinated by an RN Trauma Program Coordinator. The Coordinator meets weekly with nurses, social service, physical therapists, neuropsychology, rehabilitation, nutritional services, pastoral care and patient accounting to analyze patients on the trauma service from a multidisciplinary perspective.

The Trauma System Plan for Contra Costa EMS was approved and updated in March of 2009 and submitted to EMSA in the fall of 2009. Feedback from EMSA is still pending and will be reviewed and considered as part of future Trauma System Plan updates.

**Trauma Injury Prevention**

John Muir Trauma Center supports an active injury prevention program that includes a prevention program for the elderly (falls and medication use); car seat inspections; school-based presentations; participation in health fairs; and representation on a number of injury prevention organizations, target groups and committees. John Muir Injury Prevention has received National Awards of Recognition for its programs and service to the community including recognition for the development of “Nurses & Cops Caring for Contra Costa Children,” which provides free car seat inspections in all areas of Contra Costa throughout the year.

**H. EMS for Children Program**

In 1999, the EMS Agency obtained a two-year grant to develop and implement a local EMS for Children (EMSC) program. An EMSC Plan was adopted in 2001 and was integrated into the County’s EMS System Plan. Hospital-related EMSC issues are addressed through the EMS Facilities and Critical Care Committee. EMS staff actively participate on the EMS Authority’s EMS for Children Committee and the Contra Costa Child Death Review Team (CDRT). During 2008 a complete re-evaluation of the Contra Costa EMS for Children Program was completed with 100% participation of stakeholders. The evaluation revealed that goals and objectives set in 2001 were met or exceeded. Opportunities for improvement in the areas of pediatric disaster and surge preparedness, child injury prevention, and prehospital training in pediatrics were identified.

During 2009 gaps in our EMS for Children program began to be addressed and included:
EMS Agency and stakeholder participation in regional EMSC conference on pediatric disaster preparedness in April 2009.

Web posting and dissemination of evidenced based pediatric surge and disaster preparedness resources to stakeholders.

Evaluation of inpatient capabilities for pediatric surge preparedness and access to pediatric critical care resources such as ECMO\(^\text{10}\) and High Frequency Jet Ventilation\(^\text{11}\) due to the H1N1 pandemic.

Assessment of Regional Pediatric Referral Center resources for critically ill children.

Consultation with CDPH Licensing and Certification as to strategies for pediatric inpatient bed expansion in the event of pediatric surge associated with H1N1.

Development of a pediatric H1N1 projection model to anticipate the number of potential pediatric ED visits, inpatient and critical care patients affected by H1N1.


Participation in Child Injury Prevention Coalition- Bay Area supporting a network of child injury prevention efforts in Contra Costa and Alameda Counties.

Participation in the development and distribution of “2009-2010 Keeping safe from injury calendar” in conjunction with Children’s Hospital and Research Center Oakland to key agencies supporting pediatric injury in the Contra Costa community.

Stakeholder meetings to address limitations in current pediatric capabilities of community hospitals.

Ongoing representation and active participation on State EMS for Children Program Technical Advisory Committee Coordinator Group.

The EMSC 2009 program evaluation and plan was submitted to the EMS Authority in December 2008. Activities of Contra Costa EMSC program will support identified opportunities for improvement. The full report and slide presentation are available at www.cccems.org under the EMSC webpage.

I. Medical Oversight

Contra Costa Health Services’ EMS Division staff includes a full-time EMS Medical Director to provide medical control and to assure medical accountability throughout the planning, implementation and evaluation of the EMS system. Medical control is provided prospectively through credentialing activities as well as EMS policies, procedures and field treatment guidelines; concurrently through standing orders and consultation available through the local designated base hospital; and retrospectively through quality assurance activities including ongoing training.

**Base Hospital Services**

John Muir Health, Walnut Creek provides direct (on-line) and indirect (retrospective review) medical oversight services for ambulances countywide. John Muir Base also provides trauma triage for ambulances transporting possible major trauma victims. In 2009 there were 2,966 base hospital contacts by field personnel.

**Field Treatment Protocols**

First responders, paramedics, EMTs, and base hospital personnel use EMS Field Treatment Guidelines to provide care to patients in the field. These guidelines, based on

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\(^{10}\) ECMO is a heart lung device used in the most critical patients with pulmonary complications associated with H1N1.

\(^{11}\) High Frequency Jet Ventilation is a special ventilator used in patients with complex pulmonary disease.
current research and medical need in the County, are reviewed and evaluated by the Medical Advisory Committee that makes recommendations to the EMS Medical Director for implementation. Field treatment protocols are reviewed and revised on an ongoing basis. During 2009 major changes occurred in the format and content of the prehospital care protocols to make them easier to use and to support a pocket-sized Field Manual. The creation of the new Field Manual was completed in consultation with the Medical Advisory Committee.

J. Quality Improvement (QI) Program

Following an assessment of local EMS System QI resources and processes in 2007, goals and objectives were established to build a comprehensive Quality Improvement Program for the Contra Costa EMS System over the next two-three years. The year 2009 marked the final year to achieve the goal of establishing the infrastructure to support a comprehensive QI Program for the EMS System. This goal has been met resulting in an active program of QI activities and processes supporting improved compliance with state and local EMS standards and guidelines. These include:

1. Consistent quarterly reporting of selected EMS System performance measures and EMS Patient Safety Reporting systems
2. Engaged EMS stakeholders fully participating in patient safety and CQI performance reporting.
3. Quarterly stakeholder CQI Meetings to review EMS system performance.
4. Successful implementation of STEMI system CQI processes allowing stakeholders to participate in an active system of continuous improvement focused on clear performance measures. Implementation of the STEMI System had a halo affect that further improved QI relationships and information sharing between prehospital and hospital providers.
5. QI program engagement in the use of technology solutions to improve efficiencies within the EMS system; and identifying and exploring electronic patient reporting and data infrastructure issues necessary to support EMS system performance assessment.
Summary of 2009 Quality Improvement Accomplishments

- Contra Costa EMS QI Plan and toolkit recognized by EMSA and National Association of State EMS Officials as a resource posted on their websites.
- All 2009 QI program goals were met or substantially met.
- Quarterly QI meetings and activities-focused on supporting stakeholder CQI competency.
- Biannual EMS system performance reporting incorporated into QI, MAC and EMCC.
- Publication of five issues EMS Best Practices Newsletter.
- Quarterly EMS stakeholder QI activity and performance reporting.
- Core Data Indicators identified and report building for prehospital skills, ePCR completion and ED drop times reported quarterly to stakeholder groups.
- Expanded Data Advisory Group activities to facilitate EMS system data management, performance indicator selection and supporting ZOLL ePCR and MEDS upgrades.
- Full implementation of CARES demonstrating significant improvement in cardiac arrest survival rates.
- Ongoing implementation of best practice SBAR communication model for base contact, patient handoff in the field and at the hospital.
- EMS website enhanced with QI, STEMI, EMSC, Fire EMS Training Consortium and Infectious Disease content.
- Ongoing active electronic Patient Care Record (ePCR) data used to support decision making on protocol and treatment guideline update and revision.
- Expanded Virtual Advisor program to provide input used to conduct pain assessment study to exploring root causes and gaps in prehospital provider compliance in pain assessment.
- Successful management of STEMI system with rigorous QI oversight.
**EMS Patient Safety Reporting**

During 2008 the EMS Agency implemented a redesigned best practice patient safety reporting program (EMS Event Reporting and Provider Recognition Program). EMS event reporting is a non-punitive patient safety-reporting program that supports EMS provider agency accountability and corrective actions while providing clear mechanisms to report patient or provider safety events within the EMS system. The program captures characteristics of events supporting objective root cause analysis while enabling the collection of aggregate patient safety and provider recognition data throughout the EMS system. Implementation required educating all EMS system providers, receiving facility providers and CQI coordinators to the new program. During 2009:

- Fifty-nine EMS events were reported. Forty-nine events were patient safety related, 10 exemplary care and three EMS provider safety events.
- Patient safety event reporting represented 0.1% of all patient contacts.
- Patient safety reporting improved 33% since 2007 under the new program but continues to need encouragement to capture events for review.
- Fifty-nine percent of patient safety events were communication related. National statistics demonstrate that communication is a key factor in 65-85% of sentinel events.
- Sixty-four percent of patient safety events were interagency up from 37% in 2008.
- Five percent (three cases) were found to be unsubstantiated, 5% (three cases) were great catches, also known as near miss reports).
- One-hundred percent of reported events were closed by EMS with appropriate follow-up and corrective action.
- Forty-one percent (24 cases) identified a recurring issue that prompted review of protocols, procedures and training.
- Average time for EMS to review and close case was 11 days with 10 cases taking greater than 20 days for investigation and follow-up.

In 2009 Contra Costa EMS was contacted by the Missouri Center for Patient Safety which was evaluating our EMS Event Reporting program as a best practice approach to patient and provider safety reporting. The program will also be recognized in an industry textbook on EMS Risk Management being published in 2010.

**K. Certification Programs**

**Paramedics.** Paramedics are licensed by the State of California and are accredited by the local EMS Agency to practice in each county or EMS region in which they are employed. In 2009, 248 paramedics were either accredited or re-accredited by the Contra Costa County EMS Agency to practice as paramedics locally.

**EMT-Is.** Any local EMS Agency may certify EMT-Is within the State. Once certified, an EMT-I may function as such statewide. In 2009, 507 EMT-Is were certified/recertified locally.

**MICNs.** In 2009, 24 MICNs were reauthorized/reauthorized in Contra Costa to practice in the expanded MICN role locally.
L. Training Programs

Local EMS Agencies are required to review and approve training programs for prehospital personnel as meeting all requirements established by State regulations.

**Paramedic Training Program.** There is no local paramedic program provider currently.


- Los Medanos Community College offers EMT training each semester (Pittsburg campus).
- Contra Costa College offers EMT training each semester (San Pablo campus).
- Mt. Diablo Adult Education offers EMT training throughout the year (Concord facility).
- Richmond Professional Black Firefighters offers EMT training periodically (Richmond facility).
- Fire services offer training and continuing education to their in-house personnel.

**MICN Training Program.** John Muir, Walnut Creek offered one three-day MICN training in 2009.

M. Public Information Education Program

Emphases of the EMS agency public information and education efforts are on techniques and first-aid skills that the public can utilize in emergency situations - CPR and public access defibrillation (PAD) specifically, as well as EMS system access, recognition of life threatening situations, and prevention of injuries. Initially in 2005, EMS distributed 42 Automatic External Defibrillators (AEDs) to public agencies within the County. This project included site selection, CPR/AED training to 121 staff members from various sites and AED orientations/demonstrations for the supplemental staff. EMS is now working with American Medical Response to assist with distribution of 25 AEDs annually.

As of December 31, 2009 there are 355 public access defibrillators registered in the EMS Agency database. The goal is to provide defibrillation to a victim of sudden cardiac arrest within three minutes of collapse.

CPR class information accessible through the EMS Agency maintained 1-800-GIVE-CPR number advertised in local telephone books. CPR class availability is posted on the EMS Agency website. The new 1-800-GIVE-CPR number answering message offers the caller a callback and refers the caller to the EMS Agency website where a listing of CPR providers in Contra Costa is provided. Since this change has occurred, the number of callers requesting callbacks has decreased dramatically.

- A Contra Costa EMS 9-1-1 brochure is available for distribution.
- PAD packets containing brochures and information necessary to implement a Public Access Defibrillation Program.
- EMS provides speakers for a number of community organizations such as Rotary Club, acute care receiving and skilled nursing facilities, and school districts.
N. HeartSafe Community Program

A “HeartSafe Community” is a community where all elements of the Chain of Survival are in place - “Early Access,” “Early CPR,” “Early Defibrillation,” and “Early Advanced Care.” The EMS Agency and the American Heart Association are partnering with communities in Contra Costa County to improve the cardiovascular health of the citizens of that community and to increase the chances that anyone suffering a cardiovascular emergency - heart attack, stroke, or cardiac arrest - would have the best possible chance for survival. For more about this program see “Issues in the Forefront.”

O. Fire EMS Training Consortium

The Fire EMS Training Consortium, formed in 2005, has been an active partner in providing standardized training for fire first responders and BLS and ALS ambulance personnel countywide. The Consortium is committed to the values of quality, teamwork and innovation supporting excellence in county-wide training and curriculum and serves some 1,000 EMS providers within Contra Costa County.

The Consortium’s Mobile Training Simulation Program includes the MetiMan and PediaSim patient simulators with AMR supplying transport and simulator support. In 2008 the patient simulator provided an average of 107 training hours per month. A reduction of use hours occurred in 2008 due to scheduling difficulties with two of the fire agencies.

The pediatric patient simulator was added to the program in 2008 and enhancement of the program with an infant simulator is planned for 2010. Simulator maintenance and repair did require the MetiMan adult simulator to be unavailable for a several weeks during 2009. MetiMan and PediaSim training has been supported by AMR, which transports and maintains the devices. During 2009 simulation training experience using these devices was rated as 48% good to excellent. Simulation moulage, instructor METI expertise and device function during trainings are the most significant factors in provider training satisfaction.

An annual Fire EMS Educational Needs Assessment was conducted April-June 2009. There was a 27.6% return rate with 32% of EMTs and 22 % of paramedics in the county participating. Top skills learning needs identified in the survey included CPAP, SBAR handoff, EndTidal CO2 monitoring, pediatric assessment and ePCR documentation. Top training needs included adult burns and trauma, MCI and Incident Command, pediatric emergencies, and special-needs kids. Results of the annual needs assessment are used to plan training curriculum for the upcoming year.
In 2009 needs assessment results from 2008 were addressed in the development of four new prehospital best practice training modules developed and implemented by Fire EMS Training Consortium Faculty. These included:

- Quarter 1 2009: OB Emergencies and Helicopter Utilization
- Quarter 2 2009: Neurological Emergencies and Street Drugs
- Quarter 3 2009: Pediatric Pain and Field Decontamination
- Quarter 4 2009: EMS Update-Field Manual, New protocols, STEMI

Contra Costa EMS Agency supported the acquisition of the following resources for enhanced education and competency training of our EMS providers:

- 2010 Field Manual development, printing and distribution
- METI Simulation program maintenance funding
- MUSE software for enhance METI simulation training
- Infant Meti Simulator

## P. Interfacility Transfer Paramedic Program

In 2002 an interfacility transfer paramedic program (Critical Care Transport-Paramedic - CCT-P) was developed to provide an alternative means of transferring stable patients who require, or may require, care within the CCT-Paramedic Scope of Practice during transfer. CCT-P units were initially used to transfer patients from acute care hospitals to other acute care facilities. Policies enacted in 2004 permitted CCT-P units to be used by outpatient clinics to transport patients to acute care hospitals. The EMS Agency authorizes and contracts with interested ambulance companies that meet the training, staffing, equipment, and oversight requirements.

### 2009 Interfacility Transfer Paramedic Program (CCT-P)

<table>
<thead>
<tr>
<th>Interval</th>
<th>Months</th>
<th>Number of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quarter I</td>
<td>Jan-Mar</td>
<td>183</td>
</tr>
<tr>
<td>Quarter II</td>
<td>Apr-June</td>
<td>198</td>
</tr>
<tr>
<td>Quarter III</td>
<td>July-Sept</td>
<td>146</td>
</tr>
<tr>
<td>Quarter IV</td>
<td>Sept-Dec</td>
<td>99</td>
</tr>
<tr>
<td><strong>2009 Totals</strong></td>
<td><strong>YTD</strong></td>
<td><strong>626</strong></td>
</tr>
</tbody>
</table>

CCT-P units are fully-equipped advanced life-support ambulances, staffed with a minimum of two qualified staff that includes at least 1 paramedic. CCT-Ps have an expanded scope of practice and the transferring physician specifies standing orders for patients based on skills and medications within the CCT-P scope of practice.

In 2003 Contra Costa and Alameda Counties signed a reciprocal agreement allowing interfacility transfer paramedics to respond and transport patients throughout both Counties. In 2007 there was a significant expansion of the CCT-P scope of practice to include additional new medications and intravenous infusions, and blood/blood products. Since then the CCT-P program has been used within Contra Costa and continues to provide critical services to the acute care patients who require intrafacility transfer in our community.
Q. Do–Not-Resuscitate Program (DNR)

A DNR program for patients with terminal medical problems was implemented in 1993. This program evolved in response to concern from the public over a patient’s right to self-determination. The Do-Not-Resuscitate program allows patients, in conjunction with their physicians, to refuse resuscitative measures in the prehospital setting, even if the 9-1-1 system is inadvertently activated. The DNR form is signed by both the patient and the patient’s physician and is recognized by prehospital personnel statewide. The DNR form provides prehospital personnel with a physician order to not resuscitate the patient. Comfort measures and care other than resuscitative measures are still provided by first responders and ambulance personnel. The EMS Agency has distributed thousands of DNR forms to individuals, hospitals, nursing homes, hospices, home health agencies, and private physicians throughout the County. Patients can alert rescuers of their DNR status by wearing Medic Alert or similar jewelry.

In January 2009 a new form was implemented throughout the State. The form, “Physician Orders for Life-Sustaining Treatment” (POLST), is intended to allow patients whose life span is limited to communicate their treatment wishes in the form of a physician’s order. The form allows for choices beyond Do Not Resuscitate, however its use is limited in the prehospital setting given the paramedic and EMT scopes of practice. It does allow for limited additional interventions, e.g. intubation to be withheld.

R. Customer Satisfaction

Customer service is a high priority for the Contra Costa Emergency Medical Services Agency and we are always looking for ways to improve the services we provide. A major office function on a day-to-day basis is the credentialing of EMT-Is and Paramedics. In 2007 we created a survey for collecting feedback from these and other customers in order to ensure optimum responsiveness, communication and courtesy. Our customers are asked to fill out and return a pre-stamped survey postcard via US mail to the EMS Agency office. Following are survey results for 2009.

<table>
<thead>
<tr>
<th></th>
<th>EMT (51 responses)</th>
<th>Paramedic (13 responses)</th>
<th>Other (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did our staff communicate the information about our services/programs in a way you could understand?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>51 (100%)</td>
<td>12 (92%)</td>
<td>1 (100%)</td>
</tr>
<tr>
<td>Somewhat</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Skipped</td>
<td>0</td>
<td>1 (8%)</td>
<td>0</td>
</tr>
<tr>
<td>Do you feel you were treated with courtesy and respect by our staff?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>51 (100%)</td>
<td>13 (100%)</td>
<td>1 (100%)</td>
</tr>
<tr>
<td>Somewhat</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Skipped</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>If you’ve visited our website at <a href="http://www.cccems.org">www.cccems.org</a>, did you find it helpful?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>31 (61%)</td>
<td>8 (62%)</td>
<td>0</td>
</tr>
<tr>
<td>Somewhat</td>
<td>5 (10%)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No</td>
<td>1 (2%)</td>
<td>1 (8%)</td>
<td>0</td>
</tr>
<tr>
<td>Skipped</td>
<td>14 (27%)</td>
<td>4 (30%)</td>
<td>1 (100%)</td>
</tr>
</tbody>
</table>
S. Disaster/Multicasualty Planning and Response

**Multicasualty Incident Plan (MCI)**

The MCI is a multi-agency plan setting forth roles and responsibilities of response and support agencies in the event of a large-scale incident involving a large number of casualties. The plan was originally developed and approved by the Board of Supervisors following the 1976 Yuba City/Martinez school bus accident. In 2005 the EMS Director appointed a multi-disciplinary work group to update the existing MCI plan. The new plan incorporated major changes to MCI activation that should increase competence of providers in the areas of incident command, triage, utilization of critical communication tools, and single-point ordering. EMS staff in conjunction with the Contra Costa Fire EMS Training Consortium developed and distributed training modules for fire, ambulance, police, and hospitals. The Emergency Medical Care Committee endorsed the plan in December 2006. The new plan was implemented on July 1, 2007.

**Medical Advisory Alert**

The Medical Advisory Alert, a notification procedure used when an incident occurred or a condition existed that might tax local medical resources, was folded into the new MCI Plan as a Level 0 incident.

**Multi-Casualty Supply Caches**

First aid supplies purchased by the EMS Agency are organized into 25 multi-casualty supply caches stored and maintained in fire stations countywide. Fire agencies transport caches to incidents when requested. Cache supplies include bandaging and splinting supplies, oxygen administration supplies, and blood pressure equipment.

**Health Services Emergency Preparedness Program (HSEEP)**

Contra Costa Health Services (CCHS) has an emergency preparedness program emphasizing ongoing and corrective action planning, and continuity of critical services. A disaster planning work group meets monthly to develop and expand plans for Health Services divisions to be prepared to jointly respond to a wide variety of emergency situations from natural disasters, e.g., earthquakes and floods, to chemical or other toxic releases to public health emergencies. The CCHS Emergency Management Team consists of CCHS division directors and staff necessary to provide a medical/health response to emergencies using the Standardized Emergency Management System (SEMS) and National Incident Management System (NIMS).

In 2009, the new CCHS Department Operating Center (DOC) was fully equipped while a regular schedule of exercises and activities utilizing HSEEP guidelines for planning, conducting and evaluating drills and exercises was conducted. This includes conducting appropriate exercises to measure level of emergency preparedness, ensuring that exercises contain objectives that test the effectiveness of plans and training, developing After Action Reports (AARs) for each exercise, and processing exercise findings to improve the level of emergency preparedness. During 2009 the CCHS DOC was activated to manage the H1N1 pandemic in the county.

**Self-Preparedness**

Several local hospitals have developed or are developing programs to train their staffs on personal and family preparedness measures. During disasters, having sufficient staff becomes...
a major concern for hospitals. Staff members that have developed family support systems are more likely to report to work following a disaster.

**Hospital-to-Hospital Coordination**

Many local hospitals work with other network hospitals allowing for coordination of supplies, equipment, and personnel. Additional solutions are being identified to provide additional support or backup resources. For example, although owned and operated by different entities, Doctors San Pablo has developed agreements with its neighbor, Brookside Community Health Center, to provide services during disasters. During 2009 the Hospital 440 MegaHz Radio Network was fully implemented to support hospital communications in the event of a disaster.

**Relationships with Local Law Enforcement.**

Many Contra Costa hospitals have contacts with local law enforcement. For example, emergency managers at both Sutter Delta and Doctors San Pablo have developed close working relationships with members of local police departments. Strong relationships with these first responders allow for more coordinated efforts during disaster, particularly if security personnel resources are needed at the hospital.

**Model Disaster Equipment/Supply Lists**

Developing and maintaining a comprehensive cache of emergency equipment and supplies is a high priority for hospitals as identified during the response to Hurricane Katrina. For example, San Ramon Regional Medical Center has developed a supply/equipment list currently being used by all Tenet hospitals. Consistency among supplies and equipment for network hospitals is beneficial to disaster response.

Contra Costa EMS hosts the ALARMS (Asset, Logistics and Resource Management) web-based system to coordinate and track disaster equipment and supplies throughout the county. In 2010 ALARMS will also be used to track equipment caches of the Contra Costa County Medical Reserve Corp.

**Community Warning System**

Refineries and other industrial sites which use or store potentially hazardous chemicals use the Community Warning System to issue alerts that indicate incidents have occurred. These alerts range from Level 0 alerts at the low end to Level 3 alerts at the high end. EMS staff is alerted by pager to Level 2 (an incident has occurred resulting in minimal off-site impact) and Level 3 (an incident has occurred resulting in significant off-site impact) events. Both Level 2 and 3 alerts normally result in Medical Advisory Alerts.
Disaster Equipment/Supply Storage Solutions

With the identified need to have additional medical and emergency supplies available to address patient surge, some hospitals have found additional storage solutions. For example, cache trailers and Conex boxes have been positioned at medical centers. San Ramon Medical Center stores some emergency supplies at a distributor of medical/surgical supplies, so that “push packs” of equipment and supplies can be transported from the warehouse to the facility when needed.

Hospital Incident Command System (HICS).

Hospitals are increasingly using the HICS for both exercise play and actual events. Best practices, implemented on a regional basis, improve the response of all Contra Costa hospitals. As the hospitals continue to participate in exercise and evaluation cycles, additional best practices that are discovered are noted and discussed at future meetings.

The EMS Operations Center was activated as part of a series of Multi-casualty Incident exercises in October 2008. Response staff practiced where to go, and assume assigned roles in the Ops Center as well as understand SEMS/NIMS functions. The drill also served to familiarize staff with various activation materials, and utilizing coordination tools such as IRIS, satellite phones, radios, ring-down lines to the County EOC, radios, and the Radio Amateur Civil Emergency Service (RACES) system. An After Action Report was developed for the follow-up of corrective actions.

Contra Costa County Medical Reserve Corps (CCCMRC)

As part of the County’s emergency planning and response system, Contra Costa Health Services saw the benefit of forming a local volunteer Medical Reserve Corps (MRC). The Contra Costa County MRC consists of trained health care professionals, including nurses, physicians, pharmacists, paramedics and EMTs, dentists, veterinarians as well as mental health professionals, such as psychologists, social workers, family therapists, and psychiatric technicians. Other community members—interpreters, chaplains,
office workers, legal advisors, and others—are also involved in the team. The CCCMRC focuses on recruitment of volunteers who would be available during a local disaster and are interested in serving as volunteers in our community during medical and health-related emergencies and events. The CCCMRC is supported by Contra Costa Health Services’ EMS and Public Health Divisions.

The mission of the Contra Costa County Medical Reserve Corps (MRC) is to improve the health and safety of community by training, organizing and utilizing public health, medical and other non-medical volunteers to assist in or augment medical care during disasters, major disease outbreaks or community events. MRC responses could include providing mass casualty triage and care at a locally needed location, assisting with mass vaccinations or prophylactic medication dispensing or other medical and health related tasks including ongoing public service to the community. The team is led by an energetic and devoted emergency physician who has vast experience in disaster and austere medicine.

To date we have 99 individuals entered into the Disaster Healthcare Volunteers of CA registry and have held on-going Orientation and Training sessions and then provided ID badges, team shirts, caps, sweatshirts, as well as Personal Go-Kits to those completing the membership process. We’ve distributed our Team Brochures and Interest Forms at Health Fairs and other venues and have a team webpage for information sharing.

Over 50 members were active in the Flu Vaccine Clinics response held in November and December providing staff to that public health community response effort. The additional funding awarded in 2009 from both Homeland Security and National Association of County and City Health Officials (NACCHO) will assist in securing team equipment for future responses.

**Incident Response Information System (IRIS)**

IRIS is an in-house software program developed for use by Health Services employees to facilitate communications among its various divisions and physical sites during major disasters, or during minor incidents of local significance. The program provides the potential for the creation of a 'virtual' Department Operations Center (DOC) during a large-scale event or disaster.

**Regional Disaster Planning Grant**

California Health and Safety Code Division 2.5, Section 1797.152, provides for the designation of Regional Disaster Medical/Health Coordinators (RDMHC). The Contra Costa Health Officer has been the designated RDMHC for OES Mutual Aid Region II, (OES Coastal Region). Since 1990, the EMS Agency has received a series of disaster planning grants funded by the State EMS Authority (EMSA) and the California Department of Public Health (CDPH). These grants provides funding for Regional Disaster Medical Health Specialists, (RDMHS), to provide staff support to each of the RDMHCs, with a Scope of Work provided by State EMSA and CDHS. In 2009 staff continued work on the medical-health mutual aid system, the focus being participation in the development and implementation of EMSA and CDHS-related plans, manuals, guides, and other operational components including:

- Provision of training on the California Disaster Medical Operations Manual (CDMOM).
- Participation with the California Department of Public Health in the development of the California Disaster Health Operations manual (CDHOM).
- Supporting the Regional Disaster Medical and Health Coordinator (RDMHC) activities in planning and response at the OA and regional response levels to include assistance in
locating, mobilizing, and deploying mutual aid resources at the request of State officials in support of mutual aid requests from within the region as well as from other impacted regions. The response to the spring and fall H1N1 events were examples of this in which each Operational Area was supported in their response to and requests for assistance and resources pertinent to H1N1 throughout the multi-week/month response.

- Participating in State/Regional planning with the EMSA and CDPH including quarterly meetings and monthly conference calls as well as providing a schedule to EMSA and CDPH of Medical/Health regional training and exercises including provision of an AAR following participation in exercises.
- Participation on committees as authorized by EMSA and/or CDPH including Urban Area Initiative (UASI) and Regional Catastrophic Preparedness Grant (RCPGP) Projects and the Association of Bay Area Health Officers (ABAHO) Pan Flu subcommittee.

**CYANOKIT Project**

Contra Costa County hospitals participate in the State sponsored CYANOKIT Project. 987 Cyanokits®, the antidote treatment for cyanide poisoning, are to be purchased by CDPH with OHS grant funds, with the intention of placing them in hospitals throughout California at no cost. Cyanide poisoning is most commonly caused by smoke inhalation. Cyanokit® is a newer generation treatment with less severe side effects than earlier versions thus, it can be given for both known and suspected cyanide poisonings.

**Hospital Preparedness Program (HPP)**

Contra Costa County has continued to receive funding for hospital, health centers and community clinic preparedness through the Hospital Preparedness Program. The most recent Year 8 grant award was in the amount of $673,731 covering the period August 1, 2009 through June 30, 2010. During 2009 a portion of these funds supported the CCHS response to H1N1. HPP funds are used for continued acquisition of emergency supplies and equipment for the County's hospitals and community clinics, development of a web-based Asset, Logistics, and Resource Management System (ALARMS) to inventory and track emergency resources, training of hospital and clinic personnel, and for emergency preparedness exercises.

Hospital and community clinic preparedness activities are coordinated at the county level by the Health Services Emergency Preparedness Manager with input from community partners through the Med/Health Preparedness Forum. In addition to each of the County's acute care hospitals, active participants in the Med/Health Preparedness Forum monthly meetings include the Hospital Council of Northern and Central California, Community Clinic Consortium of Contra Costa, Veterans' Administration Martinez Outpatient Clinic, American Medical Response, fire and law enforcement representatives, and County staff from the Sheriff's Office of Emergency Services, Health Services Public Health Division, and EMS. Three consultants have played major roles in the Hospital Preparedness Program: The Abaris Group has assisted with planning and budgeting; Ecology and Environment, with exercises and exercise evaluation and developed the ALARMS software; and Global Vision Consortium has assisted the community clinics in emergency preparedness planning and training.

The HRSA National Bioterrorism Hospital Preparedness Program is now known as the U.S. Health and Human Services Assistant Secretary for Preparedness and Response (ASPR)
Hospital Preparedness Program (HPP). Funding is expected for the upcoming year, and capabilities currently prioritized and funded for Year 9 are:

- Maintaining interoperable communications including the 440 MegaHz radio system connecting community clinics, senior nursing facilities (SNFs), hospitals and the health department
- Healthcare surge planning including alternative care site
- Bed tracking and ReddiNet upgrades
- Mass vaccination activities e.g. H1N1
- Contra Costa County Medical Reserve Corp activities and recruitment
- Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP)
- Fatality management plans
- Hospital evacuation plans
- Implementation of Federal standards, e.g. CAL OSHA Airborne Transmission Disease Standard

Optional capabilities that may be funded to the extent that required capabilities are met include alternate care sites, mobile medical assets, pharmaceutical caches, personal protective equipment, and decontamination.

Homeland Security (HLS) Programs State and Local Domestic Preparedness Equipment Support Program

Contra Costa EMS continued preparedness activities with fire, law, OES and EMS agencies to distribute and implement communications equipment, personal protective equipment, detection equipment, EMS caches, EOC upgrades, strategic and tactical planning, and training for fire, EMS and law enforcement responders that Homeland Security grants that have provided. A major priority is developing interoperable communications for emergency responders in Contra Costa and Alameda Counties. A five-person County Approval Authority consisting of the Sheriff, Health Services Director, Contra Costa County Fire Chief, a municipal fire chief and a municipal police chief administers this HLS grant program.

T. Disaster Medical Assistance Team (DMAT)

Contra Costa EMS is a sponsor of the non-profit San Francisco Bay Area Chapter of the California Disaster Medical Services Association (formerly the San Francisco Bay Area Disaster Medical Assistance Team). The federal entity, DMAT CA-6, is established under Department of Health and Human Services (DHHS), Office of the Assistant Secretary for Preparedness and Response (ASPR), Office of Preparedness and Emergency Operations (OPEO). The majority of the team members belong to both entities with the difference being CA-6 deploys on federal missions and the non-profit entity deploys to state and local missions. Both DMAT CA-6 and the San Francisco Bay Area Chapter of CDMSA were formed in 1997 with support of Contra Costa, San Mateo, Alameda and San Francisco Counties.

Disaster Medical Assistance Teams are comprised of trained and prepared medical and support personnel organized to provide medical/health care to disaster victims. Teams can be staged prior to ‘high-risk’ events such as the Olympics, or can be deployed during or post event to provide medical services in an austere post-disaster environment. There are approximately 50
federal DMATs considered operational nationwide, with six in California plus a mental health specialty team.

Following is the chronology of DMAT CA–6 (DMAT CA-6) and San Francisco Bay Area Chapter of CDMSA (formerly SFBAY DMAT):

1997
- SFBAY DMAT formed and sponsored by Contra Costa Health Services.

1998
- DMAT CA-6 attained Level II designation.

1999
- Members traveled to Ukraine for joint training mission.

2000
- SFBAY DMAT incorporated as a non-profit organization with 501(c)(3) status.
- SFBAY DMAT provided medical coverage for Wildland 2000 and at Fleet Week in San Francisco.

2001
- CA Department of Forestry (CDF) contracted with SFBAY DMAT to pilot medical response to National Fire Service events when requested. SFBAY DMAT was the first team to undertake this type of response, and is the prototype for a nationwide collaborative between DMATs and U.S. Dept of Forestry.
- DMAT CA-6 deployed to the Presidential Inauguration, Washington D.C.; for Tropical Storm Allison, TX; to NYC/World Trade Center, and to US Postal Service Annex for employee anthrax screening.
- SFBAY DMAT provided medical coverage for Wildland 2001.

2002
- DMAT CA-6 deployed to Salt Lake City for the 2002 Winter Olympics.
- SFBAY DMAT provided medical coverage for Wildland 2002, and 4 major CA wildfires as part of the CDF contract.
- SFBAY DMAT staged for response at the 2002 World Series and Fleet Week in San Francisco.

2003
- DMAT CA-6 staged to provide care for the Sunnyvale Anti-War Protests.
- DMAT deployed to 5 major Southern California fires as part of CDF contract.
- SFBAY DMAT provided medical coverage for Moffett Field Air Show and San Francisco Fleet Week.

2004
- DMAT CA-6 was on alert for Hurricanes Charley, Ivan, Frances and Isabel.
- DMAT CA-6 deployed to Guam for care of neonates following a premature birth surge.
- SFBAY DMAT members deployed for major California wildfires as part of CDF agreement.
- SFBAY DMAT participated in Contra Costa Flu Vaccine Clinics.
- SFBAY DMAT provided medical coverage at Moffett Air Expo, SF Fleet Week and Republican Natl Convention.
- SFBAY DMAT members traveled to Ukraine for Joint Training Exercise, and to the Haiti Relief Mission.

2005
- SFBAY DMAT deployed to provide medical coverage for firefighters participating in Wildland 2005.
- DMAT CA-6 deployed on 3 missions to provide medical support for Hurricane Katrina and posted at PMAC shelter in Baton Rouge, Nicholls State University in Thibadeaux, San Gabriel Morgue Operations, the Superdome and Louie Armstrong Airport, New Orleans, as well as a medical clinic in Cameron, LA and West Jefferson Hospital.

2006
- DMAT CA-6 members deployed to provide medical coverage for firefighters participating in Wildland 2006.
- SFBAY DMAT members traveled to Haiti to provide care in the Relief Mission.

2007
- SFBAY DMAT provided medical support to the All Star Game in San Francisco, including standby surge capacity and forward movement of a Chempack from Alameda County.
- SFBAY DMAT assisted San Jose in providing medical care at the San Jose Grand Prix.
- SFBAY DMAT members participated in four 1-week international medical missions to Haiti.
- SFBAY DMAT assisted Alameda County in providing medical care to Urban Shield ’07.
- SFBAY DMAT members responded to 3 wildfires: Tar (Alameda Cty), Lick (Santa Clara Cty), Witch (San Diego Cty).
- SFBAY DMAT deployed as part of a CAL-MAT to San Diego for the wildfires, providing a special needs shelter, and 2 shelter outreach, 5 shelter assessment, and 4 standby (alert) assessment teams.
- DMAT CA-6 members provided federal logistical support to NDMS for the S. CA wildfires in Pasadena.

2008
- SFBAY DMAT entered into a formal contract with the California Emergency Medical Services Authority (EMSA) to provide CAL-MAT services.
- SFBAY DMAT merged with the non-profit DMATs from Orange County, Sacramento and San Bernardino, into a new entity called the California Disaster Medical Services Association (CDMSA).
- Members of SFBAY DMAT responded on numerous wildfires, spending more than 60 days deployed.
- SFBAY DMAT assisted Alameda County in providing medical care to Urban Shield ’08.
- DMAT CA-6 was placed on Alert in preparedness for a possible response to a satellite re-entry into a populated area.
- DMAT CA-6 deployed to the Democratic National Convention in Denver, CO.
- DMAT CA-6 members deployed to Hurricane Gustav in support of the HHS Incident Response Coordination Team (IRCT).
> DMAT CA-6 deployed to Hurricanes Gustav/Ike (combined mission), providing medical and special needs shelter support in Baton Rouge, LA.
> SFBAY DMAT formally changed to the San Francisco Bay Area Chapter of the California Disaster Medical Services Association.

2009
> Members of CDMSA-SF responded to the SHU Lightning Complex Fire in Shasta County.
> CDMSA-SF assisted Alameda, Contra Costa, and San Mateo Counties in providing medical care to Urban Shield ’09.
> DMAT CA-6 activated for an international Typhoon Melor mission in Saipan, and sent a 10-person advance team to Guam. The full team remained activated-in-place at home for 5 days.
VI. 2009 STATISTICAL REPORT
A. Ambulance & QRV Dispatch Reports
Ambulance Dispatch Report – 2009

Number of Dispatches, Response Code, and Response Level by Ambulance Provider
American Medical Response (AMR), San Ramon Valley Fire District, Moraga-Orinda Fire District

<table>
<thead>
<tr>
<th>Response Code &amp; Level</th>
<th>All Providers</th>
<th>AMR</th>
<th>San Ramon Valley Fire</th>
<th>Moraga-Orinda Fire</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
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<td>52,808</td>
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<tr>
<td>Code 2 Dispatches</td>
<td>19,840</td>
<td>25.5</td>
<td>18,106</td>
<td>25.5</td>
</tr>
<tr>
<td>Total Code 3 Dispatches</td>
<td>58,032</td>
<td>100.0</td>
<td>52,808</td>
<td>100.0</td>
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<td>ALS Response</td>
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<td>50,107</td>
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<td>0.1</td>
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<td>2,668</td>
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<td>Total Code 2 Dispatches</td>
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Source: EMS Agency based on data from American Medical Response, San Ramon Valley and Moraga-Orinda Fire Protection Districts.
Ambulance Dispatch Report – 2009 (cont)

Patient Transport by Ground Ambulance Provider
American Medical Response, San Ramon Valley Fire District, Moraga-Orinda Fire District

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<th></th>
<th>Moraga-Orinda Fire</th>
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<td>#</td>
<td>%</td>
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<td>5,021</td>
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<td>1,937</td>
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<td>53,932</td>
<td>79.7</td>
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<td>61.9</td>
<td>1,254</td>
<td>64.7</td>
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<td>21.9</td>
<td>13,763</td>
<td>20.3</td>
<td>1,915</td>
<td>38.1</td>
<td>683</td>
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<td>3,106</td>
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<td>-</td>
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<tr>
<td>Total Canceled</td>
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<td>100.0</td>
<td>13,763</td>
<td>100.0</td>
<td>1,915</td>
<td>100.0</td>
<td>683</td>
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<td>3,702</td>
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<td>73.1</td>
<td>1,574</td>
<td>82.2</td>
<td>614</td>
<td>89.9</td>
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Source: EMS Agency based on data from American Medical Response, San Ramon Valley and Moraga-Orinda Fire Protection Districts.
## Ambulance Dispatch Report – 2009 (cont)

**Responses by Community, Response Code, Average Code 3 Response Time, and BLS Response on Code 3 Dispatches**

American Medical Response West, San Ramon Valley Fire District, Moraga/Orinda Fire District

<table>
<thead>
<tr>
<th>Community</th>
<th>All Responses</th>
<th>Code Two</th>
<th>Code Three</th>
<th>Average Response Time¹ in Minutes</th>
<th>BLS Only Response</th>
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<td>#</td>
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<td>#</td>
<td>%</td>
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<tr>
<td><strong>Totals</strong></td>
<td>77,872</td>
<td>100.0</td>
<td>19,840</td>
<td>25.5</td>
<td>58,032</td>
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<td>886</td>
<td>24.7</td>
<td>2,7087</td>
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<td>2,953</td>
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<td>432</td>
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<td>371</td>
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<td>967</td>
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<td>697</td>
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<td>9</td>
<td>25.7</td>
<td>26</td>
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<td>29.2</td>
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<td>1,605</td>
<td>28.3</td>
<td>4,057</td>
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Source: EMS Agency based on data from American Medical Response, San Ramon Valley and Moraga-Orinda Fire Districts.

¹ Average response times do not include calls canceled enroute or QRV calls
### Ambulance Dispatch Report – 2009 (cont)

#### Transports by Destination and Transport Code

American Medical Response, San Ramon Valley Fire District and Moraga-Orinda Fire District

<table>
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<tr>
<th>Hospital</th>
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<th>Code Three Transports</th>
<th>Code Two Transports</th>
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<td>%</td>
</tr>
<tr>
<td>Totals</td>
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</tr>
<tr>
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<td>667</td>
<td>16.6</td>
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<tr>
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<td>1,113</td>
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<td>0.0</td>
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</table>

Source: EMS Agency based on data from American Medical Response, San Ramon Valley and Moraga-Orinda Fire Protection Districts.

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2 Kaiser Hospital in Antioch opened in November 2007.

3 Helicopter rendezvous site may be established if a safe helicopter-landing site is not available in proximity to the patient.
Quick Response Vehicle (QRV) Dispatch Report

QRV\(^4\) Dispatch Code

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<tr>
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QRV Response by City

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<th>2008</th>
<th>2009</th>
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<tr>
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<td>3,029</td>
<td>3,268</td>
<td>3,219</td>
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<td>7</td>
</tr>
<tr>
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<td>1</td>
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<td>Hercules</td>
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<td>3</td>
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<tr>
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<td>1</td>
<td>3</td>
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<tr>
<td>Rodeo</td>
<td>48</td>
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<td>23</td>
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<td>270</td>
<td>270</td>
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<td>12</td>
<td>13</td>
<td>10</td>
</tr>
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<td>5</td>
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<tr>
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<td>0</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Oakley</td>
<td>1,126</td>
<td>1,361</td>
<td>180</td>
<td>142</td>
</tr>
<tr>
<td>Bethel Island</td>
<td>242</td>
<td>259</td>
<td>220</td>
<td>197</td>
</tr>
<tr>
<td>Knightsen</td>
<td>26</td>
<td>21</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Brentwood</td>
<td>193</td>
<td>458</td>
<td>1,093</td>
<td>2,006</td>
</tr>
<tr>
<td>Discovery Bay</td>
<td>44</td>
<td>13</td>
<td>24</td>
<td>26</td>
</tr>
<tr>
<td>Byron</td>
<td>366</td>
<td>534</td>
<td>541</td>
<td>466</td>
</tr>
<tr>
<td>Out Of County</td>
<td>1</td>
<td>6</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>38</td>
<td>12</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

\([^4]\) QRVs are paramedic-staffed, non-transport vehicles that are dispatched by American Medical Response as first responder paramedics in areas where fire services provide a basic life support first response.

\([^5]\) Rodeo Hercules Fire Protection District added an additional fire paramedic first responder unit reducing the need for QRV response into the area.
B. Helicopter Utilization Report
## Helicopter Utilization Report - 2009
### Contra Costa Patients Transported by Helicopter

<table>
<thead>
<tr>
<th>Origin</th>
<th>2005</th>
<th></th>
<th>2006</th>
<th></th>
<th>2007</th>
<th></th>
<th>2008</th>
<th></th>
<th>2009</th>
<th></th>
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<td>%</td>
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<td>%</td>
<td>Pts</td>
<td>%</td>
<td>Pts</td>
<td>%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>372</td>
<td>100.0</td>
<td>338</td>
<td>100.0</td>
<td>348</td>
<td>100.0</td>
<td>256</td>
<td>100.0</td>
<td>258</td>
<td>100.0</td>
</tr>
<tr>
<td>East County</td>
<td>182</td>
<td>48.9</td>
<td>149</td>
<td>44.1</td>
<td>167</td>
<td>48.0</td>
<td>126</td>
<td>49.2</td>
<td>124</td>
<td>48.1</td>
</tr>
<tr>
<td>West County</td>
<td>139</td>
<td>37.4</td>
<td>156</td>
<td>46.2</td>
<td>148</td>
<td>42.5</td>
<td>90</td>
<td>35.2</td>
<td>106</td>
<td>41.1</td>
</tr>
<tr>
<td>South County</td>
<td>22</td>
<td>5.9</td>
<td>14</td>
<td>4.1</td>
<td>10</td>
<td>2.9</td>
<td>18</td>
<td>7.0</td>
<td>15</td>
<td>5.8</td>
</tr>
<tr>
<td>Central County</td>
<td>29</td>
<td>7.8</td>
<td>19</td>
<td>5.6</td>
<td>23</td>
<td>6.6</td>
<td>22</td>
<td>8.6</td>
<td>13</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Source: EMS Agency based on data supplied by helicopter provider agencies.

## Helicopter Transports Originating Within Contra Costa by Provider Agency

<table>
<thead>
<tr>
<th>Provider</th>
<th>2005</th>
<th></th>
<th>2006</th>
<th></th>
<th>2007</th>
<th></th>
<th>2008</th>
<th></th>
<th>2009</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>%</td>
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<td>%</td>
<td>Pts</td>
<td>%</td>
<td>Pts</td>
<td>%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>372</td>
<td>100.0</td>
<td>338</td>
<td>100.0</td>
<td>348</td>
<td>100.0</td>
<td>256</td>
<td>100.0</td>
<td>258</td>
<td>100.0</td>
</tr>
<tr>
<td>CALSTAR</td>
<td>197</td>
<td>53.0</td>
<td>195</td>
<td>57.7</td>
<td>198</td>
<td>56.9</td>
<td>141</td>
<td>55.1</td>
<td>165</td>
<td>64.0</td>
</tr>
<tr>
<td>REACH</td>
<td>168</td>
<td>45.2</td>
<td>141</td>
<td>41.7</td>
<td>145</td>
<td>41.7</td>
<td>105</td>
<td>41.0</td>
<td>86</td>
<td>33.3</td>
</tr>
<tr>
<td>CHP</td>
<td>5</td>
<td>1.3</td>
<td>2</td>
<td>0.6</td>
<td>4</td>
<td>1.1</td>
<td>9</td>
<td>3.5</td>
<td>6</td>
<td>2.3</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>0.5</td>
<td>0</td>
<td>0.0</td>
<td>1</td>
<td>0.3</td>
<td>1</td>
<td>0.4</td>
<td>1</td>
<td>0.4</td>
</tr>
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</table>

Source: EMS Agency based on data supplied by helicopter provider agencies.

## Helicopter Transports by Destination

<table>
<thead>
<tr>
<th>Provider</th>
<th>2005</th>
<th></th>
<th>2006</th>
<th></th>
<th>2007</th>
<th></th>
<th>2008</th>
<th></th>
<th>2009</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pts</td>
<td>%</td>
<td>Pts</td>
<td>%</td>
<td>Pts</td>
<td>%</td>
<td>Pts</td>
<td>%</td>
<td>Pts</td>
<td>%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>372</td>
<td>100.0</td>
<td>338</td>
<td>100.0</td>
<td>348</td>
<td>100.0</td>
<td>256</td>
<td>100.0</td>
<td>258</td>
<td>100.0</td>
</tr>
<tr>
<td>John Muir Health</td>
<td>291</td>
<td>78.2</td>
<td>274</td>
<td>81.1</td>
<td>265</td>
<td>76.1</td>
<td>199</td>
<td>77.7</td>
<td>211</td>
<td>81.8</td>
</tr>
<tr>
<td>Children's</td>
<td>58</td>
<td>15.6</td>
<td>43</td>
<td>12.7</td>
<td>52</td>
<td>14.9</td>
<td>33</td>
<td>12.9</td>
<td>30</td>
<td>11.6</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>23</td>
<td>6.2</td>
<td>21</td>
<td>6.2</td>
<td>31</td>
<td>8.9</td>
<td>24</td>
<td>9.4</td>
<td>17</td>
<td>6.6</td>
</tr>
</tbody>
</table>

Source: EMS Agency based on data supplied by helicopter provider agencies.

---

6 All of these flights originated from within Contra Costa County.
### Helicopter Transports by Patient Assessment

<table>
<thead>
<tr>
<th>Provider</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pts</td>
<td>%</td>
<td>Pts</td>
<td>%</td>
<td>Pts</td>
</tr>
<tr>
<td>TOTAL</td>
<td>372</td>
<td>100.0</td>
<td>338</td>
<td>100.0</td>
<td>348</td>
</tr>
<tr>
<td>Trauma</td>
<td>350</td>
<td>94.1</td>
<td>305</td>
<td>90.2</td>
<td>322</td>
</tr>
<tr>
<td>Burn</td>
<td>13</td>
<td>3.5</td>
<td>2</td>
<td>0.6</td>
<td>13</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>1.8</td>
<td>5</td>
<td>1.5</td>
<td>13</td>
</tr>
<tr>
<td>Unknown</td>
<td>2</td>
<td>&gt;0.1</td>
<td>26</td>
<td>7.7</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: EMS Agency based on data supplied by helicopter provider agencies.

### Helicopter to Trauma Center Transports by Age and Severity (Major Trauma Victim “MTV”)

<table>
<thead>
<tr>
<th>Origin</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pts</td>
<td>%</td>
<td>Pts</td>
<td>%</td>
<td>Pts</td>
</tr>
<tr>
<td>TOTAL</td>
<td>349</td>
<td>100.0</td>
<td>315</td>
<td>100.0</td>
<td>322</td>
</tr>
<tr>
<td>Adult</td>
<td>298</td>
<td>100.0</td>
<td>277</td>
<td>100.0</td>
<td>269</td>
</tr>
<tr>
<td>MTV (ISS &gt; 15)</td>
<td>107</td>
<td>35.9</td>
<td>96</td>
<td>34.7</td>
<td>106</td>
</tr>
<tr>
<td>Non-MTV (ISS &lt; 15)</td>
<td>191</td>
<td>64.1</td>
<td>181</td>
<td>65.3</td>
<td>163</td>
</tr>
<tr>
<td>Pediatric</td>
<td>51</td>
<td>100.0</td>
<td>38</td>
<td>100.0</td>
<td>53</td>
</tr>
<tr>
<td>MTV (ISS &gt; 15)</td>
<td>3</td>
<td>5.9</td>
<td>6</td>
<td>15.8</td>
<td>5</td>
</tr>
<tr>
<td>Non-MTV (ISS &lt; 15)</td>
<td>48</td>
<td>94.1</td>
<td>32</td>
<td>84.2</td>
<td>48</td>
</tr>
</tbody>
</table>

Source: EMS Agency based on data from the Trauma Registries at John Muir Walnut Creek, Children's Hospital, Eden Medical Center and UC Davis Medical Center.

---

7 All of these flights originated from within Contra Costa County.
8 Definition of Major Trauma Victim (MTV) modified in 2009 to include only patients with Injury Severity Score (ISS) of greater than 15. Prior years’ data is compared based on new definition. Some outcomes were not available.
C. Base Hospital Contact Report
**Base Hospital Activity Summary by Age Distribution**

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
<td>#</td>
</tr>
<tr>
<td>Total Base Contacts</td>
<td>3,599</td>
<td>9.9</td>
<td>3,443</td>
<td>9.4</td>
<td>3,280</td>
</tr>
<tr>
<td>Daily Average</td>
<td>3,239</td>
<td>90.0</td>
<td>3,153</td>
<td>91.6</td>
<td>2,983</td>
</tr>
<tr>
<td>Pediatric Patients (age &lt; or = 14)</td>
<td>360</td>
<td>10.0</td>
<td>290</td>
<td>8.4</td>
<td>297</td>
</tr>
</tbody>
</table>

Source: EMS Agency based upon data provided by John Muir Health, Walnut Creek.

**Base Hospital Activity Summary by Medical Condition**

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
<td>#</td>
</tr>
<tr>
<td>Total Base Contacts</td>
<td>3,599</td>
<td>77.0</td>
<td>2,770</td>
<td>74.4</td>
<td>2,510</td>
</tr>
<tr>
<td>Trauma</td>
<td>653</td>
<td>18.1</td>
<td>713</td>
<td>20.7</td>
<td>633</td>
</tr>
<tr>
<td>Medical</td>
<td>164</td>
<td>4.6</td>
<td>163</td>
<td>4.7</td>
<td>129</td>
</tr>
<tr>
<td>Unknown</td>
<td>12</td>
<td>0.3</td>
<td>6</td>
<td>0.2</td>
<td>8</td>
</tr>
</tbody>
</table>

Source: EMS Agency based upon data provided by John Muir Health, Walnut Creek.
D. Trauma System Report
## Contra Costa Trauma System Report - 2009

### On-Scene Triage of Patients within Contra Costa Meeting Field Trauma Criteria

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TOTAL PATIENTS TRIAGED</strong></td>
<td>2,648</td>
<td>2,491</td>
<td>2,488</td>
<td>2,269</td>
<td>2,381</td>
</tr>
<tr>
<td>Transported to a trauma center</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>John Muir Health, Walnut Creek</td>
<td>917</td>
<td>1,006</td>
<td>1,026</td>
<td>953</td>
<td>1,018</td>
</tr>
<tr>
<td>Children's Hospital, Oakland</td>
<td>121</td>
<td>94</td>
<td>107</td>
<td>93</td>
<td>108</td>
</tr>
<tr>
<td>Other trauma center</td>
<td>25</td>
<td>23</td>
<td>51</td>
<td>51</td>
<td>29</td>
</tr>
<tr>
<td>Transported to non-trauma center hospitals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contra Costa Regional Medical Center</td>
<td>89</td>
<td>80</td>
<td>79</td>
<td>66</td>
<td>61</td>
</tr>
<tr>
<td>Doctors San Pablo</td>
<td>290</td>
<td>201</td>
<td>190</td>
<td>135</td>
<td>136</td>
</tr>
<tr>
<td>John Muir Health - Concord</td>
<td>261</td>
<td>209</td>
<td>169</td>
<td>153</td>
<td>138</td>
</tr>
<tr>
<td>John Muir Health - Walnut Creek</td>
<td>208</td>
<td>216</td>
<td>235</td>
<td>220</td>
<td>253</td>
</tr>
<tr>
<td>Kaiser Antioch</td>
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<tr>
<td>Kaiser Richmond</td>
<td>84</td>
<td>102</td>
<td>75</td>
<td>75</td>
<td>71</td>
</tr>
<tr>
<td>Kaiser Walnut Creek</td>
<td>155</td>
<td>116</td>
<td>136</td>
<td>110</td>
<td>115</td>
</tr>
<tr>
<td>San Ramon Regional</td>
<td>44</td>
<td>21</td>
<td>26</td>
<td>33</td>
<td>41</td>
</tr>
<tr>
<td>Sutter Delta</td>
<td>260</td>
<td>257</td>
<td>238</td>
<td>176</td>
<td>201</td>
</tr>
<tr>
<td>Out-of-county</td>
<td>38</td>
<td>38</td>
<td>28</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>Unknown</td>
<td>156</td>
<td>128</td>
<td>110</td>
<td>91</td>
<td>86</td>
</tr>
</tbody>
</table>

Source: EMS Agency based on data from the John Muir Health, Walnut Creek Trauma Registry and Emergency Department Log.

### Undertriage by Year

<table>
<thead>
<tr>
<th>Type of Triage Error</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TOTAL UNDERTRIAGES</strong></td>
<td>39</td>
<td>26</td>
<td>36</td>
<td>52</td>
<td>48</td>
</tr>
<tr>
<td>Undertriage Rate  (^{10})</td>
<td>3.6</td>
<td>2.3</td>
<td>3.0</td>
<td>4.7</td>
<td>4.2</td>
</tr>
<tr>
<td>Undertriage % (^{11})</td>
<td>2.5%</td>
<td>1.9%</td>
<td>2.8%</td>
<td>4.4%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Base Contact for Trauma Destination</td>
<td>27</td>
<td>14</td>
<td>17</td>
<td>15</td>
<td>18</td>
</tr>
<tr>
<td>Triaged by Field Personnel</td>
<td>12</td>
<td>12</td>
<td>19</td>
<td>37</td>
<td>30</td>
</tr>
</tbody>
</table>

Source: EMS Agency based on data from the John Muir Health, Walnut Creek Trauma Registry and Emergency Department Log. Note: Definition of Major Trauma Victim (MTV) modified in 2009 to include only patients with Injury Severity Score (ISS) of greater than 15. Prior years' data is compared based on new definition.

### Trauma Center Time on Trauma By-Pass by Year

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.2%</td>
<td>2.1%</td>
<td>2.1%</td>
<td>1.4%</td>
<td>0.9%</td>
</tr>
</tbody>
</table>

Source: EMS Agency based on data from the ReddiNet system.

\(^9\) These patients were triaged as not having major trauma but were transported to John Muir, Walnut Creek as the closest facility.  
\(^{10}\) Undertriage Rate = number of under triages/number of patients triaged to trauma centers.  
\(^{11}\) Undertriage Percent = number of under triages/number of patients triaged to receiving facilities.
# Trauma Center - Activity Report 2009

All Trauma Patients Seen at the John Muir Trauma Center, Walnut Creek

<table>
<thead>
<tr>
<th>Field Transports</th>
<th>Hospital Transfers</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Patients</td>
<td>All Patients</td>
</tr>
<tr>
<td>Total</td>
<td>Total</td>
</tr>
<tr>
<td>From Contra Costa</td>
<td>From Contra Costa</td>
</tr>
<tr>
<td>From Another County</td>
<td>From Another County</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#</th>
<th>%</th>
<th>#</th>
<th>%</th>
<th>#</th>
<th>%</th>
<th>#</th>
<th>%</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL PATIENTS 1564</td>
<td>100.0</td>
<td>1293</td>
<td>100.0</td>
<td>1025</td>
<td>100.0</td>
<td>268</td>
<td>100.0</td>
<td>271</td>
<td>100.0</td>
</tr>
</tbody>
</table>

| Adult Total 1550 | 99.1 | 1281 | 99.1 | 1014 | 98.8 | 267 | 99.6 | 269 | 99.3 |

| Pediatric Total 14 | 0.9 | 12 | 0.9 | 11 | 1.1 | 1 | 0.4 | 2 | 0.7 |

## Injury Type

<table>
<thead>
<tr>
<th>Injury Type</th>
<th>#</th>
<th>%</th>
<th>#</th>
<th>%</th>
<th>#</th>
<th>%</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blunt</td>
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## Mode of Arrival

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## County of Injury

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<td>85.8</td>
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## Injury Severity

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<tr>
<td>ISS &gt;15 (Major Trauma)</td>
<td>487</td>
<td>31.1</td>
<td>366</td>
<td>28.3</td>
<td>267</td>
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<td>ISS &lt;15 (Not Major Trauma)</td>
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<td>927</td>
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## ED Disposition

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<td>992</td>
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<td>765</td>
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<td>84.7</td>
<td>249</td>
<td>91.9</td>
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<td>1.0</td>
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<tr>
<td>Home</td>
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<td>264</td>
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</table>

Source: EMS Agency based on data from the John Muir Health, Walnut Creek Trauma Registry.
## Trauma Center Activity Report

All Trauma Patients Seen at the John Muir Trauma Center, Walnut Creek by Year

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<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
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<tr>
<td><strong>All Patients</strong></td>
<td>1,561</td>
<td>1,607</td>
<td>1,601</td>
<td>1,538</td>
<td>1,564</td>
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<tr>
<td><strong>Adult</strong></td>
<td>1,535</td>
<td>1,597</td>
<td>1,581</td>
<td>1,525</td>
<td>1,550</td>
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<tr>
<td><strong>Pediatric</strong></td>
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<td>10</td>
<td>20</td>
<td>13</td>
<td>14</td>
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<td></td>
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<td><strong>Blunt</strong></td>
<td>1,266</td>
<td>1,292</td>
<td>1,210</td>
<td>1,187</td>
<td>1,228</td>
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<tr>
<td><strong>Penetrating</strong></td>
<td>267</td>
<td>299</td>
<td>358</td>
<td>318</td>
<td>301</td>
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<tr>
<td><strong>Both</strong></td>
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<td>13</td>
<td>30</td>
<td>31</td>
<td>34</td>
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<td>3</td>
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<td>424</td>
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<td>989</td>
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<tr>
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<td><strong>Contra Costa</strong></td>
<td>1,182</td>
<td>1,188</td>
<td>1,207</td>
<td>1,189</td>
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<tr>
<td><strong>Solano</strong></td>
<td>279</td>
<td>349</td>
<td>320</td>
<td>274</td>
<td>275</td>
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<td><strong>Alameda</strong></td>
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<td>22</td>
<td>19</td>
<td>18</td>
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<td><strong>Marin</strong></td>
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<td>7</td>
<td>12</td>
<td>10</td>
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<tr>
<td><strong>Napa</strong></td>
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<td>15</td>
<td>16</td>
<td>8</td>
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<tr>
<td><strong>Sonoma</strong></td>
<td>8</td>
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<td>5</td>
<td>2</td>
<td>1</td>
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<td><strong>Other</strong></td>
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<td><strong>ISS &gt;15</strong></td>
<td>430</td>
<td>414</td>
<td>485</td>
<td>497</td>
<td>487</td>
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<td>1,186</td>
<td>1,114</td>
<td>1,038</td>
<td>1,077</td>
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<tr>
<td><strong>Major Trauma</strong></td>
<td>27.7%</td>
<td>25.9%</td>
<td>30.3%</td>
<td>32.4%</td>
<td>31.1%</td>
</tr>
<tr>
<td><strong>Not Major Trauma</strong></td>
<td>72.3%</td>
<td>74.1%</td>
<td>69.7%</td>
<td>67.6%</td>
<td>68.9%</td>
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<td>1,241</td>
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<td>16</td>
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<td>249</td>
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<td>278</td>
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<td><strong>Transfer</strong></td>
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<td>17</td>
<td>7</td>
<td>8</td>
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<tr>
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<td>17</td>
<td>13</td>
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<td>0</td>
<td>21</td>
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</table>

Source: EMS Agency based on data from the John Muir Trauma Registry.

---

12 Includes patients transported from field in Contra Costa, from field in other counties, and from hospitals within/outside of Contra Costa.

13 Based on retrospective review, a major trauma victim is defined as having an Injury Severity Score (ISS) >15. This criteria was modified in 2009 and prior years’ data is compared utilizing new criteria.
E. CARES Registry Report

Cardiac Arrest Registry to Enhance Survival
Utstein Survival Report
Contra Costa County EMS
Date of Arrest: From 01/01/2009 Through 12/31/2009

Resuscitations Attempted 622

Cardiac Etiology 579

Non-Cardiac Etiology 43

Unwitnessed Arrest 274
*see page 2

Initial Rhythm Asystole 108

Initial Rhythm VF/VT 82

No ROSC 74

ROSC in Field 34
ROSC in Hospital 0

Expired in Field 1
Expired in ED 16

Admitted to Hospital 17 (0 incomplete)

Expired In Hospital 16
Discharged Alive 1

Neurological Status
CPC 1 or 2 1
CPC 3 or 4 0
Unknown = 0

Witnessed Arrest By EMS 45
*see page 3

Witnessed Arrest (Bystanders) 260

Other Initial Rhythm 70

No ROSC 34

ROSC in Field 43
ROSC in Hospital 5

Expired in Field 0
Expired in ED 5

Admitted to Hospital 43 (0 incomplete)

Expired In Hospital 16
Discharged Alive 27

Neurological Status
CPC 1 or 2 24
CPC 3 or 4 3
Unknown = 0

Bystander Intervention (534)
AED %: 1.5% (8)
CPR %: 20.0% (107)

Cardiac Etiology Survival Rates
Overall: 8.6% (579)
Bystander Wit'd: 12.7% (260)
Utstein: 32.9% (82)
Utstein Bystander: 33.3% (45)
EMS Witnessed: 17.8% (45)
Unwitnessed: 3.3% (274)
Shockable/Bystand: 31.5% (260)
Unwitnessed Arrest 274

Initial Rhythm Asystole 190

- No ROSC 169
  - ROSC in Field 20
    - ROSC in Hospital 1
  - Expired in Field 1
    - Expired in ED 10
  - Admitted to Hospital 10 (0 incomplete)
    - Expired In Hospital 9
      - Discharged Alive 1

- ROSC in Field 10
  - ROSC in Hospital 0
  - Expired in Field 0
    - Expired in ED 4
  - Admitted to Hospital 6 (0 incomplete)
    - Expired In Hospital 2
      - Discharged Alive 4

- Neurological Status CPC 1 or 2 0
  - CPC 3 or 4 1
    - Unknown = 0

Other Initial Rhythm 51

- No ROSC 40
  - ROSC in Field 11
    - ROSC in Hospital 0
  - Expired in Field 0
    - Expired in ED 2
  - Admitted to Hospital 9 (0 incomplete)
    - Expired In Hospital 5
      - Discharged Alive 4

- Neurological Status CPC 1 or 2 2
  - CPC 3 or 4 2
    - Unknown = 0
EMS CAD Times
Contra Costa County EMS

17 - Presumed Cardiac Arrest Etiology: Presumed Cardiac Etiology, Unknown | Date of Arrest: From 01/01/2009 Through 12/31/2009 | 18 - Resuscitation Attempted by 911 Responder: Yes

EMS Times: 911 to Arrival

EMS Times: 911 to Dispatch

EMS Times: Dispatch to Arrival
First Responder CAD Times
Contra Costa County EMS

First Responder Times: 911 to Arrival

First Responder Times: 911 to Dispatch

First Responder Times: Dispatch to Arrival
Demographics
Contra Costa County EMS
17 - Presumed Cardiac Arrest Etiology: Presumed Cardiac Etiology, Unknown | Date of Arrest: From 01/01/2009 Through 12/31/2009 | 18 - Resuscitation Attempted by 911 Responder: Yes

Gender

- Female = 198
- Male = 381

Male = 65.80%
Female = 34.20%

Age

Mean Age: 68.7

Location Type | Count
---|---
Home/Residence | 400 - 69.1%
Nursing Home/Assisted Living Center | 79 - 13.6%
Public Building | 22 - 3.8%
Street/Hwy | 21 - 3.6%
Residence/Institution | 21 - 3.6%
Physician Office/Medical Clinic | 14 - 2.4%
Recreation/Sport Facility | 11 - 1.9%
Other | 5 - 0.9%
Industry | 3 - 0.5%
Jail | 2 - 0.3%
Educational Institution | 1 - 0.2%
F. STEMI System Performance

ST Elevation Myocardial Infarction
Contra Costa STEMI System Performance Report

January 1, 2009 to December 31, 2009

<table>
<thead>
<tr>
<th>Performance Criteria</th>
<th>Performance Benchmarks</th>
<th>Contra Costa Performance</th>
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</thead>
<tbody>
<tr>
<td>EMS* to Intervention (PCI) Median Time</td>
<td>&lt;90 minutes (National)</td>
<td>78 minutes</td>
</tr>
<tr>
<td>EMS* Scene Median Time</td>
<td>&lt;15 minutes (Local EMS)</td>
<td>14 minutes</td>
</tr>
<tr>
<td>911 Call to Intervention (PCI) Median Time</td>
<td>&lt;90 minutes (National)</td>
<td>87 minutes</td>
</tr>
<tr>
<td>Door to first PCI Time with Field Activation</td>
<td>&lt;60 minutes (National)</td>
<td>53 minutes</td>
</tr>
<tr>
<td>Percentage of Time Door to PCI &lt; 90 minutes</td>
<td>&gt; 75% of time (National)</td>
<td>100%</td>
</tr>
<tr>
<td>EMS* = First contact with EMS provider</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Current National Statistics
American Heart Association Mission Lifeline Program

- This year, an estimated 1.4 million people will suffer a heart attack
- Every year some 400,000 people experience will experience a STEMI heart attack—the deadliest type of heart attack
- The vast majority (>50%) of chest pain victims enter the hospital by taking themselves or having a family member drive them to the hospital
- 30% of STEMI victims do not receive reperfusion treatment
- 25% of hospitals nationally are equipped to perform PCI Intervention
- Recent data from the National Registry of Myocardial Infarction found median delays of 180 minutes from arrival at the non-PCI hospital to balloon inflation at the primary PCI-capable hospital. Only 4.2 percent of transferred patients achieved door-to-balloon times within the recommended 90-minute window.
- Only 40% of STEMI patients are treated within the 90-minute standard

National statistics help benchmark STEMI System performance
### 2009 YTD: January 1, 2009 to December 31, 2009

Key Time Intervals for STEMI System Patients (Minutes)
Prehospital Times Include All Patients with Confirmed STEMI Alert and Primary PCI Done (99)
PCI Times Includes only those with no exclusion criteria for immediate PCI (88)

<table>
<thead>
<tr>
<th>Time Interval (Minutes)</th>
<th>Average</th>
<th>Median</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Prehospital Time (911 Call to Hospital Arrival)</td>
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<td>33</td>
<td>99</td>
</tr>
<tr>
<td>Scene Time</td>
<td>14</td>
<td>14</td>
<td>99</td>
</tr>
<tr>
<td>911 Dispatch to First PCI Time</td>
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<td>87</td>
<td>88</td>
</tr>
<tr>
<td>Patient Contact to First PCI Time</td>
<td>81</td>
<td>78</td>
<td>88</td>
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<tr>
<td>ECG to First PCI Time*</td>
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<td>74</td>
<td>85</td>
</tr>
<tr>
<td>Door to First PCI Time</td>
<td>54</td>
<td>53</td>
<td>88</td>
</tr>
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</table>

#### Fractile Performance
PCI Times Includes only those with no exclusion criteria for immediate PCI (88)

<table>
<thead>
<tr>
<th>Time Interval</th>
<th>≤75 min</th>
<th>≤90 min</th>
<th>≤120 min</th>
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<tr>
<td>911 Dispatch to First PCI Time</td>
<td>22%</td>
<td>64%</td>
<td>94%</td>
</tr>
<tr>
<td></td>
<td>19 of 88</td>
<td>56 of 88</td>
<td>83 of 88</td>
</tr>
<tr>
<td>Patient Contact to First PCI Time</td>
<td>43%</td>
<td>70%</td>
<td>99%</td>
</tr>
<tr>
<td></td>
<td>38 of 88</td>
<td>62 of 88</td>
<td>87 of 88</td>
</tr>
<tr>
<td>Diagnostic ECG to First PCI Time*</td>
<td>54%</td>
<td>86%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>46 of 85</td>
<td>73 of 85</td>
<td>85 of 85</td>
</tr>
<tr>
<td>Door to First PCI Time</td>
<td>88%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>77 of 88</td>
<td>88 of 88</td>
<td>88 of 88</td>
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</table>

* ECG time unavailable in 3 cases

#### Benchmarks for Prehospital Care

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<tr>
<th>Criteria</th>
<th>Number</th>
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<tr>
<td>Aspirin Administered or Noted as Contraindicated (All STEMI Alerts)</td>
<td>93%</td>
</tr>
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<td></td>
<td>185 of 200</td>
</tr>
<tr>
<td>ECG Acquired in STEMI Patient</td>
<td>99%</td>
</tr>
<tr>
<td></td>
<td>92 of 93</td>
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<tr>
<td>Identified STEMI Delivered to PCI Center</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>92 of 92</td>
</tr>
<tr>
<td>Diagnostic ECG to PCI &lt;90 Minutes</td>
<td>86%</td>
</tr>
<tr>
<td></td>
<td>73 of 85</td>
</tr>
<tr>
<td>Percent ECG within 5 minutes of ambulance arrival (STEMI Alerts with PCI)</td>
<td>58%</td>
</tr>
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</table>
Contra Costa Emergency Medical Services
Quarterly STEMI System: STEMI Center Statistics
STEMI Center Door to Intervention (minutes)
National Benchmark < 90 Minutes

![STEMI Center Door to Intervention Chart]

- Median Minutes
- Center A
- Center B
- Center C
- Center D
- Center E
- Center F
- All

VI-27
Prehospital STEMI Care Run Chart
ASA Given/ECG Acquired/STEMI Patient to PCI Center: Goal 100%
12-lead ECG < 5 minute within patient contact: Goal 80%

<table>
<thead>
<tr>
<th></th>
<th>Q4 2008</th>
<th>Q1 2009</th>
<th>Q2 2009</th>
<th>Q3 2009</th>
<th>Q4 2009</th>
<th>YTD 2009</th>
<th>Q1 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASA administered or noted as contraindicated</td>
<td>97%</td>
<td>90%</td>
<td>90%</td>
<td>93%</td>
<td>95%</td>
<td>93%</td>
<td>90%</td>
</tr>
<tr>
<td>ECG Acquired in STEMI Patient</td>
<td>97%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>97%</td>
<td>99%</td>
<td>97%</td>
</tr>
<tr>
<td>Identified STEMI Delivered to PCI Center</td>
<td>97%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Diagnostic ECG to PCI &lt;90 minutes</td>
<td>80%</td>
<td>93%</td>
<td>95%</td>
<td>75%</td>
<td>84%</td>
<td>86%</td>
<td>72%</td>
</tr>
<tr>
<td>PH 12 lead &lt; 5 minute from arrival</td>
<td>47%</td>
<td>71%</td>
<td>70%</td>
<td>55%</td>
<td>47%</td>
<td>58%</td>
<td>67%</td>
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</table>
### Contra Costa EMS False Positives STEMI Alerts

#### Table:

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<tr>
<th>Quarter</th>
<th>2008 Q4</th>
<th>2009 Q1</th>
<th>2009 Q2</th>
<th>2009 Q3</th>
<th>2009 Q4</th>
<th>2010 Q1</th>
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<tbody>
<tr>
<td>Unknown</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Machine Overread</td>
<td>7</td>
<td>4</td>
<td>11</td>
<td>6</td>
<td>7</td>
<td>8</td>
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<tr>
<td>Artifact</td>
<td>4</td>
<td>6</td>
<td>3</td>
<td>7</td>
<td>4</td>
<td>2</td>
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<tr>
<td>No Field STEMI ECG (alert in error)</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>ED ECG Does not Verify STEMI</td>
<td>12</td>
<td>15</td>
<td>18</td>
<td>17</td>
<td>18</td>
<td>13</td>
</tr>
<tr>
<td>STEMI Alerts</td>
<td>35</td>
<td>39</td>
<td>51</td>
<td>45</td>
<td>65</td>
<td>50</td>
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</table>
Contra Costa STEMI System Overall False Positive Rate

<table>
<thead>
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<th>Q4 2008</th>
<th>Q1 2009</th>
<th>Q2 2009</th>
<th>Q3 2009</th>
<th>Q4 2009</th>
<th>Q1 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall False Positive Rate</td>
<td>37%</td>
<td>38%</td>
<td>35%</td>
<td>38%</td>
<td>28%</td>
<td>26%</td>
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</tbody>
</table>
Prehospital Time Intervals Benchmark Run Chart

- Patient Contact to Intervention < 90 minutes
- Scene time < 15 minutes
- Patient Contact to ED Arrival < 30 minutes
- 911 to ED Arrival < 120 minutes

Median Minutes
- 911 to ED Arrival
- Scene Time
- 911 to PCI
- Pt Contact to PCI
- ECG to PCI
- Door to PCI

Quarters
- Q4 2008
- Q1 2009
- Q2 2009
- Q3 2009
- Q4 2009
- Q1 2010
VII. EMS AGENCY ORGANIZATIONAL CHART
VIII. EMS EXPENDITURES
## EMS Revenue & Expenditures by Year

**Fiscal Years Ending 2001 - 2009**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>County Service Area EM-1 (Measure H)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone A (San Ramon Valley)</td>
<td>$212,172</td>
<td>$228,641</td>
<td>$238,947</td>
<td>$311,221</td>
<td>$225,290</td>
<td>$266,677</td>
<td>$(58,371)</td>
<td>$(87,384)</td>
<td></td>
</tr>
<tr>
<td>Beginning fund balance</td>
<td>$212,172</td>
<td>$228,641</td>
<td>$238,947</td>
<td>$311,221</td>
<td>$225,290</td>
<td>$266,677</td>
<td>$(58,371)</td>
<td>$(87,384)</td>
<td></td>
</tr>
<tr>
<td>Revenue</td>
<td>183,014</td>
<td>184,083</td>
<td>186,480</td>
<td>191,466</td>
<td>193,615</td>
<td>198,922</td>
<td>204,064</td>
<td>209,838</td>
<td>214,182</td>
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<tr>
<td>Expenditures</td>
<td>166,545</td>
<td>173,776</td>
<td>114,206</td>
<td>277,397</td>
<td>152,228</td>
<td>306,954</td>
<td>421,059</td>
<td>238,872</td>
<td>144,765</td>
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<tr>
<td>Surplus (deficit)</td>
<td>16,469</td>
<td>10,307</td>
<td>72,274</td>
<td>$(85,932)</td>
<td>41,387</td>
<td>$(108,032)</td>
<td>(216,995)</td>
<td>(29,034)</td>
<td>69,417</td>
</tr>
<tr>
<td>Year end fund balance</td>
<td>228,641</td>
<td>238,947</td>
<td>311,221</td>
<td>225,290</td>
<td>266,677</td>
<td>158,645</td>
<td>$(58,371)</td>
<td>$(87,405)</td>
<td>$(17,967)</td>
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<tr>
<td>Zone B (Balance of County)</td>
<td>837,743</td>
<td>897,392</td>
<td>1,048,524</td>
<td>2,313,424</td>
<td>2,192,675</td>
<td>3,259,758</td>
<td>3,230,290</td>
<td>3,907,533</td>
<td>3,282,897</td>
</tr>
<tr>
<td>Beginning fund balance</td>
<td>837,743</td>
<td>897,392</td>
<td>1,048,524</td>
<td>2,313,424</td>
<td>2,192,675</td>
<td>3,259,758</td>
<td>3,230,290</td>
<td>3,907,533</td>
<td>3,282,897</td>
</tr>
<tr>
<td>Revenue</td>
<td>4,206,156</td>
<td>4,334,861</td>
<td>4,246,115</td>
<td>4,353,031</td>
<td>4,403,691</td>
<td>4,429,758</td>
<td>4,485,987</td>
<td>4,416,152</td>
<td>4,507,639</td>
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<tr>
<td>Surplus (deficit)</td>
<td>59,649</td>
<td>151,132</td>
<td>1,264,900</td>
<td>(120,748)</td>
<td>1,067,082</td>
<td>(29,467)</td>
<td>677,242</td>
<td>(624,636)</td>
<td>965,686</td>
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<tr>
<td>Year end fund balance</td>
<td>897,392</td>
<td>1,048,524</td>
<td>2,313,424</td>
<td>2,192,675</td>
<td>3,259,758</td>
<td>3,230,290</td>
<td>3,907,533</td>
<td>3,282,897</td>
<td>4,248,583</td>
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<tr>
<td>General EMS Program</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Revenue, total</td>
<td>1,091,299</td>
<td>1,503,126</td>
<td>1,019,853</td>
<td>1,540,686</td>
<td>1,442,819</td>
<td>1,515,285</td>
<td>1,958,891</td>
<td>1,222,772</td>
<td>1,375,611</td>
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<td>EMS Fund (SB 12)</td>
<td>377,562</td>
<td>259,930</td>
<td>210,815</td>
<td>468,210</td>
<td>299,731</td>
<td>290,647</td>
<td>311,879</td>
<td>417,190</td>
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<td>Grants &amp; Contracts</td>
<td>201,311</td>
<td>779,087</td>
<td>698,445</td>
<td>143,270</td>
<td>579,867</td>
<td>322,033</td>
<td>887,941</td>
<td>134,736</td>
<td>339,095</td>
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<td>RDMHS Contract</td>
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<td></td>
<td></td>
<td></td>
<td>142,149</td>
<td>115,735</td>
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<tr>
<td>Trauma Fee (John Muir)</td>
<td>75,000</td>
<td>75,000</td>
<td>75,000</td>
<td>75,000</td>
<td>75,000</td>
<td>75,000</td>
<td>7,500</td>
<td>7,500</td>
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<tr>
<td>STEMI Fees</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16,214</td>
<td>9,600</td>
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<td>CSA EM-1 (Measure H)</td>
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<td>412,773</td>
<td>412,773</td>
<td>742,818</td>
<td>606,416</td>
<td>473,708</td>
<td>359,194</td>
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<td>39,250</td>
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<td>Certification Fees</td>
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<td></td>
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<td>13,680</td>
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<td>Other</td>
<td>16,214</td>
<td>19,423</td>
<td>35,594</td>
<td>41,931</td>
<td>75,448</td>
<td>84,788</td>
<td>74,655</td>
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<td>5,469</td>
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<td>Expenditures, total</td>
<td>931,745</td>
<td>1,514,038</td>
<td>1,331,808</td>
<td>1,041,774</td>
<td>1,056,468</td>
<td>1,746,762</td>
<td>1,641,359</td>
<td>1,520,165</td>
<td>1,642,207</td>
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<tr>
<td>Surplus (deficit)</td>
<td>159,554</td>
<td>(10,912)</td>
<td>(311,955)</td>
<td>498,912</td>
<td>386,351</td>
<td>(231,477)</td>
<td>314,532</td>
<td>(297,393)</td>
<td>(266,596)</td>
</tr>
</tbody>
</table>

Source: Data compiled by EMS from Contra Costa Auditor-Controller financial reports.
IX. DEVELOPMENT OF EMS IN CONTRA COSTA
Contra Costa County - Chronology of Historic Events in EMS

The emergency medical services system approach and the use of paramedic personnel to provide advanced life support care under the supervision of a base hospital physician or mobile intensive care nurse began evolving as a new model for health care delivery in the late 1960s. Contra Costa County as well as a number of other progressive counties throughout California began developing its emergency medical services system during this time. Following are milestones in the development of the EMS system in Contra Costa County:

1966
- National Academy of Sciences "White Paper" entitled "Accidental Death and Disability: The Neglected Disease of Modern Society" identified deficiencies in providing emergency medical care in the country. The paper was the catalyst prompting federal leadership toward an organized approach to EMS and trauma care.
- The 1966 Highway Safety Act further reinforced and encouraged states to set standards, regulate EMS, and implement programs designed to reduce injury.

1968
- Contra Costa Emergency Medical Care Committee (EMCC) appointed by County Board of Supervisors to provide oversight of emergency medical services within the County.

1970
- State Wedworth-Townsend Act enabled counties to conduct pilot projects using paramedics and mobile intensive care nurses (MICNs) to provide advanced life support services to patients in the field.
- Ambulance Regulations added to the County Ordinance Code which included permit and ambulance registration processes.

1972
- Ten ambulance zones established for provision of emergency ambulance service.

1973
- Emergency Medical Services Systems (EMSS) Act provides federal guidelines and funding for the development of regional EMS systems.

1975
- Health Department agreed to develop an advanced life support program and to provide coordination of emergency medical services countywide based on EMCC's recommendation and with County approval. Initial EMS Program developed with Federal funding under auspices of Comprehensive Health Planning.
- First EMS System Plan developed for Contra Costa County.

1976
- Los Medanos Community College, in conjunction with Stanford University, developed first training programs for paramedics and MICNs.

1977
- First paramedics and MICNs graduated from Los Medanos Community College training programs and were certified by County Health Officer.
- John Muir Medical Center and Mt. Diablo Medical Center designated Base Hospitals for medical control of paramedic units throughout the County. (Initial base hospital services were provided on a monthly rotation schedule.)
- Joint Exercise of Powers Agreement between Alameda and Contra Costa Counties established an East Bay EMS Region for development of a Regional EMS program.
- First paramedic-staffed ambulances responded in Walnut Creek (Pomeroy Ambulance in May 1977); in Moraga (Moraga Fire Protection District in June 1977); in Concord (Michael's Ambulance in January 1978); and in Richmond (Cadillac Ambulance February 1978 - Labor issues delayed active participation in program until 1979).

1980
- Joint Powers Agreement for Regional emergency medical services disbanded following recommendations from Alameda and Contra Costa Counties’ EMCCs
- Comprehensive California Emergency Medical Services System and Prehospital Emergency Medical Care Personnel Act passed. This legislation set EMS system standards, prehospital personnel training/certification standards, and provided basic standardized structure for EMS systems.
- Provision added to the County Ambulance Ordinance, which established exclusive ambulance zones for emergency and non-emergency transport.
- Brookside Hospital, San Pablo designated by County as third base hospital to provide medical direction for West County paramedic units.

1981
- In 1981 the establishment of State law and the California EMS Authority (EMSA) provided for significant State EMS leadership in California regarding the development of EMS systems.
- The California State Legislature enacted the “Emergency Medical Services System and Prehospital Emergency Medical Care Personnel Act (Health and Safety Code 1797, et al.).” This law specifically authorized local EMS agencies to “…plan, implement, and evaluate an emergency medical services systems…consisting of an organized pattern of readiness and response services…”
- The Act further authorized local EMS agencies to plan, implement and monitor limited advanced life support and advanced life support programs.
1982

- **Multicasualty Incident Plan** approved by County Board of Supervisors providing for on-scene coordination, resource notification, and patient distribution in multicasualty events.

1983

- County Health Services designated as **Local EMS Agency** and County Health Officer designated as **EMS Medical Director** by Board of Supervisors pursuant to State EMS Act.
- Competitive bid process for **emergency ambulance service contracts** conducted pursuant to revised County Ambulance Ordinance. A Request for Proposal process that sought highest level of service possible without County subsidy resulted in exclusive contracts with Cadillac Ambulance, Regional Ambulance, Moraga Fire District, San Ramon Valley Fire District, and East County Ambulance.

1984

- **Paramedic level ambulance transport services** implemented by San Ramon Valley Fire District in a joint program with John Muir Medical Center.
- Ten ambulance zones consolidated into 5 **Emergency Response Areas** (ERAs). Following a competitive bid process, exclusive ambulance service contracts awarded to Cadillac Ambulance, Regional Ambulance, Moraga Fire and San Ramon Valley Fire.

1985

- **EMS System Plan** developed according to standards set by EMS Authority.
- First competitive bid process for paramedic **base hospital designation** administered for 4 base hospital zones countywide. Contracts awarded to John Muir Med Center, Mt. Diablo Medical Center, Brookside Hospital and Los Medanos Hospital.
- Small plane crashed into **Sun Valley Mall** injuring some 80 victims. Multicasualty plan implemented.
- **Emergency Medical Dispatch** (EMD) standards/criteria developed; endorsed by EMCC.
- Procedure for **Emergency Department (ED) diversion** implemented allowing diversion of an emergency ambulance away from an ED if number of critical patients in ED was such that additional critical patients could not be cared for adequately.
- Brookside Hospital emergency department downgraded licensure to "Standby Emergency Services" and relinquished paramedic base hospital designation.

1986

- Comprehensive **Trauma System Plan** approved by Board of Supervisors providing for designation of a single Level II Trauma Center.
- John Muir Medical Center designated as County's **Level II Trauma Center**.
- Bay Area **Trauma Registry Project** initially funded by State EMSA.
- Operational Procedures for **Patient Transport by Helicopter** implemented.
- **Cadillac Ambulance purchased by Regional Medical Systems** (RMS) making RMS the single private emergency ambulance provider in County.
- **Competitive bidding process** for emergency ambulance providers in 5 ERAs. Service contracts awarded to Regional Ambulance, Moraga Fire and San Ramon Valley Fire.
- **Base Hospital contracts** established with John Muir Med Center, Mt. Diablo Med Center and Los Medanos Hospital.
- Emergency medical dispatch program including pre-arrival instructions implemented by **Contra Costa County Fire Dispatch Center**.

1987

- **Formal Patient Transfer Guidelines**, including an EMS Agency administered multi-disciplinary quality assurance process adopted by Board of Supervisors, and by all hospitals within the County.
- Health Services Department **Emergency Management Team**, consisting of key Health Services personnel, designated to respond to County EOC or Medical/Health Operations Center in a disaster.
- Program for reporting **communicable disease exposure** implemented.
- **Brookside Hospital** basic emergency license restored.

1988

- "**Measure H,**" a general election ballot advisory measure calling for the establishment of a benefit assessment for enhanced EMS services, approved by 71.6% of voters Countywide.
- **Joint Solano/Contra Costa EMS Hazardous Materials Training Project** supported by 5-year funding from consent agreement between IT Corporation and State Health Services and administered by EMS Agency.
- Pilot "**first responder paramedic engine**" program undertaken by Moraga Fire.

1989

- Countywide **Benefit Assessment District for Enhanced Emergency Medical Services**, County Service Area (CSA) EM-1, approved by all city councils and established by Board of Supervisors under Health Services administration.

1990

- **CSA Em-1** became operational.
- **EMS Disaster Planning Project** funded by State EMSA and administered by EMS Agency. County Health Officer designated Regional Disaster Medical Health Coordinator (RDMHC) for OES Region 2 counties.
- **San Ramon Regional Medical Center** in the City of San Ramon licensed for Basic Emergency Services.

1991

- **High-performance ambulance contracts** initiated with Regional Ambulance, San Ramon Valley Fire, and Moraga Fire.
- RFP competitive bid process performed to select equipment for a new First Responder Defibrillation Program. Physio Control semi-automatic defibrillators were selected.
- Countywide system of Multicasualty Medical Caches established for use in multicasualty or disaster situations.
- Specialized Hazardous Materials Response Protocols and training program developed and implemented.
- Paramedic training program offered at Los Medanos Community College.
- Veterans Administration Hospital closed.
- **1992**
  - Fire First Responder Defibrillation Program implemented Countywide.
  - "Emergency Medical Guidelines for Law Enforcement Agencies" endorsed by EMCC/County Police Chiefs' Assoc.
  - "EMS Operational Procedures For Response to an Expanded Medical Emergency" (EME) developed/implemented.
  - "Do Not Resuscitate" policy established.
  - EMS treatment protocols for children developed and implemented.
  - John Muir Trauma Center permanently (20 years) designated as Level II trauma center following request-for-proposal review process.
  - In-Fire Service EMS Models Assessment completed.
  - Base Hospital agreements renegotiated with Mt. Diablo, John Muir and Los Medanos hospitals.
  - Medical Transmission Network or "MTN" fire/medical dispatch computer linkage project initiated.
  - Paramedic quick response vehicle (QRV) program funded by Measure H, provided by American Medical Response, and implemented in Byron/Discovery Bay area (5/1/92).
  - MEDARS radio system used for ambulance-hospital communications upgraded from 2 to 4 channels.
- **1993**
  - Base hospital services no longer provided by Los Medanos Hospital.
  - General Chemical Company chemical release in Richmond area triggered large-scale fire, police and EMS response. Thousands of patients requested evaluation at local medical facilities in following weeks.
  - Poison control public hotline terminated by San Francisco Poison Control Center due to funding issues. EMS Agency maintained PCC access via local 9-1-1 system.
  - San Ramon Valley Fire's Dispatch Center piloted Medical Priority's computerized ProQA Dispatch System for prehospital EMS dispatch.
  - Contra Costa County, Riverview, Orinda, Moraga and West County fire districts functionally integrated.
  - "Quality Action Team" formed to improve EMS incident review.
  - Mobile radios programmed with fire service radio channels installed in paramedic units.
  - Funding obtained by EMS Agency for Highway Injury Record Linkage Software and Firearm Injury Reporting, Surveillance and Tracking System; programs administered by Health Services Injury Prevention.
  - Board of Supervisors approved AMR contract through 7/2/95 and then through 5/2/96.
- **1994**
  - Continuing education activities approved for EMT-I's to maintain State certification.
  - Los Medanos Community Hospital closed 4/23/94.
  - Responsibility for paramedic certification transferred from individual counties/regions to State EMSA.
  - Hospital Emergency Incident Command System (HEICS) adopted by hospitals to provide an organized approach to hospital disaster management.
  - Medical/health mutual aid response to Northridge earthquake in southern California coordinated among northern California coastal counties (Region II).
  - EMT-I training program for firefighters established by EMS Agency.
  - EMS Agency obtained State EMSA grant to study poison control center alternatives.
  - Emergency Medical Care Committee restructured to report to Health Services Director.
- **1995**
  - The Oakland and Richmond Kaiser hospitals merged. Richmond facility received only non-critical ambulance patients due to lack of ICU capabilities.
  - Paramedic State licensing requirements implemented in place of local certification procedures.
  - Assistant EMS Medical Director position allotted to the EMS Agency.
  - The 1-800-GIVE-CPR public information program began.
- **1996**
  - Dedicated EMS Medical Director position appointed for the EMS Agency.
Standards for EMS Enhanced First Responder Programs developed.

- Bethel Island Fire's First Responder Paramedic program implemented (10/7/96).
- San Ramon Valley Fire Dispatch Center recognized as Center of Excellence by National Academy of Emergency Medical Dispatch.

**1997**
- Bay Area Disaster Medical Assistance Team (DMAT) formed/sponsored by County Health Services.
- Contra Costa Fire Protection District’s First Responder Paramedic Program implemented (8/1/97). “Partners” course used to train EMT-Is to assist paramedics.
- Multicasualty response to Concord Water World slide collapse. One death and 32 injured were triaged to area hospitals.
- Public health nurse mutual aid provided during northern California winter storms.
- Computerized pen-based patient care reporting implemented Countywide.
- Emergency Medical Care Committee re-appointed by the Board of Supervisors as a Board advisory committee.
- Statewide Poison Control Center system implemented.
- John Muir and Mt. Diablo Medical Centers merged to form John Muir/Mt. Diablo Health System.
- Brookside Hospital acquired by Tenet Corp. and renamed Doctors Hospital, San Pablo Campus. Doctors, Pinole became Doctors Hospital, Pinole Campus.
- Kaisers Richmond and Martinez downgraded services. Not designated to receive ambulance patients.
- Orinda Fire and Moraga Fire merged to form Moraga-Orinda Fire Protection District.
- American Medical Response purchased by Laidlaw. Merged its ambulance services under the AMR name.
- Interfacility Transfer Review process revised.

**1998**
- Local emergency declared by Board of Supervisors for hospital emergency/critical care resource shortages.
- Contra Costa Regional Medical Center’s new hospital opened.
- First load of spent nuclear fuel rods transported by train through County.
- Antioch Ambulance Service bought by Golden Empire Ambulance.
- American Medical Response accepted subsidy reduction to fund expansion of Contra Costa Fire First Responder Paramedic Program.
- West County Consolidated Communications Operations and Contra Costa Fire District Dispatch Center personnel trained in Emergency Medical Dispatch.
- Multicasualty Incident (MCI) Plan revised.
- Resource Information Management System (RIMS) installed to link OES Region II counties to statewide disaster information management system.
- First hospital resource assessment completed.
- Department-wide Contra Costa Health Services Emergency Plan completed.
- Moraga Police and Orinda Police Departments implemented first responder defibrillation programs.

**1999**
- Kaiser Richmond opened inpatient critical care services.
- Oakley Fire organized as a fire protection district.
- Multicasualty responses to a fire at Tosco’s Avon Refinery; to a fire at Chevron Refinery, North Richmond; and to Richmond Health Center for noxious odor assessment.
- Pilot bi-phasic AED project implemented.
- Health Services Department Operations Center (DOC) activated for Y2K transition.
- Two-year State grant for a Data Linkage and Outcome Project obtained.
- Orinda Police Department implemented first responder defibrillation program.
- Antioch Ambulance Company ceased all operations (7/99).
- Contra Costa Fire began fire/medical dispatch for Pinole, Rodeo, Hercules, and Crockett-Carquinez Fire.

**2000**
- All Moraga-Orinda Fire EMS response vehicles staffed with paramedics.
- Impact Evaluation Study conducted including 2 public hearings prior to the March closing of Doctors Medical Center, Pinole Campus emergency department.
All fire/medical dispatch centers provide fire/ambulance dispatch using Medical Priority Dispatch System.

EMS for Children grant obtained to develop an EMS for Children Plan.

EMS for Children Plan developed for Contra Costa through 2-year grant funding.

EMS base hospital services no longer provided by Mt. Diablo Medical Center.

El Cerrito paramedic engine program implemented to serve Kensington and areas in El Cerrito hills.

First responder defibrillation programs implemented by Kensington and Brentwood Police Departments.

County Trauma System Plan updated to reflect changes in California Trauma regulations/requirements.

Office of Justice Planning grant ($300,000) used to purchase mass decontamination, communications, and personal protective equipment for use by fire/other agencies.

Bioterrorism Workgroup appointed by Health Services to plan/train for response to terrorist events.

Regional Disaster Medical Health Response staff funded full-time by State EMSA.

ReddiNet system implemented providing a communications link among hospitals, medical dispatch centers and EMS Agencies in Alameda and Contra Costa Counties.

EMS website opened providing online access to EMS policies, protocols and other EMS-related information.

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Department of Justice fingerprint background check procedure for all EMT-I certification and recertification applicants implemented.

East Diablo, Oakley, and Bethel Island Fire Protection Districts form East Contra Costa Fire Protection District.

AMR paramedic ORV established in Bethel Island replacing Bethel Island paramedic engine.

Paramedic engine feasibility assessment conducted by Fitch and Associates.

West County Dispatch Center (Richmond Police) accredited as EMD Center of Excellence by National Academy of Emergency Medical Dispatch.

Year 1 of 2-year State grant "Medical Education for Drug Safety" carried out by John Muir Medical Center Injury Prevention staff through the EMS Agency.

Paramedic Interfacility Transfer (CCT-P) Program implemented that allows specially trained paramedics to transport critical, but stable patients from hospital to hospital for specialized procedures or higher level of care.

Countywide post market evaluation of Medtronic-Physio-Control CR Plus defibrillator Implemented.

First responder defibrillation program implemented by Blackhawk Police Department.

EMS Aircraft policies and procedures for classification, authorization, request for, transport criteria and field operations revised.

Contra Costa County Fire Dispatch accredited EMD Center of Excellence by Emergency Medical Dispatch National Academy.

Fitch report released on the integration of fire paramedic engines into the EMS response system.

Tenet’s Doctors San Pablo management contract with West Contra Costa Health Care District terminated.

Mental health committee convened to address education, data collection and review necessary for ED physicians to resume responsibility for writing 72-hour psychiatric holds (5150s) following County Mental Health policy changes.

Reciprocal agreement with Alameda County implemented for Paramedic Interfacility Transfer Programs.

National Registry of Emergency Medical Technician’s exam adopted as the approved statewide EMT-I certification exam.

First responder paramedic program implemented by Rodeo-Hercules Fire Protection District.

Comprehensive Countywide EMS quality improvement plan implemented.

Comprehensive plan developed for integration of paramedic first responder and ambulance services in those areas of the County covered by private ambulance services.

Request for Proposal process for emergency ambulance service in areas of the County served by private provider American Medical Response. Proposals submitted by AMR and StarWest ambulance.

EMS-related cultural disparity project conducted along with American Medical Response.

EMS public access defibrillation (PAD) project implemented including distribution of 42 defibrillators to government agencies and training of recipients.

Mass flu immunization clinics held throughout the County.

Trauma system and trauma center review process revised to take advantage of technology.
- Contra Costa EMS educational conference held for prehospital personnel.
- Impact analysis for possible closure of Doctors San Pablo.
- First responder defibrillation program implemented by San Ramon Police Department and Mount Diablo State Park.
- First responder paramedic program implemented by Pinole Fire Department.

2005
- Five to nine-year contract for emergency ambulance services awarded American Medical Response.
- Contra Costa EMS Fire Training Consortium established to standardize training for fire first responders and ambulance personnel Countywide.
- First responder defibrillation program implemented by Antioch Police Department.
- A multidisciplinary committee convened to consider a Multicasualty Plan revision.
- Richmond Police/Fire dispatch center and AMR's dispatch center linked allowing requests for ambulances to go directly to AMR via computer versus a secondary phone call saving time in ambulance dispatch.

2006
- RedNet system upgraded.
- MetiMan, an emergency care simulator purchased to provide patient simulation training for fire/ambulance personnel.
- An electronic patient care data collection system purchased for fire first responder paramedic providers.
- John Muir Mt. Diablo Health System renamed John Muir Health, Walnut Creek and John Muir Health, Concord.
- Doctors San Pablo declared bankruptcy. Ambulance traffic diverted to surrounding hospitals for a 2-month period. Hospital is downsized and structure reorganized.
- Emergency Department (ED) Diversion for ED overcrowding discontinued.
- Public safety defibrillation program implemented by Department.

2007
- Emergency care simulator equipment transported by AMR to fire services countywide for scheduled fire EMS training.
- New Multicasualty Plan implemented countywide 7/1/07. 10,000 triage tags purchased and distributed to fire first responder agencies and emergency ambulance service providers.
- Kaiser Medical Center opened in Antioch. 11/1/07
- Fire electronic PCR implemented. 1/2/07
- EMS provider focused quality newsletter “EMS Best Practices” initiated.
- SWAT paramedic program proposal approved for Concord Police Department.
- CCT-P Program treatment guidelines now coordinated with Alameda and Santa Clara County guidelines.

2008
- Trial study of LUCAS chest compression system for patients in cardiac arrest implemented.
- STEMI system launched including implementation of 12-lead EKG program in ambulances countywide and the appointment of 4 hospital receiving facilities (Doctors San Pablo; John Muir Health, Concord and Walnut Creek Campuses; and San Ramon Regional Medical Center.

2009
- Developed portal for Fire EMS Training Consortium to access Prehospital training curriculum online.
- Sutter Delta Medical Center joined Contra Costa STEMI System on August 17, 2009.
- Completed one full year of participation in CARES National Cardiac Arrest Registry.
- Cyanokitks placed throughout the RDMHC region.
- RDMHC Program participation in the development and roll-out of California Disaster Health Operations Manual (CDHOM).
- Contra Costa County Medical Reserve Corps (CCMRC) implemented as part of County’s emergency planning and response system, and
- Contra Costa County Medical Reserve Corps became official May 2009.
- Society of Chest Pain site visit participation supporting John Muir Medical Center Concord and Walnut Creek Campuses accreditation as Chest Pain Centers with PCI in July 2009.
- Ethnic and racial data collection incorporated into prehospital care record (American Medical Response) to assess for racial disparities in EMS care delivery.
- Quarterly facility drop time performance reporting established as part of Facilities and Critical Care Committee Activities.
X. EMS & RELATED ABBREVIATIONS
## Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>ACLS</td>
<td>Advanced Cardiac Life Support</td>
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<tr>
<td>AED</td>
<td>Automatic External Defibrillator</td>
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<td>AIS</td>
<td>Abbreviated Injury Score</td>
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<td>ALARMS</td>
<td>Asset Logistics &amp; Resource Management System</td>
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<td>ALS</td>
<td>Advanced Life Support</td>
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<td>BLS</td>
<td>Basic Life Support</td>
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<td>BTLS</td>
<td>Basic Trauma Life Support</td>
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<td>CAD</td>
<td>Computer Aided Dispatch</td>
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<td>CAHAN</td>
<td>California Health Alert Network</td>
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<td>CAN</td>
<td>Community Alert Network</td>
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<td>CCCMRC</td>
<td>Contra Costa County Medical Reserve Corps</td>
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<tr>
<td>CCT</td>
<td>Critical Care Transport</td>
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<td>CCT-P</td>
<td>Critical Care Transport – Paramedic</td>
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<td>CDC</td>
<td>Center for Disease Control &amp; Prevention</td>
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<td>CDHMOM</td>
<td>California Disaster Health Operations Manual</td>
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<td>CPR</td>
<td>Cardiopulmonary Resuscitation</td>
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<td>DMAT</td>
<td>Disaster Medical Assistance Team</td>
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<td>DOC</td>
<td>Departmental Operations Center</td>
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<td>EM</td>
<td>Emergency Management</td>
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<td>EMSC</td>
<td>Emergency Medical Care for Children Program</td>
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<td>EMCC</td>
<td>Emergency Medical Care Committee</td>
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<td>EMD</td>
<td>Emergency Medical Dispatch</td>
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<tr>
<td>EMS</td>
<td>Emergency Medical Services</td>
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<td>EMSA</td>
<td>Emergency Medical Services Authority</td>
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<td>EMT</td>
<td>Emergency Management Team</td>
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<td>EMT-I</td>
<td>Emergency Medical Technician-I</td>
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<tr>
<td>EMT-P</td>
<td>Emergency Medical Technician-Paramedic or “Paramedic”</td>
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<tr>
<td>EOC</td>
<td>Emergency Operating Center</td>
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<td>ERA</td>
<td>Emergency Response Area</td>
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<td>HazMat</td>
<td>Hazardous Materials</td>
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<tr>
<td>HAvBED</td>
<td>Hospital System for tracking inpatient surge capacity</td>
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<td>HICS</td>
<td>Hospital Incident Command System</td>
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<td>HSEEP</td>
<td>Homeland Security Exercise and Evaluation System</td>
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<td>ICS</td>
<td>Incident Command System</td>
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<td>IRIS</td>
<td>Incident Response Information System</td>
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<td>ISS</td>
<td>Injury Severity Score</td>
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<td>LEMSA</td>
<td>Local EMS Agency</td>
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<td>MCI</td>
<td>Multicasualty Incident</td>
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<td>MEDARS</td>
<td>Medical Emergency and Disaster Ambulance Radio System</td>
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<td>MICN</td>
<td>Mobile Intensive Care Nurse</td>
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<td>MICP</td>
<td>Mobile Intensive Care Paramedic</td>
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<td>MRC</td>
<td>Medical Reserve Corp</td>
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<td>MTN</td>
<td>Message Transmission Network</td>
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<td>MTV</td>
<td>Major Trauma Victim</td>
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<td>MHOAC</td>
<td>Medical/Health Operational Area Coordinator</td>
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<td>NIMS</td>
<td>National Incident Management System</td>
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<td>OES</td>
<td>Office of Emergency Services</td>
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<tr>
<td>PAD</td>
<td>Public Access Defibrillation</td>
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<td>PALS</td>
<td>Pediatric Advanced Life Support</td>
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<td>PEPP</td>
<td>Pediatric Education for Prehospital Professionals</td>
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<tr>
<td>PIE</td>
<td>Public Information and Education</td>
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<tr>
<td>PIO</td>
<td>Public Information Officer</td>
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<td>PSAP</td>
<td>Public Safety Answering Point</td>
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<tr>
<td>QRV</td>
<td>Quick Response Vehicle</td>
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<tr>
<td>RACES</td>
<td>Radio Amateur Civil Emergency Services</td>
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<tr>
<td>RDMHC</td>
<td>Regional Disaster Medical/Health Coordinator</td>
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<tr>
<td>RDMHS</td>
<td>Regional Disaster Medical/Health Specialist</td>
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<tr>
<td>RIMS</td>
<td>Response Information Management System</td>
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<tr>
<td>SARS</td>
<td>Severe Acute Respiratory Disease</td>
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<tr>
<td>SEMS</td>
<td>Standardized Emergency Management System</td>
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<tr>
<td>SNS</td>
<td>Strategic National Stockpile</td>
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<tr>
<td>STEMI</td>
<td>S-T elevation myocardial infarction</td>
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<tr>
<td>WMD</td>
<td>Weapons of Mass Destruction</td>
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XI. GLOSSARY OF EMS TERMS
EMS Terms

- **Advanced Cardiac Life Support (ACLS):** An advanced level certification provided by the American Heart Association generally required for paramedics, emergency nurses and emergency physicians.
- **Advanced Life Support (ALS):** Special services designed to provide prehospital emergency medical care, including, cardiopulmonary resuscitation, cardiac monitoring, cardiac defibrillation, advanced airway management, intravenous therapy, specified drug administration, and other specified techniques and procedures administered by paramedics as part of a local EMS system. Patient care is provided according to EMS Field Treatment Protocols.
- **Air Ambulance:** An aircraft used for responding to emergency calls and transporting critically ill or injured patients. The medical flight crew has at a minimum of 2 attendants certified or licensed in advanced life support.
- **Automatic External Defibrillator (AED):** Automatic or semi-automatic defibrillators assess a patients cardiac status and provide a shock (or instruct the machine to shock) if needed. AEDs are now available in public places by many communities for use by laypersons under Public Access Defibrillations Programs (PADs).
- **Base Hospital:** A hospital which, upon designation by the local EMS agency, is responsible for directing the advanced life support (ALS) system and prehospital care system assigned to it by the local EMS agency.
- **Basic Life Support (BLS):** Emergency first aid and cardiopulmonary resuscitation procedures, which as a minimum, include recognizing respiratory and cardiac arrest and starting cardiopulmonary resuscitation (CPR) to maintain life without invasive techniques until the victim is transported or until advanced life support is available.
- **Basic Trauma Life Support (BTLS):** A trauma care course developed by the American College of Emergency Physicians, and required for local paramedics.
- **Blunt trauma:** Injuries that occur without penetrating the body (e.g. vehicle injuries, falls, blunt instrument assaults).
- **Cardiac Arrest:** A condition where the heart stops beating (asystole) or where it quivers (ventricular fibrillation) and does not pump blood to the rest of the body resulting in death if not corrected.
- **Cardiopulmonary Resuscitation (CPR):** The procedure of performing artificial respiration and artificial circulation to a non-breathing, pulseless patient.
- **Centers for Disease Control and Prevention (CDC):** The Centers for Disease Control and Prevention (CDC) is recognized as the lead federal agency for public health.
- **Code 2:** Used by EMS systems to refer to immediate ambulance responses to potentially urgent but non-life threatening incidents without using red lights/sirens and adhering to all Vehicle Code requirements (speed limits and rights-of-ways).
- **Code 3:** Emergency unit response with red lights/siren to an emergency incident. When responding Code 3, emergency units may exceed posted speed limit within certain constraints and may proceed through red lights without making a full stop, although the driver is held responsible for assuring safety for his/her unit and other drivers while doing so.
- **Community Alert Network (CAN):** Community Alert Network, Inc. is a high-speed, telephone emergency notification service that provides the ability to get critical information to large numbers or a precise number of people in a short period of time. CAN uses computer, telephone and digitized voice technology.
- **Computer Aided Dispatch (CAD):** A computer system consisting of associated hardware and software to facilitate call taking; unit selection; resource dispatch/deployment; time stamping; and real time incident database maintenance.
- **County Service Area (CSA) EM-1:** A special benefit assessment district established by the Board of Supervisors to fund local EMS enhancements.
- **Critical Care Transport-Paramedic (CCT-P):** Individual whose scope of practice includes the basic and optional scopes but also has an extended scope of practice through specialized training that includes advanced medications and procedures approved through EMDAAC and by the EMS Medical Director.
- **Defibrillator:** A piece of equipment which can momentarily arrest all non-coordinated contractions of heart muscle fibers with the use of electric current in order that a spontaneous beat may resume. Hospitals and paramedics (ALS providers) use manually operated defibrillators that require judgment on the part of the rescuer. First responders use automatic or semi-automatic defibrillators that assess the patient's cardiac status and provide a shock if necessary.
- **Departmental Operations Center (DOC):** An emergency operations center used by specific departments of government for emergency response coordination.
- **Disaster Medical Assistance Team (DMAT):** A group of health professionals/support personnel trained to provide medical/health care during disasters in austere environments. DMAT is part of the National Disaster Medical System (NDMS), which is part of the Emergency Preparedness and Response branch of the Federal Emergency Management Agency (FEMA).
- **Dispatch Center:** Coordinating center for efficient management of all participating emergency resources within a designated area of responsibility. Centers dispatch rescue personnel/equipment, and manage these resources to ensure maximum effectiveness.
- **Emergency (medical):** A condition or situation in which an individual has a need for immediate medical attention.
- **Emergency Ambulance:** A specialized vehicle equipped with appropriate medical equipment/supplies, and staffed with qualified personnel for transporting sick or injured patients.

- **Emergency Department:** The area of a licensed general acute care hospital that receives patients in need of emergency medical evaluation and or care.

- **Emergency Medical Services Authority (EMSA):** The State EMS organization that develops standards for local EMS systems and provides coordination and leadership.

- **Emergency Medical Services Commission:** A State multidisciplinary committee established by State legislation to review and approve regulations, standards, and guidelines, as well as to advise the EMS authority on a variety of issues.

- **Emergency Medical Services Medical Director:** Licensed physician appointed as local EMS Agency medical director to provide medical control and to assure medical accountability through planning, implementation and evaluation of EMS system.

- **Emergency Medical Services System:** An organized and coordinated arrangement that provides for the personnel, facilities, and equipment for the effective and coordinated delivery of medical care services under emergency conditions.

- **Emergency Medical Services System Plan:** A plan for the delivery of emergency medical services consistent with State guidelines addressing components listed in Health and Safety Code Section 1797.103.

- **Emergency Medical Technician-Paramedic, EMT-P or Paramedic:** Individual whose scope of practice includes skills and procedures to provide advanced life support as part of an EMS system and who is licensed by the State of California and accredited by the local EMS agency as having met established criteria. In the Contra Costa County EMS system, paramedics are dispatched to all emergency medical requests unless it has been established by the fire/medical dispatch center that a basic life support ambulance is a sufficient level of response.

- **Emergency Operating Center (EOC):** Facility designed and equipped for use by city, county or other governmental agency leadership to manage disaster response within area of responsibility.

- **Emergency Response Area (ERA):** An ambulance zone designated by the county for issuing ambulance permits and identifying exclusive operating areas for emergency ambulance service agreements. Contra Costa County consists of ERAs.

- **Fire/Medical Dispatch Center:** Public Safety Dispatch Center that receives requests for emergency medical services, dispatches medical first responders and initiates ground and air ambulance response.

- **First Responder:** The first EMS rescuer to arrive on scene of a medical emergency; generally a fire non-transport unit.

- **Hazardous Materials (HAZMAT):** Any material source of danger/element of risk to people/property.

- **Health & Safety Code:** State legislation that includes Division 2.5 EMS Statutes.

- **Health Services:** The department of County government responsible for health-related issues. The local Board of Supervisors has designated Contra Costa Health Services, which includes the Emergency Medical Services Agency, as the “Local EMS Agency.”

- **Hospital Incident Command System (HICS):** A crisis management plan, developed expressly for comprehensive medical facilities, that is modeled closely after the Fire Service Incident Command System.

- **Incident Commander (IC):** Person designated to direct and/or control resources and is responsible for overall management of the event response.

- **Incident Command System (ICS):** A flexible organizational structure that provides a basic expandable system developed by Fire Services to mitigate any size emergency situation. In 1992 California law mandated that emergency responders and emergency planning officials within public service use this system.

- **Local EMS Agency (LEMSA):** A local agency, usually a county health department/office, which has primary responsibility for administration of emergency medical services in a county/multi-county area.

- **Major Trauma Victim (MTV):** The most seriously injured patients identified retrospectively based on a specialized injury scoring system.

- **Measure H:** The Contra Costa County advisory ballot measure in the Fall of 1988, which, when passed overwhelmingly in each city and in the County unincorporated areas, advised a special assessment be collected to support EMS programs. It specifically added paramedic ambulances, EMS communications system enhancements, disaster supplies, and enhanced medical training and equipment for fire first responders.

- **Medical Reserve Corp:** Volunteer group of health providers recruited and trained to serve local and regional needs in the event of a county health emergency or event.

- **Medical Control:** Medical management of the emergency medical services system. This is done prospectively through policies and procedures, on-line through base hospital consultation, and retrospectively through continuing education, case review, and quality improvement activities.
Mobile Intensive Care Nurse (MICN) or Authorized Registered Nurse (ARN): A registered nurse who the EMS Medical Director has authorized as qualified to issue instructions to prehospital emergency medical care personnel within an EMS system according to standardized procedures.

Multicasualty Incident (MCI): Emergency incident involving any number of injured persons that over-taxes rescue and medical resources of responsible agencies within an area of the County.

Mutual Aid: The furnishing of resources from one individual/agency to another, including facilities, personnel, equipment and/or services when requested during time of need pursuant to an agreement between individuals/agencies.

National Disaster Medical System (NDMS): A cooperative asset sharing partnership created in the mid-1980s among the Department of Health and Human Services, the Department of Defense, the Department of Veterans Affairs and the Federal Emergency Management Agency (FEMA). The system provides medical response to a disaster site for patient evacuation, and hospitalization in a national network of hospitals.

National Incident Management System (NIMS): A standardized system of management processes, protocols, and procedures established by the federal government that all responders - Federal, state, tribal, and local - used to prepare for, respond to, and recover from domestic incidents, regardless of cause, size, or complexity.

Pediatric Education for Prehospital Providers (PEPP): Course developed by the American Academy of Pediatrics to better prepare prehospital personnel in caring for children.

Penetrating trauma: Injury caused by penetration of the body by an object such as a knife, bullet, flying glass, etc.

Public Access Defibrillation (PAD): A program supported by EMS in partnership with the American Heart Association to make automatic electronic defibrillators (AEDs) available in public places for use by laypersons.

Public Safety Agency: A functional division of a public agency that provides fire fighting, police, medical or other emergency services.

Public Safety Answering Point (PSAP): The location where 9-1-1 calls are answered and either appropriate resources are dispatched or the request is relayed to the responding agency.

Quick Response Vehicle (QRV): QRVs are paramedic-staffed, non-transport vehicles that are dispatched as first responder paramedics in areas where fire services provide a basic life support first response.

RACES: Radio Amateur Civil Emergencies Service.

ReddiNet: Proprietary system of networking hospitals and county central points for the purpose of sharing information of hospital status and other important information related to the EMS system, multicasualty incidents, and disasters.

Regional Disaster Medical/Health Coordinator (RDMHC): An individual within each State OES Region whose principle function is to coordinate acquisition of medical/health mutual aid in response to a request from State EMSA, Department of Health Services, or Governor's OES in support of state medical/health response to a major disaster.

Regional Disaster Medical/Health Specialist (RDMHS): An individual whose principle function is to assist an RDMHC in planning for and coordinating acquisition of medical and health mutual aid in response to a request from State EMSA, Department of Health Services, or Governor's OES in support of a state medical/health response to a major disaster.

Rescue Aircraft: An aircraft whose usual function is rescue, but which may be used, in compliance with local EMS policy, for prehospital emergency patient transport when use of an air or ground ambulance is inappropriate or unavailable.

Response Time: The actual elapsed time between receipt of a request for service and the arrival of the ambulance at the requested location.


STEMI: An S-T elevation myocardial infarction is a particular type of heart attack best treated by rapidly unblocking arteries in the heart.

STEMI Receiving Center: A hospital designated by the EMS Agency as having the staffing, equipment and other resources to provide percutaneous coronary intervention (PCI), which involves heart catheterization and direct treatment of vessel cots and blockages.

Strategic National Stockpile (SNS): Designed to provide a back-up supply of large quantities of essential medical items to states and communities who have exhausted local or regional supplies during an emergency. The Federal Center for Disease Control and Prevention manages the program. The first shipment of the SNS would arrive within 12 hours of federal decision to deploy. It contains a broad range of material that authorities could use to protect and treat several hundred thousand people for an ill-defined causative agent.

Trauma Center: A licensed general acute care hospital designated by the local EMS Agency as a Level I, II or III Trauma Center. Trauma centers provide staffing and equipment for immediate evaluation and intervention for severely injured patients. John Muir Medical Center is the designated Level II Trauma Center for Contra Costa
Trauma System Plan: A formal plan for the transport and care of critically injured patients. Trauma system plans must be submitted to and approved by the State EMS Authority. Contra Costa’s Trauma System Plan includes the designation of one level II trauma center within the County.

Triage: Continuous process of sorting accident victims according to severity of their injuries. Necessary when the number of victims exceeds the number of rescuers or resources available.

Weapons of Mass Destruction (WMD): Include nuclear, biological or chemical weapons, which may be used in terrorist attacks.
XII. DOCUMENTS AVAILABLE FROM THE EMS AGENCY
DOCUMENTS, PLANS AND OTHER EMS INFORMATION

Contra Costa EMS posts an extensive list of resources, documents, plans and educational materials on our website at www.cccems.org. If you need assistance finding the information you need please contact our offices at 925-646-4690. Examples include:

9-1-1 Brochures
County Service Area EM-1 Proposal and Service Plan
Contra Costa Health Services Emergency Plan
Disaster Medical Assistance Team, DMAT CA-6 information
EMCC By-laws
Emergency Medical Guidelines for Law Enforcement Agencies
EMS Agency Annual Program Reports
EMS for Children Program
EMS Emergency Operations Procedures
EMS Event Reporting Program
EMS Policies and Procedures
EMS System Plan, Annual Updates
Facilities Assessment
HeartSafe Community Program
Message Transmission Network Specification
Multicasualty Incident (MCI) Plan
Paramedic Interfacility Transfer Program application packet
Prehospital Care Manual
Public Access Defibrillation (PAD) packets
Regional Disaster Medical/Health Coordinator Emergency Plan
Request for Proposal for Emergency Ambulance Services, 2004
Request for Proposal for Trauma Center Designation, 1992
STEMI System Program
Trauma System Plan
XIII. CPR & FIRST AID RESOURCES
## CPR/First Aid Resources

<table>
<thead>
<tr>
<th>Agency</th>
<th>Class Location</th>
<th>Courses</th>
<th>AHA card</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams Safety Training</td>
<td>San Ramon</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://www.adamssafety.com">www.adamssafety.com</a></td>
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<tr>
<td>American Heart Association</td>
<td>Various locations</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://www.americanheart.org">www.americanheart.org</a></td>
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<td>American Medical Response</td>
<td>Various locations</td>
<td>CPR &amp; First Aid</td>
<td>No</td>
<td><a href="http://www.amr.net">www.amr.net</a></td>
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<tr>
<td>American Red Cross</td>
<td>Various locations</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://www.bayarea-redcross.org">www.bayarea-redcross.org</a></td>
</tr>
<tr>
<td>California Safety Management</td>
<td>El Sobrante</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://www.csmcpr.com">www.csmcpr.com</a></td>
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<tr>
<td>Concord, City of</td>
<td>Concord</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://www.ci.concord.ca.us/">www.ci.concord.ca.us/</a></td>
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<tr>
<td>CPR Training Center</td>
<td>Concord</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://www.cprtrainingcenter.com">www.cprtrainingcenter.com</a></td>
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<tr>
<td>Fast Response</td>
<td>Berkeley, Walnut Creek</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://www.fastresponse.org/">www.fastresponse.org/</a></td>
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<tr>
<td>Heart Start CPR</td>
<td>San Ramon</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://www.heartstartcpr.net">www.heartstartcpr.net</a></td>
</tr>
<tr>
<td>Fontaine Fire, Inc.</td>
<td>Danville (by arrangement)</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://www.fontainefire.com">www.fontainefire.com</a></td>
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<td>Hercules Community Swim Center</td>
<td>Hercules</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://www.ci.hercules.ca.us/New/">www.ci.hercules.ca.us/New/</a></td>
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<tr>
<td>John Muir Women’s Health Center</td>
<td>Walnut Creek</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://www.johnmuirhealth.com">www.johnmuirhealth.com</a></td>
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<tr>
<td>Kaiser Clinic</td>
<td>Antioch</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://members.kaiserpermanente.org/kpweb/classes/list.do">http://members.kaiserpermanente.org/kpweb/classes/list.do</a></td>
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<td>Lafayette, City of</td>
<td>Lafayette</td>
<td>CPR</td>
<td>Yes</td>
<td><a href="http://www.lafmor-recreation.org">www.lafmor-recreation.org</a></td>
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<td>Los Medanos College</td>
<td>Pittsburg</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://www.losmedanos.edu/">www.losmedanos.edu/</a></td>
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<td>Martinez Adult Education</td>
<td>Martinez</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://www.martinez-ed.org/">www.martinez-ed.org/</a></td>
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<tr>
<td>Mt. Diablo Adult Education</td>
<td>Concord</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://www.mdusd.k12.ca.us/adulted">www.mdusd.k12.ca.us/adulted</a></td>
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<tr>
<td>Moraga Orinda Fire</td>
<td>Moraga/Orinda</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://www.mofd.org">www.mofd.org</a></td>
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<tr>
<td>National Safety Council</td>
<td>Various locations</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://www.nsc.org">www.nsc.org</a></td>
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<td>Orinda, City of</td>
<td>Orinda</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://www.ci.orinda.ca.us">www.ci.orinda.ca.us</a></td>
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<tr>
<td>San Ramon, City of</td>
<td>San Ramon</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://www.ci.san-ramon.ca.us/">www.ci.san-ramon.ca.us/</a></td>
</tr>
<tr>
<td>Walnut Creek, City of</td>
<td>Heather Farms, Walnut Creek</td>
<td>CPR &amp; First Aid</td>
<td>Yes</td>
<td><a href="http://www.walnutcreekrec.org">www.walnutcreekrec.org</a></td>
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</tbody>
</table>