

**VENTURA**

**COUNTY**

**TRAUMA**

**PLAN**

**2008**

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## Section I

## Summary of Plan

### A. Introduction

Injury is a major public health concern in Ventura County and has been prioritized as such within the Public Health Department. Traumatic injury, both accidental and intentional, is the leading cause of death in the first forty years of life. According to the 2007 Medical Examiner's report, injuries were the cause of 254 deaths in Ventura County. In addition to the loss of life, the costs associated with traumatic injury are staggering. Reducing these costs and the loss of life can be achieved through an efficient trauma care system. The efficacy of trauma systems in reducing preventable deaths, reduction of rehabilitation time, and improving patient outcomes has been clearly established.

### B. Purpose

The Trauma Plan for Ventura County is, first and foremost, a patient advocacy document. Its purpose is to provide a framework for the establishment of a comprehensive injury management strategy for the County that addresses the needs of the injured. The plan acknowledges the inherent challenges of the urban, semi-rural, and rural healthcare environment and provides an organized process to ensure quality trauma services while remaining sensitive to the intrinsic resource and financial constraints of the system participants. This plan recognizes that a partnership of organizations, institutions and individuals form the nucleus of a quality trauma system. It is only through this partnership and adherence to quality trauma care standards that the goals of this plan will be achieved.

This Trauma Plan will design a countywide trauma system in order to:

1. Identify the causes of injury.
2. Pursue injury prevention activities to decrease the incidence of trauma.
3. Identify and measure preventable death and disability from trauma.
4. Assure timely, optimal trauma services in a cost-efficient manner through close coordination of prehospital, hospital and rehabilitation services.
5. Reduce mortality and morbidity from trauma within the County.
6. Match patient medical needs with resources of the trauma receiving center.
7. Manage costs of trauma system implementation.

### C. Overview

An organized, systematic approach to trauma care results in a reduction in patient mortality and morbidity. In addition, the incidence of injury decreases due to organized prevention efforts. In recognition of this local public health issue, the California State Emergency Medical Services Authority has authorized the development of this Trauma Plan as one component in the process of the implementation of an organized injury management strategy.

The intent of this plan is to build on the strengths of the current Emergency Medical Services (EMS) structure and formalize Ventura County's trauma care system by defining the roles and responsibilities of the hospitals. The system will be based on an inclusive model, encouraging all hospitals to participate at some level, dependent upon their resources. According to the American College of Surgeons Committee on Trauma *Resources for Optimal Care of the Injured Patient: 2006*, "As opposed to an *exclusive* system that incorporates only specialized centers as the providers of acute trauma care, the inclusive system, conceptualized in 1990, acts to match patient care needs to the capability of receiving centers. Using this approach makes the best use of available resources, matches patient needs to level of care, engages all acute care facilities in the management of acutely injured patients, avoids overburdening the specialized trauma centers with large numbers of patients with more minor injuries, and helps improve surge capacity in the event of mass casualty events." This plan also recognizes the importance of all facilities to provide trauma care to not only the severely injured victim but to all other injured patients as well. "The model developed and put forth in the 1990 Trauma Care System and Development Act encouraged the formation of an inclusive trauma system in which each care provider is incorporated into the system." (American College of Surgeons Committee on Trauma *Resources for Optimal Care of the Injured Patient: 2006*.) The Plan will comply with all applicable State statutes and regulations.

The facility standards contained in this document are based upon the California Code of Regulations, Trauma Care Systems for Level I, II, and III Trauma Centers. Interfacility transfer agreements will be established to facilitate the rapid and appropriate transfer of patients both within and outside of the County as their medical care needs dictate.

The Ventura County EMS Agency (VC EMS) will rigorously monitor the system established by this plan through review of Trauma Registry data, outcome studies and site visits. The care of the injured patient is not unique; frequently, the needs of trauma patients overlap with other critically ill patients. The planning of care for these patients must be coordinated with all other components of the EMS system. A Continuous Quality Improvement (CQI) model will be instituted for system review and a comprehensive management information system will be implemented to ensure the seamless integration of dispatch, prehospital, hospital and registry information. It is the goal of the VC EMS that through this Trauma Plan quality of care to all patients will be enhanced.

This plan defines and establishes programs to:

1. Develop and operate a countywide, inclusive trauma system.
2. Develop prehospital trauma treatment and transportation protocols, which recognize the urban, semi-rural and rural nature of the County.
3. Provide aeromedical response and transportation requirements.
4. Define operational requirements for all levels of trauma care facilities.
5. Designate and contract with healthcare facilities to provide trauma care services.
6. Provide a clear line of authority for the countywide trauma system administration.
7. Maintain a Continuous Quality Improvement program, including a trauma registry.
8. Optimize trauma system stability and cost containment considerations.
9. Evaluate trauma system effectiveness.

This Trauma Plan anticipates the designation of two Level II trauma centers, but it will set criteria and allow for the flexibility to establish Level I and III facilities as needed.

The Base Hospitals will continue to provide on-line communications and medical control to the field personnel for trauma patients. All prehospital care personnel will be trained on appropriate trauma treatment and transportation protocols.

#### **D. Background**

The 1966 National Academy of Sciences white paper entitled *Accidental Death and Disability: The Neglected Disease of Modern Society*, identified deficiencies in providing emergency medical care in the country. This paper was the catalyst prompting federal leadership toward an organized approach to EMS and trauma care. The authority of states to set standards, regulate EMS, and implement programs designed to reduce injury were further reinforced and encouraged by the 1966 Highway Safety Act. Various subsequent federal and state initiatives have been responsible for improving and refining prehospital systems of care during the two decades which followed the landmark 1966 paper.

Significant state EMS leadership from California regarding the development of EMS systems began in 1981 with the enactment of the "Emergency Medical Services System and Prehospital Emergency Medical Care Personnel Act." (Health and Safety Code 1797, et al.). This law established the State Emergency Medical Services Authority and specifically authorized local EMS agencies to "...plan, implement, and evaluate an emergency medical services system...consisting of an organized pattern of readiness and response services..." (Health and Safety Code 1797.204). The Act further authorized local EMS agencies to plan, implement and monitor advanced life support programs.

The California EMS Authority promulgated the document *Emergency Medical Services System Standards and Guidelines* in 1985, revised in 1993, pursuant to Section 1797.103 of the California Health and Safety Code.

Ventura County has been working to evaluate its trauma care since 2000, when it began to identify and solicit community support for the planning process. Since that time, VC EMS has been steadily moving toward developing a trauma plan to submit to the California EMS Authority for approval. To meet this objective, it has conducted meetings with representatives from hospitals, advanced life support providers, and the Healthcare Association of Southern California, and conducted retrospective trauma patient flow and outcome studies. This process has allowed VC EMS to assess prehospital care resources and needs, identify hospital services and resources and begin to develop and revise trauma-specific policies, protocols and system standards. A Trauma Advisory Committee has been established to provide broad EMS community input and support and has been in place since January 30, 2008.

#### **E. Trauma Plan Philosophy**

The goal for Ventura County's Trauma Plan is to assure high quality trauma care to all residents of, and visitors to, the County. To this end, trauma centers will be designated to optimize both care and access. A priority consideration in this plan's development will be given to a system design that provides high quality trauma services to the population served while remaining cognizant of the available resources. The hospitals will be integrated into a total system of care that includes prevention programs as well as comprehensive treatment, prehospital through rehabilitation and follow-up. Air medical dispatch procedures will be evaluated and revised as needed. The trauma system of care will be carefully implemented and monitored by VC EMS and the Trauma Advisory Committee.

The philosophy of the Ventura County Trauma Plan calls for the following elements:

**1. Regional Trauma Centers**

One hospital in the West County and one hospital in the East County will be designated as a Level II trauma center.

**2. Inclusive**

Participation of all hospitals will be encouraged countywide, with a demonstrated and documented commitment to quality care.

**3. Continuous Quality Improvement/Outcome**

Orientation towards a continuous quality improvement process and an emphasis on patient outcomes will be the primary focus of program evaluation.

**4. Prevention**

An emphasis on injury control as a priority at all levels of trauma care will be established.

**5. Continuum of Services**

The trauma care program will be developed as an integrated system comprised of pre-hospital, hospital and rehabilitative care.

**6. Financial Impact**

Efforts will be made to evaluate system structure, process, and outcomes to assist with evaluating the financial impact of the trauma system and to allow integration of the trauma system within the changing healthcare environment.

**F. Legal Basis**

VC EMS, under the authority of the Health and Safety Code, sections 1798.160 through 1798.169, and California Code of Regulations (CCR), Title 22, Division 9, Chapter 7,

develops this Trauma Plan. Responsibility for the plan's development, implementation and oversight rests with VC EMS.

## **G. Plan Approach**

Designation of trauma centers in Ventura County will be based on standards published in the American College of Surgeons Committee on Trauma *Resources for Optimal Care of the Injured Patient: 2006*. All designated trauma center(s) will be required to enter into written transfer agreements as a requirement of the process.

Criteria for pediatric trauma care have been integrated into the hospital requirements. Also, specific requirements to establish other formal linkages with specialty care centers will be established.

Los Angeles, Kern, and Santa Barbara Counties have formal trauma systems in place. VC EMS will coordinate with EMS agencies located within close proximity to ensure the integration of adjacent trauma systems for efficient care of trauma patients. Transfer and Mutual Aid Agreements will be developed and executed as necessary. These agreements will be directed toward systems that have specialty care services.

A Request for Proposal (RFP) process will be used to designate Level II trauma centers. VC EMS will work with all hospitals to encourage participation in the trauma system.

## **H. Key Problems and Solutions**

A coordinated, documentable system approach to care for the injured patient from the prehospital through the rehabilitation phase is nonexistent. There is no mechanism in place for an organized review of existing policies and procedures, individual hospital trauma plans, base hospital and prehospital provider agreements and hospital trauma review committee processes. This process will require development and collaboration. Additional areas of concern are:

### **1. Air Transport Issues**

The Ventura County Sheriff Aviation Unit is the air rescue provider for the County. This unit is staffed 7 days a week, nine hours a day. After 5 pm, the pilot and crew must be recalled to respond to an emergency. Most calls for service occur during staffed hours of the Sheriff Aviation Unit. Air Ambulance services may be requested from Cal Star located in Santa Maria or Mercy Air in Rialto. Both have potential flight times of over 30 minutes. Mutual Aid Air Rescue resources can also be utilized by Los Angeles County and city fire departments which staff their units 24 hours a day and have ETA's of less than 30 minutes to most areas of the County.

#### **Proposed Solution:**

Ventura County does not have a sufficient population base or number of trauma patients to support a dedicated air ambulance at this time. Mercy Air, based at the Oxnard Airport, was the local air ambulance provider from August 1998 to January 2006. Services were discontinued because of insufficient transport volume. VC EMS will

continue to monitor air transportation services with particular attention to training and oversight of the Sheriff Aviation Unit.

## **2. Data Management Issues**

The quality of care is difficult to determine from the lack of a coordinated data collection process. VC EMS is in the process of installing a more robust system from Zoll Medical. In addition, the County Fire Department will automatically do a daily download of all EMS calls to our central data base located at the Ventura County Government Center.

### **Proposed Solution:**

The Zoll Medical prehospital Electronic Medical Record (EMR) and the county-based data server will allow VC EMS to structure a system-wide information management service. VC EMS is planning to contract for the part-time service of a database administrator to begin this process.

## **3. Transfer Agreements**

The County of Ventura does not have written transfer agreements with trauma centers outside of the County.

### **Proposed Solution:**

As required in CCR, Title 22, and the *Resources for Optimal Care of the Injured Patient: 2006*, all trauma centers will have interfacility transfer agreements with surrounding hospitals as well as with out-of-county trauma centers.

## **4. Lack of Coordinated Injury Prevention Activities**

Injury prevention activities are a priority throughout Ventura County and the Public Health Department, but they have been sporadic, limited, and dependent on grant funding dollars.

### **Proposed Solution:**

VC EMS will use trauma center designation fees for a trauma coordinator who will be, in part, responsible for the coordination of a system-wide injury prevention program. It is anticipated that a trauma system which focuses on prevention will substantially contribute to a decrease in preventable deaths.

## **I. Developing a Quality Trauma System**

Elements of quality in the Ventura County Trauma Plan include:

1. Adoption of trauma care standards consistent with the American College of Surgeons Committee on Trauma *Resources for Optimal Care of the Injured Patient: 2006*.
2. The use of an outcome-based evaluation process that will at a minimum address the following areas: clinical and system screens, outcome processes, (compared to national and/or state standards where they exist), and patient satisfaction.
3. Establishment of a Continuous Quality Improvement method for evaluation.

4. Establishment of a clearly stated and objective trauma center selection process (VC EMS Policy Number 1401 – Appendix Q).
5. Establishment of a data registry system.
6. Establishment of an ongoing process of oversight.

## **Section II**

## **Organizational Structure**

### **A. County Structure**

The Ventura County EMS Agency is a single county local EMS Agency and is part of the County Public Health Department. The Director of Public Health reports to the Director of the Health Care Agency, who reports to the County CEO, who reports to the County's Board of Supervisors. The Ventura County EMS Agency's organizational structure is shown in Appendix C. Staff includes: EMS Medical Director, EMS Director, Deputy EMS Administrator and support staff.

### **B. Additional Information**

Additional details on the County structure can be found in the Ventura County EMS Plan.

## Section III

## Needs Assessment

### A. Geography

The County of Ventura is located in Southern California and encompasses an area of 2,208 square miles (1,845 land, and 363 water). The boundary of the County extends from the Sierra Madre and San Rafael mountain ranges and a small portion of Kern County on the Northwest, from Santa Barbara County on the Northwest, Los Angeles County on the Southeast and the Pacific Ocean on the Southwest. The size and industrial diversity of the Ventura County area presents special problems in the allocation and availability of healthcare resources. Mountainous terrain, expanses of agricultural land, and widely dispersed rural communities intensify this problem by limiting accessibility to health care.

Water plays a vital role in the growth and development of this area. Ventura County is a water-deficient area with demand greater than the local supply. Acquisition, quality, and conservation of water are paramount to the area's development. Local water supplies come from runoff stored in reservoirs or from ground water. Water is the main recreational feature in Ventura County, attracting tourists and the fishing industry.

The mountains bordering the eastern section of the County join together with humid conditions to create dense fog during the summer months at the higher elevations. This dense fog can produce zero visibility and result in a high crash rate for the area and also hinders the accessibility to healthcare services, especially for rural residents.

### B. Transportation

The automobile is the predominate form of transportation in Ventura County. Two major arteries, Highways 101 and 118, transact the area from south to north along the edge of the Pacific Ocean. There are three other smaller arteries, Highway 33, Highway 23, and Highway 126. There is a network of County and city roads which provide access between the incorporated cities and the agricultural lands and rural communities of the County.

Scheduled commercial and private air travel is provided at the Oxnard Airport. There are also scheduled charter services and private air travel from Camarillo Airport and private services available at the Santa Paula Airport. Passenger rail service is available via Amtrak and Metrolink.

Community Memorial Hospital, Ventura County Medical Center, St. John's Regional Medical Center (Oxnard), Los Robles Hospital and Medical Center, and Simi Valley Hospital have FAA approved helipads. St. John's Pleasant Valley Hospital and Ojai Community Hospital do not have helipads, although a helicopter could land in close proximity to these hospitals if necessary. Santa Paula Hospital has a helipad, however it is not FAA approved.

### C. Demographics

By the year 2010, the population is expected to exceed 855,876. The percent of all births to Hispanic parents is steadily rising in all Southern California counties. 59.7 percent of all births in Ventura County are to Hispanic women. Elsewhere in the state, the Hispanic population continues to grow faster than all other ethnicities.

Because we expect a similar trend to remain in place for the foreseeable future, Hispanic demand for housing, retail products, and personal services will become an increasingly important element of consumerism in Ventura County. The Hispanic population currently represents 36.5% of the population in the County. By the year 2010, this proportion will rise to approximately 37%.

Injuries disproportionately affect the poor and certain minority populations. Although Ventura is known as a highly desirable place to live for its physical beauty, the median household income is \$59,379. The demographics of the County indicate that there are many concentrated low-income areas. Census reports show that 9.3% of the County residents live at or below the poverty level (compared with 13.2% of the State population).

The population over 65 years of age in Ventura County is 10.9%. The percentage for California as a whole is 10.8%. As the population of Ventura County continues to age, there will be an increased demand for EMS services in the over 65 age group.

#### **D. Epidemiology**

Data from the Vital Records Department of Public Health show that the major causes of death in Ventura County are from heart disease and cancer, which is consistent with the trend throughout California and the United States. The following is a summary from the Automatic Vital Statistics System for Ventura County of the top five causes of death for years 2007-2008. Injury is the fifth leading cause of death.

1. Heart Disease
2. Cancer
3. Cerebrovascular Disease (Stroke)
4. Chronic Lower Respiratory Disease
5. Injury

#### **E. Trauma and Emergency Medical Care Resources**

##### **1. Prehospital**

Private and public EMS providers cover the County. Advanced Life Support (ALS) ambulance response is supported by simultaneous dispatch of Advanced Life Support (ALS) and/or Basic Life Support (BLS) first responder fire department personnel. Prehospital providers are currently trained in the principles of field resuscitation of injured patients and meet all of the State requirements for education.

As the Trauma Plan is implemented, additional training classes will be conducted by Base Hospitals and prehospital service provider organizations for all prehospital providers on new guidelines as needed. Prehospital providers will continue to make

contact with their base hospital or, for designated trauma patients, the appropriate trauma center. Field triage criteria (also referred to as patient destination criteria) will be developed by the Trauma Advisory Committee. VC EMS will monitor all trauma triage decisions and patient outcomes through the Trauma Registry, and present these data on a regular basis to the Trauma Advisory Committee. VC EMS and the Trauma Advisory Committee have the responsibility to review trauma triage decisions with patient outcomes and to revise trauma triage criteria as necessary for progressive improvement of trauma care.

VC EMS has implemented a prehospital data collection system. All prehospital ALS providers utilize a standardized paramedic care report form. This form contains all the information that is entered into the County data collection system. Currently VC EMS is collecting data electronically from all ALS service providers. **Table 1** on the following page lists all ALS providers for Ventura County.

**Table 1. Advanced Life Support Providers**

Name/Address	No of Units	Trans- port Units	Service Area	EMS Responses 2005		EMS Responses 2006		EMS Responses 2007	
				Responses	Transports	Responses	Transports	Responses	Transports
ALS									
American Medical Response	15	15	2,3,4,5,7	24,500	19,342	31,391	21,142	23,936	21,392
Gold Coast Ambulance	6	6	6	15,278	7,207	15,472	7,779	14,675	7,298
Lifeline Medical Transport	2	2	1	1,557	1,005	1,556	810	1,595	1,122
Ventura County Sheriff	1	1	All	Unavail	100	155	140	153	108
Fillmore Fire Department	1	0	Fil City	677	0	573	0	632	0
Venura City Fire Dept.	7	0	Vta City	7,603	0	7,560	0	7,978	0
Ventura County Fire Dept.	0	0	Vta Cnty	18,564	0	19,354	0	20,508	0
County-Wide Total	32	24		68,179	27,654	76,061	29,871	69,477	29,920

## 2. Hospitals

There are currently eight acute care hospitals in the County. It is important to note that because of the growth in the region and changing healthcare needs, hospitals and corporations in our County are planning many changes. The planning will recognize the flexibility necessary to continue to provide a comprehensive system of trauma care.

Each of the acute care facilities in the County acts as a Receiving Hospital (RH) for the prehospital providers. Base Station services are provided by four hospitals via a contract between the facility and VC EMS. Each Base Hospital (BH) is required to have a Medical Director and a Prehospital Care Coordinator (PCC).

**Table 2. Ventura County Hospitals**

Name/Address	No. of Beds	No of ICU Beds	No of PED. Beds	Base Receive		NUMBER OF ER Visits			
						2004	2005	2006	2007
Community Memorial Loma Vista & Brent Ventura, CA 93003	242	21	5	No	Yes	34,245	34,746	34,502	36,943
Ventura County Medical Center 3291 Loma Vista Road Ventura, CA 93003	223	18	16	Yes	Yes	32,603	32,763	32,413	31,940
Santa Paula Hospital 825 N. 10 <sup>th</sup> Street Santa Paula, CA 93060	49	6	0	No	Yes			4,794	12,031
St. John's Regional Medical Center 1600 N. Rose Avenue Oxnard, CA 93030	265	20	0	Yes	Yes	46,720	46,145	44,845	42,673
St. Johns Pleasant Valley 2309 Antonio Avenue Camarillo, CA 93010	180	8	0	No	Yes	17,090	15,884	15,790	15,167
Los Robles Hospital 215 W. Janss Road Thousand Oaks, CA 91360	220	30	9	Yes	Yes	33,376	33,833	33,185	32,362
Ojai Valley Hospital 1306 Maricopa Highway Ojai, CA 93023	33	4	0	No	Yes	7,599	8,268	8,061	8,021
Simi Valley Hospital 2975 N. Sycamore Drive Simi Valley, CA 93065	185	11	0	Yes	Yes	23,120	24,042	23,726	23,406

**F. Trauma Incidence and Distribution**

Ventura County EMS contracted with the New Mexico Trauma Foundation to prepare a report on the existing trauma patient volume and distribution. Using the California Office of Statewide Health Planning and Development 2003 Inpatient Discharge Data Set, the analysis found the following:

- 1,407 trauma patients admitted to Ventura County hospitals were identified (Table 3).

- 381 trauma patients had an injury severity score of 15 or greater, indicating major/severe trauma (Table 3).
- An additional 357 residents of Ventura County were admitted to trauma centers in Los Angeles, Santa Barbara or other counties.
- Only 11% of Ventura County trauma was classified as intentional (suicides, assaults, stabbings and gun shots) compared to 18.5% for Southern California as a whole.
- The average length of stay for all identified trauma patients was 6 days, for a total of about 8,500 patient days in Ventura County hospitals.

**Table 3: Ventura County Hospital Trauma Admissions by Severity**

Hospital	Minor ISS < 9	Moderate ISS 9-15	Major ISS 16-24	Severe ISS >= 25	Total
Ojai Valley Community Hospital	36	35	16	3	<b>90</b>
Community Memorial Hospital	84	67	33	3	<b>187</b>
Ventura County Medical Center	81	89	56	30	<b>256</b>
Santa Paula Hospital	4	1	3	0	<b>8</b>
St John's Regional Medical Center	94	112	61	26	<b>293</b>
St John's Pleasant Valley Hospital	39	28	17	1	<b>85</b>
Los Robles Regional Medical Center	128	109	67	17	<b>321</b>
Simi Valley Hospital	60	59	35	13	<b>167</b>
<b>Total</b>	<b>526</b>	<b>500</b>	<b>288</b>	<b>93</b>	<b>1,407</b>

This data was updated in a second report [Appendix I], using the Office of Statewide Health Planning and Development 2006 Inpatient Discharge Data Set. It found:

- Persons residing in the County who were admitted as a trauma patient to any Southern California hospital varied somewhat when 2003 is compared to 2006 (1,573 compared to

1,726) with an increase of 153 admissions or 9.73%. Relative percentages in each of the injury severity levels remained essentially the same.

- Relatively small percentages of County residents with major or severe traumatic injury were admitted to designated trauma centers (17.57% and 18.37%) in 2006 when compared to overall regional percentages of 66.91% for major trauma admissions and 85.02% for severe trauma admissions.
- The most frequently admitted type of trauma patients for both years were patients with head injuries. In 2003, head injuries represented 26.32% of the trauma admissions and in 2006 this percentage increased slightly to 26.59%.
- As in 2003, 2006 trauma admissions were generally spread over several hospitals with no one hospital dominating the market.

Bishop & Associates prepared a report using the Office of Statewide Health Planning and Development 2004 Inpatient Discharge Data Set (Appendix L):

Table 4 contains the results of this analysis of 2004 data:

**Table 4: Trauma Admissions by Injury Severity Score (ISS)**

Injury Severity Score	Trauma Admissions	ISS < 9	ISS 9 - 15	ISS 16-24	ISS >= 25
Hospital Name	Total	Minor	Moderate	Major	Severe
St Johns Regional MC	314	93	114	74	33
Ventura County MC	283	103	100	46	34
Community Memorial Hospital	206	97	73	33	3
St Johns Pleasant Valley Hospital	85	44	29	11	1
Ojai Valley Community	57	29	21	6	1
<b>Total West County</b>	<b>945</b>	<b>366</b>	<b>337</b>	<b>170</b>	<b>72</b>
Los Robles Hosp & MC	380	146	138	83	13
Simi Valley Hospital	162	59	54	42	7
<b>East County Total</b>	<b>542</b>	<b>205</b>	<b>192</b>	<b>125</b>	<b>20</b>
Data Set Total	1487	571	529	295	92

The report concluded that the trauma incidence and distribution would support one Level II or III trauma center in the West County and one Level II or III trauma center in the East County.

## Section IV

## Trauma System Design

### A. Overview of Planning Basis

This section describes the process that has been used to design the optimal trauma care system for Ventura County. Such a trauma system assures the broadest coverage for trauma patients consistent with the availability and prudent use of healthcare resources. This plan uses the following parameters for system design:

#### 1. Service Areas

In examining the County, several factors have been considered. Patient transport times, trauma care resources and access to definitive trauma care services have been weighed.

#### 2. Resource Limitations

Consideration has been given to existing in-county and out-of-county hospital, trauma center, and physician resources. Also, special consideration of the need for and access to specialty services has been addressed.

#### 3. Hospital Capabilities

Within each of the trauma service areas, the goal is to have the hospital with an interest in and capability to meet the minimum standards to be designated as a trauma center, as provided in this plan. Pediatric standards will be integrated into the trauma center standards.

#### 4. Oversight by VC EMS

EMS is required to provide oversight and monitoring as well as continuous quality assurance activities as a part of the Trauma Plan and trauma center designation. It is anticipated that the plan will have an impact on EMS Agency resources, and the recovery of these costs will be factored into designation/contract fees as needed.

#### 5. Out-of-County Coordination

To achieve complete coverage of trauma services and to assure seamless coverage, Ventura County will need to coordinate with adjacent counties to achieve complete, comprehensive, and seamless trauma system coverage, especially where the closest most appropriate trauma center may not be within the County.

### B. Summary of Planning Basis

The above-mentioned planning criteria have been designed to define resource needs and capabilities for the Ventura County Trauma Plan. These criteria are the basis for the solicitation and designation of the trauma centers.

Ventura County will encourage participation by all healthcare facilities in the County. After having interviewed each hospital and identified the level of interest, the proposed system suggests that St. John's Regional Medical Center and Ventura County Medical Center compete to be designated as a Level II trauma center in the West County and Los Robles Hospital and Simi Valley Hospital compete to be a Level II trauma center in the East County. The County will retain the option of contracting with hospitals outside the County for these services, dependent upon the applicants' ability and willingness to meet the standards as established within this plan. Tertiary hospital arrangements will be made with hospitals as needed.

## **C. Trauma System Administration**

### **1. Lead Agency**

California statute assigns the responsibility to adopt and implement trauma standards, implement triage guidelines, designate trauma care facilities, establish data collection systems and monitor trauma system performance to the local EMS Agency. The lead agency for EMS and trauma care system development in Ventura County is the Ventura County EMS Agency. VC EMS staff and EMS Medical Director will be responsible for administering the plan and coordinating activities of the trauma care system and integrating this system with all components of the EMS system.

As the lead agency for Ventura County's EMS and trauma system, VC EMS is responsible for planning, implementing and managing the trauma care system. These responsibilities include but are not limited to:

- a. Assessing needs and resource requirements of the County.
- b. Developing the system design.
- c. Assigning roles to system participants.
- d. Working with the trauma participants and trauma centers and with neighboring EMS systems on outreach and mutual aid services.
- e. Developing a trauma registry data system.
- f. Assisting the County's acute care facilities in the implementation of a hospital Trauma Registry.
- g. Establishing a prehospital data collection system that is capable of interfacing with the Trauma Registry.
- h. Monitoring the system to determine compliance with appropriate law, regulations, policies, procedures and contracts.
- i. Evaluating the impact of the system and revising the system design as needed.

To fulfill these responsibilities, VC EMS will hire staff to do the monitoring and oversight of the trauma care system. VC EMS will oversee the Continuous Quality Improvement processes.

### **2. Trauma Advisory Committee**

The Trauma Advisory Committee has been created as a function of the planning process and will continue as a part of this plan. It provides for countywide input of

knowledgeable individuals and organizations into the discussion and resolution of trauma system issues. It will also foster communication between VC EMS and various groups with an interest in the County's trauma system.

The functions of the Trauma Advisory Committee are:

- a. Provide input and guidance to VC EMS in trauma program development.
- b. Conduct assessment of the trauma system needs and resources in the County.
- c. Assist with the solicitation of recommendations and the provision of linkages with various groups.
- d. Make recommendations regarding the future growth of the trauma system.
- e. Provide overall direction and coordination to trauma subcommittees for policy making and program development.
- f. Design and institute a Continuous Quality Improvement program for the trauma system.
- g. Analyze the results of data collection and the monitoring system.
- h. Describe the goals and activities for EMS trauma public education and injury prevention.
- i. Advise VC EMS on matters relating to the delivery of trauma care within the County.
- j. Conduct local trauma quality management programs, including monitoring the performance of the trauma system participants, through an appropriate EMS Agency-approved medical review committee.

### **3. Medical Control**

Medical control and direction of the trauma system is an essential ingredient of the Ventura County Trauma Plan and is the overall responsibility of the local EMS Medical Director. Medical control includes medical supervision of prehospital care services and the provision of medical supervision of overall trauma system development and ongoing monitoring.

The Trauma Advisory Committee, in conjunction with input received from other sources of medical expertise, shall provide input to VC EMS on trauma system planning and monitoring. The County's EMS Medical Director will continue to work with the Trauma Advisory Committee, prehospital care providers and the trauma directors to provide overall medical supervision of the trauma system.

In addition, each of the acute care facilities in the County acts as a Receiving Hospital (RH) for the prehospital providers. Base Hospital (BH) services are provided via contract between four hospitals and VC EMS. Each BH is required to have a Medical Director and a PCC.

## **D. Trauma System Operational Components**

A set of policies will be developed and/or revised which will direct the trauma system to provide a clear understanding of the structure of the system and manner in which the system utilizes the resources available to it.

## **1. Prehospital System**

Prehospital personnel in Ventura County will be trained in treatment and triage protocols, as well as Prehospital Trauma Life Support standards. The trauma system policies will include the following: trauma care coordination within the trauma system; early notification of impending arrival at trauma center; coordination with all healthcare organizations to facilitate transfer of patients; trauma center equipment; availability of trauma team; criteria for activation of trauma team; mechanism for prompt availability of specialists; quality improvement and system evaluation; and criteria for pediatric and adult trauma triage, including destination.

Air transport systems will be fully integrated into the trauma system and will comply with VC EMS air medical transport policies and procedures. (Appendix F)

## **2. Hospital System**

### **a. Current System**

There are no designated trauma centers in Ventura County.

### **b. Proposed System**

Trauma service areas will be designed in accordance with planning criteria as stipulated in Section IV B above.

### **c. Integration of Pediatric Trauma Care**

Each trauma center will meet specific pediatric standards commensurate with the level of designation and have a transfer agreement with a hospital having pediatric resources, as necessary, for services not provided.

### **d. Mutual Aid and Relation to Other Trauma Systems**

VC EMS will work with the neighboring EMS Agencies to develop mutual aid agreements to ensure patient needs and other inter-system needs are met.

### **e. Patient Flow**

Patient destination decisions will be made on a patient-specific basis. This decision will consider distance, weather, traffic and other factors that may affect transport time.

#### **(1) Prehospital Transportation**

For patients who meet trauma triage criteria, the prehospital care team will determine appropriate destination and whether ground or air transport is used. This will require consideration of ground transport time, air transport time (including response time if the helicopter is not on-scene), weather, traffic and

other factors. In general, a patient who is identified in the field with minor or moderate injuries will not be transported by air.

Ground transport times for the majority of the County will be less than 20 minutes. In areas with prolonged transport times, such as the far northern County and portions of the Santa Clara River Valley, air resources will be utilized as appropriate.

## **(2) Interfacility Transfers**

Hospitals applying for trauma center designation must develop transfer procedure criteria agreements based on their capabilities and resources. Patients who require treatment not available at the receiving hospital, e.g., burns and reimplantation, will be transferred expeditiously to the appropriate facility. This may include out-of-county facilities. Procedures, criteria and agreements are subject to County approval and to the CQI process. All transfer agreements must comply with Joint Commission standards and California State regulations.

## **(3) Saturation Levels**

In major incidents, multi-casualty incident triage will override the trauma destination triage policy in order to provide the best care for the largest number of patients.

## **f. Hospital Service Delivery**

### **(1) Clinical Capability**

Trauma centers will meet criteria set forth in the American College of Surgeons *Resources for Optimal Care of the Injured Patient: 2006* and County standards as defined in California regulations and modified in this plan.

### **(2) Medical Organization and Management**

Trauma centers will meet criteria set forth in the American College of Surgeons *Resources for Optimal Care of the Injured Patient: 2006, Chapter 5: Hospital Organization and the Trauma Program*.

### **(3) Quality Improvement**

Trauma centers will meet criteria set forth in the American College of Surgeons *Resources for Optimal Care of the Injured Patient: 2006, Chapter 16: Performance and Patient Safety*.

## **g. Resource availability to meet trauma center staffing requirements**

California Trauma Regulations and ACS COT trauma center standards were summarized and distributed to all hospitals with instructions to review, determine whether they could meet all applicable requirements, and if so to send a letter of intent to be designated as a level II trauma center to VC EMS. As described

previously, four hospitals have determined that they are able to meet minimum staffing requirements.

#### **h. Service Areas**

Service areas for trauma centers will be finalized after trauma center designation. They will take into account transport times and accessibility, and this will vary depending on which hospitals are designated as trauma centers.

### **E. Trauma System Support Components**

#### **1. System Access**

Identification of trauma victims and access to EMS are significant priorities for the trauma system in Ventura County. It will be an ongoing goal to further evaluate and determine the need for patient evaluation and triage decision making.

#### **2. Public Information and Education**

Ventura County recognizes that public awareness and education are critical to injury prevention. All trauma centers will participate in ongoing need analysis and program development.

#### **3. Prevention**

The ultimate goal of the Trauma Plan is the prevention of injury. VC EMS, in collaboration with system participants, will develop strategies for the establishment and coordination of injury prevention programs in the County.

**Section V****Intercounty Trauma Center Agreements**

The three counties that border Ventura County each have trauma systems with designated trauma centers. Intercounty transfer agreements will be completed with trauma centers in each County.

**A. Los Angeles County**

Los Angeles County has had a trauma system in place for over 20 years and currently designates Level I and Level II pediatric and adult trauma centers. The two adult Level II trauma centers proximate to Ventura County are Northridge Hospital Medical Center and Henry Mayo Newhall Memorial Hospital. Children's Hospital of Los Angeles is designated as a Level I pediatric trauma center.

**B. Santa Barbara County**

Santa Barbara Cottage Hospital is an adult Level II trauma center that also has a pediatric ICU.

**C. Kern County**

Kern Medical Center is a Level II trauma center and may be the most appropriate destination hospital for some trauma patients in the northwest portion of the County.

**Burn Centers**

Burn patients will be transported to the closest trauma center for stabilization and evaluation. Ventura County EMS will negotiate transfer agreements with burn centers.

## Section VI

## Objectives

### A. Overview

The following trauma system components are identified for the Ventura County trauma system:

1. Identification/Access
2. Prehospital Care/Transportation
3. Hospital Care; Definitive Care; Special Care; Interfacility transfer
4. Evaluation
5. Prevention
6. Administration
7. Disaster Preparedness
8. Finance

### B. System Goals and Objectives

The goals and objectives for the Ventura County trauma system are as follows:

#### 1. Identification and Access:

Goal: To improve injury identification and access to the EMS system.

Objective: VC EMS will study the epidemiology of trauma and identify access problems. Absent a functional trauma registry, this has been problematic to date.

#### 2. Prehospital Care/Transportation:

Goal: Assure high quality prehospital treatment and transportation systems for the movement of injured patients.

Objectives:

- a. VC EMS will plan for trauma-specific education of prehospital care providers.
- b. VC EMS will coordinate a resource inventory and needs analysis of prehospital care providers to include:
  - (1) Capacity for trauma patients
  - (2) Equipment
  - (3) Education/training needs

#### 3. Hospital Care:

Goal: Development of a network of acute care treatment and rehabilitation facilities.

Objectives:

- a. VC EMS will complete the RFP materials for the trauma center designation process.
- b. VC EMS will assist with the RFP process for the trauma center application/designation.
- c. VC EMS will contract with appropriate Level II trauma centers.
- d. VC EMS will monitor all participating facilities.
- e. VC EMS will identify necessary specialty center linkages such as:
  - (1) burn centers
  - (2) rehabilitation
  - (3) reimplantation
  - (4) tissue recovery
  - (5) pregnancy
  - (6) pediatrics
  - (7) brain/spinal cord injury

#### **4. Evaluation:**

Goal: To establish a monitoring program designed to assure appropriate access, flow and treatment of the trauma patient and to assist with trauma system refinements.

Objectives:

- a. VC EMS will finalize and fully implement a countywide trauma registry and integrated management information system.
- b. VC EMS will seek participation of trauma centers in neighboring counties.
- c. Ventura County trauma providers will conduct countywide monitoring of trauma system via:
  - (1) Trauma Registry data review
  - (2) Trauma Advisory Committee
  - (3) Internal trauma center audits
  - (4) Focused studies as necessary
  - (5) Annual County staff site visits and surveys
  - (6) Redesignation/site survey processes as needed

#### **5. Injury Prevention:**

Goal: Integrate injury control program standards into the trauma system that are sensitive to the special needs/epidemiology of Ventura County and that are consistent with the County's existing injury programs. Ensure that subsequent prevention activities do not duplicate existing programs.

Objectives:

- a. VC EMS and trauma system participants will study the etiology of injury based on the countywide Trauma Registry and other data sources.

- b. VC EMS and trauma system participants will identify priorities and establish public education and injury prevention goals.
- c. VC EMS will assist in the implementation of injury prevention/education strategies.

**6. Administration:**

Goal: Establish a program of leadership and oversight to facilitate the implementation of the Trauma Plan.

Objectives:

- a. VC EMS will finalize the trauma system plan.
- b. VC EMS will conduct an annual review of the trauma system plan's components, criteria and system configuration.
- c. The Trauma Advisory Committee will provide ongoing system input and direction.

**7. Disaster Preparedness:**

Goal: Integrate disaster/emergency preparedness with the trauma system.

Objectives: VC EMS will evaluate the specific impact of disaster emergency incidents on the trauma system.

**8. Finance:**

Goal: Monitor, evaluate and modify trauma system components as appropriate, based on the financial assessment the trauma system.

Objectives: VC EMS will continue to collaborate with trauma systems Statewide to review financial impacts, to include:

- a. system costs
- b. provider costs
- c. system funding alternatives
- d. provider funding alternatives

## Section VII

## Implementation Schedule

The Trauma Plan will be implemented according to the following Table:

**Table 6: Trauma Plan Implementation Schedule**

**A. Trauma Center Designation**

<u>PLAN IMPLEMENTATION</u>	<u>Date (2008)</u>
<b>Task 1: RFP development</b>	
Draft RFP	1-Jun
Finalize RFP based on comments from Stakeholder Advisory Group	1-Sep
Issue RFP to facilities	TBD
<b>Task 2: RFP process</b>	
Applicants' conference	TBD
Answer questions from applicants during process (written response to all applicants)	TBD
Develop proposal review committee	TBD
Develop list of potential proposal review committee (PRC) members*	TBD
Talk to potential team members	TBD
Proposals due from hospitals	TBD
<b>Task 3: Proposal Review</b>	
First reading of individual proposals	TBD
Committee request for follow up or additional information from applicant	TBD
Review final submissions	TBD
<b>Task 4: Conduct site visits</b>	
Draft letter to team and identify contents of packet for visit	TBD
Pick up team members at airport and provide miscellaneous logistical support during visit	TBD
Attend site visits. Provide staff services.	TBD
Either take team members' individual reports and compile team report or work with team on development of their report	TBD
Distribute draft to team members. Receive and reconcile comments/changes and revise report.	TBD
Finalize team reports	TBD
Designate trauma hospitals based on team reports/recommendations	TBD
<b>Task 5: Contract and workplan development</b>	
Meet with successful applicant(s) to discuss workplan	TBD
Meet with unsuccessful applicant(s), as requested	TBD
Review workplan(s) and make recommendations	TBD
Draft any necessary correspondence with hospitals regarding workplan.	TBD
Complete contracts for final action & signature	TBD
Board Meeting to ratify contracts with designated hospitals	TBD

## B. Injury Prevention

<b>Task 1: Injury Prevention Program</b>	
Meet with Injury Prevention Program directors of each hospital and County	TBD
Prepare Countywide Injury Prevention Plan	TBD

\* Proposal Review Committee is made up of outside trauma experts.

1. A California EMS Agency Director
2. An ACS Representative (Robert C. Mackersie, MD, FACS)
3. A Trauma Program Manager
4. A California EMS Agency Medical Director

## Section VIII

## Fiscal Impact

It is difficult to predict the fiscal impact of this plan on the designated hospitals. Exact costs associated with the plan are not known at this time. However, it is known that all participants will incur costs for additional staff and a Trauma Registry. This section represents estimates available on the fiscal impact to the applying and designated hospitals of developing and implementing a trauma system plan in Ventura County.

Bishop and Associates prepared and presented the “Ventura County Regional Trauma Economic Analysis” in March 2008. This is attached as Appendix L.

The Trauma Plan involves an open application process for designation of Level II trauma centers. This process will require contracting with a custom review team. Costs associated with the designation process will be offset through application fees. Annual trauma center designation fees of approximately \$70,000 per facility will be assessed. This revenue will be used to offset costs for employing a Trauma Nurse Coordinator.

The Ventura County Trauma Plan specifically acknowledges the need to monitor the financial impact of the trauma system. Financial elements in the plan designed to encourage financial stability include:

1. Assisting participant hospitals in identifying and maximizing current reimbursement sources.
2. Establishing an objective for VC EMS to conduct a system-wide study of trauma center cost and reimbursement.
3. Establishing objectives to advocate for further increased reimbursement through County, state and national legislative efforts.
4. Integrating the trauma system with future changes to the healthcare delivery system.
5. Committing to and supporting an ongoing program of injury prevention.

## Section IX

## Policy and Plan Development

**A. Planning Responsibility**

VC EMS is responsible for preparation of the Trauma Plan.

**B. Plan Development Process**

1. A Trauma Advisory Committee (TAC) has been established and has prepared and approved this plan. TAC membership is listed in Appendix H.
2. The Trauma Plan was prepared according to the list of tasks and timeline in the chart below.

**STAGE 1: PRE-PLAN DEVELOPMENT****2007**

<b>Task 1:</b>	
A. Pre-planning	26-Sep
B. Compare ACS vs. State Trauma Guidelines	26-Sep
C. Develop letter of intent for hospitals	26-Sep
D. Decide on designation fee	27-Sep
E. Develop job description for EMSA Trauma Nurse Coordinator	27-Sep
F. Develop job description for data management report writer	26-Sep
G. Identify members of stakeholder group	26-Sep
<b>Task 2: System design</b>	
A. Develop invite letter for Stakeholder Advisory Group	12-Oct
B. Presentation to Board of Supervisors (trauma system planning)	6-Nov
C. Send invite letter to Stakeholder Advisory Group	6-Nov
D. Identify medical resources in community and compare to trauma regulations including TC criteria, inventory of resources, triage criteria, transfer criteria, registry requirements	15-Nov
E. Identify prehospital data elements	15-Nov
F. Meet with key stakeholders in the trauma care system, including hospital administrators, trauma surgeons, emergency physicians, and prehospital managers	15-Nov
G. Develop trauma system design recommendations	15-Dec
H. Select system design concept	1-Jan-08
I. Financial Meeting with Hospital CEOs and Greg Bishop	8-Mar-08

**2008****STAGE 2: PLAN DEVELOPMENT**

<b>A. Public review draft</b>	
Develop Trauma System policies and procedures	12-Jun
Distribute public review draft	12-Jun
Receive comments and organize	23-Jun
Based on comments, revise plan if needed	26-Jun

Distribute second draft of public review draft as needed	7-Jul
Receive comments and organize	7-Jul
<b>B. Stakeholder Advisory Group endorsement of plan (SAG)</b>	
Presentation to SAG	14-Jul
<b>C. Obtain local approval</b>	
BOS meeting/public hearing	9-Sep
<b>D. Submit Plan to EMSA</b>	
Prepare final draft of plan for submission to EMSA	17-Sep
Meet with EMSA staff to discuss plan, as needed.	TBD

## C. Policy Development

### Summary of Related Trauma Policies

Note: Copies of policies are located in Appendices M through T.

### VC EMS Policy 420 – Receiving Hospital Standards

In an inclusive Trauma Plan, each of the hospitals has a defined role. This policy specifies the role and responsibilities of hospitals other than trauma centers.

### VC EMS Policy 729 – Trauma Treatment Protocol

Trauma patients will be evaluated, treated, and transported according to this protocol.

### VC EMS Policy 1203: Criteria for Patient Emergency Transport

General transportation of trauma patients is handled by ground ambulances, helicopter air rescue, and air-ambulance. The decision to transport by helicopter is based on patient condition and a comparison of expected transport times. All transporting units (ground and air) are required to have redundant systems of communication.

### VC EMS Policy 1400: Trauma Care System – General Provisions

#### The Multidisciplinary Nature of Systematized Trauma Care

Ventura County recognizes the multi-disciplinary nature of a systemized approach to trauma care and will adopt policies that ensure all injured patients are taken to the time-closest appropriate hospital.

#### Public Information and Education

Public education and information about the Ventura County trauma care system is accomplished through two mechanisms. The first is through the VC EMS, which coordinates with out-of-hospital providers to facilitate the dissemination of information and training to the community. The second is through designated trauma facilities that are required to provide professional and public outreach programs promoting public awareness and injury prevention.

#### Marketing and Advertising

Ventura County designated trauma centers are required to adhere to local and state laws that govern marketing and advertising.

#### Service Areas for Trauma Hospitals

Ventura County trauma service areas are determined by its EMS policy of transporting all patients who meet trauma triage criteria to the time-closest and appropriate trauma center. This decision is made by the paramedics on the scene who are acutely familiar with local road, access and travel conditions.

#### EMS Dispatching

EMS dispatching for Ventura County is provided for and coordinated through the Ventura County Fire Communications Center and the Oxnard PD center.

#### Training of EMS Personnel

All EMS personnel must meet all State requirements for licensure or certification. Paramedics must be locally accredited, with the process including education on the local trauma system.

#### Trauma Care Coordination and Mutual Aid

Ventura County will execute reciprocity agreements with adjacent EMS jurisdictions. These agreements provide for the seamless provision of out-of-hospital trauma care services regardless of jurisdictional boundaries. Ventura County was, and continues to be, a principal proponent and participant in the State Office of Emergency Services (OES) Region 1 multi casualty incident (MCI) planning and operations. OES Regional MCI operations provide for regional and statewide management and coordination of all patient care services, including trauma. Ventura County participates in the California Conference of Local Health Officers Emergency Care Committee, the California EMS Administrators Association and the California EMS Medical Directors Association. Ventura County also maintains an EMS Home Page, which contains all local EMS/trauma policies and procedures.

#### Interfacility Transfers

As an inclusive trauma system, all hospitals have a role in providing trauma care to injured patients. Trauma centers and other hospitals are required to establish and maintain a transfer agreement with trauma center(s) of higher designation for the transfer of patients that require a higher level of care.

#### Pediatric Trauma Care

Pediatric hospital(s), when applicable, will be integrated into the overall trauma care system to ensure that all trauma patients receive appropriate trauma care in the most expeditious manner possible

#### Coordinating and integration with non-medical emergency services

VC EMS ensures that all non-medical emergency service providers are apprised of trauma system activities as it relates to their agency/organization.

#### Trauma Center Fees

VC EMS has developed a fee structure that covers the direct cost of the designation

process and to effectively monitor and evaluate the trauma care system.

#### Medical Control and Accountability

Medical control and accountability will be maintained in accordance with the California Health and Safety Code, Division 2.5, and the California Code of Regulations, Title 22. The EMS Medical Director is responsible for overseeing all aspects of medical control (prospective, concurrent and retrospective). Ventura County has implemented an extensive list of field treatment protocols to direct the care administered in the field by paramedics and EMTs. The Base Hospital must provide on-line medical control in certain instances. Each ALS provider and Base Hospital must have a continuous quality improvement/assurance program and committee, which are sub-committees to the Ventura County EMS Agency Continuous Quality Improvement Committee. Trauma centers must establish internal quality assurance measures as well as participate in the Ventura County Trauma Review Committee.

#### **VC EMS Policy 1401 – Trauma Center Designation**

Trauma centers will meet the listed criteria and will be designated according to these standards.

#### **VC EMS Policy 1402: Trauma Review Committee**

Quality control and system evaluation is provided in accordance with State statute/regulation and local policies, which are appended to this plan. VC EMS will conduct periodic reviews of trauma-related records and perform specific evaluations of individual component and system-wide activities.

#### **VC EMS Policy 1403: Trauma Hospital Data Elements**

This program document identifies data elements and establishes the reporting requirements for the designated trauma centers.

#### **VC EMS Policy 1405: Trauma Patient Destination**

Critical and non-critical trauma patients will be transported to the closest appropriate facility. Base Hospitals may participate in destination decisions.

## Section X

## Written Local Approval

On November 15, 2007, VC EMS invited interested parties to a meeting to discuss the trauma care system and the planning process. Questions were answered and input was received which helped VC EMS begin the planning process. This was a lengthy process. Much time and energy was spent evaluating our current system.

A first draft of the plan was distributed on June 12, 2008. Written comments were received and suggested changes were put in place. Additional written comments were received from others who did not attend the meeting.

A second draft of the plan was then developed and distributed to interested parties. The trauma workgroup met and reviewed the document. Additional written and verbal comments were received from others who did not attend the meeting.

Based on the comments received on the third draft and follow-up discussions, a final draft was developed and distributed to interested parties. The public hearing meeting was publicized through the local media and the draft and notice of the public hearing were distributed to interested parties within Ventura County. Individuals who received the notice and the draft included:

1. Hospital administrators
2. Ambulance service administrators
3. Base hospital medical directors
4. County Board of Supervisors
5. City managers
6. County Sheriff
7. County and city fire chiefs; city police chiefs
8. County Coroner
9. Ventura County Medical Association
10. The Healthcare Association of Southern California

Additional comments were incorporated into the Plan. It was reviewed and additional revisions recommended. Public hearings were held on TBD in TBD. Following public comments, the Plan received Board approval on TBD (Appendix K).

## Section XI

## Data Collection

### Ventura County Trauma Registry

#### A. Overview of County Trauma Registry

A Ventura County Trauma Registry will be established and will include pre-hospital and trauma registry data from all participating facilities.

Data will be entered into the participating facility's Trauma Registry data base and then system information will be transferred electronically (format specified by the County) to VC EMS. The Trauma Registry at the trauma centers will identify "red flags" for review by the Trauma Advisory Committee and produce annual trauma system reports.

#### B. Data Elements

VC EMS shall require the collection, analysis, and regular presentation of specific trauma care data by each trauma center and will comply with State regulations. VC EMS shall collect and analyze trauma data for the purposes of system evaluation and audit. The data will be collected using a standardized data collection instrument which will be compatible with a State registry if and when applicable.

The system shall include the collection of both prehospital and hospital patient care data as determined by VC EMS and the Trauma Review Committee based on the Centers for Disease Control national standard data set.

Data collected by trauma system participants will be in a format and fashion dictated by State EMS regulations and local Ventura County procedure. Data will be submitted to VC EMS on a regularly scheduled basis.

##### 1. Pre-hospital

Data elements collected during the pre-hospital stage will include normal patient identification, times, operational and treatment information as previously identified on the paramedic care report. Data specific to the trauma system includes physiologic scoring and other clinical signs as appropriate to determine the injury severity.

##### 2. Hospital

Data elements collected during the hospital stage will include patient demographics, times, operational and treatment information including complications specific to the trauma system monitoring and review.

#### C. Trauma Registry System Reports

Reports from the Trauma Registry will include:

1. Excess time on the scene

2. Geographic incidence of trauma
3. Total number of trauma victims in the system
4. Total number of trauma victims by month of year and day of week
5. Total number of trauma victims by time of day
6. Delay prior to surgery
7. Transfers to Level I, II trauma centers and other specialty care centers
8. Diagnosis, disposition and final disposition by triage criteria

Additional reports may be deemed necessary for comprehensive system review. That determination will be made by the VC EMS and the Trauma Review Committee.

## Section XII

## Trauma System Evaluation

### A. Evaluation Overview

Coordination of the overall trauma care system evaluation process is the responsibility of the Ventura County EMS Agency. Quality trauma care depends on having all the necessary system components in place and functioning. These components range from the pre-response phase to rehabilitation. The failure of one of these components can result in a failure for the trauma care system. Each component should be evaluated separately - as well as in the context of the entire system. Problem areas in any of the components must be identified and corrected. The evaluation process serves to validate the effectiveness of the local trauma care system.

### B. Data Collection for Trauma Care System Evaluation

As described in a previous section, the periodic performance evaluation of the trauma care system includes, but is not limited to, a review of the following:

- I. System design
2. Adequacy of out-of hospital care, at least in so far as can be determined by:
  - a. Out-of-hospital time, including:
    - (1) Response times to scene
    - (2) Accuracy of triage
    - (3) Appropriateness of out-of hospital care, including type and amount of intervention
    - (4) Time at scene
    - (5) Out-of-hospital transport time
  - b. Appropriateness of receiving hospital selection
  - c. Patient status upon delivery to receiving hospital
3. Verification that designated trauma care hospitals are fulfilling their trauma care system responsibilities
4. Hospitals, including:
  - a. All trauma team activations and specialist notifications
  - b. Surgical intervention, times and procedures
  - c. SICU information
  - d. Rehabilitation information
  - e. All trauma-related deaths at designated trauma care hospitals
  - f. All patient transfers with regard to their appropriateness and patient outcome
  - g. Overall management of selected major trauma patients

The audit and evaluation may include the following:

1. Review of all trauma-related deaths
2. Annual performance evaluation

3. Measurement of patient outcome versus triage criteria and injury severity
4. Review of applicability of trauma triage criteria

## **C. Trauma Center Continuous Quality Improvement**

A key element in a trauma care system plan is the monitoring and evaluation component. It is imperative that a system be able to monitor its own performance over time and to assess its impact on trauma mortality and morbidity. This requires a plan for continuous evaluation of operations, demonstration that the system is meeting its stated goals, and documentation of system performance. The Trauma Continuous Quality Improvement process has been designed to assure these goals are met. The process is multifaceted in design, and includes the following components:

### **1. Data Collection**

As described in the previous section of this plan, certain data elements from the hospital registry are downloaded to the system registry maintained by VC EMS for overall monitoring of the system. Specific patient and physician identifiers are stripped from the data to assure confidentiality. The Trauma Registry contains the recommended minimum data as set forth by the Centers for Disease Control, as well as those elements required pursuant to California Code of Regulations, Title 22, Section 100257. The hospital component of the Trauma Registry incorporates details from injury through discharge. VC EMS is accountable for regular ongoing analysis and interpretation of the trauma data. The Agency provides ongoing feedback through regular reporting of trauma care system activities and outcomes to the population it serves. Protocols are designed to assure the confidential reporting of the data and to allow access to the data for research.

### **2. Trauma CQI**

The goal for the CQI process is to monitor the process and outcome of trauma patient care and to document appropriate and timely provision of care according to established standards of care. All hospitals are required to participate in a Trauma CQI process. In order to implement an effective process, the following key components shall be addressed by the CQI plan submitted by each applying facility.

- An organizational structure that facilitates the process of quality improvement.
- Clearly stated goals and objectives of the quality improvement plan.
- The development of standards of care
- A process to delineate surgical privileges for surgeons providing trauma care.
- Participation in the Trauma Registry.
- Establishment of quality indicators (audit filters). The plan must include, at a minimum, the audit filters recommended by the ACS and the Joint Commission. The plan should define adverse outcomes by using an explicit list of well-defined complications.

- Establishment of a systematic informed peer review process utilizing a multi-disciplinary method including out-of-hospital care providers,
- A process for incorporating autopsy information on trauma patient deaths. A complete diagnosis of injury is essential to the quality of trauma care.
- The facility plan that includes a method for computing survival probability and comparing patient outcomes. The standard outcome tool, Trauma Revised Injury Severity Score (TRISS) method may be utilized.

#### **D. Multi-Disciplinary Trauma CQI Committee**

A multi-disciplinary Trauma CQI Committee will be established to review certain potential problem cases and system issues identified through the system registry. This committee will be composed of representatives of all chiefs of trauma services; chiefs of emergency services; trauma nurse coordinators; Base Hospital Prehospital Care Coordinators; out-of-hospital providers and VC EMS staff and will be chaired by the VC EMS Medical Director.

Meetings will be conducted in accordance with §1040 of the Government Code and §1157.7 of the California Evidence Code. All members of the committee will be required to sign an agreement to maintain the confidentiality of patient specific information.

The committee will be responsible for establishing the audit criteria for cases to be brought to the committee. Each case reviewed by the committee will have a finding of appropriateness of care rendered and, where appropriate, recommendations made for changes.

VC EMS will require trauma centers to collect data on all patients received by that facility who meet trauma triage criteria. This data will be compiled and transmitted to the VC EMS where the system trauma registry is maintained. Audit filters will be applied to the Trauma Registry to study the frequency and/or effectiveness of specific procedures and monitor general system performance.

VC EMS will reciprocate in the coordination of data with other county/regional trauma review committees when trauma patients are transported across jurisdictional boundaries.

#### **E. Periodic Trauma System Evaluation**

Every two years VC EMS will conduct a performance evaluation of the trauma system. This will involve all hospitals, trauma centers, prehospital providers, and other system participants.