Contra Costa County Health Services Department

Emergency Medical Services Agency

1997 Annual Program Report

- April 1998 -

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I. Introduction

A. Overview of EMS

Emergency Medical Services include that system of services organized to provide rapid response to serious medical emergencies, including immediate medical care and patient transport to definitive care in an appropriate hospital setting. An effective EMS system involves **a variety of agencies and organizations working together to accomplish the goal of providing rapid emergency medical response and treatment.** While most EMS responses are day-to-day emergencies, EMS agencies also plan and prepare for disaster medical response. EMS 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 and medical advisory groups**
- **Local and State EMS agencies**
- **Other governmental and voluntary organizations**

In California, EMS systems are organized on a county or regional basis. Local EMS Agencies designated by county boards of supervisors are responsible for local EMS planning and coordination consistent with State law and regulations. Local EMS Agencies (LEMSA's) are the lead agencies coordinating EMS services at the county or regional level. The **State Health Services Emergency Medical Services Authority (EMSA) is the lead EMS agency.** The State 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. 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 the County Health Services Department as the Local EMS Agency. The EMS functions of the

Health Services Department are carried out by the EMS Director, EMS Medical Director, and staff. The EMS Medical Director has statutory responsibilities to oversee medical aspects of the EMS program. An **Emergency Medical Care Committee** (EMCC) provides advice regarding EMS matters to the Board of Supervisors, to the Health Department and to its EMS Agency.

B. Local EMS Agency Functions

The **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 credentialling programs for EMT-I's, paramedics and MICN's.
- Authorizing advanced life support (ALS) programs.
- Establishing policies and procedures for medical control of the EMS system, including dispatch, patient destination, patient care, and quality assurance.
- Establishing ordinances and/or exclusive operating areas for the regulation of ambulance services.
- Developing and implementing a trauma system plan.

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

- Monitoring interfacility patient transfers.
- Implementing EMS program enhancements funded under County Service Area EM-1 (Measure H).

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

- Planning and coordinating disaster medical response.
- Approving and monitoring Prehospital Continuing Education Providers.

To accomplish these functions, the EMS Agency employees a staff of 9 persons, including the EMS director, part-time EMS medical director, program coordinator, two prehospital care coordinators, trauma coordinator, training coordinator, and two clerks.

C. Emergency Medical Care Committee

The Contra Costa County EMCC acts as an advisory body to the Health Services Department and its local EMS agency on all matters relating to EMS. Members are appointed by the Health Services Director. In 1997, the Contra Costa EMCC consisted of 30 members including up to 6 consumer representatives. The following organizations were represented on the EMCC:

- American Heart Association
- American Red Cross
- California Highway Patrol
- Contra Costa Ambulance Providers (1 each)
- Emergency Department Physicians
- Emergency Nurses Association
- Fire Chiefs' Association
- County Health Officer or designee
- Hospital Council of No. & Central California, East Bay Conference
- EMS Training Institution
- County Office of Emergency Services
- Police Chiefs' Association
- Public Managers' Association
- Sheriff-Coroner Communication Division
- Alameda-Contra Costa Medical Association
- Base Hospital (1 each)
- Trauma Center
- Community Awareness and Emergency Response (CAER)
- County Dispatchers' Association

The EMCC meets in the County Emergency Operating Center located at 50 Glacier Drive, Martinez. All meetings of the EMCC and its subcommittees are open to the public.

During 1997, the primary emphasis of the EMCC was directed towards the EMS System Planning process. Specialized EMCC subcommittees were established to

assess the extent to which the County EMS System met goals and objectives identified in the EMS System Plan. These subcommittees included:

- System Organization and Management
- Response and Transportation
- Staffing and Training
- Disaster Medical Response
- Facilities and Critical Care
- Communications
- Public Information and Education
- Data Collection and Evaluation (ad hoc)

D. 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 **Public Safety Answering Point (PSAP)**. A dispatcher or complaint operator at the PSAP determines the nature of the emergency and, if the PSAP is part of a fire/medical dispatch center, obtains information necessary to dispatch the appropriate response units. If the PSAP is not part of a fire/medical dispatch center, the call may be transferred to a "secondary PSAP" where a dispatcher then obtains necessary information to dispatch fire and medical units.

The initial response to a potentially life threatening incident may include both a **fire first responder unit** and a paramedic-staffed ambulance. The location of fire stations throughout the county enables firefighters to make **a rapid initial response to a medical emergency**. Firefighters are trained and equipped to provide rescue, first aid, and cardiac defibrillation. In some areas, firefighter first responders may respond to medical emergencies in an ambulance vehicle rather than an engine. This provides backup transport capability to the paramedic transport ambulance in the event there are multiple victims or a delay in the transport ambulance response. In other areas, rapid paramedic first response is provided in non-transport vehicles so that advanced life support can be initiated prior to the arrival of the ambulances.

Emergency ambulance services in most parts of the County are provided by a private company, American Medical Response (formerly Regional Ambulance) under contract with the County. In the San Ramon Valley and Moraga-Orinda areas, emergency ambulance service is provided by the fire service. Depending upon the nature of the incident, an ambulance may be dispatched Code 3 (red lights and siren) or Code 2 (immediate response, but following normal traffic regulations). Ambulances may be staffed with either paramedic-trained or EMT-I-trained personnel. **Advanced life support (ALS) ambulance units are staffed with two paramedics and are always dispatched to potentially life threatening incidents.** Paramedics work under direction of base hospital medical personnel and are able to administer lifesaving drugs and perform other invasive lifesaving procedures. **Basic life support (BLS) ambulance units are staffed by two EMT-I's and may be used for non-emergency response or to provide additional support at an emergency incident.**

Patient treatment and transport are carried out under State and local EMS agency policies and procedures. These policies may include, in the case of paramedics, making contact with a **mobile intensive care nurse (MICN) or physician at a designated base hospital** to obtain direction in management of the patient. Patients are transported to hospitals able to provide needed services. Hospital destination is based upon patient preference and County EMS protocols. Critical patients may be directed to the nearest emergency department or to the trauma center. Noncritical 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. CALSTAR, one of six medical helicopter services authorized to respond to EMS calls in Contra Costa, maintains a 24-hour helicopter unit staffed by specially trained flight nurses based at Buchanan Field in Concord. Other helicopter services are available to respond from neighboring counties if CALSTAR is unavailable.

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

In 1988, the voters of Contra Costa County passed countywide **Measure H** providing for **enhancements to the EMS system** including increased paramedic ambulance service, additional medical training and equipment for firefighter first responders, and an improved EMS communications system. Following a 71.6% affirmative vote, the Board of Supervisors, with the support of the 18 city councils, formed County Service Area EM-1 to levy charges on real property as specified in Measure H. Assessments are limited to $10.00 annually for a single family residence. Commercial and industrial properties are generally assessed at $30.00 or higher, depending upon the use code classification of the parcel. Measure H assessments have been used to add six staffed paramedic ambulance units to respond to 9-1-1 calls; to establish a firefighter first responder defibrillation program and to purchase and maintain automatic defibrillators for all fire response units; to purchase and maintain medical supply caches for use in multicasualty and disaster response; to upgrade the MEDARS radio system used for ambulance-to-hospital communications; to provide ambulances with radios for communication with fire first responders, and to upgrade the ambulance dispatch system and dispatcher preparedness.

F. Development of EMS in Contra Costa County

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 1960's. Contra Costa as well as a number of other progressive counties throughout California began developing their emergency medical services systems during this time. Following are milestones in the development of the EMS system in Contra Costa County:

1968
- **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 (MICN's)** to provide **advanced life support services** to patients in the field setting.
- **Ambulance Regulations** added to County Ordinance Code which included permit and ambulance registration processes.

1972
- Ten **ambulance zones** established for the provision of emergency ambulance service within the county.

1975
- In response to EMCC's recommendation and with county approval, Health Department agreed to develop an **advanced life support program** and to provide coordination of emergency medical services countywide. Initial **EMS Program** developed with Federal funding under auspices of Comprehensive Health Planning.

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

1977
- **First paramedics and MICN's 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 the 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 EMS disbanded following recommendation of EMCC's from Alameda and Contra Costa Counties.

- Comprehensive **California Emergency Medical Services System and Prehospital Emergency Medical Care Personnel Act** enacted. This legislation set EMS system standards, as well as prehospital personnel training/certification standards, and provided a basic standardized structure for EMS systems throughout the State.

- Provision added to the County Ambulance Ordinance which established **exclusive ambulance zones** for emergency and non-emergency transport .

- Brookside Hospital designated by county as third base hospital to provide in-area medical direction for west county paramedic units.

1982

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

1983

- Health Services Department 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** was established pursuant to a revised County Ambulance Ordinance. A **Request for Proposal** process which sought the 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)**. Exclusive ambulance service contracts were awarded to Cadillac Ambulance, Regional Ambulance, Moraga Fire and San Ramon Valley Fire following competitive bid process.

1985

- **EMS System Plan** developed according to standards set by EMS Authority.
- First formal **RFP process for paramedic base hospital designation** developed and administered for 4 base hospital zones countywide.

- **Emergency Medical Dispatch (EMD) standards and criteria** developed and recommended by the EMCC.

- Procedure for **Emergency Department (ED) diversion** implemented to allow diversion of emergency ambulances away from an ED if number of critical patients in ED was such that any more critical patients could not be cared for adequately.

- Brookside Hospital emergency department downgraded licensure to "Standby Emergency Services" and relinquished paramedic base hospital designation. West County paramedic ambulances reassigned to Mt. Diablo and John Muir paramedic base hospitals.

1986

- Comprehensive **Trauma System Plan** providing for the designation of a single Level II Trauma Center approved by Board of Supervisors. Trauma system **treatment and triage protocols** adopted. Ambulance personnel and first responders trained in specialized critical trauma patient management.
- John Muir Medical Center designated as County's **Level II Trauma Center**.

- **Bay Area Trauma Registry Project** initially funded by State EMSA to develop a trauma data registry.

- Operational Procedures for **Patient Transport by Helicopter** implemented.
- Cadillac Ambulance purchased by Regional Medical Systems making RMS

the single private emergency ambulance provider in county.

- **Competitive bidding process held for emergency ambulance service providers** in 5 ERA's. Ambulance service contracts awarded to Regional Ambulance, Moraga Fire and San Ramon Valley Fire.

- **Base Hospital** contracts established with John Muir Medical Center (2 zones), Mt. Diablo Medical Center and Los Medanos Community Hospital.

- **Emergency medical dispatch program** including pre-arrival instructions implemented by Contra Costa County Fire Dispatch Center.

1987

- Formal **Patient Transfer Guidelines**, which included a multi-disciplinary quality assurance process to be administered by the EMS Agency, adopted by Board of Supervisors, as well as by all hospitals within the county.

- Health Services Department **Emergency Management Team** consisting of key Health Services personnel designated to respond to the County EOC or Medical/Health Operations Center in a disaster.

- Program for reporting **communicable disease exposure** developed and made available to fire, police and ambulance agencies countywide.

- Brookside Hospital restored to **basic emergency licensure** status.

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 the voters countywide.

- Joint **Solano/Contra Costa County EMS Hazardous Materials Training Project** established with 5 year funding under consent agreement between IT Corporation and State Department of Health Services; administered by EMS Agency.

- Pilot "**first responder paramedic engine**" program undertaken by Moraga Fire Protection District.

1989

- Countywide **Benefit Assessment District for Enhanced Emergency Medical Services, County Service Area EM-1,** approved by all city

councils and established by Board of Supervisors under administration of Health Services.

1990

- **County Service Area EM-1** became operational.

- Initial funding for the **EMS Disaster Planning Project** obtained from State EMSA and administered by local EMS Agency. The County Health Officer is the designated **Regional Disaster Medical Health Coordinator** (RDMHC) for OES Region 2.

- San Ramon Regional Medical Center licensed for Basic Emergency Services opened in San Ramon.

1991

- **High-performance ambulance contracts** initiated with Regional Ambulance, San Ramon Valley Fire, and Moraga Fire. Standards set for required paramedic-staffed ambulance response to emergency calls at a 95% 10 minute maximum response for urban areas of county. Number of paramedic staffed ambulances increased from 12 to 19 to meet this standard with ambulance service subsidies funded by Measure H.

- **First Responder Defibrillation Program** developed which included an RFP competitive bid process for semi-automatic defibrillator selection. PhysioControl was selected to provide defibrillation equipment.

- Countywide system of **Multicasualty Medical Caches** established containing supplies to be used in multicasualty or disaster situations.

- Specialized **Hazardous Materials Response Protocols and training program** developed and implemented for ambulance personnel.

- The first **paramedic training program** to be provided in the County on an on-going basis began at Los Medanos Community College.

1992

- **Fire First Responder Defibrillation Program** implemented countywide.

- "**Emergency Medical Guidelines for Law Enforcement Agencies**" endorsed by the EMCC and the County Police Chiefs' Association.

- "EMS **Operational Procedures For Response to an Expanded Medical**

Emergency" (EME) developed and implemented.

- "**Do Not Resuscitate**" program instituted which provides patients with option of predetermining levels of resuscitation to be performed by field personnel.

- **EMS treatment protocols for children** developed and implemented.

- **Two new radio channels** for ambulance-hospital communications put into service.

- 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 contracts** renegotiated with Mt. Diablo, John Muir and Los Medanos hospitals.

- The **Medical Transmission Network**, a fire/medical dispatch computer linkage project was begun.

- **First responder paramedic** program funded by Measure H and provided by American Medical Response was implemented in Byron/Discovery Bay area.

1993

- **Base hospital** services no longer provided by Los Medanos Hospital.

- **Chemical release** from General Chemical Company in Richmond area triggered a large scale fire, police and EMS response. Thousands of patients requested evaluation at local medical facilities in following weeks.

- **Poison control public hotline discontinued** by San Francisco Poison Control Center (PCC) due to funding issues. EMS Agency maintained PCC access via local 911 system.

- **Functional integration** of 5 County fire districts (Contra Costa County, Riverview, Orinda, Moraga and West County).

- County "**Do Not Resuscitate**" program reorganized to incorporate new State Guidelines.

- **"Quality Action Team"** formed to improve prehospital incident review process.

- **16 channel mobile radios**, programmed with existing fire service radio channels, installed in all paramedic units.

- State funding for **Highway Injury Record Linkage Software (HIRLS)** and **Firearm Injury Reporting, Surveillance and Tracking (FIRST) System** projects obtained by EMS Agency; programs administered by Health Services Injury Prevention Program.

1994

- Continuing education adopted as method for an EMT-I to maintain State certification.

- Los Medanos Community **Hospital closes** on 4/23/94.

- Responsibility for **paramedic certification** was transferred from individual counties/regions to State EMSA.

- Hospital personnel were trained in **Hospital Emergency Incident Command System** .

- **Medical/health mutual aid response** to Northridge earthquake in southern California was coordinated among northern California coastal counties (Region II).

- **EMT-I training program for firefighters** established by EMS Agency.

- State EMSA grant to study **poison control center alternatives** obtained by EMS Agency.

- **Emergency Medical Care Committee** restructured to report to Health Services Director.

1995

- Kaiser Richmond, merged with Kaiser Oakland. Richmond facility receives only non-critical ambulance patients due to lack of ICU capabilities.

- Paramedic certification changed to State **licensure**.

- Revised **EMS System Plan** approved by EMCC and Board of Supervisors.

- EMS Agency gained part-time **Assistant EMS Medical Director**.

- San Ramon Valley Fire Protection District successfully completed pilot **computerized medical dispatch program**.

- **1-800-GIVE-CPR** listed in county phone books and staffed by EMS Agency.

- **Basic Life Support standards** added to the EMS Prehospital Care Manual.

1996

- Asst. EMS Medical Director position converted to EMS Medical Director.

- Standards for EMS **Enhanced First Responder Programs** developed.

- **Request for Proposal** process provided for emergency ambulance service in 4 of 5 county emergency response areas. Contracts awarded to San Ramon Fire and American Medical Response. Moraga Fire exempt from competitive bid process.

- Bethel Island Fire's **First Responder Paramedic** program implemented.

- Major EMS System evaluation performed by **Emergency Medical Care Committee**.

- Local hospitals and Health Services/EMS staff participated in **"Hospital Shelter-in-Place Project"** funded by local Emergency Planning Committee and State OES.

- **Infrequent skills and intubation CE modules** developed for paramedics.

- **Computerized pen-based Patient Care Report pilot** introduced.

1997

- John Muir Medical Center and Mt. Diablo Medical Center merge to form **John Muir/Mt. Diablo Health System**.

- Brookside Hospital acquired by Tenet Corporation and renamed **Doctor's Hospital, San Pablo campus.** Doctor's, Pinole became **Doctor's Hospital, Pinole Campus.**

- **Kaiser, Richmond** and **Kaiser, Martinez** downgraded services provided and were no longer designated ambulance receiving facilities.

- Orinda Fire and Moraga Fire merged to form the **Moraga-Orinda Fire Protection District**.

- **American Medical Response** was purchased by Laidlaw. Laidlaw merged its ambulance services together under the AMR name.

- Board of Supervisors raised concerns about hospital closures and downsizing. Requested a freeze on hospitals cutting **emergency and critical care resources.** Position taken **against "standby emergency"** designation for urban areas.

- **Interfacility Transfer Review process** was revised.

1998

- Board of Supervisors declared a local emergency with respect to **emergency and critical care resources.**

II. List of Major Accomplishments - 1997

- **20th anniversary** of paramedic program in Contra Costa County.
- **Computerized pen-based patient care reporting** implemented countywide.
- Bay Area **Disaster Medical Assistance Team (DMAT)** sponsored by County Health Services. **69 local DMAT volunteers** recruited.
- **Multicasualty response** by ambulances, public safety, hospitals, EMS and others provided coordination/care for victims of Concord Water World slide collapse. One death and 32 injured were triaged to area hospitals.
- **Emergency Medical Care Committee** advisory to Board of Supervisors and to Health Services Director.
- **RDMHC** used to provide public health nurse mutual aid during 1996-97 winter storms in northern California.
- Contra Costa Fire Protection District's **First Responder Paramedic Program** implemented.
- "**Partners" course** implemented to train EMT-I's to assist paramedics.
- Total of **52,143** emergency ambulance responses dispatched. **41,402 of the 41,849 ambulances dispatched Code 3 "lights and siren" were paramedic staffed units.**
- Total of **36,877 patients transported** by ambulance. **3,018 patients** were transported **Code 3 "lights and siren"**. **173 patients** were transported by **helicopter.**
- **957 patients** with possible major traumatic injuries were **transported to trauma centers** including **841 to John Muir** and **88 to Childrens**.
- **13 patients** receiving **first responder defibrillation** discharged as hospital **"saves".**

- **10,136 EMS System 911 brochures** distributed throughout the community.
- **68 1-800-GIVE-CPR** requests for CPR training information processed.
- **315 EMT-I's, 118 paramedics and 31 MICN's credentialed.**
- Statewide **Poison Control Center** system implemented.
- **Poison Center Alternatives** grant project completed.
- Ad hoc committee appointed to review **EMS Multicasualty Plan**.
- New **emergency ambulance services contracts** signed with American Medical Response and San Ramon Valley Fire Protection District.
- Participated in **23nd annual EMS Week** activities.
- **Hospital/emergency personnel** participated in **radioactive materials training** in preparation for spent nuclear fuel rod shipment through County.

III. EMS System Participants

A. Advisory Committees

Emergency Medical Care Committee (EMCC): The EMCC is a multidisciplinary committee appointed by and advisory to the Health Services Director. Membership consists of representatives of EMS related organizations and consumers. The EMCC is supported by a comprehensive standing committee/ad hoc committee structure. Until 1994 the Contra Costa EMCC was appointed by and provided advice to the County Board of Supervisors. At that time the EMCC was assumed as an advisory body by the Health Services Department. In 1997, the Board of Supervisors re-established the EMCC as advisory to the Board. The EMCC meets quarterly (March, June, September, December), and meetings are open to guests. Specific meeting information is available through the EMS Agency.

System Organization and Management (EMCC Standing Committee): This committee evaluates and makes recommendations to the EMCC with respect to local EMS system coordination. This coordination helps to ensure close cooperation, to limit conflict, and to ensure that the interests of the patients are primary in the system. Membership is made up of EMCC Executive Board.

Staffing/Training (EMCC Standing Committee): This committee evaluates and makes recommendations to the EMCC with respect to local EMS system staffing status and availability (prehospital and hospital), and the training of prehospital personnel according to appropriate standards.

Communications (EMCC Standing Committee): This committee evaluates and makes recommendations to the EMCC with respect to local EMS communications system availability between prehospital and hospital personnel for medical control and resource management, as well as EMS system accessibility by the public.

Response/Transportation (EMCC Standing Committee): This committee evaluates and makes recommendations to the EMCC with respect to the adequacy of the local EMS response and transportation system including equipment and safety.

Facilities/Critical Care (EMCC Standing Committee): This committee evaluates and makes recommendations to the EMCC with respect to the appropriate number and level of local health facilities to receive and treat emergency patients, and system used to get patients to the most appropriate facility.

Public Information & Education - PIE (EMCC Standing Committee): This

committee evaluates and makes recommendations to the EMCC with respect to availability of EMS public education and information regarding the local EMS system, system accessibility and system use, as well as availability of first aid and CPR training.

Disaster Medical Response (EMCC Standing Committee): This committee evaluates and makes recommendations to the EMCC with respect to the local EMS system's capability to expand EMS operations to meet needs created by multicasualty incidents and medical disasters, including integration of out-of-area resources.

Data Collection (EMCC ad hoc Committee): This ad hoc committee evaluates and makes recommendations to the EMCC regarding adequacy of the local EMS operational and clinical data collection systems to assure information necessary to provide day-to-day quality improvement audits and overall evaluations of system operations is available.

Medical Advisory Committee (MAC): Established in 1977, this committee provides advice and recommendations to the EMS Agency and EMS Medical Director on medically related topics. Examples include ALS and BLS medical treatment guidelines; new prehospital skills and/or medications; prehospital policies and procedures related to patient medical management; and review of medical quality issues. Membership consists of base hospital coordinators, liaison physicians, paramedic representatives of each ALS provider agency, and receiving hospital emergency physician representatives.

Pre-Trauma Audit/Trauma Audit Committees (Pre-TAC/TAC): These committees evaluate trauma system care and monitor compliance to trauma system standards established in the County Trauma System Plan. Members of these confidential quality improvement committees are appointed by EMS Medical Directors. Both Pre-TAC and TAC are held jointly with Alameda County and provide monitoring for two separate trauma systems. Pre-TAC, which meets monthly, is responsible for initial committee review of all trauma related system issues, including select trauma center cases. Cases identified by Pre-TAC are referred to the Bi-County Trauma Audit Committee (TAC).

Co-chaired by the EMS Medical Directors of each county, TAC meets bimonthly and includes multidisciplinary representation from the four Alameda/Contra Costa County trauma centers, as well as representatives of non-trauma center receiving hospitals, coroner's office, and EMS agency staff. Cases referred from Pre-TAC are reviewed along with those cases with teaching value. This committee presents observations and makes recommendations to respective EMS agencies regarding identified trauma system or trauma center issues.

Transfer Review Committee: The County Patient Transfer Guidelines established a confidential multidisciplinary committee to review patient transfers between acute care hospitals. Committee members appointed by the EMS Medical Director included representatives of major medical specialties, Hospital Conference, Alameda-Contra Costa Medical Association, Emergency Department Nurses Association, and the EMCC. In 1997 the County Patient Transfer Guidelines was revised to more specifically address those issues for which the County is the appropriate authority for oversight. The regularly scheduled quarterly meetings were curtailed during the revision process.

Multicasualty Advisory Committee (MCAC): This ad hoc multidisciplinary committee was originally organized by the EMS Agency in 1978 to develop an integrated emergency response plan for multicasualty incidents. The committee has also developed additional procedures for emergency response to varying magnitudes of emergency medical incidents. Representatives from police, fire, EMS, ambulance providers (both ground and air), and receiving hospitals participate. The Multicasualty Incident Plan was revised in 1997.

First Responder Defibrillation Operations Committee: This committee, charged with reviewing and evaluating operational matters related to the first responder defibrillation program, consists of training representatives from each of the fire first-responder agencies.

Hospital Disaster Forum: This forum, organized in 1990 as a part of the Disaster Planning Project, provides an arena for interested individuals and agencies to discuss issues of mutual concern regarding hospital disaster preparedness. Membership of the Forum consists of hospital and city disaster planners, ambulance and fire agencies, industry, OES and EMS Agencies as well as hospital/clinic representatives. Expanded in 1994 to include clinics, the Forum has welcomed speakers from both private and government agencies to support hospitals and cities in disaster preparedness. Membership This group meets quarterly.

B. PSAP's 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
- Richmond Police Dispatch
- San Ramon Valley Fire Dispatch
- Sheriff's Dispatch
- West Bay Dispatch (Pinole Police)

Ambulance Dispatch Centers:

- American Medical Response (formerly Regional Medical Systems)
- San Ramon Valley Fire
- Contra Costa County Fire (Moraga-Orinda only)

C. First Responders

County Fire Protection Districts:

- Bethel Island Fire Protection District (3 units)
- Contra Costa County Fire Protection District (43 units)
- Crockett-Carquinez Fire Protection District (3 units)
- East Diablo Fire Protection District (11 units)
- Pinole Fire Protection District (Covered by Pinole Fire Department)

Municipal Fire Departments:

- El Cerrito Fire Department (2 units)
- Pinole Fire Department (2 units)
- Richmond Fire Department (12 units)

Independent Fire Protection Districts:

- San Ramon Valley Fire Protection District (22 units)
- Rodeo-Hercules Fire Protection District (3 units)
- Moraga-Orinda Fire Protection district (5 units)

Other First Responders:

- East Bay Regional Parks
- Private & military fire services

Special Paramedic First Responder Programs:

- Moraga-Orinda Fire - Paramedic Engine
- American Medical Response (Regional) - Byron/Discovery Bay area
- Bethel Island Fire Protection District - Paramedic Engine
- California Highway Patrol - Helicopter Unit

- Contra Costa Fire - Paramedic Engines and Medic Unit

D. Emergency Ambulance Providers

- American Medical Response
- San Ramon Valley Fire
- Moraga-Orinda Fire

E. EMS Helicopters

Air Ambulances:

- CALSTAR based 24 hours/day at Buchanan Field; other helicopters based in Gilroy and Roseville.
- REACH helicopter based in Santa Rosa; a second ship in Vacaville (Reach located to Buchanan Field 4/98)
- Stanford Life Flight based in Palo Alto
- Davis Life Flight based in Sacramento
- Medi-Flight, 2 helicopters based in Modesto
- Air Med Team based in Stanislaus County

Rescue Aircraft:

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

F. Hospitals

Receiving Hospitals:

- Contra Costa Regional Medical Center (formerly Merrithew)
- Doctors' Hospital, San Pablo Campus (formerly Brookside Hospital)
- Doctor's Hospital, Pinole Campus
- John Muir Medical Center
- Kaiser Medical Center, Walnut Creek
- Mt. Diablo Hospital Medical Center
- San Ramon Regional Medical Center
- Sutter Delta Medical Center

Base Hospitals:

- John Muir Medical Center
- Mt. Diablo Medical Center

Trauma Center:

- John Muir Medical Center

Burn Center:

- Doctor's Hospital, San Pablo Campus

IV. EMS Program Activities

A. Emergency Ambulance Services

Emergency ambulance services are provided countywide under **performance based contracts** with the County in each of five exclusive operating areas (**Emergency Response Areas**) designated by the Board of Supervisors. Contracts are awarded on a competitive basis, as required by law, in all areas except ERA 3 served by Moraga-Orinda Fire, which is exempt from competitive bidding under a provision of the Health & Safety Code. ERA's 1, 2, and 5 are served by American Medical Response. ERA 4 is served by San Ramon Valley Fire.

ERA 1	All of west county and central county west of I-680 including cities of Richmond, San Pablo, El Cerrito, Hercules, Pinole, Martinez, Pleasant Hill, Lafayette, and a portion of Walnut Creek.	**American Medical Response** 7 ALS units 3 + BLS units
ERA 2	Central county east of I-680 including cities of Concord, Clayton, and a portion of Walnut Creek.	**American Medical Response** 5 ALS units 2 + BLS units
ERA 3	Area of Moraga-Orinda Fire Protection District including town of Moraga and city of Orinda.	**Moraga-Orinda Fire** 2 ALS units
ERA 4	Area of San Ramon Valley including cities of Danville and San Ramon.	**San Ramon Valley Fire/ John Muir Med Center** 4 ALS units 3 BLS units
ERA 5	All of east county including cities of Pittsburg, Antioch, and Brentwood.	**American Medical Response** 4 ALS units 1 BLS unit

All five ERA's are covered by performance based contracts which require **ALS level response to all life threatening or potentially life threatening emergencies**, and a **10 minute or shorter response time for at least 95 percent of all Code 3 calls** within urban areas. In **1997**, the county **ambulance staffing standard was met on 41,407 (98.9%) of 41,849 Code 3 ambulance responses**. Paramedics respond to emergency medical requests, while BLS ambulance units remain available to respond to non-life threatening calls and to provide backup during multicasualty incidents or during rare occasions when all ALS units are on calls.

During 1997, the EMS system received **52,143 requests for emergency ambulance response**. Of these, 41,849 (**80.3%**) were considered to involve potentially life threatening situations to which a Code 3 (red lights and siren) ambulance response was necessary. The remaining 10,794 (**19.7%**) ambulance responses were dispatched Code 2 (immediate response without lights and siren). Of the total responses, **48,311** (92.7%) were handled by American Medical Response, **3,209** (6.2%) by San Ramon Valley Fire Protection District ambulance, and **623** (1.1%) by Moraga-Orinda Fire Protection District ambulance. **Average Code 3 ambulance response time** countywide was **6.98 minutes**.

Not all ambulance responses result in patient transport. Of the **52,143** emergency ambulance responses during the year, **36,877** (70.7%) resulted in patient transport to an emergency receiving hospital. Ambulances responding to the remaining **15,266** (29.3%) 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 which was initially perceived to be a medical emergency had been resolved or stabilized by the time an ambulance unit arrived on the scene.

Emergency Ambulance Dispatches

	1993		1994		1995		1996		1997	
All EMS Ambulance Dispatches	43,774	100.0%	44,473	100.0%	46,969	100.0%	46,980	100.0%	52,143	100.0%
Code 3 (lights & siren)	36,484	83.3%	36,172	81.3%	37,428	79.7%	37,580	80.0%	41,849	80.3%
Code 2	7,290	16.7%	8,301	18.7%	9,541	20.3%	9,400	20.0%	10,294	19.7%
American Medical Response	40,650	92.9%	41,329	92.9%	44,285	94.3%	44,298	94.3%	48,311	92.7%
San Ramon Fire	2,561	5.9%	2,613	5.9%	2,139	4.6%	2,131	4.5%	3,209	6.2%
Moraga Fire	563	1.3%	531	1.2%	545	1.2%	551	1.2%	623	1.1%
Transport	30,886	70.6%	31,332	70.5%	33,056	70.4%	34,010	72.4%	36,877	70.7%
No Transport (Dry Run)	12,888	29.4%	13,141	29.5%	13,913	29.6%	12,970	27.6%	15,266	29.3%
Average Code 3 Response Time	6.85 minutes		6.87 minutes		7.01 minutes		6.92 minutes		6.98 minutes	
Code 3 Responses Not Meeting Ambulance Staffing Standard[1]	162	0.4%	201	0.5%	561	1.5%	497	1.3%	447	1.1%

[1] Ambulance staffing standard is a two paramedic staffed ambulance dispatched to all emergency medical requests, or a minimum of two EMT-I staffed ambulance on multiple ambulance responses or if requested by a public safety dispatch center.

B. Base Hospital and Paramedic Service Programs

Base Hospital Services: Mt. Diablo Medical Center and John Muir Medical Center provide direct (on-line) and indirect (retrospective review) **medical control** services for ambulances countywide. Total base hospital contacts by prehospital personnel in 1997 totaled **10,426**, a sharp decrease from the previous year. This was due to changes made in base hospital call-in criteria. Twelve field care audits were offered by the two bases as continuing education opportunities for prehospital personnel.

Treatment Protocols: **EMS Field Treatment Guidelines** are used by first responders, paramedics, EMT-I's, MICN's, and base hospital physicians to provide care to patients in the prehospital setting. These guidelines are reviewed and endorsed by the **Medical Advisory Committee** based on current research and medical need in the county and are adopted by the **EMS Medical Director**. Field treatment protocols are reviewed and revised annually. Major changes were made in 1997 with respect to requirements for base contact which has resulted in less need for online base hospital consultation.

C. First Responder Services

A responding fire unit usually arrives at the scene of an emergency a few minutes ahead of the ambulance, as there are many more fire stations than ambulance stations throughout the County. For this reason, the individuals on the fire response unit are known as the **fire first responders**. These first responders are trained and equipped to provide medical aid to patients until the ambulance arrives. All fire fighters are trained in first aid, CPR and defibrillation. Most are trained and certified as Emergency Medical Technician-I's. In situations involving patient problems such as obstructed airway, severe bleeding, or cardiac arrest, fire fighters arriving early on the scene may be able to initiate lifesaving measures and achieve some stabilization of the patient before an ambulance arrives. Fire first responders also provide rescue, extrication, and an extra pair of hands to care for patients with particularly complex medical problems. Some fire agencies provide paramedic first responder services for which cases advanced life support services can be initiated prior to the arrival of the ambulance.

Early Defibrillation Program: A major EMS program enhancement identified in the Measure H Service Plan was the establishment of a **first responder defibrillation program** in the fire services. Early defibrillation is the standard of care for patients in cardiac arrest. The successful resuscitation of patients in ventricular fibrillation is directly related to how quickly defibrillation is provided. As fire first responders are generally the first rescuers on scene, the EMS Agency developed and implemented a First Responder Defibrillation program in which all fire agencies in Contra Costa County participate to assure that this state-of-the-art cardiac care is provided patients countywide. Fire first responders use a **"semi-automatic" defibrillator** which, when applied to the patient's chest, automatically assesses the patient's heart rhythm and instructs the firefighter to shock the patient if he/she is in ventricular fibrillation. A defibrillator is available on each first response fire apparatus routinely used to respond to medical emergencies. Approximately 4 hours of training is necessary to prepare firefighters to use the defibrillator. The program became available to citizens countywide in 1992.

In 1997, fire first responders used a "semi-automatic" defibrillator to assess **387 patients** in cardiac arrest. Of those patients, **107** or 27.6% were assessed by the semi-automatic defibrillator to be in a shockable rhythm and received early defibrillation. Twenty-three of the 107 patients who received early defibrillation were admitted to the hospital, for a **21.5%** field save rate. Of those 23 patients who received early defibrillation and were admitted to the hospital, **13 or 12.1% of the patients receiving early defibrillation were discharged from the hospital**.

Paramedic First Responder Programs: **Paramedic first responders** provide a method

for combining early advanced life support care with the generally shorter response times provided by first responder units. Several models of paramedic first responder service are provided in Contra Costa County.

- In 1988, the EMS Agency approved the use of an **ALS Engine** in **Moraga Fire District**, as a pilot program to provide back up ALS service to Moraga paramedic ambulance. ALS Engine is staffed with at least 1 paramedic and 1 EMT-1. ALS engine is stocked with ALS equipment/supplies, and is dispatched simultaneously with an ALS transport unit. Program received permanent approval in 1992.

- In 1992, **American Medical Response, East Diablo Fire District and the EMS** Agency entered into a formal cooperative effort to provide a more timely, cost effective method of delivering ALS to the citizens of the **Discovery Bay and Byron** areas by implementing a **ALS First Responder Paramedic Unit**. This program has had a positive impact on the manner in which ALS care is delivered to this low call volume area.

- In 1996, the EMS Agency approved an **ALS Engine** pilot in the **Bethel Island Fire District**, to provide early ALS service prior to the arrival of the AMR paramedic transport ambulance. In this largely volunteer fire district, experienced full-time paramedic employees of other ALS provider agencies are hired by Bethel Island an a part-time, on-call basis to staff its ALS Engine. The pilot was extended through 1997.

- In 1997, **Contra Costa Fire** implemented a **first responder paramedic program** in the Walnut Creek Area. Two engines, staffed with a paramedic and 2 firefighters, and a "Medic Unit" provide first responder services.

All four First Responder Paramedic Units operate under base hospital medical control as well as EMS Agency policies and procedures.

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

D. Dispatch and Communications

MEDARS: Medical Emergency & Disaster Ambulance Radio System is the County radio system used for ambulance/hospital and for Sheriff's Dispatch/ambulance communications. Prior to 1992, the system consisted of two radio channels, MED 1-2, which provided a channel for communications between Sheriff's Dispatch and ambulances and only one channel for all paramedic and EMT units to contact hospitals.

In 1992, two channels were added bringing the EMS communications system up to the current 4 radio channels. Three channels are used exclusively for ambulance/hospital communications, and one channel, Med 11, is used exclusively for communications between Sheriff's Dispatch and ambulances. These four medical radio channels are now identified as Med 11-14. The two new channels, Med 13-14 are used in the central and eastern parts of the County. (They are not available in the western part of the County, due to possible interference with another Bay Area agency assigned the same frequencies.) The two new channels were designated for paramedic use only, to avoid overcrowding and possible base hospital communications delays. MED 12 continues to be used by paramedics in the western part of the County, and by EMT units throughout the County.

Message Transmission Network (MTN): MTN is a computer network designed to interconnect the county's four fire/medical dispatch centers, Sheriff's dispatch, and American Medical Response (AMR) dispatch. Currently, the MTN system is in use at Contra Costa Fire Dispatch, Sheriff's Dispatch, and AMR Dispatch and handles about 60% of all EMS dispatches countywide. By establishing a direct data link among the various computer-aid dispatch systems, MTN decreases dispatch time, reduces dispatch errors, enhances ambulance monitoring capability of Sheriff's dispatch, and provides system response data.

MTN makes use of 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.

Priority Dispatching: Emergency Medical Dispatch (EMD) is a process where EMS dispatchers screen calls to provide appropriate EMS first-responder/ambulance response, and provide simple emergency medical instructions for the caller to initiate prior to the arrival of EMS personnel. Contra Costa Fire Dispatch has been providing limited call screening and pre-arrival instructions for a number of years. In 1993, Medical Priority's ProQA Dispatch System, the only available computerized medical dispatch system, was selected for use as a pilot program by San Ramon Valley Fire's Dispatch Center. Following the successful pilot, the Medical Priority Pro QA Dispatch System has been fully implemented in San Ramon's fire/ambulance dispatch center.

Fire Radios: Sixteen channel mobile radios, programmed with existing **fire service radio channels**, have been installed in all paramedic units, to facilitate communication among paramedics, fire dispatch centers, and fire first responders.

E. Trauma System

In 1986, the Board of Supervisors approved a **comprehensive Trauma System Plan** for the County and designated **John Muir Medical Center as the county's Level II Trauma Center**. June 1986, ambulance personnel began transporting critical trauma patients directly to John Muir.

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 1997, **2,853 patients** were identified as requiring trauma triage, **841** of whom were transported directly to John Muir Trauma Center. Patients in traumatic full arrest or whose airway cannot be managed, (total of **39** in 1997) are triaged to the closest basic emergency department for resuscitation. Critically injured patients who inadvertently arrive at a non-trauma center hospital may be transferred to a trauma center. Thirty seven of the 50 injured patients transferred to trauma centers in 1997 were retrospective major trauma victims. John Muir Trauma Center also receives some trauma patients from surrounding counties, generally by air.

During the past **11.5 years of operation**, a total of **34,838 patients have been triaged through the County trauma system**. This group consists of **11,940 patients** who were transported to John Muir, **928 patients** who were transported to other trauma centers, (primarily Children's Hospital in Oakland) and **22,082 patients** who were transported to non-trauma center hospitals, refused transport or expired in the field.

If trauma center resources are temporarily overwhelmed the trauma center may consider "Trauma Center Bypass", which lets ambulance personnel know not to deliver any additional critical trauma patients until resources are again available. In 1997 John Muir Trauma Center bypass rate was **1.6%** and was most often due to simultaneous arrival of multiple trauma patients. Patients may be triaged to out-of-county trauma centers or even to non-trauma centers within the county during trauma center bypass. One patient with major trauma injuries was transported to a non-trauma center due to trauma center bypass in 1997.

Trauma Injury Prevention: The EMS Agency supported injury prevention activities in 1997, by participating in the Childhood Injury Prevention Coalition and its subcommittees and events (e.g., bicycle Safety Days), and in the Health Service Department's Committee for Violence Prevention. The EMS Agency also participates on the County's Child Death Review Team. John Muir Trauma Center supports an active injury prevention program which includes school based presentations, participation in health fairs, representation on a number of specialized trauma organizations, target groups and committees.

F. Helicopter Transport

The **Operational Procedures for Patient Transport by Helicopter** were originally developed during trauma system planning in 1985/1986. Most helicopter transports are for trauma patients from distant areas of Contra Costa or from other counties to the John Muir Trauma Center in Walnut Creek. Brookside Hospital in San Pablo also has a helipad and may be used as an ambulance/helicopter rendezvous point. The county standard of care for air transport of emergency patients has been by "air ambulance" which is staffed with two ALS care providers. Rescue aircraft are also requested for their special resources. As an example, a U.S. Coast Guard helicopter has been used for its hoist capability. Additionally, a formal procedure for access of military aircraft has been adopted.

In 1997 there were **429 transports of patients by helicopter to John Muir Trauma Center**; **425** by air ambulance and **4** by rescue helicopter. **273** of these transports were from Contra Costa, **141** from out of county, and **15** with unknown origin. The majority of helicopter transports are performed by CALSTAR.

G. Hospital Emergency Services

Transfer Review Process: The original Contra Costa County **Patient Transfer Guidelines** were approved by the County Board of Supervisors on February 2, 1988. These guidelines established the procedures necessary for the transfer of patients between acute care facilities. A process for review of interfacility transfers was identified in this document including the formation of the **Transfer Review Panel**, a confidential multidisciplinary committee to oversee the transfer review process. The panel members represent facilities and organizations from throughout the County including major medical specialties. The panel's purpose was to review and make recommendations on patient transfer investigations as outlined in the County Transfer Guidelines. **In 1997, this review process was suspended** due to changes in case review reporting requirements and other activities at the State and Federal levels. A revision of the transfer review process to focus review on issues relevant to county oversight has begun, and is anticipated to be implemented in 1998.

Emergency Department Diversion of Ambulances: Diversion of ambulances by the emergency departments of acute care receiving facilities in the County is permitted by EMS Policy #24, initially developed and implemented in August, 1985. Under the **ambulance diversion policy**, hospitals whose emergency departments are temporarily overloaded, may direct certain ambulance patients to other nearby hospitals. The purpose of this policy is to assure that patients are transported to a hospital which is able to provide immediate emergency treatment. The documentation pertaining to all reported incidents of ED ambulance diversion is reviewed by EMS staff. During 1997, there were 7 facilities which utilized diversion a total of 88 times. There were no reports of problems in patient care resulting from these diversion incidents.

At the end of 1997, Contra Costa County experienced an acute shortage of ED and critical care resources. This phenomena was felt in surrounding counties and throughout much of the State. A review and possible revision of the EMS ED Diversion policy and procedure has been undertaken.

H. Disaster and Multicasualty Planning

Disaster Planning Grant: Since 1990, the EMS Agency has received a series of disaster planning grants through the State EMS Authority in connection with the designation of the Contra Costa County Health Officer as the **Regional Disaster Medical/Health Coordinator (RDMHC)** for the northern California coastal area (OES Region II). These grants have enabled the EMS Agency to enhance the County's EMS disaster preparedness by improving coordination among cities, hospitals, the county EMS agencies and the State EMS Authority in the event of an earthquake or other major disaster. Initial efforts were toward development of procedures for the rapid assessment of hospital operating status and capacity, and for the communication of that information from hospitals to the County.

In 1997 the major objectives of the disaster planning grant were to continue to develop and implement a medical mutual aid system throughout the region, and to develop a **Disaster Medical Assistance Team (DMAT).**

Disaster Medical Assistance Team (DMAT): In 1997, County Health Services began sponsoring a DMAT, drawing participation from the 16 counties throughout the Bay area and OES Coastal Region. A physician DMAT Commander has been appointed and 69 individuals have volunteered to become a part of the response team or team support services.

This new team will be the **only DMAT based in northern California** and one of just eight within the State. A DMAT, a volunteer team organized under the National Disaster Medical System (NDMS), through the U.S. Public Health Service, is organized, trained and prepared to provide medical and health care to disaster victims.

Multicasualty Plan: The multidisciplinary **Multicasualty Advisory Committee (MCAC),** produced the first Multicasualty Incident Plan in 1982. Following the Yuba City/Martinez bus accident in 1976, the EMS Agency recognized the need for a coordinated response to multicasualty events by police, fire and ambulance personnel. This plan established a common organization and management structure for coordination of emergency response to multicasualty incidents, and may be implemented whenever the number of *injured* exceeds local medical capabilities. The plan was updated in 1997 to incorporate the most current emergency medical response information.

In June, 1997, a giant water slide collapsed at Waterworld, USA, in Concord carrying a large number of high school students on a class trip. The **Multicasualty Plan** was immediately put into motion by EMS staff. At least **23** agencies played a roll in the overall rescue effort. Eleven police, fire and ambulance provider agencies responded to the scene and participated in triage, treatment and transport. Ten hospitals received and cared for the injured students. One student died and 32 others were injured, 10 of them critically.

Medical Advisory Alert: The Medical Advisory Alert, a **notification procedure** developed in 1987, may be **implemented when an incident has occurred or a condition exists which *might* tax the local medical resources**. When an MAA is implemented, Sheriff's Communications alerts those agencies with responsibilities in providing administrative or other support during a multicasualty incident that the potential for such a situation exists.

Expanded Medical Emergency: The operational procedures for response to an Expanded Medical Emergency were developed to **provide an on-scene organizational structure for incidents requiring more than one ambulance**, but not requiring the outside support services activated with the Multicasualty Plan. It is designed to avoid overloading one hospital with patients and to eliminate multiple calls to base hospital(s) regarding the same incident. Developed and initiated in 1992, this procedure is used frequently and successfully throughout the County.

Multi-Casualty Supply Caches: In 1991 the EMS Agency purchased emergency medical supplies to be available for use countywide in a multicasualty or disaster situation. Supplies are organized into **25 multi-casualty supply caches** which are stored and maintained in fire stations throughout the County. Fire agencies have agreed to rapidly transport caches to incidents if possible. Cache supplies include bandaging equipment, splinting supplies, oxygen administration supplies, and blood pressure equipment.

Health Services Disaster Preparedness Program: In 1997, the County Health Services Department appointed a Program Manager to the EMS Agency staff to coordinate the development of a **department-wide Disaster Preparedness Program** and to coordinate emergency plans among the various Health Services divisions. Representatives of each division meet regularly to develop an integrated County Health Services (HS) Disaster Plan and to identify resources and training necessary for implementation.

The HS Disaster Plan will identify how critical health and medical services will continue to operate in a disaster and how the increased demand for services brought on by the disaster will be managed. It will organize an **Emergency Management Team** to

coordinate emergency resources and to interface with other county departments and non-county facilities. Emergency-task checklists, procedures and reporting sites to ensure that staff are mobilized effectively will be developed.

The HS Disaster Program promotes training for Health Services staff emphasizing employee preparedness and procedures to be followed in emergencies; disaster roles and assignments; and workplace safety to mitigate hazards, to insure the effective restoration of services. In 1997, **14 management staff** were trained through the California Standardized Training Institute (CSTI) in **Emergency Operations and Standardized Emergency Management Systems (SEMS)**. "Disaster Preparedness Days" are being planned for 1998. These functions will provide opportunities for Health Services employees to access readiness supplies and information and to showcase the Disaster Program.

I. Certification Programs

Paramedics: In January 1994, State EMS Authority was legislated responsibility for credentialling paramedics. In January 1995, paramedic certification was reorganized to become paramedic licensure, and State paramedic recertification written examination procedure was eliminated. In 1997, **118 paramedics were either accredited or re-accredited** by the Contra Costa County EMS Agency to practice as paramedics within the County.

EMT-I's: EMT-I's are certified by any one local EMS Agency in the State. Once certified, an EMT-I may function as such state-wide. In June 1994, legislation passed which permits EMT-I's to either complete continuing education (24 hours), or an EMT-I refresher course every two years to maintain certification. Required written/skills testing process was modified from a 2 year to a 4 year cycle. In 1997, **315 EMT-I's were either certified or recertified** in Contra Costa County.

MICN's: In 1997, **31 RN's were either authorized or re-authorized** in Contra Costa to practice in the expanded MICN role within the County.

Credential Review: Credential review, as defined in state regulations, is a process reserved for formal investigation of cases where serious lapses in operational or medical protocol not thought to be amenable to remediation have occurred, or cases where there has been a significant deviation from state regulations or county policy. Potential problem cases are identified by provider agency, base hospital or EMS Agency.

In 1997, credential review was undertaken by the EMS Agency in five cases. One MICN and three paramedics successfully completed remediation programs assigned by the EMS Medical Director. One other paramedic was referred to the State EMS Authority after termination from employment by a local paramedic provider agency.

J. 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 Programs: Los Medanos Community College in Pittsburg provides a paramedic training program. Since most paramedic training programs operated

on the same time schedule, in 1994 Los Medanos Community College changed its program schedule to start programs in the spring instead of the fall. This change was made to facilitate the availability of field preceptorships for students. Los Medanos will complete a paramedic program for 1997, in early 1998, and plans to offer another course beginning in April 1998.

EMT-I Training Programs: Los Medanos Community College, Mt. Diablo Adult Education and Contra Costa College currently offer EMT-I training in Contra Costa County. The EMT-I courses offered by these training institutions have been approved by the EMS Agency.

- **Los Medanos Community College** offers an EMT training program each fall at its Pittsburg campus.
- **Contra Costa College** offers an EMT-I training program each year at its San Pablo campus.
- **Mt. Diablo Adult Education** offers EMT training programs at various times throughout the year at its facility in Concord.

MICN Training Programs: Several area training programs have found it necessary to temporarily or permanently discontinue MICN classes. Los Medanos Community College did conduct one MICN class in 1997. Stanford University and UC Davis provide MICN training in the Bay area. Although lack of MICN classes makes it difficult for interested nurses to obtain this training, both base hospitals continue to have a sufficient number of MICN's for staffing purposes.

K. Public Information Education Programs

The **Public Information and Education (PIE)** Subcommittee of the Emergency Medical Care Committee is charged with providing public information and education concerning Emergency Medical Services. Emphasis has been on EMS system access, recognition of life threatening situations, prevention of injuries, self-help techniques and first-aid skills that the public can utilize in emergency situations (CPR specifically). PIE activities for 1997 included:

- Over 10,136 of EMS Agency's **9-1-1 Brochure** were distributed to schools, industry, health fairs and hospitals. The **9-1-1 Brochure** includes information about CPR training and importance of early 9-1-1 access in emergency situations.
- In 1997, **68 calls for CPR training information** were processed by EMS staff. Local CPR class availability can be accessed through 1-800-GIVE-CPR. Up until November 1994, the program was available to local residents through the USF/Paramedic Association. When that program was discontinued, the EMS Agency was able to acquire and staff the 800 number for county residents. This number is advertised in the EMS 9-1-1 Brochure, local newspapers, telephone books, CCC Cable T.V. and B.A.R.T.
- Speakers for a number of community and wellness organizations such as "Mended Hearts" and the Rotary Club.

L. Other Programs

DNR Program: A Do-Not-Resuscitate **(DNR)** program for patients with terminal medical problems was implemented in January 1993. This program evolved in response to concern from the public over the 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, recognized by prehospital personnel statewide, is physician initiated and 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 hospitals, nursing homes, hospices, home health agencies, and private physicians throughout the county.

EMS Newsletter: The "**Emergency Medical Services Newsletter**" is in its eighth year of publication.

V. 1997 Statistical Reports

A. Ambulance Dispatch Report

Number of Responses, Response Code, and Response Level by Ambulance Provider
American Medical Response, San Ramon Valley Fire District, Moraga Fire District

Year 1997

Response Code and Level	All Providers		American Medical Response West		San Ramon Valley Fire District		Moraga Fire District	
	#	%	#	%	#	%	#	%
Total Dispatches	**52,143**	**100.0**	**48,311**	**100.0**	**3,209**	**100.0**	**623**	**100.0**
Code 3 dispatches	41,849	80.3	38,318	79.3	2,978	92.8	553	88.8
Code 2 dispatches	10,294	19.7	9,993	20.7	231	7.2	70	11.2
Code 3 dispatches	**41,849**	**100.0**	**38,318**	**100.0**	**2,978**	**100.0**	**553**	**100.0**
ALS response	41,402	98.9	37,924	99.0	2,927	98.3	551	99.6
Exempt BLS response	0	0.0	0	0.0	0	0.0	0	0.0
Non-Exempt BLS response	447	1.1	394	1.0	51	1.7	2	0.4
Code 2 dispatches	**10,294**	**100.0**	**9,993**	**100.0**	**231**	**100.0**	**70**	**100.0**
ALS response	7,919	76.9	7,649	76.5	202	87.4	68	97.1
BLS response	2,375	23.1	2,344	23.5	29	12.6	2	2.9

Patient Transport by Ambulance Provider
American Medical Response West, San Ramon Valley Fire District, Moraga Fire District

Year 1997

Response Outcome	All Providers		American Medical Response West		San Ramon Valley Fire District		Moraga Fire District	
	#	%	#	%	#	%	#	%
Total Dispatches	**52,413**	**100.0**	**48,311**	**100.0**	**3,209**	**100.0**	**623**	**100.0**
Transported	36,877	70.7	34,324	71.0	2,122	66.1	431	69.2
Cancelled	15,266	29.3	13,987	29.0	1,087	33.9	192	30.8
Total patient transports	**36,877**	**100.0**	**34,324**	**100.0**	**2,122**	**100.0**	**431**	**100.0**
Transported code 3	3,018	8.2	2,835	8.3	155	7.3	28	6.5
Transported code 2	33,681	91.3	31,316	91.2	1,967	92.7	398	92.3
Helicopter Transport	173	0.5	173	0.5	0	0.0	0	0.0
Transport code not reported	5	0.0	0	0.0	0	0.0	5	1.2
Total Cancelled	**15,266**	**100.0**	**13,987**	**100.0**	**1,087**	**100.0**	**192**	**100.0**
Enroute	4,368	28.6	3,940	28.2	417	38.4	11	5.7
On Scene	10,898	71.4	10,047	71.8	670	61.6	181	94.3

Responses by Community, Response Code, Average Code 3 Response Time, and BLS Response on Code 3
American Medical Response West, San Ramon Valley Fire District, and Moraga Fire District

Year 1997

Community	All Responses		Code Two		Code Three				
	#	%	#	%	#	%	Average Response Time[1]	BLS Unit Only on Response	
Richmond	8,958	18.4	1042	11.6	7916	88.4	6.56	143	1.8
San Pablo	2,655	5.5	426	16.1	2229	84.0	6.06	34	1.5
El Cerrito	1,522	3.1	208	13.7	1314	86.3	7.32	18	1.4
El Sobrante	554	1.1	71	12.8	483	87.2	8.10	7	1.5
North Richmond	381	0.8	29	7.6	352	92.4	6.70	3	0.9
Kensington	200	0.4	28	14.0	172	86.0	11.37	4	2.3
Pinole	1,181	2.4	158	13.4	1023	86.6	5.88	10	1.0
Hercules	631	1.3	107	17.0	524	83.0	7.73	7	1.3
Rodeo	476	1.0	112	23.5	364	76.5	8.19	5	1.4
Crockett	189	0.4	32	16.9	157	83.1	11.17	3	1.9
Concord	7,838	16.1	2024	25.8	5814	74.2	6.70	43	0.7
Martinez	2,221	4.6	560	25.2	1661	74.8	7.73	40	2.4
Pleasant Hill	1,778	3.7	444	25.0	1334	75.0	7.24	7	0.5
Pacheco	269	0.6	68	25.3	201	74.7	7.64	0	0.0
Clayton[1]	321	0.7	80	24.9	241	75.1	12.15	0	0.0
Clyde	17	0.0	3	17.7	14	82.4	7.58	0	0.0
Walnut Creek	4,738	9.7	917	19.4	3821	80.7	7.01	34	0.9
Lafayette	964	2.0	233	24.2	731	75.8	8.36	6	0.8
Orinda	574	1.2	171	29.8	403	70.2	11.28	2	0.5
Moraga	654	1.3	112	17.1	542	82.9	5.57	2	0.4
Alamo	267	0.6	30	11.2	237	88.8	5.01	3	1.3
Danville	1,334	2.7	104	7.8	1230	92.2	5.66	19	1.5
San Ramon	1,320	2.7	92	7.0	1228	93.0	4.90	27	2.2
Antioch	4,444	9.1	1086	24.4	3358	75.6	6.64	16	0.5
Pittsburg	4,114	8.5	1110	27.0	3004	73.0	6.80	7	0.2
Bay Point	1,483	3.1	346	23.3	1137	76.7	7.17	0	0.0
Oakley	940	1.9	229	24.4	711	75.6	8.18	2	0.3
Bethel Island	256	0.5	70	27.3	186	72.7	14.18	0	0.0
Knightsen	11	0.0	1	9.1	10	90.9	7.80	0	0.0
Brentwood[1]	833	1.7	222	26.7	611	73.4	8.81	1	0.2
Discovery Bay[1]	179	0.4	54	30.2	125	69.8	16.31	0	0.0
Byron[1]	160	0.3	40	25.0	120	75.0	13.70	0	0.0
Out of County	31	0.1	7	22.6	24	77.4	7.71	0	0.0
Other/Unknown	650	1.3	78	12.0	572	88.0	7.46	4	0.7

TOTALS	**52,143**	**100.0**	**10,294**	**19.7**	**41,849**	**80.3**	**6.98**	**447.0**	**1.1**

[1] Average response times do not include calls cancelled enroute or Unit 75 calls

Number of Transports by Hospital Destination, Transport Code, and Major Trauma Victim Status.
American Medical Response, San Ramon Valley Fire District, Moraga Fire District

Year 1997

Hospital	All Transports		Code Three Transports		Code Two Transports		Transport Code Unknown	
	#	%	#	%	#	%	#	%
Doctors' San Pablo	6,878	18.7	530	17.0	6348	18.8	0	0.0
Sutter Delta	5,218	14.2	443	14.2	4775	14.2	0	0.0
Doctors' Pinole	2,128	5.8	212	6.8	1916	5.7	0	0.0
John Muir	4,415	12.0	665	21.3	3750	11.1	0	0.0
Kaiser Martinez	823	2.2	24	0.8	799	2.4	0	0.0
Kaiser Richmond	305	0.8	2	0.1	303	0.9	0	0.0
Kaiser Walnut Creek	3,560	9.7	232	7.4	3328	9.9	0	0.0
Contra Costa	4,679	12.7	95	3.0	4584	13.6	0	0.0
Contra Costa RCC	121	0.3	0	0.0	121	0.4	0	0.0
Mount Diablo	5,529	15.0	570	18.3	4959	14.7	0	0.0
San Ramon	1,164	3.2	103	3.3	1061	3.1	0	0.0
Valley Care	50	0.1	1	0.0	49	0.2	0	0.0
Alta Bates	657	1.8	20	0.6	637	1.9	0	0.0
Children's	172	0.5	49	1.6	123	0.4	0	0.0
Eden	1	0.0	0	0.0	1	0.0	0	0.0
Highland	10	0.0	5	0.2	5	0.0	0	0.0
Kaiser Vallejo	226	0.6	1	0.0	225	0.7	0	0.0
Kaiser Oakland	288	0.8	8	0.3	280	0.8	0	0.0
Summit	92	0.3	4	0.1	88	0.3	0	0.0
Helicopter Transport	173	0.5	106	3.4	67	0.2	0	0.0
Other/Unknown	388	1.1	54	1.7	329	1.0	5	100.0
TOTALS	**36,877**	**100.0**	**3,124**	**100.0**	**33,748**	**100.0**	**5**	**100.0**

B. Helicopter Utilization Report

Contra Costa Patients Transported by Helicopter

Origin	1993		1994		1995		1996		1997	
	Pts	%	Pts	%	Pts	%	Pts	%	Pts	%
TOTAL	**383**	**100.0**	**305**	**100.0**	**280**	**100.0**	**268**	**100.0**	**273**	**100.0**
West County	217	56.7	139	45.6	114	40.7	114	42.5	130	47.6
East County	135	35.2	126	41.3	120	42.9	102	38.1	103	37.7
South County	21	5.5	23	7.5	10	3.6	23	8.6	12	4.4
Central County	10	2.6	17	5.6	36	12.9	29	10.8	28	10.3

Helicopter Transports Originating Within Contra Costa by Provider Agency

Provider	1994		1995		1996		1997	
	Pts	%	Pts	%	Pts	%	Pts	%
TOTAL	**305**	**100**	**280**	**100**	**268**	**100**	**273**	**100**
CALSTAR	278	91	250	89	251	94	244	89
REACH	6	2	8	3	7	3	13	5
Stanford Life Flight	9	3	8	3	1	< 1	6	2
Davis Life Flight	0	0	0	0	0	0	0	0
Medi-Flight	5	2	4	1	0	0	3	1
California Highway Patrol	6	2	4	1	6	2	3	1
East Bay Regional Parks	0	0	3	1	2	1	3	1
U.S. Coast Guard	0	0	2	1	1	< 1	0	0
Other	0	0	0	0	0	0	1	< 1
Unknown	1	< 1	1	< 1	0	0	0	0

C. Trauma System Report

On-scene Triage of Patients Meeting Field Trauma Criteria

	1993	1994	1995	1996	1997
Total Patients Meeting One or More Field Trauma Triage Criteria	**3,682**	**3,438**	**3,101**	**2,993**	**2,853**
Triaged in field as major trauma	1,274	1,167	977	881	997
Transported to a trauma center	1,198	1,092	930	842	957
John Muir Medical Center	1,095	977	835	735	841
Children's Hospital, Oakland	76	81	71	87	88
Other trauma center	27	34	24	20	28
Transported to the closest receiving hospital	76	75	47	39	40
CPR/Unstable airway	73	70	46	38	39
Trauma center on bypass	3	5	1	1	1
Triaged in the field as not having major trauma	2,408	2,271	2,124	2,112	1,856

Field Triage Errors (errors per 100 patients triaged with major trauma) - **1997**

Undertriage error rate	=	Patients triaged in the field as not having major trauma, but subsequently found to have major trauma / Total number of patients triaged in the field as having major trauma	=	38 / 997	= **3.8**
Overtriage error rate	=	Patients triaged in the field as having major trauma, but subsequently found not to have major trauma / Total number of patients triaged in the field as having major trauma	=	501 / 997	= **50.3**

Definitions: Field triage as major trauma - All patients meeting County EMS criteria based upon CRAMS score or anatomic factors for automatic consideration as a major trauma patient, plus all patients meeting trauma base hospital call-in criteria for whom a trauma center destination is given.

Retrospective major trauma determination - All patients whose hospital Injury Severity Score (ISS) is over 15 or who have an ISS between 10 and 14 with at least three day hospital stay are considered to be major trauma patients. All patients not meeting these criteria are considered non-major trauma patients.

Undertriage and Overtriage Rates by Year

Type of Triage Error	1993	1994	1995	1996	1997
Undertriage	1.3	1.2	2.0	2.4	3.8
Overtriage	54.9	55.2	54.1	46.5	50.3

D. Early Defibrillation Program Reports

First Responder Defibrillation Activity Report

	1993		1994		1995		1996		1997	
	#	%	#	%	#	%	#	%	#	%
Total patients in cardiac arrest	532	100.0	428	100.0	488	100.0	461	100.0	387	100.0
Patients with shockable cardiac rhythm	150	28.2	123	28.7	142	29.1	145	31.5	107	27.6
Patients without shockable cardiac rhythm	382	71.8	305	71.3	356	70.9	316	68.5	280	72.4
Patients with shockable cardiac rhythms	150	100.0	123	100.0	142	100.0	145	100.0	107	100.0
Patients with witnessed arrests	N/A	N/A	79	64.2	88	62.0	82	56.6	97	90.6
Patients receiving CPR prior to EMS arrival	N/A	N/A	56	45.5	65	45.8	66	45.5	87	81.3
Total patients with shockable cardiac rhythm	150	100.0	123	100.0	142	100.0	145	100.0	107	100.0
"Field Saves" (patient admitted to hospital)	36	24.0	21	17.1	43	30.3	35	24.1	23	21.5
"System Saves" (patient discharged from hospital)	16	10.6	7	5.7	17	12.0	17	11.7	13	12.1

1997

Fire Agency	Defibrillator Attached	Patient Shocked	Patient Admitted	Patient Discharged
Total	387	107	23	13
Bethel Island	1	1	0	0
Contra Costa	276	81	19	11
Crockett	1	0	0	0
East Diablo	11	2	1	1
El Cerrito	21	4	0	0
Kensington	0	0	0	0
Moraga	0	0	0	0
Oakley	0	0	0	0
Orinda	1	4	1	0
Pinole	15	5	1	1
Richmond	16	6	2	0
Rodeo	5	1	0	0
San Ramon	6	0	0	0

E. Patient Transfer Report

Interfacility Transfer Statistics by Transferring Hospital

	1993	1994	1995	1996	1997
Total reported transfers	1,069	804	831	907	2,520
Transferring facility					
Doctors' San Pablo	296	151	143	197	244
Sutter Delta	206	250	334	335	302
Doctors' Pinole	32	42	41	50	88
John Muir	21	31	26	11	19
Kaiser Martinez	33	35	37	17	257
Kaiser Richmond	74	78	65	126	1,312
Kaiser Walnut Creek	11	13	8	10	128
Los Medanos	231	59	**	**	**
Contra Costa	7	10	5	6	5
Mt. Diablo	135	107	144	127	148
San Ramon	15	17	22	20	21
Other	18	11	6	8	11

**Los Medanos closed 3/94.

F. Emergency Department Diversion Report

Emergency Department Diversion (By-Pass)

	1993	1994	1995	1996	1997
Contra Costa, Merrithew					
# of events	40	44	62	50	25
Total time	95.3 hrs	79.1 hrs	155.2 hrs	115.5 hrs	41.3 hrs
Avg time/event	2.4 hrs	1.8 hrs	2.5 hrs	2.3 hrs	1.6 hrs
Doctors' Pinole					
# of events	1	1	0	0	3
Total time	0.8 hrs	9.5 hrs	0 hrs	0 hrs	5.4 hrs
Avg time/event	0.8 hrs	9.5 hrs	0 hrs	0 hrs	1.8 hrs
Doctors' San Pablo Brookside					
# of events	39	55	35	16	34
Total time	59.5 hrs	103.0 hrs	49.8 hrs	24.7 hrs	77.8 hrs
Avg time/event	1.5 hrs	1.9 hrs	1.4 hrs	1.5 hrs	2.3 hrs
John Muir					
# of events	1	0	0	0	1
Total time	0.3 hrs	0 hrs	0 hrs	0 hrs	1.4 hrs
Avg time/event	0.3 hrs	0 hrs	0 hrs	0 hrs	1.4 hrs
Kaiser Martinez					11/97 - No
# of events	0	0	0	1	longer receives
Total time	0 hrs	0 hrs	0 hrs	13 hrs	ambulance
Avg time/event	0 hrs	0 hrs	0 hrs	13 hrs	patients
Kaiser Richmond					4/97 - No
# of events	3	0	2	0	longer receives
Total time	7.9 hrs	0 hrs	26.0 hrs	0 hrs	ambulance
Avg time/event	2.6 hrs	0 hrs	13.0 hrs	0 hrs	patients
Kaiser Walnut Creek					
# of events	0	0	0	0	3
Total time	0 hrs	0 hrs	0 hrs	0 hrs	12.8 hrs
Avg time/event	0 hrs	0 hrs	0 hrs	0 hrs	4.3 hrs
Los Medanos					
# of events	7	2			
Total time	14.8 hrs	1.8 hrs	Los Medanos Hospital closed in 1994.		
Avg time/event	2.1 hrs	0.9 hrs			
Mt Diablo					
# of events	3	8	20	19	9
Total time	8.3 hrs	12.9 hrs	34.6 hrs	46.2 hrs	14.0 hrs
Avg time/event	2.8 hrs	1.6 hrs	1.7 hrs	2.4 hrs	1.5 hrs
San Ramon Reg.					
# of events	0	0	0	1	0
Total time	0 hrs	0 hrs	0 hrs	1.1 hrs	0 hrs
Avg time/event	0 hrs	0 hrs	0 hrs	1.1 hrs	0 hrs
Sutter Delta					
# of events	17	5	2	6	13
Total time	35.3 hrs	6.2 hrs	2.0 hrs	5.5 hrs	28.5 hrs
Avg time/event	2.1 hrs	1.2 hrs	1.0 hrs	0.9 hrs	2.2 hrs

G. Base Hospital Contact Report

Base Hospital Activity Summary

	1992	1993	1994	1995	1996	1997
Total Base Contacts	18,331	14,920	13,922	13,296	13,646	10,426
ALS Care Provided	15,310	12,474	10,524	10,172	10,407	8,572
No ALS Provided	3,021	2446	3,398	3,124	3,239	1,854
EMT-P Contacts	N/A	N/A	N/A	12,823	13,057	9,633
EMT-I Contacts	N/A	N/A	N/A	187	163	186
EMT Not Identified	N/A	N/A	N/A	286	1	607
Adult Patients	N/A	N/A	12,929	12,744	12,857	9,781
Pediatric Patients (age < or = 14)	N/A	N/A	887	398	525	403
Age Not Identified	N/A	N/A	106	158	231	262

Contacts by Base Hospital

1997

	System Totals	John Muir Base	Mt. Diablo Base
Total Base Contacts	10,426	6,392	4,034
ALS Care Provided	8,572	4,722	3,850
No ALS Provided	1,854	1,670	184
EMT-P Contacts	9,633	5,867	3,766
EMT-I Contacts	186	98	88
EMT Not Identified	607	427	180
Adult Patients	9,781	5,936	3,845
Pediatric Patients (age < or = 14)	403	290	113
Patient Age Not Identified	262	166	96

VI. EMS Agency Organizational Chart

EMS Agency Organizational Chart

4/98

Board of Supervisors

Advisory Bodies:

- Emergency Medical Care Committee
- CSA EM-1 Oversight Committee
- Health Services Director
- Medical Advisory Committee
- Transfer Review Panel
- County Health Officer/ Medical Director
- Trauma Audit Committee

State EMS:

- California Emergency Medical Services Commission
- California Emergency Medical Services Authority

EMS Staff:

- Emergency Medical Services Director
- Program Coordinator (0.5 FTE)
- RN/Trauma Coordinator
- RN/First Responder Programs
- Data Specialist
- Training Management
- Prehospital Care Coord./ Ops. & Persn'l.
- Prehospital Care Coord./ Hosp. & Q.A.
- Support Staff (2.0 FTE)
- Special Projects

EMS Providers:

- Fire Services
- Ambulance Services
- Hospitals
- EMS Medical Director
- Dispatch Centers
- Police and Sheriff Medical Helicopter Services
- Institutions

EMS Functions:

- Provide overall coordination of County EMS System.
- Provide medical disaster planning and coordinate medical disaster response.

- Regulate emergency ambulance services.
- Regulate County Trauma System.
- Establish prehospital treatment protocols.
- Approve and monitor paramedic programs.
- Approve and monitor first responder defibrillation programs.
- Review interfacility patient transfers.
- Review and approve training programs for prehospital personnel.
- Conduct certification program for prehospital personnel.
- Administer County Service Area EM-1 to provide enhancements to the EMS system.

VII. EMS Expenditures

Emergency Medical Services Expenditures

A. Basic Emergency Medical Services (Budget Unit #6543)

Category	FY 1992-93	FY 1993-94	FY 1994-95	FY 1995-96	FY 1996-97
Salaries & benefits	404,232	394,862	413,827	428,867	440,308
Services & supplies	159,482	150,885	150,916	192,078	159,823
TOTAL	**563,714**	**545,747**	**564,743**	**620,945**	**600,131**

B. Measure H Enhancements (County Service Area EM-1)

Category	FY 1992-93	FY 1993-94	FY 1994-95	FY 1995-96	FY 1996-97
Direct costs:					
Salaries & benefits	190,634	193,132	199,984	178,254	176,573
Services & supplies	3,072,466	3,534,011	3,580,773	4,409,931	3,797,066
Paramedic ambulance services (AMR contract)	2,301,036	2,293,852	2,502,384	2,502,384	2,502,384
Paramedic ambulance services (Moraga Fire contract)	33,208	58,558	117,116	58,558	58,558
Base hospital services	100,000	100,000	100,000	100,000	100,000
First responder services - fire service reimbursements	--	414,969	76,503	830,714	299,999
First responder services - defibrillation program	29,889	7,055	35,332	133,029	94,436
First responder services - Bethel Island paramedic program	--	--	--	--	81,113
First responder services - East Diablo paramedic program (AMR contract)	209,836	209,150	229,841	233,480	232,840
Sheriff's dispatch	--	168,012	168,012	168,012	168,012
Other EMS dispatch and radio communications	75,920	85,216	55,933	38,031	15,695
Poison control center services	--	20,456	20,361	107,965	44,618
Hazmat program	--	--	150,000	150,000	150,000
Other services & supplies	322,577	176,743	125,291	87,758	49,411
Total direct costs	3,263,100	3,727,143	3,780,757	4,588,185	3,973,639
Administration/collection	336,245	333,566	262,687	403,000	383,922
Contribution to reserves	--	--	180,637	--	--
TOTAL	**3,599,345**	**4,060,709**	**4,224,081**	**4,991,185**	**4,357,561**

VIII. Glossary of EMS Terms

Glossary of EMS Terms

Abbreviated Injury Score (AIS): A scale created to describe the anatomical injuries resulting from trauma. AIS scores obtain a value from each of 9 body areas: head, face, neck, thorax, spine, upper extremities, lower extremities, and external/other. For each body region, a severity code is assigned which describes the injuries as minor, moderate, serious severe, critical, maximum injury with little chance of survival, and unknown. The AIS is universally accepted and is the foundation for the Injury Severity Score.

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: Special services designed to provide definitive prehospital emergency medical care, including, but not limited to, cardiopulmonary resuscitation, cardiac monitoring, cardiac defibrillation, advanced airway management, intravenous therapy, administration of specified drugs and other medicinal preparations, and other specified techniques and procedures administered by paramedics under the direct supervision of a base hospital as part of a local EMS system at the scene of an emergency, during transport to an acute care hospital, during interfacility transfer, and while in the emergency department of an acute care hospital until responsibility is assumed by the emergency or other medical staff of that hospital.

Air Ambulance: Any aircraft specifically constructed, modified or equipped, and used for the primary purpose of responding to emergency calls and transporting critically ill or injured patients whose medical flight crew has at a minimum two attendants certified or licensed in advanced life support.

Authorized Registered Nurse (ARN) or Mobile Intensive Care Nurse (MICN): A registered nurse who has been authorized by the medical director of the local EMS agency as qualified to issue instructions to prehospital emergency medical care personnel within an EMS system according to standardized procedures developed by the local EMS agency.

Authorizing EMS Agency: The local EMS Agency which approves utilization of specific EMS aircraft within its jurisdiction.

Base Hospital: One of a limited number of hospitals which, upon designation by the local EMS agency and upon the completion of a written contractual agreement with 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.

Base Hospital Physician: A physician who is currently licensed in California, who is assigned to the emergency department of a base hospital, and who is knowledgeable in the medical protocols, radio procedure and general operating policies of the County EMS system, and a person from whim ambulance personnel may take medical direction by radio or other telephone.

Basic Life Support: Emergency first aid and cardiopulmonary resuscitation procedures which, as a minimum, include recognizing respiratory and cardiac arrest and starting the proper application of cardiopulmonary resuscitation (CPR) to maintain life without invasive techniques until the victim may be 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. This course is required for paramedics in Contra Costa County.

Blunt: An injury that occurs without penetration of the body (e.g. motor vehicle injuries, falls, assaults with a blunt instrument).

Cardiac Arrest: A state when the heart stops beating or where it quivers (ventricular fibrillation) and does not pump blood to the rest of the body, which will result in death. Resuscitation, such as defibrillation, if provided soon enough may save the patient's life in some situations.

Cardiopulmonary Resuscitation (CPR): The procedure of performing artificial respiration and artificial circulation to a non-breathing, pulseless patient.

Casualty Collection Point (CCP): A site for the congregation, triage (sorting), preliminary treatment, and evacuation of casualties following a disaster.

Code 2: Used by EMS systems to refer to an immediate ambulance response to a potentially urgent but non-life threatening incident without the use of red lights and sirens and adhering to all requirements of the vehicle code (speed limits and rights-of-ways).

Code 3: Ambulance response with red lights and sirens to an emergency incident. When responding Code 3, the emergency unit may exceed the posted speed limit within certain constraints and may proceed through red lights without making a complete stop, although the ambulance driver is held responsible for assuring safety for his/her unit and other drivers while doing so.

Computer Aided Dispatch (CAD): A computer system consisting of associated hardware and software to facilitate call taking, unit selection, resource dispatch and deployment, event time stamping, as well as creation and real time maintenance of incident database.

County Service Area (CSA) EM-1: Special benefit assessment district established by the Board of Supervisors to fund EMS enhancements.

CRAMS: A 10 point scale used to identify Critical Trauma Patients. The acronym CRAMS represents five weighted component measures: **C**irculation, **R**espiration, **A**bdomen/Thorax, **M**otor and **S**peech. It was designed as a prehospital triage tool. The scale ranges from 0 (most severe) to 10 (least severe).

Critical Trauma Patient (CTP): Any patient who meets established field trauma triage criteria and is triaged to a trauma center or is triaged to a closer facility due to trauma center bypass or due to trauma full arrest or unmanageable airway.

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 which require judgement on the part of the rescuer. First responders use automatic or semi-automatic defibrillators which assess the patient's cardiac status and provide the shock (or instruct that the shock be provided) if necessary.

Dispatch Center: A coordinating center for the efficient management of all participating emergency resources within a designated area of responsibility. The center dispatches rescue personnel and equipment and coordinates these various resources to ensure maximum effectiveness.

Emergency: A condition or situation in which an individual has a need for immediate medical attention, or where the potential for such need is perceived by emergency medical personnel or a public safety agency.

Emergency Ambulance Unit: A vehicle specially constructed, 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 customarily receives patients in need of emergency medical evaluation and or care.

Emergency Medical Services Aircraft: Any aircraft utilized for the purpose of prehospital emergency patient response and transport. EMS aircraft includes air ambulances and all categories of rescue aircraft.

Emergency Medical Services Authority (EMSA): The State EMS organization which 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: A licensed physician appointed as the medical director of the local EMS Agency to provide medical control and to assure medical accountability through the planning, implementation and evaluation of the EMS system.

Emergency Medical Services System: A specially organized and coordinated arrangement which 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 the components listed in Health and Safety Code Section 1797.103.

Emergency Medical Technician-I (EMT-I): An individual trained in all facets of basic life support and certified by the EMS Agency in the county where training occurred. In the Contra Costa County EMS system, EMT-I staffed ambulances generally provide back-up to paramedic staffed ambulances, although they may be dispatched to respond to certain requests which have been determined to require only basic life support services.

Emergency Medical Technician-Paramedic, EMT-P or Paramedic: An individual whose scope of practice includes skills and procedures to provide advanced life support as part of an EMS system and who is certified by the State of California and accredited by the local EMS agency has having met established criteria. In the Contra Costa County EMS system, paramedics are to be 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): A facility designed and equipped for the use by city, county or other governmental agency leadership to manage the disaster response to the community.

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 is divided into five emergency response areas.

Fire/Medical Dispatch Center: A public Safety Dispatch Center which receives requests to respond to medical emergencies, dispatches medical first responders and initiates ground and air ambulance response.

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

Health & Safety Code: The division of State legislation that includes Division 2.5 EMS Statutes.

Health Services Department: A department of county government responsible for health related issues. The Contra Costa County Health Services Department, which includes the Emergency Medical Services Agency, has been designated by the local Board of Supervisors as the "Local EMS Agency", and the County Health Officer as the "EMS Medical Director".

Hospital Emergency Incident Command System (HEICS): A generic crisis management plan developed expressly for comprehensive medical facilities which is modeled closely after the Fire Service Incident

Command System.

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

Injury Severity Score (ISS): The sum of the squares of the highest AIS codes in each of the three most severely injured body regions. The ISS is one component used in calculating the patient's probability of survival.

Local EMS Agency: The local agency, usually a county health department, or office having primary responsibility for administration of emergency medical services in a county or multi-county area.

Major Trauma Patient (MTV): A retrospective determination made by assessing and scoring a patient's injuries using the Abbreviated Injury Scale (AIS) and Injury Severity Score (ISS). In Contra Costa County, an ISS of greater than 15 or an ISS of 10 to 14 with a greater than 3 day length of hospitalization is classified as an MTV.

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

Medical Control: The medical management of the emergency medical services system. This is done prospectively, e.g., policies and procedures; on-line, e.g., base hospital direction; and retrospectively, e.g., continuing education, case review, quality improvement activities.

Morbidity: Negative effects (e.g. disability or abnormality) resulting from illness or injury.

Mortality: Any death resulting from injury or illness.

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

Mutual Aid: The furnishing of resources from one individual or agency to another, including but not limited to facilities, personnel, equipment and/or services, pursuant to an agreement between the individuals and/or agencies when requested during time of need.

Penetrating: Any injury that penetrates the skin (e.g. gunshot wounds or stabbings).

Predesignated Rendezvous Landing Site: An emergency medical services landing site as authorized by the local EMS Agency with input of jurisdictional fire agency, predesignated to facilitate transport of patients when the scene does not allow for a landing site.

Probability of Survival: Statistically defines the patient's chance of surviving sustained injuries. The range of possible values for this probability (referred to as Ps) is from 0.0 to 1.0. A Ps of 0.0 indicates no chance of survival and a 1.0 means that the patient is expected to live. The components of Ps are RTS, age ISS and the type of injury (blunt or penetrating).

Public Safety Agency: A functional division of a public agency which 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.

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

Rescue Aircraft: An aircraft whose usual function is not prehospital emergency medical transport but which may be utilized, 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.

Revised Trauma Score (RTS): A score using three physiological parameters to measure injury severity: The Glasgow Coma Scale, systolic blood pressure, and respiratory rate.

Standardized Emergency Management System: A system require by Government Code for managing response to multi-agency and multi-jurisdictional emergencies in California. SEMS consists of five organizational levels which are activated as necessary: Field Response, Local Government, Operational Area, Region, State.

START: Acronym for Simple Triage and Rapid Treatment. This is the initial triage system developed by Hoag Hospital and Newport Beach Fire Department, Newport Beach CA that has been adopted by the California Fire Chief's Association.

Trauma Care System: A formally organized arrangement of health care resources, defined by the local EMS Agency, by which severely injured patients are triaged, transported to and treated at designated trauma centers.

Trauma Center: A licensed general acute care hospital which has been designated as a Level I, II or III Trauma Center by the local EMS Agency. The trauma center provides staffing and equipment to immediately provide evaluation and intervention for severely injured patients. John Muir Medical Center is the designated Level II Trauma Center for Contra Costa County.

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 EMS Authority and must be updated annually. The Contra Costa County Trauma System Plan includes the utilization of one level II trauma center within the county.

Trauma Triage Criteria: The method used by ambulance personnel to determine whether an injured patient needs the specialized services of a trauma center. The method takes into consideration the mechanism of injury, obvious injuries and other information obtained in a brief patient exam.

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

IX. List of Documents Available from the EMS Agency