CALIFORNIA STATEWIDE TRAUMA PLANNING

ASSESSMENT AND FUTURE DIRECTION

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September 2006

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PURPOSE OF REPORT

This report analyzes current trauma care in California and makes specific recommendations to address limitations. This is the first such assessment of trauma care in our state.

Although the Emergency Medical Services Authority (EMSA) and the Trauma Advisory Committee have been evaluating trauma care in our state for over two years, in 2005 Governor Schwarzenegger requested a report as part of his veto message on SB-266:

> "…*I am directing EMSA, informed by its Trauma Advisory Committee, to complete its statewide trauma care plan…*"

This report completes the EMSA's assessment of trauma care in California and makes recommendations as requested by Governor Schwarzenegger.

PROJECT APPROACH

EMSA and the Trauma Advisory Committee reviewed and analyzed information related to current trauma care in the state, including statutes and regulations, national standards and guidelines, trauma care costs and losses, and national trauma and emergency care reports, and developed recommendations for a statewide system. This project consisted of five phases:

1. Review of Current Trauma Care in California

Over the past two years, EMSA and the Trauma Advisory Committee (Appendix A) have reviewed regulations and statutory authority to determine how trauma care is delivered in California. In addition, this review considered how the local optional system for trauma care delivery in California was developed, and the limitations of that development approach.

2. Analysis of National Standards for Trauma Care Delivery Systems and How they Relate to California's Trauma Care Needs

EMSA and the Trauma Advisory Committee evaluated trauma care against two different U.S. Department of Health and Human Services, Health Resources and Services Administration's (HRSA) benchmarks.

> *Health Resources & Services Administration (HRSA) - the primary Federal agency for improving access to health care services for people who are uninsured, isolated or medically vulnerable.*

- EMSA used the HRSA bioterrorism trauma surge capacity recommendations as a guideline to assess California's readiness related to critical trauma care surge capacity in the event of a moderate traumatic disaster (e.g., explosive device in crowded area or earthquake with occupied structure collapse).

- In addition, EMSA and the Trauma Advisory Committee used the "2006 HRSA Model Trauma System Planning and Evaluation" assessment tool to evaluate how California provides trauma care based upon the national standards set forth in the document. The document was developed by a group of national experts with input from each state, including California. Guidelines were designed to provide trauma care professionals and health policy experts with direction in developing integrated statewide trauma systems focused on a public health model for injury prevention and disability mitigation after injury. The document includes core functions with benchmarks and indicators for planning a statewide trauma system. EMSA and the Trauma Advisory Committee scored each indicator as it relates to trauma care in California (Appendix B). The difference between the score (which reflects the current status) and the goal shows the gap in the current system. The committee then reviewed the scores and divided the results into short, intermediate, and long

term goals. Although all components of the assessment are important, because it is so comprehensive, this stratification of implementation was determined to be a more manageable approach to implementation of trauma care improvements.

3. Review of Trauma Care Costs in California

To quantify trauma center costs and losses, EMSA worked with the California Hospital Association which surveyed all the trauma centers in California. Responses were received from 34 of the 65 trauma centers in the state (53 percent) and represented approximately 43 percent of the patients in Northern California, 67 percent in Central California, and 63 percent in Southern California. Because of stated hospital confidentiality concerns, CHA only provided EMSA with aggregate numbers by trauma center level, the average and median annual figures to operate the trauma center, total hospital estimated trauma center losses, and per patient figures. EMSA was unable to determine if the costs, estimated losses and per patient figures reflect actual costs or billable charges.

4. Review of the 2006 IOM Report on the Future of Emergency Care in the United States Health System

EMSA reviewed the 2006 Institute of Medicine (IOM) Report: "The Future of Emergency Care in the United States Health System." The report, released in June 2006, is the first comprehensive look by the IOM at hospital based emergency and trauma care, emergency medical services, and emergency care for children. EMSA used some of the report's findings in making recommendations contained in this plan.

5. Development of Recommendations for a California Statewide Trauma System

Based on the review and assessment, EMSA and the Trauma Advisory Committee identified gaps in the current delivery of trauma care and proposed solutions to prioritize and address the most significant gaps.

HISTORY AND BACKGROUND

What is Trauma?

For the purposes of this report, the trauma patient is a seriously injured person who requires timely diagnosis and treatment of actual or potential injuries by a multidisciplinary team of health care professionals, supported by the appropriate resources, to diminish or eliminate the risk of death or permanent disability.[1]

What is a Trauma System?

A trauma system is an organized, coordinated effort in a defined geographic area that delivers the full range of care to all injured patients and is integrated with the local medical and public health systems. The true value of a trauma system is derived from the seamless transition between each phase of care (pre-hospital, hospital, and rehabilitation), integrating existing resources to achieve improved patient outcomes. Injuries occur across a broad spectrum and a trauma system must determine the appropriate level of care for each type of injury.[1]

Trauma systems may be regionalized, making efficient use of limited health care resources. Trauma systems are based on the unique requirements of the population served, such as rural, inner-city, urban, or Native American communities. Trauma systems emphasize preventing injuries in the context of community health. Statewide trauma systems allow for seamless and effective care of patients across political boundaries, with the ability to expand to meet the medical needs of the community from a human-made or natural disaster.

National Efforts in Trauma System Development

In 1966, the 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 emergency medical services (EMS) and trauma care.

Trauma is the primary cause of death for people ages 1-44, regardless of gender, race, or economic status. Injuries, both unintentional and those caused by acts of violence, are among the top ten killers for Americans of all ages (Appendix C). Trauma results from motor vehicle collisions, falls, burns, stabbing and gunshot wounds, or other blunt or penetrating forces. Trauma is also caused by the most common form of terrorist attack – the improvised explosive device (IED).   Trauma can affect any one at any time. With motor vehicle collisions being one of the most common causes of traumatic injury, a trip to work, a ball game, or even a vacation

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[1] 2002 Trauma System Agenda for the Future. U.S. Department of Transportation, National Highway Traffic Safety Administration

destination can become a life-altering event, resulting in lost productivity, lost quality of life, and lifelong pain or disability, or even death.

The cost of all trauma in the United States is estimated at more than $224 billion each year. These costs include direct medical care, rehabilitation, lost wages and lost productivity. The federal government pays about $12.6 billion each year in injury-related medical costs and about $18.4 billion in death and disability benefits. Insurance companies and other private sources pay about $161 billion.[2] These costs are associated with all types of trauma that may or may not have required trauma center level care. The Sierra Sacramento Valley EMS Agency estimated the costs of trauma care for patients seen in California's trauma centers range between $136 and $183 million per year.[3]

The Trauma Care Systems Planning and Development Act was developed in response to a 1986 General Accounting Office Report (GAO/HRD-86-132) that found that severely injured individuals in a majority of both urban and rural areas of the United States sampled were not receiving the benefit of trauma systems, despite considerable evidence that trauma systems improve survival rates. A subsequent report in 1999 by the Institute of Medicine (IOM), "Reducing the Burden of Injury," called on Congress to "support a greater national commitment to, and support of, trauma care systems at the federal, state, and local levels." An estimated 20-40 percent of deaths due to severe injury could be prevented if all Americans lived in communities that are organized to transport severely injured patients promptly to an area hospital that is staffed and equipped to provide expert trauma care.

Multi-system trauma – injury to more than one body system, (e.g. orthopedic, cardiac, pulmonary, renal, neurologic) usually deemed serious.

Literature indicates that survival of multi-system trauma patients is greatly increased if they are brought to definitive surgical intervention within what has become known as "The Golden Hour." This is the one-hour time period from injury to specialized trauma care – only 60 minutes from the moment of injury to call 9-1-1, dispatch an ambulance to the scene, transport the victim to a hospital, summon the appropriate surgical and support staff, and perform necessary life-saving surgery.

While an emergency department (sometimes referred to as an emergency room) is responsible for providing medical and surgical care to patients arriving at the hospital in need of immediate care, trauma centers maintain a higher level of service than a basic emergency department for victims of multi-system trauma. These services are provided 24 hours per day, 7 days per week, year-round. Operating rooms, surgical intensive

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[2] National Center for Injury Prevention and Control (2001). Injury fact book 2001-2002. Atlanta, GA. Centers for Disease Control and Prevention. Retrieved on August 24, 2005, from http://www.cdc.gov/ncipc/fact_book/factbook.htm. Centers for Disease Control and Prevention (2004). Medical expenditures attributable to injuries – United States, 2000. Morbidity and Mortality Weekly Report, 43(01), 1-4.
[3] Sierra-Sacramento Valley Emergency Medical Services Agency, California's Trauma Care: In Crisis (2001)

care units, anesthesia, surgical recovery, and a multidisciplinary team of highly trained physicians and support staff are available to respond at a moment's notice. Without this organized system of emergency trauma care, it is easy to imagine how that Golden Hour could tick away before each life-saving element of the trauma scenario could be completed.

The American College of Surgeons (ACS) and its Committee on Trauma championed the development of trauma centers and trauma systems with the development of "Resources for Optimal Care of the Injured Patient". In 1976, the ACS first published this document that provides guidelines for the hospital and pre-hospital resources necessary for optimal trauma care. These guidelines describe in detail the qualifications and level of commitment required of hospitals, medical and surgical personnel, and local communities to provide high-quality trauma care. The ACS guidelines have been adopted by state and regional trauma systems throughout the nation; studies have shown that systems employing these standards have significantly reduced preventable deaths due to injury.

Multidisciplinary Team – Includes a trauma surgeon, emergency physician, anesthesiologist, other medical and surgical specialists, nursing, radiology, laboratory, operating suites, and ancillary services

The ACS Committee on Trauma, along with the Coalition for American Trauma Care, commissioned Harris Interactive to conduct a public opinion poll on the public's awareness, knowledge, and perception of the importance of trauma care and trauma systems of care. Interviews with 1,000 randomly dialed individuals were conducted November 3-14, 2004 and the results were released during a Congressional Briefing on March 2, 2005. Some of the key findings are as follows:

- Most Americans do not recognize injury as the leading cause of death for ages 44 or younger.
- Almost all Americans feel it is extremely or very important to be treated at a trauma center in the event of a life-threatening injury.
- Almost all Americans feel it is extremely or very important for their state to have a trauma system.
- The majority of Americans feel having a trauma center nearby is equally as important as, or more important than having a fire department or police department.
- Significant majorities of Americans feel that having a trauma system in place is equally important as, or more important than having HAZMAT teams or state police.
- A significant majority of Americans would be extremely or very concerned if they learned the trauma system in their state did not meet recognized standards of care.

In 2002, the American Trauma Society, supported by the U.S. Department of Transportation, National Highway Traffic Safety Administration, issued the Trauma System Agenda for the Future. This report noted that:

Trauma systems, when fully implemented throughout the U.S., will enhance community health through an organized system of injury prevention, acute care and rehabilitation that is fully integrated with the public health system in a community. Trauma systems will possess the distinct ability to identify risk factors and related interventions to prevent injuries in a community, and will maximize the integrated delivery of optimal resources for patients who ultimately need acute trauma care. Trauma systems will address the daily demands of trauma care and form the basis for disaster preparedness. The resources required for each component of a trauma system will be clearly identified, deployed and studied to ensure that all injured patients gain access to the appropriate level of care in a timely, coordinated and cost-effective manner.

Data from the New England Journal of Medicine's January 26, 2006 article, "A National Evaluation of the Effect of Trauma-Center Care on Mortality," suggested that trauma centers are the difference between life and death. It concluded that:

Our findings show that risk of death is significantly lower when care is provided in a trauma center than in a non-trauma center and argue for continued efforts at regionalization.

The report found that the overall risk of death was 25 percent lower when care was provided at a trauma center. Coordinated trauma care systems are critical to saving lives because they are the front line response for all disasters, local or large scale.

According to the 2006 IOM Report on emergency care, Americans count on the EMS system to respond with timely and high quality care. Trauma systems represent an impressive achievement. They are a critical component of the emergency care system since approximately 35 percent of ED visits are injury-related, and injuries are the number one killer of people between the ages of 1 and 44. Yet according to the IOM, the development of trauma systems has been inconsistent across states and regions.

An organized trauma system is not only essential to deliver trauma care to seriously injured patients; it is also the foundation for disaster and terrorism readiness. Historically, the overwhelming majority of all human-made disasters or incidents of terrorism has involved explosives and has resulted in large numbers of people with life and/or limb threatening injuries (multi-system trauma). Though future acts of terrorism may include the use of other less conventional weapons of mass destruction (chemical, biological or radiological), they will most likely continue to involve the use of explosives. In light of this experience, disaster medical response is best provided through an extension of existing resources within a statewide trauma system. As demonstrated by recent catastrophic events such as 9-11, Hurricane Katrina, and the state of emergency declared in California because of the precarious levee system, emergency preparedness must include a strong trauma system infrastructure that will deal with daily injuries and have the capacity to efficiently expand (surge capacity) to respond to the demands of an unconventional or natural disaster of greater magnitude.

Development of California's Trauma System

In California, state EMS leadership began in 1980 when state law added Division 2.5 of the Health and Safety Code that established the Emergency Medical Services Authority. During this period, some local EMS agencies such as Los Angeles, Orange, San Diego, and Santa Clara established local trauma care systems. In 1983, Article 2.5 Regional Trauma Systems was added to the Health and Safety Code to allow, but not require, development of local trauma care systems; therefore, California is based upon a series of local, optional trauma care systems. In September 1986, trauma care regulations (California Code of Regulations, Title 22, Division 9, Chapter 7 -Trauma Care Systems) were promulgated to provide minimum standards for local trauma systems and locally designated trauma centers. These regulations were updated in August 1999 to reflect current standards based on the American College of Surgeons 1999 version of "Optimal Resources for the Care of the Injured Patient".

California Legislative Activities

In 1987, the Assembly Office of Research described California's trauma care system as being in a medical and financial emergency, pointing to financial losses experienced by trauma centers and a need to financially stabilize trauma care systems. Some hospitals, particularly in Los Angeles, had dropped their trauma center designation, citing financial losses. Since then, the closure or threatened closure of trauma centers in several areas of the state resulted in media attention and policy initiatives to increase state subsidies or develop alternative funding sources. Physicians and hospitals indicated that the root problem of the emergency and trauma care issues was the high level of uncompensated care. They believed that appropriate funding for trauma centers would ensure continued operation of existing trauma centers and lead to the establishment of new trauma centers. By keeping trauma centers viable, stresses on emergency departments would not be exacerbated. Over the years, several legislative proposals to provide funding for trauma care have surfaced. Many failed, but some were successful in providing funding for uncompensated care or one-time funding for trauma as indicated below:

Maddy Fund: The Legislature enacted Chapter 1240, Statutes of 1987, allowing counties to establish a Maddy Emergency Medical Services Fund (Maddy Fund) to compensate health care providers (hospitals and physicians) for emergency services for the uninsured and medically indigent and to ensure the population has continued access to emergency care. Maddy Funds are financed through additional penalties assessed on certain criminal and motor vehicles fines and forfeitures ($2 per $10 fine). Although this funding does not specifically provide for trauma care, it can be used for uncompensated emergency care reimbursements.

AB 430: AB 430 (Cardenas, Chapter 171, Statutes of 2001), created the Trauma Care Fund and a formula for distribution of funds to local EMS agencies for designated trauma centers.

- In fiscal year 2001/02, $25 million was provided for trauma center funding. Additionally, $2.5 million was provided for planning and implementing trauma care systems for local EMS agencies without a trauma system plan. Trauma plans detail how local EMS agencies will care for their trauma patients and are required for trauma center designation.

- In fiscal year 2002/03, $20 million was provided for trauma center funding.

- In fiscal year 2005/06, $10 million was provided for trauma center funding.

The state has experienced significant progress since this funding has been made available. Since 2001, 20 new trauma centers have been designated throughout the state, predominantly in the rural areas, and 9 new local trauma care systems have been developed in Tulare, Imperial, Mountain Valley Region (includes Alpine, Amador, Calaveras, Mariposa, and Stanislaus Counties), North Coast Region (includes Del Norte, Humboldt, and Lake counties), San Benito, San Joaquin, San Luis Obispo, Santa Cruz, and Tuolumne. These systems are in various stages of implementation. The following chart illustrates how funding was allocated for the previous funding cycles.

Trauma Center Funding

LOCAL EMS AGENCY TRAUMA CENTERS	Total Allocation FY 2001/02	Total Allocation FY 2002/03	Total Allocation FY 2005/06	LOCAL EMS AGENCY TRAUMA CENTERS	Total Allocation FY 2001/02	Total Allocation FY 2002/03	Total Allocation FY 2005/06
Alameda	$1,679,578	$1,072,046	$441,069	Nor Cal	$485,151	$611,846	$227,966
Coastal Valleys	$450,592	$329,107	$275,959	Orange	$1,612,892	$1,188,128	$723,117
Contra Costa	$648,175	$418,040	$239,606	Riverside	$1,568,344	$1,031,320	$633,220
Central California	$564,576	$634,987	$430,325	Sacramento	$1,853,334	$1,451,404	$693,569
Imperial	$0	$0	$48,709	San Diego	$4,900,196	$2,782,223	$1,418,836
Inland Counties	$219,702	$1,487,145	$700,195	San Francisco	$938,085	$587,035	$240,860
Kern	$75,750	$588,150	$252,142	Santa Barbara	$405,167	$329,815	$212,387
Los Angeles	$7,223,611	$5,550,841	$2,194,423	Santa Clara	$1,494,068	$1,038,759	$511,984
Marin	$130,450	$206,974	$67,692	Sierra-Sacramento Valley	$470,330	$412,180	$211,491
Mountain Valley	$0	$0	$196,449	GRAND TOTALS	$24,720,001	$19,720,000	$9,719,999

Current Status of Trauma Care in California

The EMS Authority is the state department responsible for developing statewide standards for <u>local</u> trauma care systems and trauma centers; providing coordination and leadership for the planning, development and implementation of trauma care systems; and reviewing and approving <u>local</u> trauma care system plans. Over 54,000 patients were admitted by trauma centers in the state for 2005, not including patients cared for at hospitals that are not trauma centers.

<u>Trauma Planning</u>: The state is divided into 31 local emergency medical services agencies (LEMSA) (24 single-county, 7 multi-county agencies). LEMSAs plan, implement and manage <u>local</u> trauma systems based upon state regulations; but are not mandated to do so. Local trauma plans are submitted to EMSA for review and approval. Plans outline local trauma systems including number and level of trauma centers and patient destination, but do not necessarily address inter-county needs. Currently, 28 of 31 local EMS agencies have approved trauma plans and one (Monterey) has a plan in the approval process. Solano and Ventura Counties have not submitted plans despite repeated attempts by EMSA to encourage them to do so. LEMSAs are in varying stages of plan implementation. Following is a map showing all of the LEMSAs in California and the status of their trauma planning efforts.
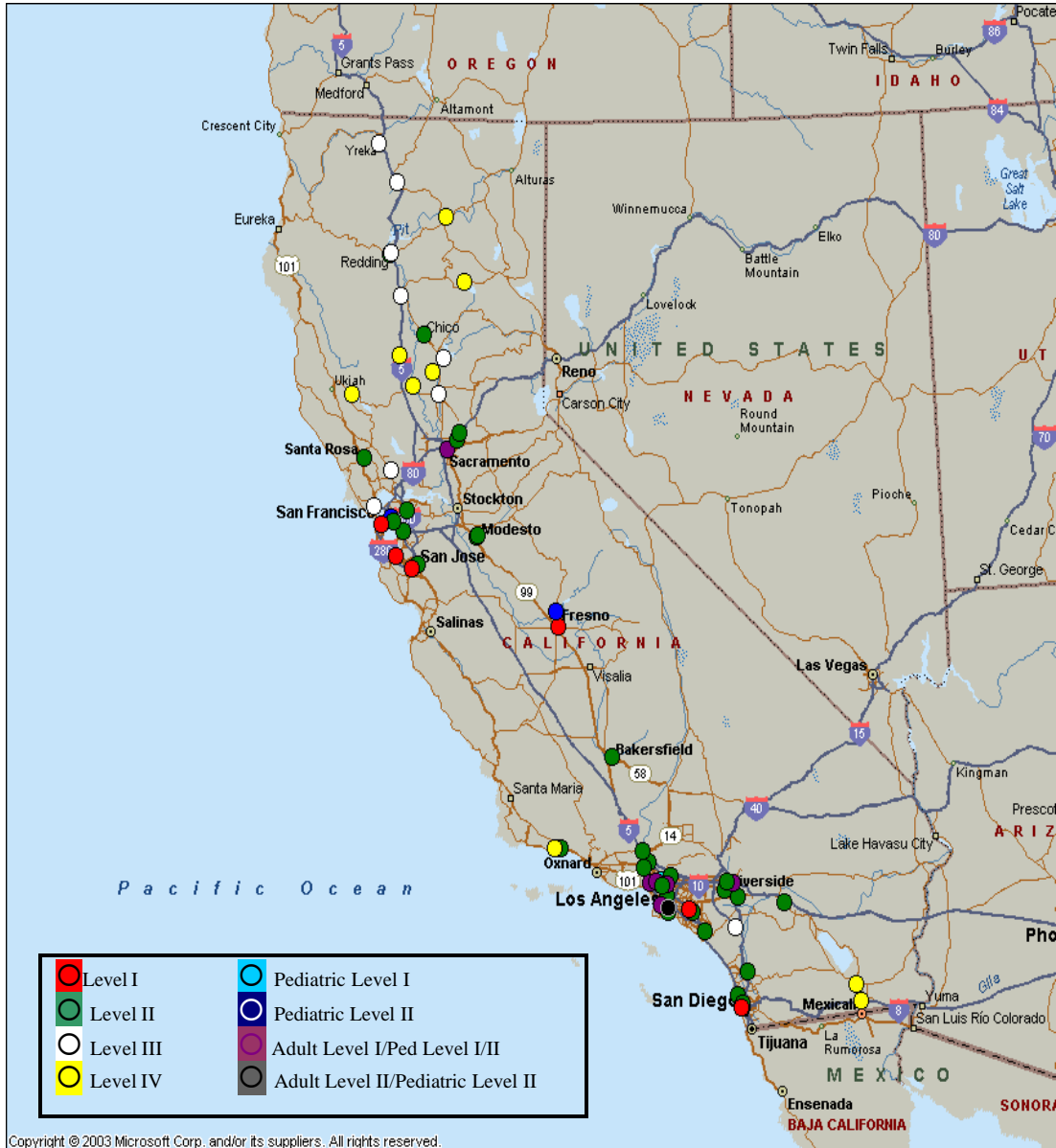

CALIFORNIA TRAUMA PLANS

**Approved Trauma Plans
28 plans = 55 counties**

**No Plan
2 LEMSAs = 2 counties**
(Solano, Ventura)

Pending = 1 (Monterey)

Trauma Centers: LEMSAs may designate trauma centers that meet state trauma regulation requirements. The designation process is locally controlled and may include a hospital site visit by the American College of Surgeon's Verification Review Team or teams developed by the LEMSA consisting of trauma care experts. Contracts are developed between the LEMSA and the trauma center and compliance is monitored by the LEMSA periodically. Trauma center designations include Levels I – IV and Pediatric Levels I and II. Level I and II trauma centers (including Pediatric Trauma Centers) have the greatest number of specialty personnel, services, and resources. Level I trauma centers are also research and teaching facilities. Level III trauma centers provide surgical service for patients with less critical injuries who do not need immediate surgery. Level IV trauma centers generally provide initial stabilization of trauma patients with secondary transfer to a higher level of trauma center care when appropriate. There are 65 designated trauma centers throughout the state (see the chart below for breakout of type of centers).

While most counties have trauma care plans and there are trauma centers throughout the state, access to trauma centers in many areas including North Coast, Central Valley, and East Sierra is extremely limited with long transport times, even by air, of one to three hours from the time of injury.

Trauma Centers in California

Note: A list of the state's trauma centers is located in Appendix D.

Level	Adult	Pediatric
I	7	4
II	29	7
III	9	-
IV	9	-

➡ *Level I and II trauma centers may also have pediatric capabilities.*

➡ *For more details see Appendix D.*

TRAUMA MODEL AND VISION

The vision for California is to develop a statewide inclusive trauma system that ensures rapid access to care for all individuals within one hour following major injury. The system focuses on prevention, quality care improvements and rehabilitation to return injured individuals to a productive life. The system is informed by data for policy decision making, and is supported by ongoing funding.

As with all areas of medical care, trauma care models have evolved. In 1992, HRSA developed a "Model Trauma Care System Plan" that emphasized the need for a fully inclusive trauma care system, one that involved not only trauma centers, but all health care facilities according to availability of trauma resources. The concept of the fully inclusive trauma care system advanced the idea that trauma care should be community-based rather than trauma center based, and planned for all populations, incorporating the unique needs of children, elder persons, and those with special health care needs and cultural considerations. This concept was also described in the 2006 revision of the HRSA document entitled, "Model Trauma System Planning and Evaluation" that was one of the tools used to assess California's delivery of trauma care. In addition,

> *Inclusive trauma system - uses all available hospital resources to ensure rapid access to trauma care for all injured patients regardless of their geographic location, and will increase surge capacity in a traumatic disaster. The trauma center remains the key component in this system; however, facilities are matched with a patient's needs. Most hospitals with emergency departments and surgical facilities play a role in an inclusive trauma system, not just designated trauma centers. An inclusive trauma system recognizes the full spectrum of injury as a disease epidemic, includes prevention, and does not focus solely on the most seriously injured patient but the needs of a wider range of injured patients.*

the vision described by the American Trauma Society and the components outlined by the American College of Surgeons all correspond to and were considered in establishing California's trauma system vision.

The American College of Surgeons has identified the major components of an inclusive statewide trauma system as follows:

Administrative Components
- Leadership - an identified lead agency with the authority, responsibility and resources to lead the development, operations, and evaluation of the trauma system
- System Development – a defined planning process for trauma system development
- Legislation – statutes and legislation to provide the legal authority for trauma system development
- Finance – financial accountability

<u>Operational and Clinical Components</u>
- Injury Prevention and Control – includes prevention and rehabilitation in addition to acute care
- Human Resources
  - Workforce – evaluate the adequacy of human resources available to support normal system activity
  - Education – education for all levels of trauma care personnel, both hospital and prehospital
- Prehospital Care
  - EMS Agency – identify an agency that is responsible for prehospital care
  - Ambulance and Non-Transporting Medical Unit Guidelines – regulations, medical control, and geographic boundaries for prehospital medical units
  - Communication System – fully integrated with EMS and emergency/disaster preparedness systems
  - Emergency/Disaster Preparedness Plan – fully integrated with EMS system, local government, private sector and acute care facilities
- Definitive Care Facilities
  - Trauma Care Facilities – uniform standards for trauma center designation; identified role and responsibilities for other acute care facilities
  - Interfacility Transfer – development of policies and procedures for appropriate and expeditious transfer
  - Medical Rehabilitation – coordinated post acute care for trauma patients with permanent or long-standing impairments
- Information System – timely collection of data from all providers in the form of consistent data sets with minimum standards
- Evaluation – monitor the performance of the system components
- Research – trauma related research to include epidemiologic research in prehospital care, acute care, rehabilitation and prevention

In addition, the American College of Surgeons Committee on Trauma's "Resources for Optimal Care of the Injured Patient" document provides detailed descriptions of the organization, staffing, facilities, and equipment needed to provide state-of-the-art treatment for the injured patient at every level of trauma system participation.

FINDINGS

There are many challenges for California related to trauma care, including the vast geographic area of the state, variations in terrain, population density, diverse EMS cultures, weather, resources, hospital and health facility locations, and the decentralized nature of EMS in the state. These factors make trauma system implementation complex. Below are findings based upon analysis of the current trauma care in California, trauma surge capacity, and the HRSA assessment.

Expert Review of Current Trauma Care in California

The current trauma care delivery system is an <u>optional, locally based, decentralized trauma system as prescribed in the Health and Safety Code.</u> Therefore, trauma care throughout the state is highly variable, and transportation and access issues exist, particularly across political boundaries. Without a statewide system for data reporting, the amount and type of variance is unknown. The issues listed below illustrate some of the variance and describe some of the transportation and access issues.

<u>Local System Inconsistencies:</u> The following are examples of how local systems can vary, ranging from those with an established trauma system, those that have trauma plans but no designated trauma centers, to those without a formal plan to care for critical trauma within their geographic boundaries.

- Los Angeles and San Diego Counties have well-established trauma systems that began in the early 1980s with numerous designated trauma centers.

- San Mateo County has a coordinated trauma system without a designated trauma center, but utilizes out-of-county trauma centers.

  > *Trauma plan - written by the local EMS agency, approved by the EMS Authority and includes policies and/or procedures to assure compliance of the trauma system with the state trauma regulations.*

- San Benito and Imperial Counties have approved trauma plans but have not formally implemented their trauma system due to difficulties with neighboring counties accepting trauma patients across county lines.

- Solano and Ventura Counties have no approved trauma care system plan. Without a plan, it is difficult to know how trauma care patients are being cared for.

<u>Limited Access and Transportation:</u> Difficulties in obtaining trauma care, particularly in rural California arise, due to limited access and transportation issues. Information obtained from local trauma plans illustrates some of these difficulties:

- Tulare County's 2002 data reports showed that 1,328 trauma patients were transported from the county with transport times ranging from ten minutes to two hours. Air ambulances are a major tool in transporting patients in rural areas where transportation times are lengthy. There is no air ambulance servicing Tulare County so most trauma patients are secondarily transferred to trauma centers from local hospitals. Ground ambulances must transport patients to the airport because local hospitals have no heliport. Most trauma patients are secondarily transported to University Medical Center in Fresno.

- Imperial County has no intercounty agreement for the transport of trauma patients from the field to either San Diego or Riverside County. Nineteen percent of trauma is critical and secondarily transferred from the closest hospital (Imperial County has two level IV trauma centers) to San Diego or Riverside County trauma centers.

- San Luis Obispo County's closest trauma center is 100 miles away in Santa Barbara County. Transfers occur by ground or air depending on weather and availability of air transport.

- El Dorado County's western edge has direct access to a trauma center located in Sacramento County, however, all other trauma patients are secondarily transferred from local hospitals.

- The counties of Sonoma, Ventura and Monterey do not have approved trauma plans and therefore have no designated trauma centers. These counties serve a combined population of over 1.5 million (5 percent of state population) in addition to a significant seasonal visitor population.

- Los Angeles County, with a mature trauma system, does not have a designated trauma center located in the highly populated San Gabriel Valley. While two level II trauma centers served this area in the early 1980s, financial difficulties and lack of physician commitment resulted in both facilities dropping their designation. Currently, trauma patients are air transported to trauma centers outside this geographic area.

- The majority of trauma patients are transported to trauma centers by ground ambulance; however, air ambulance use is necessary in rural areas where there are extended transport times to the closest trauma center. The use of air transport has inherent limitations such as: safety, capacity, weather (coastal, mountains, and deserts have weather patterns that many times preclude air transport), and availability.

- Other geographic areas with gaps in trauma service include the North Coast, Central California (east of Interstate 5 to the Nevada border), and the Central Coast area including the vacation area of Santa Cruz and the college town of San Luis Obispo. While transport to a trauma center may occur, it requires either use of limited air transport resources or a secondary transfer resulting in a delay in care. In addition, these transports remove patients from their community and family support as well as placing additional burdens on the receiving trauma center that is already serving its own community.

Surge Capacity Assessment

EMSA used the HRSA bioterrorism standards, as benchmarked in the bioterrorism grant, to determine California's readiness related to surge capacity for the care of critical trauma. The HRSA benchmark states that systems shall be established that at a minimum can provide triage, treatment and initial stabilization, above current daily staffed bed capacity, for adult and pediatric patients requiring burn and/or trauma care hospitalization within three hours in the wake of a terrorism incident or other public health emergency. The benchmark is 50 such beds per one million population which, for California, equates to 1,840 trauma/burn beds. To date, this benchmark has not been evaluated independent of general hospital surge capacity.

> *Surge Capacity - health care system's ability to expand quickly beyond normal services to meet an increased demand for medical care in the event of bioterrorism or other large-scale public health emergencies.*

A trauma/burn bed is much more than an acute hospital bed as it implies that a multidisciplinary trauma team, with trauma care expertise and adequate ancillary support and facilities, is immediately available to perform emergency surgery. Multiple critical trauma and burn patients arriving at a trauma center create a unique surge challenge to such a system.

To illustrate California's surge capacity for trauma, EMSA created the following chart based upon immediately available surgical resources. The California trauma regulations require that surgical teams be available 24-hours a day. The last column of the chart refers to California's current capacity to treat critical trauma patients requiring immediate surgical intervention by a trauma team within the first three hours of the event.

California Immediate Trauma Surgery Capacity by County (within 3 hours)

County	OES Region	Population Estimates for 2005	Trauma Center(s)	Immediate Surgical Capacity
Alameda	II	1,448,905	Pediatric Level II (1) Level II (1)	10 patients
Alpine	IV	1,159	No trauma center	0
Amador	IV	38,471	No trauma center	0
Butte	III	214,185	Level II (1) Level III (1) Level IV (1)	6 patients
Calaveras	IV	46,871	No trauma center	0
Colusa	III	21,095	Level IV (1)	0
Contra Costa	II	1,017,787	Level II (1)	4 patients
Del Norte	II	28,705	No trauma center	0
El Dorado	IV	176,841	No trauma center	0
Fresno	V	877,584	Level I (1)	6 patients
Glenn	III	27,759	Level IV (1)	0
Humboldt	II	128,376	No trauma center	0
Imperial	VI	155,823	Level IV (2)	0
Inyo	VI	18,156	No trauma center	0
Kern	V	756,825	Level II (1)	4 patients
Kings	V	143,420	No trauma center	0
Lake	II	65,147	Level IV (1)	0
Lassen	III	34,751	No trauma center	0
Los Angeles	I	9,935,475	Level I (4) Level II (8) Pediatric Level I (1) Pediatric Level II (4) *Note: Some are both pediatric and adult centers*	78 patients
Madera	V	142,788	Pediatric Level I (1)	6 patients
Marin	II	246,960	Level III (1)	2 patients
Mariposa	V	18,069	No trauma center	0
Mendocino	II	88,161	No trauma center	0
Merced	V	241,706	No trauma center	0
Modoc	III	9,524	No trauma center	0
Mono	VI	12,509	No trauma center	0
Monterey	II	412,104	No trauma center	0
Napa	II	132,764	Level III (1)	2 patients
Nevada	IV	98,394	No trauma center	0
Orange	I	2,988,072	Level I (1) Level II (2)	14 patients
Placer	IV	317,028	Level II (1)	4 patients
Plumas	III	21,477	Level IV (1)	0

County	OES Region	Population Estimates for 2005	Trauma Center(s)	Immediate Surgical Capacity
Riverside	VI	1,946,419	Level II (3) Level III (1)	13 patients
Sacramento	IV	1,363,482	Level I (1) Level II (1) Pediatric Level I (1) *Note: Some are both pediatric and adult centers*	16 patients
San Benito	II	55,936	No trauma center	0
San Bernardino	VI	1,963,535	Level I (1) Level II (1)	10 patients
San Diego	VI	2,933,462	Level I (2) Level II (3) Pediatric Level II (1) *Note: Some are both pediatric and adult centers*	28 patients
San Francisco	II	739,426	Level I (1)	6 patients
San Joaquin	IV	664,116	No trauma center	0
San Luis Obispo		255,478	No trauma center	0
San Mateo	II	699,610	No trauma center	0
Santa Barbara	I	400,762	Level II (1) Level IV (1)	4 patients
Santa Clara	II	1,699,052	Level I (2) Level II (1)	16 patients
Santa Cruz	II	249,666	No trauma center	0
Shasta	III	179,904	Level II (1) Level III (1) Level IV (1)	6 patients
Sierra	III	3,434	No trauma center	0
Siskiyou	III	45,259	Level III (2)	2 patients
Solano	II	411,593	No trauma center	0
Sonoma	II	466,477	Level II (1)	4 patients
Stanislaus	IV	505,505	Level II (2)	8 patients
Sutter	III	88,876	No trauma center	0
Tehama	III	61,197	Level III (1)	2 patients
Trinity	III	13,622	No trauma center	0
Tulare	V	410,874	No trauma center	0
Tuolumne	IV	59,380	No trauma center	0
Ventura	I	796,106	No trauma center	0
Yolo	IV	184,932	No trauma center	0
Yuba	III	67,153	Level III (1)	2 patients
California Total		**36,132,147**	**65 Trauma Centers** *Note: some have dual pediatric capabilities*	**253 patients**

Level I = 6 patients in first 3 hours	Level III = 2 patients in first 3 hours
Level II = 4 patients in first 3 hours	Level IV = no surgical capabilities

Trauma Surgery Surge Capacity by Office of Emergency Services (OES) region.

OES Region	Population Estimates for 2005	Trauma Centers	Immediate Surgical Capacity
I Los Angeles Area	14,375,893	Level I (5) Level II (11) Level IV (1) Pediatric Level I (1) Pediatric Level II (4)	96 Patients
II Coastal Region	7,890,669	Level I (3) Level II (4) Level III (2) Level IV (1) Pediatric Level II (1)	44 Patients
III Northern California	788,236	Level II (2) Level III (6) Level IV (5)	18 Patients
IV Capital Region	3,456,179	Level I (1) Level II (4) Pediatric Level I (1)	28 Patients
V Central California	2,591,266	Level I (2) Level II (1)	16 Patients
VI San Diego Area	7,029,904	Level I (3) Level II (7) Level III (1) Level IV (2) Pediatric Level II (1)	51 Patients

California Regions

Northern OES Region III

Inland OES Region IV

Coastal OES Region II

Valley OES Region V

Southern OES Region VI

Southern OES Region I

To better illustrate surge capacity issues, EMSA has created the following hypothetical scenario using a terrorist bombing incident at the State Capitol:

News

A terrorism bombing occurred in Sacramento's Capitol building today at 2:00 p.m. The Governor was not in the Capitol at the time of the bombing. There are 63 confirmed deaths and 200 injuries including many children present for school field trips.

Assuming that 50 percent of the injured patients suffered multi-system trauma (critical), there will be 100 patients that require trauma center level care. The State Capitol is located in Sacramento County, which is part of OES Region IV. Within OES Region IV, there are one Level I adult/pediatric Trauma Center (located in Sacramento County) and four Level II Trauma Centers (located in Sacramento, Placer and Stanislaus Counties). These centers have the capacity to receive a total of 28 critically injured patients requiring immediate surgical intervention within the first three hours after the bombing. The additional 72 patients would need to be transported extended distances outside the region via ground and air ambulances.

HRSA Model Trauma Guidelines Assessment of California

The Trauma Advisory Committee used the HRSA Assessment as a tool to evaluate California's system. The assessment tool is the national standard for trauma care and is predicated upon an inclusive statewide system.

> *Benchmarks* are global overarching goals, expectations, or outcomes. In the context of the trauma system, a benchmark identifies a broad system attribute

The U.S. Department of Health and Human Services, HRSA "Model Trauma System Planning and Evaluation" document provided the Trauma Advisory Committee and EMSA with guidance on assessing California's current status in providing trauma care and identifying the next steps for developing an inclusive and comprehensive statewide trauma system. The intent of the tool is to allow an individual trauma system to identify its own strengths and weaknesses, prioritize activities, and measure progress against itself over time.

Each core function in the tool (Assessment, Policy Development, and Assurance) contains a variety of benchmarks. These benchmarks are based, to the extent possible, on current literature on trauma system development. The benchmarks focus primarily on process measures, not on outcomes. It is assumed that meeting these process measurements will result in improved outcomes. For each benchmark, a number of indicators define the benchmark and scoring for each indicator to help identify progress, efforts, and/or compliance. The assessment uses benchmarks and indicators that are qualitative, and requires judgment and discretion by all working on the assessment.

> *Indicators* are those tasks or outputs that characterize the benchmark. Indicators identify actions or capacities within the benchmark. Indicators are the measurable components of a benchmark.

Each indicator contains a scoring mechanism to assess progress in complying. There are three core functions, based on a public health model for trauma, as follows:

- **Assessment** (#100 Series) is the first core function. This section deals with systematic collection, assembly, analysis, and dissemination of information regarding the health of the community.

- **Policy Development** (#200 Series) is the second core function. This section looks at the use of scientific knowledge in decision making including building constituencies, identifying needs and setting priorities, legislative authority and funding to develop plans and policies to address needs, and assuring the public's health and safety.

- **Assurance** (#300 Series) is the third core function and deals with assuring constituents that necessary services to achieve agreed-on goals are provided

by encouraging actions of others (public or private), requiring action through regulation, or providing services directly.

The HRSA Assessment tool revealed the following **short term** goals for trauma system improvement in California (Appendix B).

> *Scoring* breaks down the indicator into completion steps. Scoring provides an assessment of the current status and marks progress over time to reach a certain milestone.

- Establish a trauma management information system for ongoing injury surveillance and system performance assessment.
- Promulgate comprehensive state statutory authority and administrative rules to support trauma system leadership and maintain trauma system infrastructure, planning, oversight, and future development.
- Provide trauma system leadership (lead agency, trauma center personnel, and other stakeholders) to establish, maintain, and constantly evaluate and improve a comprehensive trauma system in cooperation with medical, professional, governmental, and citizen organizations.
- Ensure the state lead agency has a comprehensive written trauma system plan based on national guidelines. The plan integrates the trauma system with EMS, public health, emergency preparedness, and emergency management. The written trauma system plan is developed in collaboration with community partners and stakeholders.
- Provide sufficient resources, including those both financial and infrastructure-related, support system planning, implementation, and maintenance.
- Complete a resource assessment for the trauma system and regularly update.
- Support the trauma system through an EMS system that includes communication, medical oversight, prehospital triage, and transportation; additionally the trauma system, EMS system, and public health agency should be well integrated.
- Integrate acute care facilities into a resource-efficient, inclusive network that meets required standards and that provides optimal care for all injured patients.
- Assure a competent workforce.
- Protect the public welfare by the lead trauma authority enforcing various laws, rules, and regulations as they pertain to trauma system components and the system overall.

The following are **intermediate** goals for statewide trauma system development:

- Complete assessment of the trauma system's disaster/ emergency preparedness including coordination with the public health and EMS systems and the emergency management agency
- Assess and monitor system for its value to its constituents in terms of cost/benefit analysis and societal investment.
- Use data to evaluate system performance and to develop public policy.

- Trauma system leadership and advisory committees regularly review system based on multi-performance reports.
- Lead agency informs and educates state, regional and local constituencies and policy makers to foster collaboration and cooperation for system enhancement and injury control.
- Jurisdictional lead agency, in cooperation with other agencies and organizations, uses analytical tools to monitor the performance of population-based prevention and trauma care services.
- Closely link trauma, public health, and emergency preparedness systems.
- Assure lead agency trauma system plan is integrated with, and complementary to, the comprehensive mass casualty plan for natural disasters and manmade disasters, including an all-hazards approach to disaster planning and operations.
- The lead agency ensures that the trauma system demonstrates prevention and medical outreach activities within its defined service area.
- Ensure each hospital measure patient outcomes to improve trauma care.
- Lead agency ensures integration of rehabilitation facilities into the trauma system and that these resources are made available to all populations requiring them.

The following are **long-term** goals for statewide trauma system development:

- Complete a description of epidemiology of injury in the system jurisdiction using both population-based data and clinical databases**.**
- Use the trauma management information system (MIS) to facilitate ongoing assessment and assurance of system performance and outcomes and provide a basis for continuously improving the trauma system including a cost-benefit analysis.
- Integrate financial aspects of the trauma systems into the overall quality improvement system to assure ongoing "fine-tuning" and cost-effectiveness.

As a result of the HRSA assessment, short-term goals can be categorized into three areas (See Appendix B). The following activities are necessary for the first stage of statewide trauma system development.

- Establish state leadership and oversight of trauma care;
- Establish a statewide trauma registry for data collection and evaluation; and
- Identify funding resources needed for statewide trauma system development.

These short-term goals must be met before intermediate or long-term goals can be considered.

Each of these system developments must be accomplished before the specific goals identified in the assessment can be realized. Below is an analysis of these policy directions.

<u>State Leadership</u> – Benchmark #202 states "Trauma system leaders use a process to establish, maintain, and constantly evaluate and improve a comprehensive trauma system in cooperation with medical, professional, governmental and citizen organizations." This benchmark requires strong state leadership direction.

Under the current statutory and regulatory framework, trauma is an optional local program and EMSA has no authority to develop a statewide trauma system. EMSA does not currently have the staff or central resources to coordinate a statewide trauma system. There are inconsistencies in care throughout the state because there is no assurance that trauma care systems are following the existing regulations. Limited resources at the state level mean that there is limited oversight of the locally based systems. EMSA cannot be confident that the trauma regulations are being adhered to and implemented uniformly. Inconsistent application of the trauma regulations can negatively affect the quality of trauma care provided throughout the state.

Because California's trauma system is a local optional system, problems exist with respect to transportation, political boundaries, access to care, lack of or inadequate trauma plans in some areas, and variable quality of care. To be effective, a state trauma system must be integrated across regions, with assurances that care is consistent and coordinated. An inclusive trauma system includes the following services within regions:
- geographic access and appropriate transport (air and ground);
- adequate adult and pediatric trauma care resources;
- specialty resources - burn care, spinal cord injury, and rehabilitation to serve the region;
- appropriate referral relationships between trauma and non-trauma hospitals;
- overall quality of care monitoring;
- adequate financial resources to fill trauma system gaps;
- use of statewide standardized data and system surveillance tools;
- prevention;
- training and education;
- mass casualty preparedness;
- research; and
- increased surge capacity.

Regionalization provides the ability to more clearly segregate roles and responsibilities. In an inclusive system, the role and responsibilities of each region include:

- Working with other regions to develop interregional plan to provide for a standardized state trauma care system.
- Developing regional plan for trauma surge capacity to meet HRSA recommendations in the event of a disaster.
- Developing trauma program policy manual for region.
- Meeting quarterly with central state staff, State Trauma Advisory Committee and other region representatives to review, at a minimum, access issues, quality of care, and funding.

- Conducting quality improvement activities including review of select trauma cases and quality indicator development.
- Developing plan for access to trauma care for region's population and visitors, including burn care and rehabilitation.
- Managing the collection of trauma data for the region including data on trauma patients transported and/or transferred to non-trauma hospitals.
- Reviewing and revise as needed triage criteria to trauma centers (may be trauma center level specific).
- Conducting periodic needs assessment and develop plan of action to address the needs identified.
- Addressing education needs of trauma region participants.
- Developing plan for appropriate distribution of trauma funds to cover the cost of trauma care from time of injury through rehabilitation, including funding for care across county lines.
- Developing transportation plan for the region to ensure appropriate trauma patient destination, including ground and air transport resource planning.
- Working with region's hospitals to develop interfacility transfer agreements.
- Developing guidelines for pre-transfer protocols.
- Developing universal access plan for critically injured patients that may include telemedicine programs in rural areas.
- Performing financial and program audits to maintain accountability for funding.
- Enforcing regulations.

Statewide Trauma Registry – Benchmark #101 states "there is a thorough description of epidemiology of injury in the system jurisdiction using both population-based data and clinical databases." This benchmark cannot be met without the development of a statewide trauma registry.

A trauma registry utilizes data to describe the cause, degree of injury and care provided to trauma patients from the initial prehospital contact through discharge from the hospital. A state trauma registry is the basis for research and quality assessment to inform clinicians and policy makers about methods to optimize the care of injured patients. Currently, the data in local trauma center registries are often so different in content and structure that comparison across registries is nearly impossible. Database construction for these trauma registries is often completed in isolation with no nationally recognized standard data dictionary to ensure consistency. The work of investigating the effectiveness of local trauma system development in California has been hampered by the lack of consistent, quality data.

Currently, the local EMS agency is responsible for developing and implementing a standardized data management system (trauma registry) to include trauma patient data from trauma centers and non-trauma centers. While a list of minimum data elements is included in California's regulations, most local EMS agencies exceed this requirement and develop their own trauma registries and associated definitions. This has resulted in inconsistent data across the state and the inability to measure the

effectiveness of existing local trauma systems to plan for a future statewide trauma system.

The American College of Surgeons Committee on Trauma in collaboration with HRSA developed a uniform set of trauma registry data elements and definitions for states to use when developing their state trauma registries for participation in national data collection efforts. California is reviewing this data set and developing a process for creating a statewide trauma registry that will comply with the HRSA standards for participation in national data collection efforts.

To inform policy, a trauma registry should include information about costs, transport times, receiving facilities, delays in care, coordination of care across facilities, and other system issues.

System Resources – Benchmark #204 states, "Sufficient resources exist, including those both financial and infrastructure related support system planning, implementation, and maintenance." Consistent and adequate funding is essential for trauma system development and maintenance.

Under the current local optional model, trauma funding in California has been sporadic and unfocused. There is no data to show the actual cost of trauma care and the appropriate role for state funding, if any, in supporting trauma centers. There is little or no financial support of LEMSAs in developing of local optional trauma systems. There is little dedicated funding to cover uninsured patients. Previous trauma funding may not have applied to areas of the state where it was most needed.

EMSA has no authority to direct funds to local trauma systems with the greatest needs. Trauma centers receive available state funds based on the admission of trauma patients to trauma centers. Some reports suggest that previous state trauma funding has been used on other hospital priorities. Trauma centers provide a large amount of uncompensated care, yet available state trauma funding is not earmarked for such compensation. In some areas, counties have not developed trauma resources but depend on trauma patients being transported to other counties at the expense of the patient or the receiving county and their trauma centers. Counties are not using their Maddy Funds to pay for the medical care of individuals injured in their jurisdiction but transferred to a trauma center in another county.

Costs and Funding Review

Over the years small amounts of grant funding have been made available to local EMS agencies to establish of trauma care systems and development of trauma plans. However, this funding was limited, not specifically earmarked for trauma, and not provided to existing trauma centers. In 2001, when state funding for trauma care planning and trauma center support was specifically provided, nine new local trauma plans were developed and 20 new trauma centers were designated. However, three counties still lack an approved trauma care plan, and many more lack trauma centers. EMSA modified the trauma regulations to include inter-county agreements between

neighboring local EMS systems to help promote a more inclusive system that better used its resources. However, developing these agreements has been problematic due to reimbursement concerns for uncompensated care.

Trauma centers, like fire departments and police services, are essential public service that must be available 24 hours a day, 7 days a week. This level of commitment by trauma centers, and the reciprocal expectation from the community, force trauma centers to make considerable investments in readiness.   This cost of readiness is expended regardless of the patient volume or insurance status. Thus, trauma centers have a large component of costs that are not captured by the traditional billing and cost accounting mechanisms within health systems, so it is difficult to recover costs within the current reimbursement environment. In addition, as noted above, there is no statewide trauma registry where these costs could be captured, so data-based recommendations for funding cannot be made. Many other components impact trauma care financing including per patient costs (variable upon the severity of the patient), reimbursement and source, patient mix (compensated, uncompensated, and under-compensated) physician on-call and standby costs, overhead, and administration.

The California Hospital Association (CHA) gathered trauma center cost data for use by EMSA. Because of stated hospital confidentiality concerns, EMSA received only aggregate numbers by trauma center level, the average and median annual figures to operate the trauma center (unknown if cost of doing business or billable charges), total hospital estimated trauma center losses, and per patient figures (unknown if cost of care or billable charges). These data were incomplete, unreliable, and highly variable, so no specific conclusions or recommendations could be made in this report. The number of trauma patients cared for at hospitals that are not designated trauma centers and the cost of such care are unknown.

The Trauma Care Fund, created by AB 430, Chapter 171, Statutes of 2001, has subsidized designated trauma centers in the past. These funds were distributed to local EMS agencies based upon number of trauma patients and earmarked specifically for trauma centers. Under current law, the EMS agencies are to use a grant-based system to determine actual distribution of funding to the trauma centers under their purview.

Currently, two sources provide funding for hospital and physician reimbursement; however, these funds are not specific for trauma. The Maddy Fund compensates physicians and medical facilities for emergency services for patients without health insurance who cannot pay for their care. This is funded through traffic fines and penalties and counties may use these funds to reimburse providers for up to 50 percent of their charges. In addition, the Cigarette and Tobacco Products Surtax Fund (Proposition 99 Funds) are available for reimbursement of physicians for patients who do not have private insurance, are unable to pay, and are not covered by any federal program. Funds, however, cannot be used to reimburse physicians employed by county hospitals. Proposition 99 funds have decreased for several years.

There are costs associated with the administration of local trauma systems. Currently, LEMSAs receive an administrative cost of only one percent to administer the provisions of the Trauma Care Fund. LEMSAs note that to cover the cost of administering their trauma systems, the Trauma Care Fund is insufficient, reporting actual costs approach 10 percent of the dollars distributed. Costs vary depending on the size and responsibilities of the local EMS agency.

Trauma center physician costs are rising as facilities must pay stipends for specialists to be on-call. This is due in large part to a nationwide shortage of physician specialists, the high level of uncompensated care delivered at trauma centers, and the high liability exposure incurred when seeing patients at a trauma center. Anecdotal information on the costs associated with these stipends suggests that they are a significant and a growing portion of trauma center budgets.

Institute of Medicine Report Review

The 2006 IOM report, "Hospital Based Emergency Care – At the Breaking Point" found that demands on emergency and trauma care have grown dramatically, but system capacity has not kept pace. Facilities have decreased and there are shortages of on-call specialists, trauma surgeons, and nurses while the number of uninsured patients has increased. Balancing these roles has become more difficult in the face of increasing patient volume and limited resources. According to the report, there is a decline in the numbers of trauma surgeons and on-call specialists due to the large amounts of uncompensated care, high levels of medical malpractice risk, and the burden that trauma practice places on family life.

Uncompensated care is a burden at many large, urban hospitals that have large numbers of uninsured patients. The burden increases as surrounding community hospitals go on diversion. Further, surrounding hospitals tend to transfer complex, high-risk patients for specialized care. These large, urban hospitals have become known as "safety net providers" as many patients depend upon them for their medical care whether insured or uninsured. Public hospitals, which provide a substantial amount of uncompensated care, are especially hard hit. A survey conducted by the National Association of Public Hospitals (NAPH) found that while NAPH member hospitals represent only 2 percent of all hospitals in the United States, they provide 24 percent of uncompensated hospital care in the United States. The survey also showed that 21 percent of the hospitals' costs were uncompensated.

Many facility closures are attributed to financial losses associated with emergency and trauma care. Public hospitals and tertiary medical centers bear a large share of this burden as complex high risk patients are transferred there for specialized care. Hospitals receive disproportionate share hospital payments from Medicare and Medicaid to compensate for losses, but payments may be inadequate.

The IOM report also identified specific problems in providing emergency and trauma care in rural areas. These problems include limited availability of hospitals and

equipment, inadequate supply of qualified staff, unfavorable payor mix, and long distances and emergency response times.

Hospitals in most large population centers are operating at or near full capacity. In many cities, the hospitals and trauma centers have problems dealing with a multiple-victim highway crash, much less a major mass casualty event. With many hospitals already operating at or near capacity, most hospitals will find it difficult to handle the volume of patients likely to result from a large-scale disaster.

The IOM report states that current literature supports the benefits of regionalization for severely injured patients in improving patient outcomes and lowering costs. Studies have also documented the value of regionalized trauma systems to improve outcomes and reduce mortality from traumatic injury. Organized trauma systems have also been shown to add value in facilitating performance measurement and promoting research.

While regionalization to distribute trauma services to high-volume centers is optimal, when feasible in terms of transport, some current literature argues for an inclusive trauma system in which smaller facilities are verified and designated as lower-level trauma centers. It is suggested that care may be substantially better in such facilities than in those outside the system, and comparable to national norms. An inclusive trauma system addresses the needs of all injured patients across the entire continuum of care and uses the resources of all committed and qualified personnel and facilities, with the goal of ensuring that every injured patient is triaged expeditiously to a level of care commensurate with his or her injuries.

Research has demonstrated a number of additional benefits of regionalization. Regionalizing inventories (pooling supplies at regional warehouses) has been shown to improve the capacity to serve the target population and save money. Regionalization may also be a cost-effective strategy for developing and training teams of response personnel. Regionalization benefits outbreak investigations, security management, and emergency management. Both the HRSA and CDC have made regional planning a condition for preparedness funding.

CONCLUSIONS

Based on an expert review of current trauma care in California, a review of the state trauma surge capacity, and the results of the California HRSA Assessment, EMSA and the Trauma Advisory Committee have concluded the following:

Trauma care in California is currently an optional, locally based, decentralized system that contains gaps and inconsistencies and has limited capacity.

The decentralized system cannot develop further without significant modifications because it is structurally designed to stop at the county lines. Additionally, there are no incentives to drive improvement of a local, optional trauma care system.

Coordination is lacking between local systems related to the use of limited trauma care resources by out-of-county patients, payment for trauma services, repatriation of patients, and patient transfers to a higher level of care. This leaves gaps and inconsistencies in trauma care and creates unknown variances in the systems that can negatively affect the care of trauma patients. Even the most developed systems generally focus resources within county borders.

Initial development of local trauma systems in California was underlined exclusive in design, as only large medical centers caring for severely injured patients were designated as trauma centers. Over time, trauma systems emerged with the goal of greater inclusion. An inclusive trauma system recognizes the full spectrum of injury as a disease epidemic and does not focus solely on the most seriously injured patient. Thus, the inclusive trauma system design represents a shift away from the more traditional approach to trauma care that only addresses the needs of severely injured persons, to a system that focuses on prevention, rehabilitation, and the needs of a wider range of injured patients. This means that while the large trauma center is the key component, a system utilizes other health care facilities and matches them with a patient's needs so that optimal and cost-effective care is achieved.

Under the current statutory scheme, EMSA does not have statutory or regulatory authority to create a statewide trauma system. In the absence of a statewide trauma system, EMSA is unable to address the HRSA trauma model benchmarks in a standardized manner.

Access to trauma care is problematic, especially in rural areas.

Small, rural community hospitals have limited resources to provide the level of trauma care needed for the critically injured. The golden hour -- the one-hour time period from injury to specialized trauma care -- passes due to long transport times from the field to a distant trauma center, or due to the need to secondarily transfer a patient from the rural community hospital to a trauma center out of the area.

Two counties do not have trauma plans and another county's plan is still in development so it is unknown what type of trauma care patients may or may not

receive in those areas. Even in areas that have mature systems, such as Los Angeles, there are areas without local access to trauma care where patients must be air transported to trauma centers outside the geographic area. While transport to a trauma center may occur, it requires an air ambulance or a secondary transfer resulting in a delay in care.

EMSA is under-resourced for monitoring regulatory compliance.

Lack of resources monitoring compliance with existing regulations compounds the state trauma care inconsistencies. EMSA cannot be confident that the trauma regulations are being adhered to or implemented uniformly. Inconsistent application of the trauma regulations can negatively affect the quality of trauma care provided throughout the state.

Under the current local optional system, 28 local trauma systems and 65 trauma centers treat over 54,000 trauma admissions annually. There is insufficient staff to develop and coordinate an integrated statewide trauma system and ensure compliance with regulations and local system plans.   EMSA staffs the state trauma program with one Trauma Coordinator and a half time administrative support staff. Responsibilities include regulation revision, technical assistance to local EMS agencies with local trauma system development, distribution of trauma funds when available, and review and approval of trauma plans and annual plan updates.

There is no statewide information system on which to base policy decisions regarding trauma care in the state.

Although local systems may have data, they lack consistency and information is not available at the state level where policy decisions should occur. Without consolidated, statewide data, it is impossible to identify problems, improve the system, or measure successes.

Without financial data, the cost of trauma care and the need for state financial support is unknown. Both the fixed and per patient costs of providing care at trauma centers in California are unknown, as is the financial burden uninsured patients have on the system. No recommendations can be made at this time regarding state funds to support trauma centers.

The current system has limited surge capacity.

As shown in the analysis applying the HRSA bioterrorism preparedness standards to California's trauma centers, California's trauma system has limited trauma surge capacity. Because the HRSA standard relates to trauma/burn beds, the analysis took into account that trauma care includes not only the trauma/burn bed but also a team of physicians and nurses to provide immediate surgical intervention. That analysis revealed that California could provide specialized trauma care to only 253 trauma patients statewide in the first few hours of a traumatic disaster.

While the daily use of the trauma system is approximately 147 patients per day, the system remains vulnerable to a large scale natural disaster or terrorism event that creates a significant number of trauma victims requiring surgical intervention within a given region.

The IOM report reveals national trauma system limitations consistent with reported California trauma system limitations.

Critical shortages of physician specialists, surge trauma team staff, and facilities for multiple simultaneous operations are key factors in leaving areas of the state vulnerable during day-to-day multiple casualty incidents. Such limitations are compounded during mass casualty events such as an earthquake or terrorist attack. A fully inclusive system connects resources and would provide greater surge capacity when major disasters occur.

RECOMMENDATIONS

Three primary recommendations were determined to be necessary for initial statewide trauma system development.

Strengthen State Trauma Leadership

Coordinated Trauma System Statewide: The State should seek statutory authority and obtain resources to transition the current decentralized, local optional trauma systems to a statewide coordinated trauma system. This transition would provide uniform local and regional participation and provide state trauma leadership consistent with the HRSA Model trauma guidelines. The HRSA Model trauma planning and evaluation guidelines cannot be met under the current local optional system.

In order to achieve strengthened State trauma leadership, steps must be made to both require local trauma systems and improve statewide consistency. Several options exist along a continuum to achieve greater State Trauma leadership. These options include:

- Require the development of local trauma care systems,
- Establish trauma care coordinating regions, or
- Establish a centralized state trauma system.

Implement Regionally-Based Trauma Systems: The State should create a regionally-based trauma system. While mandating local trauma systems would increase access to trauma care, problems would still exist related to regional coordination and effective use of resources. The establishment of a regional trauma care network may be preferable to the formation of a centralized state trauma system as an initial step to solve problems of access and standardization.

A statewide trauma system could use regional coordinating committees as a method to address gaps and inconsistencies, and improve surge capacities. Regions would serve to break the large state into more manageable pieces while ensuring better local coordination. Counties working through their regions could coordinate to improve trauma care resources, including financial concerns and patient flow.

EMSA would review the state for patient flow patterns, mutual aid, and surge capacity before making a final determination regarding the number of trauma care regions. The State trauma care delivery and planning would be accomplished through coordination of services through no more than six trauma care regions. Each region would be responsible for trauma care within the region including access for underserved areas, balance of resources, and leverage of academic resources. Each region should include Level I and II trauma centers, pediatric trauma centers, and burn centers, if possible.

Regions would also provide better coordination of trauma care between LEMSAs. The regions will not replace LEMSAs, but would build upon existing local EMS jurisdictions

to address challenges of access, geographic isolation, coordination of resources, funding of out-of-county patients, and optimal distribution of trauma care resources (pre-hospital, trauma centers, pediatric trauma centers, acute care, burn care, and rehabilitation).

A regional structure could encourage optimal sharing of resources because the trauma care regions would have responsibility and accountability for access and quality care throughout their regions. Patient flow patterns, provisions for uncompensated care, and quality of care would be improved through the sharing of resources throughout the region.

The regional trauma structure would require state coordination to facilitate and assist in the activities of each region. A regional trauma coordination committee would also be required to address organizational and quality issues, and developing a process for ensuring adherence to state standards and regional funding distribution. The regional committee should include representatives from the state and local EMS agencies, prehospital care providers, trauma hospitals, non-trauma hospitals, managed care, private payers, physician subspecialties, long-term care providers, medical examiners, rehabilitation, information technology support (IT), and research experts. Inter-regional standardization would occur through state coordination, collaboration between regions to meet state standards, sharing of best practices, assessing state resource deployment, and maintaining uniformity of data collection.

Develop Statewide Trauma Registry

Development of a statewide trauma data system is imperative to improving and continuously monitoring the statewide system. Data is necessary to assess performance, quality, utilization and prevention, benchmark against existing national standards, and to inform future policy decisions and directions.

In the absence of statewide trauma system data, including financial data, a reliable determination of what additional system resources are needed cannot be made.

At the present time, trauma centers and some LEMSAs have trauma registries; however, data varies and without a centralized state trauma registry, monitoring the delivery of trauma care is limited to the local county/region without state oversight. The creation of standard data definitions and standards would likely require regulatory changes.

The registry would also be used to collect financial data with regard to trauma center funding to get a better perspective of actual trauma center costs and needs.

Consider Trauma System Funding

At this time, there are insufficient data to determine if state trauma system funding is necessary, or what level of funding would be needed to cover uncompensated trauma care in the state.

Trauma system providers express widespread belief that additional trauma system funding is required. However, until system and financial data are collected consistently statewide, no definitive statement can be made regarding funding.

As part of the work associated with developing this plan, the Trauma Advisory Committee outlined the following as possible models for funding: (1) Supporting local agency administration of the program, (2) Developing capacity to enhance regional trauma care, and (3) Stabilizing existing trauma centers by assisting with the costs of uncompensated care.

> Supporting local agency administration of the program – Under current law, LEMSAs receive only one percent of the funding provided to administer the program when those funds are made available. Under a statewide trauma system, LEMSA's responsibilities would increase, as they would participate in the regional coordinating committee and assist in developing a regional plan. Because of the additional responsibilities for the LEMSAs, it is recommended that the percent of allowable administrative costs be increased. In order to arrive at a specific number, additional analysis would be needed.

> Developing capacity to enhance regional trauma care –Funding to increase the participation of community hospitals would help develop regional trauma care capacity.   Within coordinated regional trauma care systems, a portion of the amount received by the LEMSA could be made available for developing system capacity and creating incentives to ensure an inclusive trauma system.

> Regional coordination committees could develop a trauma system plan for the region that would outline areas for development and expansion and funds targeted for those purposes.

> Stabilizing existing trauma centers by assisting with the cost of uncompensated care – Under current law, when funds are appropriated to the Trauma Care Fund, EMSA provides funds to the LEMSAs based upon percentage of statewide trauma patients. One percent is provided for administrative costs and the rest is provided to existing trauma centers under a grant-based system. The grants focus on trauma centers with the highest admission rates and only loosely on the level of unreimbursed care they provide.

APPENDICES

- Appendix A: Trauma Advisory Committee Representatives

- Appendix B**:** HRSA Assessment

- Appendix C: CDC – Leading Causes of Death Report

- Appendix D: Trauma Centers

APPENDIX A: Trauma Advisory Committee Representatives

Emergency Medical Services Authority

DIRECTOR'S TRAUMA ADVISORY COMMITTEE
Cesar Aristeiguieta, M.D.
Director

David Hoyt, M.D., Chief of Trauma Trauma Advisory Committee Chair UCSD Medical Center San Diego Trauma Surgeon; ACS	Michael Rossini, M.D. Trauma Advisory Committee Vice Chair Doctor's Medical Center Modesto Trauma Surgeon; Commission Liaison, Rural
Bob Eisenman, Ph.D. Director, Strategy & External Relations Kaiser Foundation Health Plan & Hospitals Oakland Hospital	Judith Brill, M.D., Director Pediatric ICU Department of Pediatrics UCLA Medical Center, Los Angeles Pediatric Critical Care Specialist; EMS for Children
Ramon Johnson, M.D. Mission Viejo EMS for Children; Cal ACEP, Emergency Physician	Ted Peterson, Battalion Chief Novato Fire Department Public EMS Transportation
Leonard Inch, Regional Executive Director Sierra-Sacramento Valley EMS Agency EMS Administrator; EMSAAC	Virginia Hastings, Southern California EMS Administrator, Urban/Rural
William Teufel, MD Coastal Valley EMS Agency EMS Regional Medical Director EMDAC	Larry Karsteadt, Administrator North Coast EMS Agency EMS Administrator; Rural
Judith Yates, Vice President Hospital Association of San Diego and Imperial Counties Hospital Association	Jay Goldman, M.D. Oakland Kaiser ER Physician; Managed Care
Carol Meyer, Director Los Angeles County EMS EMS Administrator, Urban	Linda Raby, RN Regional Medical Center Trauma Manager's Association of California (TMAC)
David Nevins, President California Ambulance Association Private EMS Transportation	Kacey Hansen, RN Trauma Coordinator John Muir Medical Center Hospital Association, Hospital Trauma Coordinator

TRAUMA SYSTEM ASSESMENT SUMMARY

Indicator scoring was evaluated and each benchmark was prioritized based upon level of importance to formation of entire statewide system. Prioritization is as follows: Short Term (within 1 year); Intermediate (within 3 years); and Long Term (3-5 years)

Priority	#	Benchmark	Solution
Short Term	102	There is an established trauma management information system for ongoing injury surveillance and system performance assessment.	Trauma Registry
Short Term	201	Comprehensive state statutory authority and administrative rules support trauma system leadership and maintain trauma system infrastructure, planning, oversight, and future development.	State Leadership & Coordination
Short Term	202	Trauma system leadership (lead agency, trauma center personnel, and other stakeholders) is used to establish, maintain, and constantly evaluate and improve a comprehensive trauma system in cooperation with medical, professional, governmental, and citizen organizations.	State Leadership & Coordination
Short Term	203	The state lead agency has a comprehensive written trauma system plan based on national guidelines. The plan integrates the trauma system with EMS, public health, emergency preparedness, and emergency management. The written trauma system plan is developed in collaboration with community partners and stakeholders.	State Leadership & Coordination
Short Term	204	Sufficient resources exist, including those both financial and infrastructure related, support system planning, implementation, and maintenance.	Trauma System Funding
Short Term/ Ongoing	103	A resource assessment for the trauma system has been completed and is regularly updated.	State Leadership & Coordination
Short Term/ Ongoing	302	The trauma system is supported by an EMS system that includes communication, medical oversight, prehospital triage, and transportation; the trauma system, EMS system, and public health agency are well integrated.	Leadership & Coordination
Short Term/ Ongoing	303	Acute care facilities are integrated into a resource-efficient, inclusive network that meets required standards and that provides optimal care for all injured patients.	Leadership & Coordination
Short Term/ Ongoing	310	The lead trauma authority assures a competent workforce.	State Leadership & Coordination
Short Term/ Ongoing	311	The lead trauma authority acts to protect the public welfare by enforcing various laws, rules, and regulations as they pertain to trauma system components and the system overall.	State Leadership & Coordination

Priority	#	Benchmark	Solution
Intermediate	104	An assessment of the trauma system's disaster/ emergency preparedness has been completed including coordination with the public health and EMS systems and the emergency management agency.	State Leadership & Coordination
Intermediate	105	The system assesses and monitors its value to its constituents in terms of cost/benefit analysis and societal investment.	Trauma Registry
Intermediate	205	Collected data are used to evaluate system performance and to develop public policy.	Trauma Registry
Intermediate	206	Trauma system leadership, including its multi-performance reports, in disciplinary advisory committees, regularly reviews system.	Trauma Registry
Intermediate	207	The lead agency informs and educates state, regional and local constituencies and policy makers to foster collaboration and cooperation for system enhancement and injury control.	State Leadership & Coordination
Intermediate	304	The jurisdictional lead agency, in cooperation with other agencies and organizations, uses analytical tools to monitor the performance of population-based prevention and trauma care services.	State Leadership & Coordination
Intermediate/ Ongoing	208	The trauma, public health, and emergency preparedness systems are closely linked.	State Leadership & Coordination
Intermediate/ Ongoing	305	The lead agency assures its trauma system plan is integrated with, and complementary to, the comprehensive mass casualty plan for natural disasters and manmade disasters, including an all-hazards approach to disaster planning and operations.	State Leadership & Coordination
Intermediate/ Ongoing	306	The lead agency ensures that the trauma system demonstrates prevention and medical outreach activities within its defined service area.	State Leadership & Coordination
Intermediate/ Ongoing	307	To maintain its state or regional or local designation, each hospital must continually work to improve the trauma care as measured by patient outcomes.	Registry/Local Trauma System
Intermediate/ Ongoing	308	The lead agency ensures that adequate rehabilitation facilities have been integrated into the trauma system and that these resources are made available to all populations requiring them.	State Leadership & Coordination

Priority	#	Benchmark	Solution
Long Term	101	There is a thorough description of epidemiology of injury in the system jurisdiction using both population-based data and clinical databases.	Coordinate with agencies that collect data/make available to participants.
Long Term/ Ongoing	301	The trauma management information system (MIS) is used to facilitate ongoing assessment and assurance of system performance and outcomes and provides a basis for continuously improving the trauma system including a cost-benefit analysis.	Trauma Registry
Long Term/ Ongoing	309	The financial aspects of the trauma systems are integrated into the overall quality improvement system to assure ongoing "fine-tuning" and cost-effectiveness.	Trauma System Funding

TRAUMA SYSTEM ASSESSMENT

The U.S Department of Health and Human Services, Health Resources and Services Administration's *"Model Trauma System Planning and Evaluation"* was used to evaluate California's trauma care based upon national standards. Trauma Advisory Sub-committees and EMSA staff scored each indicator using the "1-5 scheme" as outlined in the model planning document, with 5 being the most comprehensive. The difference between the score and the goal shows the gap in the current system. Scores reflect consideration of current state, local, or other resources that could be used to bring each element in the system into compliance with national standards. The actual status of California's system is also included for a more accurate assessment.

Core Function 100: ASSESSMENT - Regular systematic collection, assembly, analysis, and dissemination of information on the health of the community.

Benchmark 101:

> **There is a thorough description of epidemiology of injury in the system jurisdiction using both population-based data and clinical databases.**

Priority: ☐Short Term (within 1 year)   ☐ Intermediate (within 3 years)
☑ Long Term (3-5 years)   ☐ Ongoing   ☐ Completed

Indicator 101.1 (Essential Service=Monitor Health): There is a thorough description of the epidemiology of injury mortality in the system jurisdiction using population-based data.

Score: 4 – Death certificate data, by E-code are reported on statewide and sub-state jurisdictions. These data are compared to national benchmarks, if available.

Status: Local trauma registries exist and data collection varies throughout the state. Reporting of population-based data varies from none to minimal reporting from these registries. However, injury mortality data is currently available from state Department of Health Services' Epidemiology and Prevention for Injury Control (EPIC), the California Highway Patrol's Statewide Integrated Traffic Records System (SWITRS), and the Office of Traffic Safety's website. Links to these sites are provided on the EMSA website. There are also numerous studies done at local levels on various traumatic injuries by both public health and injury control experts.

Goal: Use death certificate data, by E-code, and statewide rural/urban preventable mortality studies as part of overall assessment of trauma centers.

Objective: Review current information resources available and determine how to use to assess trauma care and ensure coordination with epidemiology agencies.

Indicator 101.2 (Essential Service=Monitor Health): There is a description of injuries within the trauma system jurisdiction including the distribution by geographic area, high-risk populations (pediatric, elderly, distinct cultural/ethnic populations, rural, and others) incidence, prevalence, mechanism, manner, intent, mortality, contributing factors, determinants, morbidity, injury severity (including death), and patient distribution using any or all of the following: vital statistics, emergency department (ED) data, emergency medical services data, hospital discharge data, CHP, medical examiner data, trauma registry, and other data sources. The description is updated at regular intervals. Note: Injury severity should be determined through the consistent and system-wide application of one of the existing injury scoring mechanisms; e.g., Injury Severity Score. See trauma systems dictionary for a list of examples of clinical databases.

> Score: 3 - *One or more population-based data sources and one or more clinical data sources are used to describe injury within the jurisdiction, and the description is systematically updated at regular intervals.*

> Status: Local agencies may use both population-based data sources and clinical data sources; however, these are not consistently linked and used to describe injuries within the jurisdiction. Injury description data is currently available from state Department of Health Services' Epidemiology and Prevention for Injury Control (EPIC), the California Highway Patrol's Statewide Integrated Traffic Records System (SWITRS), and the Office of Traffic Safety's website. Links to these sites are provided on the EMSA website.

> Goal: Describe injury within jurisdictions by linking one or more clinical data sources electronically.

> Objective: Review existing reports for appropriate information and make information available for system use.

Indicator 101.3 (Essential Service=Monitor Health): There is a comparison of injury mortality against national, regional, and other data.

> Score: 4 – *There is written descriptive, graphic, and tabular comparison of the top three leading causes of injury death using local, regional, statewide and national data.*

> Status: There is no statewide trauma registry; however comparisons are available from state Department of Health Services' Epidemiology and Prevention for Injury Control (EPIC), the California Highway Patrol's Statewide Integrated Traffic Records System (SWITRS), and the Office of Traffic Safety's database. Links to these sites are provided on the EMSA website.

Goal: Compare the top ten leading causes of injury death between and among local, regional, and statewide data (written descriptive, graphic, and tabular).

Objective: Establish process to review existing information and provide region specific data.

Indicator 101.4 (Essential Service=Monitor Health): Collaboration exists between Emergency Medical Services (EMS), other public health officials, and trauma system personnel to complete injury risk assessments.

Score: 4 – *Public health officials, along with EMS and trauma system leaders, assist with the design and analysis of injury risk assessments.*

Status: Injury risk assessments may be conducted at the local level or hospital level and are required for all injury prevention grants. The Department of Health Services epidemiologists are involved in development of injury reports; however, access and sharing of data is not as comprehensive as it could be.

Goal: Provide evidence of data sharing, data linkage, and well-defined reporting roles and responsibilities and develop injury reports using an epidemiologist.

Objective: Review existing injury report for relevance and provide to regions.

Indicator 101.5 (Essential Service=Monitor Health): Integration of injury into other public health risk assessments that occurs at state, regional, and community levels, resulting in the integration into key reports and planning documents such as *Healthy People 2010.*

Score: 5 – *Injury risk assessments are conducted by public health officials as an integrated component with other health risk assessments, and comparisons and contrasts between injury death and disability rates are made, fully integrated, and published along with other leading health risk indicators, e.g., HIV/AIDS, cardiac, cancer, and others, in "Health of the State" and other formal public health documents.*

Status: The Department of Health Services is the primary lead for this responsibility. Injury risk assessments may also be conducted at the local level or hospital level. DHS conducts risk assessments

Goal: Injury risk assessments, conducted by public health officials as an integrated component with other health risk assessments, and comparisons and contrasts between injury death and disability rates are made, fully integrated, and published along with other leading health risk indicators, e.g., HIV/AIDS, cardiac, cancer, and others, in "Health of the State" and other formal public health documents.

Objective: Continue coordination with DHS.

Indicator 101.6 (Essential Service=Diagnose and Investigate): The trauma system works with the EMS and public health systems to complete a jurisdiction-wide study of the determinants of injury using existing data sources and public health tools.

Score: 4 - *Statewide data from all potential sources, for example, BRFSS, YRBS, Fatality Analysis Reporting System (FARS), vital records, and others, pertaining to the risk of injury, are summarized, electronically linked, and analyzed to determine the potential target areas for injury prevention activities.*

Status: A state injury prevention plan exists for California and in the first stages of being updated, through grant funding from CDC. This plan will extend injury prevention planning and response for California into the next five years.

Goal: Complete a state injury prevention plan which identifies injury prevention targets based, in part, on the determinants of injury and injury risk, and identifies strategies to document and demonstrate the cost-benefit of various behaviors.

Objective: Work with DHS and other participants on newly-formed Injury Prevention Planning Group to create a new strategic plan.

Indicator 101.7 (Essential Service= Diagnose and Investigate): The trauma system works with the EMS and public health systems to identify special at-risk populations.

Score: 5 - *There is demonstrable evidence that multiple special "at-risk" populations have been identified during the assessment processes.*

Status: At-risk populations are identified in the EPIC report.

Goal: There is demonstrable evidence that "at-risk" populations have been identified during the assessment processes.

Objective: Work with DHS to ensure at-risk populations related to trauma are adequately identified in report.

Benchmark 102:

> **There is an established trauma management information system for ongoing injury surveillance and system performance assessment.**

Priority: ☑ Short Term (within 1 year)   ☐ Intermediate (within 3 years)
☐ Long Term (3-5 years)   ☐ Ongoing   ☐ Completed

Indicator 102.1 (Essential Service=Monitor Health): There is an established injury surveillance process that can, in part, be used as an MIS performance measure.

> Score: 1 - *There is no established system-wide injury surveillance system.*
>
> Status: Most local EMS agencies have central site trauma registries that receive trauma data from designated trauma centers; however, there is no statewide trauma registry. There are statewide inclusion criteria to be used for submission of trauma registry data from trauma centers. State level injury surveillance exists at Department of Health Services obtained from the Office of Statewide Health Planning and Development.
>
> Goal: Establish a statewide surveillance and system performance measures and system where trauma registry, EMS data system, ED data system, hospital discharge data, rehabilitation, and burn data are accessible, electronically linked, and have consistent data definitions and elements.
>
> Objective: Establish a statewide trauma registry with consistent data definitions and elements. The minimum inclusion criteria and minimum data set for state participation in the National Trauma Data Base (NTDB) will be taken into consideration.

Indicator 102.2 (Essential Service=Monitor Health): Injury surveillance is coordinated with statewide and local community health surveillance.

> Score: 4 - *Injury surveillance occurs as part of broader health risk assessments.*
>
> Status: The Department of Health Services' EPIC report gathers this information and provides access to various reports.
>
> Goal: Monitor, investigate, and diagnose community health risks using shared and linked data among EMS systems, public health systems, and trauma systems.
>
> Objective: Ensure statewide trauma registry is linked to the DHS surveillance system.

Indicator 102.3 (Essential Service=Monitor Health): Trauma data are electronically linked from a variety of sources. Note: Deterministically means with such patient identifiers as name and date of birth. Probabilistically means computer software is used to match likely records through such less certain identifiers as date of incident, patient age, gender, and others.

Note: Deterministically means with such patient identifiers as name and data of birth. Probabilistically means computer software is used to match likely records through such less certain identifiers as data of incident, patient age, gender, and others.

> Score: 1 – *Trauma registry data exist but are not deterministically or probabilistically linked to other databases.*
>
> Status: Local trauma registry data exist but are not linked to a statewide system. A state system, CEMSIS, is being developed which will ultimately link with hospital emergency department and hospital discharge data. In addition, linkages will be explored with traffic data and vital statistics.
>
> Goal: Link all data stakeholders (insurance carriers, FARS, and rehabilitation, in addition to typical trauma system resources), execute data access agreements, secure hardware/software resources, and provide the "manpower" to deterministically and probabilistically link a variety of data sources.
>
> Objective: Establish a statewide trauma registry capable of linkages with all stakeholders.

Indicator 102.4 (Essential Service=Monitor Health): There is a process to evaluate the quality, timeliness, completeness, and confidentiality of the data.

> Score: 1 - *There is no process or written policy to evaluate the quality, timeliness, completeness, and confidentiality of the data collected in the system.*
>
> Status: Local systems have varying processes in place to evaluate data; however there is no statewide trauma registry.
>
> Goal: Ensure comprehensive written policy and demonstrated compliance concerning data management and governance including an evaluation of the quality, timeliness, and completeness of data, with confidential protection of records ensured while allowing appropriate access for research purposes.
>
> Objective: Establish a trauma care registry with policies for confidentiality, data management, evaluation, and research.

Indicator 102.5 (Essential Service=Monitor Health): There is an established method of collecting trauma financial information from all health care facilities and trauma agencies including patient charges as well as administrative and system costs.

Score: 1 – *Financial data are not collected as part of the trauma system registry.*

Status: Hospitals collect financial data with select elements (usually "charges") which are transmitted to the local EMS agencies on trauma center patients. However, there is no standardized mechanism for collection of financial data.

Goal: Link and analyze financial data from trauma registry, insurers, ED, EMS, hospital discharge, and rehabilitation and compare with general trauma system infrastructure costs to establish the general financial health of the system and its value to the community.

Objective: Develop statewide trauma registry with appropriate financial data collection.

Benchmark 103:

> **A resource assessment for the trauma system has been completed and is regularly updated.**

Priority: ☑Short Term (within 1 year)　☐ Intermediate (within 3 years)
☐ Long Term (3-5 years)　☑ Ongoing　☐ Completed

Indicator 103.1 (Essential Service=Monitor Health): The trauma system has completed a comprehensive system status inventory that identifies the availability and distribution of current capabilities and resources.

Score: 3 - *A state resource assessment has been completed that documents the frequency and distribution of resources for at least two of the following categories: leadership, system development, legislation, finances, injury prevention, work force resources, education, EMS, transport, communications, trauma care facilities, interfacility transfer, medical rehabilitation, information systems, medical oversight, system evaluation, performance improvement, and research.*

Status: Some resources, such as trauma care facilities and system development have been identified and are made available for statewide use. The trauma care system plans identify some of the remaining components. Statewide trauma regulations outline the resource requirements for trauma care systems and designated trauma centers. Local EMS agencies are responsible

for ensuring the system and facilities are in compliance with the regulatory requirements.

Goal: A trauma jurisdiction-specific resource assessment has been completed for at least half of the trauma jurisdictions and status of inventories and system resource capabilities identified.

Objective: Prepare a resource assessment tool and conduct a resource assessment of all trauma jurisdictions and maintain update of results.

Indicator 103.2 (Essential Service= System Management): The trauma system has completed a gap analysis based on the internal and external system status inventories and system resource standards.

Score: 2 - *The State Trauma Advisory Committee has begun to develop statewide trauma system resource standards so that a gap analysis can be completed.*

Status: The trauma regulations outline the requirements for trauma care systems and trauma care facilities. The Trauma Care Advisory Committee has completed a preliminary informal gap analysis of resources.

Goal: A statewide trauma system gap analysis has been completed for the entire State and is updated at regular intervals based on the trauma resource standards in place.

Objective: Develop trauma resource standards and conduct a gap analysis.

Indicator 103.3 (Essential Service= System Management): There has been an initial assessment (and periodic reassessment) of overall system effectiveness.

Score: 1 - *No preventable mortality assessment has been conducted on a system-wide basis.*

Status: No assessment has been conducted.

Goal: Complete preventable mortality studies including determination of rates of inappropriate care, as well as an examination of the number of severely injured (ISS > 15) patients arriving at the highest levels of available care within appropriate times. Repeat assessment at regular intervals (could be an annual summary of deaths and complications).

Objective: Collect and analyze information on preventable deaths and provide information to regions for quality improvement.

Indicator 103.4 (Essential Service= System Management): The trauma system has undergone a jurisdiction-wide external independent analysis.

Score: 2 - *Individual trauma centers have undergone outside consultation and verification.*

Status: Some trauma centers have outside review of verification. An internal assessment of the state's trauma care system has been completed, but no external assessment has been completed.

Goal: Conduct an external assessment of the trauma system.

Objective: Planning for external assessment should be conducted after system is in place and has been tested.

Benchmark 104:

An assessment of the trauma system's disaster/emergency preparedness has been completed including coordination with the public health and EMS systems and the emergency management agency.

Priority: ☐ Short Term (within 1 year)   ☑ Intermediate (within 3 years)
☐ Long Term (3-5 years)   ☑Ongoing   ☐ Completed

Indicator 104.1 (Essential Service= System Management): There is a resource assessment that identifies the trauma system's expanded capability to respond to mass casualty incidents in an all-hazards approach.

Score: 4 - *A written inventory of system-wide Mass Casualty Incident (MCI) capacity has been completed and includes: medical reserve personnel, facility surge capacity, additional equipment resources and caches, communications interoperability, overall management structure such as NIMS (National Incident Management System), and SEMS (Standardized Emergency Management System).*

Status: Integrated plans of the EMS Trauma System and the Disaster Medical System exist at the local level. Department of Health Services is currently conducting an assessment of hospital preparedness based on the benchmarks in the HRSA Bioterrorism grant.

Goal: Incorporate the inventory of trauma system-wide MCI capacity inventory into broader communitywide and statewide planning efforts for all-hazards responses.

Objective: Ensure capacity is incorporated into communitywide efforts.

Indicator 104.2 (Essential Service= System Management): There has been a consultation by external experts to assist identifying current status and needs of the trauma system to be able to respond to mass casualty incidents.

> Score: 4 - *Preparations are under way for a formal system-wide review of the trauma system response to MCI (to occur within the next six months).*

> Status: Department of Health Services is currently conducting an assessment of hospital preparedness based on the benchmarks in the HRSA Bioterrorism grant.

> Goal: An outside group of all-hazards response "experts" has conducted a formal external assessment and has made specific recommendations to the system.

> Objective: Review DHS survey & determine what resources may be needed.

Indicator 104.3 (Essential Service= System Management): The trauma system has completed a gap analysis based on the resource assessment for trauma disaster preparedness.

> Score: 1 - *No formal gap analysis has been completed.*

> Status: There has been no gap analysis.

> Goal: A system-wide trauma system MCI resource gap analysis has been completed for the jurisdiction based on the system resource standards adopted.

> Objective: Complete gap analysis based upon information from DHS study.

Benchmark 105:

> **The system assesses and monitors its value to its constituents in terms of cost/benefit analysis and societal investment.**

Priority: ☐ Short Term (within 1 year) ☑ Intermediate (within 3 years)
☐ Long Term (3-5 years) ☐ Ongoing ☐ Completed

Indicator 105.1 (Essential Service= System Management): The benefits of the trauma system, in terms of years of productive life lost (YPLL), quality—adjusted life years (QALY), disability—adjusted life years (DALY), and so on, are described.

> Score: 1 - *There are no cost data available to the system to compare to quality of life indicators.*

Status: Although there is no formal cost-benefit analysis, literature does indicate that trauma systems are beneficial.

Goal: Provide a series of reports and fact sheets that are regularly updated to descriptively and graphically illustrate costs and benefits of the trauma system as well as the cost and benefits of specific personal behaviors.

Objective: Develop a statewide trauma registry.

Indicator 105.2 (Essential Service= System Management): Cases that document the societal benefit are reported on so that the community sees and hears the benefit of the trauma system to society.

Score: 2 - *Dramatic saves and functional outcome returns are documented at each facility or within various components of the system.*

Status: Local EMS agencies and trauma centers may have specific cases showing the societal benefit. There is no formal process of collection of these cases at the state level.

Goal: Use cases as part of information fact sheets documenting cost- benefit of the trauma system to the community that are distributed to the press and other segments of the community.

Objective: Develop Statewide Trauma Registry to capture this information.

Indicator 105.3 (Essential Service= System Management): An assessment of the needs of the media concerning trauma system information has been conducted.

Score: 2 - *Plans are in place to feed information to the media in response to a particular traumatic event.*

Status: There is no routine or planned contact with the media regarding trauma, however, there is a process for media response including traumatic events.

Goal: Develop media information resources based on the stated needs of the media themselves, and include media representatives in trauma system informational events.

Objective: Establish a media plan and outline targeted goals.

Indicator 105.4 (Essential Service= System Management): An assessment of the needs of the public officials concerning trauma system information has been conducted.

Score: 2 - *Plans are in place to provide information to the general public in response to a particular traumatic event.*

Status: There is no routine or planned contact with the general public; however, there is a process to notify the general public in case of a traumatic event.

Goal: Develop public official information resources based on the stated needs of the public officials themselves, and include public officials in trauma system informational events.

Objective: Establish public official resource plan.

Indicator 105.5 (Essential Service= System Management): An assessment of the needs of the general public concerning trauma system information has been conducted.

Score: 1 - *There is no routine or planned contact with the general public.*

Status: There is a process for notification of public regarding various topics.

Goal: Develop general public information resources based on the stated needs of the general public themselves, and include general public representatives in trauma system informational events.

Objective: Establish general public information resource plan.

Indicator 105.6 (Essential Service= System Management): An assessment of the needs of the health insurers concerning trauma system information has been conducted.

Score: 1 - *There is no routine or planned contact with the health insurers*

Status: .There is no health insurer plan.

Goal: Develop health insurer information resources based on the stated needs of the insurers themselves, and include insurance representatives in trauma system informational events.

Objective: Establish health insurer resource plan.

Indicator 105.7 (Essential Service= System Management): An assessment of the needs of the general medical community, including physicians, nurses, prehospital care providers, and others, concerning trauma system information has been conducted.

Score: 1 - *There is no routine or planned contact with the broad medical community*.

Status: The trauma advisory committee does have representatives from these groups.

Goal: Develop general medical community information resources based on the stated needs of the general medical community themselves, and general medical community representatives.

Objective: Develop general medical community information resources.

$$\boxed{\text{End Core Function 100}}$$

Core Function 200: POLICY DEVELOPMENT - Promoting the use of scientific knowledge in decision making that includes building constituencies; identifying needs and setting priorities; legislative authority and funding to develop plans and policies to address needs; and assuring the public's health and safety.

Benchmark 201:

> **Comprehensive State statutory authority and administrative rules support trauma system leadership and maintain trauma system infrastructure, planning, oversight, and future development.**

Priority: ☑ Short Term (within 1 year)   ☐ Intermediate (within 3 years)
            ☐ Long Term (3-5 years)   ☐ Ongoing   ☐ Completed

Indicator 201.1 (Essential Service= Develop Policies): The Legislative authority (statute and regulations) plans, develops, implements, manages, and evaluates the trauma system and its component parts, including the identification of the lead agency and the designation of trauma facilities.

Score: 4 - *The lead agency is authorized (has a legal basis) to take actions to implement the trauma system and to report on the progress and effectiveness of system implementation.*

Status: California's Health and Safety Code *allows* local agencies to develop trauma care systems. If a local agency chooses to implement a trauma care system, they must prepare a local trauma plan that follows the state regulations, submit it for approval to the EMS Authority (the regulatory agency), and periodically evaluate their systems. Agencies with an approved local plan may designate trauma centers according to state regulations.

Although 56 of California's 58 counties have chosen to develop a trauma care system, there are two single-county agencies (Solano and Ventura) that have not. In addition, management and evaluation of local systems varies throughout the state. A regional structure would help coordinate local efforts and standardize trauma care.

Health and Safety Code Section 1797.1 states that it is the responsibility of the Authority to coordinate and integrate all state activities concerning emergency medical services that is inclusive of a trauma care system.

Goal: State lead agency (exercises the legal authority) plans, develops, manages, monitors, and improves the trauma system while reporting regularly on the status of the trauma system within the State.

Objective: Ensure proper authority for establishment of system.

Indicator 201.2 (Essential Service= Develop Policies): The legislative authority states that all the trauma system components, EMS, injury control, incident management, and planning, work together for the effective implementation of the trauma system (infrastructure is in place).

> Score: 3 - *There is no legislative authority, but people are working together to improve system effectiveness and management within their individual jurisdictions.*
>
> Status: Trauma is a component of the Emergency Medical Services (EMS) system. Statute requires EMS plans to include all of the components in this goal along with the trauma regulations. There is, however, variance in application of the processes and limited coordination between existing systems.
>
> Goal: Ensure legislative authority for the integration of trauma system components for an effective management and infrastructure to plan and implement the trauma system, as evidenced by agency involvement and interaction.
>
> Objective: Establish a statewide regional infrastructure building upon the local EMS agency structure.

Indicator 201.3 (Essential Service= Develop Policies): Administrative rules direct the development of operational policies and procedures at the state, regional, and local levels.

> Score: 4 - *There are existing statewide administrative rules/regulations for planning, developing, and implementing the trauma system and its components at the state, regional, and local levels.*
>
> Status: State Trauma Regulations identify required policies and procedures for trauma care systems at the state and local level.
>
> Goal: Conduct regular reviews, through established committees and stakeholders, of the regulations governing system performance including policies and procedures for system operations at the state, regional, and local levels that include integration with disaster services and public health preparedness plans.
>
> Objective: Develop standardized policies for regions and a review schedule.

Indicator 201.4 (Essential Service= Develop Policies): The lead agency has adopted clearly defined trauma system standards (e.g., facility standards, triage and transfer guidelines, and data collection standards) and has sufficient legal authority to ensure and enforce compliance.

Score: 3 - *There is sufficient legal authority to adopt and implement operation and performance standards including enforcement. Draft process procedures have been developed.*

Status: The trauma regulations clearly define trauma system standards and require development of policies regarding triage, transfer, and data collection. Standards may differ locally.

Goal: Ensure authority exists, operational policies and procedures and system performance standards are in place, and active monitoring of compliance is taking place.

Objective: Establish regional structure to assist in compliance monitoring and ensure adequate legal authority to perform duties.

Benchmark 202:

> **Trauma system leaders (lead agency, trauma center personnel, and other stakeholders) use a process to establish, maintain, and constantly evaluate and improve a comprehensive trauma system in cooperation with medical, professional, governmental, and citizen organizations.**

Priority: ☑ Short Term (within 1 year)   ☐ Intermediate (within 3 years)
☐ Long Term (3-5 years)   ☐ Ongoing   ☐ Completed

Indicator 202.1 (Essential Service= Mobilize Community Partnerships): The lead agency demonstrates that it can bring organizations together to implement and maintain a comprehensive trauma system.

Score: 5 - *The lead agency has brought together multiple stakeholder groups to assist with and make recommendations on the development and implementation of the trauma system, preferably through a multidisciplinary advisory committee.*

Status: State Trauma Regulations are in place that requires local EMS agencies to establish and monitor local trauma care systems with state approval of local plans.

Goal: Organize multiple stakeholder groups to assist with and make recommendations on the development and implementation of the trauma system, preferably through a multidisciplinary advisory committee.

Objective: Review membership annually and determine adequate membership.

Indicator 202.2 (Essential Service= Mobilize Community Partnerships):
The lead agency has developed and implemented a trauma specific statewide multidisciplinary multi-agency trauma system committee to provide overall guidance to trauma system planning and implementation strategies. The committee meets regularly and is instrumental in providing guidance to the lead agency.

Score: 5 - *There is a trauma specific multidisciplinary multi-agency advisory committee with well-defined goals and responsibilities. It meets regularly with the lead agency providing staff support. The committee routinely provides guidance and assistance to the lead agency concerning system issues. Multiple subcommittees meet as often as necessary to resolve specific system issues and to report back to the statewide trauma system advisory committee. There is strong evidence of consensus building among system participants.*

Status: California has a multidisciplinary State Trauma Advisory Committee that provides expert advice on all trauma related issues and planning strategies. This committee meets on a quarterly basis. A regional level committee should also be established for better local coordination.

Goal: Maintain the multidisciplinary trauma system committee which meets regularly to resolve system issues and provides a forum for consensus building among participants.

Objective: Maintain multidisciplinary representation on the committee.

Indicator 202.3 (Essential Service= Inform, Educate, Empower): A clearly defined and easily understood structure is in place for the trauma system decision-making process.

Score: 1 - *There is no defined process (written policy and procedure) for decision making regarding the trauma program within the trauma system lead agency or its committees.*

Status: California statute identifies the Emergency Medical Services Authority (EMSA) as the regulatory authority responsible for establishing trauma care regulations. The trauma regulations set out the requirements for trauma care plans and designation of facilities. In order to have better coordination at the local level, a regional structure should be developed and a process to address issues clearly defined.

Goal: Maintain a clearly defined trauma program decision-making process which is known and used by the stakeholders to resolve issues and improve the system.

Objective: Develop guidelines for decision-making process and outline activities for regional committee.

Indicator 202.4 (Essential Service= Inform, Educate, Empower): Trauma system leadership has adopted and uses goals and time-specific quantifiable and measurable Indicators for the trauma system.

Score: 1 - *There are no system goals or measurable objectives.*

Status: Trauma regulations set out requirements for trauma care systems. Local trauma plans may contain an implementation plan with goals and Indicators. These, however, vary widely and are not consistent throughout the state.

Goal: Establish measurable programmatic goals and outcome-based quantifiable and time specific objectives to guide system effectiveness and system performance.

Objective: Create consistent measurable Indicators to be included in each trauma care system plan.

Benchmark 203:

> **The State lead agency has a comprehensive written trauma system plan based on national guidelines. The plan integrates the trauma system with EMS, public health, emergency preparedness, and emergency management. The written trauma system plan is developed in collaboration with community partners and stakeholders.**

Priority: ☑ Short Term (within 1 year)   ☐ Intermediate (within 3 years)
☐ Long Term (3-5 years)   ☐ Ongoing   ☐ Completed

Indicator 203.1 (Essential Service= Inform, Educate, Empower): The lead agency, in concert with the multidisciplinary, multi-agency trauma system committee, has adopted a trauma plan.

Score: 2 - *There is no trauma plan, although some groups have begun meeting to discuss the development of a trauma plan.*

Status: Fifty-six of the 58 counties have established local trauma care systems. The State Trauma Advisory Committee is working on the development of a statewide plan.

Goal: Develop and adopt a comprehensive trauma plan which includes the integration of all the components of a trauma system (such as EMS, public

health, and disaster/emergency preparedness) in conjunction with trauma stakeholders.

Objective: Finalize trauma plan

Indicator 203.2 (Essential Service= Inform, Educate, Empower): A trauma system plan exists and is based on the analysis of the trauma demographics assessment and the resource assessments.

Score: 3 - *The lead agency is actively developing a trauma system plan based on the trauma demographics and resource assessments and analyses.*

Status: Local EMS agencies design local trauma care systems which are based on an assessment of the needs and resource availability. These systems, however, tend to be locally focused and may not include neighboring areas, however, a state trauma plan is being finalized. A regional structure would help to coordinate and distribute these resources.

Goal: Maintain a trauma system plan that is integrated with EMS, emergency/disaster preparedness, and public health plans and is regularly updated based on changes in trauma demographics and resource assessments.

Objective: Outline the regional structure

Indicator 203.3 (Essential Service= Inform, Educate, Empower): There is within the trauma system plan congruence of the population demographics with system development and resource allocation priorities. Needs of specific populations (e.g., pediatrics, burn) are integrated into the plan. Considerations should be given to age, population characteristics, and urban and rural environments are all part of the planning process.

Score: 3 - *There is evidence that planning processes take into consideration the needs of special populations and other cultural or geographic parameters.*

Status: The trauma regulations have requirements to address pediatric patient special needs and require transfer agreements for burn patients. Local agencies look at needs when preparing a trauma care system.

Goal: Address the needs of all residents and visitors including special population groups applicable to the geographic area in the plan.

Objective: Work with regional committee to identify special needs population within geographic areas and develop plan to address special needs.

Indicator 203.4 (Essential Service= Inform, Educate, Empower): The trauma system plan clearly describes the system design (including the components necessary to have an integrated and inclusive trauma system) and is used to guide system implementation and management. Example: The plan includes references to regulatory standards and documents, and includes methods of data collection and analysis.

> Score: 3 - *The trauma system plan provides general information about all the components including disaster preparedness, EMS, and public health integration; however, it is difficult to determine who is responsible and accountable for system performance and implementation.*

> Status: Trauma regulations require a description of the local trauma care system in the trauma plan and an implementation plan.

> Goal: Use the trauma plan to guide system implementation and management; familiarize stakeholders and policy leaders with the plan and its components; and use the plan to monitor system progress and to measure results.

> Objective: Establish monitoring process for trauma components.

Indicator 203.5 (Essential Service= Inform, Educate, Empower): A written injury prevention and control plan is developed and coordinated with other agencies and community health programs. The injury program is data driven, and targeted programs are developed based on high injury risk areas. Specific goals with measurable Indicators are incorporated into the injury plan.

> Score: 3 - *There is a written plan for a coordinated injury prevention and control program that is linked to the trauma system plan and that has goals and time-specific, measurable objectives.*

> Status: The Department of Health Services is updating the statewide injury control plan and local agencies and facilities also have a variety of prevention programs although these programs are not specifically linked to trauma.

> Goal: Implement injury prevention and control plan in accordance with the timelines and collect data regarding the effectiveness of the plan to validate, evaluate, and modify the plan.

> Objective: Review current plan to determine trauma components and work with DHS to modify the plan.

Indicator 203.6 (Essential Service= Mobilize Community Partnerships):

The trauma system plan has established clearly defined methods of integrating with disaster preparedness plans (all hazards).

Score: 2 - *There is an established trauma plan but it is silent on emergency/ disaster integration, and no evidence is present to demonstrate an integrated disaster and trauma system.*

Status: Disaster planning is incorporated into the overall local EMS plan and drills are routinely conducted.

Goal: Coordinate lead agency, EMS and emergency preparedness and integrate the trauma plan and conduct routine drills on all-hazards approach to further improve the plans and processes.

Objective: Ensure integration with disaster planning.

Indicator 203.7 (Essential Service= Mobilize Community Partnerships):

The trauma system plan has established clearly defined methods of integrating the trauma system plan with the EMS, emergency/disaster, and public health preparedness plans.

Score: 2 - *There is some cross-reference between plans, but defined methods of working collaboratively together are not developed.*

Status: Trauma is a component of EMS and is, therefore integrated into the local trauma plans.

Goal: Integrate trauma system planning and operations with public health, EMS, and emergency/disaster preparedness and conduct training and exercises regularly.

Objective: Ensure collaboration with emergency/disaster planning.

Benchmark 204:

Sufficient resources exist, including those both financial and infrastructure related, support system planning, implementation, and maintenance.

Priority: ☑ Short Term (within 1 year)   ☐ Intermediate (within 3 years)
☐ Long Term (3-5 years)   ☐ Ongoing   ☐ Completed

Indicator 204.1 (Essential Service= Develop Policies): The trauma system plan clearly identifies the human resources and equipment necessary to develop, implement, and manage the trauma program, both clinically and administratively. (The trauma system plan integrates with the Assessment of Resources done previously.)

> Score: 2 - *There is no method of assessing available resources or of identifying resource deficiencies in either the clinical or administrative areas of the trauma system.*
>
> Status: The trauma regulations address some clinical and administrative requirements for trauma care systems; however, those needs have not been assessed for deficiencies.
>
> Goal: Incorporate resource assessment into the trauma system plan; reduce or eliminate resource deficiencies; and evaluate progress.
>
> Objective: Assess and evaluate resources periodically.

Indicator 204.2 (Essential Service= System Management): Financial resources exist that support the planning, implementation, and ongoing management of the administrative and clinical care components of the trauma system.

> Score: 3 - *There is current funding for the development of the trauma system within the lead agency organization consistent with the trauma system plan, but costs to support clinical care support services have not been identified (transportation, communication, uncompensated care, standby fees, and others). No ongoing commitment of funding has been secured.*
>
> Status: One-time local system planning funding was provided for local agencies without trauma care systems in fiscal year 2001/02. Trauma center funding was also provided for designated trauma centers in fiscal years 2001/02 ($25 million), 2002/03 ($20 million), and 2005/06 ($10 million). There is no ongoing funding available for planning, implementation, or management of administrative and clinical care components of the trauma care system.
>
> Goal: Identify a stable (consistent) source of reliable funding for development, operations, and management of the trauma program (clinical care and lead agency administration) and trauma implementation, maintenance, and ongoing program enhancements.
>
> Objective: Identify costs and obtain funding.

Indicator 204.3 (Essential Service= System Management): Designated funding for the trauma system support infrastructure (lead agency) is legislatively appropriated. Note: Although nomenclature concerning designated, appropriated, and general funds

varies between jurisdictions, the intent of this indicator is to demonstrate long-term, stable funding for trauma system development, management, evaluation, and improvement.

> Score: 3 - *Limited funds for trauma system development have been identified, but the funds have not been appropriated for trauma system infrastructure support.*
>
> Status: One-time funds were provided for local trauma system development and there is minimum funding available for all EMS projects which may include trauma system development. The limited federal funds that were appropriated to support the statewide trauma committee have been eliminated and no ongoing funds have been appropriated for trauma system infrastructure support.
>
> Goal: Appropriate sufficient infrastructure funding for the lead agency consistent with the trauma system plan and priorities for funding administration and operations.
>
> Objective: Identify costs and obtain appropriate funding.

Indicator 204.4 (Essential Service= System Management): Operational budgets (system administration and operations, facilities administration and operations, and EMS administration and operations) are aligned with the trauma system plan and priorities. Examples: Full-Time Equivalents (FTEs) per population to support the infrastructure. Costs to improve communications system.

> Score: 1 - *There is no operational budget.*
>
> Status: One-time funds have been provided for planning and existing trauma centers, however, there is no ongoing operational budget.
>
> Goal: Develop an operational budget for each component in the plan that matches system needs and priorities with programmatic and operational expenditures.
>
> Objective: Determine costs and prepare budget.

Indicator 204.5 (Essential Service= Mobilize Community Partnerships): The trauma system plan includes identification of additional resources (both manpower and equipment) necessary to respond to mass casualty situations.

> Score: 1 - *The plan does not include the identification of resources necessary to respond to mass casualty situations.*
>
> Status: EMS plans incorporate disaster planning and trauma is a component of EMS. Disaster plans exist for the state.

Goal: Complete a response plan, along with sufficient caches of equipment and backup personnel, that ensures the rapid deployment of additional resources during mass casualty incidents.

Objective: Coordinate activities with Disaster planning.

Benchmark 205:

> **Collected data are used to evaluate system performance and to develop public policy.**

Priority: ☐ Short Term (within 1 year)   ☑ Intermediate (within 3 years)
☐ Long Term (3-5 years)   ☐ Ongoing   ☐ Completed

Indicator 205.1 (Essential Service= System Management): Collected data are used for strategic and budgetary planning.

Score: 2 - *There are varying databases that can be accessed but no single reporting structure to produce reports and to analyze findings.*

Status: Local EMS agencies collect local data. There is no statewide data system for strategic or budgetary planning purposes. EMSA is working on CEMSIS which will include a trauma registry.

Goal: Establish a central data base that can be accessed by all trauma centers and lead agency for all trauma system data and provide reports for identification of financial/budget information and strategic planning and performance.

Objective: Develop a statewide trauma registry and provide standardized reporting.

Indicator 205.2 (Essential Service= Develop Policies): Collected data from a variety of sources are used to review the appropriateness of trauma system policies and procedures.

Score: 1 - *There are no written, quantifiable trauma system performance standards or quality improvement mechanisms.*

Status: Local EMS agencies collect local trauma center data; however, data review application varies from county to county.

Goal: Improve system design and make refinements based upon compliance data and provide routine feedback to all systems providers regarding data-identified deficiencies.

Objective: Establish statewide trauma registry and reporting procedures.

Indicator 205.3 (Essential Service= Develop Policies): The trauma information management system is used to assess system performance, to measure system compliance with applicable standards, and to allocate trauma system resources to areas of need or to acquire new resources.

Score: 2 - *There is no trauma management information system (MIS).*

Status: Local EMS agencies collect trauma system data, however, system assessment may vary from county to county.

Goal: Use trauma MIS reports to improve and report on system performance and issue routine reports to providers for assessment of system deficiencies and allocation of resources to areas of greatest need. System performance and standard compliance are to be regularly assessed and reported on.

Objective: Establish statewide trauma registry based on system performance.

Indicator 205.4 (Essential Service= Inform, Educate, Empower): Injury prevention programs use trauma information to develop intervention strategies.

Score: 4 - *Trauma MIS reports on the status of injury and injury mechanisms are routinely available to injury prevention providers and are used routinely to realign injury programs to target the greatest need.*

Status: Local agencies collect trauma information and there are some injury prevention programs throughout the state. Although there is no specific trauma management report, DHS collects injury information, including trauma, which is used to establish prevention programs.
Goal: Establish a well-integrated trauma and injury reporting system; demonstrate how system providers routinely use the information to identify program needs, to develop strategies on program priorities, and to set annual goals for injury prevention.

Objective: Establish electronic links between state trauma registry (when developed) and DHS injury surveillance data systems.

Indicator 205.5 (Essential Service= Inform, Educate, Empower): Education for trauma system participants is developed based on a review and evaluation of trauma system data.

> Score: 2 - *There is limited use of trauma management information reports to target educational opportunities.*
>
> Status: Local agencies collect trauma system data, however, there is no standardized application regarding educational requirements for trauma system participants. Trauma regulations do specify some required training.
>
> Goal: Conduct routine analysis of trauma information and educational opportunities; integrate program objectives; evaluate system performance and education; regularly update trauma information and education; and measure outcomes and effectiveness.
>
> Objective: Establish trauma registry to collect information and identify evaluation needs.

Benchmark 206:

> **Trauma system leaders, including trauma-specific statewide multi-agency advisory committees, regularly reviews system performance reports.**

Priority: ☐ Short Term (within 1 year) ☑ Intermediate (within 3 years)
☐ Long Term (3-5 years) ☐ Ongoing ☐ Completed

Indicator 206.1 (Essential Service= Inform, Educate, Empower): Trauma data reports are generated by the trauma system no less than once per year and are disseminated to trauma system leaders and stakeholders to evaluate and improve system performance effectiveness.

> Score: 1 - *No trauma data reports are generated to assess system effectiveness or performance.*
>
> Status: Statute requires local evaluation of the trauma care system by the local EMS agencies. There is no requirement for dissemination of information to trauma leadership and stakeholders.
>
> Goal: Provide regularly scheduled reports from trauma system data to stakeholder groups to assess system effectiveness.
>
> Objective: Establish statewide trauma registry

Indicator 206.2 (Essential Service= Inform, Educate, Empower):

The multidisciplinary, multi-agency trauma system committee regularly reviews annotated trauma system data reports and system compliance information to monitor trauma system performance and to determine the need for system modifications.

> Score: 2 - *There is a trauma-specific statewide multi-disciplinary, multi-agency advisory committee, but it does not routinely review trauma data reports.*

> Status: Local agencies are required to periodically review the trauma system; however, there is no provision for review at the state level.

> Goal: The lead agency, multidisciplinary, multi-agency committee and related stakeholder groups meet regularly and review trauma data reports to assess system performance overtime, looking for ways to improve system effectiveness and patient outcomes.

> Objective: Establish statewide trauma registry.

Benchmark 207:

> **The lead agency informs and educates State, regional and local constituencies and policy makers to foster collaboration and cooperation for system enhancement and injury control.**

Priority: ☐ Short Term (within 1 year)   ☑ Intermediate (within 3 years)
☐ Long Term (3-5 years)   ☐ Ongoing   ☐ Completed

Indicator 207.1 (Essential Service= Mobilize Community Partnerships):

The lead agency ensures communications, collaboration, and cooperation between State and regional/local systems.

> Score: 2 - *There is little evidence that the lead agency and other governmental agencies working to implement a trauma system actively engage in system planning and operational dialogue.*

> Status: EMSA does promote communication, collaboration, and cooperation among state and local agencies. There is, however, no formal standardized reporting.

Goal: State, regional, and local systems engage in mutual and cooperative plan development and implementation; lead agency seeks input and dialogue with a multitude of stakeholders. Frequent dialogue occurs among the lead agency and local, regional, or State trauma system participants and leaders. There is evidence of mutual respect and sharing of information among the multidisciplinary groups.

Objective: Establish regional committees.

Indicator 207.2 (Essential Service= Inform, Educate, Empower): The trauma system leadership (lead agency, advisory committees, and others) informs and educates constituencies and policy makers through community development activities, targeted media messaging, and active collaborations aimed at injury prevention, and trauma system development.

Score: 3 - *Community activities have begun with the development of an injury prevention campaign, and there have been initial discussions with policy makers regarding trauma system development.*

Status: There are several media campaigns underway for injury prevention (DHS, CHP), however, not specifically targeted at trauma system development.

Goal: Establish a continuing trauma media campaign is underway and ensure key policy makers at the state, regional, and local levels are keenly aware of the benefits of a trauma system and of the importance of injury prevention programs

Objective: Work with DHS to specifically incorporate trauma into injury prevention programs.

Indicator 207.3 (Essential Service=Mobilize Community Partnerships):
Trauma system leaders (lead agency, advisory committees, and others) mobilizes community partners in identifying the injury problem throughout the state and in building coalitions of personnel to design systems that can reduce the burden of injury.

Score: 3 - *A state lead agency for injury prevention has been established, and a statewide injury coalition has been meeting regularly and reporting on the status of injury in the state. Interface between the injury coalition and the trauma system multidisciplinary committee or trauma system leadership (government, acute care, or rehabilitation) has been limited.*

Status: Injury prevention programs exist in various locations within the state. Department of Health Services has an injury prevention program, however, it does not address trauma specifically.

Goal: Integrate injury coalitions and trauma committees to work collaboratively to inform the community and to educate community leaders. The trauma system and injury prevention leadership regularly informs and educates policy makers on trauma system development and injury prevention.

Objective: Integrate injury coalition and trauma committee.

Indicator 207.4 (Essential Service= Inform, Educate, Empower): A trauma system public information and education program exists that heightens public awareness of trauma as a disease, the need for a trauma care system, and the preventability of injury.

Score: 1 - *There is no written public information and education plan on trauma system or injury prevention and control.*

Status: No written education or injury plan exists.

Goal: Implement a trauma system and injury prevention program public information and education plan and use data concerning the effectiveness of the strategies to modify the plan and programs.

Objective: Prepare public information and education plan.

Benchmark 208:

> **The trauma, public health, and emergency preparedness systems are closely linked.**

Priority: ☐ Short Term (within 1 year) ☑ Intermediate (within 3 years)
☐ Long Term (3-5 years) ☑ Ongoing ☐ Completed

Indicator 208.1 (Essential Service= Mobilize Community Partnerships): The trauma system and the public health system have established linkages including programs with an emphasis on population based public health surveillance, and evaluation, for acute and chronic traumatic injury and injury prevention.

Score: 2 - *There is little population-based public health surveillance shared with the trauma system, and program linkages are rare. Routine public health status reports are available for review by the trauma system lead agency and constituents.*

Status: Public health surveillance information regarding trauma is limited.

Goal: Integrate the trauma system and the public health system; provide routine reporting, programmatic participation, operational integration, and

measurable progress can be demonstrated. (Demonstrated integration and linkage could include such activities as rapid response and notification in disasters, integrated data systems, communication cross-operability, and regular epidemiology report generation.)

Objective: Establish trauma registry and provide linkages among systems.

Indicator 208.2 (Essential Service= Mobilize Community Partnerships):
The incident management and trauma system and the disaster management system have formal established linkages for system integration and operational management.

Score: 3 – *Plans are in place for both disaster and trauma system linkage. Integration is beginning, and cooperation within the multidisciplinary groups is occurring.*

Status: *Draft policies are being reviewed, and operational management strategies are being aligned.*   Linkages between the trauma system and disaster planning are occurring. EMS plans incorporate both disaster and trauma planning.

Goal: Integrate trauma system plan and the disaster preparedness plan; implement, test, and evaluate operational procedures; hold regular system participants meetings; and share data from the trauma system and from the disaster preparedness program.

Objective: Fully link the disaster and trauma plans.

End Core Function 200

Core Function 300: <u>**ASSURANCE: Assurance to constituents that services necessary to achieve agreed-on goals are provided by encouraging actions of others (public or private), requiring action through regulations, or providing services directly.**</u>

Benchmark 301:

> **The trauma management information system (MIS) is used to facilitate ongoing assessment and assurance of system performance and outcomes and provides a basis for continuously improving the trauma system including a cost-benefit analysis.**

Priority: ☐ Short Term (within 1 year) ☐ Intermediate (within 3 years)
  ☑ Long Term (3-5 years) ☑ Ongoing ☐ Completed

Indicator 301.1 (Essential Service= Evaluation): The lead trauma authority ensures that each member of the trauma system collects and uses patient data as well as provider data to assess system performance and to improve quality of care. Assessment data are routinely submitted to the lead trauma authority.

> Score: 2 - *There is a trauma registry system in place in the trauma centers, but it is not used by all facilities within the system nor is it used by the lead trauma authority to assess system performance.*

> Status: LEMSAs that have a trauma care system collect data locally and use some form of trauma registry. Trauma regulations require designated trauma centers to have a trauma registry. Trauma centers use their internal trauma registry to assess quality of care. There is no statewide trauma registry, however, minimum inclusion criteria have been established and a minimum data set has been drafted.

> Goal: Evaluate overall system performance using aggregated trauma registry data submitted to lead trauma authority from hospital trauma registries.

> Objective: Establish a statewide trauma registry and develop a reporting process for the local agencies.

Indicator 301.2 (Essential Service= Evaluation): Prehospital care providers collect patient care and administrative data for each episode of care and provide these data not only to the hospital, but have a mechanism to evaluate the data within their own agency including monitoring trends and identifying outliers.

> Score: 2 - *Prehospital providers have a patient care record for each episode of care, but it is not yet automated or integrated with the trauma MIS.*

Status: LEMSAs are required to have a patient care record for each episode of care, however, not all LEMSAs have a trauma care system or registry. Trauma center registries collect prehospital data from patient care records in a patient chart, if available. There is no standardization of record collection throughout the state.

Goal: Use electronically submitted prehospital agency data submitted from the lead agencies to evaluate overall trauma system performance.

Objective: Establish a statewide trauma registry and a reporting process for the local agencies.

Indicator 301.3 (Essential Service= Evaluation): Trauma registry, emergency department, prehospital, rehabilitation, and other databases are linked or combined to create a trauma system registry.

Score: 2 - *Prehospital providers have a patient care record for each episode of care, but it is not yet automated or integrated with the trauma MIS.*

Status: Most LEMSAs have trauma registries; however they differ throughout the state regarding specialty center and rehabilitation information. In addition, not all LEMSAs have trauma registries. Statewide injury data is provided by EPIC (DHS). There are data bases for trauma, emergency departments, prehospital and rehabilitation as well as statewide injury data bases. None of the data bases are routinely linked.

Goal: Monitor trauma system performance using integrated management information system.

Objective: Develop a statewide trauma registry.

Indicator 301.4 (Essential Service= Evaluation): The lead trauma agency has available for use the latest in computer/ technology advances and analytical tools for monitoring injury prevention and control components of the trauma system. There is reporting on the outcome of implemented strategies for injury prevention and control within the trauma system.

Score: 3 - *The lead agency is using the computer/technology systems and analytical tool available to assist in monitoring the injury prevention and control programs of the trauma system. The evaluation of injury prevention and control programs is in its formative stages.*

Status: There is no statewide trauma registry.

Goal: Train trauma participants on the use of the computer/technology systems and analytical tools; facilitate access to data for evaluation and research; and ensure use of data for routine monitoring and outcome reporting.

Objective: Establish statewide trauma registry.

Benchmark 302:

> **The trauma system is supported by an EMS system that includes communication, medical oversight, prehospital triage, and transportation; the trauma system, EMS system, and public health agency are well integrated.**

Priority: ☑ Short Term (within 1 year) ☐ Intermediate (within 3 years)
☐ Long Term (3-5 years) ☑ Ongoing ☐ Completed

Indicator 302.1 (Essential Service= Link to Provide Care): There is well-defined trauma system medical oversight integrating the specialty needs of the trauma system with the medical oversight for the overall EMS system. Note: The EMS system medical director and the trauma medical director may, in fact, be the same person.

Score: 2 – *EMS medical oversight for all levels of prehospital providers caring for the trauma patient is provided, but such oversight is provided outside the purview of the trauma system.*

Status: EMS medical oversight is provided at the local level, however systems vary statewide.

Goal: Fully integrate up-to-date medical oversight (including input from system providers of medical oversight policies) and regularly evaluate the effectiveness of the program.

Objective: Establish a statewide trauma registry to assist in managing statewide trauma issues.

Indicator 302.2 (Essential Service= Link to Provide Care): There is a clearly defined, cooperative, and ongoing relationship between the trauma specialty care physician leadership (e.g., trauma medical director within each facility) and the EMS system medical director.

Score: 3 - *There is no formally established, ongoing relationship between the trauma medical director (within each trauma center) and the EMS system medical director, however, the trauma medical director and the EMS medical director meet or visit informally to resolve problems, "to plan strategies," and to coordinate efforts.*

Status: Local EMS agencies have a medical director that oversees the trauma system and a base hospital medical director that oversees the prehospital personnel that informally work together to resolve issues. Not all LEMSAs have trauma systems.

Goal: Develop written procedure for delineating the responsibilities of the trauma medical director and the EMS system medical director and specify how they are to work together.

Objective: Establish regional structure with policy regarding coordination.

Indicator 302.3 (Essential Service= Link to Provide Care): There is clear-cut legal authority and responsibility for the EMS system medical director including the authority to adopt protocols, to implement a quality improvement system, to restrict the practice of prehospital care providers, and to generally assure medical appropriateness of the EMS system.

Score: 5 - *There is an EMS system medical director with a written job description and whose specific legal authorities and responsibilities are formally granted by law or by administrative rule. There is written evidence that the system medical director has, consistent with the formal authority, adopted protocol implemented a quality improvement program, and is making significant efforts to improve the   appropriateness of the EMS system and to fully integrate EMS into the trauma care system.*

Status: Statute outlines responsibility for coordination and integration of all state activities concerning emergency medical services, personnel requirements, sets out medical director responsibilities, and prehospital requirements.

Goal: Completed.

Objective: Review statute to ensure adequate authority.

Indicator 302.4 (Essential Service= Assure Competent Workforce):
The trauma system medical director is actively involved with the development, implementation, and ongoing evaluation of system dispatch protocols to assure they are congruent with the trauma system design. These protocols include, but are not limited to, which resources to dispatch (ALS vs. BLS), air-ground coordination, early notification of the trauma care facility, pre-arrival instructions, and other procedures necessary to assure resources dispatched are consistent with the needs of injured patients. Note: The trauma system medical director and the EMS system medical director may be the same individual. However, specific responsibility for, and oversight of, the trauma system must be assured.

Score: 4 - *Trauma dispatch protocols have been developed in close coordination with the trauma system medical director and are congruent with the trauma system design.*

Status: Trauma dispatch protocols exist in areas with trauma care systems that are congruent with the trauma system design.

Goal: Develop trauma dispatch protocols that are congruent with trauma system design and establish procedures to involve dispatchers and supervisors in trauma system quality link.

Objective: Include dispatchers and supervisors in trauma quality link.

Indicator 302.5 (Essential Service= Evaluation): The retrospective medical oversight of the EMS system for trauma triage, communication, treatment, and transport is closely coordinated with the established quality improvement processes of the trauma system.

Score: 5 - *There is a retrospective medical oversight of the trauma triage communication, treatment, and transport that is coordinated with the EMS system retrospective medical direction, or visa versa. There is evidence this procedure is being regularly used to monitor system performance and to make system improvements.*

Status: All LEMSAs have a medical director and oversight a quality improvement process so this Indicator is met in those areas with a trauma system.

Goal: Completed

Objective: Ensure trauma systems are established in all areas of the state. And include monitoring requirements in the trauma plan update.

Indicator 302.6 (Essential Service= Link To Provide Care): There are mandatory system-wide prehospital triage criteria to ensure that trauma patients are transported to an appropriate facility based on their injuries. These triage criteria are regularly evaluated and updated to ensure acceptable and system-defined rates of sensitivity and specificity for appropriately identifying the major trauma patient.

Score: 2 - *There are differing triage criteria guidelines used by different providers. Appropriateness of triage criteria and subsequent transportation are not evaluated for sensitivity of specificity.*

Status: The trauma regulations require each LEMSA to develop triage criteria. No state triage criteria exist and local criteria vary.

Goal: Routinely evaluate triage criteria for effectiveness and update triage criteria to improve system performance.

Objective: Develop guidelines to standardize triage criteria.

Indicator 302.7 (Essential Service= Link To Provide Care): There is a universal access number for citizens to access the EMS/trauma system, with dispatch of appropriate medical resources. There is a central communications system for the EMS/trauma system to ensure field-to-facility bidirectional communication, interfacility dialogue, and all hazards response communications among all systems participants. Note: In some systems with limited resources, e.g., rural, the available resources are, at least initially, the "appropriate resources."

Score: 3 - *There is a universal access number and central communications system (911). A communications plan for the trauma system has been completed.*

Status: All areas have enhanced 911 systems available via hard-wired phone lines with both automatic number identification and automatic location identification capabilities. Most populated areas also have enhanced 911 available for wireless callers. Local agency capabilities vary regarding centralized communications systems statewide, especially in rural and remote areas. Currently there are planning efforts statewide to streamline access where true interoperability occurs.

Goal: Integrate trauma system communications plan with other systems plans, ensure system is available during disasters, and the system is evaluated periodically.

Objective: Review system and encourage state of the art communication equipment.

Indicator 302.8 (Essential Service= Link To Provide Care): There are sufficient and well-coordinated transportation resources to ensure EMS providers arrive at the scene promptly and expeditiously transport the patient to the correct hospital by the correct transportation mode.

Score: 4 - *There is a priority dispatch and transportation system that ensures appropriate system resources for prompt transport of trauma victims to trauma centers. A trauma transportation plan has been implemented. System issues are evaluated and corrective plans are implemented as needed.*

Status: Local agencies have coordinated resources with priority dispatch, however not all areas in California have a trauma care system. Local agency dispatch policies vary.

Goal: Institute a priority dispatch system that is regularly assessed for ability to obtain proper resources to the scene and to transport by using the correct mode of transportation. Include transportation system as part of the overall EMS, trauma, and disaster system.

Objective: Develop transportation guidelines using statewide best practices.

Indicator 302.9 (Essential Service= Link To Provide Care): There is a procedure for communications among medical facilities when arranging for interfacility transfers including contingencies for radio or telephone system failure.

Score: 2 - *Interfacility communications procedures are generally included in the patient transfer protocols for each facility, but there is not a system wide procedure.*

Status: Regulations require trauma centers to have a policy for interfacility transfer of patients, however transfer communications vary among local agencies statewide. Currently most hospitals use the ReddiNet, or like, systems to show hospital availability. An E-Team project is underway which will allow all status reporting systems to be coordinated statewide so that resources can be tracked on a statewide level.

Goal: Establish uniform system wide procedures for communications among facilities when arranging to interfacility patient transfers, establish alternative communications procedures in case of system failures, and evaluate periodically for necessary changes.

Objective: Develop guidelines for prompt transfer of patients.

Indicator 302.10 (Essential Service= Link To Provide Care): There are established procedures for EMS and trauma system communications in all hazards that are effectively coordinated with the overall all hazards response or major EMS incident plan.

Score: 4 - T*here are statewide or regional EMS communication procedures in the event of a disaster or major EMS incident that are coordinated with other jurisdictions, with the overall disaster plan, and with the incident management system.*

Status: hospital has a disaster plan that incorporates trauma and there is statewide coordination to help manage disasters.

Goal: Establish statewide and regional EMS communications procedures in event of disaster that are coordinated with other jurisdictions, with the overall disaster plan, incident management system, provide redundancies in case of system failure, regularly test procedures, and make changes as necessary.

Objective: Work with disaster planners to ensure adequate communications are available.

Benchmark 303:

> **Acute care facilities are integrated into a resource-efficient, inclusive network that meets required standards and that provides optimal care for all injured patients.**

Priority: ☑ Short Term (within 1 year)   ☐ Intermediate (within 3 years)
☐ Long Term (3-5 years)   ☑ Ongoing   ☐ Completed

Indicator 303.1 (Essential Service= Link to Provide Care): The trauma system plan has clearly defined the role and responsibilities of all acute care facilities treating trauma and of facilities that provide care to specialty populations (e.g., burns and spinal cord injury).

Score: 1 - *There is no trauma system plan that outlines roles and responsibilities of all acute care facilities.*

Status: The trauma regulations define required resources for trauma centers and outline trauma care system requirements. Further it requires non-trauma centers to ensure transfer patients to a higher level of care. There is no plan outlining roles and responsibilities of acute care centers.

Goal: Define roles of all acute care hospitals within the plan and appropriate policies and procedures are implemented and tracked.

Objective: Determine if additional guidelines are necessary and establish guidelines for acute care centers.

Indicator 303.2 (Essential Service= Link to Provide Care): The trauma system lead agency should ensure the number, levels, and distribution of trauma centers required to meet system demand are available.

Score: 2 - *There is a trauma system plan, but it does not identify the number, location, or levels of trauma facilities needed for the jurisdiction served.*

Status: Regulations require local EMS agencies with a trauma care system to develop a local plan including number and levels of trauma centers based on system need.

Goal: Establish plan that identifies number and level of trauma facilities based on needs assessment process; use plan to make decisions about trauma facility designations; account for facility resources and geographic distribution,

population densities, injured patient volumes, transport resource capabilities, and transport times, review periodically.

Objective: Develop trauma center designation guidelines for consistency statewide.

Indicator 303.3 (Essential Service= Evaluation): The trauma lead authority ensures that trauma facility patient outcomes and quality of care are monitored. Deficiencies are recognized and corrective action is implemented. Variations in standards of care are minimized, and improvements are made routinely.

Score: 4 - *Require designated trauma centers to maintain a trauma registry including patient outcomes, use data for ongoing quality improvement program, provide regular comparisons to local trauma system standards, report finding to lead authority.*

Status: Local agencies with trauma centers must meet state regulations which include monitoring patient outcomes.

Goal: Require designated trauma centers to maintain a trauma registry including patient outcomes, use data for ongoing quality improvement program, provide regular comparisons to local trauma system standards, report finding to lead authority, compare with state and national norms, provide written feedback regarding significant variations to local agencies.

Objective: Establish statewide trauma registry.

Indicator 303.4 (Essential Service= Link to Provide Care): When injured patients arrive at a medical facility that cannot provide the appropriate level of definitive care, there is an organized and regularly monitored system to ensure the patients are expeditiously transferred to the appropriate, system-defined trauma facility.

Score: 1 - *There is no system to regularly review the conformity of interfacility transfers within the trauma system according to preestablished procedures.*

Status: Regulations require local systems to have interfacility transfer policies, however, it is fragmented and there is no monitoring.

Goal: Integrate monitoring of interfacility transfers of trauma patients into the overall program of quality and system improvement, implement plan of action for corrections.

Objective: Establish interfacility transfer monitoring procedures.

Indicator 303.5 (Essential Service= Link to Provide Care): The specific needs of unique populations (e.g., Language [EASL], socially disadvantaged, migrant/ transient, remote, rural, and others) are accommodated within the existing trauma system.

> Score: 2 - *The trauma system lead agency and stakeholders are beginning to consider the needs of unique populations in implementing the trauma system.*
> Status: All local EMS agencies have EMS plans which consider special needs for children.
>
> Goal: Accommodate the needs of unique populations that allow them to effectively access trauma care, routinely monitor these populations and incorporate into the evaluation of trauma system effectiveness.
>
> Objective: Determine unique needs to be addressed in trauma plans.

Benchmark 304:

> **The jurisdictional lead agency, in cooperation with other agencies and organizations, uses analytical tools to monitor the performance of population-based prevention and trauma care services.**

Priority: ☐ Short Term (within 1 year) ☑ Intermediate (within 3 years)
☐ Long Term (3-5 years) ☑ Ongoing ☐ Completed

Indicator 304.1 (Essential Service= Evaluation): The lead agency, along with partner organizations, prepares annual reports on the status of injury prevention and trauma care in state, regional, or local areas.

> Score: 5 - *There is an integrated annual reporting system that is electronically available to stakeholders. The lead agency along with partner organizations prepares and disseminates regular annual reports on the status of injury prevention and trauma care in state, regional, or local areas.*
>
> Status: Local EMS agencies collect trauma data and may provide reports. EPIC and SWITRS produce annual report on traumatic injury and death. Information is on all injuries and not specifically trauma.
>
> Goal: Completed.
>
> Objective: Work with DHS to monitor trauma data and make data available to users.

Indicator 304.2 (Essential Service= Evaluation): The trauma system MIS database is available for routine public health surveillance. There is concurrent access to the databases (emergency department, trauma, medical examiner, and

public health epidemiology) for the purpose of routine surveillance and monitoring of health status that occurs regularly and is a shared responsibility. Note: All legal requirements for confidentiality and safeguarding of patient information must be met when sharing data between or among agencies.

Score: 2 - *The databases can be accessed by only the owner of the data, and sharing of information goes through a formal request process.*

Status: EMS agencies maintain trauma data bases, however data bases vary by county. There is no statewide data base.

Goal: Share information from prehospital, emergency departments, trauma, medical examiner, and public health epidemiology files, provide routine surveillance for system, and ensure effectiveness of injury prevention and trauma system.

Objective: Establish statewide trauma care system.

Benchmark 305:

> **The lead agency assures its trauma system plan is integrated with, and complementary to, the comprehensive mass casualty plan for natural disasters and manmade disasters, including an all-hazards approach to disaster planning and operations.**

Priority: ☐ Short Term (within 1 year)   ☑ Intermediate (within 3 years)
☐ Long Term (3-5 years)   ☑ Ongoing   ☐ Completed

Indicator 305.1 (Essential Service= Link to Provide Care): The EMS trauma system and the all hazards medical system have operational trauma and disaster response plans and have established an ongoing cooperative working relationship to assure trauma system readiness to "all hazard" multiple patient events.

Score: 4 - *There are plans in place to ensure that the EMS, the trauma system, and the disaster systems are integrated and operational. Disaster exercises and drills have the cooperation and participation of the trauma system.*

Status: With the focus on Homeland Security, increased attention has been given to the integration of the EMS Trauma System and the Disaster Medical System. Integrated plans do exist at the local level but not at the state level. Four of 6 regions have regional disaster plans which include the principal functions involved in providing mutual aid: coordinating the acquisition of medical and health resources in response to a request from EMSA, CDHS, or state OES in support of a state medical/health response to a major disaster and

responding to Operational Areas requesting mutual aid assistance for disasters within the region. The State Disaster Medical Plan is currently being revised.

Goal: Integrate EMS, trauma system and all hazards response plans and cooperate and share information to improve trauma system readiness.

Objective: Continue working with disaster to ensure trauma is incorporated into disaster planning.

Indicator 305.2 (Essential Service= Evaluation): All hazards events routinely include situations involving natural (e.g., earthquake), unintentional (e.g., school bus crash), and intentional (e.g., terrorist explosion) trauma-producing events that test expanded response capabilities and surge capacity of the trauma systems.

Score: 5 - *Exercises and training in all-hazards disaster situations including testing of facility/clinic surge capacity are regularly conducted with trauma, EMS, and public health stakeholders. Post-disaster debriefing sessions occur after each drill or event.*

Status: EMSA has conducted or participated in 37 statewide and/or regional drills with scenario emphasis on chemical, biological, radiological, and nuclear disasters. These exercises involved multiple disciplines including EMS, hospitals and trauma centers, policy, labs, public health, Indian Nations, FBI, and CDC. Exercises and drills conducted or participated in by the medical/health community emphasize a regional approach in support of California's Standardized Emergency Management System (SEMS). Local agencies initiate resource requests that are forwarded to county, region, state, and then the federal government as needed. EMSA is working on a Master Exercise that will coordinate with other local, state, and federal drills to maximize resources and to assure that all disciplines and hazards are included in preparedness training.

Goal: Completed

Objective: Continue to work with disaster planning.

Indicator 305.3 (Essential Service= Link to Provide Care): The trauma system through the lead trauma agency has access to additional equipment, materials, and personnel for large-scale traumatic events. Note: The lead trauma agency will work with other appropriate national, State, regional, and local agencies to secure these additional resources.

Score: 4 - *The lead trauma agency, in conjunction with the trauma stakeholders, has begun to test a method of deploying additional equipment, materials, and personnel during disasters and mass casualty events.*

Status: Funding for bioterrorism events has provided funding for supply caches for every Level I or II trauma center in California which can be mobilized in the event of an emergency.

Goal: Acquire equipment and material for prehospital and hospital response to disasters and mass casualty events, resolve deployment issues, develop mechanism to share personnel resources, and test system capabilities routinely.

Objective: Work with disaster planning to ensure resources are shared.

Benchmark 306:

The lead agency ensures that the trauma system demonstrates prevention and medical outreach activities within its defined service area.

Priority: ☐ Short Term (within 1 year)   ☑ Intermediate (within 3 years)
☐ Long Term (3-5 years)   ☑ Ongoing   ☐ Completed

Indicator 306.1 (Essential Service= Link to Provide Care): The trauma system has developed mechanisms to engage the medical community and other system participants in their research findings and quality improvement efforts.

Score: 2 - *There is some evidence of medical community interface with the trauma centers, but it is sporadic and not well coordinated.*

Status: There is some medical community interface, however, there is not coordinated system at the state level.

Goal: Maintain active participation between the trauma system and the general medical community, share quality updates, research, and integrate within medical care system.

Objective: Encourage coordination between medical community and trauma system.

Indicator 306.2 (Essential Service= Link to Provide Care): The trauma system is active within its jurisdiction with the evaluation of prevention programs and injury-related community-based activities and injury prevention and response programs

Score: 2 - *There is some activity by the trauma system in the evaluation of prevention programs and other community-based efforts.*

Status: There are some prevention plans at the local level and pockets of excellence throughout the state; however, there is no standardized evaluation of prevention programs. There are a number of programs throughout the state including NHTSA, DHS, an Governor's initiatives. EMSA evaluates all prevention-related programs funded through the block grant. EMSA also maintains known prevention and public education activities on the website.

Goal: Integrate injury prevention and community based injury response activities with other community efforts and ensure they are well coordinated and duplication of effort is avoided; conduct ongoing evaluation.

Objective: Coordinate trauma system with current prevention efforts.

Indicator 306.3 (Essential Service= Evaluation): The effect or impact of outreach programs (both medical community training/support and prevention activities) is evaluated as part of a system performance improvement process. Note: "Evaluation" implies both informal evaluation processes and more structured research.

Score: 3 - *Trauma center do internal monitoring and evaluations of their efforts in outreach and prevention activities. The results are shared with the lead trauma agency.*

Status: Trauma regulations require trauma centers to have outreach programs; however, there is no standard for the programs nor monitoring or evaluation.

Goal: Use data to implement prevention programs and to communicate trauma system outcomes and performance to medical community through its annual report; evaluate processes and use to enhance future outreach and prevention activities.

Objective: Coordinate prevention activities with current injury prevention activities.

Benchmark 307:

> **To maintain its State or regional or local designation, each hospital must continually work to improve the trauma care as measured by patient outcomes.**

Priority: ☐ Short Term (within 1 year)   ☑ Intermediate (within 3 years)
☐ Long Term (3-5 years)   ☑ Ongoing   ☐ Completed

Indicator 307.1 (Essential Service= Evaluation): The trauma system engages in regular evaluation of licensed acute care facilities that provide trauma care to

trauma patients and designated trauma hospitals. Such evaluation involves independent external reviews.

> Score: 2 – *There is a mechanism for the trauma system to evaluate trauma care services in designated trauma hospitals through internal performance improvement processes.*
>
> Status: Statute and regulation require local ongoing evaluation of trauma system, but does not specify external system review.
>
> Goal: Quality of trauma care is ensured through both internal and external methods. Internal review is regular, and participation is routine for trauma stakeholders. External independent review teams provide further assurance of quality trauma care within all licensed acute care and trauma facilities treating trauma patients.
>
> Objective: Prepare system review guidelines to standardize reviews.

Indicator 307.2 (Essential Service= Evaluation): The trauma system implements and regularly reviews a standardized report on patient care outcomes as measured against national norms. Note: This process may include clinical and bench marks.

> Score: 2 - *There is some standardized measurement of outcomes for trauma patients within the trauma system and applied to the trauma centers.*
> Status: Local EMS agencies review patient outcomes as part of their QI process; however they are not necessarily measured against national norms.
>
> Goal: Complete an assessment of trauma care outcomes based on national norms and implement correction action; conduct routine measurements of quality and report on improvements made, trends, and highlights.
>
> Objective: Develop a statewide trauma registry.

Benchmark 308:

> **The lead agency ensures that adequate rehabilitation facilities have been integrated into the trauma system and that these resources are made available to all populations requiring them.**

Priority: ☐ Short Term (within 1 year)   ☑ Intermediate (within 3 years)
☐ Long Term (3-5 years)   ☑ Ongoing   ☐ Completed

Indicator 308.1 (Essential Service= Link to Provide Care): The lead agency has incorporated, within the trauma system plan and the trauma center standards, requirements for rehabilitation facilities including interfacility transfer of trauma patients to rehabilitation centers.

> Score: 1 - *There are no written standards for the integration of rehabilitation services with the trauma system or with trauma centers.*

> Status: The regulations require transfer agreements, but not specifically for rehabilitation.

> Goal: Integrate rehabilitation programs into the trauma plan and ensure trauma center work closely with rehabilitations center to assure quality outcomes for trauma patients.

> Objective: Establish rehabilitation guidelines.

Indicator 308.2 (Essential Service= Evaluation): Rehabilitation centers and out-patient rehabilitation services provide data on trauma patients to the central trauma system registry that include final disposition, functional outcome, and rehabilitation costs and also participate in quality improvement processes.

> Score: 1 - *There is no requirement for the rehabilitation center or outpatient rehabilitation services to contribute data on trauma patient outcomes.*

> Status: There is no statewide trauma registry.

> Goal: Integrate rehabilitation center and outpatient rehabilitation services early in the patient's treatment and collect data for evaluation and reporting; include rehabilitation personnel in quality improvement processes.

> Objective: Establish a statewide trauma registry and determine what rehabilitation requirements are for trauma patients.

Benchmark 309:

> **The financial aspects of the trauma systems are integrated into the overall quality improvement system to assure ongoing "fine-tuning" and cost-effectiveness.**

Priority: ☐ Short Term (within 1 year)   ☐ Intermediate (within 3 years)
☑ Long Term (3-5 years)   ☑ Ongoing   ☐ Completed

Indicator 309.1 (Essential Service= Evaluation): Cost data are collected and provided to the trauma system registry for each major component including: prevention, prehospital, acute care, disaster planning, and rehabilitation.

Score: 1 - *No cost data are collected.*

Status: EPIC and SWITRs both provide productive lift loss costs. There is no statewide system for collection and reimbursement data. Some data exists at the local level however it is inconsistent and incomplete.

Goal: Determine aggregate system using trauma system registry information and include in annual report.

Objective: Establish statewide trauma registry and include collection and reimbursement data.

Indicator 309.2 (Essential Service= Evaluation): Collection and reimbursement data are submitted by each agency or institution on at least an annual basis.

Score: 1 - *No cost recovery data are collected nor do common definitions exist.*

Status: Local agencies may have some cost data, however, it is not standardized nor easily collected.

Goal: Establish common definitions, require reporting of cost data, and report data in annual trauma system report.

Objective: Establish a statewide trauma care system and Identify cost recovery data to be collected.

Indicator 309.3 (Essential Service= Evaluation): Cost, charge, collection, and reimbursement data are aggregated with other data sources including insurers and data system costs and are included in annual trauma system reports. Note: "Outside" financial data means costs that may not routinely be captured in trauma center or registry data, e.g., transportation, communication, training, infrastructure, and the overall cost of readiness.

Score: 1 - *No outside financial data are captured.*

Status: Some information regarding cost, charges, and reimbursement is available, however there is not consolidation of this information.

Goal: Combine outside financial data with internal trauma system data to estimate total system costs and detail these costs in an annual trauma system report.

Objective: Establish statewide trauma registry and work with hospital organizations to collect data.

Indicator 309.4 (Essential Service= Evaluation): Financial data are combined with other cost, outcome, or surrogate measures (e.g., YPLL, QALY, and DALY), length of stay, length of Intensive Care Unit (ICU) stay, number of ventilator days, and others, to estimate and track true system costs and cost-benefits.

Score: 1 - *No nonfinancial burden of disease costs and outcome measures are collected or modeled.*

Status: Some information is collected locally, however there is no standard system that analyzes and compares these components.

Goal: Calculated estimated savings using burdens of disease costs or outcome measure models for injury prevention programs and combined with actual system costs to determine total system cost savings and detail in annual report.

Objective: Establish statewide trauma registry and reporting system.

Benchmark 310:

> **The lead trauma authority assures a compete nt workforce.**

Priority: ☑Short Term (within 1 year)   ☐ Intermediate (within 3 years)
☐ Long Term (3-5 years)   ☑Ongoing   ☐ Completed

Indicator 310.1 (Essential Service= Assure Competent Workforce):
In cooperation with the prehospital certification/licensure authority, sets guidelines for prehospital personnel for initial and ongoing trauma training including trauma-specific courses and those courses that are readily available throughout the state.

Score: 4 – *Prehospital trauma continuing education courses are regularly scheduled throughout the state.*

Status: Certification/licensure of EMT I and Paramedics require completion of an accredited training course. Training courses are based upon the national standard curriculum which includes a module on trauma. Ongoing training is required but is not specific to trauma. Trauma regulations require training of prehospital EMS personnel to include trauma triage.

Goal: Conduct routine continuing education in prehospital trauma care, require as part of initial certification and licensure (BTLS, PHTLS).

Objective: Review prehospital training requirements and determine if additional trauma specific courses should be required.

Indicator 310.2 (Essential Service= Assure Competent Workforce):
In cooperation with the prehospital certification/licensure authority, assure that prehospital care providers who routinely respond to trauma have a current trauma training certificate, e.g., PHTLS, BTLS, and others, or that after initial certification, training needs are driven by quality assurance or performance improvement (QA/PI) mechanisms, or both.

Score: 3 – *There is a requirement for EMTs providing care to trauma patients to complete a prehospital trauma course. Compliance with training requirements is the responsibility of the employing agency as part of the quality assurance process.*

Status: Certification/licensure of EMT I and Paramedics require completion of an accredited training course. Training courses are based upon the national standard curriculum which includes a module on trauma. Ongoing training is required but is not specific to trauma.

Goal: Regular EMT trauma training is conducted through a variety of venues. Other trauma training as identified through the performance improvement process is completed in cooperation with the appropriate authorities (e.g., trauma center, lead agency, and licensing bogy) to ensure a collectively competent prehospital workforce in issues of trauma care.

Objective: Ensure regular EMS trauma training is conducted.

Indicator 310.3 (Essential Service= Assure Competent Workforce): As part of the trauma center standards and regulations, set appropriate levels of trauma training for all nursing personnel who routinely care for trauma patients in acute care facilities.

Score: 1 – *There are no trauma training standards for nursing personnel who routinely care for trauma patients in acute care facilities, for example, Advanced Trauma Care for Nurses (ATCN), Trauma Nursing Care Course (TNCC), Advanced Trauma Life Support (ATLS), or any national or state-recognized trauma nurse verification course or state-recognized trauma nurse verification course.*

Status: LEMSAs or hospitals may have some specific training requirements for nurses; however, there is no state trauma training requirements.

Goal: Nursing personnel working in acute care facilities that see trauma patients receive initial and ongoing trauma training, including updates in trauma care, continuing education, and trauma nurse certifications as appropriate. Outcome data are monitored for performance improvement and subsequent training opportunities.

Objective: Ensure trauma nurses receive initial and ongoing trauma training.

Indicator 310.4 (Essential Service= Assure Competent Workforce): Ensure that appropriate, approved trauma training opportunities are provided for nursing personnel on a regular basis.

Score: 2 – *There is a process to provide appropriate, approved trauma training courses for nursing personnel, but courses are sporadic and uncoordinated with needs.*

Status: Local EMS agencies and trauma centers provide trauma training for nurses and local or hospital policies may require training. There is no trauma training requirement for nurses at the state level.

Goal: Ensure appropriate training courses for nursing personnel have been approved and are provided regularly throughout the jurisdiction and within the trauma centers. Courses are open to nurses from any facility that treats trauma patients and are matched to needs identified in the performance improvement process.

Objective: Ensure ongoing trauma training courses are available to nurses.

Indicator 310.5 (Essential Service= Assure Competent Workforce):
In cooperation with the nursing licensure authority, assure that all nursing care providers
who routinely respond to trauma have a current trauma training certificate (e.g., ATCN, TNCC, or any national or state trauma nursing verification course). As an alternative after initial trauma course completion, training can be driven by QA/PI processes.

Score: 2 – *There is a requirement for nurse verification in trauma; however, no mechanism to ensure compliance has been instituted.*

Status: There is no state trauma training requirement for nurses, although local agencies or hospitals may have specified requirements.

Goal: Conduct courses for nurse verification in trauma; provide other trauma training as identified through a performance improvement process conducted in cooperation with appropriate authorities; document compliance; and forward to appropriate oversight body to ensure competent workforce.

Objective: Establish process for verification of current nurse trauma training.

Indicator 310.6 (Essential Service= Assure Competent Workforce): As part of the trauma center regulations, set appropriate levels of training for physician personnel who routinely care for trauma patients in all facilities.

Score: 2 – *There are physician training standards but no mechanism to ensure course attendance or successful completion.*

Status: Trauma regulations require ATLS training for emergency physicians providing trauma care and are qualified specialists in other than emergency medicine. Training requirements may be required at the local or hospital level.

Goal: Ensure physicians working in acute care facilities seeing trauma patients receive initial and ongoing trauma training.

Objective: Develop standards and establish process for ensuring ongoing trauma training for physicians.

Indicator 310.7 (Essential Service= Assure Competent Workforce): Assure that appropriate, approved trauma training opportunities are provided for physicians on a regular basis.

Score: 2 – *There is a process to provide appropriate, approved trauma training courses for physicians, but courses are sporadic and uncoordinated with needs.*

Status: Training courses are provided throughout the state; however, there is no standardized coordination.

Goal: Provide regularly scheduled physician courses which are matched to needs.

Objective: Identify training needs and establish process to ensure compliance.

Indicator 310.8 (Essential Service= Assure Competent Workforce):
In cooperation with the physician licensure authority, assure that all physician providers
who routinely respond to trauma have a current trauma training certificate of completion (e.g., Advanced Trauma Life Support [ATLS] and others). Alternatively, physicians may maintain trauma competence through continuing medical education programs following initial ATLS completion.

Score: 1 – *There is no mechanism to ensure that physicians who routinely provide care to trauma patients are certified in ATLS.*

Status: Trauma regulations require ATLS training for emergency physicians providing trauma care and are qualified specialists in other than emergency medicine. Training requirement may be required at the local or hospital level.

Goal: Identify trauma training through performance improvement process and ensure physician completion of ATLS and other necessary training.

Objective: Establish process for verification of current physician trauma training.

Indicator 310.9 (Essential Service= Assure Competent Workforce): Conduct at least one multidisciplinary trauma conference annually that encourages system and team approaches to trauma care.

Score: 2 – *There are sporadic multidisciplinary trauma conferences conducted.*

Status: There are some multidisciplinary trauma conferences conducted annually in the state.

Goal: Conduct annual multidisciplinary conference including EMS, physicians, nurses, physiatrists, policy makers, and consumers.

Objective: Identify trauma conferences and work with sponsors to determine if partnerships could be established.

Indicator 310.10 (Essential Service= Assure Competent Workforce): As new protocols and treatment approaches are instituted within the system, structured mechanisms are in place to inform all personnel in those changes in a timely manner.

Score: 3 – *A structured mechanism is in place to inform or educate personnel in new protocols or treatment approaches as changes in the system are identified.*

Status: Local EMS agencies and hospitals provide changes in procedures to appropriate staff.

Goal: Establish a mechanism to educate personnel in new protocols and treatments and monitor compliance.

Objective: Ensure regions/LEMSAs have mechanisms to educate personnel on new protocols and treatments.

Indicator 310.11 (Essential Service= Assure Competent Workforce): There are mechanisms within the system quality improvement processes to identify and correct systemic personnel deficiencies. Note: Systemic personnel deficiencies are those that cut across multiple agencies and institutions and impact the system as a whole. As an example, if trauma triage protocols are not being adhered to by most prehospital providers from multiple agencies, then it is a systemic problem that could involve communication, training, medical direction, or quality improvement issues.

Score: 3 – *The trauma system has a mechanism to identify systemic personnel deficiencies and is working on a process for corrective action.*

Status: The trauma regulations require a quality improvement process for local systems, however not at the state-level.

Goal: Stakeholders monitor and correct personnel deficiencies as identified through QA/PI process; institute correction action as appropriate with follow-up and monitoring of system deficiencies.

Objective: Establish regional system design and develop personnel guidelines.

Indicator 310.12 (Essential Service= Assure Competent Workforce): There are mechanisms in place within institutional and agency quality improvement processes to identify and correct individual personnel deficiencies.

Score: 3 - *A mechanism is in place to monitor and report on practice patterns of individual practitioners within the trauma system.*

Status: *The process is evolving as part of the QA/PI processes.* The trauma regulations require a quality improvement process for local systems, however not at the state-level.

Goal: Routinely assess practice patterns of individual practitioners (EMTs, paramedics, nurses, physicians, and others) outside the standards of care and ensure corrective actions are taken and reported to the lead or licensing agency.

Objective: Establish reporting process.

Indicator 310.13 (Essential Service= Assure Competent Workforce): There is authority to hire, and a clear job description for the lead agency trauma physician medical director, including requisite education, training, and certification. Note: The trauma medical director and the EMS medical director may be one and the same.

Score: 2 - *There is authority for a trauma medical director, but no job description has been developed.*

Status: The regulations outline some duties of the trauma director for a local system. Individual local systems may have job descriptions

Goal: Ensure appropriate authority exists for medical director; a job description exists; director is appropriately credentialed; and classification is routinely assessed for appropriate duties.

Objective: Ensure regions incorporate requirements into system.

Benchmark 311:

> **The lead trauma agency acts to protect the public welfare by enforcing various laws, rules, and regulations as they pertain to trauma system.**

Priority: ☑ Short Term (within 1 year)   ☐ Intermediate (within 3 years)
☐ Long Term (3-5 years)   ☑ Ongoing   ☐ Completed

Indicator 311.1 (Essential Service= Enforce Laws): The lead trauma authority works in conjunction with the prehospital regulatory agency to ensure that prehospital care is provided by licensed agencies and that those agencies are in compliance with any rules, regulations, or protocols specific to prehospital trauma delivery (e.g., taking patients to the correct facility in accordance with pre-existing destination protocols). Note: In many cases, the trauma lead agency and the prehospital regulatory agency are one and the same.

Score: 3 - *The trauma system lead agency and the prehospital agency licensure authority work together to resolve complaints involving prehospital agencies as it relates to trauma system performance.*

Status: The regulations require quality an improvement process where cases are reviewed to determine appropriate handling. Regulations also require all prehospital personnel to be trained in the local trauma triage and patient care methodology. Prehospital providers are also required to have a policy approved by the local EMS agency for early notification of trauma centers of impending arrival of a trauma patient.

Goal: Prehospital and licensing authority work together with the lead agency to ensure ongoing trauma system performance improvement processes occur and are in compliance with trauma regulations.

Objective: Ensure cooperation from prehospital and licensing authorities.

Indicator 311.2 (Essential Service= Enforce Laws): The lead trauma authority refers issues of personnel noncompliance with trauma laws, rules, and regulations to appropriate boards or licensure authorities.

Score: 5 - *Appropriate licensure boards are involved in the system performance improvement processes.*

Status: Statute and regulations require local agencies to ensure compliance with the trauma regulations. Local agencies conduct reviews of the trauma system including quality improvement.

Goal: Completed

Objective: Review periodically to ensure compliance.

Indicator 311.3 (Essential Service= Enforce Laws): The lead trauma authority enforces laws, rules, and regulations concerning the verification of trauma centers, including the ability to de-designate trauma facilities for matters of noncompliance.

Score: 3 - *The lead trauma system agency has the authority to dedesignate trauma facilities for matters of noncompliance and monitors facility performance.*

Status: Local EMS agencies are required by statute and regulation to verify regulatory compliance and have the ability to designate trauma centers.

Goal: Ensure facilities are represented in system performance improvement processes and benchmark against local and national standards; issues of noncompliance are addressed as part of performance improvement process.

Objective: Ensure agencies report status of compliance in annual trauma plan and prepare outline of de-designation considerations to assist local EMS agencies in decision-making activities.

Indicator 311.4 (Essential Service= Enforce Laws): Laws, rules, and regulations are routinely reviewed and updated to continually strengthen and improve the trauma system.

Score: 4 - *Laws, rules, and regulations are reviewed by agency personnel on a continuous basis and are revised as needed.*

Status: The local agencies are required to review local trauma systems every two years and make the evaluation available to system participants.

Goal: Review laws, rules, and regulations as part of the performance improvement process involving representatives of all system components and revise when negatively impact system performance.

Indicator 311.5 (Essential Service= Enforce Laws): The lead agency routinely evaluates all components of the system to assure compliance with various laws, rules, and regulations pertaining to their role and performance within the trauma system.

Score: 3 - *Trauma agency personnel collaborate actively with licensure agencies to resolve complaints involving component performance within the trauma system.*

Status: Trauma regulations require local EMS agencies to conduct a performance evaluation of the trauma system every two years and ensure that trauma centers and other hospitals that treat trauma patients participate in the quality improvement process.

Goal: Represent all components of the trauma system improvement process and work to improve individual component compliance and overall trauma system performance and use de-designation only as a last resort to safeguard public health.

Objective: Ensure local evaluations are included in annual trauma plan update.

Indicator 311.6 (Essential Service= Enforce Laws): Incentives are provided to individual component agencies and institutions to seek State or nationally recognized accreditation in areas that will contribute to overall improvement across the trauma system (e.g., Commission on Accreditation of Ambulance Services [CAAS] for prehospital agencies, Council on Allied Health Education Accreditation [CAHEA] for training programs, American College of Surgeons [ACS] verification for trauma facilities, and others).

Score: 2 - *Accreditation processes are generally encouraged but are not specifically acknowledged; e.g. no special dispensation is offered to programs or agencies completing such accreditation.*

Status: Accreditation is encouraged, however it is not required.

Goal: Monitor impact of outside review and accreditation on various components and subcomponents as part of system performance review process and provide incentives as appropriate.

Objective: Determine if outside accreditation should be required.

APPENDIX C: CDC – Leading Cause of Death Report

10 Leading Causes of Death, United States: 2003/ *Source: CDC: WISQARS Leading Causes of Death Reports, 1999 - 2003*

Rank	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	All Ages
1	Congenital Anomalies 5,621	Unintentional Injury 1,717	Unintentional Injury 1,096	Unintentional Injury 1,522	Unintentional Injury 15,272	Unintentional Injury 12,541	Unintentional Injury 16,766	Malignant Neoplasms 49,843	Malignant Neoplasms 95,692	Heart Disease 563,390	Heart Disease 685,089
2	Short Gestation 4,849	Congenital Anomalies 541	Malignant Neoplasms 516	Malignant Neoplasms 560	Homicide 5,368	Suicide 5,065	Malignant Neoplasms 15,509	Heart Disease 37,732	Heart Disease 65,060	Malignant Neoplasms 388,911	Malignant Neoplasms 556,902
3	SIDS 2,162	Malignant Neoplasms 392	Congenital Anomalies 180	Suicide 244	Suicide 3,988	Homicide 4,516	Heart Disease 13,600	Unintentional Injury 15,837	Chronic Low. Respiratory Disease 12,077	Cerebro-vascular 138,134	Cerebro-vascular 157,689
4	Maternal Pregnancy Comp. 1,710	Homicide 376	Homicide 122	Congenital Anomalies 206	Malignant Neoplasms 1,651	Malignant Neoplasms 3,741	Suicide 6,602	Liver Disease 7,466	Diabetes Mellitus 10,731	Chronic Low. Respiratory Disease 109,139	Chronic Low. Respiratory Disease 126,382
5	Placenta Cord Membranes 1,099	Heart Disease 186	Heart Disease 104	Homicide 202	Heart Disease 1,133	Heart Disease 3,250	HIV 5,340	Suicide 6,481	Cerebro-vascular 9,946	Alzheimer's Disease 62,814	Unintentional Injury 109,277
6	Unintentional Injury 945	Influenza & Pneumonia 163	Influenza & Pneumonia 75	Heart Disease 160	Congenital Anomalies 451	HIV 1,588	Homicide 3,110	Cerebro-vascular 6,127	Unintentional Injury 9,170	Influenza & Pneumonia 57,670	Diabetes Mellitus 74,219
7	Respiratory Distress 831	Septicemia 85	Septicemia 39	Chronic Low. Respiratory Disease 81	Influenza & Pneumonia 224	Diabetes Mellitus 657	Liver Disease 3,020	Diabetes Mellitus 5,658	Liver Disease 6,428	Diabetes Mellitus 54,919	Influenza & Pneumonia 65,163
8	Bacterial Sepsis 772	Perinatal Period 79	Benign Neoplasms 38	Influenza & Pneumonia 72	Cerebro-vascular 221	Cerebro-vascular 583	Cerebro-vascular 2,460	HIV 4,442	Suicide 3,843	Nephritis 35,254	Alzheimer's Disease 63,457
9	Neonatal Hemorrhage 649	Chronic Low. Respiratory Disease 55	Chronic Low. Respiratory Disease 37	Benign Neoplasms 41	Chronic Low. Respiratory Disease 191	Congenital Anomalies 426	Diabetes Mellitus 2,049	Chronic Low. Respiratory Disease 3,537	Nephritis 3,806	Unintentional Injury 34,335	Nephritis 42,453
10	Circulatory System Disease 591	Benign Neoplasms 51	Cerebro-vascular 29	Cerebro-vascular 40	HIV 178	Influenza & Pneumonia 373	Influenza & Pneumonia 992	Viral Hepatitis 2,259	Septicemia 3,651	Septicemia 26,445	Septicemia 34,069

APPENDIX D: Trauma Centers

COUNTY	HOSPITAL	Pediatric Level I & II	Adult/ Pediatric Centers Levels I & II	Adult Levels I - IV	Date Design-ated	Status Change
ALAMEDA	Eden Hospital Medical Center Castro Valley			1	Jun-85	
	Children's Hospital Medical Center-Oakland	1			Jun-85	
	Highland Alameda County Medical Center Ca mpus Oakland			1	Jun-85	
CENTRAL CALIF EMS (Fresno, Kings, Madera, Tulare)	University Medical Center Fresno			1	Jun-84	
	Children's Hospital Central California 9300 Children's Place Madera	1			Oct-02	
COASTAL VALLEY EMS: (Napa, Sonoma, Mendocino)	Queen of the Valley Hospital Napa			1	Dec-88	
	Santa Rosa Memorial Hospital Santa Rosa			1	May-00	
CONTRA COSTA	John Muir Medical Center Walnut Creek			1	Jun-86	
IMPERIAL	Pioneers Memorial Healthcare District Brawley			1	Mar-04	
	El Centro Regional Medical Center El Centro			1	Mar-04	
INLAND COUNTIES EMS: (San Bernardino, Inyo, Mono)	Loma Linda University Medical Center Loma Linda		1		Oct-81	7/27/04 Design as Level I Ped/Adult Trauma Center
	Arrowhead Regional Medical Center Colton			1	Oct-81	
KERN	Kern Medical Center Bakersfield			1	Nov-01	
LOS ANGELES	California Hospital Medical Center Los Angeles			1	Dec-04	2/85-De-designated; 12/04 Re-designated
	Cedars-Sinai Medical Center Los Angeles		1		Apr-84	Added Pediatric Level II designation 4/1/02
	Children's Hospital of Los Angeles Los Angeles	1			Dec-83	
	Harbor UCLA Medical Center Torrance		1		Dec-83	Added Pediatric Level II designation 4/1/02

COUNTY	HOSPITAL	Pediatric Level I & II	Adult/ Pediatric Centers Levels I & II	Adult Levels I - IV	Date Design-ated	Status Change
	Henry Mayo NewhallMemorial Hospital Valencia			1	Oct-84	Changed from Level III to Level II - 1992
	Huntington Memorial Hospital Pasadena			1	Dec-83	Changed from Level I to II - 1992
	LAC/USC Medical Center Los Angeles		1		Dec-83	Added Pediatric Level II designation 4/1/02
	Long Beach Memorial/Miller Children's Center Long Beach		1		Dec-83	Changed from Level I to II Adult 1992; Added Pediatric Level II designation 4/1/02
	Northridge Hospital Medical Center Northridge			1	Jun-84	
	Providence Holy Cross Medical Center Mission Hills			1	May-84	
	St Francis Medical Center Lynwood			1	Jan-96	
	St. Mary Medical Center Long Beach			1	Dec-83	Changed from Level I to II in 1992
	UCLA Medical Center Los Angeles		1		Dec-83	Added Pediatric Level I designation 4/1/02
	Antelope Valley Medical Center				Oct-84	De-designated 12/1/1987
	Daniel Freeman Memorial				Jun-84	De-designated 6/1/1987
	Queen of Angels				Mar-84	De-designated 2/1/1987
	Methodist Hospital of Southern California				Jul-84	De-designated 1/1/1989
	Pomona Valley Medical Center				Jul-84	De-designated 10/1/1986
	Presbyterian Intercommunity				Aug-85	De-designated 8/1/1989
	Queen of the Valley Hospital				Feb-84	De-designated 12/1/1987

COUNTY	HOSPITAL	Pediatric Level I & II	Adult/ Pediatric Centers Levels I & II	Adult Levels I - IV	Date Design- ated	Status Change
	St. Joseph Medical Center				May-84	De-designated 6/1/1989
	Santa Monica				Jul-83	De-designated 8/1/1987
	Westlake Community				Oct-84	De-designated 6/1/1994
	Martin Luther King Jr./Drew Medical Center Los Angeles				Dec-83	7/04 - Changed from Level I to II 3/1/05- Dedesignated
MARIN	Marin General Hospital Greenbrae			1	Jan-01	
MOUNTAIN VALLEY EMS: (Alpine, Amador, Calaveras, Mariposa, Stanislaus)	Doctor's Medical Center Modesto			1	Feb-04	
	Memorial Medical Center Road Modesto			1	Feb-04	
NORTH COAST EMS: (Del Norte, Humboldt, Lake)	Sutter-Lakeside Hospital Lakeport			1	Apr-06	
NORTHERN CA EMS: (Lassen, Modoc, Siskiyou, Trinity, Shasta, Butte, Colusa, Plumas, Glenn, Tehama, Sierra)	Mercy Medical Center Redding			1	Aug-90	
	Enloe Medical Center Chico			1	Jul-88	
	Fairchild Medical Center Yreka			1	Dec-01	
	Shasta Regional Medical Center Redding			1	Dec-01	
	St. Elizabeth Community Hospital Red Bluff			1	Dec-01	
	Mercy Medical Center Mt. Shasta			1	Dec-01	Changed from Level IV to Level III June 27, 2002
	Oroville Medical Center Oroville			1	Dec-01	Changed from Level IV to Level III June 27, 2002
	Biggs-Gridley Memorial Hospital Gridley			1	Jun-04	
	Mayers Memorial Hospital District Fall River Mills			1	Dec-01	
	Colusa Regional Medical Center Colusa			1	Dec-01	

COUNTY	HOSPITAL	Pediatric Level I & II	Adult/ Pediatric Centers Levels I & II	Adult Levels I - IV	Date Design- ated	Status Change
	Glenn Medical Center Willows			1	Jul-02	
	Seneca District Hospital Chester			1	Dec-02	
	Indian Valley Healthcare District Greenville				Dec-01	De-designated 1/3/05 Level IV (close ED)
ORANGE	UCI Medical Center Orange			1	Jun-80	
	Western Medical Center-Santa Ana Santa Ana			1	Jun-80	
	Mission Hospital Regional Medical Center Mission Viejo			1	Jun-80	
	Anaheim Memorial				Jun-80	De-designated 4/1/1983
	St. Jude				Apr-83	De-designated 9/1/1983
	Fountain Valley				Jun-80	De-designated 12/1/1989
RIVERSIDE	Desert Regional Medical Center Palm Springs			1	Sep-94	
	Inland Valley Medical Center Wildomar			1	Jan-96	
	Riverside Community Hospital Riverside			1	Sep-94	
	Riverside County Regional Medical Center Moreno Valley			1	Sep-94	
SACRAMENTO	University of California-Davis Medical Center Sacramento		1		Jun-84	
	Mercy San Juan Medical Center Carmichael			1	Aug-99	
SAN DIEGO	Children's Hospital & Health Center San Diego	1			Aug-84	
	Scripps Mercy Hospital and Health Center San Diego			1	Aug-84	Changed from Level II to Level I 8/12/03
	Palomar Medical Center Escondido			1	Oct-84	
	Scripps Memorial La Jolla			1	Aug-84	
	Sharp Memorial Hospital San Diego			1	Aug-84	

COUNTY	HOSPITAL	Pediatric Level I & II	Adult/ Pediatric Centers Levels I & II	Adult Levels I - IV	Date Design- ated	Status Change
	University of California - San Diego Medical Center San Diego			1	Aug-84	
	Grossmont				Aug-84	De- designated 8/1/1985
SAN FRANCISCO	San Francisco General Hosp & Med Center San Francisco			1	Feb-91	
SANTA BARBARA	Santa Barbara Cottage Hospital Santa Barbara, CA 93102			1	Jun-01	
	Goleta Valley Cottage Hospital Santa Barbara			1	Jun-01	
SANTA CLARA	Santa Clara Valley Medical Center San Jose			1	Aug-86	Redesignation 8/1/98
	Stanford University Medical Center Stanford			1	Aug-86	Redesignation 8/1/98
	Regional Medical Center of San Jose San Jose			1		Designated 5/25/05
	San Jose Medical Columbia Center San Jose				Aug-86	De- designated 12-9-04 (facility closed)
SIERRA -SACRAMENTO VALLEY EMS (Nevada, Placer, Sutter, Yolo, Yuba)	Sutter Roseville Medical Center Roseville			1	Jan-95	
	Rideout Memorial Hospital Marysville			1	Dec-01	

TRAUMA CENTER SUMMARY

TOTAL TRAUMA CENTERS BY LEVEL	
Pediatric Only - Level I & II	4
Adult/Pediatric - Levels I & II	7
Adult Levels I - IV	54
TOTAL:	65

- ➲ Local EMS Agencies = 20
- ➲ Counties = 46
- ➲ Public Facilities = 14
- ➲ Private Facilities = 51
- ➲ Trauma Centers Designated 7/1/01 & After = 20
- ➲ Trauma Centers De-designated 7/1/01 & After = 3