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I. Introduction

A. Overview of EMS

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

- **Public safety dispatch centers**
- **Fire services**
- **Ground and air ambulance services**
- **Law enforcement agencies**
- **Hospitals and specialty care centers**
- **Training institutions and organizations**
- **Citizen and medical advisory groups**
- **Local and State EMS Agencies**
- **Other governmental and voluntary organizations**

In California, EMS systems are organized on a county or regional basis. Local EMS Agencies designated by county boards of supervisors are responsible for local EMS planning and coordination consistent with State law and regulations. Local EMS Agencies (LEMSA's) are the lead agencies coordinating EMS services at the county or regional level. The State Health Services **Emergency Medical Services Authority (EMSA)** is the lead EMS agency. The State EMSA approves local EMS system plans, provides guidance to local EMS agencies, develops EMS regulations, administers the Regional Poison Control Center program, and carries out other EMS activities. The **State EMS Commission**, with members appointed by the Governor and certain other State officials, is advisory to the EMSA and reviews and approves all EMS regulations.

In Contra Costa County, the Board of Supervisors has designated County Health Services as the **Local EMS Agency.** The EMS functions of Health Services are carried out by the EMS Director, EMS Medical Director, and staff. The EMS Medical Director has statutory responsibilities to oversee medical aspects of the

EMS program. An **Emergency Medical Care Committee** (EMCC) provides advice regarding EMS matters to the Board of Supervisors, to Health Services and to its EMS Agency.

B. Local EMS Agency Functions.

The **principal functions of a local EMS agency** as specified in the Health & Safety Code include:

- ➢ Planning, implementing, and evaluating emergency medical services.
- ➢ Monitoring and approving EMT-I, paramedic, and Mobile Intensive Care Nurse (MICN) training programs.
- ➢ Conducting credentialling programs for EMT-I's, paramedics and MICN's.
- ➢ Authorizing advanced life support (ALS) programs.
- ➢ Establishing policies and procedures for medical control of the EMS system, including dispatch, patient destination, patient care, and quality assurance.
- ➢ Establishing ordinances and/or exclusive operating areas for the regulation of ambulance services.
- ➢ Approving and monitoring Prehospital Continuing Education Providers.
- ➢ 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).
- ➢ Tracking and monitoring hospital emergency and critical care capacity.

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

- ➢ Planning and coordinating disaster medical response at local and regional levels.

To accomplish these functions, the EMS Agency employees a staff of 10, including the EMS director, part-time EMS medical director, program coordinator, Health Services disaster preparedness manager, two prehospital care coordinators, trauma coordinator, training coordinator, and two clerks.

C. Emergency Medical Care Committee.

Each county may, under the Health & Safety Code, establish an Emergency Medical Care Committee (EMCC) with membership prescribed and appointed by

the county board of supervisors. The EMCC acts as an advisory body to its board of supervisors and local EMS agency on all matters relating to EMS. In 1998, the Contra Costa EMCC consisted of representatives of the following groups/organizations as well as **five consumer representatives.**

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

The EMCC meets quarterly and all meetings of the EMCC and its subcommittees are open to the public. During **1998**, the primary emphasis of the EMCC was directed towards completion of a new EMS System Plan and EMCC reorganization.

D. Delivery of EMS Services.

EMS services are typically provided in response to a medical emergency reported

through the **9-1-1 emergency telephone system**. A 9-1-1 call placed from any telephone is automatically routed to the appropriate designated **Public Safety Answering Point (PSAP)**. A dispatcher or complaint operator at the PSAP determines the nature of the emergency and, if the PSAP is part of a fire/medical dispatch center, obtains information necessary to dispatch the appropriate response units. If the PSAP is not part of a fire/medical dispatch center, the call may be transferred to a "secondary PSAP" where a dispatcher then obtains information necessary to dispatch fire and medical units.

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

A private company, American Medical Response under contract with the County, provides emergency ambulance services in most parts of the County. In the San Ramon Valley and Moraga-Orinda areas, emergency ambulance service is provided by the fire service. Depending upon the nature of the incident, an ambulance may be dispatched Code 3 (red lights and siren) or Code 2 (immediate response, but following normal traffic regulations). Ambulances may be staffed with either paramedic-trained or EMT-I-trained personnel. **Advanced life support (ALS) ambulance units** are staffed with paramedics and are always dispatched to potentially life threatening incidents. Paramedics are able to administer lifesaving drugs and perform other 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 include, in the case of paramedics, making contact with a **mobile intensive care nurse (MICN) or physician at a designated base hospital** for medical direction in patient management according to County EMS treatment guidelines. 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. Two medical helicopter services, CALSTAR and REACH, are authorized to respond to local EMS calls on a daily

rotation schedule. Both agencies provide advanced life support services and maintain 24-hour helicopter unit availability based at Buchanan Field in Concord. Other helicopter services are available to respond from neighboring counties if both CALSTAR and REACH are unavailable.

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

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

F. Development of EMS in Contra Costa County.

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

1968 ➢ **Emergency Medical Care Committee (EMCC)** appointed by County Board of Supervisors to provide oversight of emergency medical services within the county.

1970 ➢ State **Wedworth-Townsend Act** enabled counties to conduct pilot projects using **paramedics** and **mobile intensive care nurses (MICN's)** to provide **advanced life support services** to patients in the field.

➢ **Ambulance Regulations** added to the County Ordinance Code which included permit and ambulance registration processes.

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

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

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

1977 ➢ **First paramedics and MICN's graduated** from Los Medanos Community College training programs and were certified by County Health Officer.

➢ John Muir Medical Center and Mt. Diablo Medical Center designated **Base Hospitals** for medical control of paramedic units throughout the county. (Initial base hospital services were provided on a monthly rotation schedule.)

➢ **Joint Exercise of Powers Agreement** between Alameda and Contra Costa Counties established an East Bay EMS Region for the development of a Regional EMS program.

➢ First **paramedic-staffed ambulances** responded in Walnut Creek (Pomeroy Ambulance in May 1977); in Moraga (Moraga Fire Protection District in June 1977); in Concord (Michael's Ambulance in January 1978); and in Richmond (Cadillac Ambulance February 1978 - Labor issues delayed active participation in program until 1979).

1980 ➢ Joint Powers Agreement for Regional emergency medical services disbanded following the recommendations of EMCC's from Alameda and Contra Costa Counties.

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

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

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

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

1983 ➢ Health Services Department designated as **Local EMS Agency** and County Health Officer designated as **EMS Medical Director** by Board of Supervisors pursuant to State EMS Act.

➢ **Competitive bid process for emergency ambulance service contracts** established pursuant to a revised County Ambulance Ordinance. A **Request for Proposal** process that sought the highest level of service possible without County subsidy resulted in exclusive contracts with Cadillac Ambulance, Regional Ambulance, Moraga Fire District, San Ramon Valley Fire District, and East County Ambulance.

1984 ➢ Paramedic level ambulance transport services implemented by **San Ramon Valley Fire District** in a joint program with John Muir Medical Center.

➢ Ten ambulance zones consolidated into **5 Emergency Response Areas (ERA's)**. Exclusive ambulance service contracts were awarded to Cadillac Ambulance, Regional Ambulance, Moraga Fire and San Ramon Valley Fire following competitive bid process.

1985 ➢ **EMS System Plan** developed according to standards set by EMS Authority.

➢ First formal **RFP process for paramedic base hospital designation** developed and administered for 4 base hospital zones countywide.

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

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

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

1986 ➢ Comprehensive **Trauma System Plan** approved by Board of Supervisors providing for the designation of a single Level II Trauma Center. Trauma system **treatment and triage protocols** adopted. Ambulance personnel and first responders trained in specialized

critical trauma patient management.

- ➢ John Muir Medical Center designated as County's **Level II Trauma Center**.
- ➢ **Bay Area Trauma Registry Project** initially funded by State EMSA to develop a trauma data registry.
- ➢ Operational Procedures for **Patient Transport by Helicopter** implemented.
- ➢ Cadillac Ambulance purchased by Regional Medical Systems making RMS the single private emergency ambulance provider in county.
- ➢ **Competitive bidding process held for emergency ambulance service providers** in 5 ERA's. Ambulance service contracts awarded to Regional Ambulance, Moraga Fire and San Ramon Valley Fire.
- ➢ **Base Hospital** contracts established with John Muir Medical Center, 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 available to fire, police and ambulance agencies countywide.
- ➢ Brookside Hospital restored to **basic emergency licensure** status.

1988

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

1989 ➢ Countywide **Benefit Assessment District for Enhanced Emergency Medical Services, County Service Area EM-1,** approved by all city councils and established by Board of Supervisors under administration of Health Services.

1990 ➢ **County Service Area EM-1** became operational.

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

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

1991 ➢ **High-performance ambulance contracts** initiated with Regional Ambulance, San Ramon Valley Fire, and Moraga Fire. Standards set for required paramedic-staffed ambulance response to emergency calls at a 95% 10 minute maximum response for urban areas of county. Number of paramedic staffed ambulances increased from 12 to 19 to meet this standard with ambulance service subsidies funded by Measure H.

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

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

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

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

1992 ➢ **Fire First Responder Defibrillation Program** implemented countywide.

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

➢ "EMS **Operational Procedures For Response to an Expanded Medical Emergency**" (EME) developed and implemented.

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

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

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

➢ John Muir Trauma Center permanently (20 years) designated as **Level II trauma center** following request-for-proposal review process.

➢ **In Fire Service EMS Models Assessment** completed.

➢ **Base Hospital contracts** renegotiated with Mt. Diablo, John Muir and Los Medanos hospitals.

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

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

1993 ➢ **Base hospital** services no longer provided by Los Medanos Hospital.

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

➢ **Poison control public hotline discontinued** by San Francisco Poison Control Center 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 EMS incident review.

➢ **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 EMT-I's to maintain State certification.

➢ Los Medanos Community **Hospital closed** 4/23/94.

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

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 (Region II).
- ➢ **EMT-I training program for firefighters** established by EMS Agency.
- ➢ State EMSA grant to study **poison control center alternatives** obtained by EMS Agency.
- ➢ **Emergency Medical Care Committee** restructured to report to Health Services Director.

1995

- ➢ Kaiser Richmond, merged with Kaiser Oakland. Richmond facility received only non-critical ambulance patients due to lack of ICU capabilities.
- ➢ Paramedic certification changed to State **licensure**.
- ➢ Revised **EMS System Plan** approved by EMCC and Board of Supervisors.
- ➢ EMS Agency gained part-time **Assistant EMS Medical Director**.
- ➢ San Ramon Valley Fire Protection District successfully completed pilot **computerized medical dispatch program**.
- ➢ **1-800-GIVE-CPR** listed in county phone books and staffed by EMS Agency.
- ➢ **Basic Life Support standards** added to the EMS Prehospital Care Manual.

1996

- ➢ Asst. EMS Medical Director position converted to EMS Medical Director.
- ➢ Standards for EMS **Enhanced First Responder Programs** developed.
- ➢ **Request for Proposal** process provided for emergency ambulance service in 4 of 5 county emergency response areas. Contracts awarded to San Ramon Fire and American Medical Response. Moraga Fire exempt from competitive bid process.
- ➢ Bethel Island Fire's **First Responder Paramedic** program implemented.
- ➢ Major EMS System evaluation performed by **Emergency Medical Care Committee**.

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

➢ **Infrequent skills and intubation continuing education (CE) modules** developed for paramedics.

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

1997 ➢ **Bay Area Disaster Medical Assistance Team (DMAT)** sponsored by County Health Services

➢ Contra Costa Fire Protection District's **First Responder Paramedic Program** implemented. **"Partners" course** used to train EMT-I's to assist paramedics.

➢ Concerns about hospital closures and downsizing raised by Board of Supervisors. Freeze on hospitals cutting **emergency and critical care resources** was requested. Position taken **against "standby emergency"** designation in urban areas.

➢ **Multicasualty response** by ambulances, public safety, hospitals, EMS and others to provide coordination/care for victims of **Concord Water World slide collapse.** One death and 32 injured were triaged to area hospitals.

➢ **Regional Disaster Medical Health Coordinator** provided public health nurse mutual aid during 1996-97 winter storms in northern California.

➢ **Computerized pen-based patient care reporting** implemented countywide.

➢ The **Emergency Medical Care Committee** appointed as Board advisory by County Board of Supervisors.

➢ Statewide **Poison Control Center** system implemented.

➢ John Muir Medical Center and Mt. Diablo Medical Center merged to form **John Muir/Mt. Diablo Health System**.

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

➢ **Kaiser, Richmond** and **Kaiser, Martinez** downgraded services provided. No longer designated ambulance receiving facilities.

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

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

its ambulance services together under the AMR name.

➢ **Interfacility Transfer Review process** revised.

1998 ➢ Board of Supervisors declared a local emergency with respect to **emergency and critical care resources.**

➢ Health Services opened its new hospital, **Contra Costa Regional Medical Center**.

➢ First load of **spent nuclear fuel rods** transported through the county by train.

➢ **Antioch Ambulance Servic**e purchased by Golden Empire Ambulance.

➢ American Medical Response accepts subsidy reduction to fund expansion of Contra Costa Fire First Responder Paramedic Program scheduled for early 1999

1999 ➢ **Kaiser, Richmond** upgraded services to "stand-by" emergency services as part of a plan to become a full-service hospital over the next year. Became an ambulance receiving facility for certain categories of ambulance patients.

➢ **Oakley Fire** became a separate fire protection district.

➢ **Multicasualty response** provided to coordinate/care for victims of a **fire at Tosco's Avon Refinery**

➢ **Multicasualty response** provided to coordinate/care for victims of a **fire at Chevron Refinery in North Richmond**.

II. List of Major Accomplishments – 1998

- **Emergency Medical Care Committee** restructure to Board of Supervisors appointed committee completed.
- **West County Consolidated Communications Operations** and **Contra Costa Fire District Dispatch Center** personnel trained in Medical Priority **Emergency Medical Dispatch** (EMD)
- **Defibrillation equipment** upgraded and **first responders** trained to new equipment.
- **Eleven patients** receiving first responder defibrillation discharged as hospital "saves".
- **Multicasualty Incident (MCI) Plan** revised**.**
- State grant obtained for **Data Linkage and Outcome Project**.
- **Resource Information Management System** (RIMS) installed to provide linkage of Region II counties to the Statewide disaster information management system.
- **Hospital resource assessment** completed.
- Bay Area **Disaster Medical Assistance Team** (DMAT) Level II designation attained. Physician Commander identified and a membership of 100 volunteers.
- Three **disaster preparedness fairs** held throughout the county.
- The new department-wide **Contra Costa Health Services Emergency Plan** completed.
- **925** of 2920 patients with possible **major traumatic injuries** met trauma criteria and were **transported to trauma centers** including **814 to John Muir Trauma Center** and **99 to Children's Hospital, Oakland.**
- **Disaster preparedness exercises** (functional, tabletop and communications drills) conducted.
- Total of **53,490 emergency ambulance responses** dispatched. **41,697 of the 42,199 ambulances** dispatched **Code 3** "lights and siren" were **paramedic staffed units.**

- Total of **38,510 patient**s transported by ambulance. **3,318 patients** were transported **Code 3 "lights and siren". 543 patients** were transported by **helicopter.**
- **361 EMT-I's. 112 paramedics and 23 MICN's credentialed.**
- **24th** annual **EMS Awareness Week** recognized.

III. EMS System Participants

A. Advisory Committees

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

EMCC Standing Committees: A comprehensive standing committee structure supports the EMCC. Standing committees periodically evaluate and make recommendations to the EMCC with respect to EMS related activities. EMCC standing committees include:

- **Staffing/Training**: This committee evaluates/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**: This committee evaluates/makes recommendations to the EMCC with respect to local EMS communications system availability among prehospital and hospital personnel for medical control and resource management, and EMS system accessibility by the public.
- **Response/Transportation**: This committee evaluates/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**: This committee evaluates/makes recommendations to the EMCC with respect to the appropriate number and level of local health facilities to receive and treat emergency patients, and system used to get patients to the most appropriate facility.
- **Public Information & Education - PIE**: This committee evaluates/makes recommendations to the EMCC with respect to EMS public education and information regarding the local EMS system, system accessibility and system use, as well as availability of first aid and CPR training.

- **Disaster Medical Response**: This committee evaluates/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**: This committee evaluates/makes recommendations to the EMCC regarding adequacy of local EMS operational and clinical data collection systems to assure information necessary to provide day-to-day quality improvement audits and overall evaluations of system operations is available.

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

Pre-Trauma Audit/Trauma Audit Committees (Pre-TAC/TAC): These committees evaluate trauma system care and monitor compliance to the trauma system standards established in the County Trauma System Plan. Both Pre-TAC and TAC are held jointly with Alameda County and provide monitoring for two separate trauma systems. County EMS Medical Directors appoint members of these confidential quality improvement committees. 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 county EMS Medical Directors, 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 offices, and EMS agency staff. Cases referred from Pre-TAC are reviewed along with cases identified as having teaching value. This committee presents observations and makes recommendations to respective EMS agencies regarding identified trauma system or trauma center issues.

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

participate. The **Multicasualty Incident Plan was revised in 1998**.

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 fire first-responder agency.

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

B. PSAP's and Dispatch Centers

Public Safety Answering Points:

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

Fire/Medical Dispatch Centers:

- Contra Costa County Fire Dispatch
- West County Consolidated Communications Operations
- San Ramon Valley Fire Dispatch
- Sheriff's Dispatch
- West Bay Dispatch (Pinole Police)

Ambulance Dispatch Centers:

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

C. First Responders

County Fire Protection Districts:

- Bethel Island Fire Protection District (10 units)
- Contra Costa County Fire Protection District (92 units)
- Crockett-Carquinez Fire Protection District (3 units)
- East Diablo Fire Protection District (14 units)
- Oakley Fire Protection District (7 units)
- Pinole Fire Protection District (Covered by Pinole Fire Department)

Municipal Fire Departments:

- El Cerrito Fire Department (6 units)
- Pinole Fire Department (5 units)
- Richmond Fire Department (20 units)

Independent Fire Protection Districts:

- San Ramon Valley Fire Protection District (38 units)
- Rodeo-Hercules Fire Protection District (9 units)
- Moraga-Orinda Fire Protection District (17 units)

Other First Responders:

- East Bay Regional Parks
- Private & military fire services

Special Paramedic First Responder Programs:

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

- Contra Costa Fire - Paramedic Engines and Medic Units
- San Ramon Valley Fire – Paramedic Engine

D. Emergency Ambulance Providers

- American Medical Response (15 – 25 ambulances)
- San Ramon Valley Fire (5 ambulances)
- Moraga-Orinda Fire (2 ambulances)

E. EMS Helicopters

Air Ambulances:

- CALSTAR (1) Buchanan Field; (other helicopters in Gilroy and Roseville).
- REACH (1) Buchanan Field; (another helicopter in Vacaville.
- Helicopter services available in surrounding counties include Stanford Life Flight, Palo Alto; Davis Life Flight, Sacramento; Medi-Flight, 2 helicopters, Modesto; Air Med Team, Stanislaus County

Rescue Aircraft:

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

F. Hospitals

Receiving Hospitals:

- Contra Costa Regional Medical Center, Martinez (formerly Merrithew Memorial Hospital)
- Doctors' Hospital, San Pablo Campus (formerly Brookside Hospital)
- Doctor's Hospital, Pinole Campus
- John Muir Medical Center, Walnut Creek
- Kaiser Medical Center, Walnut Creek
- Mt. Diablo Hospital Medical Center, Concord
- San Ramon Regional Medical Center
- Sutter Delta Medical Center, Antioch
- Kaiser Medical Center, Richmond (1999)

Base Hospitals:

- John Muir Medical Center
- Mt. Diablo Medical Center

Trauma Center:

- John Muir Medical Center

Burn Center:

- Doctor's Hospital, San Pablo Campus

IV. EMS Program Activities

A. Emergency Ambulance Services

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

American Medical Response	All of west, east county and north/central county. Includes cities of Richmond, San Pablo, El Cerrito, Hercules, Pinole, Pittsburg, Antioch, Brentwood, Martinez, Pleasant Hill, Lafayette, Walnut Creek, Concord, and Clayton.	**15 – 25 ALS/BLS ambulances**
Moraga-Orinda Fire	Area of Moraga-Orinda Fire Protection District including town of Moraga and city of Orinda.	**2 ALS ambulances**
San Ramon Valley Fire	Area of San Ramon Valley Fire Protection District including cities of Danville and San Ramon.	**5 ALS ambulances**

Contracts with all three providers 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 **1998**, the county **ambulance staffing standard was met on 41,697 (98.8%) of 42,199 Code 3 ambulance responses.** Paramedics respond to emergency medical requests, while BLS ambulance units remain available to respond to non-life threatening calls and to provide backup during multicasualty incidents or during rare occasions when all ALS units are on calls.

During 1998, the EMS system received 53,490 requests for emergency ambulance response. Of these, 42,199 (78.9%) were considered to involve potentially life threatening situations to which a Code 3 (red lights and siren) ambulance response was necessary. The remaining 11,291 (21.1%) ambulance responses were dispatched Code 2 (immediate response without lights and siren). Of the total responses, 50,007 (93.5%) were handled by American Medical Response, 2,368 (4.4%) by San Ramon Valley Fire Protection District ambulance, and 1,115 (2.1%) by Moraga-Orinda Fire Protection District ambulance. **Average Code 3 ambulance response time** countywide was **7.22 minutes**.

Not all ambulance responses result in patient transport. Of the **53,490 emergency ambulance responses** during the year, 38,510 **(72.0%)** resulted in **patient transport** to an emergency receiving hospital. Ambulances responding to the remaining **14,980 (28.0%**) 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

	1994		1995		1996		1997		1998	
All EMS Ambulance Dispatches	**44,473**	**100.0%**	**46,969**	**100.0%**	**46,980**	**100.0%**	**52,143**	**100.0%**	**53,490**	**100.0%**
Code 3 (lights & siren)	36,172	81.3%	37,428	79.7%	37,580	80.0%	41,849	80.3%	42,199	78.9%
Code 2	8,301	18.7%	9,541	20.3%	9,400	20.0%	10,294	19.7%	11,291	21.1%
American Medical Response	41,329	92.9%	44,285	94.3%	44,298	94.3%	48,311	92.7%	50,007	93.5%
San Ramon Fire	2,613	5.9%	2,139	4.6%	2,131	4.5%	3,209	6.2%	2,368	4.4%
Moraga-Orinda Fire	531	1.2%	545	1.2%	551	1.2%	623	1.1%	1,115	2.1%
Transport	31,332	70.5%	33,056	70.4%	34,010	72.4%	36,877	70.7%	38,510	72.0%
No Transport (Dry Run)	13,141	29.5%	13,913	29.6%	12,970	27.6%	15,266	29.3%	14,980	28.0%
Average Code 3 Response Time	6.87 minutes		7.01 minutes		6.92 minutes		6.98 minutes		7.22 minutes	
Code 3 Responses Not Meeting Ambulance Staffing Standard	201	0.5%	561	1.5%	497	1.3%	447	1.1%	499	1.2%

NOTE: Orinda Fire and Moraga Fire combined into the Moraga-Orinda Fire Protection District in 1997. Prior to that time, calls in Orinda were handled by American Medical Response.

B. Base Hospital and Paramedic Service Programs

Base Hospital Services: Mt. Diablo Medical Center and John Muir Medical Center provide direct (on-line) and indirect (retrospective review) **medical oversight** services for ambulances countywide. Total base hospital contacts by field personnel in 1998 totaled 7270, a sharp decrease from the previous year. This was due to changes made in base hospital call-in criteria. The two base hospitals offered twelve field care audits as continuing education opportunities for prehospital personnel.

Treatment Protocols: EMS Field Treatment Guidelines are used by first responders, paramedics, EMT-I's, MICN's, and base hospital physicians to provide care to patients in the field. These guidelines are reviewed and endorsed by the **Medical Advisory Committee** based on current research and medical need in the county and are adopted by the **EMS Medical Director**. Field treatment protocols are reviewed and revised on

an ongoing basis. Changes made in 1998 resulted in a decrease in requirements for base contact that has led to less need for online base hospital consultation.

C. First Responder Services

A responding fire unit usually arrives at the emergency scene a few minutes ahead of the ambulance, as there are many more fire stations than ambulance stations throughout the County. For this reason, individuals on the fire response unit are known as the **fire first responders**. These first responders are trained and equipped to provide medical aid to patients until the ambulance arrives.

All fire fighters are trained in first aid, CPR and defibrillation. Most are trained and certified as Emergency Medical Technician-I's. In situations involving patient problems such as obstructed airway, severe bleeding, or cardiac arrest, fire fighters arriving early on the scene may be able to initiate lifesaving measures and achieve some **stabilization of the patient before an ambulance arrives**. Some fire agencies provide paramedic first responder services for which cases advanced life support services can be initiated prior to the arrival of the ambulance. 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 made possible through the passage of Measure H in 1989 was the establishment of a fire services **first responder defibrillation program**. 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. Basic life support 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 a rhythm requiring a shock. A defibrillator is available, at a minimum, on each first out fire apparatus. Approximately 4 (four) hours of training is necessary to prepare firefighters to use the defibrillator. The program became available countywide in 1992.

Twenty-four more patients were assessed by the semi-automated defibrillator in 1998, an increase of 6.2% over 1997. However, the number of overall patients assessed has been lower in both 1998 and 1997 as compared to prior years. There are likely multiple reasons for the down trend, including more liberal use of “Do-Not-Resuscitate” orders, better preventative care, and increased use of first-responder paramedics, who provide advanced life support care.

The percentage of patients who were able to be shocked by the semi-automated defibrillator increased by 10% in 1998 compared to the past four years (39.9% in 1998, an average of 29.3% in the prior four years). In part, this

may be attributed to countywide education done early in 1998 about the importance of decreasing the time interval from initial notification of the firefighters to delivery of the shock. The sooner a patient is treated, the higher the chance that the heart can be defibrillated.

The total number of patients defibrillated in 1998 increased by 26.9% compared to the past four years. However, the number of witnessed arrests (when the patient is either seen or heard at the time of the cardiac arrest) was significantly lower in 1998 than prior years (44.5% of those with shockable rhythm compared to an average of 66.9% in the prior four years). Unwitnessed cardiac arrests have a miniscule chance of survival, and unfortunately more of these occurred in 1998 than in past years.

The total number of "system saves" (meaning the patient was discharged alive from the hospital) decreased from an average of 13.5 for the past four years to 11 in 1998. This decrease in saves reflects the lower number of witnessed arrests (those with the best chance of survival). The overall efficacy of the program remains relatively constant, with **saves representing 15.1% of patients with witnessed arrests in 1998**. In the prior four years, saves represented an average of 15.6% of patients with witnessed arrests.

Paramedic First Responder Programs: Paramedic first responders provide a method for combining early advanced life support care with the generally shorter response times provided by first responder units. Several models of paramedic first responder service are provided in Contra Costa County.

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

- In 1992, **American Medical Response, East Diablo Fire District and the EMS Agency** entered into a formal cooperative effort to provide a more timely, cost effective method of delivering ALS to citizens in **Discovery Bay/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 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 on a part-time, on-call basis to staff its ALS Engine. The pilot was extended through 1998.

- In 1997, **San Ramon Valley Fire** implemented a pilot program under which ambulances were staffed with at least one paramedic and EMT-I, and

stratigic stations with paramedics who could respond to emergencies in first responder units. A two paramedic response was dispatched to all calls coded by the Medical Priority's **Emergency Medical Dispatch System** as likely to be emergent and require ALS care. The two paramedics arrived in separate vehicles, but joined force on-scene and provided care for emergent patients in the field and during transport to the hospital. In **1998**, the dual paramedic response was refined based on response data to permit transport by the single paramedic/EMT-I ambulance in most situations. Both paramedics provide care to certain categories of the most critical patients such as those with shortness of breath, cardiac arrest, and chest pain, and other cases where two paramedics might be needed during transport to the hospital.

➢ In 1997, **Contra Costa Fire** implemented a **pilot first responder paramedic program** in the Walnut Creek area. Two engines, staffed with a paramedic and 2 firefighters, and a "Medic Unit" provide first responder services. In **1998** the program expanded to 3 (three) engines and a "Medic Unit" extending first responder paramedic coverage to the Martinez area. In 1999 the program expanded to seven engines and a "Medic Unit" extending coverage throughout Contra Costa Fire's district in the central county area.

All five First Responder Paramedic programs operate under base hospital medical direction as well as EMS Agency policies and procedures.

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

D. Dispatch and Communications

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

In 1992, two channels were added bringing the EMS communications system up to the current 4 radio channels. Three channels are used exclusively for ambulance/hospital communications, and one channel, Med 11, is used exclusively for communications between Sheriff's Dispatch and ambulances. These four medical radio channels are now identified as Med 11-14. The two new channels, Med 13-14 are used in the central and eastern parts of the County.

(They are not available in the western part of the County, due to possible interference with another Bay Area agency assigned the same frequencies.) The two new channels were designated for paramedic use only, to avoid overcrowding and possible base hospital communications delays. MED 12 continues to be used by paramedics in the western part of the County, and by EMT units throughout the County.

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

MTN makes use of the All County Criminal Justice Information Network (ACCJIN), which provides an existing linkage among 9-1-1 answering points using similar protocols (TCP/IP) to those used on the Internet.

Priority Dispatching: Emergency Medical Dispatch (EMD) is a process where EMS dispatchers screen calls to provide appropriate EMS first-responder/ambulance response, and provide simple emergency medical instructions for the caller to initiate prior to the arrival of EMS personnel. Contra Costa Fire Dispatch has been providing limited call screening and pre-arrival instructions for a number of years. In 1993, Medical Priority's ProQA Dispatch System, the only available computerized medical dispatch system, was selected for use as a pilot program by San Ramon Valley Fire's Dispatch Center. Following the successful pilot, the Medical Priority Pro QA Dispatch System has been fully implemented in San Ramon's fire/ambulance dispatch center. In **1998** the Medical Priority Program was implemented in Contra Costa Fire Dispatch Center and West County Consolidated Communications Operations.

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

E. Trauma System

In 1986, the Board of Supervisors approved a **comprehensive Trauma System Plan** for the County and designated **John Muir Medical Center as the county's Level II Trauma Center,** and in June of that year, ambulance personnel began transporting critical trauma patients directly to John Muir. Ambulance and base hospital personnel use triage protocols, which include evaluation of mechanisms of injury and anatomic factors as well as a physiologic trauma scoring system to identify **critical trauma patients**.

In **1998, 2,920 patients were identified as requiring trauma triage, 814 of**

whom were transported directly to John Muir Trauma Center. 111 patients were transported to **out of county trauma centers**, primarily Children's Hospital, Oakland; Eden Hospital, Castro Valley; and Highland Hospital, Oakland. Patients in traumatic full arrest or whose airway cannot be managed, (total of 38 in 1998) are triaged to the closest basic emergency department for resuscitation. During the past **12.5 years of operation**, a total of **37,758 patients have been triaged through the County trauma system**

Critically injured patients who arrive at a non-trauma center hospital may be transferred to a trauma center. **Thirty of the 46 injured patients transferred to John Muir** in 1998 were retrospective "major trauma victims". John Muir Trauma Center also received 173 trauma patients from surrounding counties, generally by air transport. .

If trauma center resources are temporarily overwhelmed the trauma center may consider "Trauma Center Bypass", directing any additional critical trauma patients to out of county trauma centers until resources are again available. In 1998 John Muir Trauma Center bypass rate was **1.9%** and was most often due to simultaneous arrival of multiple trauma patients. One critical trauma patient was triaged to an out of county trauma center during bypass.

Trauma System Evaluation: A major aspect of the trauma system is an extensive trauma system and trauma center monitoring program. Included in the monitoring program is a unique, bi-county audit system held in conjunction with Alameda County EMS and Alameda County trauma centers. This joint county evaluation system has been in place since the inception of the county trauma system.

Trauma Injury Prevention: The EMS Agency supported injury prevention activities in 1998, by participating in the Childhood Injury Prevention Coalition and its subcommittees and events (e.g., bicycle Safety Days) and helmet use studies. The EMS Agency also participates on the County's Child Death Review Team. John Muir Trauma Center supports an active injury prevention program that includes care seat inspections, school based presentations, participation in health fairs, representation on a number of injury prevention organizations, target groups and committees.

F. Helicopter Transport

The **Operational Procedures for Patient Transport by Helicopter** were originally developed during trauma system planning in 1985/1986 and were revised in 1994. 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. Doctors' Hospital, San Pablo also has a helipad and may be used as an ambulance/helicopter rendezvous point. The county standard of care for emergency patients transport by air is by an "air ambulance" which is staffed with two ALS care providers. Rescue aircraft are also requested for their special

resources. As an example, a U.S. Coast Guard helicopter has been used for its hoist capability. Additionally, a formal procedure for access of military aircraft has been adopted.

In **1998** there were **376 transports of local patients by helicopter, almost exclusively to trauma centers**. Local authorized air ambulance helicopter providers CALSTAR and REACH, which are dispatched on a daily rotation schedule, performed the majority of transports in 1998.

G. Hospital Emergency Services

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

In **1998, 4,085 transfers were reported**; approximately double those reported in prior years. A revision of the transfer review process to focus on aggregate data was initiated in 1998. In the new transfer review process, the sending, rather than receiving hospital is responsible for providing the EMS Agency with the transfer data form explaining the large increase in reported transfers. The EMCC's Facilities and Critical Care Standing Committee reviews this data quarterly. Trends and issues identified through this process are used to modify policy and to educate hospital and prehospital personnel throughout the county.

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 that is able to provide immediate emergency treatment. EMS staff reviews the documentation pertaining to all reported incidents of ED ambulance diversion. During **1998** there were **4 facilities** that utilized diversion a total of **21 times**. There were no reports of problems in patient care resulting from these diversion incidents.

At the end of 1997, and into the first quarter of 1998, Contra Costa experienced an acute shortage of ED and critical care resources. This

phenomenon was felt in surrounding counties and throughout much of the State. As a result of this shortage, in 1998 the hospitals in Contra Costa worked in conjunction with the Hospital Council and EMS Agency to develop a framework for hospital response to scarcity in staffing, equipment, and/or bed capacity. Each hospital agreed to develop and internally integrate this Hospital Census Alert System for shortages in their facility. This system was implemented countywide in early 1999.

H. Disaster and Multicasualty Planning

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

In **1998 the major objectives** of the disaster planning grant were:

- ➢ To continue to develop and implement a medical mutual aid system throughout the region;
- ➢ To further develop a **Disaster Medical Assistance Team (DMAT);** and,
- ➢ To assist Region II counties to develop their own medical/health **Departmental Operations Center emergency response plans.**

Disaster Medical Assistance Team (DMAT): In 1997, County **Health Services began sponsoring a DMAT**, drawing support from 4 other Bay area counties. Alameda, San Francisco, San Mateo, Marin and Contra Costa Counties participate in the Bay area DMAT. A physician serves as DMAT Commander and 130 individuals have submitted applications volunteering to become a part of the response team or of team support services.

This new team will be the **only DMAT based in northern California** and one of just eight within the State. In August of 1**998, the Bay area team was awarded a Level II designation**, and is working toward a Level I designation which they hope to attain by December 1999. A DMAT, is volunteer team established under the National Disaster Medical System (NDMS), through the U.S. Public Health Service. DMAT volunteer teams are organized, trained, and prepared to provide medical and health care to disaster victims.

Multicasualty Plan: Following the Yuba City/Martinez bus accident in 1976, the EMS Agency recognized the need for a coordinated response to multicasualty events by police, fire and ambulance personnel. The multidisciplinary

Multicasualty Advisory Committee (MCAC), produced the first Multicasualty Incident Plan in 1982. This plan established a common organization and management structure for coordination of emergency response to multicasualty incidents, and may be implemented whenever the number of injured exceeds local medical capabilities. The plan was updated in 1998 to incorporate the most current emergency medical response information.

In **1998**, multicasualty responses were mounted to a fire at the **Tosco** Avon Refinery and to a fire at the **Chevron** Refinery in North Richmond.

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** that are stored and maintained in fire stations throughout the County. Fire agencies have agreed to rapidly transport caches to incidents if possible. Cache supplies include bandaging equipment, splinting supplies, oxygen administration supplies, and blood pressure equipment.

Health Services Emergency Preparedness Program: In **1998**, Health Services made substantial progress in developing the **department-wide Emergency Preparedness Program**, and to coordinate emergency plans among the various Health Services divisions. Representatives of each division meet regularly to implement the new integrated County Health Services (HS) Emergency Plan.

The HS Emergency Plan identifies how critical health and medical services will continue to operate in a disaster and how the increased demand for services brought on by the disaster will be managed. Emergency-task checklists, procedures and reporting sites ensure staff is mobilized effectively.

I. Certification Programs

Paramedics: In January 1994, State EMS Authority was legislated responsibility for credentialling paramedics. In January 1995, paramedic certification was reorganized to become paramedic licensure, and State paramedic

recertification written examination procedure was eliminated. In **1998**, **112 paramedics** were either **accredited or re-accredited** by the Contra Costa County EMS Agency to practice as paramedics within the County.

EMT-I's: EMT-I's are certified by any one local EMS Agency in the State. Once certified, an EMT-I may function as such statewide. In June 1994, legislation passed which permits EMT-I's to either complete continuing education (24 hours), or an EMT-I refresher course every two years to maintain certification. Required written/skills testing process was modified from a 2 year to a 4 year cycle. In **1998**, **361 EMT-I's** were either **certified or recertified** in Contra Costa County.

MICN's: In 1997, **23 RN's** were either **authorized or re-authorized** in Contra Costa to practice in the expanded MICN role within the County.

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

In **1998**, the EMS Agency undertook credential review in one case. This review resulted in the paramedic being assigned to a remediation program, and referral to the State EMS Authority. The paramedic resigned from employment in Contra Costa prior to completion of the remediation program.

J. Training Programs

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

Paramedic Training Programs: Los Medanos Community College in Pittsburg provides a paramedic training program. Since most paramedic training programs operated on the same time schedule, in 1994 Los Medanos Community College changed its program schedule to start programs in the spring instead of the fall. This change was made to facilitate the availability of field preceptorships for students. Los Medanos completed a paramedic program in early 1998. (Another course began in March 1999)

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 EMS Agency has approved the EMT-I courses offered by these training institutions.

- **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: Los Medanos Community College conducted one MICN class in 1998. Stanford University and UC Davis also provide MICN training in the Bay area. Although lack of MICN classes makes it difficult for interested nurses to obtain this training, both base hospitals continue to have a sufficient number of MICN's for staffing purposes.

K. Public Information Education Programs

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

➢ 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 and CCC Cable TV.

➢ EMS has continued to provide speakers for a number of community and wellness organizations such as "Mended Hearts", the Rotary Club, skilled nursing facilities and school districts.

L. Other Programs

DNR Program: A Do-Not-Resuscitate **(DNR)** program for patients with terminal medical problems was implemented in January 1993. This program evolved in response to concern from the public over the patient's right to self-determination. The **Do-Not-Resuscitate** program allows patients, in conjunction with their physicians, to refuse resuscitative measures in the prehospital setting, even if the 9-1-1 system is inadvertently activated. The DNR form, recognized by prehospital personnel statewide, is physician initiated and provides prehospital personnel with a physician order to not resuscitate the patient. Comfort measures and care other than resuscitative measures are still provided by first responders and ambulance personnel. The EMS Agency has distributed thousands of DNR forms to hospitals, nursing homes, hospices, home health agencies, and private physicians throughout the county.

V. 1997 Statistical Reports

A. Ambulance Dispatch Report

Year 1998

Number of Responses, Response Code, and Response Level by Ambulance Provider

American Medical Response, San Ramon Valley Fire District, Moraga Fire District

	All Providers		American Medical Response West		San Ramon Valley Fire District		Moraga/Orinda Fire District	
Response Code and Level	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Total Dispatches	**53,490**	**100.0**	**50,007**	**100.0**	**2,368**	**100.0**	**1,115**	**100.0**
Code 3 dispatches	42,199	78.9	38847	77.7	2276	96.1	1076	96.5
Code 2 dispatches	11,291	21.1	11160	22.3	92	3.9	39	3.5
Total code 3 dispatches	**42,199**	**100.0**	**38,847**	**100.0**	**2,276**	**100.0**	**1,076**	**100.0**
ALS response	41,697	98.8	38345	98.7	2276	100.0	1076	100.0
Exempt BLS response	3	0.0	3	0.0	0	0.0	0	0.0
Non-Exempt BLS response	499	1.2	499	1.3	0	0.0	0	0.0
Code 2 dispatches	**11,291**	**100.0**	**11,160**	**100.0**	**92**	**100.0**	**39**	**100.0**
ALS response	6,369	56.4	6238	55.9	92	100.0	39	100.0
BLS response	4,922	43.6	4922	44.1	0	0.0	0	0.0

Report Generated: October 3, 2001

Ambulance Dispatch Report (cont.)

Year 1998

Patient Transport by Ambulance Provider

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

Response Outcome	All Providers		American Medical Response West		San Ramon Valley Fire District		Moraga/Orinda Fire District	
	#	%	#	%	#	%	#	%
Total Dispatches	**53,490**	**100.0**	**50,007**	**100.0**	**2,368**	**100.0**	**1,115**	**100.0**
Transported	38,510	72.0	36047	72.1	1773	74.9	690	61.9
Canceled	14,980	28.0	13960	27.9	595	25.1	425	38.1
Total patient transports	**38,510**	**100.0**	**36,047**	**100.0**	**1,773**	**100.0**	**690**	**100.0**
Transported code 3	3,318	8.6	3178	8.8	117	6.6	23	3.3
Transported code 2	35,146	91.3	32823	91.1	1656	93.4	667	96.7
Helicopter Transport	46	0.1	46	0.1	0	0.0	0	0.0
Transport code not reported	0	0.0	0	0.0	0	0.0	0	0.0
Total Canceled	**14,980**	**100.0**	**13,960**	**100.0**	**595**	**100.0**	**425**	**100.0**
Enroute	3,140	21.0	3011	21.6	60	10.1	69	16.2
On Scene	11,840	79.0	10949	78.4	535	89.9	356	83.8

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	#	%	#	%	#	%	Average Response Time*	BLS Unit Only on Response	
TOTALS	**53,490**	**100.0**	**11,291**	**21.1**	**42,199**	**78.9**	**7.22**	**499.0**	**1.2%**
Richmond	9,024	16.9	1,180	13.1	7,844	86.9	6.75	104	1.3
San Pablo	2,766	5.2	542	19.6	2,224	80.4	6.23	27	1.2
El Cerrito	1,475	2.8	212	14.4	1,263	85.6	7.55	22	1.7
El Sobrante	573	1.1	58	10.1	515	89.9	7.92	6	1.2
North Richmond	272	0.5	20	7.4	252	92.6	7.02	0	0.0
Kensington	145	0.3	19	13.1	126	86.9	11.33	2	1.6
Pinole	1,234	2.3	144	11.7	1,090	88.3	6.22	12	1.1
Hercules	595	1.1	101	17.0	494	83.0	7.83	3	0.6
Rodeo	272	0.5	55	20.2	217	79.8	8.00	3	1.4
Crockett	117	0.2	23	19.7	94	80.3	10.77	4	4.3
Concord	8,280	15.5	2,324	28.1	5,956	71.9	7.02	71	1.2
Martinez	2,606	4.9	772	29.6	1,834	70.4	7.85	67	3.7
Pleasant Hill	2,010	3.8	508	25.3	1,502	74.7	7.61	19	1.3
Pacheco	266	0.5	82	30.8	184	69.2	8.67	3	1.6
Clayton[1]	345	0.6	87	25.2	258	74.8	12.55	3	1.2
Clyde	19	0.0	4	21.1	15	78.9	8.75	0	0.0
Walnut Creek	5,307	9.9	1,196	22.5	4,111	77.5	7.23	38	0.9
Lafayette	1,061	2.0	292	27.5	769	72.5	9.17	7	0.9
Orinda	517	1.0	39	7.5	478	92.5	7.92	0	0.0
Moraga	537	1.0	33	6.1	504	93.9	6.27	0	0.0
Alamo	303	0.6	13	4.3	290	95.7	5.80	0	0.0
Danville	952	1.8	51	5.4	901	94.6	5.59	0	0.0
San Ramon	1,099	2.1	41	3.7	1,058	96.3	5.21	0	0.0
Antioch	4,854	9.1	1,276	26.3	3,578	73.7	6.99	40	1.1
Pittsburg	4,628	8.7	1,247	26.9	3,381	73.1	7.29	37	1.1
Bay Point	1,230	2.3	246	20.0	984	80.0	7.37	13	1.3
Oakley	660	1.2	167	25.3	493	74.7	8.48	2	0.4
Bethel Island	344	0.6	105	30.5	239	69.5	13.93	3	1.3
Knightsen	1	0.0	1	100.0	0	0.0	NA	0	
Brentwood[1]	920	1.7	240	26.1	680	73.9	8.76	5	0.7
Discovery Bay[1]	205	0.4	60	29.3	145	70.7	26.34	0	0.0
Byron[1]	102	0.2	26	25.5	76	74.5	13.24	0	0.0
Out of County	73	0.1	28	38.4	45	61.6	8.70	1	2.2
Other/Unknown	698	1.3	99	14.2	599	85.8	8.49	7	1.2

*Average response times do not include calls canceled enroute or Unit 75 calls Report Generated: October 3, 2001

			Transports				Unknown	
		%	#		#	%		%
Totals	**38,510**	**100.0**	**3,332**	**100.0**	**35,154**	**100.0**	**24**	**100.0**
Contra Costa Reg.	4,699	12.2	281	8.4	4,418	12.6		0.0
	2,112	5.5		5.4	1,931		0	0.0
	7,728	20.1	588	17.6	7,140	20.3	0	0.0
John Muir	4,451	11.6	601	18.0	3,850	11.0	0	0.0
Kaiser, Richmond		0.0	NA		NA	0.0		0.0
Kaiser, Walnut Crk	3,237	8.4	246		2,991	8.5		0.0
Mt. Diablo	7,677	19.9	675	20.3	7,002	19.9	0	0.0
San Ramon Reg.	840		59	1.8		2.2	0	.0
	5,670	14.7		14.6	5,184		0	0.0
Valley Care	23	0.1	0	0.0	23	0.1	0	0.0
Alta Bates	552	1.4	24	0.7	528	1.5	0	0.0
Children's	166	0.4	36	1.1	130	0.4	0	0.0
Eden	0		0	0.0		0.0	0	
Highland		0.0		0.0	2		0	0.0
	44	0.1		0.0	44		0	0.0
	40	0.1		0.0	40		0	0.0
	23	0.1		0.0	23		0	0.0
	46	0.1		0.4	8		24	100.0
	1,199	3.1		4.2		3.0	0	

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B. Helicopter Utilization Report

Year 1998

Contra Costa Patients Transported by Helicopter

Origin	1994		1995		1996		1997		1998	
	Pts	%	Pts	%	Pts	%	Pts	%	Pts	%
TOTAL	**305**	**100.0**	**280**	**100.0**	**268**	**100.0**	**273**	**100.0**	**376**	**100.0**
West County	139	45.6	114	40.7	114	42.5	130	47.6	127	33.8
East County	126	41.3	120	42.9	102	38.1	103	37.7	122	32.4
South County	23	7.5	10	3.6	23	8.6	12	4.4	9	2.4
Central County	17	5.6	36	12.9	29	10.8	28	10.3	29	7.7
Unknown									89*	23.7

*Information unavailable from air ambulance providers. A significant portion of these patients are thought to have been transported from outside of Contra Costa.

Helicopter Transports Originating Within Contra Costa by Provider Agency

Provider	1994		1995		1996		1997		1998	
	Pts	**%**	**Pts**	**%**	**Pts**	**%**	**Pts**	**%**	**Pts**	**%**
TOTAL	**305**	**100.0**	**280**	**100.0**	**268**	**100.0**	**273**	**100.0**	**376**	**100.0**
CALSTAR	278	91.1	250	89.3	251	93.7	244	89.4	195	51.9
REACH	6	2.0	8	2.9	7	2.6	13	4.8	86	22.9
CHP	6	2.0	4	1.4	6	2.2	3	1.1	3	< 1
Other	14	4.6	17	6.1	4	1.5	13	4.8	0	0.0
Unknown	1	> 1	1	< 1	0	0.0	0	0.0	92	24.5

*Information unavailable from air ambulance providers. A significant portion of these patients are thought to have been transported from out side of Contra Costa.

Triaged in field as major trauma	1,167	977	881	997	964
Transported to a trauma center	1,092	930	842	957	925
John Muir Medical Center	977	835	735	841	814
Children's Hospital, Oakland	81	71	87	88	99
Other trauma center	34	24	20	28	12
Transported to the closest receiving hospital	75	47	39	40	39
CPR/Unstable airway	70	46	38	39	38
Trauma center on bypass	5	1	1	1	1
Triaged in the field as not having major trauma	2,271	2,124	2,112	1,856	1,917

Field Triage Errors (errors per 100 patients triaged with major trauma) – 1998

Undertriage error rate	=	Patients triaged in the field as not having major trauma, but subsequently found to have major trauma / Total number of patients triaged in the field as having major trauma	= 28/964	=	**2.9**
Overtriage error rate	=	Patients triaged in the field as having major trauma, but subsequently found not to have major trauma (a) / Total number of patients triaged in the field as having major trauma	= 437/964	=	**45.0**

(a) No followup received from Eden Hospital.

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	1994	1995	1996	1997	1998
Undertriage	1.2	2.0	2.4	3.8	2.9
Overtriage	55.2	54.1	46.5	50.3	45.0

Solano	131
Alameda	14
Marin	12
Other	5
Unknown	89

Mode of Transport for All Trauma Patients Transported to John Muir Trauma Center

Mode of Transport & Origin	1998	
	Pts.	%
Total All Modes	**1,065**	**100.0**
Ground	527	49.5
Air	538	50.5
Contra Costa (287)		
Out of County (162)		
Unknown (89)*		

* Incomplete data submitted by CALSTAR and REACH.

Major Trauma Diagnosis for All Trauma Patients Transported to John Muir Trauma Center

Major Trauma Diagnosis	1998	
	Pts.	%
Patients transported to John Muir Trauma Center from the FIELD as critical trauma patients	814	100.0
Diagnosed in the trauma center as major trauma victims	482	59.2
Diagnosed in the trauma center as NOT major trauma victims.	332	40.8

Total patients in cardiac arrest	**428**	**100.0**	**488**	**100.0**	**461**	**100.0**	**387**	**100.0**	**411**	**100.0**
Patients with shockable cardiac rhythm	123	28.7	142	29.1	145	31.5	107	27.6	164	39.9
Patients without shockable rhythm	305	71.3	356	70.9	316	68.5	280	72.4	247	60.1
Patients with shockable cardiac rhythms	**123**	**100.0**	**142**	**100.0**	**145**	**100.0**	**107**	**100.0**	**164**	**100.0**
Patients with witnessed arrests	79	64.2	88	62.0	82	56.6	97	90.6	73	44.5
Patients receiving CPR prior to EMS arrival	56	45.5	65	45.8	66	45.5	87	81.3	40*	24.4
Total patients with shockable cardiac rhythm	**123**	**100.0**	**142**	**100.0**	**145**	**100.0**	**107**	**100.0**	**164**	**100.0**
"Field Saves"	21	17.1	43	30.3	35	24.1	23	21.5	20	12.2
"System Saves"(patient discharged from hospital)	7	5.7	17	12.0	17	11.7	13	12.1	11	6.7

* CPR was not addressed on records submitted for 7 patients who were found to have a shockable rhythm.

First Responder Defibrillation Activity Report by Agency

Fire Agency	Defibrillator Attached	Patient Shocked	Patient Discharged
Total	**411**	**164**	**11**
Bethel Island	0	0	0
Contra Costa	275	118	9
Crockett	1	0	0
East Diablo	11	5	1
El Cerrito	32	7	0
Moraga-Orinda	5	3	0
Pinole	9	4	0
Richmond	61	20	0
Rodeo	10	4	1
San Ramon	7	3	0

Transferring facility					
Contra Costa Regional	10	5	6	5	38
Doctors' Pinole	42	41	50	88	194
Doctors' San Pablo	151	143	197	244	686
John Muir	31	26	11	19	38
Kaiser Martinez	35	37	17	257	118*
Kaiser Richmond	78	65	126	1,312	1,498
Kaiser Walnut Creek	13	8	10	128	635
Mt. Diablo	107	144	127	148	203
San Ramon	17	22	20	21	52
Sutter Delta	250	334	335	302	623

*Kaiser Martinez closed 1/98.

Reason for Transfer

Reason for Transfer	1998	
	#	%
Total patients transferred.	**4,085**	**100**
Higher Level of Care	2,069	51
5150	929	23
No Bed	568	14
Insurance Status	311	8
Other	113	3
Patient Request	76	2
Not Marked	19	< 1

Other Medical	1,241	30
Psychiatric	949	23
Cardiac	710	17
Pediatric	458	11
Respiratory	310	8
Neurosurgery	110	3
General Surgery	109	3
OB/GYN	95	2
Trauma	83	2
Other	14	< 1
Not Marked	6	< 1

Mode of Transfer

Transfer Mode	1998	
	#	%
Total patients transferred.	**4,085**	**100**
EMT-I Ambulance	2,449	60
Critical Care Transport	1,477	36
Paramedic Ambulance	43	1
Auto/Taxi	52	1
Other (including Helicopter)	54	1
Not Marked	10	< 1

Total time Avg time/event	1.8 hrs	2.5 hrs	2.3 hrs	1.6 hrs	4.3 hrs
Doctors' Pinole # of events Total time Avg time/event	1 9.5 hrs 9.5 hrs	0 0 hrs 0 hrs	0 0 hrs 0 hrs	3 5.4 hrs 1.8 hrs	0 0 hrs 0 hrs
Doctors San Pablo, Brookside # of events Total time Avg time/event	55 103.0 hrs 1.9 hrs	35 49.8 hrs 1.4 hrs	16 24.7 hrs 1.5 hrs	34 77.8 hrs 2.3 hrs	6 6.2 hrs 1.0 hrs
John Muir # of events Total time Avg time/event	0 0 hrs 0 hrs	0 0 hrs 0 hrs	0 0 hrs 0 hrs	1 1.4 hrs 1.4 hrs	0 0 hrs 0 hrs
Kaiser Martinez # of events Total time Avg time/event	0 0 hrs 0 hrs	0 0 hrs 0 hrs	1 13 hrs 13 hrs	11/97 - No longer receives ambulance patients	N/A
Kaiser Richmond # of events Total time Avg time/event	0 0 hrs 0 hrs	2 26.0 hrs 13.0 hrs	0 0 hrs 0 hrs	4/97 - No longer receives ambulance patients	N/A
Kaiser Walnut Creek # of events Total time Avg time/event	0 0 hrs 0 hrs	0 0 hrs 0 hrs	0 0 hrs 0 hrs	3 12.8 hrs 4.3 hrs	0 0 hrs 0 hrs
Mt Diablo # of events Total time Avg time/event	8 12.9 hrs 1.6 hrs	20 34.6 hrs 1.7 hrs	19 46.2 hrs 2.4 hrs	9 14.0 hrs 1.5 hrs	1 1.7 hrs 1.7 hrs
San Ramon Regional # of events Total time Avg time/event	0 0 hrs 0 hrs	0 0 hrs 0 hrs	1 1.1 hrs 1.1 hrs	0 0 hrs 0 hrs	0 0 hrs 0 hrs
Sutter Delta # of events Total time Avg time/event	5 6.2 hrs 1.2 hrs	2 2.0 hrs 1.0 hrs	6 5.5 hrs 0.9 hrs	13 28.5 hrs 2.2 hrs	10 10.2 hrs 1.0 hrs

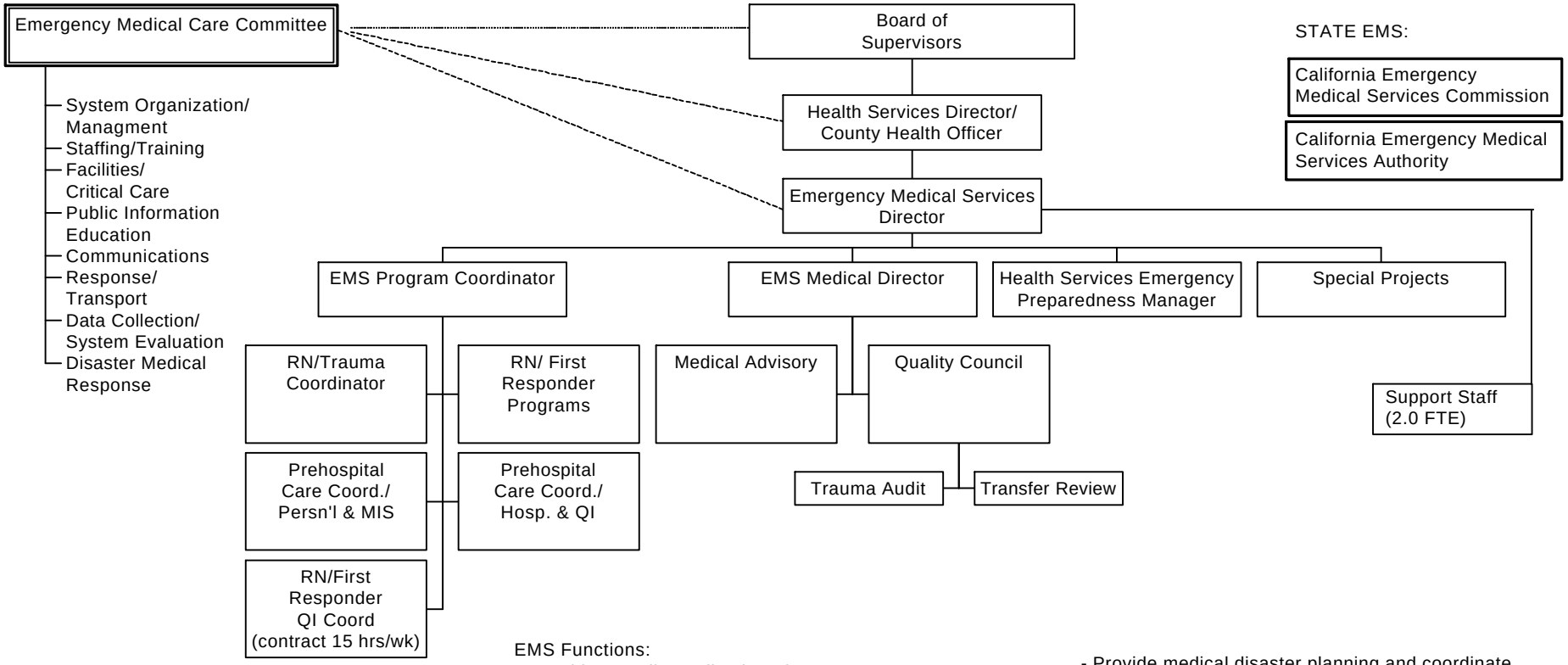
	1994	1995	1996	1997	1998
Total Base Contacts	**13,922**	**13,296**	**13,646**	**10,426**	**7,270**
ALS Care Provided	10,524	10,172	10,407	8,572	4,819
No ALS Provided	3,398	3,124	3,239	1,854	2,451
EMT-P Contacts	N/A	12,823	13,057	9,633	6,482
EMT-I Contacts	N/A	187	163	186	132
EMT Not Identified	N/A	286	1	607	103
Adult Patients	12,929	12,744	12,857	9,781	6,849
Pediatric Patients (age < or = 14)	N/A	887	398	525	290
Age Not Identified	N/A	106	158	231	149

Contacts by Base Hospital

	System Totals	John Muir Base	Mt. Diablo Base
Total Base Contacts	**7,270**	**4,788**	**2,482**
ALS Care Provided	4,819	2,760	2,059
No ALS Provided	2,451	2,028	423
EMT-P Contacts	6,482	4,348	2,134
EMT-I Contacts	132	68	64
EMT Not Identified	103	103	0
Adult Patients	6,849	4,435	2,414
Pediatric Patients (age < or = 14)	290	223	67
Age Not Identified	149	131	18

VI. EMS Agency Organizational Chart

Contra Costa Health Services Emergency Medical Services



EMS Functions:

- Provide overall coordiantion 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.
- 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.

TOTAL	**545,747**	**564,743**	**620,945**	**600,131**	**827,423**

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

Category	FY 1993-94	FY 1994-95	FY 1995-96	FY 1996-97	FY 1997-98
Direct costs:					
Salaries & benefits	193,132	199,984	178,254	176,573	167,657
Services & supplies	3,534,011	3,580,773	4,409,931	3,797,066	3,595,767
Paramedic ambulance services (AMR contract)	2,293,852	2,502,384	2,502,384	2,502,384	2,356,412
Paramedic ambulance services (Moraga Fire contract)	58,558	117,116	58,558	58,558	79,872
Base hospital services	100,000	100,000	100,000	100,000	--
First responder services - fire service reimbursements	414,969	76,503	830,714	299,999	306,902
First responder services - defibrillation program	7,055	35,332	133,029	94,436	58,070
First responder services - Bethel Island paramedic program	--	--	--	81,113	106,160
First responder services - East Diablo paramedic program (AMR contract)	209,150	229,841	233,480	232,840	237,312
Sheriff's dispatch	168,012	168,012	168,012	168,012	180,747
Other EMS dispatch and radio communications	85,216	55,933	38,031	15,695	59,775
Poison control center services	20,456	20,361	107,965	44,618	--
Hazmat program	--	150,000	150,000	150,000	150,000
Other services & supplies	176,743	125,291	87,758	49,411	60,517
Total direct costs	3,727,143	3,780,757	4,588,185	3,973,639	3,763,424
Administration/collection	333,566	262,687	403,000	383,922	357,720
Contribution to reserves		--	180,637	--	--
TOTAL	**4,060,709**	**4,224,081**	**5,171,822**	**4,357,561**	**4,121,144**

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, specified drug administration, 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

➢ **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 immediate ambulance responses to potentially urgent but non-life threatening incidents without using red lights and sirens and adhering to all Vehicle Code requirements (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:** Disability or abnormality resulting from an 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 required 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

EMS System Plan, Annual Update - 1998

Trauma System Plan, 1986

Patient Transfer Guidelines, 1997

EMCC By-laws

Prehospital Care Manual, 1/99

Multicasualty Incident (MCI) Plan, 1/98

County Service Area EM-I Proposal and Service Plan

Operational Procedures for Patient Transport by Helicopter, 7/94

Medical Helicopter Dispatch Guidelines, 4/98

EMS Aircraft – Classification, 1998

Emergency Medical Guidelines for Law Enforcement Agencies, 1992

Request for Proposal for Trauma Center Designation, 1992

Request for Proposal for Emergency Ambulance Services, 1996

Multicasualty Cache Supplies and Locations

Expanded Medical Emergency Response Procedure

Disaster Medical Assistance Team, DMAT CA-6 Application/Brochure

Message Transmission Network Specifications

EMS Policies:

EMT-1 Certification

Paramedic Accreditation

MICN Authorization and Re-Authorization

Contra Costa County Fee Structure For EMT-1, PARAMEDIC, and MICN

Prehospital Credential Review Process Guidelines

Prehospital Continuing Education Provider

County Paramedic Evaluator

Paramedic Student Preceptor Program

Patient Destination Determination

Patient Refusal of Emergency Medical Care and/or Ambulance Transport

Paramedic Base Hospital Communications on ALS Calls

Immediate Medical Control & Direction of Paramedics

Trauma Patients

Transfer of Critical or Possibly Critical Trauma Patients to Trauma Center

Hospital Guidelines for Interfacility Transfers Via Ambulance

Transfer of Care in the Field

First Responder Paramedic Programs

First Responder Defibrillation

Determination of Death in the Prehospital Setting

Do Not Resuscitate (DNR) Orders in the Prehospital Setting

Physician On Scene

Communicable Disease Exposure

Reporting Abuse of Children or Elder/Dependent Adults

Emergency Department Diversion

Procedures for Controlled Substances

Pulse Oximetry

Prehospital Patient Care Record (PCR)

Interfacility Paramedic Transfer Program