Contra Costa County Health Services Department

Emergency Medical Services Agency

1996 Annual Program Report

- December 1997+ -

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I. IntroductionI. Introduction

A. Overview of EMSA. 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. EMS includes ambulance services, fire services, law enforcement agencies, public safety dispatch centers, hospitals and specialty care centers, training institutions and organizations, citizen and medical advisory groups, local and state EMS agencies, and other governmental and voluntary organizations. While most EMS responses are day-to-day emergencies, EMS agencies also plan and prepare for disaster medical response.

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 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) appointed by the Health Services Director provides advice regarding EMS matters to the Health Department and to its EMS Agency.

B. Local EMS Agency FunctionsB. Local EMS Agency Functions

The principal functions of a local EMS agency are specified in the Health & Safety Code. These 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 CommitteeC. 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 1996, 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
  1 County Fire District
  1 Independent Fire District
  1 Municipal Dept. or Regional Fire Authority
- 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 1996, 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:

- Response and Transportation
- Personnel and Training
- Disaster Response Preparedness
- Facilities and Critical Care
- Communications
- Public Information and Education
- Data Collection and Evaluation

D. Delivery of EMS ServicesD. 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 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 ambulance in the event there are multiple victims or a delay in the paramedic 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 transport 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 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) FundingE. 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 CountyF. 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. This committee laid the foundation for the EMS system as it exists today.

1970 ➢ State **Wedworth-Townsend Act** passed enabling 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 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 as a means for the development of a Regional EMS program.

➢ First **paramedic-staffed ambulances** responded in Walnut Creek by Pomeroy Ambulance (5/77); in Moraga by Moraga Fire Protection District (6/77), in Concord by Michael's Ambulance (1/78); and in Richmond by Cadillac Ambulance (2/78 -Labor issues delayed active participation in program until 1979).

1980 ➢ Joint Powers Agreement for Regional EMS disbanded at request of the EMCC's of both Alameda and Contra Costa Counties.

➢ Comprehensive **California Emergency Medical Services System and Prehospital Emergency Medical Care Personnel Act** passed. 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 establishing **exclusive ambulance zones** for emergency and non-emergency

transport added to the County Ambulance Ordinance.

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

1982
- The Board of Supervisors approved first County **Multicasualty Incident Plan** providing for on-scene coordination, resource notification, and patient distribution in multicasualty situations.

1983
- Health Services Department designated by Board of Supervisors as **Local EMS Agency** pursuant to State EMS Act. County Health Officer designated **EMS Medical Director**.
- **Revised Ambulance Ordinance** established competitive bidding process for emergency ambulance service. **Request for Proposal** process resulted in selection of five providers based upon highest level of service without County subsidy: Cadillac Ambulance, Regional Ambulance, Moraga Fire District, San Ramon Valley Fire District, and East County Ambulance.

1984
- **San Ramon Valley Fire District** established paramedic level ambulance service through joint program with John Muir Medical Center.

- Ten ambulance zones consolidated into **5 Emergency Response Areas (ERAs)**. Exclusive ambulance service contracts were awarded to 4 providers: Cadillac Ambulance, Regional Ambulance, Moraga Fire and San Ramon Valley Fire.

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 by an Ad Hoc subcommittee of 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 ineligible for paramedic base hospital designation when it downgraded its' emergency department from "Basic Emergency Services" to "Standby Emergency Services" licensure. 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 received **specialized training** in critical trauma patient management.
- John Muir Medical Center designated as County's **Level II Trauma Center** in response to

RFP process for designation pursuant to Trauma System Plan.

- **Bay Area Trauma Registry Project** funded by State began work to develop 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.

- **RFP process for emergency ambulance service** in 5 ERA's. Ambulance service contracts awarded to 3 providers: 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 restores **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.
- State began funding the **EMS Disaster Planning Project** 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 ambulances increased from 12 to 19 paramedic units to meet this standard with ambulance service subsidies funded by Measure H.
- **First Responder Defibrillation Program** developed including 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 made available which provides patients with option of predetermining levels of resuscitation to be performed in the field.
- **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.

- Beginning of fire/medical dispatch computer linkage project **Medical Transmission Network**.

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

1993

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

- A **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 the 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 **maintaining certification as EMT-I**.

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

- New legislation transferred responsibility for **paramedic certification** from individual counties/regions to State EMSA.

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

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

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

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

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

1995

- Kaiser Medical Center, Richmond, merged with Kaiser, Oakland. Richmond facility limited to receiving non-critical ambulance patients due to lack of ICU capabilities.

- **Paramedic credentialling** converted from state "certification" 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 all county phone books and staffed by EMS Agency.

- **Basic Life Support skills standards** added to the EMS Field Treatment Guidelines.

II. List of Major Accomplishments - 1996II. List of Major Accomplishments - 1996

- New Statewide Poison Control Center system approved.
- Asst. EMS Medical Director position converted to EMS Medical Director.
- Standards for EMS **Enhanced First Responder Programs** developed.
- **16 county region-wide Bay Area DMAT** to be sponsored by County Health Services.
- **Request for Proposal** issued for emergency ambulance service in 4 of 5 county emergency response areas.
- **46,980** emergency ambulance responses dispatched.
- Bethel Island Fire's **First Responder Paramedic** program implemented.
- EMS system evaluation undertaken by **Emergency Medical Care Committee**.
- **San Ramon Valley Fire Protection District Dispatch** named "Center of Excellence" by National Academy of Emergency Medical Dispatch.
- **9,770 EMS System 911 brochures** distributed throughout the community.
- Responded to **118 1-800-GIVE-CPR** requests for CPR training information.
- Local hospitals and Health Services/EMS staff participated in **"Hospital Shelter-in-Place Project"** funded by local Emergency Planning Committee and State Office of Emergency Service.
- Successful trauma system celebrated tenth anniversary.
- **275** EMT-I's **certified, 86** paramedics **accredited** and **31** MICN's **authorized**.
- Formal **evaluation of emergency ambulance contracts** with Moraga Fire, San Ramon Valley Fire, and American Medical Response conducted.
- Participated in **22nd annual EMS Week** activities.
- **Infrequent skills and intubation CE modules** available for paramedics.
- **Computerized pen-based Patient Care Report pilot** introduced on 4 paramedic units.

III. EMS System ParticipantsIII. EMS System Participants

A. Advisory CommitteesA. 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. 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 systems used to get patients to the most appropriate facilities.

Public Information & Education - PIE (EMS Standing Committee): This committee evaluates and makes recommendations to the EMCC with respect to the availability of EMS public education and information with respect to 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 committee evaluates and makes recommendations to the EMCC with respect to the adequacy of the local EMS operational and clinical data collection systems to assure that information necessary to provide both 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. Such topics include medical treatment guidelines for ALS and BLS services; 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.

Measure H Oversight Committee: This committee was appointed by the Health Services Director to assist in ongoing program planning and monitoring and to advise the Department on preparation of the annual budget for the County Service Area for EMS. The Oversight Committee includes representatives of the Public Managers' Association, Fire Chiefs' Association, Police Chiefs' Association, East Bay Hospital Conference and two consumer members of the EMCC. Meetings are held as needed.

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 defined this 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, East Bay Hospital Conference, Alameda-Contra Costa Medical Asso., Emergency Department Nurses Asso., and EMCC. The panel meets quarterly or as needed to review and recommend action on specific patient transfer investigations.

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 been used to develop 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.

Helicopter Operations Committee: This committee was established to provide a forum for exchange of helicopter related information. The committee meets as needed and includes representatives of fire, police, hospitals, ambulance and helicopter providers. Typical topics include provider agency updates, review of

procedures, operational issues, policies and procedures, equipment and training issues and other items of interest.

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 to discuss issues of mutual concern regarding hospital disaster preparedness. 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 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. This group meets quarterly.

B. PSAP's and Dispatch CentersB. 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 only)

C. First RespondersC. 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)
- Moraga Fire Protection District (2 units)
- Orinda Fire Protection District (3 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)

Other First Responders:

- East Bay Regional Parks
- Private & military fire services

Special Paramedic First Responder Programs:

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

D. Emergency Ambulance ProvidersD. Emergency Ambulance Providers

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

E. EMS HelicoptersE. EMS Helicopters

Air Ambulances:

- CALSTAR based 24 hours/day at Buchanan Airport with other helicopters based in Gilroy and Roseville.
- Stanford Life Flight based in Palo Alto
- Davis Life Flight based in Sacramento

- REACH helicopter based in Santa Rosa with a second ship in Vacaville
- 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)
- Sonoma County Sheriff's Dept (ALS Helicopter, long line capability)

F. HospitalsF. Hospitals

Receiving Hospitals:

- Brookside Hospital
- Sutter Delta Medical Center
- Doctor's Hospital of Pinole
- John Muir Medical Center
- Kaiser Medical Center, Martinez
- Kaiser Medical Center, Richmond (until 1997)
- Kaiser Medical Center, Walnut Creek
- Merrithew Memorial Hospital
- Mt. Diablo Hospital Medical Center
- San Ramon Regional Medical Center

Base Hospitals:

- John Muir Medical Center
- Mt. Diablo Medical Center

Trauma Center:

- John Muir Medical Center

Burn Center:

- Brookside Hospital

IV. EMS Program ActivitiesIV. EMS Program Activities

A. Emergency Ambulance ServicesA. 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 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, Orinda, 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 Fire Protection District including city of Moraga	**Moraga Fire** 1 ALS unit
ERA 4	Area of San Ramon Valley including cities of Danville and San Ramon	**San Ramon Valley Fire/John Muir Medical Center** 3 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 **1996**, the county ambulance staffing standard was met on 37,083 (98.7%) of 37,580 Code 3 ambulance responses. Paramedic response to emergency medical requests. 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 1996, the EMS system received **46,980** requests for emergency ambulance response. Of these, 37,580 (**80.0%**) were considered to involve potentially life threatening situations to which a Code 3 (red lights and siren) ambulance response was necessary. The remaining 9,400 (**20.0%**) ambulance responses were dispatched Code 2 (immediate response without lights and siren). Of the total responses, **44,298** (94.3%) were handled by American Medical Response, **2,131** (4.5%) by San Ramon Valley Fire Protection District ambulance, and **551** (1.2%) by Moraga Fire Protection District ambulance. Average Code 3 ambulance response time countywide was **6.92 minutes**.

Not all ambulance responses result in patient transport. Of the 46,980 emergency ambulance responses during the year, **34,009** (72.4%) resulted in patient transport to an emergency receiving hospital. Ambulances responding to the remaining **12,970** (27.6%) 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	
All EMS Ambulance Dispaches	43,774	100.0%	44,473	100.0%	46,969	100.0%	46,980	100.0%
Code 3 (lights & siren)	36,484	83.3%	36,172	81.3%	37,428	79.7%	37,580	80.0%
Code 2	7,290	16.7%	8,301	18.7%	9,541	20.3%	9,400	20.0%
American Medical Response	40,650	92.9%	41,329	92.9%	44,285	94.3%	44,298	94.3%
San Ramon Fire	2,561	5.9%	2,613	5.9%	2,139	4.6%	2,131	4.5%
Moraga Fire	563	1.3%	531	1.2%	545	1.2%	551	1.2%
Transport	30,886	70.6%	31,332	70.5%	33,056	70.4%	34,010	72.4%
No Transport (Dry Run)	12,888	29.4%	13,141	29.5%	13,913	29.6%	12,970	27.6%
Average Code 3 Response Time	6.85 minutes		6.87 minutes		7.01 minutes		6.92 minutes	
Code 3 Responses Not Meeting Ambulance Staffing Standard[1]	162	0.4%	201	0.5%	561	1.5%	497	1.3%

[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 ProgramsB. 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 1996 totaled 13,646, approximately the same number of contacts made in the previous year. Twelve field care audits were offered by the two bases as continuing education opportunities for prehospital personnel.

Treatment Protocols: ALS Field Treatment Guidelines are used by paramedics, MICN's, and base hospital physicians to provide care to patients in the pre-hospital 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 were reviewed and some revisions were made in 1996.

C. First Responder ServicesC. 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 and CPR and 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.

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 March, 1992.

In 1996, fire first responders used a "semi-automatic" defibrillator was used to assess **461** patients in cardiac arrest. Of those patients, **145** or 31.5% were assessed by the semi-automatic defibrillator to be in a shockable rhythm and received early defibrillation. Thirty-five of the 145 patients who received early defibrillation were admitted to the hospital, for a **24.1%** field save rate. Of those 35 patients who received early defibrillation and were admitted to the hospital, 17 or **11.7%** 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. Three 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 was permanently designated in 1992.

- In 1992, the EMS Agency, American Medical Response, and East Diablo Fire District 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. Evaluation of this pilot delivery model will be evaluated

following 12 months of service.

All three 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 CommunicationsD. Dispatch and Communications

MEDARS: Medical Emergency & Disaster Ambulance Radio System is the County radio system used for communications between ambulances and hospitals, and between Sheriff's Dispatch and ambulances. Prior to March 1992, the system consisted of two radio channels, MED 1-2, which provided one channel for communications between Sheriff's Dispatch and ambulances and only one channel for all paramedic and EMT units to use to contact hospitals. In 1992, two additional channels were added to the system bringing the EMS communications system up to the current 4 radio channels. Three of the 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 the possibility of interference with another Bay Area agency assigned to 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 the ambulance dispatch center at American Medical Response. Currently, the MTN system is in use at Contra Costa County Fire Dispatch, Sheriff's Dispatch, and American Medical Response Dispatch and handles about 60 percent of all EMS dispatches countywide. By establishing a direct data link among the various computer-aid dispatch (CAD) systems, MTN decreases dispatch time, reduces dispatch errors, enhances the 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 of screening calls to provide the appropriate EMS first-responder/ambulance response, and of providing simple emergency medical instructions to the caller for the caller to initiate prior to the arrival of EMS personnel. Contra Costa County Fire Dispatch has been providing limited call screening and pre-arrival instructions for a number of years. In 1993, commercial medical dispatch programs were evaluated and 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 Protection District Dispatch Center. Following the successful pilot program, 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 SystemE. 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. On June 30, ambulance personnel began to transport 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 1996, **2,993** patients were identified as requiring trauma triage, **745** of whom were transported directly to John Muir Trauma Center. A patient in traumatic full arrest or who's airway cannot be managed, (total of **36** in 1996) are triaged to the closest basic emergency department for resuscitation. A critically injured patient who inadvertently arrives at a non-trauma center hospital may be transferred to a trauma center. **Thirty four** of the **50** injured patients transferred to trauma centers in 1996 were retrospective major trauma victims. John Muir Trauma Center also receives some trauma patients from surrounding counties, generally by air.

During the past **10.5** years of operation, a total of **31,985** patients have been triaged through the County trauma system. This group consists of **11,099** patients (or 34.7%) who were transported to John Muir, **816** patients (or 2.6%) who were transported to other trauma centers, (primarily Children's Hospital in Oakland) and **20,070** patients (or 62.7%) 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 1996, John Muir Trauma Center bypass rate was **1.5%** 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 1996.

Trauma Injury Prevention: The EMS Agency supported injury prevention activities in 1996, 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 also 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 TransportF. 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 is often used as an ambulance/helicopter rendezvous point. The county standard of care for air transport of emergency patients has been by "air ambulance"

G. Hospital Emergency ServicesG. Hospital Emergency Services

Transfer Review Process: 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 is to review and make recommendations on patient transfer investigations as outlined in the County Transfer Guidelines. In 1996, a total of **907** transfers were reported to and reviewed by the EMS staff. This staff evaluation resulted in indepth review of **17** cases by the EMS Agency staff and the Transfer Review Panel.

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 1996, there were 6 facilities which utilized diversion a total of 93 times. There were no reports of problems in patient care resulting from these diversion incidents.

H. Disaster and Multicasualty PlanningH. 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.

Prior to 1995, RDMHC's were responsible for coordination of medical and health mutual aid response to major disasters **not** affecting Region II counties. New State legislation requires regional coordination of medical and health mutual aid for impacted counties within that region.
In 1996 the major emphasis of the disaster planning grant was to incorporate the Standardized Emergency Management System into the RDMHC mutual aid process. Additional major objectives were to designate

number of *injured* exceeds local medical capabilities. The plan has been updated from time to time and is being revised currently to include the most current emergency medical response information.

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.

EMS HAZMAT Response Preparedness: From 1987 until 1992, Contra Costa and Solano Counties participated in a Joint EMS Hazardous Materials (Hazmat) Response Program funded by the IT Corporation under consent decree. Specialized training programs and treatment protocols for ambulance personnel and for hospitals in managing patients exposed to hazardous materials were developed under this program. The EMS Agency participates as a guest member on C.A.E.R. (Community Awareness and Emergency Response) and P.M.A.O. (Petro-Chemical Mutual Aid) thereby encouraging joint emergency medical response planning.

I. Certification ProgramsI. Certification Programs

Paramedics: In January 1994, State EMS Authority was legislated responsibility for credentialling paramedics, and in January 1995, paramedic certification became paramedic licensure, and State paramedic recertification written examination procedure was eliminated. In 1996, **86 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

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 1996, credential review was undertaken by the EMS Agency in six cases. In four cases EMT-P's were assigned remediation programs by the EMS Medical Director. The two others were terminated by their employers, one of which was referred to the state EMS Authority for disposition as is now required by state regulations.

J. Training ProgramsJ. 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 did not offer a paramedic program for 1996, but plans to offer a course in 1997.

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, which has provided an MICN program for many years, abandoned its MICN training program in 1992 due to budget constraints and low attendance. Mt. Diablo Medical Center, in cooperation with John Muir Medical Center, held an MICN course in 1995. 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.

- In 1996 over 9,769 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.
- 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. In 1996, **118 calls for CPR training information** were processed by EMS staff.
- Speakers have been provided for a number of community and wellness organizations such as "Mended Hearts" and the Rotary Club.

L. Other ProgramsL. 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 seventh year of publication.

A. Ambulance Dispatch ReportA. Ambulance Dispatch Report

Number of Responses, Response Code, and Response Level by Emergency Ambulance Provider - Year 1996

Response Code and Level	All Providers		American Medical Response West		San Ramon Valley Fire District		Moraga Fire District	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total Dispatches	**46,980**	**100.0**	**44,298**	**100.0**	**2,131**	**100.0**	**551**	**100.0**
Code 3 dispatches	37,580	80.0	35249	79.6	1889	88.6	442	80.2
Code 2 dispatches	9,400	20.0	9049	20.4	242	11.4	109	19.8
Total code 3 dispatches	**37,580**	**100.0**	**35,249**	**100.0**	**1,889**	**100.0**	**442**	**100.0**
ALS response	36,878	98.2	34761	98.6	1684	89.1	433	98.0
Exempt BLS response	205	0.5	0	0.0	205	10.9	0	0.0
Non-Exempt BLS response	497	1.3	488	1.4	0	0.0	9	2.0
Code 2 dispatches	**9,400**	**100.0**	**9,049**	**100.0**	**242**	**100.0**	**109**	**100.0**
ALS response	5,531	58.8	5184	57.3	240	99.2	107	98.2
BLS response	3,869	41.2	3865	42.7	2	0.8	2	1.8

Ambulance Dispatch Report

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

Year 1996

Response Outcome	All Providers		American Medical Response West		San Ramon Valley Fire District		Moraga Fire District	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total Dispatches	**46,980**	**100.0**	**44,298**	**100.0**	**2,131**	**100.0**	**551**	**100.0**
Transported	34,010	72.4	32174	72.6	1448	67.9	388	70.4
Cancelled	12,970	27.6	12124	27.4	683	32.1	163	29.6
Total patient transports	**34,009**	**100.0**	**32,173**	**100.0**	**1,448**	**100.0**	**388**	**100.0**
Transported code 3	2,769	8.1	2553	7.9	188	13.0	28	7.2
Transported code 2	31,030	91.2	29415	91.4	1256	86.7	359	92.5
Helicopter Transport	201	0.7	201	0.7	0	0.0	0	0.0
Transport code not reported	9	0.0	4	0.0	4	0.3	1	0.3
Total Cancelled	**12,970**	**100.0**	**12,124**	**100.0**	**683**	**100.0**	**163**	**100.0**
Enroute	3,554	27.4	3315	27.3	239	35.0	0	0.0
On Scene	9,416	72.6	8809	72.7	444	65.0	163	100.0

San Pablo	2,440	5.2	404	16.6	2036	83.4	5.94	26	1.3
El Cerrito	1,360	2.9	131	9.6	1229	90.4	7.28	20	1.6
El Sobrante	482	1.0	68	14.1	414	85.9	7.88	2	0.5
North Richmond	353	0.8	21	5.9	332	94.1	6.43	4	1.2
Kensington	167	0.4	14	8.4	153	91.6	10.90		0.0
Pinole	1,055	2.2	122	11.6	933	88.4	5.39	14	1.5
Hercules	583	1.2	107	18.4	476	81.6	7.67	6	1.3
Rodeo	406	0.9	84	20.7	322	79.3	8.03	3	0.9
Crockett	196	0.4	42	21.4	154	78.6	10.88	2	1.3
Concord	7,479	15.9	2019	27.0	5460	73.0	6.44	61	1.1
Martinez	2,131	4.5	507	23.8	1624	76.2	7.86	71	4.4
Pleasant Hill	1,455	3.1	344	23.6	1111	76.4	7.10	5	0.5
Pacheco	242	0.5	56	23.1	186	76.9	7.43	2	1.1
Clayton[1]	265	0.6	56	21.1	209	78.9	11.52	1	0.5
Clyde	12	0.0	1	8.3	11	91.7	8.33		0.0
Walnut Creek	4,158	8.9	856	20.6	3302	79.4	6.63	36	1.1
Lafayette	894	1.9	183	20.5	711	79.5	8.08	2	0.3
Orinda	621	1.3	162	26.1	459	73.9	11.06	7	1.5
Moraga	567	1.2	138	24.3	429	75.7	7.97	5	1.2
Alamo	239	0.5	42	17.6	197	82.4	7.06	1	0.5
Danville	918	2.0	95	10.3	823	89.7	5.99		0.0
San Ramon	979	2.1	115	11.7	864	88.3	6.67		0.0
Antioch	4,121	8.8	998	24.2	3123	75.8	6.91	18	0.6
Pittsburg	3,697	7.9	922	24.9	2775	75.1	6.79	7	0.3
Bay Point	1,393	3.0	323	23.2	1070	76.8	9.76	1	0.1
Oakley	872	1.9	194	22.2	678	77.8	8.82	1	0.1
Bethel Island	270	0.6	66	24.4	204	75.6	13.69	1	0.5
Knightsen	13	0.0	1	7.7	12	92.3	8.30		0.0
Brentwood[1]	851	1.8	197	23.1	654	76.9	8.60	3	0.5
Discovery Bay[1]	206	0.4	62	30.1	144	69.9	15.95		0.0
Byron[1]	125	0.3	31	24.8	94	75.2	12.81	2	2.1
Out of County	29	0.1	10	34.5	19	65.5	6.06		0.0
Other/Unknown	155	0.3	26	16.8	129	83.2	9.69	2	1.6
TOTALS	46,980	100.0	9,400	20.0	37,580	80.0	6.92	497.0	1.3

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

Ambulance Dispatch Report

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 1996

Hospital	All Transports		Code Three Transports		Code Two Transports		Transport Code Unknown	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Brookside	5,713	16.8	507	17.7	5206	16.7		0.0
Delta	4,642	13.6	434	15.1	4205	13.5	3	18.8
Doctors	1,876	5.5	143	5.0	1733	5.6		0.0
John Muir	3,868	11.4	620	21.6	3246	10.4	2	12.5
Kaiser - Martinez	2,312	6.8	81	2.8	2230	7.2	1	6.3
Kaiser - Richmond	1,059	3.1	14	0.5	1045	3.4		0.0
Kaiser - Walnut Creek	2,541	7.5	174	6.1	2366	7.6	1	6.3
Merrithew	4,849	14.3	65	2.3	4784	15.4		0.0
Merrithew - RCC	96	0.3	0	0.0	96	0.3		0.0
Mount Diablo	4,416	13.0	466	16.2	3950	12.7		0.0
San Ramon	802	2.4	119	4.1	682	2.2	1	6.3
Valley Care Med. Ctr.	28	0.1	3	0.1	25	0.1		0.0
Alta Bates	613	1.8	30	1.0	583	1.9		0.0
Children's	178	0.5	48	1.7	130	0.4		0.0
Eden	1	0.0	1	0.0	0	0.0		0.0
Highland	20	0.1	8	0.3	12	0.0		0.0

Kaiser - Vallejo	155	0.5	1	0.0	154	0.5		0.0
Kaiser - Oakland	250	0.7	19	0.7	231	0.7		0.0
Summit	70	0.2	2	0.1	68	0.2		0.0
Helicopter Transport	201	0.6	101	3.5	93	0.3	7	43.8
Other/Unknown	319	0.9	34	1.2	284	0.9	1	6.3
	34,009	100.0	2,870.00	100.0	31,123	100.0	16	100.0

B. Helicopter Utilization ReportB. Helicopter Utilization Report

Patients Transported by Helicopter

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

Helicopter Transports by Provider Agency

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

C. Trauma System ReportC. Trauma System Report

On-scene Triage of Patients Meeting Field Trauma Criteria

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

Field Triage Errors -- (errors per 100 patients triaged with major trauma) 1996

Undertriage error rate	=	Patients triaged in the field as not having major trauma, but subsequently found to have major trauma	=	21	=	**2.4**
		Total number of patients triaged in the field as having major trauma		881		
Overtriage error rate	=	Patients triaged in the field as having major trauma, but subsequently found not to have major trauma	=	410	=	**46.5**
		Total number of patients triaged in the field as having major trauma		881		

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
Undertriage	1.3	1.2	2.0	2.4
Overtriage	54.9	55.2	54.1	46.5

D. Early Defibrillation Program Reports

First Responder Defibrillation Activity Report

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

Activity Report by Agency - 1996

Fire Agency	Defibrillator Attached	Patient Shocked	Patient Admitted	Patient Discharged
Total	461	145	35	17
Bethel Island	5	3	0	0
Contra Costa	317	95	23	12
Crockett	0	0	0	0
Dougherty	17	7	2	0
East Diablo	12	2	1	1
El Cerrito	27	13	3	1
Kensington	0	0	0	0
Moraga	1	1	1	1
Oakley	0	0	0	0
Orinda	6	4	1	0
Pinole	3	3	1	1
Richmond	50	11	3	1
Rodeo	11	4	0	0
San Ramon	12	2	0	0

E. Patient Transfer Report

	1992	1993	1994	1995	1996
Total reported transfers	842	1,069	804	831	907
Type of transfers					
trauma	12	12	33 (4%)	17 (2%)	18 (2%)
medical	377	407	332 (41%)	358 (43%)	398 (44%)
non-medical	453	650	439 (55%)	450 (54%)	489 (54%)
not identified				3 (< 1%)	2 (< 1%)
Insurance identified					
CCHP	107	93	56	70	84
Medicare	27	41	24	30	21
MediCal	157	250	158	181	165
Private	50	42	66	93	96
Kaiser	156	190	135	137	170
No insurance	310	447	347	172	174
Other/not Identified	35	6	18	148	196
Mode of transport					
EMT ambulance	663	911	630	662	652
EMT ambulance w/RN	23	6	23	35	117
EMT ambulance w/MD	6	9	9	4	6
EMT-P ambulance	15	13	25	20	21
EMT-P ambulance w/RN	10	17	22	11	15
Helicopter/plane	4	1	1	1	3
Pvt. auto/taxi	112	109	83	72	78
Other/not Identified	9	3	11	16	12
Transferring facility					
Brookside	175	296	151	143	197
Delta Memorial	175	206	250	334	335
Doctors	30	32	42	41	50
John Muir	27	21	31	26	11
Kaiser Martinez	23	33	35	37	17
Kaiser Richmond	61	74	78	65	126
Kaiser Walnut Creek	18	11	13	8	10
**Los Medanos	219	231	59	**	**
Merrithew	5	7	10	5	6
Mt. Diablo	100	135	107	144	127
San Ramon	15	15	17	22	20
Other	6	18	11	6	8
Receiving facility					
Merrithew	587	778	523	552	596
Other/not indicated	243	279	281	262	298

**Los Medanos closed 3/94.

F. Emergency Department Diversion Report

Emergency Department Diversion (By-Pass)

	1992	1993	1994	1995	1996
Contra Costa, Merrithew					50
# of events	37	40	44	62	115.5 hrs
Total time	104.3 hrs	95.3 hrs	79.1 hrs	155.2 hrs	2.3 hrs
Avg time/event	2.8 hrs	2.4 hrs	1.8 hrs	2.5 hrs	
Doctors, Pinole					
# of events	0	1	1	0	0
Total time	0 hrs	0.8 hrs	9.5 hrs	0 hrs	0 hrs
Avg time/event	0 hrs	0.8 hrs	9.5 hrs	0 hrs	0 hrs
Doctor's, San Pablo					
# of events	74	39	55	35	16
Total time	164.7 hrs	59.5 hrs	103.0 hrs	49.8 hrs	24.7 hrs
Avg time/event	2.2 hrs	1.5 hrs	1.9 hrs	1.4 hrs	1.5 hrs
John Muir					
# of events	0	1	0	0	0
Total time	0 hrs	0.3 hrs	0 hrs	0 hrs	0 hrs
Avg time/event	0 hrs	0.3 hrs	0 hrs	0 hrs	0 hrs
Kaiser, Martinez					
# of events	1	0	0	0	1
Total time	3.8 hrs	0 hrs	0 hrs	0 hrs	13 hrs
Avg time/event	3.8 hrs	0 hrs	0 hrs	0 hrs	13 hrs
Kaiser, Richmond					
# of events	0	3	0	2	0
Total time	0 hrs	7.9 hrs	0 hrs	26.0 hrs	0 hrs
Avg time/event	0 hrs	2.6 hrs	0 hrs	13.0 hrs	0 hrs
Kaiser, Walnut Creek					
# of events	0	0	0	0	0
Total time	0 hrs	0 hrs	0 hrs	0 hrs	0 hrs
Avg time/event	0 hrs	0 hrs	0 hrs	0 hrs	0 hrs
Los Medanos					
# of events	12	7	2		
Total time	23.9 hrs	14.8 hrs	1.8 hrs	Los Medanos Hospital closed in 1994.	
Avg time/event	2.0 hrs	2.1 hrs	0.9 hrs		
Mt Diablo					
# of events	2	3	8	20	19
Total time	6.1 hrs	8.3 hrs	12.9 hrs	34.6 hrs	46.2 hrs
Avg time/event	3.0 hrs	2.8 hrs	1.6 hrs	1.7 hrs	2.4 hrs
San Ramon					
# of events	0	0	0	0	1
Total time	0 hrs	0 hrs	0 hrs	0 hrs	1.1 hrs
Avg time/event	0 hrs	0 hrs	0 hrs	0 hrs	1.1 hrs
Sutter Delta					
# of events	2	17	5	2	6
Total time	1.2	35.3 hrs	6.2 hrs	2.0 hrs	5.5 hrs
Avg time/event	0.6 hrs	2.1 hrs	1.2 hrs	1.0 hrs	0.9 hrs

Source: Contra Costa County Emergency Medical Services

G. Base Hospital Contact Report[10]

Base Hospital Activity Summary[10]

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

Source: Contra Costa County Emergency Medical Services from data supplied by Base Hospitals.

Contacts by Base Hospital 1996

	System Totals	John Muir Base	Mt. Diablo Base
Total Base Contacts	13,646	8,368	5,278
ALS Care Provided	10,407	5,757	4,997
No ALS Provided	3,239	2,611	281
EMT-P Contacts	13,057	7,859	5,198
EMT-I Contacts	163	116	47
EMT Not Identified	1	1	0
Adult Patients	12,857	7,880	4,977
Pediatric Patients (age < or = 14)	525	304	221
Patient Age Not	231	184	47

Identified				

Source: Contra Costa County Emergency Medical Services from data supplied by Base Hospitals.

VI. EMS Agency Organizational ChartVI. EMS Agency Organizational Chart

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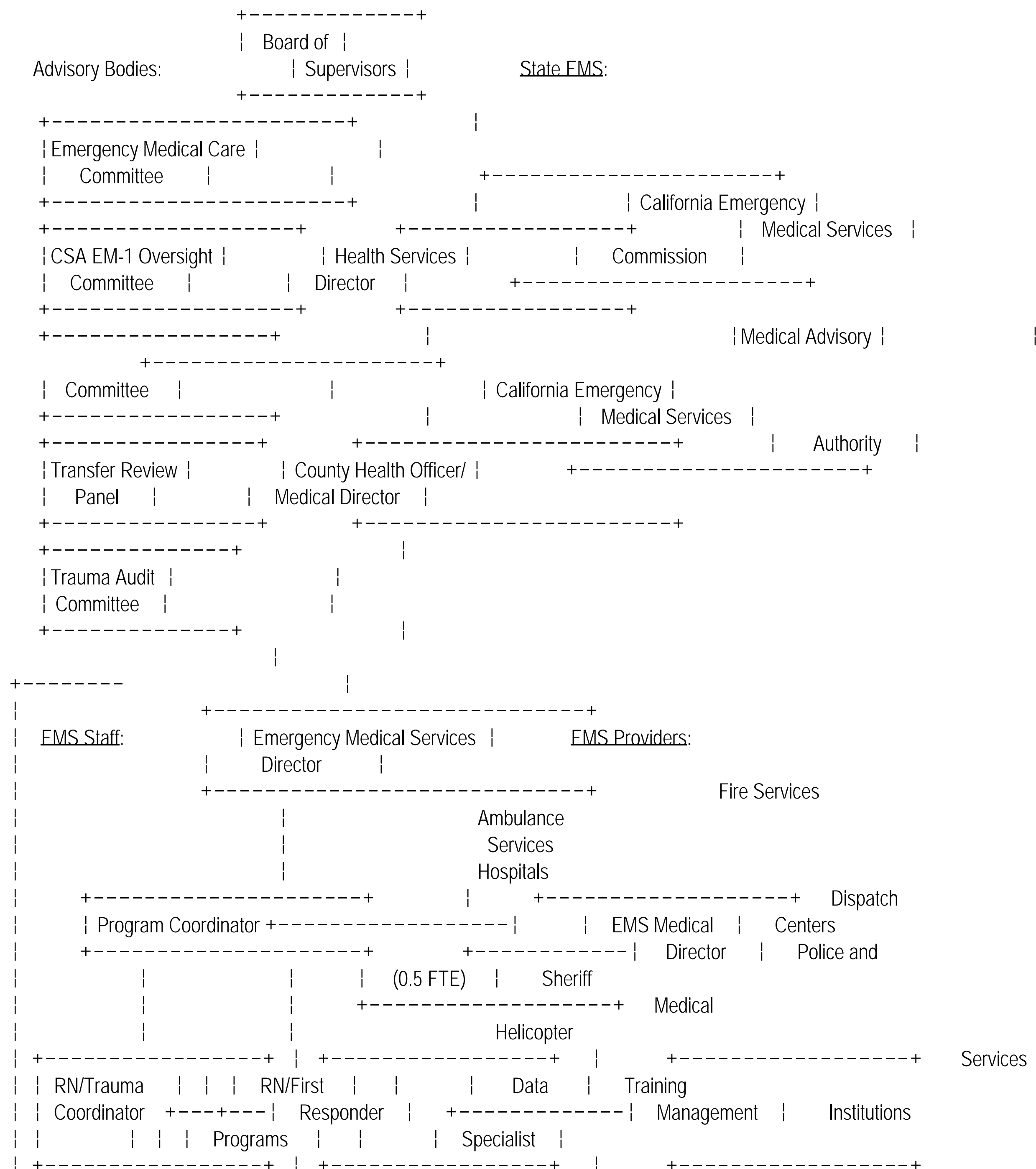

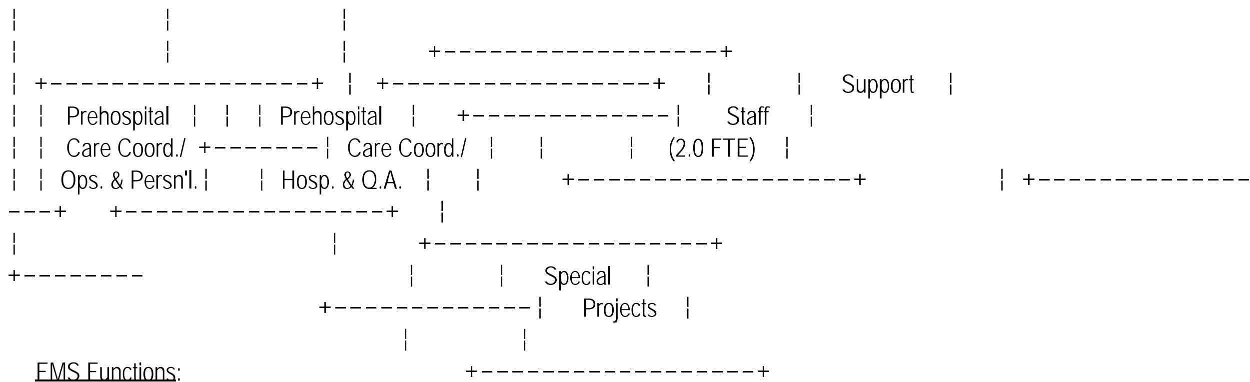

EMS Functions:

- Provide overall coordination of County EMS System.
- Regulate emergency ambulance services.
- Regulate County Trauma System.
- Establish prehospital treatment protocols.
- Approve and monitor paramedic programs.
- Approve and monitor first responder defibrillation programs.

- Provide medical disaster planning and coordinate medical disaster response.
- 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

FY 1993-94 through 1996-97

A. Basic Emergency Medical Services (Budget Unit #6543

Category	FY 1993-94	FY 1994-95	FY 1995-96	FY 1996-97 (estimated)
Salaries & benefits	$ 394,862	$ 413,827	$ 428,867	$ 434,637
Services & supplies	150,885	150,916	188,702	131,640
Total	$ 545,747	$ 564,743	$ 617,569	566,277

B. Measure H Enhancements County Service Area EM-1

Category	FY 1993-94	FY 1994-95	FY 1995-96	FY 1996-97 (estimated)
Direct costs:				
Salaries & benefits	$ 193,132	$ 199,984	$ 183,311	$ 179,147
Services & supplies	3,534,011	3,580,773	4,519,495	3,907,547
Paramedic ambulance services (AMR contract)	2,293,852	2,502,384	2,502,384	2,502,384
Paramedic ambulance services (Moraga Fire contract)	58,558	117,116	58,558	58,558
Base hospital services	100,000	100,000	100,000	100,000
First responder services - fire service reimbursements	414,969	76,503	830,714	300,000
First responder services - defibrillation program	7,055	35,332	133,029	92,000
First responder services - Bethel Island paramedic program	--	--	--	92,348
First responder services - East Diablo paramedic program (AMR contract)	209,150	229,841	233,480	243,245
Sheriff's dispatch	168,012	168,012	168,012	168,012
Other EMS dispatch and communications	85,216	55,933	38,031	50,000
Poison control center services	20,456	20,361	107,965	--
Hazmat program	--	150,000	150,000	150,000
Other services & supplies	176,743	125,291	197,322	150,000
Total direct costs	3,727,143	3,780,757	4,702,806	4,086,694
Administration/collection	333,566	262,687	403,675	381,475
Contribution to reserves	--	180,637	131,573	--

Total	$ 4,060,709	$ 4,224,081	$ 5,238,054	$ 4,468,169

VIII. Glossary of EMS TermsVIII. 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

EMS System Plan, 1995
Trauma System Plan, 1986
Patient Transfer Guidelines, 1987
Prehospital Care Manual, 7/96
Multicasualty Incident (MCI) Plan, 1/92
County Service Area EM-I Proposal and Service Plan
Emergency Medical Guidelines for Law Enforcement Agencies, 1992
Request for Proposal for Trauma Center Designation, 1992
Request for Proposal for Emergency Ambulance Services, 1990
Multicasualty Cache Supplies and Locations
Expanded Medical Emergency Response Procedure
Message Transmission Network Specifications
EMS Policies:

1 - EMT-1 Certification
2 - Paramedic Accreditation
3 - MICN Authorization and Re-Authorization
4 - Contra Costa County Fee Structure for EMT-1, Paramedic, and MICN
5 - Prehospital Credential Review Process Guidelines
6 - Prehospital Continuing Education Provider
7 - County Paramedic Evaluator
8 - Paramedic Student Preceptor Program
9 - Patient Destination & Transport Code Determination
10 - Patient Refusal of Emergency Medical Care and/or Ambulance Transport
11 - Paramedic Base Hospital Communications on ALS Calls
12 - Immediate Medical Control & Direction of Paramedics
13 - Trauma Patients
14 - Transfer of Critical or Possibly Critical Trauma Patients to Trauma Center
15 - Guidelines for Interfacility Transfers via Ambulance
16 - Transfer of Care in the Field
17 - First Responder Paramedic Programs
18 - First Responder Defibrillation
19 - Determination of Death in the Prehospital Setting
20 - Do Not Resuscitate (DNR) Orders in the Prehospital Setting
21 - Physician on Scene
22 - Communicable Disease Exposure
23 - Reporting Abuse of Children or Elder/Dependent Adults
24 - Emergency Department Diversion
25 - Procedures for Controlled Substances
26 - Pulse Oximetry