



Emergency Medical Services/Trauma Committee

Wednesday, June 7, 2017

California Hospital Association

1215 K Street, Suite 800

Sacramento, CA 95814

Conference Call Option:

(800) 882-3610 Access Code: 1953936#

Emergency Medical Services/Trauma Committee Meeting Book

AGENDA

10:00

I. CALL TO ORDER/INTRODUCTIONS

Schneider

A. Membership

1. Membership Roster Page 5
2. Member Updates
3. Member Breakdown Page 8
4. Member Map Page 9
5. Guidelines for EMS/Trauma Committee Page 10
6. CHA EMS/T Goals and Objectives 2016-2017 Page 14

10:20

II. REVIEW OF PREVIOUS MEETING MINUTES

Schneider

A. Minutes - March 1, 2017 Meeting

Page 15

Recommendation: Approval

III. OLD BUSINESS

A. Trauma

1. Trauma Plan and ACS Consultation Page 22
2. Annual Trauma Conference Meeting
McGinness
3. TQIP Update
McGinness
4. TMAC Update Page 264

B. Stroke/STEMI EMSA

1. JC Thrombectomy Ready Hospital Page 267

C. ECSI Bartleson

- 1. Status Update Page 285
- 2. Prefunding Activity
- 3. Discuss Vision/Mission/Potential Proposal
- 4. Next Steps
- 5. Updates from San Francisco
Serrano-Sewell
- 6. Update from San Diego
Yates

D. EMS/C Update Page 356

E. Community Paramedicine Update
EMSA Page 357

F. APOT
Barton Page 361

G. C diff
Schneider Page 376

H. Reducing Readmissions and ED Overcrowding
Zepeda

1. Reducing Readmissions and ED Overcrowding Page 386

IV. NEW BUSINESS

A. Legislation
Bartleson Page 397

B. Enloe Post Debrief on Spillway Evacuation
Cline Page 430

C. CARESTAR
Meehan Page 431

D. ED Forum
Bartleson Page 434

E. HIE
Smiley Page 435

1:40 F. Behavioral Health Update
Lowe

1:45 V. INFORMATION ONLY

A. Rural Emergency Acute Care Hospital (REACH) Act Page 439

B. Bakersfield Memorial's ER For Children Page 440

C. Emergency Care Innovation of the Year Award Page 442

2:00

VI. ADJOURNMENT
Schneider

A. Next Meeting - Wednesday, August 30, 2017



EMS/TRAUMA COMMITTEE 2017 MEMBER ROSTER

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CHA Member/ED Breakdown
February, 2017

HOSPITAL COMMITTEE

MEMBER:

Carla Schneider	Hoag Memorial Presbyterian Hospital
Pam Allen	Redlands Community Hospital
Nancy Blake	Children's Hospital Los Angeles
Neal Cline	Enloe Medical Center
Rose Colangelo	Scripps Memorial Hospital La Jolla
Connie Cunningham	Loma Linda University Med Center
Karla Earnest	Lucile Packard Children's Hospital
Fred Hawkins	Ridgecrest Regional Hospital
Cheryl Heaney-Ordez	St. Joseph's Medical Center
Marlena Montgomery	Sharp Memorial Hospital
Laurie McCully	Cedars-Sinai Medical Center
Karen Murrell	Kaiser Permanente South Sacramento
Rupy Sandhu	UC Davis Medical Center
Jason Zepeda	Hoag Memorial Presbyterian Hospital

EX-OFFICIO COMMITTEE MEMBER:

Heather Venezia	CAL ENA
Eric Morikawa	California Department of Public Health
Farid Nasr	California EMS Authority
Ross Fay	CALSTAR
Jim Pierson	Medic Ambulance
Ron Smith	California Department of Public Health
Lawrence Stock	Antelope Valley Hospital
Chi Perloth	CAL ACEP
	EMSA

ED TYPE BY MEMBER:

Carla Schneider	Hoag Memorial Presbyterian Hospital	Emergency Services
Pam Allen	Redlands Community Hospital	Emergency Services
Nancy Blake	Children's Hospital Los Angeles	Pediatric/Trauma
Neal Cline	Enloe Medical Center	Flight Nurse/Pre-Hospital/STEMI
Rose Colangelo	Scripps Memorial Hospital La Jolla	Emergency Services
Connie Cunningham	Loma Linda University Med Center	Emergency/Trauma
Karla Earnest	Lucile Packard Children's Hospital	Pediatric/Trauma
Fred Hawkins	Ridgecrest Regional Hospital	Emergency Services
Cheryl Heaney-Ordez	St. Joseph's Medical Center	Emergency Services
Laurie McCully	Cedars-Sinai Medical Center	General
Marlena Montgomery	Sharp Memorial Hospital	Emergency Services
Karen Murrell	Kaiser Permanente South Sacramento	Emergency Services
Rupy Sandhu	UC Davis Medical Center	Emergency Services
Jason Zepeda	Hoag Memorial Presbyterian Hospital	Trauma/General

CHA/REGIONAL STAFF

BJ Bartleson	California Hospital Association
Judith Yates	HASD&IC
David Serrano Sewell	Hospital Council
Keven Porter	HASC

STATE REPRESENTATION

Northern California	5
Southern California	9

EMS/T Committee Hospital Representation

BY COUNTY and HOSPITAL TYPE

As of February 10, 2017

HOSPITAL/HEALTH SYSTEM TYPES	
Free-Standing Facility	3
Hospital System	7
Small/Rural Facility	1
University/Teaching Facility	3
TOTAL COMMITTEE REPRESENTATION	14



Denotes number of hospitals/health systems represented within that county.

**GUIDELINES FOR THE
CALIFORNIA HOSPITAL ASSOCIATION'S
EMS/TRAUMA COMMITTEE**

Updated 09/23/15

I. NAME

The name of this committee shall be the CHA EMS/Trauma Committee.

II. MISSION

The EMS/Trauma Committee represents CHA members that provide emergency medical and/or trauma services in the State of California, and serves in an advisory capacity to the CHA Board of Trustees regarding EMS/Trauma member needs, policies and legislation.

Recognizing the diverse organizations and providers that work in emergency systems across the state, the mission of the committee also includes representation from diverse multidisciplinary health care organizations and associations that include professional associations, regulatory agencies, emergency services organizations, prehospital providers and others, that promote quality emergency services in the state of California. This multidisciplinary group will act as a collaborative source of emergency services expertise, providing a venue for the coordination of emergency and trauma services to advocate for the highest standards of emergency trauma care services across the state.

The purposes of the Committee shall be:

- to serve as a forum for all CHA members and associated groups interested in EMS/Trauma to receive and exchange information, adopt policies and positions, guide management, adopt strategies and serve as the primary public policy arm of CHA for emergency medical services and trauma issues;
- to provide CHA member EMS/Trauma providers with a statewide structure dealing with the issues important to their interests;
- to create a representative form of leadership which is based on participation of all its members;
- to provide direct input to the CHA Board of Trustees; and
- to provide a unified voice on behalf of CHA members, taking into account the multiple diverse organizations that interact with hospital emergency/trauma services

III. COMMITTEE

The committee shall consist of a maximum of 22 representatives from California hospital /health system organizations, and organizations with related interests.

A. MEMBERSHIP

1. Membership on the CHA EMS/Trauma Committee shall be based upon membership in CHA, and reserved for those members.
2. The Committee shall consist of various representatives from large hospital systems, public institutions, private facilities, free-standing facilities, small and rural facilities, university/teaching facilities, specialty facilities and a representative from a professional group specializing in EMS/Trauma issues.
3. Membership by EMS related organizations will be considered Ex-officio members. Ex-officio members will be determined by committee input and CHA determination.
4. Appointment of members to the Committee will follow the CHA Guidelines for Committee Membership.

B. TERMS OF THE COMMITTEE MEMBERS

1. As members leave the Committee, vacancies shall be filled. It is understood that a member forfeits his/her seat if they no longer serve in the capacity, or represent a facility that is not a CHA member.
2. Committee members with specialized skills, knowledge, or professional associations may serve on the committee as ex-officio members. Ex-officio members are not subject to the above terms. These determinations shall be made by CHA.
3. Provider representatives who transition from one position to another are welcome to attend committee meetings during their transition; however, this should not exceed two consecutive meetings.
4. Provider representatives who misrepresent their organization's position are subject to review and dismissal from the committee.

C. COMMITTEE MEETINGS

1. Meetings of the Committee shall be held quarterly.
2. Provider representatives may send an appropriate substitute to the meetings when they are unable to attend. To maintain continuity for Committee meetings, this should be used sparingly, not to exceed two consecutive meetings.

3. Three consecutive unexcused absences by a Committee member may initiate a review by the Chair and CHA staff for determination of the Committee member's continued service on the Committee.
4. Special meetings may be scheduled by the Chair, majority vote or CHA staff.
5. Membership is based on one's ability to be physically present at quarterly meetings and conference call only as needed for emergency situations.

D. VOTING

1. Voting rights shall be limited to members of the Committee, and each member present shall have one vote. Voting by proxy is not acceptable.
2. All matters requiring a vote of the Committee must be passed by a majority of a quorum of the Committee members only at a duly called meeting or telephone conference call.

E. QUORUM

Except as set forth herein, a quorum shall consist of the majority of the Committee membership in attendance.

F. MINUTES

Minutes of the Committee shall be recorded at each meeting, disseminated to the membership, and approved as disseminated or as corrected at the next meeting of the Committee.

IV. OFFICERS

The officers of the Committee shall be the committee chair, co-chair, and CHA staff.

Except as provided herein, the chair and co-chair shall be elected by the Committee for a two-year term.

The chair officers vacate their Committee positions upon election, and their seats shall be filled through the nominating and election process. The past-chairs will be invited by the Committee to serve as ex-officio members.

Should a chair or co-chair vacate his/her position prior to the end of the term, a nominating committee will convene to select a replacement, and assume a two-year term of office.

V. COMMITTEES

For special and specific purposes, the chair or CHA staff may appoint a committee or ad hoc on task force. Membership may be expanded to non-members of the Committee.

VI. GENERAL PROVISIONS

The strategic plan defining the goals, objectives, and work plans shall be developed annually by the CHA staff and approved by the Committee. Quarterly updates and progress reports shall be completed by the Committee and CHA staff.

Staff leadership at the state level shall be provided by CHA with local staff leadership provided by HCNCC, HASD&IC, and HASC. The primary office and public policy development and advocacy staff of the Committee shall be located within the CHA office.

The Committee staff shall be an employee of CHA.

VII. AMENDMENTS

These Guidelines may be amended by a majority vote of the members of the Committee at any regular meeting of the Committee.

VIII. LEGAL LIMITATIONS

Any portion of these Guidelines which may be in conflict with any state or federal statutes or regulations shall be declared null and void as of the date of such determination.

Any portion of these Guidelines which are in conflict with the Bylaws and policies of CHA shall be considered null and void as of the date of the determination.

Information provided in meetings is not to be sold or misused.

IX. CONFIDENTIALITY FOR MEMBERS

Many items discussed are confidential in nature, and confidentiality must be maintained. All Committee communications are considered privileged and confidential, except as noted.

X. CONFLICT OF INTEREST

Any member of the Committee who shall address the Committee in other than a volunteer relationship excluding CHA staff and who shall engage with the Committee in a business activity of any nature, as a result of which such party shall profit pecuniarily either directly or indirectly, shall fully disclose any such financial benefit expected to CHA staff for approval prior to contracting with the Committee and shall further refrain, if a member of the Committee, from any vote in which such issue is involved.

CHA Emergency Services /Trauma Committee Goals and Objectives, 2016-2017

SUMMARY

Goals and Objectives have been drafted for review and approval of the committee.

- 1) Develop guidance, tools, information and strategies to support emergency department and trauma services of the future that enhance quality patient care.
 - a. Implement subject matter task forces where members can utilize their expertise to explore, plan and suggest strategies for the larger EMS/T committee
- 2) Advise the CHA Board on ED crowding surge issues and the changing LEMSA regulatory environment affecting hospital/health systems and EMS/Trauma care systems.
 - a. Develop an issue brief that describes the present environment, issues and strategic recommendations.
- 3) Plan and implement a successful 2015 Behavioral Health/EMS Summit where one full day is dedicated to pure EMS/T issues and one day is combined EMS/behavioral health topics.
 - a. Discuss conference planning activities at the 6/24/2015 committee meeting
 - b. Assess other statewide ED conferences and identify topics of interest to stimulate high conference participation
 - c. Bring interested members together as a planning team

ACTION ITEM

Discuss and advise.

Should you have any questions, please feel free to contact me at (916) 552-7537 or via email at bjbartleson@calhospital.org.

**CHA EMS/TRAUMA COMMITTEE
MEETING MINUTES**
March 1, 2017 / 10:00 a.m. – 2:00 p.m.

1215 K Street, Suite 800
Sacramento, CA

Members Present: Carla Schneider, Pam Allen, Neal Cline, Rose Colangelo, Fred Hawkins, Cheryl Heaney-Ordez, Laurie McCully, Chi Perloth, James Pierson, Jason Zepeda, Karen Murrell, Heather Venezia

Members Attending by Call: Connie Cunningham, Ross Fay,

Guests: Bruce Barton, Kevin Mackey, Dan Lynch (via phone), Andrea Barandas (for Ron Smith), Dan Smiley (for Farid Nasr)

CHA Staff: BJ Bartleson, Barb Roth, Debby Rogers, Sheree Lowe

RVP Staff: Keven Porter, Judith Yates, (via phone) David Serrano Sewell

I. CALL TO ORDER/INTRODUCTIONS

Ms. Schneider called the meeting to order at 10:00 a.m. Introductions and member updates were made. There are several guests joining the meeting today. Announcement that Darlene Bradley, Co-Chair has retired. Ms. Bartleson reviewed goals and objectives of the committee for new members.

➤ **ACTION:** *Information only*

II. REVIEW OF PREVIOUS MEETING MINUTES

The minutes of the December 21, 2016, EMS/Trauma Committee meeting were reviewed as submitted. The following corrections were noted:

- Page 4 last sentence has a spelling error – uncle should be unclear.
- Roster location correction for Pam Allen –location should be Redlands
- c difficile - spelling error on page 5

IT WAS MOVED, SECONDED AND CARRIED with corrections:

➤ ***Approved with corrections.***

III. OLD BUSINESS

- A. Trauma Performance Improvement & Patient Safety Plan -
Mr. Smiley stated the plan was sent for public comment and based upon the comments they received, they will be revising the document.

5/26/2017 8:25 AM

➤ *ACTION: Information only*

B. Trauma Regulations -

Mr. Smiley stated EMSA still wants to create this pre-review committee. However, given workload with the recent Stroke and STEMI regulations, this may not be a top priority. Also need to look at fiscal impact.

➤ *ACTION: Information only*

C. TMAC Update

Ms. Venezia stated a meeting was held at the end of January/beginning of February in San Diego to talk about priorities for coming year. ACS is soliciting feedback on chapter 16 of orange book. This is the performance improvement chapter – feedback to date is for more frame work around the orange book.

The second annual educational event will be in Orange County on June 29 or 30. The event will focus on best practice performance improvement projects that have worked in other facilities.

The ACS TQIP state collaborative contract arrangement has not been solved yet. LA County is going online with their TQIP program.

➤ *ACTION: Information only*

D. ECSI

Ms. Bartleson gave an update to the committee on the statewide initiative. We are in a prefunding phase, soliciting support letters from all stakeholders to successfully obtain funding.

San Francisco ECSI Update -Mr. Serrano-Sewell reported that the Hospital Council of Northern and Central California has commissioned a report for San Francisco ED's. They rolled out a report to hospital CEOs, the Mayor of San Francisco and others in December, 2016. The recommendations of the report were adopted. An ongoing effort in San Francisco is the establishment of a Behavioral Health ED task force. The members appointed 12 people to the task force, anticipating completion by late April. The report identified a lot factors that affect ED crowding. There is an increase in behavioral health and substance abuse patients. The report focused on that point. Following a model done previously in SF, it was reported 10 years ago they had problem with inebriates in ED's. They opened a sobering center to assist with care of inebriates versus care in the hospital ED.

San Diego ECSI Update - Ms. Yates, Hospital Association of San Diego and Imperial Counties, report the inception of their statewide work to address ED crowding about a year ago. They have tried to address specifics, but the problem is multi-factorial. They have an advanced HIE in their community known as San Diego Health Connect which could be a huge advantage but still has barriers to overcome. We are currently studying ED offload delays and working on definitions to get accurate data to provide to EMSA.

We are presently working on a new objective: ED case management- studying how to monitor frequent ED users in a timely, effective way.

➤ *ACTION: Information only*

E. MOON Update

As mentioned in December meeting, CHA did a webinar on this topic with CDPH in late February. Ms. Rogers provided a crosswalk to give details on how the federal and state requirements differ. The crosswalk is in the meeting book along with an informative memo.

➤ *ACTION: Information only*

F. Behavioral Health Update

Ms. Lowe reported that a stand-alone conference is being planned for July which will be dedicated to variety of issues related specifically to behavioral health issues in emergency departments. Ms. Lowe is looking for input from the committee on topics they would like to see covered.

A white paper was commissioned to look into reimbursement responsibilities for patients with behavioral health issues. This white paper has been recrafted and circulated through CHA for review. After another edit it may be ready to be distributed.

CHA, in cooperation with NAMI California (key opposition to last bill), is working with 52 statewide organizations to discuss the entire delivery system. Mr. Duane Dauner, CHA CEO, determined CHA would only proceed if NAMI would cooperate. NAMI has agreed and they have already had their first meeting. Subcommittees are meeting in next 5-7 days and will report back.

➤ *ACTION: Information only.*

G. EMS/C Update

Ms. Venezia reported that EMS/C is waiting on regulations to come out and have been told that STEMI and Stroke regulations are the priority before EMS/C.

They will have another yearly educational event to discuss more hands-on EMS –C simulations, etc. This will be announced soon. They are prioritizing initiatives such as pediatric triage.

Mr. Smiley provided an update regarding EMS/C. They will have grant funding reductions and will strategize what they can achieve throughout the rest of this year.

➤ *ACTION: Information only*

H. Community Paramedicine(CP)

Ms. Bartleson reported that the CHA EMS/T Meeting book has information regarding Community Paramedicine.

Mr. Pierson reported on CP Pilot #13/Solano County which started their readmissions program in September 2015. Currently, 120 patients are enrolled and they have done 120-140 visits. They use a patient based documentation system. They are experiencing readmission rates of 9-10%. They are working with patients inside the home to do medication checks, home safety checks and patient education. Mr. Pierson brought up a couple of bills that have been introduced this session:

1. AB 1650 - Authorizes a local EMS agency to authorize a community paramedicine program that provides services utilizing EMT-P personnel for the delivery of medical care and is consistent with a specified community paramedicine pilot program authorized by the Office of Statewide Health Planning and Development. This bill does not include community paramedicine utilizing alternate destination.
2. AB 820 – a spot bill that may include alternate destination

The Solano CP pilot has financial sustainability unlike most of the CP pilots. They are paid by the hospital to do this service because the hospitals see benefits in readmission reductions

Mr. Cline informed the group on CP#4 program, Butte County readmissions pilot. They screen all patients and patients can opt in or out. The goal for the project is to reduce readmissions by 20%. Deficient medication reconciliation is one of the biggest issues. Enloe Hospital owns its ambulance service and the paramedics provide home service after being discharged from the hospital.

Mr. Smiley advised that the paramedic practice still works under auspices of LEMSA. Based upon 1 year report from Mr. Cline, there is good reason to look at community paramedicine. This could be part of future legislative solutions. As the legislation moves forward, a consideration should be to prevent legislative conflict with one another and sponsors should seek to harmonize the issues. Training and scope of practice must be considered as well.

Dr. Mackey's program, (CP#12/Stanislaus) has highly trained paramedics. The program has experienced great success. CalACEP has concerns about lack of data and evidence. Training is done locally, starting with the UCLA training process. His paramedics do the medical clearance and screening in the street, serving purpose of the ED physician to decide if they go to a crisis stabilization unit or the ED. At this time, they serve adults, 18-59 years old. There is a need for adolescent facilities. He reports that the problem is 1000 psychiatric patients are delivered to the ED every year and they should be sent directly to a mental health facility. Sending these patients to the ED first delays their care and treatment.

➤ *ACTION: Information only*

I. Stroke Regulations

Mr. Smiley advised that EMSA has received public comments. Mr. Nasr is working on those now. They will need to make slight changes to the regulations and will resubmit for public comment. Some comments can be taken into consideration, others cannot.

Regarding the heart association regulations that CHA requested, Smiley explained that this would not really help them. They would still need to make regulatory changes and justifications if the American Heart Association makes regulatory changes, therefore they did not accept those recommendations.

➤ *ACTION: Information only*

J. APOT – Bartleson/Barton/Lynch

Mr. Barton has been working on APOT for a number of years. AB1223 changed sections of the CA health and safety code related to collection of data. It required the state to standardize methodology and LEMSA's to use that methodology if they choose to measure APOT. There is a core measures project to provide a statewide report generated from specification sheets. We used that same sheet to define APOT1, which is how to collect the data, time stamps and rank the data. And APOT2, which specifies that of the data collected, what is under 20 minutes, 20-60 minutes, etc. They are at a starting point and this will be refined. They are now trying to determine how the local systems get together to gather the information. Approved by EMSA in December, 2016, the documents are available on EMSA website. This information is in the committee meeting book.

Past bill, AB1129, related to data collection, requires EMS providers to collect data using an electronic PCR system. This will enhance EMSA's ability to measure accurately across all LEMSA's.

There is a regional LEMSA coalition looking at this, as it is important to clean up the data collection since the process control is at local level. The clock stop/start time stamp is in question. There has to be a process control discussion statewide to determine this start/stop time so there will not be any inconsistency in the data that is provided. The clock starts when the ambulance wheels stop at the hospital. The stop time is what LEMSAs are now trying to determine.

The transfer of care module raises the question as to how is the information collected if hospitals are using different systems for identifying the time stamp. There was a question as to how the 20 minutes was identified as it is not a state mandate. Mr. Barton advised that the local EMS system determines their own time basis. The 20 minute bases mentioned in the document is a benchmark that the state EMSA will use, however individual LEMSA's can determine their own benchmarks.

➤ *ACTION: Information only*

IV. NEW BUSINESS

A. Alternate Destination

Mr. Lynch, Fresno LEMSA Executive Director, reported that the problem with 5150 patients is that the ED is not the right place for them. In 2015 Fresno saw 9,600 patients. In 2016 about 4,300 (44%) of those were transported directly to a crisis stabilization unit. When 911 receive a call for a psychiatric hold, if they meet criteria, they can go directly to the CSU. They also have a youth (14 – 18year old) CSU. Their criteria are similar to the program presented by Dr. Mackey. Fresno is not a pilot project. Their triage tool and the criteria used are in their EMS policy and are available online on their website. There

is no funding for this program. The paramedics realize that if they go to the CSU they don't get paid. They realize that the patient needs to go to the right place and they know it's the right thing to do.

➤ *ACTION: Information only*

B. MyCares Program -

Dr. Mackey gave a presentation regarding the MyCares program which he has been using in his counties. Their mission is to help communities determine standardized outcome measures for out-of-hospital cardiac arrest allowing for quality improvement efforts and benchmarking capability to improve care and increase survival. There are currently 19 statewide participants. More information about the program will be sent out the committee members.

➤ *ACTION: Ms. Roth to send out additional information to committee.*

C. Ambulance Cleaning Policies –

Ms. Schneider reports that 60-70% of patients in long term facilities have c. diff. Most ambulances that transfer these patients to the hospital are also transferring patients that are immune compromised. There is a big problem as to how to prevent cross contamination. Bleach must be used to kill c. diff. Standardization of the cleaning procedures for ambulances needs to be in place. Request was made to Mr. Pierson to see if this can be brought to the attention of the Ambulance Association. Ms. Bartleson advised that the CHA EMS/T committee will work to support some effort to standardize. Request was made to send the information to Mr. Pierson or Mr. Fay. Ms. Schneider will send some examples to Mr. Pierson. It was reported that currently there is SB432 bill on communicable disease reporting.

➤ *ACTION: 1. Ms. Schneider to send examples to Mr. Pierson.
2. Mr. Pierson to bring subject of ambulance cleaning procedure standardization to the attention of the California Ambulance Association.*

D. STEMI Regulation –

Mr. Smiley advised that EMSA has received public comments. Mr. Nasr is working on those now. They will need to make slight changes to the regulations and will resubmit for public comment. Some comments can be taken into consideration, others cannot.

➤ *ACTION: Information only*

E. EMTALA - Bartleson

➤ *ACTION: To be discussed at the next meeting.*

F. Analysis of ED Length of Stay for Mental Health Patients at 10 Massachusetts Hospitals

➤ *ACTION: To be discussed at the next meeting.*

V. NEXT MEETING

June 7, 2017, 2017.

➤ *ACTION: Informational Only.*

VI. ADJOURNMENT

Having no further business, the meeting adjourned at 1:53 p.m.

DRAFT



June 7, 2017

TO: EMS/Trauma Committee Members
FROM: BJ Bartleson, VP Nursing & Clinical Services
SUBJECT: Trauma

SUMMARY

1. California Statewide Trauma System Planning and ACS Trauma System Consultation Report
2. Annual Trauma Conference Meeting
3. TQIP Update
4. TMAC Update

ACTION REQUESTED

- Information and Discussion

DISCUSSION QUESTIONS

1. What issues come to mind after reviewing the Trauma System Planning and Trauma System Consultation Report?
2. What are next steps?
3. How Does TQIP help with trauma care delivery?
4. How does TMAC, RTCC's and the STAC work together for common goals and objectives?

A map of California showing its counties, each labeled with its name. The map is overlaid with large, bold, black text. The text is centered and reads: "California Statewide Trauma System Planning". Below this, in a smaller font, it says "Recommendations of the State Trauma Advisory Committee" and "May 2017". The map uses various colors to distinguish between counties, including shades of red, orange, yellow, blue, green, and purple.

California Statewide Trauma System Planning

**Recommendations of the
State Trauma Advisory Committee**

May 2017

California Statewide Trauma System Planning

Recommendations of the State Trauma Advisory Committee May 2017

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California Statewide Trauma System Planning

Recommendations of the State Trauma Advisory Committee
May 2017

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I. Executive Summary

Death and long-term disability due to traumatic injuries are increasing at an alarming rate across America. In the State of California, traumatic injury is the most common cause of death in persons age 1 to 44 and accounts for more productive years of life lost than cancer and heart disease combined.¹ In 2010 the cost of fatal trauma in California was estimated at more than \$17 billion with national data showing U.S. costs of over \$189 billion.² According to the United States Centers for Disease Control and Prevention, injury-related deaths increased by 18% from 2010-2015. In 2015, just over 214,000 people died from injuries, 19,054 in California.³

The cost of healthcare and the loss of productivity from traumatic injuries cost Californians billions of dollars every year. California hospitals admitted over 250,000 injured patients in 2014. Thirty percent of these patients required further rehabilitation services with the highest percent between the ages of 65 and 84 years.⁴

Rapid diagnosis and specialized treatment is the key to reducing the morbidity and mortality rates of trauma patients. Most states, including California, have developed trauma systems to meet the needs of their diverse populations and to provide optimum patient care. In 2010, the California Emergency Medical Services Authority (EMSA) asked the State Trauma Advisory Committee (STAC) [*Appendix C*] to analyze the current California trauma care system and to provide recommendations to the EMSA director. These Statewide Trauma System Planning recommendations are designed to describe the analysis and provide recommendations for continued improvement of the trauma system to achieve best practices in care of the injured patient.

California's Trauma System

Currently, there are 80 designated Trauma Centers in California [*Appendix D*] that receive and admit over 70,000 trauma patients per year.⁵ Trauma care in California is delivered and governed by a structure of public and private entities working together to prevent injuries, reduce trauma-related mortality and morbidity rates, and maximize cost-benefit of trauma healthcare for all Californians. EMSA is charged with providing oversight and leadership to 33 local emergency medical service agencies (LEMSAs) statewide. These LEMSAs are responsible for assessing, directing, developing, and implementing their local or regional EMS and trauma plans based on local topography, demographics, population density, available healthcare resources, and funding. The trauma systems in California are locally designed to allow for variation and flexibility in order to build a responsive and effective trauma system that is tailored to individual jurisdictions. However, the system operates within state regulations and requires consistent quality standards and protocols for patient transfers across local and regional jurisdictions. To further build on this delivery model and improve the quality of trauma systems across the state,

¹ CDC Injury Response, United States http://www.cdc.gov/injury/overview/leading_cod.html

² WISQARS™ Injury Prevention & Control: Data & Statistics 2010

³ Centers for Disease Control and Prevention (CDC), National Center for Injury Prevention and Control, Fatal Injury Reports, 2015, for National, Regional, and States (WISQARS)[Internet. Available from http://www.cdc.gov/injury/wisqars/fatal_injury_reports.html

⁴ California Department of Health Services EPICenter, Injury Reports. Available from <http://epicenter.cdph.ca.gov/>

⁵ California EMS Information System (CEMSIS)-Trauma, volume count report for 2013-2016.

EMSA must support opportunities for LEMSAs to innovate and share best practices in order to improve patient outcomes.

Components of the Statewide Trauma System Planning Recommendations

The STAC developed these Statewide Trauma System Planning recommendations based on an evaluation of California's current delivery of trauma care [**Appendix A**]. The 2006 American College of Surgeons (ACS) Committee on Trauma *Regional Trauma Systems: Optimal Elements, Integration, and Assessment* guidance document, the 2006 Health Resources Services Administration (HRSA) *Model Trauma System Planning and Evaluation* report, and recommendations from the ACS's Trauma System Consultation Visit were reviewed to address national standards in these Statewide Trauma System Planning recommendations.

These Statewide Trauma System Planning recommendations outline 3 goals for trauma systems:

1. Timely Access to Trauma Care
2. Delivery of Optimal Trauma Care
3. Community Health and Wellness

The California system is mature at the local level with considerable expertise and responsiveness to local need. These Statewide Trauma System Planning recommendations focus on maximizing the benefit of regional and statewide coordination and integration of trauma care, while supporting local and sub-regional system development and quality.

There are fifteen (15) Statewide Trauma System Planning components and associated objectives that support these goals. EMSA, in collaboration with the STAC, LEMSAs, Regional Trauma Coordination Committees (RTCCs), Trauma Centers, and other applicable state departments and EMS stakeholders, should strive to achieve the vision of these Statewide Trauma System Planning recommendations through work on these objectives [**Appendix B**]. EMSA may lead efforts to implement some of the recommendations while LEMSAs, RTCCs, Trauma Centers and other groups will take the lead on other recommendations. The successful implementation of these Statewide Trauma System Planning recommendations depends on participation of a broad range of community partners.

Component	Objectives
Trauma System Leadership	<ul style="list-style-type: none"> • Collaborate with counties to support and share resources for a regionally based trauma system. • Work with the LEMSAs, STAC and the trauma regions to develop a consensus compendium of trauma-related policies, procedures, and clinical guidelines that may be shared throughout the state. • Evaluate current local trauma plans and work to update plans in the context of regional trauma care with input from Trauma Centers and trauma regions. • Establish basic quality and activity reporting standards and report templates for the LEMSAs to provide EMSA, STAC, and Performance Improvement and Patient Safety (PIPS) subcommittee with sufficient data to assess the performance of trauma systems.
System Development Operations	<ul style="list-style-type: none"> • Conduct a systematic review of local trauma plans in the context of these Statewide Trauma System Planning recommendations and the structures and processes it outlines. • Develop processes and mechanisms for providing optimal access and care to special populations; for example, pediatric populations. • Update regulations to define specific standards and requirements for LEMSAs that chose to implement a trauma system, and to address recommendations consistent with these California Statewide Trauma System Planning recommendations, 2017.
Trauma System Financing	<ul style="list-style-type: none"> • Identify new critical trauma system components and the cost to develop and maintain. • Establish a basis for estimating the actual cost for trauma care in California. • Explore sustainable funding sources to support regional infrastructure and planning.

Component	Objectives
EMS System: Prehospital Care	<ul style="list-style-type: none"> • Utilize the most current national standard for prehospital triage as the foundation for prehospital trauma triage guidelines. Based on specific environments (e.g., urban vs. rural) and presence or absence of Trauma Center resources, some local modifications may be required. • Develop definitions to study over-/under-triage with a mechanism to track on a regional basis. • Work with Office of Statewide Health Planning and Development (OSHPD) to obtain specified data on major trauma patients transported to non-trauma facilities and not subsequently transferred. • Improve the transfer of documented information from field units to receiving hospitals with the goal that prehospital care reports are available as part of the medical record for all trauma patients. • Explore the need for special population field trauma triage criteria, e.g., pediatric and geriatric. • Develop EMS protocol guidance for field trauma care.
EMS System: Ambulance and Non-Transporting Medical Units	<ul style="list-style-type: none"> • Develop minimum prehospital equipment inventory for EMS units specific to trauma needs. • Recommend air resource utilization guidelines applicable statewide including access to air resources.
EMS System: Communications	<ul style="list-style-type: none"> • Develop guidance for priority dispatch protocols for trauma and investigate process changes that improve dispatch effectiveness while improving outcomes. • Study the hospital alert systems currently in place to identify hospital capability, capacity, and specialty care availability (e.g., burns, pediatrics) and complete a gap analysis.
Definitive Care: Acute Care Facilities	<ul style="list-style-type: none"> • Develop guidelines outlining a process for the assessment of Trauma Center compliance with California Code of Regulations (CCR) Title 22, Chapter 7. • Outline the responsibilities and expected participation in the trauma system for non-designated acute care hospitals. • Establish EMSA guidelines to standardize the Trauma Center designation process across LEMSAs.
Definitive Care: Re-triage Interfacility Transfer	<ul style="list-style-type: none"> • Capture re-triage and Interfacility Transfer (IFT) data for statewide analysis and develop a map of re-triage and IFT movement within the state. • Explore the development of centralized re-triage/transfer coordination within the state. • Assist in the development of regional cooperative arrangements between sending and receiving centers that will facilitate re-triage, reduce delays, and ensure that patients are re-triaged to an appropriate level of care.

Component	Objectives
Definitive Care: Rehabilitation	<ul style="list-style-type: none"> • Improve the data collection for evaluation of rehabilitative needs and degree of access to rehabilitation throughout the state. • Adopt a standardized measure of functional recovery suitable for use throughout the trauma system.
Data Collection	<ul style="list-style-type: none"> • Improve data sharing. • Improve data quality and compliance. • Evaluate data validity.
System Evaluation and Performance Improvement	<ul style="list-style-type: none"> • Develop and implement a statewide comprehensive trauma PIPS Plan consistent with the elements of these Statewide Trauma System Planning recommendations. • Evaluate state data, identify regional opportunities for improvement, determine if similar opportunities are occurring in other regions, and explore mechanisms for shared resolution. • Create a policy, in coordination with the California Office of Health Information Integrity (CalOHII), regarding the sharing of data for the performance improvement process, recognizing hospital confidentiality and HIPAA regulations. • Benchmark individual systems, hospitals, LEMSAs, and trauma regions to the group as a whole, and to an outside standard including a comparative analysis of risk-adjusted outcomes.
Education and Training	<ul style="list-style-type: none"> • Develop a plan for providing information to the public regarding the structure and function of the trauma system. • Perform a needs assessment prior to developing new or additional trauma-related professional educational programs. • Encourage the use of the ACS's Rural Trauma Team Development Course, video conferencing, and online education. • Encourage development of telemedicine connections between non-trauma facilities and level III and IV Trauma Centers with level I and II Trauma Centers.
Research	<ul style="list-style-type: none"> • Develop a research agenda and collaborate with established investigators to conduct research projects. • Periodically review trauma system data derived from the state trauma registry, Office of Statewide Health Planning and Development (OSHPD), and other sources, and make a recommendation to various system stakeholders regarding potential areas of research.

Component	Objectives
Injury Prevention	<ul style="list-style-type: none"> • Develop a compendium of regional injury prevention programs. • Collaborate with the Department of Public Health to evaluate, implement, and determine the effectiveness of initiatives to reduce intentional and unintentional injuries.
Emergency/Disaster Preparedness	<ul style="list-style-type: none"> • Incorporate the role of the trauma system in the California Public Health and Medical Emergency Operations Manual. • Develop a recommended inventory for a trauma cache to be utilized at Trauma Centers in the event of a disaster. • Plan for trauma system surge capacity in collaboration with local Public Health and Medical Emergency Function (EF 8), depending on disaster risk assessment.

II. Purpose of Statewide Trauma System Planning Recommendations

EMSA assessed trauma care in California in the 2006 report, “*California Statewide Trauma Planning: Assessment and Future Direction*”. Guided by this report, and the 2016 ACS’s Trauma System Consultation Report, these Statewide Trauma Systems Planning recommendations are a culmination of an extensive process that began in 2010. .

California, in addition to being the most populous state in the Union, is unique as it is the only state where the statutory responsibility for the EMS system, including local trauma systems, rests predominately with local EMS agencies (LEMSAs). California's 33 LEMSAs provide local flexibility and allow tailoring of regional trauma systems to individual jurisdictional demographics, population density, and available resources.

The LEMSAs design trauma systems that meet minimum state standards and regulations. The intent of these Statewide Trauma System Planning recommendations is to provide a roadmap for improving overall trauma care in California, promote best practices throughout the state, identify and resolve issues impacting the quality of care, and enhance the movement of patients across jurisdictions while allowing ample local flexibility to deliver high quality care within a locally organized system.

These Statewide Trauma System Planning recommendations analyze current trauma care in California, provide an updated trauma system status, and make specific recommendations for further coordination of the trauma system across the state. These Statewide Trauma System Planning recommendations are not immutable and will require periodic review and revision as changes occur within the EMS and healthcare environment.

III. History and Background

What is Trauma?

For the purposes of these Statewide Trauma System Planning recommendations, 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.⁶

Multidisciplinary Team—an EMS responder, trauma surgeon, emergency physician, anesthesiologist, other medical and surgical specialists, nursing, radiology, laboratory, operating suites, and ancillary services

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. Trauma systems, including specialized Trauma Centers, offer a highly effective, integrated approach to reducing the incidence and impact of major injury to society; they exist in most states in the United States.⁷ The true value of a trauma system derives from the coordinated transition between each phase of care (prehospital, 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.⁸

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, all of which are found in California. Trauma systems emphasize preventing injuries in the context of community health.

The benefits of a successful trauma system include a reduction in death and disability caused by trauma, resulting in an increase in the number of productive working years. Years of potential life lost because of injury far exceed those of cancer, heart disease, or stroke.⁹ The impact of injuries on society can be mediated by assuring that the more severely injured are treated at Trauma Centers. Opportunities exist for improving overall cost-effectiveness by assuring our systems are inclusive in their design, and that triage guidelines are effective in matching the right patient with the right facility.¹⁰ Being cost effective with initial treatment and continued rehabilitation of trauma victims leads to a reduced burden on local communities in support of disabled trauma victims and a decrease in the impact of the disease on "second trauma"

⁶ 2002 Trauma System Agenda for the Future. U.S. Department of Transportation, National Highway Traffic Safety Administration

⁷ "Access to Trauma Centers in the United States" Charles C. Branas, PhD; Ellen J. MacKenzie, PhD; Justin C. Williams, PhD; C. William Schwab, MD; Harry M. Teter, JD; Marie C. Flanigan, PhD; Alan J. Blatt, MS; Charles S. ReVelle, PhD, Journal of American Medical Association, Volume 293 Issue 21 pages 2626-2633, June 2005

⁸ 2002 Trauma System Agenda for the Future. U.S. Department of Transportation, National Highway Traffic Safety Administration

⁹ WISQARS Leading Causes of Death Reports. Available at <http://webappa.cdc.gov/sasweb/ncipc/leadcaus10.html>.

¹⁰ *The Value of Trauma Center Care*, The Journal of Trauma Injury, Infection, and Critical Care, volume 69, Number 1, July 2010.

victims— families. Second trauma is the emotional trauma/upheaval of the family when a loved one suffers a life-threatening injury or sudden illness.¹¹

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. It allows for consistent and effective care of patients across geographic boundaries, with the ability to expand to meet the medical needs of the community from a human-made or natural disaster.

Disaster medical response includes planning and integration of trauma system resources into the local Emergency Operational Area Plan operating within the Standardized Emergency Management System (SEMS). As demonstrated by catastrophic events occurring in California such as the Northridge and Loma Prieta earthquakes, La Conchita mudslide, Chatsworth train collision, and the Asiana Airlines crash, emergency preparedness must include a strong trauma system infrastructure that will deal with daily injuries and have the capacity to rapidly expand (surge capacity) to respond to the demands of an unconventional or natural disaster that creates casualties of greater magnitude.

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.

The Trauma Care Systems Planning and Development Act was developed in response to a 1986 U.S. Government Accountability Office Report (GAO/HRD-86-132) that found severely injured individuals in a majority of both urban and rural areas of the United States 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.”

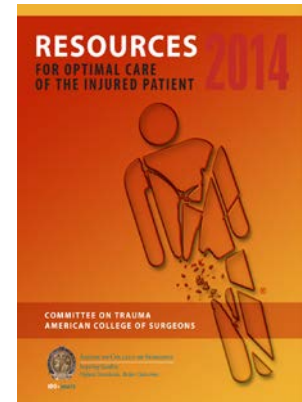
While an emergency department (sometimes referred to as an emergency room) is responsible for evaluation and stabilization with definitive care in some cases, Trauma Centers maintain a higher level of service both within and beyond a basic emergency department for victims of multi-system trauma. Operating rooms, anesthesia, surgical intensive care units, surgical recovery, and a multidisciplinary team of highly trained physicians and nurses is available to respond rapidly.

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

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.” Published

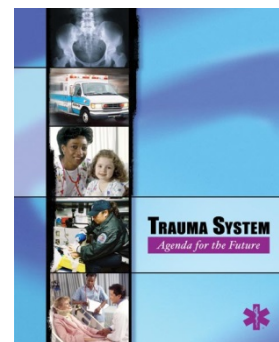
¹¹ American Trauma Society, *Second Trauma Course*, accessed at www.amtrauma.org

in 1976, this document provided guidelines for hospital and prehospital resources necessary for optimal trauma care. Since that time, this document has gone through numerous revisions, with the most recent published in 2014. 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.



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 should possess a distinct ability to identify risk factors and related interventions to prevent injuries in the community, and should maximize the integrated delivery of optimal resources for patients who ultimately need acute trauma care. Trauma systems should address the daily demands of trauma care and form the basis for disaster preparedness. The resources required for each component of a trauma system should 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.



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. The results were released during a Congressional Briefing on March 2, 2005. Some of the key findings were:

- 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.

A study published in the September 2010 Journal of Trauma found:

Triaging severely injured patients to hospitals that are incapable of providing definitive care is associated with increased mortality. Attempts at initial stabilization at a non-

*trauma facility may be harmful. These findings are consistent with the need for continued expansion of regional trauma systems.*¹²

Cost of Trauma Care

The total lifetime medical and work loss costs of injuries and violence in the United States was \$671 billion in 2013. The cost associated with fatal injuries was \$214 billion, while nonfatal injuries accounted for over \$457 billion. Injuries, including all causes of unintentional and violence-related injuries combined, account for 59% of all deaths among people ages 1-44 years of age in the U.S.—that is more deaths than non-communicable diseases and infectious diseases combined. Injuries killed more than 214,000 in 2015—one person every three minutes.¹³ The cost of fatal trauma in California is estimated at more than \$17 billion each year. These costs include medical and work loss costs.¹⁴

¹² Journal of Trauma 2010, Scoop and Run to the Trauma Center or Stay and Play at the Local Hospital: Hospital Transfer's Effect on Mortality, Nirula, Ram MD, MPH, FACS; Maier, Ronald MD; Moore, Ernest MD; Sperry, Jason MD, MPH; Gentilello, Larry MD

¹³ WISQARS Injury Prevention & Control: Data & Statistics

¹⁴ WISQARS™ Injury Prevention & Control: Data & Statistics

IV. Development of California’s Trauma System

In California, state EMS leadership began in 1980 when the legislature added Division 2.5 of the Health and Safety Code that established EMSA (SB125, 1980). In the early 1980’s, some LEMSAs 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. 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 standards based on the ACS 1999 version of “Optimal Resources for the Care of the Injured Patient”. In 2016, EMSA began the revision process, now based on the 2014 ACS Optimal Resources document.

State leadership of trauma care is vested in EMSA, providing statewide coordination, guidance, and technical assistance to the LEMSAs in their development of local trauma systems including

- reviewing and approving local trauma plans and annual Trauma System Status Reports,
- promulgating trauma system and Trauma Center requirements,
- facilitating participation in a statewide trauma registry,
- coordinating the activities of the STAC and its subcommittees, and
- liaising with other state departments regarding trauma system issues.

The American College of Surgeons is a scientific and educational association of surgeons founded to improve the quality of care for the surgical patient by setting high standards for surgical education and practice.

The following represent milestones in the development of California’s Trauma System.

- **Changes to the Health & Safety code (1983)**
Changes to the Health & Safety code enabled but did not require the development of local trauma care systems. LEMSAs may implement a trauma care system contingent upon meeting minimum regulatory standards, and may formally designate as well as limit the number of hospitals meeting a set of specific requirements as Trauma Centers.
- **The California Code of Regulations, Title 22, Division 9, Chapter 7 - Trauma Care Systems (1986)**
Regulations for development of the trauma systems were first promulgated in 1986 as part of the California Code of Regulations, Title 22, Division 9, Chapter 7 (Trauma Care Systems). By this time, there were already 28 Trauma Centers, designated by their local EMS agencies, throughout California.

- **Trauma Regulations Updated (1999)**
 Trauma regulations were updated to reflect minimum Trauma Center standards based on the ACS 1999 edition of the “Optimal Resources for the Care of the Injured Patient”. These regulations established Pediatric Trauma Centers which currently number 17, and Level IV Trauma Center standards. As the 2014 edition of the ACS document has been released, California is beginning the process of revising the trauma regulations.
- **Implementation of Standardized Reporting (2003)**
 The implementation of standardized reporting criteria for trauma patients to local trauma registries was initiated as required in Health and Safety Code Division 2.5 §1797.199 (k).
- **Formal Assessment of Trauma Care in California (2006)**
 Under the direction of the EMSA Director, the STAC completed a formal assessment of trauma care in California, making recommendations regarding state trauma leadership, regionalization, a statewide trauma data system, trauma system funding and education. The resulting report “California Statewide Trauma Planning: Assessment and Future Direction” was published to guide further trauma system coordination.
- **Assessments Put Into Action at First State Trauma Summit (2008)**
 Following the recommendations made in the 2006 trauma care assessment, EMSA convened its first Trauma Summit for trauma stakeholders from around the state. Five RTCCs were established based on a LEMSA survey by EMSA of transport and transfer patterns of injured patients to Trauma Centers. The RTCCs formulated their membership and preliminary goals and objectives and began to meet in late 2008. At this time, there were 65 designated Trauma Centers.
- **System Goals Developed at Second State Trauma Summit (2009)**
 Convened by EMSA, the second State Trauma Summit identified five (5) major goals for coordinating trauma care in California.

 1. Establish a structured relationship for the RTCCs with the LEMSAs and EMSA
 2. Profile best practices of the RTCCs
 3. Implement a state trauma registry with participation from the LEMSAs
 4. Write inclusive Statewide Trauma Systems Planning recommendations
 5. Involve non-trauma hospitals in a statewide trauma system.
- **Collection of Data with California EMS Information System (2009)**
 The California EMS Information System (CEMSIS) was established for the collection and analysis of statewide trauma registry data and began to accept data from Trauma Centers around the state. The data standards and inclusion criteria were vetted through a public comment process with final approval by the Commission on EMS.

- **Forum for Regional Trauma Coordinating Committees (2010)**
 EMSA convened the third State Trauma Summit that provided a forum for the RTCCs to report on their projects. The STAC membership was updated to include representation from the RTCCs.
- **State Trauma Summit IV (2012)**
 The fourth Trauma Summit was held in conjunction with the *UCSD Trauma and Resuscitation Conference* and presented information on trauma system performance improvement, access to trauma care, and provided an update on RTCC activities. It concluded with an open forum: “Where Do We Go From Here”?
- **State Trauma Summit V (2014)**
 The fifth Trauma Summit was held in collaboration with the Stanford University Medical Center and Santa Clara Valley Medical Center Trauma Symposium. Presentations covered “State of the State”, the Affordable Health Care Act, Trauma Performance Improvement: A National Program, and Regional Best Practices.
- **State Trauma Summit VI (2015)**
Trauma 2015: California’s Future was held in both Southern California (San Diego) and Northern California (San Francisco). Presentations included The Evaluation of California’s Trauma System from a National Perspective, Trauma System Advocacy and The Optimal Model for Pediatric Trauma Care. Case Studies were presented to illustrate system challenges.
- **American College of Surgeons Trauma System Consultation (2016)**
 ACS conducted a Consultative Trauma System Review for California in March 2016. The review process assessed all key areas of a trauma system based on national standards and provided EMSA with recommendations to improve the system.
- **State Trauma Summit VII (2016)**
Trauma 2016: Yesterday, Today, Tomorrow was held in San Francisco and focused on the ACS consultation visit report adding presentations on prevention, rehabilitation, and system management of senior falls. Case studies that crossed jurisdictional lines were also presented along with a panel on the San Bernardino mass shooting incident.

California Trauma Center Financing

In 1987, the Assembly Office of Research described California's trauma care system as being in a state of medical and fiscal crisis, pointing to financial losses experienced by Trauma Centers. Multiple hospitals, particularly in Los Angeles, had dropped their Trauma Center designation, citing monetary losses. 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.¹⁵ Physicians and hospitals indicated that the root problem of emergency and trauma care issues was the high level of uncompensated care. They believed that appropriate funding for trauma care would provide continued operation of existing Trauma Centers and lead to the establishment of new Trauma Centers.

Most of the efforts to increase California's trauma funding have focused on the direct reimbursement for patient care because of significant shortfalls reported by Trauma Centers. The main source of funding to compensate hospitals and physicians for uninsured and under-compensated emergency services, including trauma services for adults and children, comes through the Maddy Fund (HSC Division 2.5, Chapter 2.5). Additional revenues are derived from tobacco taxes that are earmarked, in part, for programs to provide health care services to indigent patients. Declining revenues from the tobacco tax have resulted in reduced support for trauma care. While the impact is yet to be seen, the expansion of both public and private insurance coverage through the Affordable Care Act may result in payment shifts that may drive new care models and fiscally benefit local trauma system efforts.

California statute (Health and Safety Code 1798.162-166) allows local trauma system development. Initially, funding from the State Trauma Fund (HSC 1797.198-199; 2001) was allocated to LEMSAs for Trauma Centers with a small amount earmarked for local trauma system development. Other statutes (HSC 1797.103, 1798.161) and regulations (CCR, Title 22, Division 9, Chapter 7, §100253) created significant EMSA responsibilities related to trauma care systems. No funding was provided for state or regional coordination, oversight, and evaluation of statewide trauma care. The only on-going funding source for EMSA for statewide trauma system coordination, data aggregation and analysis, and quality improvement activities is the Federal Preventive Health and Health Services (PHHS) Block Grant.

Two counties, Los Angeles and Alameda, have developed funding mechanisms for trauma care through assessments on property value. Other counties have established local fees to fund the coordination and administration of a trauma care system as authorized by HSC 1798.164.

Maddy Fund: The Maddy EMS Fund is financed through an additional penalty assessment on certain motor vehicle fines and forfeitures. The Legislature enacted Chapter 1240, Statutes of 1987 (SB 12), amended in 1988 (SB 612) allowing counties to establish a Maddy Emergency Medical Services Fund (Maddy EMS 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. A charge of \$2 per \$10 is levied on applicable fines, penalties, and forfeitures pursuant to Government Code 76000 and 76104 and section 42007 of the Vehicle Code. Although this funding is not specifically earmarked for

¹⁵ Richard A. Narad and Daniel R. Smiley, *Trauma Care: System in Crisis? California Policy Choices*, Volume 7, University of Southern California, Los Angeles/Sacramento/Washington DC, 1991.

trauma care, it can be used for uncompensated emergency care reimbursements. Each county may establish an EMS Fund, upon the adoption of a resolution by the Board of Supervisors. Currently, 50 (86%) counties have established Maddy EMS funds pursuant to HSC Section 1797.98a.

Courts collect the penalty assessments or surcharges and forward them to the County. Ten percent of these revenues may be used by the county for the administration of the EMS Fund. The remaining funding is allocated as follows:

- 58% to the Physicians Services Account for payments made to physicians who care for patients who have no insurance coverage or are otherwise unable to pay for the emergency visit. Physicians may receive reimbursement for up to 50% of their claims;
- 25% to the Hospital Services Account for payments to hospitals for the provision of disproportionate trauma and emergency medical care services. Hospital costs may be reimbursed up to 100%;
- 17% to the Discretionary Account for other EMS purposes as determined by each county. Many LEMSAs depend on this funding to carry out mandated statutory EMS responsibilities, including trauma system administration.

An additional provision was enacted in 2006 (SB 1773, Alarcon) to allow a county to augment the Maddy EMS Fund from penalty assessments. This optional provision adds an additional penalty assessment of \$2 per \$10 and requires that 15% of the money deposited into the EMS fund from Government Code 76000.5 be allocated for funding pediatric trauma care (Richie's Fund¹⁶). The Alarcon penalty assessment has been implemented by 31 (53%) counties. SB 1465 signed in 2014, increased the transparency of the Maddy EMS Fund by requiring the local jurisdictions to report income and expenditures to EMSA, which aggregates and reports on the use of these funds.

AB 430: AB 430 (Cardenas, Chapter 171, Statutes of 2001), created the Trauma Care Fund (HSC §1797.198-199) to provide funding for trauma care to uninsured patients with a formula for distribution of funds by the LEMSAs for designated Trauma Centers. The funds were passed from EMSA to the LEMSA for distribution. From 2002 through 2005 a total of \$55 million was provided for Trauma Center funding and \$2.5 million was provided for planning and implementing trauma care systems for LEMSAs without a local Trauma Plan. The Trauma Care Fund has not received funding since 2005.

Local Data System Funding: Funds were made available to LEMSAs by EMSA as part of the Office of Traffic Safety and/or Federal Block Grants to modify their local data systems to be compliant with national standards and to participate in the California EMS Information System (CEMSIS). The total amount of funding provided from 2009 through 2016 was \$1,527,637.

Regional Trauma Care Committee (RTCC) Funding: Funding was provided by EMSA to support the development of the RTCCs by funding regional summits and conference calls from

¹⁶ California Health and Safety Code § 1797.98a: California Code - Section 1797.98a - See more at: <http://codes.lp.findlaw.com/cacode/HSC/1/d2.5/2.5/s1797.98a#sthash.AhNKhs9Z.dpuf>

the Federal Preventive Health and Health Services Block Grant. Each of the five RTCCs was allocated up to \$10,000 per year during FY 2010/11 and FY 2011/12 for regional activities. Subsequently, due to financial limits at both the state and federal level, there has been no funding available since FY 2011/12 to fund the activities of the RTCCs.

V. Current Organization of Trauma Care in California

Trauma care systems in California are aligned with the two-tier regulatory structure of EMS in California consisting of EMSA and LEMSAs. EMSA is the state department responsible for developing statewide standards for local trauma care systems and Trauma Centers; providing coordination and leadership for the planning, development, and implementation of trauma care systems; and reviewing and approving local trauma care system plans.

State Trauma Advisory Committee (STAC)

The STAC is an 18 member body, appointed by the Director of EMSA under Health and Safety Code 1797.133, to assist in implementing trauma care and coordinating statewide activities. The STAC is comprised of physicians, nurses, administrators, and other EMS providers and personnel for the purpose of advising the EMSA Director on matters pertaining to the planning, development, and implementation of the local trauma systems (*Appendix C*). The Chair of the STAC has historically been a senior practicing trauma surgeon, recognized nationally for his/her experience and knowledge of trauma care and trauma systems. In 2009, the committee was reorganized to have broad representation with term limits from the major stakeholder groups in California.

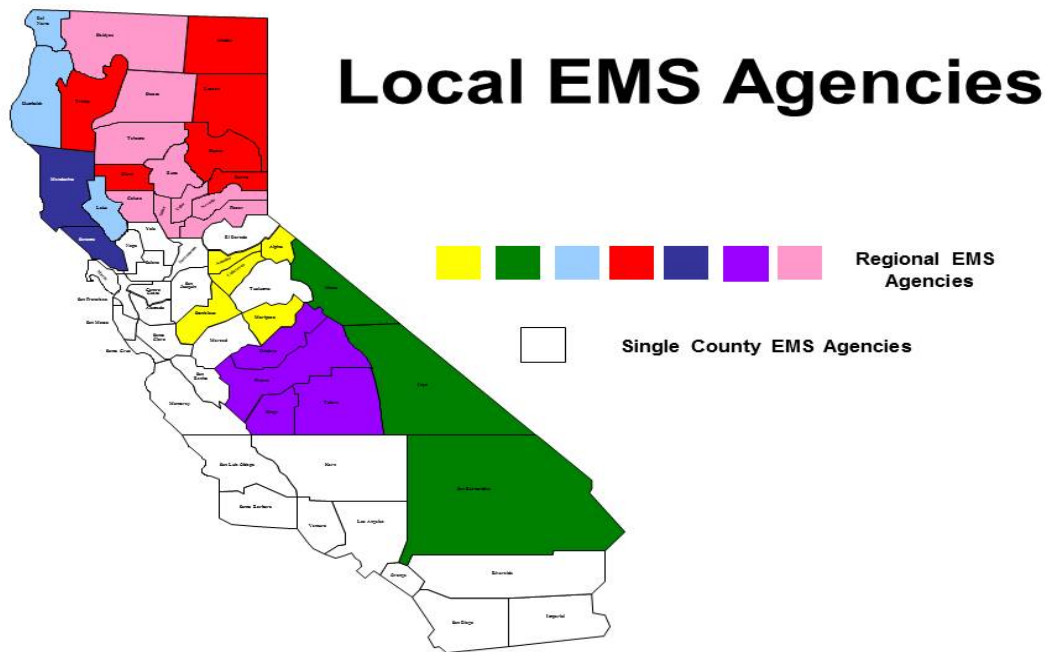


Figure 1

Local EMS Agency (LEMSA)

The LEMSA is charged with implementing statute, regulations, and local policy for trauma services in their area of jurisdiction, ensuring the system components function in concert

throughout the continuum of care. There are currently 33 LEMSAs (Figure 1) within the State of California; 26 are a single county and 7 have a multi-county jurisdiction. The LEMSA is responsible for:

- local trauma system plan development and implementation;
- local trauma system policy development;
- Trauma Center designation;
- monitoring compliance with contractual agreements in accordance with California statute, regulations and local policy;
- providing PIPS programs for ongoing review of trauma system performance and outcomes;
- facilitating a confidential and collaborative local trauma advisory committee;
- maintaining a local trauma database and participating in the State Trauma Registry (CEMSIS-Trauma); and
- participating in injury prevention, public and professional education.

Each LEMSA with a trauma care system is required by statute and regulation to submit a Trauma Plan for EMSA approval followed by annual Trauma System Status Reports. This Plan is designed to meet state minimum trauma system standards, and address local short and long term trauma system needs. Plans outline the number and level of Trauma Centers and patient destination, but do not necessarily address inter-county needs. All 33 LEMSAs have approved trauma plans.

Regional Trauma Coordinating Committees (RTCC)

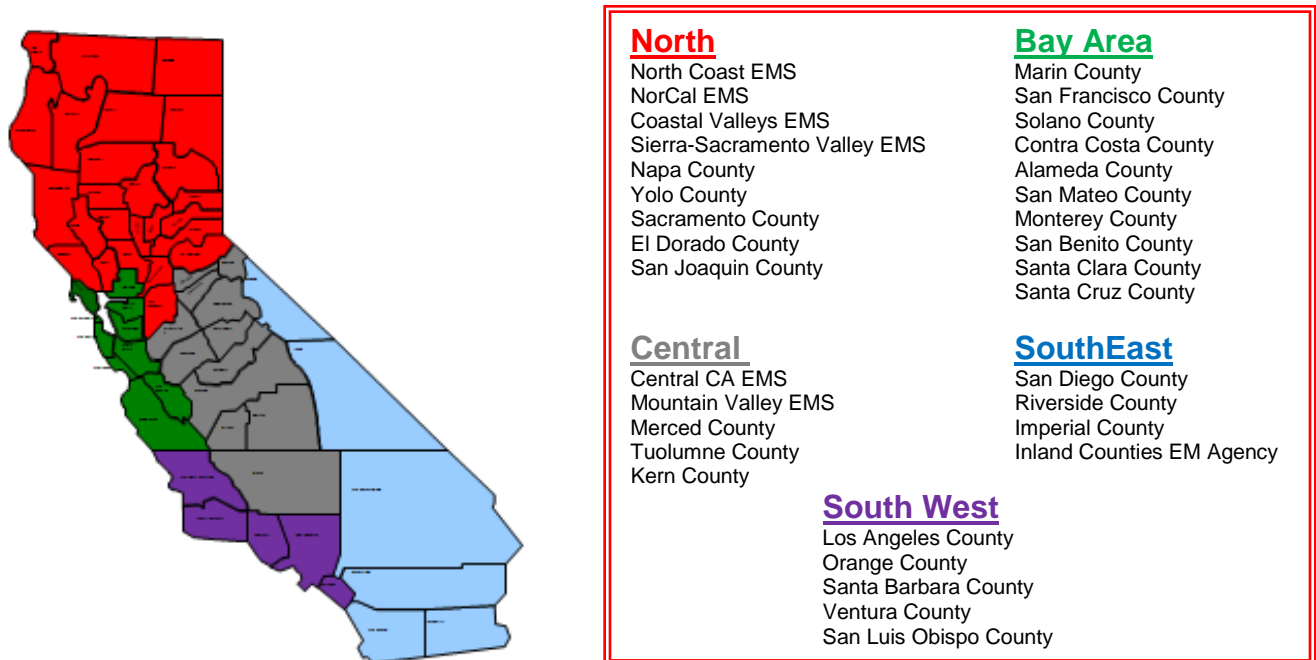


Figure 2

As a result of recommendations made by the STAC and the 2006 *California Statewide Trauma Planning, Assessment and Future Direction* document, five trauma regions were defined by EMSA and corresponding RTCCs were created in 2008 (Figure 2). RTCCs function as a conduit between the regions and EMSA/STAC to aid in statewide coordination and development of local trauma systems. In addition, the RTCCs leverage a broad range of voluntary expertise within the five regions to facilitate communication and collaboration within and between regions, to share and support best practices, to assist with the interpretation of regional data, and to provide requested technical assistance to LEMSAs and to EMSA related to the development and operation of a system of trauma care for the State of California. RTCCs may facilitate discussions related to trauma care challenges within the region working towards resolutions to minimize variations in practice. Additional regional issues may include addressing geographic isolation, coordination of trauma care resources, and funding for out-of-county patients. RTCC membership is currently voluntary and is drawn from trauma system partners within each region to include, but not be limited to, LEMSAs Trauma System Coordinators, EMS Directors and Administrators, Trauma Center Directors, Trauma Center Managers, non-trauma facility representatives, EMS providers, and CA Hospital Association representatives. State-level activity includes representation on the STAC, (acting as a subcommittee) reporting regional activities and issues, sharing regional work products, and relaying STAC information and decisions back to the region.

Trauma Centers

Trauma Centers are the key element in a trauma system and the focal point for trauma care. Many Trauma Centers participate in state and regional trauma system planning and development. Lead Trauma Centers (Level I and II) contribute administrative and medical leadership, and academic expertise to the system. Many of these lead Trauma Centers, in collaboration with the LEMSAs, engage all other Trauma Centers (Level III and IV), and a few include non-trauma acute care facilities, in the performance improvement process.

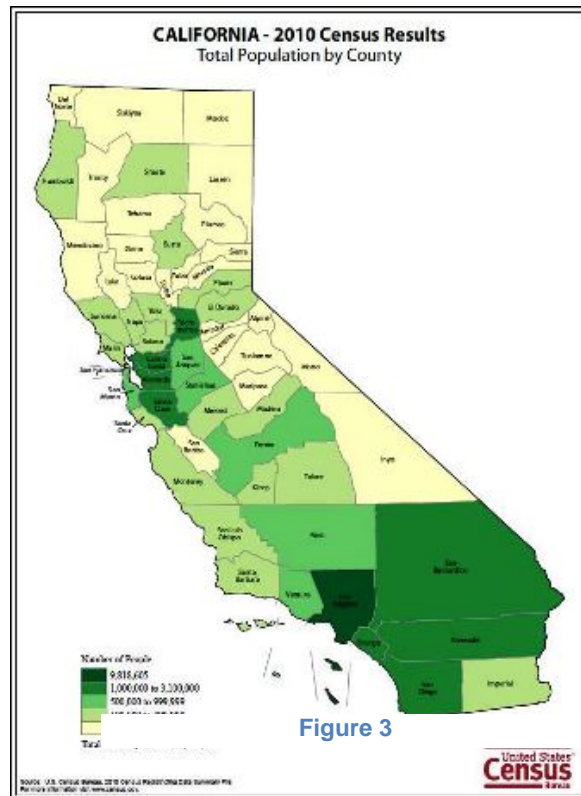
As of April 2017 there are 80 designated Trauma Centers (Table 1) in California (*Appendix D*.) It is estimated that over 70,000 trauma patients are admitted to Trauma Centers in the state annually.

TOTAL TRAUMA CENTERS BY DESIGNATION	
Level I Pediatric Trauma Center Only	2
Level II Pediatric Trauma Center Only	3
Level I Trauma Center & Level I Pediatric Trauma Center	5
Level I Trauma Center & Level II Pediatric Trauma Center	3
Level II Trauma Center & Level II Pediatric Trauma Center	4
Level I Trauma Center	5
Level II Trauma Center	34
Level III Trauma Center	13
Level IV Trauma Center	11
TOTAL:	80

Table 1

LEMSAs may designate Trauma Centers that have the capability and willingness to demonstrate a commitment to trauma care based on population needs and meet state trauma regulation requirements. The designation process is locally controlled and may include a hospital site visit by the ACS's 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 a surgical service for patients with less critical injuries which may or may not need surgery. Level IV Trauma Centers provide initial stabilization of trauma patients. Level III and IV Trauma Centers provide secondary transfer to a higher level of Trauma Center care when appropriate.



The participation of all acute care hospitals in the trauma system, providing initial assessment and care with appropriate transfer to Trauma Centers, is also a key component of an inclusive trauma system. Hospitals that are not Trauma Centers will see both patients brought by private transportation as well as patients not initially identified as having severe trauma by EMS transport providers.

System Challenges

There are many challenges and complexities for California related to trauma care, including the vast geographic area of the state with variation in terrain, population density, (Figure 3) diverse EMS cultures, weather, resources, hospital and health facility locations, and the decentralized nature of EMS in the state.

The current trauma care delivery system is an optional, locally based, decentralized trauma system as prescribed in the Health and Safety Code. Given the vast and diverse topography, transportation and access issues exist in varying degrees across the State.

The examples below illustrate some of the variation in transportation issues that are inherent between urban and rural trauma systems within California. These differences illustrate the need for coordination across the state. It is common for patients from the isolated rural areas to be

stabilized then transferred long distances to a higher level Trauma Center.

Urban California

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, utilizing out-of-county Trauma Centers.

Rural California:

The entire northern geographic one-third of the State (counties of the North RTCC as described in Figure 2) has one designated Level I Trauma Center (also Pediatric Level I), six Level IIs, eight Level IIIs and eight Level IVs. The higher level centers tend to be in the more populated areas, leaving vast rural and remote sections of the State with no hospitals, few designated Trauma Centers and long transport distances over difficult terrain. Large portions of these areas experience weather extremes, periodic isolation and lack immediately available medical resources.

The northern coast of California typically experiences extended patient discovery and transport times due to difficult terrain and winding roads with no air medical resources based within the region. Prompt and efficient transport of patients to higher level Trauma Centers is extended due to distance to urban centers and, as a result, many cases are interfacility transfers. In the more southern portion of the north coast, air medical resources are more readily available resulting in direct transport from the scene to a higher level Trauma Center whenever possible.

Geographic areas with gaps in trauma service include North Eastern and Central California (east of Interstate 5 to the Nevada border, including Yosemite), and parts of the Central Coast area including the vacation and college town of Santa Cruz. While transport to a Trauma Center occurs, it requires use of limited air transport resources, long ground transport times, or a secondary transfer resulting in delays to definitive 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.

VI. Statewide Trauma System Planning: Project Approach and Methods

The STAC has developed these Statewide Trauma System Planning recommendations to assist EMSA in the implementation of best practices and system improvements for the trauma system in California. The STAC created an expert writing group for each planning component to assist in the recommendations. The lead for each group was chosen based on their knowledge of the assigned component. The writing groups reviewed and analyzed information related to current trauma care in the state, including statute and regulations, national standards and guidelines, trauma care costs and losses, and national trauma and emergency care reports to develop recommendations.

The Statewide Trauma System Planning development process included the following.

Review of Current Trauma Care in California

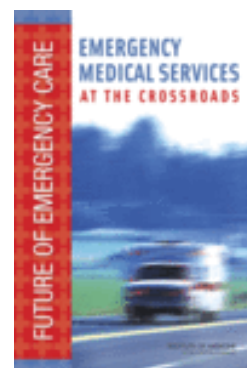
Regulations and statutory authority were reviewed to determine the current framework for how trauma care is delivered in California. In addition, this review considered how local optional systems for trauma care delivery in California were developed and the limitations of that approach.

The 2008 ACS Committee on Trauma “Regional Trauma Systems: Optimal Elements, Integration, and Assessment offers a guide to assist in trauma system development and implementation in line with the HRSA Model. The California Statewide Trauma System Planning recommendations are more in line with the context and substance found in the ACS document, taking into consideration HRSA’s public health conceptual model.

ACS provided a trauma system assessment in March 2016 based on this document. The review team complimented EMSA on well written Statewide Trauma System Planning recommendations. Recommendations from the ACS Assessment Report were then integrated into the Statewide Trauma System Planning objectives. (*Appendix B*)

Review of the 2006 Institute of Medicine (IOM) Report on 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. The STAC used some of the report’s findings in making recommendations contained in these Statewide Trauma Systems Planning recommendations.



Analysis of National Standards for Trauma Care Delivery Systems and how they relate to California’s Trauma Care Needs

California’s current trauma care system was evaluated based on two nationally recognized authorities in trauma system development. In 2006, the Health Resources and Services Administration (HRSA) revised its previous *Model Trauma Care System Plan* and re-titled it *Model Trauma System Planning and Evaluation*. This document continues to emphasize the need

for a fully inclusive trauma care system. It provides a modern system development guide using the public health approach to the development and evaluation of trauma systems. A primary strategy of the public health approach is to identify a problem based on data, devise and implement an intervention, and evaluate the outcome.¹⁷

The ACS *Regional Trauma Systems: Optimal Elements, Integration, and Assessment* guide takes the concepts from the HRSA document and provides a self- assessment tool for trauma system planning, development and evaluation. In addition, the ACS Committee on Trauma’s 2014 *Resources for Optimal Care of the Injured Patient* 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.

The HRSA document is the standard model for the development of the administrative components of a trauma plan, and the ACS standards provide important organizational and clinical standards related to systems and Trauma Center designation. These two documents, when used together, form the typical approach to trauma system planning and evaluation.

The HRSA and ACS documents were consulted in the development of the California Statewide Trauma System Planning recommendations and provided the major functional components of an inclusive statewide trauma system, which were used to develop the fifteen components in the Statewide Trauma System Planning recommendations:

1. Administrative Components
 - A. Leadership—an identified lead agency with the authority, responsibility and resources to lead the development, operations, and evaluation of the trauma system
 - B. System Development—a defined planning process for trauma system development, assessment, and evaluation
 - C. Finance—financial forecasting and accountability by the State, local trauma systems, and Trauma Centers
2. Operational and Clinical Components
 - A. Prehospital Care
 - B. Ambulance and Non-Transporting Medical Unit Guidelines—regulations, medical control, and geographic boundaries for prehospital medical units
 - C. Communication System—fully integrated with EMS and emergency/disaster preparedness systems
3. Definitive Care
 - A. Trauma Care Facilities—uniform standards for Trauma Center designation; identified role and responsibilities for other acute care facilities

An Inclusive trauma system uses all available hospital resources to ensure rapid access to trauma care by prehospital personnel 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, all facilities are matched with a patient’s needs. Other components include injury prevention, medical examiners and rehabilitation services.

¹⁷ **Model Trauma System Planning and Evaluation**, Health Resources and Services Administration, February 2006.

- B. Interfacility Transfer—development of policies and procedures for appropriate and expeditious transfer
 - C. Medical Rehabilitation—coordinated post-acute care for trauma patients with permanent or long-standing impairment
4. Information System—timely collection of data from all providers in the form of consistent data sets meeting minimum established standards
 5. System Evaluation and Performance Improvement—use of data to monitor the performance of the system components
 6. Education and Training—education for all levels of trauma care personnel, both hospital and prehospital as well as public education
 7. Trauma System Research—trauma related research to include epidemiologic research in prehospital care, acute care, rehabilitation and prevention
 8. Injury Prevention and Control—comprehensive and integrated approach to injury prevention
 9. Emergency/Disaster Preparedness—fully integrated with EMS system, local government, private sector and acute care facilities

HRSA Model Trauma Guidelines Assessment of California

The “2006 Health Resources Services Administration Model Trauma System Planning and Evaluation” demonstrates the interrelationship of the core functions, essential services and trauma system benchmarks. It depicts core research that drives the system and essential governance structure that supports system management, and system benchmarks that circulate around the core constructs. This model supports assessment, policy development and assurance representing core functions of public health necessary for successful trauma system development.¹⁸ The document also provides an assessment tool to evaluate how California’s delivery of trauma care meets 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. The intent of the tool is to allow an individual trauma system to identify its strengths and weaknesses, prioritize activities, and measure progress against itself over time. Guidelines are 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. 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. It is assumed that meeting these process measures should result in improved outcomes.

¹⁸ **Model Trauma System Planning and Evaluation**, Health Resources and Services Administration, February 2006,

Using the HRSA document, the STAC assessed California's current system of trauma care and identified next steps to develop an inclusive and comprehensive State Trauma System. **Appendix A** provides California's current status of these benchmarks based on the 2006 Trauma System Assessment Indicators. Although all components of the HRSA assessment are important, because of the nature of California's system, these Statewide Trauma System Planning recommendations configure the national indicators into 15 components allowing for a more manageable and tailored approach to the implementation of trauma care/system improvements.

Surge Capacity Assessment

EMSA used the HRSA bioterrorism standards 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. HRSA has established an ad hoc surge capacity target of 500 extra hospital patients per million population in urban areas.¹⁹ 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 the 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.

Incorporation of the recommendations made in the 2006 California Statewide Trauma Planning: Assessment and Future Direction

In addition to the findings from the HRSA assessment, there were three primary recommendations that were cited for the trauma system in the 2006 *California Statewide Trauma Planning: Assessment and Future Direction* document. Progress on these recommendations was evaluated, as work continues:

1. Strengthen State Trauma Leadership

The development of trauma systems is not required in statute or regulations; however all 33 LEMSAs have Trauma Plans approved by EMSA. The Annual Trauma System Status Report from each LEMSA must show that the LEMSA is in compliance with its approved Trauma Plan as well as statute and regulations. Since the publication of the *California Statewide Trauma Planning: Assessment and Future Direction* in 2006, 22 additional Trauma Centers have been designated.

¹⁹ Bioterrorism and Health System Preparedness. Rockville (MD): Agency for Healthcare Research and Quality; Optimizing surge capacity: regional efforts in bioterrorism readiness. Issue Brief No. 4. AHRQ Publication No. 04-P009. Also available from: URL: <http://www.ahrq.gov/news/ulp/btbriefs/btbrief4.htm>.

In 2008, EMSA established five RTCCs as a method to address gaps and inconsistencies and improve surge capacities. The RTCCs bring together system stakeholders and member LEMSAs to facilitate communication and coordination to minimize variations in practice, and provide regional performance improvement activities to advance the delivery of quality trauma care. Standardization occurs through state coordination, collaboration between RTCCs to support state standards, sharing of best practices, and promoting uniformity of data collection. EMSA participates in each RTCC by providing updates on statewide EMS issues and soliciting feedback on current projects under development. Each RTCC is a subcommittee of the STAC and provides representation where RTCC activities are shared and discussed. The STAC provides guidance to the RTCC as needed.

2. Develop Statewide Trauma Registry

The California EMS Information System (CEMSIS) was developed as a demonstration project funded by the Office of Traffic Safety. Data collection at the state level is dependent on the local EMS and trauma data systems managed by the local EMS agencies. The current regulations require the integration of prehospital and hospital trauma system data into the LEMSA and the EMSA data system (CCR, Title 22, Division 9, Chapter 7, §100253). Trauma Centers send trauma data into CEMSIS – either directly or through their LEMSA. From 2009 through 2012, CEMSIS collected over 250,000 patient care records. The standards for data collection are based on national standards established by the National Trauma Data Bank. In 2013, the State migrated CEMSIS into new data system software. As a result, LEMSAs have modified their systems for submission to the state. Participation has improved significantly over time. From 2013 through 2016, CEMSIS has collected over 250,000 patient care records.

3. Consider Trauma System Funding

Limited funds were made available to LEMSAs to modify their local data systems to be compliant with national standards and participate in CEMSIS. In addition, seed monies were provided to the RTCCs to assist in regional summits and conference calls. These monies are no longer available and there is no dedicated funding for state oversight of the Trauma System.

VII. Trauma System Strategies and Directions

Based on the HRSA benchmarks (Figure 4) and a current evaluation of California’s trauma system, utilizing the ACS’s trauma system guidance document, the following 15 components outline the future recommendations to continue the successful development and implementation of an effective Trauma System. Details on the proposed development for each component are found in **Appendix B** including the recommendations found in the ACS State Trauma System Assessment Report.

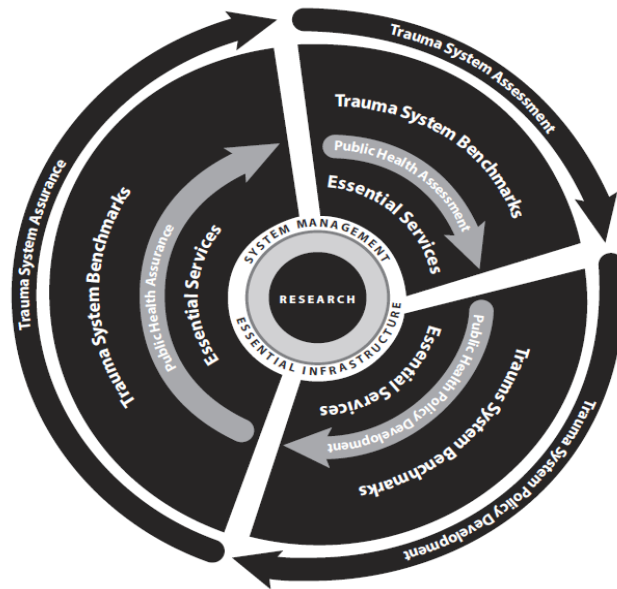


Figure 4

1. State Leadership—HRSA

Benchmark #202 (200 series: policy development). *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 requires strong state leadership.*

Barriers

Under the current statutory and regulatory framework, trauma is an optional local program. Since all 33 local EMS agencies have trauma plans in place, care is being provided locally; however, the trauma community perceives the need for improved coordination of patient movement between LEMSAs in addition to greater consistency in standards of care. EMSA has staff to review and approve statutorily mandated trauma plans but insufficient staff or central resources to fully coordinate a statewide trauma system. Limited resources at the state level mean that there is limited oversight of the locally based systems including lack of comprehensive regional and statewide performance analysis to assess such issues as field triage and timely access to care. While California’s decentralized approach to EMS permits flexibility and the tailoring of EMS practices to local needs, it has also allowed problematic variability in trauma care practices, as previously described under system challenges.

Opportunities

LEMSA and EMSA leadership remains essential to the overall success of the trauma system. The creation and development of RTCCs represent a principal change in the structure of the trauma system, including the composition of the STAC that now includes regional representatives from each RTCC.

The RTCCs do not replace LEMSAs or supplant the authority that EMS agencies currently maintain over EMS and trauma systems, but should have State support to build upon existing local EMS jurisdictions to address challenges of access, geographic isolation, coordination and optimal distribution of trauma care resources, and funding of out-of-county patients.

A regional structure, supported by the LEMSAs and RTCCs encourages optimal sharing of resources and information. Patient flow patterns, provisions for uncompensated care, and quality of care are improved through optimal sharing of resources throughout the region. The STAC and EMSA promote interregional standardization.

Goal: EMSA provides coordination, guidance, and assistance to the LEMSAs and RTCCs to enhance the consistency of trauma-related standards and guidelines throughout the state and improve the overall quality of trauma care

Objectives:

1. EMSA to encourage the collaborative efforts of the counties to support and share resources for a regionally-based trauma system.
2. EMSA to work with the LEMSAs, STAC and the RTCCs to develop a consensus compendium of trauma-related policies, procedures, and clinical guidelines that may be shared throughout the state.
3. LEMSAs to develop local trauma plans in the context of regional trauma care with input from Trauma Centers and RTCCs.
4. Establish basic quality and activity reporting standards and report templates for the LEMSAs to ensure that EMSA, STAC, and PIPS subcommittee receive sufficient data to assess state trauma system performance.

2. System Development—HRSA Benchmark #203 (200 series: policy development). *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.*

Barriers

Since trauma system development is optional, and the commitment to advanced trauma care by an existing facility with the population to support it is necessary, there is a wide range of trauma system models in California. The variance runs from LEMSAs with well-established trauma systems with designated Trauma Centers at various levels to LEMSAs that have limited implementation of the plan or no designated Trauma Centers. The ability to help coordinate trauma system activity and facilitate related interactions among all the LEMSAs by EMSA and STAC has historically been limited.

Opportunities

The LEMSA may assist EMSA in providing for a comprehensive analysis of trauma resources throughout the State including access-to-care assessment. The STAC may provide guidance and coordination for specific RTCC activities and projects with statewide implications.

Goal: Develop an inclusive statewide trauma system that provides an appropriate level of care for all individuals following major injury.

Objectives:

1. Conduct a systematic review of local trauma plans in the context of these Statewide Trauma System Planning recommendations and the structures and processes it outlines.
2. Develop processes and mechanisms for providing optimal care to special populations; for example, pediatric populations.
3. Update regulations to set specific standards and requirements for trauma system implementation, and to address changes to be consistent with the California Statewide Trauma System Planning recommendations, 2017.

3. Trauma System Financing—HRSA Benchmark #204 (200 series: policy development) and #309 (300 series: assurance). *The financial aspects of the trauma systems are integrated into the overall quality improvement system to assure ongoing “fine-tuning” and cost-effectiveness.*

Barriers

Beyond the Maddy EMS Fund, there is limited statewide funding to support local trauma systems, Trauma Centers or emergency/trauma care. Previously, legislation has been proposed to identify funding through levying taxes or fees on products associated with trauma, (i.e. alcohol, ammunition, firearms). However, these efforts have not been successful. The Tobacco Tax in 1990 was the last approved tax for uncompensated care; however, the majority of these funds have been redirected to other programs at the State, and the limited remaining funds do not go to the organization, coordination, and development of the State Trauma System. The lack of standardized data collection across the State leads to limited information about trauma care to inform policy based on cost effectiveness and efficiency. Beyond very limited federal grant funds, there is no stable funding source to manage the Trauma System.

There are three areas where funding is needed to develop an effective State Trauma System:

1. Support for uncompensated care
There are insufficient data to analyze the current fiscal status of our Trauma Centers. Historically, trauma system providers have indicated that additional Trauma Center funding is required. Health and Safety Code §1797.199 created the Trauma Care Fund for the purposes of compensating Trauma Centers for high percentages of uninsured patients, but this fund has not had appropriation since 2005. As more patients obtain coverage through the Affordable Care Act, and insurance coverage is expanded in both the public and private sector, the changes to trauma care reimbursement patterns should be studied under these changing payment mechanisms.
2. Support for EMSA and LEMSA administration of the program
Under current law, some LEMSAs receive only a small percentage of existing funds (Tobacco, Maddy, etc.) to support administrative, hospital, and physician costs. Some LEMSAs support local trauma system administrative and data costs through Trauma Center designation fees, which vary (from \$0 to \$100,000) across the State. There is

insufficient information about local funding to determine if there are enough resources to meet trauma system regulatory mandates and national guidelines. System requirements for performance improvement necessitate stable funding. In addition to funding, data are required for system evaluation, including fiscal information and post-discharge outcome data from rehabilitation facilities.

Current State Trauma System oversight is funded through the Federal Preventive Health and Health Services Block Grant.

3. Increase participation of community hospitals in the trauma system

Funding is necessary to initiate development of level III and IV Trauma Centers to provide regional trauma care in rural areas without nearby higher level trauma capacity. Existing local funding sources in rural areas are insufficient to fund both facilities and system administration.

Opportunities

The Affordable Care Act reauthorizes and improves the trauma care program by providing competitive grants, administered by the U.S. Health and Human Services Secretary, to states and Trauma Centers to strengthen the nation’s trauma system. The prerequisites for some of this funding may include the establishment of tracking communications systems and participation in the National Trauma Data Bank. Although the Affordable Care Act reauthorizes the trauma care program, funding has not been appropriated.

Goal: EMSA, in collaboration with the STAC, LEMSAs, and RTCCs, to explore the feasibility of a State Trauma System Business Plan to identify the system’s current financial status, perform a needs assessment to identify specific aspects of the system that need funding, and identify opportunities for future trauma system funding. It is important to recognize that dollars spent on infrastructure are returned through improved performance and quality of care that lead to better patient outcomes.

Objectives:

1. Identify critical Trauma System components and the cost to develop and maintain them.
2. Work with researchers and hospitals to establish a basis for estimating the actual cost for trauma care in California
3. Identify sustainable funding sources to support regional infrastructure and planning.

4. EMS System: Prehospital Care—HRSA Benchmark #302 (300 series: assurance). *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.*

Barriers

Trauma triage and destination policies often reflect the availability of trauma services within a specific community. With varying availability of resources, along with dense and sparse

populations there is variation in trauma triage criteria and destination determinations. The study of under and over triage has been limited due to differing triage policies and definitions.

Opportunities

The Centers for Disease Control and Prevention and the ACS Committee on Trauma have developed national trauma triage guidelines. These guidelines have been adopted by many of the LEMSAs both locally and regionally through RTCC collaboration.

Goal: Develop a minimal statewide standard for the triage of trauma patients to enable study of under and over triage.

Objectives:

1. Utilize the most current national standard for prehospital triage as the foundation for prehospital trauma triage guidelines. Based on specific environments (e.g. urban vs. rural) and presence or absence of Trauma Center resources, some local modifications may be required.
2. Develop definitions to study over and under triage with a mechanism to track on a regional basis.
3. Work with OSHPD in obtaining specified data from non-trauma facilities on major trauma patients transported to the facility and not transferred.
4. Adopt standards for transfer of documented information from field units to receiving hospitals with the goal that prehospital care reports be made available as part of the medical record for all trauma patients.
5. Explore the need for minimal special population field trauma triage criteria, e.g. pediatric and geriatric.
6. Develop EMS protocol guidance for field trauma care

5. EMS System: Ambulance and Non-Transporting Medical Units—HRSA Benchmark #302 (300 series: assurance). *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.*

Barriers

Non-transporting prehospital medical units are configured in various ways throughout California. In urban regions, it's common for non-transporting units to be fire apparatus staffed by EMT or paramedic level personnel. Rural areas (including state and federal parks, forests, and beaches) may have staff cars or rescue units in various configurations and capabilities staffed with trained first responders, EMTs, or in some cases paramedics; many have volunteer personnel. Organized search and rescue teams also fit the category of non-transporting EMS units. Because of the diverse population and environmental challenges in California, response and transport times for EMS units vary significantly from area to area.

Opportunities

National recommendations have been developed for standards for equipment inventories of EMS resources. EMSA enforces EMS Aircraft regulations and publishes statewide Prehospital EMS Aircraft Guidelines.

Goal: Provide a minimum standard and align the use of ground vs. air resources for the transport of trauma patients to the closest appropriate level of Trauma Center that is equipped and staffed to best meet the needs of the injured patient.

Objectives:

1. Develop minimum prehospital equipment inventory for non-transport/transport EMS units specific to trauma needs.
2. Recommend air resource utilization guidelines applicable state-wide including access to air resources.

6. EMS System: Communications—HRSA Benchmark #302 (300 series: assurance). *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.*

Barriers

The current 911 alert system has limited integration with cell phones or internet-based communication methods. Many small dispatch centers and rural regions are without priority dispatch or protocols.

Opportunities

PIPS Programs and processes are found in systems utilizing Emergency Medical Dispatching (EMD). Opportunities exist to expand the implementation of PIPS in dispatch centers regardless of implementation of an EMD program.

Goal: Standardized communications to be coordinated between all EMS systems on a given incident, utilizing current technology, to notify the trauma care team of essential information about the injured patient and ensure that appropriate destination decisions are made.

Objectives:

1. Develop guidance for priority dispatch protocols for trauma and investigate process changes that improve dispatch effectiveness while improving outcomes.
2. Study the hospital alert systems currently in place to identify hospital capability, capacity, and specialty care availability (e.g., burns, pediatrics,) and complete a gap analysis.

7. Definitive Care: Acute Care Facilities—HRSA Benchmark #303 (300 series: assurance). *Acute care facilities are integrated into a resource-efficient, inclusive network that meets required standards and that provides optimal care for all injured patients.*

Barriers

There are currently 343 acute care facilities with emergency departments in the state of California. Of these, 80 are designated Trauma Centers. Twenty California counties currently have no designated Trauma Centers within county lines. The process by which a non-trauma facility applies for and achieves formal LEMSA designation, as well as the process for re-designation varies throughout the state.

Opportunities

The Trauma System with respect to its acute care facilities should strive towards providing basic trauma care throughout the state, make every effort to provide definitive care regardless of the type and severity of injury, have designated centers maintain capabilities commensurate with their level of designation, and improve the consistency of processes related to initial and recurring designation.

Goal: Develop a network of acute care facilities intended to provide universal access to the appropriate level of trauma care.

Objectives

1. Develop guidelines outlining a process for the assessment of Trauma Center compliance with CCR Title 22, Chapter 7.
2. Outline the responsibilities and expected participation in the trauma system for non-designated acute care hospitals.
3. Establish EMSA guidelines to standardize the Trauma Center designation process across LEMSAs.

8. Definitive Care: Re-triage²⁰ Interfacility Transfer—HRSA Benchmark #303 (300 series: assurance). *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.*

Barriers

The frequency, location, and severity of related injuries involved with re-triage and interfacility transfer within the state are largely unknown. Obstacles to transfer and re-triage include lack of a proximally located Trauma Center, lack of knowledge regarding the capacity and capabilities of potential receiving centers, concern about potential EMTALA violations if patients are not fully evaluated and treated before transfer to a higher level of care, local geographical and climatic obstacles to transportation (e.g. remote location, mountains, fog, etc.), or transportation availability.

²⁰ For purposes of this document, re-triage means the immediate evaluation, resuscitation and transport of a seriously injured patient from a lower level trauma facility or NTC to a designated Trauma Center at a higher level of care. This process involves direct ED to ED transfer of patients that have not been admitted to the hospital. Interfacility transfer (IFT) refers to the transfer of an admitted patient, under the care of an admitting physician-of-record, from one facility to another.

Opportunities

Re-triage/Interfacility Transfer (IFT) protocols have been developed in several areas in the state, and their effectiveness has just begun to be monitored.

Goal: Develop mechanisms, processes, and guidelines that will optimize timely access to trauma care at a level commensurate with the severity of injury, regardless of geographic location.

Objectives:

1. Capture re-triage and IFT data in CEMISIS for statewide analysis and develop a map of re-triage and IFT traffic within the state.
2. Explore the development of centralized re-triage/transfer coordination within the state.
3. Assist in the development of regional cooperative arrangements between sending and receiving centers that will facilitate re-triage, reduce delays, and provide that patients are re-triaged to an appropriate level of care.

9. Definitive Care: Rehabilitation—HRSA Benchmark #308 (300 series: assurance). *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.*

Barriers

California trauma regulations currently contain specific requirements for early rehabilitation involvement and the utilization of physical, occupational, and/or speech therapies for the trauma patient, some of which may be provided through a written transfer agreement. Most rehabilitation facilities are independent facilities and the degree of integration into the trauma system varies considerably. In addition, the degree of access to level-of-care post-injury rehabilitation throughout the state is unknown.

Opportunities

The rehabilitative needs of trauma patients in the context of a statewide system of care should be systematically addressed using acceptable standards.

Goal: Develop a plan to assess the availability and capabilities of rehabilitation facilities in the state and integrate them into the regional planning and performance improvement process.

Objectives:

1. Improve the data collection for evaluation of rehabilitative needs and degree of access to rehabilitation throughout the state
2. Adopt a standardized measure of functional recovery suitable for use throughout the trauma system

10. Information System—HRSA Benchmark #101(100 series: assessment). *There is a thorough description of the epidemiology of injury in the system jurisdiction using both population-based data and clinical databases.*

Integration of our trauma and EMS data with performance dashboards and more in-depth analysis is imperative to improving and continuously monitoring the Trauma System. Continued collection of trauma system data is necessary to assess performance, quality, utilization and prevention, benchmark against existing national standards, and to inform future policy decisions and directions.

Barriers

With the exception of the counties included in the multi-county EMS agencies, participation in CEMSSIS by LEMSAs is inconsistent. While data-related regulations exist for Trauma Centers and LEMSAs, compliance with these requirements from LEMSAs and non-trauma facilities is disparate. In addition, data elements and their definitions vary among LEMSAs, and thus interpretation of outcomes or processes is inconsistent. In the absence of statewide trauma system data, including financial data, a reliable assessment of system performance and determination of additional system resource needs is imprecise.

CCR Title 22 §100257 states:

- (a) The local EMS agency shall develop and implement a standardized data collection instrument and implement a data management system for trauma care.*
 - (1) The system shall include the collection of both prehospital and hospital patient care data, as determined by the local EMS agency;*
 - (2) trauma data shall be integrated into the local EMS agency and State EMS Authority data management system; and*
 - (3) all hospitals that receive trauma patients shall participate in the LEMSA data collection effort in accordance with LEMSAs policies and procedures.*
- (b) The prehospital data shall include at least those data elements required on the EMT-II or EMT-P patient care record, as specified in Section 100129 of the EMT-II regulations and Section 100176 of the EMT-P regulations.*

Opportunities

The State Trauma Registry should be linked with the EMS Data System (prehospital care data) to create a robust program in support of the EMS system core measures to achieve process and outcome measures to better measure trauma care across the state. In addition, the system should be expanded to include a minimal dataset from non-trauma facilities. There should be a process to evaluate the quality, timeliness, completeness, and confidentiality of data.

Effective January 2016, Health and Safety Code, Division 2.5, Chapter 3, Article 2, permits the release of patient-identifiable medical record information to an EMS provider, LEMSA and EMSA for quality assessment and improvement purposes.

1797.122. (Sharing of Patient-Identifiable Data)

- (a) Notwithstanding any other law, a health facility as defined in subdivision (a) or (b) of Section 1250 may release patient-identifiable medical information under the following circumstances:*

(1) To an EMS provider, information regarding a patient who was treated, or transported to the hospital by, that EMS provider, to the extent that specific data elements are requested for quality assessment and improvement purposes.

(2) To the authority or the local EMS agency, to the extent that specific data elements are requested for quality assessment and improvement purposes.

(b) An EMS provider, local EMS agency, and the authority shall request only those data elements that are minimally necessary in compliance with Section 164.502 (b) and Section 164.514 (d) of title 45 of the Code of Federal Regulations.

Goal: Establish linkages of databases to create a complete patient record.

Objectives:

1. Improve data sharing
2. Improve data quality and compliance
3. Evaluate data validity

11. System Evaluation and Performance Improvement—HRSA Benchmark #301(300 series: assurance). *The trauma management information system is used to facilitate ongoing assessment/analysis and assurance of system performance and outcomes and provides a basis for continuously improving the trauma system including a cost-benefit analysis.*

Barriers

The role of the RTCCs in overall system performance improvement is still being developed. Participation by non-trauma facilities in the local trauma system PIPS Program, including contributing data to the LEMSA's trauma registry, is inconsistent across LEMSAs. Without consistent metrics to measure performance across the LEMSA boundaries effectiveness of a statewide system cannot be demonstrated.

Opportunities

In order to evaluate the Trauma System, the continuum of care from dispatch to prehospital to hospital disposition must be connected through a data system. Only then can we begin to understand how care provided translates to improved outcomes and system effectiveness.

Goal: A PIPS Program to be developed by EMSA in collaboration with the LEMSAs and RTCCs to evaluate statewide trauma system performance.

Objectives:

1. In collaboration with the LEMSAs, and with the participation from the RTCCs, formulate a statewide comprehensive Trauma PIPS Plan consistent with the elements of these Statewide Trauma System Planning recommendations. Utilizing State Trauma Registry data:
 - a) Measure performance and quality through the development and analysis of system-wide performance improvement standards that are applicable statewide.

- b) Develop methodologies for outcomes analysis, using both registry data and OSHPD hospital and emergency department discharge data and medical examiner/coroner data.
 - c) Promote case-based performance improvement whereby sentinel events relative to trauma system deficiencies are identified.
 - d) Develop a methodology to assess over and under triage to support evaluation of field triage protocol.
2. Evaluate state data, identify regional opportunities for improvement, determine if similar opportunities are occurring in other regions, and explore mechanisms for shared resolution.
 3. Create a policy regarding the sharing of data for the PI process, recognizing hospital confidentiality and HIPPA regulations.
 4. Benchmark individual systems, hospitals, LEMSAs and RTCCs to the group as a whole and to an outside standard including a comparative analysis of risk-adjusted outcomes.

12. Education and Training—HRSA Benchmark #105 (100 series: assessment), #205 (200 series: policy development) and #310 (300 series: assurance). *Education for trauma system participants is developed based on a review and evaluation of trauma data. In cooperation with the prehospital certification and licensure authority, set guidelines for prehospital personnel for initial and ongoing trauma training including trauma-specific courses and those courses that are readily available throughout the State. An assessment of the needs of the general public concerning trauma system information should be conducted.*

Barriers

Private and public surveys indicate that the general public regards all hospitals as Trauma Centers and few can indicate where their closest Trauma Center is located; furthermore, many citizens are not aware that the EMS system is the best avenue to receive trauma care.

Education and training of trauma care professionals is compartmentalized into prehospital, nursing, and physician education with limited trauma systems education.

Opportunities

State, regional and local education needs should be identified, and resources readily available to meet those needs. Guidance for education competencies should exist, and each region's individual educational offerings should address local needs.

Goal: Identify statewide educational needs through the PIPS Program in consultation with the community, EMS providers, hospitals, LEMSAs, and RTCCs.

Objectives:

1. Develop a plan for providing information to the public regarding the structure and function of the Trauma System.
2. Perform a needs assessment prior to developing new or additional trauma-related professional educational programs.

3. Encourage the use of the ACS Rural Trauma Team Development Course, video conferencing, online education, and telemedicine connections between non-trauma facilities and lower level Trauma Centers with higher level Trauma Centers.

13. Research—HRSA Benchmark #301 and #306 (300 series: assurance). *A process is in place to facilitate the access to data for evaluation and research. The trauma system has developed mechanisms to engage the general medical community and other system participants in their research findings and performance improvement efforts.*

Barriers

Most research projects are being conducted by single institutions or agencies and are not utilizing the opportunities of collaborative, multidisciplinary research.

Opportunities

Trauma system research involving both local and state agencies should be part of local/regional trauma system.

Goal: The CEMISIS, LEMSAs, and Trauma Centers should become the basis for collaborative systems research.

Objectives:

1. Develop a research agenda (possibly through a local research committee) and collaborate with established investigators to conduct research projects.
2. Periodically review trauma system data derived from CEMISIS, OSHPD, and other sources, and make a recommendation to various system stakeholders regarding potential areas of research.

14. Injury Prevention—HRSA Benchmark #203 (200 series: policy development). *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 objectives are incorporated into the injury plan.*

Barriers

Statewide injury control in California has been established primarily under the direction of the Department of Public Health; however EMSA recognizes the need to interface these efforts and with Trauma System objectives.

Opportunities

Recommend the application of the public health model in reducing trauma and subsequent injuries by applying basic public health principles and guidelines to identify risk factors and help develop and choose prevention strategies that are comprehensive. It is important to know which injury prevention strategies are proven effective, and those that are less effective, in order to have the greatest impact.

Goal: Improve coordination and utilization of public health and trauma systems injury prevention resources at the state, regional and local levels.

Objectives:

1. Develop a compendium of regional injury prevention programs.
2. Collaborate with the Department of Public Health to evaluate, implement, and determine the effectiveness of initiatives to reduce intentional and unintentional injuries.

15. Emergency/Disaster Preparedness—HRSA Benchmark #203 (200 series: policy development). *The trauma system plan has established clearly defined methods of integrating with emergency preparedness plans (all hazards).*

Barriers

Funding from HRSA and FEMA is limited to assist Trauma Centers in preparing for the next inevitable event when they are already under economic duress. There is inconsistent coordination of Trauma Centers with disaster response planning to fully utilize the specialty resources of the trauma system.

Opportunities

EMSA can advocate utilizing federal hospital preparedness funds, emphasizing the integration of the trauma system into the statement of work. Funds may be used to assess the trauma system's emergency preparedness including coordination with the public health agency, EMS system, and the emergency management agency. Funding through the Affordable Care Act for States, when appropriated, can serve to improve pre-hospital and trauma care at a regional level on a day-to-day basis and could have implications for surge management and regional disaster response.

Goal: Have the Statewide Trauma Planning Recommendations integrated with, and complementary to, the comprehensive mass casualty plan for natural and manmade incidents, including an all-hazards approach to planning and operations.

Objectives:

1. Incorporate the role of the trauma system in the California Department of Public Health and Medical Emergency Operations Manual.
2. Develop a recommended inventory for a trauma cache to be utilized at Trauma Centers in the event of a disaster.
3. Plan for trauma system surge capacity in collaboration with local Public Health and Emergency Health Management, depending on disaster risk assessment.

VIII. Priorities for Trauma System Objectives

The following priorities are based on these Statewide Trauma System Planning recommendations for strategies and policy direction:

1. Strengthen State Trauma Organizational Structure and Leadership

(Goal 1: State Leadership; Goal 2: System Development)

EMSA should explore mechanisms within state rules and existing funding sources to better leverage resources to support trauma care in California. EMSA's infrastructure should have appropriately trained personnel in Trauma System development to provide management and evaluation of the system in collaboration with the STAC, LEMSAs, and RTCCs.

The RTCCs are well-established through consensus practice and volunteer effort. They provide for regional needs assessments and set priorities based on the results that encourage optimal sharing of resources to improve access to quality trauma care throughout their regions. To move forward, the RTCCs, LEMSAs and EMSA should work towards standardization within the region as well as inter-regionally where appropriate.

2. Examine Trauma System Funding Options

(Goal 3: Trauma System Finance)

There are three areas where funding options should be further evaluated in order to improve the existing trauma care system in California:

A. To provide support for state, regional, and local administration of the trauma program

Neither EMSA nor LEMSAs currently receive state general funds to support administrative development and oversight of the Trauma System. EMSA funding is dependent in part on the Preventive Health and Health Services Block Grant. There are other time-limited grants to support data and performance improvement activities. Permanent funding sources may be necessary to maintain and advance the Trauma System.

Local systems receive only a small percentage of existing funds (Tobacco Tax, Maddy EMS Fund, Richie's Fund) to support administrative costs. The majority of these funds are applied to trauma care reimbursement. Many LEMSAs receive designation fees from the Trauma Centers which may be applied to trauma system costs. Two LEMSAs receive monies from property taxes to support the trauma system. Stable funding sources are desirable at the local level to maintain essential trauma systems.

B. To help increase system participation by community hospitals

An inclusive Trauma System requires the participation of all acute care facilities to increase trauma care capacity and to collect and analyze essential data. Some hospitals have limited resources to provide a level of trauma care needed for the critically injured who arrive at their facility. Financial support for these facilities would facilitate an

inclusive system and a regional approach to trauma care. Specifically it would provide a coordinated process to stabilize and transfer trauma patients to the level of care commensurate with their injuries. The exchange of data and participation in local and regional performance improvement by all facilities that receive trauma patients advances the system and provides the tools to improve care.

C. Support for Uncompensated Care

At this time, there are insufficient data to determine if additional funding for indigent patient care is needed and at what level to cover uncompensated trauma care. EMSA should work with researchers and hospitals to establish the basis for estimating the actual cost of trauma care in California. In addition, the effect of the Affordable Care Act and insurance coverage expansions (both public and private) on trauma care reimbursement should be studied to determine the future impact of uncompensated care with payment shifts driving new care models and changing payment mechanisms. Decreasing reimbursement may cause some Trauma Centers to downgrade or de-designate. Alternatively, the formation of Medicare Accountable Care Organizations may stimulate interest in Trauma Center designation to keep patients within the service network.

3. Establish a Statewide Performance Improvement and Patient Safety (PIPS) Program

(Goal 11: System Evaluation and Performance Improvement)

A PIPS Program is a structured effort to demonstrate a continuous process for improving care for injured patients. EMSA should provide the leadership necessary to coordinate the PIPS program supported by a reliable method of data collection that consistently obtains valid and objective information necessary to identify opportunities for improvement. The PIPS method involves guideline development, process assessment, process correction, and monitoring for improvement. The California PIPS program would be characterized by

- authority and accountability for the program;
- a well-defined organizational structure;
- appropriate, objectively defined standards to determine the quality of care; and
- explicit definitions of outcomes derived from relevant standards where available.

Patient safety is inseparable from the PIPS process and underscores an important program goal. The patient safety process will direct its efforts at the environment in which care is given, and the PIPS process will be directed at the care itself.

4. Design the State Trauma Registry to support the PIPS Program

(Goal 10: Information System)

Development of a statewide trauma data system is imperative to improving and continuously monitoring trauma systems. Data is necessary to assess performance, quality, utilization and prevention, benchmark against existing national standards, and inform future policy decisions and directions. The State Trauma Registry should be linked with the EMS Data System (prehospital care data) and hospital emergency medical record to create a robust program in

support of the EMS system core measures. In addition, the system should be expanded to include a minimal data set from non-trauma facilities.

The National Trauma Data Standard (NTDS) has served as a key mechanism to assess Trauma Centers. The State Trauma Registry should utilize NTDS as well as additional data elements which will serve to assess trauma system function in the state.

LIST OF APPENDICES

Appendix A: HRSA/EMS Authority Benchmark Status

Spreadsheet showing HRSA Benchmarks from the 2006 Model Trauma System Planning and Evaluation document and how California is currently meeting each benchmark

Appendix B: Statewide Trauma System Planning Components and Assessment

The functional components of the Statewide Trauma System Planning recommendations are divided into 15 components. Each component contains two parts: 1) Background and Current Status; a brief description of the existing component and 2) Planned Development; a listing of objectives outlining how the component is expected to develop over the next 3-5 years.

Appendix C: State Trauma Advisory Committee Membership

Listing of STAC membership with associated affiliation

Appendix D: Designated Trauma Centers

Listing of current designated Trauma Centers with Level of designation noted

Appendix E: Trauma System Research

A selection of trauma system articles reflecting national and California research on trauma system development

Appendix F: Scudder Oration

The Scudder Oration on Trauma was presented by Brent Eastman, MD, FACS at the American College of Surgeons 95th Annual Clinical Congress in Chicago, Illinois, October 2009. Much of the oration surrounds the development of trauma systems with specific reference to California

Appendix A

HRSA/EMS Authority Benchmark Status

APPENDIX A: HRSA/EMS Authority Benchmark Status

Each indicator from the 2006 HRSA *Model Trauma System Planning and Evaluation* document was evaluated and a 2013 status is provided. Prioritization is as follows: Short Term (within 1 year); Intermediate (within 3 years); and Long Term (3-5 years).

Priority	#	Benchmark	Solution	Status
Short Term	102	There is an established trauma management information system for ongoing injury surveillance and system performance assessment.	Trauma Registry	Met <input checked="" type="checkbox"/> Partially Met <input type="checkbox"/> Majority Met <input type="checkbox"/> Not Met <input type="checkbox"/> The California EMS Information System (CEMSIS) was created as a demonstration project funded by the Office of Traffic Safety. As of August 2014, 16 of the 26 LEMSAs with designated Trauma Centers were submitting data totaling 52 of the 76 designated Trauma Centers.
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	Met <input type="checkbox"/> Partially Met <input type="checkbox"/> Majority Met <input checked="" type="checkbox"/> Not Met <input type="checkbox"/> The EMS Authority has legislative authority to manage the State Trauma System. In 2008 a regional infrastructure composed of five (5) Regional Trauma Coordinating Committees was established building upon the local EMS agency structure. The development of standardized policies for regions is in process in varying degrees in the regions.

Priority	#	Benchmark	Solution	Status
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	Met <input type="checkbox"/> Partially Met <input type="checkbox"/> Majority Met <input checked="" type="checkbox"/> Not Met <input type="checkbox"/> The State Trauma Advisory Committee is advisory to the Director of the EMS Authority. Membership is multidisciplinary and provides overall guidance to trauma system planning. These Statewide Trauma System Planning recommendations provide a decision-making process for system issues with measurable goals and objectives.
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	Met <input type="checkbox"/> Partially Met <input type="checkbox"/> Majority Met <input checked="" type="checkbox"/> Not Met <input type="checkbox"/> These Statewide Trauma System Planning recommendations integrate EMS, public health, emergency preparedness and emergency management and were developed in collaboration with trauma system partners.

Priority	#	Benchmark	Solution	Status
Short Term	204	Sufficient resources exist, including those both financial and infrastructure related support, system planning, implementation, and maintenance.	Trauma System Funding	Met <input type="checkbox"/> Partially Met <input type="checkbox"/> Majority Met <input type="checkbox"/> Not Met <input checked="" type="checkbox"/> <p>Due to ongoing budget constraints, improving the financial support of the State Trauma System was not feasible. Federal Block Grant funding continues to support state trauma program staff. Benchmark will be moved to Long Term priority.</p>
Short Term/ Ongoing	103	A resource assessment for the trauma system has been completed and is regularly updated.	State Leadership & Coordination	Met <input type="checkbox"/> Partially Met <input checked="" type="checkbox"/> Majority Met <input type="checkbox"/> Not Met <input type="checkbox"/> <p>Many of the Regional Trauma Coordinating Committees have either completed or are working on a resource assessment for their region followed by a gap analysis. Reports on status are given routinely to the State Trauma Advisory Committee. As the CEMSIS program becomes more mature and complete, morbidity and mortality assessment will be done. Each Local EMS agency provides for outside consultation to assist with Trauma Center designation and re-designation.</p>

Priority	#	Benchmark	Solution	Status
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	Met <input type="checkbox"/> Partially Met <input type="checkbox"/> Majority Met <input checked="" type="checkbox"/> Not Met <input type="checkbox"/> The regionalization of the trauma system has provided 5 avenues for support of a State Trauma System. Most regions have worked toward triage standardization utilizing the national CDC standards. Each region encourages communication with the region's trauma partners. The state trauma registry, while still under development, provides data on the system which is shared with its regions and State Trauma Advisory Committee upon request.
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	Met <input type="checkbox"/> Partially Met <input checked="" type="checkbox"/> Majority Met <input type="checkbox"/> Not Met <input type="checkbox"/> While regions have improved communication with all acute care facilities in the region, standards do not exist specific to trauma. Re-triage standards are under development in some of the regions that improve the coordination of care when a patient requires urgent transport to a Trauma Center with the higher level of care needed. The state registry is under revision and will include specific data to describe the transfer.

Priority	#	Benchmark	Solution	Status
Short Term/ Ongoing	310	The lead trauma authority assures a competent workforce.	State Leadership & Coordination	Met <input type="checkbox"/> Partially Met <input checked="" type="checkbox"/> Majority Met <input type="checkbox"/> Not Met <input type="checkbox"/> Regulations only partially require a specific level of training for physicians and/or nurses. The Rural Trauma Team Development Course is being offered throughout the State sponsored by the Trauma Mangers Association, California. Other trauma-specific education is provided by the LEMSA as needed and may be part of the accreditation process for paramedics. Compliance assessment for Trauma Centers is the responsibility of the LEMSA.

Priority	#	Benchmark	Solution	Status
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	Met <input checked="" type="checkbox"/> Partially Met <input type="checkbox"/> Majority Met <input type="checkbox"/> Not Met <input type="checkbox"/> The Trauma Center (through Title 22) and the LEMSA (through statute and Title 22) are required to provide for performance improvement of the local system. Regions have included system case reviews as part of their mission. Local Trauma Plans are required to describe their PI program and how they ensure Title 22 compliance. The majority of LEMSAs require ACS verification and/or consultation for continued designation. The State has developed guidance documents to assist LEMSAs in the compliance reviews. The State is responsible for approving local Trauma Plans prior to system implementation to ensure statute and regulatory compliance. Annual reports are due from each LEMSA to ensure continued compliance.

Priority	#	Benchmark	Solution	Status
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	Met <input type="checkbox"/> Partially Met <input checked="" type="checkbox"/> Majority Met <input type="checkbox"/> Not Met <input type="checkbox"/> The EMS Authority coordinates its trauma system with the California Office of Emergency Services. An assessment needs to be completed.
Intermediate	105	The system assesses and monitors its value to its constituents in terms of cost/benefit analysis and societal investment.	Trauma Registry	Met <input type="checkbox"/> Partially Met <input type="checkbox"/> Majority Met <input type="checkbox"/> Not Met <input checked="" type="checkbox"/> The State Registry has been developed and in part collects information to assess the fiscal impact of the trauma system. As the registry becomes more complete, the state will publish trauma system information to educate the public and professional population on the trauma system. LEMSAs have a mechanism in place to partially support the system through designation fees. An organized approach to public information about the trauma system is limited to local/regional activities.

Priority	#	Benchmark	Solution	Status
Intermediate	205	Collected data are used to evaluate system performance and to develop public policy.	Trauma Registry	Met <input type="checkbox"/> Partially Met <input checked="" type="checkbox"/> Majority Met <input type="checkbox"/> Not Met <input type="checkbox"/> The State Trauma Registry has been developed based on national standards. 56/76 Trauma Centers participate with 100% participation anticipated by the end of the fiscal year. Linkage has yet to be done. A new system for EMS and trauma data is now in place which should improve the linkage capabilities.
Intermediate	206	Trauma system leadership, including its multi-performance reports, in disciplinary advisory committees, regularly reviews system.	Trauma Registry	Met <input type="checkbox"/> Partially Met <input checked="" type="checkbox"/> Majority Met <input type="checkbox"/> Not Met <input type="checkbox"/> While data exists for much of the system, performance reports have yet to be developed. A quality and consistency review of the data needs to be completed before the system can rely on the data reports to guide policy.

Priority	#	Benchmark	Solution	Status
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	Met <input type="checkbox"/> Partially Met <input checked="" type="checkbox"/> Majority Met <input type="checkbox"/> Not Met <input type="checkbox"/> The 5 regions are collaborative groups that foster system enhancement. Most projects are focused on post-injury system issues. Some of the regions are beginning to work on prevention activities such as pediatric and elderly falls. The Department of Public Health focuses on prevention. Injury prevention activities are shared through the Strategic Highway Safety Program.
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	Met <input type="checkbox"/> Partially Met <input checked="" type="checkbox"/> Majority Met <input type="checkbox"/> Not Met <input type="checkbox"/> Data from the state registry is provided to the regions upon request for the monitoring of trauma care in the region. Common mechanisms of injury are also identified which has resulted in prevention activities related to pediatric and elderly falls. The development of these Statewide Trauma System Planning recommendations is a significant step towards the development of a State Trauma System. Many of the Plan's objectives are already being addressed.

Priority	#	Benchmark	Solution	Status
Intermediate / Ongoing	208	The trauma, public health, and emergency preparedness systems are closely linked.	State Leadership & Coordination	Met <input type="checkbox"/> Partially Met <input checked="" type="checkbox"/> Majority Met <input type="checkbox"/> Not Met <input type="checkbox"/> The State Trauma System and the Disaster Preparedness Operations are loosely linked with need for more formal integration.
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	Met <input type="checkbox"/> Partially Met <input type="checkbox"/> Majority Met <input type="checkbox"/> Not Met <input checked="" type="checkbox"/> Integration of the State Trauma System with all disaster preparedness activities is state as a goal in these Statewide Trauma Planning System recommendations.
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	Met <input type="checkbox"/> Partially Met <input checked="" type="checkbox"/> Majority Met <input type="checkbox"/> Not Met <input type="checkbox"/> Regional activities may incorporate prevention and medical outreach. Pediatric and elderly falls have become a focus throughout the state. The Strategic Highway Safety Plan links Department of Public Health with EMS.

Priority	#	Benchmark	Solution	Status
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	Met <input type="checkbox"/> Partially Met <input checked="" type="checkbox"/> Majority Met <input type="checkbox"/> Not Met <input type="checkbox"/> Each Trauma Center and its LEMSA are responsible for measuring patient outcomes. The State will be formalizing its Performance Improvement Program once the State Trauma Registry is complete with quality and consistent data. Outcomes for trauma patients seen at non-Trauma Centers needs to be addressed with utilization of OSHPD data.
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	Met <input type="checkbox"/> Partially Met <input type="checkbox"/> Majority Met <input type="checkbox"/> Not Met <input checked="" type="checkbox"/> There are no standards to integrate rehabilitation services into the trauma system except for minor requirements for acute rehabilitation services in Title 22. The State Trauma Registry has minimal information regarding functional outcome and rehabilitation costs.

Priority	#	Benchmark	Solution	Status
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.	Met <input type="checkbox"/> Partially Met <input checked="" type="checkbox"/> Majority Met <input type="checkbox"/> Not Met <input type="checkbox"/> While the State Trauma Registry contains detailed information on the epidemiology of injury, there has been no true analysis. However, coroner and non-trauma facility data is limited and not linked to the trauma registry. Regional reports are provided upon request describing the injury patterns of the region.
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	Met <input type="checkbox"/> Partially Met <input type="checkbox"/> Majority Met <input checked="" type="checkbox"/> Not Met <input type="checkbox"/> 52/76 Trauma Centers provide data to the State Trauma Registry. Regional reports are provided upon request to assist in regional performance improvement. LEMSAs are responsible for local system performance review including costs (many require Trauma Centers to pay annual fee). Limited state reports are generated due to incomplete participation.

Priority	#	Benchmark	Solution	Status
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	Met <input type="checkbox"/> Partially Met <input type="checkbox"/> Majority Met <input type="checkbox"/> Not Met <input checked="" type="checkbox"/> No cost data is available in the State Trauma Registry. Payer mix and charges can be analyzed. While specific financial data is not available, length of stay, ICU length of stay etc. can be evaluated based on cost estimates.

Appendix B

Statewide Trauma System Planning Components and Assessment

Appendix B: Statewide Trauma System Planning Components and Assessment

Organized approaches within single trauma care facilities to treat victims of severe injury have repeatedly demonstrated improved patient outcomes, an observation that has led to the development of the Trauma Center designation process. But individual facilities are insufficient, since patient distribution and health system capabilities are not optimized or consistent. Since high level Trauma Centers are not available in all areas of the state, regional coordination is required to provide care across all geographic areas so all patients get the level of care they need in a timely manner.

Regionalized trauma systems should have a process for triaging patients, which would provide that a patient gets to the level of trauma care that matches his/her injury severity and results in improved outcomes. Moreover, using a rigorous disease management approach to injury across the entire spectrum, from prevention to rehabilitation, has shown improved outcomes.²¹

A broad approach to policy development through laws and regulations should include building a system infrastructure that can provide system oversight and future development, routine monitoring of system performance, updating laws, regulation, policies and procedures, and the establishment of standard operating methods across all phases of intervention.²²

These Statewide Trauma System Planning recommendations depend on the exercise of regulatory authority by the local EMS agencies (LEMSAs), and are not designed to interfere with or compromise this authority. The recommendations also rely on the activities of the Regional Trauma Coordinating Committees (RTCCs) and the State Trauma Advisory Committee (STAC) to provide expertise, support, and technical assistance to both the LEMSAs and the State EMS Authority (EMSA) in matters pertaining to state and regional trauma care and trauma system development.

As described by the American College of Surgeons' (ACS) *Regional Trauma Systems: Optimal Elements, Integration, and Assessment* the functional components of a State Trauma System are divided into 15 parts:

1. Trauma System Leadership
2. System Development Operations
3. Trauma System Finance
4. EMS System: Prehospital Care
5. EMS System: Ambulance and Non-Transporting Medical Units
6. EMS System: Communications
7. Definitive Care: Acute Care Facilities
8. Definitive Care: Inter-Facility Transfer and Re-Triage

²¹ *Resources for Optimal Care of the Injured Patient 2014*, Committee on Trauma American College of Surgeons

²² *Regional Trauma Systems: Optimal Elements, Integration, and Assessment*, American College of Surgeons Committee on Trauma, 2007

9. Definitive Care: Rehabilitation
10. Information Systems
11. System Evaluation and Performance Improvement
12. Education and Training
13. Trauma System Research
14. Injury Prevention
15. Emergency/Disaster Preparedness

Each component contains two parts: 1) Background and Current Status with a brief description of the existing component; and 2) Planned Development with a list of objectives with assigned responsibility outlining how the component is expected to develop over the next 3-5 years.

The recommendations provided by ACS as part of the Consultative State Trauma System Review for California in March 2016 are consistent with these Statewide Trauma System Planning recommendations. The ACS recommendations are incorporated and indicated either by footnotes or *italicized* (if verbatim) throughout this appendix. Objectives in **bold** are considered priority by ACS.

It is understood that many objectives require resources that may not be available. These objectives have been designated as long-term goals with suggested prioritization and should be met through collaborative efforts between EMSA, LEMSAs, the STAC, the RTCCs, Trauma Centers, and other interested groups and organizations. Through voluntary collaboration and coordination, improvements in patient care quality can be achieved.

Component 1—Trauma System Leadership

Trauma System Partners

State EMS Authority

EMSA was established in 1980 through the Emergency Medical Services System and Prehospital Emergency Care Personnel Act (SB 125). EMSA is one of 13 departments within the State of California Health & Human Services Agency and has statutory responsibility (Health and Safety Code §1797.103) for:

- Manpower and training
- Communications
- Transportation
- Assessment of hospitals and critical care centers
- System organization and management
- Data collection and evaluation
- Public information and education
- Disaster response

EMSA's role specific to trauma programs

- 1798.161 Required to Establish Regulations
- 1797.199 Trauma Care Fund Distribution
- 1798.166 Approval of local Trauma Plans in Accordance with Regulations

Local EMS Agencies

There are currently 33 LEMSAs within the State of California; 26 are single-county and seven have a multi-county jurisdiction. The LEMSA has statutory responsibility to plan, implement, and evaluate an emergency medical services system in accordance (in part) with the following sections within the California Health and Safety Code:

- 1797.204 Plan, implement, and evaluate EMS system
- 1797.206/1797.218 Implementation and Approval of ALS & LALS Systems
- 1797.208 Compliance of EMT Training Programs
- 1797.214 Additional Training Requirements
- 1797.220 Local Medical Control Policies & Procedures
- 1797.252 EMS System Coordination
- 1798.100 Designation of Base Hospitals
- 1798.163 Trauma Care System Policies & Procedures
- 1797.151 Coordination of Disaster Preparedness

The LEMSA is charged with implementing statutes (1798.162, 1798.163), regulations and local policy for trauma services in their area of jurisdiction including designation of Trauma Centers. Using State trauma guidelines, LEMSAs design trauma systems that meet minimum State standards and regulations, which provide a level of consistency between counties. The LEMSA ensures the system components operate in an effective and compliant manner throughout the continuum of care.

State Trauma Advisory Committee

The STAC's 18 member committee is comprised of physicians, nurses, administrators and other EMS providers and personnel for the purpose of advising the EMSA Director on matters pertaining to the planning, development, and implementation of the State Trauma System.

Regional Trauma Coordinating Committees

As the result of recommendations made by the STAC and the 2006 *California Statewide Trauma Planning, Assessment and Future Direction* document, five (5) trauma regions were defined by EMSA; corresponding RTCCs were created in 2008. These committees are composed of trauma system providers, LEMSAs staff, and trauma system stakeholders from within each region for the purpose of promoting regional cooperation, enhancing and developing best practices, assisting in the interpretation of regional data, and working collaboratively with the State and LEMSAs in support of a state trauma system.

Trauma Centers

Trauma Centers are a key element in a trauma system and the focal point for trauma care. Lead Trauma Centers (Level I and II) contribute administrative and medical leadership and academic expertise to the system. These lead Trauma Centers, in collaboration with the LEMSAs, engage all other Trauma Centers (Level III and IV) and other non-trauma acute care facilities in the performance improvement process. Many Trauma Centers participate in state and regional trauma system planning and development.

Planned Development

LEMSA and EMSA leadership remain critical to the overall success of the Trauma System. The creation and development of RTCCs represent a principal change in the inclusion of expertise and participants of the trauma system, including the composition of the STAC, which now includes regional representatives from each RTCC.

State EMS Authority

As part of the responsibility to coordinate the planning, development and implementation of the State Trauma System, EMSA, with recommendations from the STAC, should work to provide coordination, guidance, and assistance to the LEMSAs and RTCCs with the goal of enhancing the consistency of trauma-related standards and guidelines throughout the state and improving the overall quality of trauma care.

The EMS Authority's objectives should include:

1. ***Establish basic quality and activity reporting standards and report templates for the LEMSAs that are individualized based upon size, activity, available resources, and degree of system development.***
2. Use system reports to educate the public regarding trauma system accomplishments and post on the EMSA's website.
3. Develop policy to facilitate communication among the LEMSAs, RTCCs, and STAC for purposes of system development.
4. Facilitate the utilization of CEMSIS data by LEMSAs and RTCCs.

5. Coordinate the development and activities of ad hoc working groups for system development projects such as data utilization, performance improvement, and regional transfer network.
6. Develop a compendium of trauma-related policies, procedures, and clinical guidelines that may be shared throughout the state.
7. Receive information and advice from the STAC pertaining to the further development, monitoring, and operation of the Trauma System.
8. Convene a statewide forum to brief stakeholders and receive feedback on system-wide developments and review the overall operation and performance of the Trauma System.

State Trauma Advisory Committee

Membership on the State Trauma Advisory Committee (STAC) is determined by the EMSA Director and includes broad representation from trauma system stakeholders, including representatives from each of the RTCCs.

The STAC Chair should be a nationally recognized trauma surgeon with experience and demonstrated expertise in Trauma Center evaluation and trauma system planning. The Vice-Chair of the STAC should ideally be a LEMSA medical director or LEMSA administrator.

The STAC advises EMSA in matters pertaining to the development, monitoring, and operation of the State Trauma System to include the following:

1. *Expand representation on the State Trauma Advisory Committee (STAC) to include Level III and Level IV Trauma Centers, non-designated acute care facilities and public member(s).*
2. *Develop subcommittees to the STAC around targeted issues to increase the number of engaged trauma stakeholders.*
3. Assist EMSA in facilitating the activities of the RTCCs.
4. Set priorities for specific guideline, protocol, and policy development/review for the state-wide work groups.
5. Receive periodic reports on LEMSA trauma plans and make related recommendations to the EMSA Director.
6. *Make recommendations to the EMSA Director in regards to modification to existing regulations pertaining to trauma systems and consistent with these Statewide Trauma Planning recommendations.*
7. Respond to requests from EMSA Director to assess trauma-related policies, procedures, regulations, or guidelines proposed by other groups or committees.
8. Receive and analyze reports from the RTCCs, making specific recommendations to the EMSA Director as needed.
9. Work with EMSA in conducting periodic (every 3-5 years) assessment and modifications to these California Statewide Trauma System Planning recommendations.

Local EMS Agencies

The authority and responsibility of the LEMSAs in implementing and monitoring local/regional trauma systems remain unchanged. The specific responsibilities of each LEMSA, with respect to the future direction of the State Trauma System, should include the following:

1. Participate in the RTCC with LEMSA Medical Director, Administrator, or Trauma System Coordinator.
2. Utilize the expertise, resources, and technical assistance of the RTCCs to assist with regional trauma care issues. This may include:
 - 2.1. Encourage all hospital to participate in improving regional trauma care.
 - 2.2. Identify and promote clinical guideline development.
 - 2.3. Implement a system-based Performance Improvement and Patient Safety (PIPS) program.
 - 2.4. Review and modify trauma-related policies within the region.
 - 2.5. Review local trauma plans in the context of regional trauma care, with input from Trauma Centers.
3. Implement data collection by non-trauma receiving facilities.
4. Share pre-hospital and trauma registry data via submission to CEMESIS.
5. Assess Trauma Center compliance with CCR, Title 22, Division 9, Chapter 7 regulations.

Regional Trauma Coordinating Committees

RTCCs are a key component of the California State Trauma System and were created for the purpose of utilizing a broad range of expertise within the five regions to enhance collaboration, share and support best practices, provide requested technical assistance to the LEMSAs and to EMSA regarding the ongoing development and operation of a system of trauma care for the State of California. The RTCCs function as a conduit between the regions and the EMSA/STAC to aid in the overall Trauma System development and standardization. Regional roles include the establishment of regular communication and collaboration within and between regions. Examples of regional activities include regular meetings, sharing best practices, exploring common issues and themes and working toward resolutions to minimize variations in practice within the region and ultimately the state. State level activity includes representation on the STAC, (acting as a subcommittee for the STAC) reporting regional activities and issues, sharing regional work products, relaying STAC information and decisions back to the region. The RTCCs:

1. *Cultivate relationships with public health, injury prevention, rehabilitation, emergency management organizations, EMS providers, transport agencies, public safety, and academic institutions to support the trauma system coalition.*
 - 1.1. *Identify an individual in California with past leadership success to guide the RTCC.*
2. *Devise mechanisms to disseminate best practices in integrated trauma care, mental health services, social services, child protective services, public safety, and law enforcement to all regional trauma stakeholders.*
3. *Formalize the structure and charge of the RTCCs and continue to develop their function, especially in domains of clinical practice guidelines and quality assurance programs.*
 - 3.1. *Seek resources to provide administrative and liaison support to the RTCCs.*

Trauma Center

Each designated Trauma Center should have its own trauma program leadership to:

1. Participate on their respective LEMSA and RTCC committees, including Performance Improvement

2. Provide expertise to the LEMSA in the development and ongoing updates of the local Trauma Plan
3. Minimum compliance with CEMISIS data standards and inclusion criteria

Component 2–System Development Operations

Background and Current Status

California is unique from the other States insofar as its systems of trauma care are administered at the local EMS level. Currently, 33 LEMSAs administrate trauma care in California's 58 counties. Of these LEMSAs jurisdictions, 27 have at least one designated Trauma Center and six (6) do not. There is no statutory or regulatory requirement for a regional or county trauma system; the statute is permissive, making all local systems optional. However, all LEMSAs have developed a trauma system and have an approved trauma system plan.

LEMSAs plan, implement and manage local trauma systems based upon state regulations. Local Trauma Plans are submitted to the EMSA for review and approval. The plans outline local trauma systems but do not necessarily address inter-county needs. The LEMSAs are responsible for designating Trauma Centers within their jurisdictions that meet state trauma regulation requirements as stipulated in CCR, Title 22, Division 9, Chapter 7.

Since trauma system development is optional and locally based, there are a wide range of trauma system models in California. The variance runs from LEMSAs with well- established trauma systems, with designated Trauma Centers at various levels, to LEMSAs that have limited implementation of the plan or no designated Trauma Centers.

Planned Development

The vision for California is to develop an inclusive state trauma system that assures timely access to an appropriate level of care for all individuals following major injury.

The system should focus on prevention, quality care improvements and rehabilitation and be informed by a robust system for data collection and analysis.

State EMS Authority

EMSA, advised by its State Trauma Advisory Committee, in order to strengthen state trauma resources, should:

1. Utilize available resources for trauma system functions to fulfill EMSA's statutory function.²³
2. *Develop a staff succession plan to ensure trauma system stability in the event of future personnel changes.*
3. Provide medical advice for trauma system activities by a clinically active trauma surgeon experienced in trauma systems to act as the Chair of the STAC.
4. *Ensure adequate personnel for data management, data analysis, and reporting for the statewide EMS and trauma information systems.*
5. Facilitate participation in and utilization of the state trauma registry.

²³ Consistent with ACS recommendation

6. Collaborate with the California Department of Public Health in an analysis of injury throughout the State of California utilizing existing databases (EPICenter, Statewide Integrated Traffic Records System (SWITRS), California EMS Information System (CEMSIS) and Office of Statewide Health Planning and Development (OSHPD).
7. *Identify and collaborate with other state agencies and external resources to enhance trauma system development.*
8. Work with the LEMSAs to conduct an analysis of trauma resources throughout the state including access-to-care at:
 - 8.1. Non-trauma facilities with emergency departments
 - 8.2. Trauma Centers and their specific (sub-specialty) capabilities, e.g. Neurosurgical Interventional Radiology, re-implantation, etc.)
 - 8.3. Rehabilitation facilities and their specific capabilities (e.g. neurological-cognitive rehabilitation).
9. Facilitate communication and information transfer among the RTCCs, LEMSAs, and EMSA through:
 - 9.1. Existing website resources
 - 9.2. Phone conferencing
 - 9.3. Video-conferencing.
10. *Provide liaison support to the RTCCs as resources allow.*
11. Work through the STAC to provide guidance and coordination for specific RTCC activities and projects with statewide implications.
12. Support statewide working groups for high priority projects that might include:
 - 12.1. Performance Improvement & Patient Safety programs
 - 12.2. System-wide trauma data procurement and analysis
 - 12.3. Regional Network for re-triage and interfacility transfers.

State Trauma Advisory Committee

The STAC to provide expertise, advice and guidance to the State EMS Authority, LEMSAs and RTCCs should:

1. Prioritize the needs of the state system, identifying related issues or problems, and assist the EMS Authority in coordinating efforts to address these specific issues and problems.
2. Review and make recommendations to the EMSA Director for revisions to these Statewide Trauma Planning recommendations.
3. Review reports from the RTCCs and make recommendations for statewide policy.
4. Advise the Authority on applications for trauma-related prehospital clinical studies.
5. Develop guidance for consistent and periodic assessment of Title 22 compliance for designated Trauma Centers throughout the state.
6. Make recommendations regarding revisions to Title 22 regulations:
 - 6.1. *Establish in regulation scalable minimum operational standards based on the size and resource capabilities of the urban, suburban, and rural LEMSAs.***
7. Make recommendations, as requested by a LEMSA, regarding the number, level, location, and capacity of Trauma Centers in regions throughout the state.
8. Prioritize the development of statewide protocols and guidelines that may be adapted to local needs by LEMSAs throughout the state.

9. Develop processes and mechanisms for providing optimal access and care to special populations specifically including pediatric populations.
10. Develop guidance for transfer, re-triage and interfacility transfer of trauma patients regionally.
11. Identify high priority areas for system-wide research projects.

Local EMS Agency

The LEMSAs will maintain the authority and responsibilities as outlined in statute and regulations. In addition, LEMSA activities should include:

1. Conduct a review of local trauma plan in the context of these Statewide Trauma Planning recommendations and the structures and processes it outlines
2. Utilize the expertise of the RTCC to provide technical assistance for the review of local trauma plans as needed

Regional Trauma Coordinating Committees

The RTCCs, by providing a broad range of expertise and experience, are instrumental in assisting the LEMSAs and EMS Authority in ongoing system development and assisting with the implementation of these Statewide Trauma System Planning recommendations. The role of the RTCCs should include the following:

1. Assist with a gap analysis of regional resources including acute care facilities, rehabilitation facilities, prevention programs, prehospital components, etc.
2. Assist the LEMSA with Trauma Plans upon request as it relates to regional trauma care.
3. Participate in the development and implementation of a regional process for ongoing Performance Improvement (as outlined in the “Evaluation” section) that includes data and case-based analyses.
4. Assist in the development of regional standards for performance improvement.
5. Work collaboratively with the LEMSA to perform regional analyses of trauma-related data.
6. Make recommendations to the STAC regarding revisions to state-wide policies and regulations.
7. With guidance from the LEMSA, contribute to the development of state and regional protocols and guidelines.
8. Assist in the development of regional trauma-related educational programs or offerings.
9. Evaluate or collaborate with regional partners on trauma-related research projects.
10. Provide technical assistance to the LEMSAs as needed for:
 - 10.1. Assessment and modification of existing trauma-related policies/guidelines/protocols, and the development of new trauma-related policies/guidelines/protocols as they relate to regional trauma care
 - 10.2. Identification of system performance improvement issues and solutions as they relate to regional trauma care
 - 10.3. Identification of regional resource issues and solutions
 - 10.4. Assist with the creation of Trauma Center survey teams to work with the LEMSA upon request
 - 10.5. Respond to ad hoc requests from LEMSAs for other types of technical assistance.
11. Submit or present reports to STAC that include:
 - 11.1. Assessment of RTCC meetings and attendance

- 11.2. Regional trauma system development and configuration
- 11.3. Regional Performance Improvement activity.

Component 3—Trauma System Finance

Background and Current Status

Funding for Trauma Systems are typically considered in two general categories: reimbursement for direct patient care, and administrative support for system oversight. Most of the efforts in improving trauma funding have focused on the direct reimbursement for uncompensated and undercompensated patient care. Fewer financial resources have been available to support development, oversight, and quality of the Trauma System (including governance, planning, a statewide trauma registry, and performance improvement efforts).

Funding of Trauma Care

An ongoing and stable source of funding is important to the success of trauma care systems.

Financial support for trauma care has been available through Senate Bill (SB) 12/612 that created the Maddy EMS Fund in 1987, Proposition 99 (California Tobacco Tax and Health Protection Act of 1988) revenue in 1990, and Assembly Bill (AB) 430 in 2001 which established a Trauma Care Fund for the State. The Maddy EMS Fund continues to be funded through penalty assessments on various traffic violations. The Trauma Care Fund was funded for 3 years until 2005. Funding specific for state coordination of the Trauma System is not available through these funds, but is available in a limited manner under the Federal Preventive Health and Health Services Block Grant.

Maddy EMS Fund

Optionally, many counties (86%) utilize the Maddy EMS Fund to reimburse physicians for uncompensated emergency services, hospitals that provide disproportionate trauma and emergency medical care services, including trauma services for adults and children, and for discretionary EMS purposes. In 2007, SB 1773 amended the statute to allow counties to increase the amount of the penalty from \$2 per \$10 to \$4 per \$10 penalty. Information from 2015 indicates that 53% of the counties have established this fund. A subsection of SB 1773, known as Richie's Fund, sets 15 percent of the funds collected in the supplemental penalty assessment to be utilized for all Pediatric Trauma Centers throughout the county. It further defines the expenditure of money with the intent for augmenting pediatric trauma care. Approximately \$80 million annually is available for local distribution from the Maddy EMS Fund.

Tobacco Tax (Proposition 99)

Revenues from tobacco taxes (Enabled by AB75, Chapter 1331, Statutes of 1989) were earmarked, in part, for programs to provide health care services for hospitals and physicians for indigent patients. The money from the Tobacco Tax is deposited by using the following formula: 20 percent is deposited in the Health Education Account (HEA); 35 percent in the Hospital Services Account; 10 percent in the Physician Services Account; 5 percent in the Research Account; 5 percent in the Public Resources Account; and 25 percent in the Unallocated Account (Revenue and Taxation Code 30124). Although Proposition 99 dollars have dwindled because of a decrease in the number of smokers, there is approximately \$85 million annually available for hospital services and \$24 million available for physician services.

Trauma Care Fund

The Trauma Care Fund was established to provide designated Trauma Centers funding for trauma care to uninsured patients. The funds were passed through the LEMSAs for distribution through a competitive grant-based system. The Trauma Care Fund allocated \$55 million for three years including \$2.5 million provided to LEMSAs for the planning and implementation of new local trauma systems. Trauma Care funds have not been allocated since FY 2005-06.

Local Funding

Two counties, Los Angeles and Alameda, have developed local funding for trauma care through earmarked assessments on property value. Another source for funding local trauma systems is paid by the Trauma Centers to the designating agency for costs associated with audits and in some cases, review by the American College of Surgeons. The fees are also used for data collection and system management.

Planned Development

The Patient Protection and Affordable Care Act (ACA) includes funding language for regional trauma systems. While not appropriated since its inception, there is a need to align the elements of the California's Trauma System with any anticipated trauma system funding requirements in the future.

Establishing health insurance programs for all citizens is expected to have a positive effect on Trauma Center financing. It is unclear how healthcare reform policies will affect the payment for trauma care, specifically the relationship between the percentages covered by the private and public payers.

State EMS Authority/State Trauma Advisory Committee

1. Explore the feasibility of a Trauma System Plan that could:
 - 1.1. Research existing funding statutes, regulations, and processes and identify the system's current financial status including distribution of any trauma system funds and sustainability.²⁴
 - 1.2. Perform a needs assessment to include the identification of specific aspects of the system that need funding, i.e. trauma care, infrastructure, data systems, performance improvement programs, rehabilitation, etc.
 - 1.3. *Identify funding options for the implementation of the Trauma Plan, trauma system planning, oversight, and evaluation at the state level.***
2. *Collaborate with the California Hospital Association to identify a strategy and potential funding mechanisms for technical assistance and outreach to non-designated acute care facilities in rural communities to assist them to become a trauma-participating hospital.*
3. Establish relationships with University Business, Financial, and Public Policy schools to collaborate on projects using open data and information to:

²⁴ 2016 ACS Recommendation from State Trauma System Consultation report

- 3.1. Identify critical Trauma System components (including local and State data systems, local EMS agency system oversight, and RTCC activities) and the cost to develop and maintain.
- 3.2. Research appropriate funding opportunities for identified critical trauma system components.
- 3.3. *Seek other sources of funding to support development of trauma care capabilities in rural California acute care facilities, such as the Rural Flex grant program.*
- 3.4. Work with researchers and hospitals to establish a basis for estimating the actual cost for trauma care in California.
- 3.5. ***Produce a report of the costs, the benefit of the trauma system and trauma care, and the importance of maintaining Trauma Center readiness to treat persons with severe injuries.***
- 3.6. ***Use information within the Cost and Benefit Trauma Report to inform the public about the importance of the trauma system and the challenges in sustaining the existing Trauma Center resources.***
4. Collaborate with the local EMS agencies and California Hospital Association to determine the cost-benefit of a Trauma System to advocate for trauma system enhancements.

Regional Trauma Coordinating Committee

- 1 Identify opportunities for funding to support regional coordination activities.
- 2 Make recommendations to the STAC and the EMSA Director regarding potential sources of revenue for consideration in supporting trauma system coordination and infrastructure at both the state and local levels.

Component 4—EMS System: Prehospital Care

Background and Current Status

In California, the EMSA has overall statutory authority for the development of prehospital care program regulations. The LEMSAs have local responsibility and oversight of these programs at county and regional government levels. The medical direction and management of EMS is under the control of the Medical Director of the LEMSA. This medical control is in accordance with standards established by EMSA. The LEMSA is responsible for trauma system management including the development of local EMS trauma triage criteria, destination policy, and accreditation of local paramedics and EMTs to include knowledge of the local trauma system.

Trauma education for prehospital providers is incorporated into prehospital training programs as a standard part of the U.S. Department of Transportation, National Highway Transportation Safety Administration National Educational Standards for EMT, Advanced EMT, and Paramedic. Multidisciplinary continuing education programs for trauma are available to prehospital personnel through local Trauma Centers, LEMSAs, and continuing education providers. At present, there is no specific trauma continuing education hours considered to be a minimum for prehospital personnel.

Triage, Destination Policies for Trauma

Trauma triage and destination policies often reflect the availability of trauma services within a specific community. The Centers for Disease Control Guidelines for Field Triage of Injured Patients (2011) have been adopted by many of the LEMSAs both locally and regionally through RTCC collaboration. While there is still needed local variation due to geography and resource availability, these guidelines have become accepted as the minimum trauma triage standards for all of California.

Medical Direction

The LEMSA, using state minimum standards, establishes policies and procedures including dispatch, patient destination, patient care guidelines, and quality improvement requirements. For trauma systems, medical direction is commonly accomplished by two complementary methods:

- Trauma system policies and procedures in written form and accepted as valid by and for the trauma community to which they apply,
- Policies such as equipment required for field stabilization of trauma victims.

Planned Development

While the prehospital component of the Trauma System is well defined and has been functioning as a key partner, there are opportunities for improvement as the system matures.

State EMS Authority

1. Support the current national standards for prehospital Trauma Triage Guidelines as the minimum statewide standard.

2. Through its State Trauma Advisory Committee, develop benchmarks for the state and regional over- and under-triage rates, analyze data, and develop process improvement strategies to address gaps.²⁵
 - 2.1. Work with OSHPD in obtaining specified data from non-trauma facilities on trauma patients transported to the facility and not transferred.
3. *Obtain CDPH and LEMSA epidemiological support to use administrative data (hospital discharge dataset) to obtain death rates and the frequency of emergency department treatment and hospital admission for any patients with trauma diagnoses in non-designated facilities.*

Local EMS Agency

As part of the local Trauma Plan, LEMSAs should:

1. Establish a Trauma System Manager/Coordinator position with appropriate qualifications.
2. Have prehospital care reports part of the electronic health record for all trauma victims.
3. Develop policy to ensure prehospital resources are available for transfer and re-triage including roles and responsibilities of prehospital personnel.
4. Adopt the current Guidelines for Field Triage of Injured Patients for prehospital trauma triage as guidelines tailored to local needs and resources, incorporating the needs of pediatric and geriatric populations.

Regional Trauma Coordinating Committee (upon request by the LEMSA)

1. Assist LEMSAs in developing California -specific continuing education programs for the training of first responders, EMTs, paramedics and Mobile Intensive Care Nurses (MICN) in the region.
2. Assist LEMSAs in developing pediatric and geriatric-specific field trauma triage criteria for regional standardization.
3. Assist LEMSAs in analyzing regional over and under triage.

²⁵ 2016 ACS Recommendation from State Trauma System Consultation report

Component 5—Ambulance and Non-Transporting Medical Units

Background and Current status

Non-transporting prehospital medical units are configured in various ways throughout California. In urban regions, it's common for non-transporting units to be fire apparatus staffed by either EMT or paramedic level personnel. Rural areas (including state and federal parks, forests, and beaches) may have staff cars or rescue units in various configurations and capabilities staffed with trained first responders, EMTs, or in some cases paramedics. Organized search and rescue teams also fit the category of non-transporting EMS units.

Transport units, ground and air, are regulated and meet policies of the jurisdictional LEMSA and applicable state and federal laws and regulations. EMS transport agencies are operated by public and private agencies. The EMS Authority enforces EMS Aircraft regulations (CCR, Title 22, Chapter 8) to ensure medical quality, and publishes statewide Prehospital EMS Aircraft Guidelines (EMSA #144).

Minimum ground ambulance equipment standards are established by the California Highway Patrol for basic life support supplies and equipment. Equipment standards to support the scope of practice are established by the LEMSA and vary between non-transporting and transporting units. Recommendations for national standards for equipment inventories for EMS resources have been developed by Commission on Accreditation of Ambulance Services, Commission on Accreditation of Medical Transport Services and California EMS for Children Program.

Planned Development

California has a complex EMS transport system utilized to expeditiously transport the critically injured patient to the most appropriate facility. As the system expands to provide universal access to trauma care, transport decisions become more multifaceted, coordinating both ground and air resources in a safe manner.

EMS Authority/State Trauma Advisory Committee

1. Recommend triage guidance for EMS Dispatch Agencies receiving automated vehicular telemetry data and Advanced Automatic Collision Notification (AACN).
2. Develop minimum prehospital equipment inventory guidelines for non-transport/transport EMS units specific to trauma needs.
3. Develop guidance for EMS Provider Agencies in providing for or allowing scene photography to aid in the assessment of the mechanism of injury and its effect on injury.

Regional Trauma Coordinating Committee

1. Assist, upon request by the LEMSA, in the development of inter-regional agreements for management and transport of mass casualty victims.
2. Assist the LEMSA, upon request, in the development of re-triage guidelines and transfer processes including necessary prehospital resources for the rapid transport of patients from non-trauma facilities to Trauma Centers that cross LEMSA jurisdictional lines within the region.
3. Recommend air transport utilization guidelines applicable to regional trauma care issues.

Component 6–Communications Systems

Background and Current status

The nation’s 911 system has been an unqualified success for more than 40 years. Computer aided E911 access system is standard in California. Unfortunately, the 911 system has been challenged by changing technology such as expanding cell phone and voice-over- internet protocol (VOIP) usage. Cellular telephone and VOIP communication systems do not easily fit current computer aided 911 dispatch systems that allow for immediate identification of the precise location of a caller.

The current state and local 911 alert system is poised to advance with communication technology and to integrate cell phones or Internet-based communication methods as part of Next Generation 911 (NG9-1-1); however, this will be done incrementally with an estimated date of completion of 2020. The lack of precise locations and transfer of callers sometimes results in a delayed response of first responders to the scene of a trauma event.

In large urban California systems, it is common for Emergency Medical Dispatch programs (EMD) to be employed. Pre-arrival instructions and protocols are often used. While some non-urban systems utilize EMD, many small dispatch centers and rural regions are without priority dispatch or protocols.

A standard public safety radio frequency has been identified for use in California for communication between all air and ground units.

Some LEMSAs maintain computer logging systems that provide diversion data to hospitals in the region. Some LEMSAs have developed on-line computer communication systems for inter-hospital communication.

Planned Development

Standardized communications should be coordinated between all EMS systems on a given incident, utilizing current technology, to notify the trauma care team of essential information on the injured patient and provide appropriate destination decisions are made.

State EMS Authority/State Trauma Advisory Committee

- 1 Explore, in coordination with CalOES, an integrated prehospital-base hospital-receiving hospital communication system to aid in mass casualty and disaster events, such as FirstNet.
- 2 Promote statewide usage of common communication frequencies between ground and air transport units (700mHz Broadband Public Safety).

Local EMS Agency

- 1 Continue to advance efforts to develop priority medical dispatch for trauma and investigate process changes that improve dispatch effectiveness while improving outcomes.
- 2 Participate in statewide gap analysis to determine ambulance to ambulance communication capability and formats with identification of shortfalls.

Regional Trauma Coordinating Committee

Study the statewide and regional hospital alert systems currently in place to identify hospital capability, capacity, and specialty care availability (e.g. burns, pediatrics, etc.) and assist the LEMSA, upon request, in a gap analysis.

Component 7–Definitive Care Facilities: Acute Care Facilities

Background and Current Status

The mainstay of a trauma system is its network of specially designated acute care hospitals that have the resources and personnel capable of providing timely care to victims of serious injury. The current characteristics of local trauma systems, with respect to its acute care facilities, include the following:

- An existing network of designated Trauma Centers that have demonstrated compliance with established standards and regulations for Trauma Center resources, personnel, and processes of care
- The number of Trauma Centers within a system is restricted to allow volume performance by the highest level centers
- An inclusive system of higher and lower level centers providing care to patients with higher and lower injury severity respectively. In the more mature systems, the LEMSA defines a role for all acute care facilities as participants in the delivery of trauma care. Markers for participation include a structured institutional and system performance improvement program, data submission to regional registries, educational outreach, injury prevention, and operational agreements between sending and receiving hospitals within the system

Given the diversity of population density, geography, economics and other factors, California presents unique challenges to the creation of optimally located, appropriately resourced networks of acute care facilities. There are currently 343 acute care facilities with emergency departments (Comprehensive, Basic, and Standby) in the state of California. Of these, 80 are designated Trauma Centers. (*Appendix D*) Twenty California counties currently have no designated Trauma Centers within their county borders.

Recognizing that under-triage will occur in the prehospital setting, and that patients with significant injuries will present themselves to hospitals not specifically equipped or designated; non-trauma facilities play a critical role in the care of trauma patients. With some of the mature local trauma systems, these facilities are integrated into the regional trauma system with their roles specifically defined and codified in the local Trauma Plan. The “inclusivity” of counties and regions within the state with respect to the spectrum of Trauma Center levels (I-IV and non-trauma facilities) varies from those counties served by a sole Level I Trauma Center (San Francisco), to those areas served by a greater number and wider variety of designated centers (Los Angeles).

Planned Development

The primary goals for the statewide system of trauma care with respect to its acute care facilities is to help provide timely access to basic trauma care throughout the state, timely access to definitive care regardless of the type and severity of injury, have designated centers maintain capabilities commensurate with their level of designation, and to improve the consistency of

processes related to initial and recurring designation. The further development of the network of acute care facilities should involve the following aims.

EMS Authority

1. Periodically assess the number and level of Trauma Centers within the state by region to evaluate access to trauma care and work with LEMSA to identify areas of insufficient coverage.
2. ***Provide EMS Authority guidelines for needs-assessment methodology supporting the authority of the LEMSAs to designate Trauma Centers based upon the needs of the population served.***
 - 2.1. ***Provide EMS Authority guidelines to refine metrics of Trauma Center need in addition to the current regulation measure of one level I-II Trauma Center per 350,000 population.***
3. ***Establish guidelines to further uniformity of the Trauma Center designation process across LEMSAs.***
 - 3.1. ***Explore use of the ACS verification process for all Level I and Level II Trauma Centers.***
 - 3.2. ***Explore use of the ACS verification process for Level III Trauma Centers operating in proximity to higher-level Trauma Centers within a LEMSA.***
 - 3.3. ***Explore modifying the designation process for Level III and Level IV Trauma Centers operating in a LEMSA without a higher level Trauma Center, or in areas of a LEMSA not served by other Trauma Centers, to focus on resource enhancement and to encourage participation in the trauma system.***
4. Identify members of the trauma community (surgeons, emergency medicine physicians, trauma program managers) within the state with the expertise, experience & willingness to serve as site surveyors under Title 22 to be provided to LEMSAs upon request.

State Trauma Advisory Committee

1. Develop a template for 'operational' agreements between sending (non-trauma facility/lower level TC) and receiving (LII, LI) centers.
2. Develop guidance documents comparing Title 22 requirements with current ACS verification requirements.

Local EMS Agency

1. Outline the responsibilities and expected participation in the trauma system for non-designated acute care hospitals.
 - 1.1. ***Exercise the regulatory authority to collect data from all acute care facilities in the region.***
2. ***Develop a long-range plan of collaboration for specialized regional centers treating trauma and other time-sensitive conditions, such as stroke and ST elevation myocardial infarction (STEMI), capitalizing on shared resources.***

Component 8—Inter-Facility Transfer and Re-Triage

Background and Current Status

Although accurate field triage and direct transport to an appropriate level of care is a goal for all trauma systems, under-triage to non-trauma facilities or lower level Trauma Centers lacking the capabilities of caring for the most seriously injured will likely occur. For purposes of this document, re-triage means the immediate evaluation, resuscitation and transport of a seriously injured patient from a lower level trauma facility or non-trauma facility to a designated Trauma Center for a higher level of care. This process involves direct ED to ED transfer of patients that have not been admitted to the hospital. Interfacility transfer (IFT) refers to the transfer of an admitted patient, under the care of an admitting physician-of-record, from one facility to another.

There is currently no mechanism for the ongoing monitoring of under-triage or the number of re-triaged or transferred patients within the state. The frequency, location, and severity of related injuries involved with re-triage and inter-facility transfer within the state are largely unknown. In situations where re-triage or inter-facility transfer does occur, it may be delayed, and patients may not be managed according to evidence-based practice guidelines (e.g. traumatic brain injury). Re-triage/IFT protocols have been developed in several areas of the state, but are not in widespread use, and their effectiveness has just begun to be monitored.

Obstacles to transfer and re-triage include lack of a proximally located Trauma Center, lack of knowledge regarding the capacity (e.g. diversion status) and capabilities of potential receiving centers, concerns regarding EMTALA violations if procedures are not followed, local geographical and climatic obstacles to transportation (e.g. remote location, mountains, fog, etc.), transportation availability, insurance or financial status of the patient, and bed availability at receiving facilities.

Planned Development

The overall goal for the state with respect to re-triage/Interfacility transfer is to develop mechanisms, processes, and guidelines that will optimize timely access to trauma care at a level commensurate with the severity of injury, regardless of geographic location. The specific elements needed to achieve this goal include the following:

State EMS Authority

1. Develop a process that will allow ongoing analysis of all re-triage and IFT activity within the state based on CEMSSIS data
 - 1.1. *Utilize LEMSA level data to develop benchmarks for system and regional level secondary transfer rates, analyze data, and develop process improvement strategies to address gaps.*
2. *Regularly analyze the interaction between definitive care facilities, within and across the LEMSAs, including the following metrics:*
 - *Primary (field to initial hospital) transport and secondary (inter-facility transfer) over-triage and under-triage,*

- *Delays in transfer,*
 - *Multi-step transfers,*
 - *Mortalities occurring outside of Level I and Level II Trauma Centers.*
3. Evaluate current paramedic scope of practice to enable and facilitate rapid re-triage and transport of severely injured trauma patients (i.e. Traumatic Brain Injury).
 4. Identify receiving centers for special injuries (i.e. spinal cord, reimplantation).
 5. Develop web-based compendium of Trauma Centers, Burn Centers, Pediatric Trauma Centers, their specialized capabilities and contact information for rapid communication when needed.
 6. Investigate integration of real-time information on California Trauma Center status: open/on-diversion/partial diversion, etc. to all receiving facilities in California.
 7. Explore development of centralized re-triage/transfer coordination within the state.
 8. Develop specific EMTALA-based guidelines for the transfer and acceptance of trauma patients within the state. These should address:
 - 8.1. The EMTALA ‘non-discrimination’ provision in regards to the obligation (or not) to accept non-level-of-care patients,
 - 8.2. EMTALA allowance for the transfer of ‘unstable’ trauma patients for documented medical need to a higher level of care.

Local EMS Agency/Regional Trauma Coordinating Committee

1. Identify areas in the state where timely access to Trauma Centers may be improved (needs assessment).
2. Develop specific physiological and anatomical indicators for re-triage on a level-of-care basis (e.g. Level III center to LI/LII, etc.).
3. Develop models for education and outreach that will promote timely re-triage/IFT where appropriate.
4. Promote the development of regional cooperative arrangements between sending and receiving centers that will facilitate re-triage, reduce delays, and ensure that patients are re-triaged to an appropriate level of care.
5. Develop clinical management guidelines for the early (re-triage phase) treatment of high-risk injuries such as TBI, pelvic fractures, mangled or crushed extremity injuries, peripheral vascular injuries, etc.
6. Explore the development of clinical management guidelines that would allow lower level facilities in remote areas to manage selected types of injuries (e.g. ‘minimal’ Traumatic Brain Injury).
7. Develop structured relationships (regional cooperative agreements), including educational outreach between sending and receiving hospitals in order to facilitate the inter-facility transfer and re-triage and clinical management guidance to allow lower level facilities to keep selected patients.
8. Explore and promote the use of telemedicine for trauma patients where appropriate.
9. Identify and promote educational resources suitable for improving re-triage and inter-facility transfers (i.e. the ACS Rural Trauma Team Development Course).

Component 9—Rehabilitation and Trauma Recovery

Background and Current Status

Rehabilitation services are optimally provided along a continuum beginning with admission to a Trauma Center and continuing through community reintegration. While California regulation Title 22 for Level I/II contains requirements for Physical Therapy/Occupational Therapy/Speech Therapy, standardized early treatment guidance does not exist. Most rehabilitation facilities are independent facilities and the degree of integration into the trauma system varies considerably. In addition, the degree of access to level-of-care post-injury rehabilitation throughout the state is unknown. In many cases, the access to post-injury rehabilitation is a function of the needs of the patient but also of their insurance status and rehabilitation resources within the region.

Planned Development

In an effort to more effectively address the rehabilitative needs of trauma patients in the context of a statewide system of care, the following objectives should to be applied:

State EMS Authority

1. Develop a compendium of rehabilitation facilities throughout the state to include:
 - 1.1. A plan to assess the availability and capabilities of rehabilitation facilities in the state (and neighboring states) and integrate them into the regional planning and performance improvement process²⁶ and perform a gap analysis to identify shortfalls in services including:
 - 1.1.1. Specialized centers for Traumatic Brain Injury & spinal cord injuries
 - 1.1.2. Pediatric centers
 - 1.1.3. Burn & other specialty recovery facilities
2. Improve the data collection for evaluation of rehabilitative needs and degree of access to rehabilitation throughout the state.
 - 2.1. *Utilize trauma rehabilitation data, such as functional outcomes and costs, to inform injury prevention programs across the state.*
3. Explore possible amendments to CCR, Title 22, Division 9, Chapter 7 to incorporate the rehabilitation needs of the trauma patient including rehabilitation as part of the continuum of care.
4. *Integrate rehabilitation specialists at the state, regional, and local level trauma system planning and evaluation.*

State Trauma Advisory Committee

Recommend a standardized measure of functional recovery suitable for use throughout the trauma system.

Local EMS Agency/Regional Trauma Coordinating Committee

1. *Encourage Trauma Centers to partner with rehabilitation services internal and external to their centers.*

²⁶ 2016 ACS Recommendation from State Trauma System Consultation report

2. Develop guidelines for the current incorporation of rehabilitation into the continuum of trauma care. These guidelines might include:
 - 2.1. A mechanism to initiate rehabilitation services or consultation upon patient admission.
 - 2.2. Policies regarding coordination of transfers between acute care and rehabilitation facilities.
 - 2.3. A template for operational Memorandum of Understanding's between definitive care facilities and rehabilitation centers to include:
 - 2.3.1. Complications and outcome follow-up,
 - 2.3.2. Data sharing for performance improvement activities,
 - 2.3.3. Educational outreach.

Component 10—Information Systems

Background and Current Status

Data collection at the state level is dependent on the local EMS and trauma data systems managed by the LEMSAs. The majority of the data is transmitted to CEMSIS from the LEMSA data systems and not directly from the EMS provider or Trauma Center. CEMSIS is divided into two components: CEMSIS-EMS, which contains prehospital data and CEMSIS-Trauma which contains Trauma Center data.

Participation in CEMSIS is voluntary by local EMS agencies and is currently managed for EMSA through a subcontract with Inland Counties EMS Agency with Image Trend as the vendor. CEMSIS is presently funded from the California Office of Traffic Safety by annual competitive grants.

CEMSIS-EMS

Select prehospital data elements are included in the state trauma data standards. Data is integrated into the data management systems of both the LEMSA and EMSA. The CEMSIS-EMS data standards are in compliance with the National EMS Information System (NEMSIS) standards.

CEMSIS-Trauma

Each designated Trauma Center is responsible for the collection of data on defined patients as outlined in CCR, Title 22, Division 9, Chapter 7. This minimum data set is expanded locally to meet the needs of the Trauma Center and trauma system. This data is integrated into both LEMSA and EMSA State's data management systems. CEMSIS-Trauma is inclusive of Trauma Center data with data standards in compliance with the National Trauma Data Standards (NTDS).

While regulations require all hospitals that receive trauma patients to participate in the local EMS agency data collection efforts, compliance with this requirement is variable as non-trauma facilities have no contractual obligation to comply. All hospitals are required to provide emergency department, and hospital discharge data to the State Office of Health Planning and Development (OSHPD) with specific data standards outlined in regulations.

Other data systems that support CEMSIS-Trauma

- Crash/law enforcement data is collected through the California Statewide Information Traffic Records System (SWITRS) by law enforcement personnel.
- California Highway Patrol at the scene of a crash on state highways; other law enforcement agencies have the option of participating in SWITRS.
- Coroner data: California has a mixed system of county coroners and medical examiners with no central data repository of data apart from the reporting of data for death certificates to the state Department of Public Health. Coroners and medical examiners report data for death certificates via an electronic (web-based) system. The California Department of Public Health edits and verifies the information and creates several files.

The most commonly used is the Deaths Statistical Master file which contains all the information found in comparable files for other states and territories.

Planned Development

State EMS Authority/State Trauma Advisory Committee/CEMSIS Data Committee

1. Explore feasibility of linking databases to create a complete longitudinal patient record.²⁷
This would include:
 - 1.1. Develop a mechanism for deterministic/probabilistic matching of data.
 - 1.2. CEMSIS-Trauma and CEMSIS-EMS linkage.
 - 1.3. CEMSIS-EMS and Hospital Data (OSHPD) linkage.
 - 1.4. CEMSIS and SWITRS linkage.
2. Evaluate data validity by developing a plan to monitor data completeness and accuracy including utilization of the state-defined inclusion criteria.
3. Improve data compliance by:
 - 3.1. Development of standard reports provided to local EMS agencies itemizing Trauma Center data compliance.
 - 3.2. Development of a subset of CEMSIS-Trauma to include data on pre-defined injured patients seen at non-trauma facilities.
 - 3.2.1. *Develop a special recognition program for non-designated acute care facilities that submit trauma data as trauma participating hospitals.*
 - 3.3. Promotion of CEMSIS participation by all local EMS agencies through submission of a minimal data set from non-trauma facilities (e.g. OSHPD data).
4. Improve data sharing through:
 - 4.1. Development of standard aggregate reports and dashboards to be publically shared on the EMSA website and the California Health and Human Services Open Data Portal, as applicable.
 - 4.2. Development of a procedure for all requests for data including a data request form.
 - 4.3. Development of a policy for data sharing in compliance, with applicable patient confidentiality laws and California Health and Human Services De-Identification Policy Standards.
 - 4.4. *Development of a comprehensive report of injuries for the state with comparisons of injury in rural, suburban, and urban counties.*
 - 4.4.1. *Obtain a template for a comprehensive state injury report from a state with a CDC Core Injury Grant.*
 - 4.4.2. *Prepare an executive summary of the injury report including key information and graphics for use in educating the public.*
5. ***Create an injury report template for the LEMSAs, and provide a list of EpiCenter queries to use to complete the injury report.***
 - 5.1. *Include a list of queries from the EMS and trauma registries.*
 - 5.2. *Consider using an injury epidemiology graduate student from a School of Public Health to support development of additional injury data reports and report templates.*

²⁷ 2016 ACS Recommendation from State Trauma System Consultation report

Local EMS Agency

1. Develop a plan to monitor data completeness and accuracy including utilization of the state-defined inclusion criteria prior to submission to CEMESIS.
2. *Assure all EMS patient data are included in hospital electronic health records (Trauma Centers and non-trauma centers), as well as trauma registries.*
3. *Develop a process to track the movement of patients through the continuum of trauma care.*²⁸

²⁸ EMS and Hospitals Join Together to Track Trauma Patients, 2011
<http://www.healthy.arkansas.gov/programs/services/hslicensing/regulation/emsandtraumasystems/documents/training/trainingmaterials/traumaband.pdf>

Component 11—System Evaluation and Performance Improvement

Background and Current Status

The purpose of a state Performance Improvement and Patient Safety (PIPS) Program ensures that injured patients receive quality care throughout the continuum. This requires monitoring care processes, structures and outcomes, identifying areas for improvement, developing and carrying out corrective action plans, and verifying that these corrective action plans result in desired improvements. The ideal PIPS Program requires accurate local, regional, and state prehospital and hospital clinical databases. Other components include identification of risk factors and best practices, accurate, standardized measurement of complications, risk-adjusted outcomes measurement, benchmarking, and appropriate feedback of benchmarking results.

EMSA may develop and implement a state-wide EMS Quality Improvement (QI) Plan with the LEMSA Trauma System Coordinators in collaboration with EMS Medical Directors. For the purposes of this plan, the terms QI and PIPS are synonymous. RTCCs may assist in case review if it crosses jurisdictional lines within the region. Trauma Centers are required to have a PIPS Program for improving care. In most cases, the PIPS program is linked to the hospital PI department and overall hospital PI Plan. Performance Improvement standards are developed to assist with monitoring care relative to standards of care.

California Code of Regulations, Title 22, Division 9, Chapter 12: EMS System Quality Improvement, requires that EMS provider agencies and Base Hospitals develop a PIPS Program with an associated Plan to be approved by the LEMSA. The LEMSA PIPS Plan is approved by EMSA. The regulations do not itemize trauma-specific components of the LEMSA PIPS Plan.

Planned Development

In order to evaluate the State Trauma System, the continuum of care from dispatch to pre-hospital to hospital disposition must be connected through a data system. Only in this way, can we begin to understand how care provided translates to improved outcomes and system effectiveness.

State EMS Authority

A program should be developed by the EMS Authority in collaboration with the LEMSAs and RTCCs to evaluate statewide trauma system performance. This should include:

1. Develop a statewide comprehensive Trauma PIPS Plan consistent with the elements of these Statewide Trauma Planning recommendations²⁹.
 - 1.1. *Identify additional staffing resources to assume responsibility for the overall implementation of the state PIPS program to ensure integration with regional and LEMSA trauma system plans and other relevant state plans.*
 - 1.2. *Utilize existing educational forums to provide information on the state PIPS plan, with an emphasis on the PIPS structure, process and metrics.*

²⁹ Recommendation from ACS State Trauma System Consultation report, 2016

2. Create a *multidisciplinary* State Trauma PIPS committee as a subcommittee of the STAC *taking into consideration the urban, suburban and rural clusters of Trauma Centers, regions, hospital network affiliations, and Committee on Trauma representation.*
 - 2.1. ***Solidify the state core trauma performance improvement measures within the State PIPS plan to include structure, process, outcome and patient safety metrics.***
 - 2.2. *Assure that the performance improvement process is protected from discovery, when conducted at all levels of the trauma system, including the Regional Trauma Coordinating Committees.*
 - 2.3. ***Query the databases to help answer specific performance improvement questions of interest, such as rates of over- and under-triage, and timeliness of re-triage and address trends in deviation of care through the PIPS plan process.***
 - 2.4. ***Consider incorporating the best practices, processes and metrics identified from LEMSAs with well-established PIPS plans.***
3. Perform a statewide assessment of the Trauma System based on national standards and California-specific resources.
4. Evaluate state data and identify regional opportunities for improvement, determining if similar opportunities are occurring in other regions and explore mechanisms for shared resolution:
 - 4.1. Develop specific database queries.
 - 4.2. Create definition for system sentinel event and monitor such events.
 - 4.3. Facilitate issue resolution by assisting other system performance improvement committees.
 - 4.4. Develop and implement standards for system-wide performance improvement.
5. Create a recommended minimal data set of information to be submitted to LEMSA system trauma registries from non-trauma facilities to track and trend outcomes of traumatically injured patients retained in non-trauma receiving facilities.
6. Direct cross-regional issues to specific PIPS Work Groups for study and recommended resolution.
7. Develop and institute a mechanism for providing data and feedback to LEMSAs to assist in optimizing local PIPS processes.
8. Explore participation in the American College of Surgeons National Trauma Performance Improvement Project (TQIP) as a state, including a cost-benefit analysis.
 - 8.1. *Seek funding partners to support a California State Collaborative to provide risk-adjusted benchmarking outcomes.*
9. Create a policy regarding the sharing of data for the PI process, recognizing hospital confidentiality and HIPPA regulations.
10. Explore the development of a HIPPA compliant universal identifier (e.g. PCR# from prehospital patient care report) that allows individual patient data to be tracked throughout the entire spectrum of care including post care outcomes.
11. Ensure recommended minimum data that set allows for risk adjustment of individual patients so that benchmarking can be carried out.
12. Develop a process to periodically collect data elements designed to focus on specific patient populations and processes that are deemed to be the most important at any given time; these focused projects may be directed from the State, Region or LEMSA.

13. Periodically benchmark individual systems, hospitals, LEMSAs and RTCCs to the group as a whole and to an outside standard such as the HRSA “Benchmarks, Indicators, Scoring” (BIS) tool³⁰.
 - 13.1. *Encourage utilization of the BIS by the LEMSAs.*
 - 13.2. *Train facilitators to conduct the BIS for LEMSAs.*

Local EMS Agency

1. Develop risk-adjusted standardized reports and based on nationally recognized formula.
2. Show overall progress in achieving goals for significant injury and patient categories.
3. *Ensure that all LEMSA medical directors report their clinical performance improvement initiatives to the EMS Authority.*
4. Create a local/regional Performance Improvement Program (may be integrated into EMS PI Program for small systems) to:
 - 4.1. Develop specific database queries.
 - 4.2. Create definition and monitor system sentinel events.
 - 4.3. Work with local Medical Examiner on guidelines for trauma post-mortem exams.
 - 4.4. Facilitate issue resolution by individual performance improvement committees.
 - 4.5. *Incorporate the state PIPS trauma performance measures as a minimum into their trauma plans.*
5. Represent LEMSA at regional and state Performance Improvement Committees

Regional Trauma Coordinating Committee

1. Identify regional system issues and work with member LEMSAs on resolution of these issues.
2. *Support regional collaboration to enhance system integration and performance improvement.*
3. Recommend audit filters based on the region’s population traits, available resources and geography.
4. Explore tools to identify variations in care and outcomes across respective regions and determine possible ways to reduce detrimental variations in regional structures and care processes that may result in negative outcomes.
5. Prioritize system issues identified for resolution.
6. Work collaboratively with each member LEMSA to ensure standardized and accurate data collection and CEMSIS participation³¹.

³⁰ 2016 ACS Recommendation from State Trauma System Consultation report

³¹ 2016 ACS Recommendation from State Trauma System Consultation report

Component 12—Education & Training

Background and Current Status

Education consists of two categories: education of the public regarding trauma systems and education and training of trauma care professionals across the continuum of care.

Education of the Public

No formal public education process exists for trauma systems. Private and public surveys indicate that the general public regards all hospitals as Trauma Centers and few can indicate where their closest Trauma Center is located; furthermore, many citizens are not aware that the EMS system is the best avenue to receive trauma care. Direct first aid is another aspect of public education. Interventions utilizing new equipment and medications formerly available only to medical professionals are now being taught to the public, including use of tourniquets for severe limb hemorrhage.

Education and Training for Trauma Care Professionals

Education and training of trauma care professionals is compartmentalized into prehospital, nursing, and physician education with very limited trauma systems education. The EMS Authority in conjunction with statewide partners has sponsored seven State Trauma Summits providing updates on national trauma system development and clinical care along with an opportunity for local systems to present on best practices.

RTCCs also offer regional Trauma Summits with a mix of systems and clinical topics. RTCCs, partnering with the Trauma Managers Association of California (TMAC), sponsor the ACS Rural Trauma Team Development Course. Standard certification courses such as International Trauma Life Support (ITLS), Prehospital Trauma Life Support (PHTLS) and Transport Nurse Advanced Trauma Course (TNATC) are available and encouraged but not required in most of areas of the State.

While there are national continuing education standards in place for Trauma Centers, they are silent in California regulations. Some education requirements are addressed through the Trauma Center designation process and monitored by the LEMSA. Various national certification programs such as Advanced Trauma Life Support (ATLS), Trauma Nurse Coordinator Course (TNCC), Advanced Trauma Care for Nurses (ATCN), Advanced Cardiac Life Support (ACLS), and Pediatric Advanced Life Support (PALS) are available; however, there is no consistent standard for training throughout the State.

Regulations specify Trauma Center physician qualifications related to specialty board certification and Advanced Trauma Life Support certification. It is also a requirement that the Trauma Center participate in continuing education in trauma care. Education standards also exist within the Trauma Center, which are met if the Trauma Center either chooses or is required to be verified by the ACS.

Planned Development

State, regional and local education needs should be identified, and resources identified to meet those needs. Standard education competencies should apply statewide, and each region's individual educational offerings should address local needs.

EMS Authority

1. Identify statewide educational needs through the Performance Improvement and Patient Safety Program in consultation with hospitals, LEMSAs and RTCCs.
2. Develop, through its State Trauma Advisory Committee, a plan for providing information to the public regarding the structure and function of the State Trauma System.
3. *Expand the state EMS annual recognition program to include a category specific to the trauma system.*
4. ***Collaborate with the Trauma Managers Association of California in their efforts to roll out a statewide media campaign to educate the public about the trauma system.***
 - 4.1. *Consider engaging graduate student(s) from a communications or marketing program to support this effort.*
 - 4.2. *Develop a one page fact sheet to summarize the updated goals in these Statewide Trauma System Planning recommendations and publish it on the EMS Authority website.*
 - 4.3. *Integrate the executive summary from the comprehensive trauma injury report.*

Local EMS Agency

1. Provide public education regarding trauma systems and injury prevention.
2. Perform a needs assessment prior to developing new or additional trauma-related educational programs.

Regional Trauma Advisory Committee

1. Promote regional efforts to educate the public on trauma systems and the role and effectiveness of Trauma Centers.
2. Develop trauma clinical care education for regional trauma professionals.

Trauma Centers

1. Work with non-trauma facilities and level IV Trauma Centers in providing for the Rural Trauma Team Development Course.
 - 1.1. *Seek funding for continued provision of the course for rural acute care facilities to assist them in becoming participating trauma facilities.*
2. Provide educational opportunities based on PIPS Program findings.

Component 13—Trauma Systems Research

Background and Current Status

Academic research centers perform the majority of trauma research done in California (Level I Trauma Center) and is required by regulation for Level I designation. Important contributions are also being made in the areas of public health, pediatrics, and prehospital. Most of these projects are being conducted by single institutions or agencies and are not utilizing the opportunities of collaborative, multidisciplinary research. Currently, funding is sought by investigators and facilitated by the research institution. To date, statewide systems research has been limited and has included isolated reports from single institutions on issues such as access to care and pediatrics.

The state trauma registry (CEMSIS-Trauma) is an important source of information and data for research. Institutional and regional databases may be used for comparative and outcomes research, and large statewide databases should be used to demonstrate the effectiveness of the system. The CEMISIS-Trauma Registry was started in 2009 and currently does not have a mechanism to request data for the purposes of research. The EMS Authority is responsible for maintaining data integrity and reliability of the state trauma registry, which is compatible with the National Trauma Data Standards (NTDS).

Research using trauma registries may provide information about resource utilization, outcomes, and system performance. Comparative benchmarking using local, regional or statewide trauma registries can be performed by comparing local data with the National Trauma Data Bank (NTDB).

Planned Development

Local EMS agencies and Trauma Centers should be the basis for collaborative systems research utilizing the statewide CEMISIS database. Trauma system research involving both local and state agencies should be part of local/regional trauma systems.

EMS Authority

1. *Develop a research agenda with priority topics identified.*
2. *Encourage continued investigation of issues that may help inform trauma system evaluation and planning in California and the nation.*
3. Facilitate access to data for individual or groups of investigators through the use of the CHHS Open Data Portal and CEMISIS³²
4. Establish internal policies for the request for data from CEMISIS for research purposes.
5. Identify the research expertise in the system and work collaboratively with experts in the field (e.g. Schools of Public Health, Finance and Economics).

State Trauma Advisory Committee

1. Facilitate multidisciplinary collaboration for research.

³² 2016 ACS Recommendation from State Trauma System Consultation Report

2. Develop research agenda (possibly through a research committee) and collaborate with established investigators to conduct research projects.
3. Periodically review trauma system data derived from CEMISIS, OSHPD and other sources, and make recommendation to various system stakeholders regarding potential areas of research.

Component 14—Injury Prevention

Background and Current Status

A number of collaborative efforts between Trauma Centers, LEMSAs and public health departments have successfully been developed at the regional level and can be used as models for injury prevention. In keeping with the public health model, statewide injury control in California has been established primarily under the direction of the Department of Public Health; however, an assessment of the state trauma system in 2006 by EMSA recognized a lack of interface between these efforts and state trauma leadership.

EMSA participates in the Strategic Highway Safety Plan (SHSP) that has 17 Challenge Areas focused on many injury prevention topics. EMSA is the lead agency for Challenge Area 15 that has the goal of “Improving Post Crash Survivability”. EMSA is actively forging relationships between EMS partners (LEMSAs, Trauma Centers, and providers) and SHSP committees to increase statewide injury prevention participation.

The Trauma Managers Association of California (TMAC) utilizes the expertise of many trauma program leaders to develop statewide coalitions for prevention. Some of the Regional Trauma Coordinating Committees (RTCC) are developing organized approaches for injury prevention.

Planned Development

The incorporation of an integrated injury prevention system into the Trauma System is a critical step in reducing the burden of injury morbidity and mortality in California. In recent years, trauma care has shifted from the medical model of treating injuries to a public health approach that defines trauma as a preventable disease. Rather than focusing on the acute care of traumatic injuries, the public health framework allows for the prevention and mitigation of injury by addressing the causes of trauma and subsequent injury.

State EMS Authority/State Trauma Advisory Committee

1. *Create a needs-based, integrated, statewide injury prevention plan, in collaboration with the California Department of Public Health that identifies priorities for intervention.*
 - 1.1. *Share the injury prevention plan and its priorities with LEMSAs and Trauma Centers.*
 - 1.2. *Encourage LEMSAs and Trauma Centers to develop strategies to address state priority injury prevention issues.*
2. Partner with existing agencies focusing on statewide injury prevention (e.g. EpiCenter at the California Department of Public Health) for the purpose of:
 - 2.1. Establishing best practice recommendations for prevention programs and evaluation based on scientifically evaluated injury prevention strategies.
 - 2.2. Improving coordination and utilization of public health and trauma systems injury prevention resources at the state, regional and local levels.
 - 2.3. Coordinating a statewide strategy to promote injury awareness with the public, media, and elected officials.

Local EMS Agency/Regional Trauma Coordinating Committee

1. Develop a compendium of regional injury prevention programs with links provided to EMSA for posting on the website.
2. Implement new and support existing scientifically proven prevention programs in response to regionally specific injury data.
3. Ensure ongoing program evaluation to determine the effectiveness in reducing intentional and unintentional injuries.
4. Collaborate with injury prevention programs to collect the necessary data for program evaluation and needs assessment.
5. Create a public information and education program with consistent messaging on the preventability of injury.

Component 15—Emergency/Disaster Preparedness

Background and Current Status

The role of trauma systems is a key component of the overall response system for disasters/multiple casualty events. Each LEMSA and Operational Area (county) has a defined means of communication and coordination of patient movement. A local jurisdiction engaged in a multi-casualty incident (MCI) commands and organizes a given incident using their local MCI Plan. Triage, using LEMSA protocols and procedures, is conducted under a Triage Unit and patient treatment and staging prior to transport are conducted under a Treatment Unit. Using local procedures, Radio communication from the Transportation Leader relays the number and acuity of victims to the healthcare system, including Trauma Centers, which in turn communicate their capacity for receiving patients. Designated trauma and burn patients, using LEMSA criteria, are directed to trauma/burn centers. If the magnitude of the MCI begins to exceed the capacity of the local or Operational Area trauma system, patient movement may be directed to contiguous trauma systems.

The State Operations Center (SOC), operated by CalOES, coordinates State resources to a disaster. The Public Health and Medical Emergency Function (EF8) support the Medical Mutual Aid system and supports affected trauma systems or to coordinate state-wide patient movement through the EMS Authority and California Department of Public Health. The SOC, with approval of the Governor, can also make requests for federal medical and health resources through the FEMA Region IX and Department of Health and Human Services Region IX.

All-hazards multi-casualty events typically include situations involving natural (earthquake), unintentional (school bus crash), and intentional (terrorist explosion) trauma-producing events that test the expanded response capabilities and surge capacity of the trauma system. Funding from HRSA and FEMA is inadequate for the task of preparing Trauma Centers for the next inevitable event when they are already under economic duress.

Planned Development

EMS Authority/State Trauma Advisory Committee

1. Perform an assessment gap analysis of the state trauma system's emergency preparedness including Trauma Center surge capacity
2. *Explore the use of Hospital Preparedness Program funding to assist the trauma system with disaster planning and exercises.*
3. Integrate Statewide Trauma System Planning with the California Department of Public Health and Medical Emergency Operations Manual Plan for natural and manmade incidents.
 - 3.1. *Integrate the Trauma Centers and EMS in the development of regional emergency, disaster, surge capacity, and mass casualty planning based upon risk, population, and bed census assessments.*
4. *Provide updated information to the State Trauma Advisory Committee and the Regional Trauma Coordinating Committees annually on the state disaster activities and the status of medical assets available to the trauma system.*

5. Explore the use of existing resource monitoring systems to provide real-time trauma capacity and resources assessment.
 - 5.1. *Utilize disaster management systems to assess hospital capacity and capability for specialized care.*
6. Incorporate the role of the trauma system in the Public Health and Medical Emergency Operations Manual³³.
7. Develop a standardized inventory for trauma caches that could be located at strategic locations in the event of a disaster.
8. Develop the capacity via the EMSA website for the dissemination of guidelines, protocols, programs, etc. relevant to the State Trauma System.
9. Encourage collaboration, communication, and involvement between LEMSAs, RTCCs, MHOAC/RDMHS, and local Trauma Center staff.
10. Coordinate and plan with LEMSAs, RTCCs, MHOAC/RDMHS, and local Trauma Center staff for rapid decompression of healthcare facilities during regional mass casualty events.

Local EMS Agency/Regional Trauma Coordinating Committee

1. Explore trauma system surge capacity, and best practices to improve disaster response.
2. Provide leadership and active participation in the state and regional trauma care system with lead functions for system and disaster planning.
3. Promote training to Trauma Centers and non-trauma facilities on the medical health disaster system in the region.
4. Develop template language for MOU's between Trauma Centers to ensure a quick process for sharing resources (personnel, equipment and medical supplies) to enhance surge capacity during disasters.
5. *Incorporate applicable LEMSA disaster planning with the LEMSA trauma plans along with annual disaster updates.*
 - 5.1. *Include guidelines that direct less severely injured patients to non-designated acute care facilities when possible, allowing Trauma Centers to receive the most severely injured patients.*
6. *Consider using a patient tracking system that could be implemented on a regular basis as well as in the event of a disaster.*

³³ 2016 ACS Recommendation from State Trauma System Consultation report

Appendix C

State Trauma Advisory Committee Membership

Appendix D

Designated Trauma Centers

Appendix E

Trauma System Research

Appendix F

Scudder Oration



State of California
EMS Authority
State Trauma Advisory Committee



Name	Representation	Nominating Organization	Employment	Term Appoint.	Term Expires
Committee Chair					
1 Robert Mackerzie, MD, FACS	EMS Authority	EMS Authority	San Francisco General Hospital & Trauma Center	02/01/14	02/01/17
Regional Representatives					
2 David Shatz, MD, FACS	Region 1 - North RTCC	North RTCC	UC Davis Medical Center	08/01/16	08/01/19
3 Adella Garland, MD, FACS	Region 2 - Bay RTCC	Bay RTCC	Santa Clara Valley Medical Center	05/01/16	05/01/19
4 James Davis, MD, FACS	Region 3 - Central RTCC	Central RTCC	Community Regional Medical Center - Fresno	08/01/16	08/01/19
5 Katy Haddock, RN	Region 4 - SW RTCC	SW RTCC	Ventura County EMS Agency	01/01/15	08/01/18
6 John Steele, MD, FACS	Region 5 - SE RTCC	SE RTCC	Palomar Medical Center	08/01/16	08/01/19
Constituent Representatives					
7 Cathy Chidester, RN	LEMSA Admin - Urban	EMSAAC	Los Angeles County EMS Agency	08/01/13	08/01/16
8 Dan Lynch	LEMSA Admin - Rural	EMSAAC	Central California EMS Agency	09/18/13	09/18/16
9 Jay Goldiman, MD	LEMSA Medical Director	EMDAC	Kaiser Permanente Foundation Health Plan & Hospi	07/20/13	07/31/16
10 BJ Bartleson, RN	California Hospital Assn	CHA	California Hospital Association	08/01/16	08/01/19
11 H. Gill Cryer, MD, PhD	Trauma Surgeon	ACS	Ronald Reagan UCLA Medical Center	05/07/10	05/08/13
12 Vacant	Emergency Physician	CAL ACEP	Emergency Medicine Associates		
13 Christy Preston	Trauma Coordinator	TMAC	Los Angeles County EMS Agency		
14 Robert Dimand, MD	Pediatric Representative	EMSC TAC	State of California - California Children's Services	12/20/13	12/31/15
15 David Shatz	Trauma Surgeon	Cal-Chiefs	UC Davis Medical Center	09/01/16	09/01/19
16 Myron Smith, MBA, EMT-P	Private Provider	CAA	Hall Ambulance Service, INC	11/22/13	11/22/16
At-Large Representatives					
17 Joe Barger, MD, FACEP	At Large	EMS Authority	Contra Costa EMS Agency	04/02/14	04/02/17
18 Christopher Newton, MD, FACS, FAAP	At Large	EMS Authority	Oakland Children's Hospital	03/14/14	03/14/17

ALAMEDA COUNTY EMS (Bay Area RTCC)	County	HOSPITAL	Level I Pediatric Trauma Center	Level II Pediatric Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level III Trauma Center	Level IV Trauma Center	Designation Date	Status Change
			Level I Pediatric Trauma Center	Level II Pediatric Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level III Trauma Center	Level IV Trauma Center				
	Alameda		1							2				
	Alameda County	Children's Hospital Medical Center - Oakland 747 52nd Street Oakland, CA 94609 Hospital: (510) 456-7800 Trauma: (510) 428-3045 (Private)											06/01/1985	04/26/2005 Designation as Level I Pediatric Trauma Center
	Alameda County	Eden Hospital Medical Center 20103 Lake Chabot Road Castro Valley, CA 94546 Hospital: (510) 537-1234 Trauma: (510) 727-2717 (Private)											06/01/1985	
	Alameda County	Highland Alameda County Medical Center Campus 1411 East 31st Street Oakland, CA 94602 Hospital: (510) 534-8055 Trauma: (510) 437-4754 (Public)											06/01/1985	
CENTRAL CALIFORNIA EMS (Central RTCC)	Fresno, Kings, Madera, & Tulare		1						1		1			
	Fresno County	Community Regional Medical Center - Fresno 2823 Fresno Street Fresno, CA 93721 Hospital: (559) 459-6000 Trauma: (559) 459-5130 (Private)											04/07/2007	
	Madera	Valley Children's Hospital 9300 Valley Children's Place Madera, CA 93636 Hospital: (559) 353-3000 (Private)											02/03/2015	
	Tulare County	Kaweah Delta Medical Center 400 West Mineral King Visalia, CA 93291-8263 Hospital: (559) 824-2000 Trauma: (559) 824-2867 (Private)											01/26/2010	
	Fresno County	University Medical Center												04/17/2007 De-Designated as Level I Trauma Center (Hospital closed)
	Fresno County	Children's Hospital Central California												10/04/2002 De-Designated as Level II Pediatric Trauma Center
COASTAL VALLEY EMS (North RTCC)	Sonoma, & Mendocino									1		2		
	Mendocino County	Ukiah Valley Medical Center 275 Hospital Drive Ukiah, CA 95482 Hospital: (707) 462-3111 (Private)											07/01/2010	
	Sonoma County	Santa Rosa Memorial Hospital 1165 Montgomery Drive Santa Rosa, CA 95405-4887 Hospital: (707) 546-3210 Trauma: (707) 547-4000 (Private)											05/01/2000	
	Sonoma County	Frank Howard Memorial Hospital 1 Marcolla Drive Willits, CA 95490 Hospital: (707) 4596801 (Private)											12/01/2016	12/1/2016 Designated as Level IV Trauma Center

EMT/Paramedic RTCC	County	HOSPITAL	Level I Pediatric Trauma Center		Level II Pediatric Trauma Center		Level I Trauma Center		Level II Trauma Center		Level III Trauma Center		Level IV Trauma Center		Designation Date	Status Change
			Level I Pediatric Trauma Center	Level II Pediatric Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level III Trauma Center	Level IV Trauma Center						
CONTRA COSTA COUNTY EMS (Bay Area RTCC)	Contra Costa									1						
	Contra Costa County	John Muir Medical Center 1601 Ygnacio Valley Road Walnut Creek, CA 94598 Hospital: (925) 939-3000 Trauma: (925) 947-5224 (Private)													06/01/1988	
EL DORADO COUNTY EMS (North RTCC)	El Dorado										2					
	El Dorado County	Barton Healthcare System 2170 South Avenue South Lake Tahoe, CA 96158 Hospital: (Private) Trauma:													01/27/2015	
	El Dorado County	Marshall Medical Center 1100 Marshall Way Placerville, CA 95667 Hospital: (530) 622-1441 Trauma: (530) 628-2784 (Private)													08/09/2009	
IMPERIAL COUNTY EMS (South East RTCC)	Imperial												2			
	Imperial County	El Centro Regional Medical Center 1415 Ross Avenue El Centro, CA 92243 Admin - (760) 339-7111 Trauma Office - (760) 339-7323 (Private)													03/24/2004	
	Imperial County	Pioneers Memorial Healthcare District 207 W Legion Road Brawley, CA 92227 Admin - (760) 344-2120 Trauma Office - (760) 351-3888 (Private)													03/22/2004	
INLAND COUNTIES EMS (South East RTCC)	San Bernardino, Inyo, & Mono							1								
	San Bernardino County	Arrowhead Regional Medical Center 400 North Pepper Avenue Colton, CA 92324 Hospital: (909) 580-1001 Trauma: (909) 580-6116 (Public)													10/01/1981	03/30/1999 Name change (formerly San Bernardino County Medical Center)
	San Bernardino County	Loma Linda University Medical Center 11234 Anderson Loma Linda, CA 92354 Hospital: (909) 824-0800 Trauma: (909) 558-4000, ext 87270 (University)													10/01/1981	07/27/2004 Added Designation as Level I Pediatric Trauma Center
KERN COUNTY EMS (Central RTCC)	Kern									1						
	Kern County	Kern Medical Center 1830 Flower Street Bakersfield, CA 93305 Hospital: (661) 326-2161 Trauma: (661) 326-5688 (Public)													11/01/2001	

County	HOSPITAL	Level I Pediatric Trauma Center	Level II Pediatric Trauma Center	Level I Trauma Center	Level II Pediatric Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level III Trauma Center	Level IV Trauma Center	Designation Date	Status Change
Kern County	Ridgecrest Regional Hospital 1081 N. China Lake Blvd. Ridgecrest, CA 93555 Hospital: (760) 446-3551											05/01/2016	
LOS ANGELES COUNTY EMS (South West RTCC)		1		1	3	2	8						
Los Angeles County	Antelope Valley Hospital 1600 W. Avenue J Lancaster, CA 93534 Hospital: (661) 949-5505 Trauma: (661) 949-5298											05/03/2010	12/01/1987 De-Designated as Level II Trauma Center; 05/03/2010 Designation as Level II Trauma Center
Los Angeles County	California Hospital Medical Center 1401 S. Grand Avenue Los Angeles, CA 90015 Hospital: (213) 748-2411 Trauma: (213) 742-5451											12/01/2004	07/01/1984 Designation as Level II Trauma Center; 02/01/1985 De-Designated as Level II Trauma Center; 12/01/2004 Designation as Level II Trauma Center
Los Angeles County	Cedars-Sinai Medical Center 8700 Beverly Boulevard Los Angeles, CA 90048-1865 Hospital: (310) 423-3277 Trauma: (310) 423-8732											04/01/1984	04/01/2002 Added Designation as Level II Pediatric Trauma Center
Los Angeles County	Children's Hospital of Los Angeles 4650 Sunset Boulevard Los Angeles, CA 90027-6062 Hospital: (323) 660-2450 Trauma: (323) 669-4526											12/01/1983	
Los Angeles County	Harbor UCLA Medical Center 1000 West Carson Street Torrance, CA 90502-2004 Hospital: (310) 222-2345 Trauma: (310) 222-1912											12/01/1983	04/01/2002 Added Designation as Level II Pediatric Trauma Center
Los Angeles County	Henry Mayo Newhall Memorial Hospital Memorial Hospital 23845 W. McBean Parkway Valencia, CA 91355-2083 Hospital: (661) 253-8000 Trauma: (661) 253-8118											10/01/1984	01/01/1992 Changed from Level III Trauma Center to Designation as Level II Trauma Center
Los Angeles County	Huntington Memorial Hospital 100 West California Blvd. Pasadena, CA 91105-3097 Hospital: (626) 397-5000 Trauma: (626) 397-5900											12/01/1983	06/30/1992 Changed from Level I Trauma Center to Designation as Level II Trauma Center
Los Angeles County	LAC + USC Medical Center 1200 North State Street Los Angeles, CA 90033-1083 Hospital: (323) 226-2622 Trauma: (323) 226-7780											12/01/1983	04/01/2002 Added Designation as Level II Pediatric Trauma Center
Los Angeles County	Long Beach Memorial + Miller Children's Medical Center 2801 Atlantic Avenue Long Beach, CA 90806-1737 Hospital: (562) 933-2000 Trauma: (562) 933-1315											12/01/1983	01/01/1992 Changed from Level I Trauma Center to Designation as Level II Trauma Center; 04/01/2002 Added Designation as Level II Pediatric Trauma Center
Los Angeles County	Northridge Hospital Medical Center 16300 Roscoe Blvd. Northridge, CA 91325-4105 Hospital: (818) 885-8500 Trauma: (818) 885-8500, xtn 2758											06/01/1984	10/04/2010 Added Designation as Level II Pediatric Trauma Center

County	HOSPITAL	Level I Pediatric Trauma Center	Level II Pediatric Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Pediatric Trauma Center	Level II Pediatric Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level III Trauma Center	Level IV Trauma Center	Designation Date	Status Change
Los Angeles County	Pomona Valley Hospital Medical Center 1798 N. Garey Avenue Pomona, CA 91767 Hospital: (909) 895-9500 (Private)													04/01/2017	10/01/1986 De-Designated as Level II Trauma Center 04/01/2017 Re-designated as Level II
Los Angeles County	Providence Holy Cross Medical Center 15031 Rinaldi Street Mission Hills, CA 91345-1207 Hospital: (818) 365-8051 Trauma: (818) 898-4312 (Private)													05/01/1984	
Los Angeles County	Ronald Reagan UCLA Medical Center 757 Westwood Plaza Los Angeles, CA 90095-3075 Hospital: (310) 825-9111 Trauma: (310) 825-5215 (Private)													12/01/1983	04/01/2002 Added Designation as Level I Pediatric Trauma Center
Los Angeles County	St. Francis Medical Center 3830 E. Imperial Hwy. Lynwood, CA 90262-2678 Hospital: (310) 900-8900 Trauma: (310) 900-8875 (Private)													01/01/1996	
Los Angeles County	St. Mary Medical Center 1050 Linden Avenue Long Beach, CA 90813-3393 Hospital: (562) 491-9000 Trauma: (562) 491-9174 (Private)													12/01/1983	01/01/1992 Changed from Level I Trauma Center to Designation as Level II Trauma Center
Los Angeles County	Daniel Freeman Memorial Hospital														06/01/1987 De-Designated as Level II Trauma Center
Los Angeles County	Martin Luther King Jr. Drew Medical Center														07/01/2004 Changed from Level I Trauma Center to Designation as Level II Trauma Center, 03/01/2005 De-Designated as Level II Trauma Center
Los Angeles County	Methodist Hospital of Southern California														01/01/1989 De-Designated as Level II Trauma Center
Los Angeles County	Presbyterian Intercommunity Hospital														08/01/1989 De-Designated as Level II Trauma Center
Los Angeles County	Queen of Angels Medical Center														02/01/1987 De-Designated as Level II Trauma Center
Los Angeles County	Queen of the Valley Hospital														12/01/1987 De-Designated as Level II Trauma Center
Los Angeles County	Santa Monica UCLA Hospital														08/01/1987 De-Designated as Level II Trauma Center
Los Angeles County	St. Joseph Medical Center														06/01/1989 De-Designated as Level II Trauma Center
Los Angeles County	Westlake Community														06/01/1994 De-Designated as Level III Trauma Center

Appendix D: California Designated Trauma Centers as of April 2017

EMT/Paramedic Agency	County	HOSPITAL	Level I Pediatric Trauma Center	Level I Trauma Center	Level II Pediatric Trauma Center	Level II Trauma Center	Level III Trauma Center	Level IV Trauma Center	Designation Date	Status Change
			Level I Pediatric Trauma Center	Level I Trauma Center	Level II Pediatric Trauma Center	Level II Trauma Center	Level III Trauma Center	Level IV Trauma Center		
MARIN COUNTY EMS (Bay Area RTCC)	Marin									
	Marin County	Marin General Hospital 250 Bonelli Road Greenbrae, CA 94912-5010 Hospital: (415) 925-7000 Trauma: (415) 925-7251 (Private)					1		01/01/2001	
MERCED COUNTY EMS (Central RTCC)	Merced									Approved Trauma Plan & No Designated Trauma Centers
MONTEREY COUNTY EMS (Bay Area RTCC)	Monterey						1			
	Monterey County	Natividad Medical Center 1441 Constitution Blvd Salinas, CA 93906 Hospital: (831) 755-4111							01/06/2015	
MOUNTAIN VALLEY EMS (Central RTCC)	Alpine, Amador, Calaveras, Mariposa, & Stanislaus						2			
	Stanislaus County	Doctor's Medical Center - Modesto 1441 Florida Avenue Modesto, CA 95350 Hospital: (209) 578-1211 Trauma: (209) 576-3776 (Private)							02/02/2004	
	Stanislaus County	Memorial Medical Center - Modesto 1700 Coffee Road Modesto, CA 95365 Hospital: (209) 526-4500 Trauma: (209) 572-7147 (Private)							02/02/2004	
NAPA COUNTY EMS (North RTCC)	Napa									
	Napa County	Queen of the Valley Hospital - Napa 1000 Trancas Street Napa, CA 94558 Hospital: (707) 252-4411 Trauma: (707) 252-4422 ext 2399 (Private)					1		12/01/1988	
NORTH COAST EMS (North RTCC)	Del Norte, Humboldt, & Lake							2		
	Del Norte County	Sutter Coast Hospital 800 E. Washington Street Crescent City, CA 95543 Hospital: (707) 464-6511 Trauma: (707) 263-3640 (Private)							05/09/2009	

	County	HOSPITAL	Level I Pediatric Trauma Center		Level I Trauma Center		Level II Trauma Center		Level II Pediatric Trauma Center		Level I Trauma Center		Level II Trauma Center		Designation Date	Status Change
			Level I Pediatric Trauma Center	Level II Pediatric Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level III Trauma Center	Level IV Trauma Center		
	Lake County	Sutter Lakeside Hospital 5176 Hill Road Lakeport, CA 95443 Hospital: (707) 263-5641 Trauma: (707) 263-5641 (Private)													04/04/2006	
NORTHERN CALIFORNIA EMS (North RTCC)	Lassen, Modoc, Trinity, Plumas, Glenn, & Sierra															
	Glenn County	Glenn Medical Center 1133 W. Sycamore Street Willows, CA 95988 Hospital: (530) 934-1800 Trauma: (530) 934-1800 Ask for ED (Public)													07/30/2002	
	Lassen County	Banner Lassen Hospital 1800 Spring Ridge Drive Susanville, CA (530) 252-2238 (Private)													01/01/2015	
	Plumas County	Seneca Healthcare District 130 Brentwood Drive Chester, CA 96080 Hospital: (530) 258-2151 Trauma: (530) 258-3073 (Private)													12/01/2002	
NORTHERN CALIFORNIA EMS	Plumas County	Indian Valley Healthcare District														01/03/2005 De-Designated as Level IV Trauma Center (ED closed)
ORANGE COUNTY EMS (South West RTCC)	Orange															
	Orange County	Mission Hospital Regional Medical Center 27700 Medical Center Road Mission Viejo, CA 92691 Hospital: (949) 364-1400 Trauma: (949) 364-7754 (Private)													06/01/1980	
	Orange County	UC Irvine Medical Center 101 The City Drive South Orange, CA 92668 Hospital: (714) 456-7800 Trauma: (714) 456-5837 (University)													06/01/1980	
	Orange County	Orange County Global Medical Center 1001 North Tustin Santa Ana, CA 92705 Hospital: (714) 835-3555 Trauma: (714) 953-3422 (Private)													06/01/1980	6/12/2015 Name Change from Western Medical Center-Santa Ana
	Orange County	Children's Hospital Orange County 1201 West La Veta Avenue Orange CA 92668 Hospital: (714) 997-3000													1/15/2015	
	Orange County	Anaheim Memorial Hospital														04/01/1983 De-Designated as Level II Trauma Center

RIVERSIDE COUNTY EMS (South East RTCC)	County	HOSPITAL	Level I Pediatric Trauma Center		Level II Pediatric Trauma Center		Level I Trauma Center		Level II Trauma Center		Level I Trauma Center		Level II Trauma Center		Designation Date	Status Change
			Level I Pediatric Trauma Center	Level II Pediatric Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level III Trauma Center	Level IV Trauma Center				
	Orange County	Fountain Valley Regional Hospital														12/01/1989 Co-Designated as Level II Trauma Center
	Orange County	St. Jude Medical Center														09/01/1983 Do-Designated as Level II Trauma Center
	Riverside															
	Riverside County	Desert Regional Medical Center 1150 North Indian Canyon Drive Palm Springs, CA 92202 Hospital: (760) 323-6511 Trauma: (760) 323-6524													09/01/1994	
	Riverside County	Inland Valley Medical Center 36485 Inland Valley Drive Wildomar, CA 92595 Hospital: (951) 877-1111 Trauma: (951) 896-6210													01/01/1996	10/1/2013 upgraded from Level III to Level II designation.
	Riverside County	Riverside Community Hospital 4445 Magnolia Riverside, CA 92501 Hospital: (951) 788-3000 Trauma: (951) 788-3369													09/01/1994	
	Riverside County	Riverside County Regional Medical Center 26520 Cactus Avenue Mereno Valley, CA 92555 Hospital: (951) 486-4000 Trauma: (951) 486-4557													09/01/1994	12/16/2009 Added Designation as Level II Pediatric Trauma Center
SACRAMENTO COUNTY EMS (North RTCC)	Sacramento															
	Sacramento County	Kaiser - South Sacramento 6600 Bruceville Road Sacramento, CA 95823 Hospital: (916) Trauma: (916)													08/09/2009	Christy Frecceri
	Sacramento County	Mercy San Juan Medical Center 6501 Coyle Avenue Carmichael, CA 95608 Hospital: (916) 537-5000 Trauma: (916) 864-5602													08/01/1999	
	Sacramento County	UC Davis Medical Center 2315 Stockton Boulevard Sacramento, CA 95817 Hospital: (916) 734-2011 Trauma: (916) 734-7122													06/01/1984	
SAN BENITO COUNTY EMS (Bay Area RTCC)	San Benito															Approved Trauma Plan & No Designated Trauma Centers

SAN DIEGO COUNTY EMS (South East RTCC)	County	HOSPITAL	Level I Pediatric Trauma Center	Level II Pediatric Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level III Trauma Center	Level IV Trauma Center	Designation Date	Status Change
			Level I Pediatric Trauma Center	Level II Pediatric Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level III Trauma Center	Level IV Trauma Center		
	San Diego		1					2	3					
	San Diego County	Palomar Medical Center 555 East Valley Parkway Escondido, CA 92025 Hospital: (760) 739-3000 Trauma: (760) 739-3692 (Private)											10/01/1984	
	San Diego County	Rady Children's Hospital San Diego 3020 Children's Way San Diego, CA 92123 Hospital: (619) 966-1700 Trauma: (619) 966-4010 (Private)											08/01/1984	
	San Diego County	Scripps Memorial Hospital 9889 Genesee Avenue La Jolla, CA 92037 Hospital: (619) 626-4123 Trauma: (619) 626-0350 (Private)											08/01/1984	
	San Diego County	Scripps Mercy Hospital and Health Center 4077 Fifth Avenue San Diego, CA 92103 Hospital: (619) 294-8111 Trauma: (619) 260-7285 (Private)											08/01/1984	08/12/2003 Changed from Level II Trauma Center to Designation as Level I Trauma Center
	San Diego County	Sharp Memorial Hospital 7901 Frost Street San Diego, CA 92123 Hospital: (619) 541-3400 Trauma: (619) 541-3200 (Private)											08/01/1984	
	San Diego County	UC San Diego Medical Center 200 West Arbor Drive San Diego, CA 92103 Hospital: (619) 543-6222 Trauma: (619) 543-7200 (Public)											08/01/1984	
	San Diego County	Grossmont Hospital												08/01/1985 De-Designated as Level II Trauma Center
SAN FRANCISCO COUNTY EMS (Bay Area RTCC)	San Francisco							1						
	San Francisco County	San Francisco General Hospital & Medical Center 1001 Potrero Avenue San Francisco, CA 94110 Hospital: (415) 208-8000 Trauma: (415) 208-4639 (Public)											02/01/1991	
SAN JOAQUIN COUNTY EMS (North RTCC)	San Joaquin County										1			
	San Joaquin County	San Joaquin General Hospital 500 W Hospital Rd French Camp, CA 95231 Hospital: (209) 468-6000 (Public)											08/01/2013	

Appendix D: California Designated Trauma Centers as of April 2017

SAN LUIS OBISPO EMS (South West RTCC)	County	HOSPITAL	Level I Pediatric Trauma Center	Level II Pediatric Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level III Trauma Center	Level IV Trauma Center	Designation Date	Status Change
			Level I Pediatric Trauma Center	Level II Pediatric Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center		
	San Luis Obispo	Sierra Vista Regional Medical Center Murray Avenue San Luis Obispo CA 93405 Hospital: (805) 546-7000 Transfer: (877) 903-0003											1		03/01/2012	
SAN MATEO COUNTY EMS (Bay Area RTCC)	San Mateo															Approved Trauma Plan & No Designated Trauma Centers
SANTA BARBARA COUNTY EMS (South West RTCC)	Santa Barbara	Marion Regional Medical Center 1400 East Church St. Santa Maria, CA 93454 Hospital: (805) 739-3000 (Private)					1								04/01/2013	
	Santa Barbara County	Santa Barbara Cottage Hospital P.O. Box 689 Santa Barbara, CA 93102 Hospital: (805) 682-7111 Trauma: (805) 568-7451 (Private)													06/01/2001	Pediatric Level II Designation
	Santa Barbara County	Goleta Valley Cottage Hospital														07/01/2008 De-Designated as Level III Trauma Center
SANTA CLARA COUNTY EMS (Bay Area RTCC)	Santa Clara								2							
	Santa Clara County	Regional Medical Center of San Jose 225 N. Jackson Avenue San Jose, CA 95116 Hospital: (408) 259-5000 Trauma: (408) 272-6466 (Private)													05/24/2005	
	Santa Clara County	Santa Clara Valley Medical Center 751 South Bascom Avenue San Jose, CA 95128 Hospital: (408) 885-5000 Trauma: (408) 885-5220 (Public)													08/01/1986	10/09/2009 Added Designation as Level II Pediatric Trauma Center; upgraded to Level I Pediatric Trauma Center
	Santa Clara County	Stanford University Medical Center 300 Pasteur Drive Stanford, CA 94305 Hospital: (650) 723-7570 Trauma: (650) 723-7570 (University)													08/01/1986	10/09/2009 Added Designation as Level II Pediatric Trauma Center; April 2014 upgraded to Level I Pediatric Trauma Center
	Santa Clara County	San Jose Medical Columbia Center														12-09-2004 De-Designated as Level II Trauma Center (facility closed)

	County	HOSPITAL	Level I Pediatric Trauma Center	Level II Pediatric Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level III Trauma Center	Level IV Trauma Center	Designation Date	Status Change
			Level I Pediatric Trauma Center	Level II Pediatric Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Trauma Center	Level II Trauma Center	Level III Trauma Center	Level IV Trauma Center		
SANTA CRUZ COUNTY EMS (Bay Area RTCC)	Santa Cruz											
SIERRA-SACRAMENTO VALLEY EMS (North RTCC)	Butte, Colusa, Nevada, Placer, Shasta, Siskiyou, Sutter, Tehama, & Yuba								3	4	1	
	Butte County	Enloe Medical Center 1531 Esplanade Chico, CA 95926 Hospital: (530) 332-7300 Trauma: (530) 332-5433									07/01/1988	
	Placer County	Sutter Roseville Medical Center One Medical Plaza Roseville, CA 95661 Hospital: (916) 781-1000 Trauma: (916) 781-1381									01/01/1995	
	Shasta County	Mercy Medical Center Redding 2175 Roselimo Avenue Redding, CA 96001 Hospital: (530) 225-6000 Trauma: (530) 225-7242									08/01/1990	
	Shasta County	Shasta Regional Medical Center 1100 Butte Street Redding, CA 96001 Hospital: (530) 244-5400 Trauma: (530) 244-5170									12/26/2001	
	Siskiyou County	Fairchild Medical Center 444 Bruce Street Yreka, CA 96097 Hospital: (530) 842-4121 Trauma: (530) 842-4121									12/18/2001	2007 Changed designation from Level III to designation as Level IV Trauma Center
	Siskiyou County	Mercy Medical Center Mt. Shasta 914 Pine Street Mt. Shasta, CA 96067 Hospital: (530) 926-5111 Trauma: (530) 926-9367									12/01/2001	06/27/2002 Changed from Level IV to Designation as Level III Trauma Center
	Tehama County	St. Elizabeth Community Hospital 2550 Sister Mary Columba Drive Red Bluff, CA 96080 Hospital: (530) 529-8000 Trauma: (530) 529-8305									12/13/2001	
	Yuba County	Rideout Memorial Hospital 726 4th Street Marysville, CA 95901-5856 Hospital: (530) 749-4300 Trauma: (530) 749-4580									12/01/2001	
	Butte County	Orchard Hospital 240 Spruce Street Gridley, CA 95948 Hospital: (530) 846-9008 Trauma: (530) 846-9008 ask for ED									06/21/2004	5/20/2015 Withdrew its designation

County	HOSPITAL	Level I Pediatric Trauma Center	Level II Pediatric Trauma Center	Level I Trauma Center	Level II Trauma Center	Level I Pediatric Trauma Center	Level II Pediatric Trauma Center	Level I Trauma Center	Level II Trauma Center	Level III Trauma Center	Level IV Trauma Center	Designation Date	Status Change
Butte County	Orville Hospital 2707 Olive Highway Orville, CA 95966 Hospital: (530) 533-8500 Trauma: (530) 532-8349 (Private)											12/01/2001	05/27/2002 Changed from Level IV Trauma Center to Designation as Level III Trauma Center; 1/1/2015 Withdrew its designation
Colusa County	Colusa Regional Medical Center 199 East Webster Street Colusa, CA 95932 Hospital: (530) 458-5821 Trauma: (530) 459-5821 Ask for ED (Private)											12/19/2001	8/5/2015 Withdrew its designation
Shasta County	Mayers Memorial Hospital District P.O. Box 439 Fall River Mills, CA 96028 Hospital: (530) 336-5511 Trauma: (530) 336-5511 Ask for ED (Private)											12/19/2001	7/1/2015 Withdrew its designation
Solano									1	1			
Solano	Kaiser Foundation Hospital 1 Quailly Drive Vacaville, CA 94988 Hospital: (707) 624-4000 Trauma: (707) 624-2275 (Private)											11/01/2011	Level II designation 11/20/2013
Solano	NorthBay Medical Center 1200 B. Gale Wilson Blvd. Fairfield, CA 94533 Hospital: (707) 646-5000 Trauma: (707) 646-4019 (Private)											11/01/2011	
TUOLUMNE COUNTY EMS (Central RTCC)													Approved Trauma Plan & No Designated Trauma Centers
VENTURA COUNTY EMS (South West RTCC)													
Ventura													
Ventura County	Los Robles Hospital & Medical Center 215 West Janss Road Thousand Oaks, CA 91380 Hospital: (805) 497-2727 Trauma: (805) 370-4424 (Private)											07/01/2010	
Ventura County	Ventura County Medical Center 3291 Loma Vista Road Ventura, CA 93003 Hospital: (805) 652-6075 Trauma: (805) 652-5993 (Public)											07/12/2010	
YOLO COUNTY EMS (North RTCC)													Approved Trauma Plan & No Designated Trauma Centers

County	HOSPITAL	Level I Pediatric Trauma Center		Level II Pediatric Trauma Center	Level I Trauma Center	Level II Trauma Center	Level III Trauma Center	Level IV Trauma Center	Designation Date	Status Change
		Level I Pediatric Trauma Center	Level II Pediatric Trauma Center	Level I Pediatric Trauma Center	Level II Pediatric Trauma Center	Level I Trauma Center	Level II Trauma Center	Level III Trauma Center		
TOTAL TRAUMA CENTERS BY DESIGNATION										
				2						
				3						
				5						
				3						
				4						
				5						
				34					Designated Pediatric Trauma Centers 17	
				13						
				11						
				80						
TOTAL:										

APPENDIX E: Research Articles

The following journal abstracts reflect National and California specific research on trauma system development.

Arch Surg. 1979;114(4):455-460

Systems of Trauma Care, A Study of Two Counties

John G. West, MD; Donald D. Trunkey, MD; Robert C. Lim, MD

Summary

Cases of motor vehicle trauma victims who died after arrival at a hospital were evaluated in both Orange County (90 cases) and in San Francisco County (92 cases), Calif. All victims in San Francisco County were brought to a single trauma center, while in Orange County they were transported to the closest receiving hospital. Approximately two thirds of the non-CNS-related deaths and one third of the CNS-related deaths in Orange County were judged by the authors as potentially preventable; only one death in San Francisco County was so judged. Trauma victims in Orange County were younger on the average, and the magnitude of their injuries was less than for victims in the San Francisco County. These data suggest that survival rates for major trauma can be improved by an organized system of trauma care that includes the resources of a trauma center.

J Trauma. 1999 Apr;46(4):565-79; discussion 579-81.

Trauma care regionalization: a process-outcome evaluation.

Sampalis JS, Denis R, Lavoie A, Fréchette P, Boukas S, Nikolis A, Benoit D, Fleiszer D, Brown R, Churchill-Smith M, Mulder D.

Summary

Regionalization of trauma care services was initiated in 1993 with the designation of four tertiary trauma centers. The process continued in 1995 with the implementation of patient triage and transfer protocols. Since 1995, the network of trauma care has been expanded with the designation of 33 secondary, 30 primary, and 32 stabilization trauma centers. In addition, during this period emergency medical personnel have been trained to assess and triage trauma victims within minimal prehospital time. The objective of the present study was to evaluate the impact of trauma care regionalization on the mortality of major trauma patients.

This study produced empirical evidence that the integration of trauma care services into a regionalized system reduces mortality. The results showed that tertiary trauma centers and reduced prehospital times are the essential components of an efficient trauma care system.

Crit Care Med. 2004 Jul;32(7):1477-83.

Impact of between-hospital volume and within-hospital volume on mortality and readmission rates for trauma patients in California.

Marcin JP, Romano PS.

Summary:

Previous research assessing the impact of between-hospital trauma volume (high volume centers vs. low volume centers) and outcomes has been inconsistent. Furthermore, previous research has not considered temporal variations in within-hospital volume (a center having higher than average volume vs. lower than average volume) as a covariate. The objective of this study was to determine the relationship of between-hospital and within-hospital trauma volume and two measures of hospital quality of care. The study analyses a population-based non-concurrent cohort included in the California Patient Discharge Data Set from 1995 to 1999 on thirty-nine nonfederal California hospitals designated as adult trauma centers .

The findings of this study suggest that relationships between trauma volume and outcomes exist but depend on which patient populations are studied and how the data are analyzed. Furthermore, trauma centers may be subject to the detrimental effects of high temporal volume overextending existing services and capacity. Since this study found that both between-hospital volume and within-hospital volume measures are associated with outcomes, we recommend that both measures be included in future volume-outcome investigations.

J Trauma. 2005 Jan;58(1):136-47

Trauma system structure and viability in the current healthcare environment: a state-by-state assessment.

Mann NC, Mackenzie E, Teitelbaum SD, Wright D, Anderson C.

Summary:

Anecdotal reports suggest that some state trauma systems are struggling to remain solvent while others appear stable in the current health care environment. The purpose of this research is to characterize the current structure and viability of state trauma systems in the U.S. Expert panels were convened in all 50 states to characterize the current structure of trauma care and to identify strengths, weakness, opportunities and threats facing trauma care delivery in each state. States continue to value the formalization of trauma systems. System operations, evaluation/research methods and trauma leadership are highly valued by states with mature systems. However, all states consider their trauma system severely threatened by inadequate funding and difficulty recruiting and retaining physicians and nurses. Trauma care systems are valued and demonstrate potential for future expansion. However, economic shortfalls and retention of medical personnel threaten the viability of current systems across the U.S.

J Trauma Nurs. 2010 Jul-Sep;17(3):126-34

Trauma systems origins in the United States.

Boyd DR.

Summary

A historical narrative is presented. The US Civilian Trauma and Emergency Medical Services Systems (EMSS) started in the 1970s. The conceptual basis, strategic, and tactical implementation approaches used to establish the national program are described. The trauma and other clinical systems were extensions of proven clinical methods initially from cardiac and trauma units and deployed in new settings. The overall systems design was regionalization. Professionals, governmental agents, the public, and politicians all worked together to establish local, regional, state, and a nationwide comprehensive trauma/EMSS program that touch every state, territory, and community.

J Trauma. 2010 Apr;68(4):783-9

Improved trauma system multicasualty incident response: comparison of two train crash disasters.

Cryer HG¹, Hiatt JR, Eckstein M, Chidester C, Raby S, Ernst TG, Margulies D, Putnam B, Demetriades D, Gaspard D, Singh R, Saad S, Samuel C, Upperman JS.

Summary:

Two train crash multi-casualty incidents (MCI) occurred in 2005 and 2008 in Los Angeles. A post-crash analysis of the first MCI determined that most victims went to local community hospitals (CHs) with underutilization of trauma centers (TCs), resulting in changes to our disaster plan. To determine whether our trauma system MCI response improved, we analyzed the distribution of patients from the scene to TCs and CHs in the two MCIs.

This study, showing a trauma system performance improvement program, allowed us to significantly improve our response to MCIs with improved utilization of TCs and improved distribution of victims according to injury severity and needs.

J Trauma. 2011 Jun;70(6):1345-53.

Out-of-hospital decision making and factors influencing the regional distribution of injured patients in a trauma system.

Newgard CD¹, Nelson MJ, Kampp M, Saha S, Zive D, Schmidt T, Daya M, Jui J, Wittwer L, Warden C, Sahni R, Stevens M, Gorman K, Koenig K, Gubler D, Rosteck P, Lee J, Hedges JR.

Summary

The decision-making processes used for out-of-hospital trauma triage and hospital selection in regionalized trauma systems remain poorly understood. The objective of this study was to assess the process of field triage decision making in an established trauma system. A total of 64,190 injured patients were evaluated by EMS in this

study, which showed that the provider cognitive reasoning for field trauma triage is driven primarily by provider judgment, rather than specific triage criteria.

J Trauma Acute Care Surg. 2012 Sep;73(3):716-20.

The mortality risk from motor vehicle injuries in California has increased during the last decade.

Waxman K¹, Izfar S, Grotts J.

Summary:

Organized trauma systems and trauma centers are thought to improve trauma outcomes. It is clear that injured patients who receive care in trauma centers have survival advantages. However, large regions of California still do not have access to trauma centers. Many injured patients in California continue to receive their care in non-trauma center hospitals. The purpose of this study was to compare outcomes in California counties with and without trauma centers and to query the efficacy of the current statewide trauma system by asking whether mortality after motor vehicle trauma in California has improved during the last decade. The mortality was significantly lower in counties with trauma centers in this retrospective outcome study using California Highway Patrol data from all motor vehicle crashes (MVCs) and mortality during the years 1999 to 2008 for the 58 counties in California. Low population and hospital density independently correlated with increased mortality. Injury mortality rates after MVCs increased during the decade, both in counties with and without trauma centers. Overall, the presence of a trauma center improved the chances of survival after an MVC in California counties. However, mortality rates after injuries increased during the decade both in counties with and without trauma centers. Future efforts to improve outcomes for injured patients in California will require new approaches, which must include improving both access to trauma centers and the care provided in non-trauma center hospitals.

Ann Emerg Med. 2013 Feb;61(2):167-74.

Emergency medical services out-of-hospital scene and transport times and their association with mortality in trauma patients presenting to an urban Level I trauma center.

McCoy CE, Menchine M, Sampson S, Anderson C, Kahn C.

Summary:

This study determines the association between emergency medical services (EMS) out-of-hospital times and mortality in trauma patients presenting to an urban Level I trauma center. In this analysis of patients presenting to an urban Level I trauma center during a 14-year period (1996 to 2009), we observed increased odds of mortality among patients with penetrating trauma if scene time was greater than 20 minutes. We did not observe

associations between increased odds of mortality and out-of-hospital times in blunt trauma victims. These findings should be validated in an external data set.

J Am Coll Surg. 2013 Apr;216(4):687-95; discussion 695-8

Fifteen-year trauma system performance analysis demonstrates optimal coverage for most severely injured patients and identifies a vulnerable population.

Ciesla DJ¹, Tepas JJ 3rd, Pracht EE, Langeland-Orban B, Cha JY, Flint LM.

Summary:

Trauma systems are designed to deliver timely and appropriate care. Prehospital triage regulations and interfacility transfer guidelines are the primary determinants of system efficacy. This study analyzed the effectiveness of the Florida trauma system in delivering trauma patients to trauma centers over time. Severe injury discharges increased at designated trauma centers (DTCs) and decreased at non-trauma centers (NTCs). The proportion of patients with severe injuries discharged from DTCs increased for all age groups, capturing nearly all severely injured children and adults. Access to DTCs was dependent on proximity for severely injured elderly but not for severely injured children and adults. Triage improved over time, enabling near complete capture of at-risk children and adults independent of DTC proximity. Because distance from a DTC does not limit access for children and adults, existing trauma system resources are sufficient to meet the current demands. Efforts are needed to determine the trauma resource and triage needs of the severely injured elderly.

J Trauma Acute Care Surg. 2013 Oct;75(4):704-16

The effect of trauma center care on pediatric injury mortality in California, 1999 to 2011.

Wang NE¹, Saynina O, Vogel LD, Newgard CD, Bhattacharya J, Phibbs CS.

Summary:

Trauma centers (TCs) have been shown to decrease mortality in adults, but this has not been demonstrated at a population level in all children. We hypothesized that seriously injured children would have increased survival in a TC versus non-trauma center (nTC), but there would be no increased benefit from pediatric-designated versus adult TC care. This was a retrospective study of the unmasked California Office of Statewide Health and Planning Department patient discharge database (1999-2011). The TC outcome models use improved injury severity and case mix adjustment to demonstrate decreased mortality for seriously injured California children treated in TCs. These results can be used to take evidence-based steps to decrease disparities in pediatric access to, and subsequent outcomes for, trauma care.

Health Aff (Millwood). 2013 Dec;32(12):2091-8.

Sustaining a coordinated, regional approach to trauma and emergency care is critical to patient health care needs.

Eastman AB, Mackenzie EJ, Nathens AB.

Summary:

Trauma systems provide an organized approach to the care of injured patients within a defined geographic region. When fully operational, the systems ensure a continuum of care involving public access through 911 calls, emergency medical services, timely triage and transport to acute care, and transfer to rehabilitation services. Substantial progress has been made in establishing statewide trauma systems, which are seen as the prototype for regionalized care for other time-sensitive, emergency conditions such as stroke. Trauma systems provide a model of care that is consistent with the goals of the Affordable Care Act, which authorizes \$100 million in annual grants to ensure the continued availability of trauma services. Full funding of these provisions is needed to stabilize statewide systems that are struggling to survive. We describe the components of a regionalized trauma system, review the evidence in support of this approach, and discuss the challenges to sustaining systems that are accountable and affordable.

J Emerg Trauma Shock. 2014 Jan;7(1):41-6.

A comparison of rural versus urban trauma care.

Lipsky AM, Karsteadt LL, Gausche-Hill M, Hartmans S, Bongard FS, Cryer HG, Ekhardt PB, Loffredo AJ, Farmer PD, Whitney SC, Lewis RJ.

Summary:

This study compared the survival of trauma patients in urban versus rural settings after the implementation of a novel rural non-trauma center alternative care model called the Model Rural Trauma Project (MRTP). Authors conducted an observational cohort study of all trauma patients brought to eight rural northern California hospitals and two southern California urban trauma centers over a one-year period (1995-1996). This study demonstrates that rural and urban trauma patients are inherently different. The rural system utilized in this study, with low volume and high blunt trauma rates can effectively care for its population of trauma patients with an enhanced, committed trauma system, which allows for expeditious movement of patients toward definitive care.

Characteristics of Pediatric Trauma Transfers to a Level I Trauma Center: Implications for Developing a Regionalized Pediatric Trauma System in California

Colleen D. Acosta, MPH, M. Kit Delgado, MD, Michael A. Gisondi, MD, Amritha Raghunathan, MD, Peter A. D'Souza, MD, Gregory Gilbert, MD, David A. Spain, MD, Patrice Christensen, RN, and N. Ewen Wang, MD

Summary:

Since California lacks a statewide trauma system, there are no uniform interfacility pediatric trauma transfer guidelines across local emergency medical services (EMS) agencies in California. This may result in delays in obtaining optimal care for injured children. This study sought to understand pattern of pediatric trauma patient transfers to the study trauma center as a first step in assessing the quality and efficiency of pediatric transfer within the current trauma system model. The hypothesis was that transferred patients would be more severely injured than directly admitted patients, primary catchment transfers would be few, and out-of-catchment transfers would come from hospitals in close geographic proximity to the study center. Trauma patients brought directly to the emergency department (ED) and patients transferred from other facilities to the center were compared. From the perspective an adult Level I trauma center with a certified pediatric intensive care unit (PICU), delays in definitive pediatric trauma care appear to be present secondary to initial transport to non-trauma community hospitals within close proximity of a trauma hospital, long transfer distances to accepting facilities, and lack of capacity at the study center. Given the absence of uniform trauma triage and transfer guidelines across state EMS systems, there appears to be a role for quality monitoring and improvement of the current interfacility pediatric trauma transfer system, including defined triage, transfer, and data collection protocols.

N Engl J Med. 2006 Jan 26;354(4):366-78.

A national evaluation of the effect of trauma- center care on mortality.

MacKenzie EJ1, Rivara FP, Jurkovich GJ, Nathens AB, Frey KP, Egleston BL, Salkever DS, Scharfstein DO

summary:

Hospitals have difficulty justifying the expense of maintaining trauma centers without strong evidence of their effectiveness. To address this gap, we examined differences in mortality between level 1 trauma centers and hospitals without a trauma center (non-trauma centers). Mortality outcomes for patients 18 to 84 years old with a moderate-to-severe injury were compared among 18 hospitals with a level 1 trauma center and 51 hospitals non-trauma centers located in 14 states. After adjustment for differences in the case mix, the in-hospital mortality rate was significantly lower at trauma centers than at non-trauma centers. The effects of treatment at a trauma center varied according to the severity of injury, with evidence to suggest that differences in mortality rates were primarily confined to patients with more severe injuries. These findings show that the 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.

Wherever the Dart Lands: Toward the Ideal Trauma System

A Brent Eastman, MD, FACS

I can't express strongly enough how honored I am to be standing before you, my peers and friends and patients, to speak about an issue that has absorbed my professional life: the development of trauma systems in North America and beyond. I accept the responsibility of giving the Scudder Oration recognizing it is meant to be a seminal address on the care of the injured patient, meant to carry a message to the people in this room and to trauma surgeons and trauma teams in the United States, Canada and around the world.

This 77th Scudder Oration will be built around surgeons, patients, and maps. I'll begin with my mantra, which some have said may be engraved on my tombstone. My wife, Tica, who is my editor and a master of brevity, says it's too long for a mantra, or a tombstone, for that matter, but here it is: my concept of an inclusive trauma system is one that is designed to ensure expeditious transfer to the appropriate level of care commensurate with the patient's injuries wherever the geographic location. Let me emphasize *appropriate* level of care because trauma systems have been misconstrued as dealing with only the most critically injured, the patients who must be triaged to a Level I or II trauma center, but that is not correct. An inclusive trauma system is meant to encompass all injuries: minor, moderate, and major. If you're a patient with a relatively minor injury, you don't need to go to a Level I or II trauma center, but you do deserve access to a facility that is committed and equipped to give you optimal care for your injury. If the facility you reach is not prepared to provide the care you need, you must be expeditiously transferred to a level of care commensurate with your injury. Hence my title, "Wherever the Dart Lands."

I've chosen to bracket this lecture in a time frame that mirrors my own career in trauma and my own life. It's tempting, when speaking about trauma, to begin with ancient history, and others have done that extremely well. In reading nearly all of the 76 previous Scudder Orations, however, I found no one who started in Evanston, WY, so I

thought, if nothing else, there's original material here. Evanston was my hometown, population 3,000. I was inspired by you, Anna Ledgerwood, when you began your Scudder Oration talking about your beginnings in rural America, and I wish to emulate your approach.

Evanston and southwest Wyoming, when I was growing up, had a trauma system that was mostly my uncle Gilbert. Gilbert was county coroner and owned the funeral home, but he also taught first aid, and whenever there were injuries on the roads or ranches, he and his mortuary helper could slip out the coffin rollers in his 1951 Cadillac combination hearse and ambulance, slip in a gurney, stick on the flashing red light, and be on their way. His son and sometime assistant told me they occasionally had to interrupt a funeral for a trauma call. It was a somewhat delicate maneuver to offload the casket and take off for the scene of the trauma, not to mention disconcerting to bystanders, when the hearse arrived. No doubt some of them wondered about a conflict of interest; would they turn left to the mortuary or right to the hospital?

Evanston also had a disaster plan, born out of civil defense in World War II, and Gilbert organized the town's response to The Great Train Wreck of November 1951, in which one passenger train slammed into the back of another during what would turn out to be the worst blizzard of the winter. That year the Annual Clinical Congress of the American College of Surgeons (ACS) met in San Francisco, November 5 to 9, at the Fairmont Hotel. On Sunday, November 11 at 5 PM, several of the attending surgeons and their wives boarded the streamliner *City of San Francisco* bound for Chicago. Eighteen hours later at Evanston, WY, the *City of San Francisco* ran a red light covered over by new snow and hit the back of the halted *City of Los Angeles* with such force that the mangled cars took out a freight train on the sideline. Some of the surgeons died; others acted quickly to help the wounded, including one orthopaedist who made his way into the kitchen car and carried out smashed orange crates to serve as splints for broken limbs—perhaps inspired by the Annual Oration on Fractures, at that year's Clinical Congress, which would be renamed The Scudder Oration, the next year. **Figure 1** shows pictures from the local newspaper about the worst rail accident in many years. As an 11-year-old boy, I was taken by my father, a locomotive engineer running the great steam engines, and my hero, to see this crash because

Disclosure information: Nothing to disclose.

Presented at the American College of Surgeons 95th Annual Clinical Congress, Chicago, IL, October 2009.

Received May 7, 2010; Accepted May 7, 2010.

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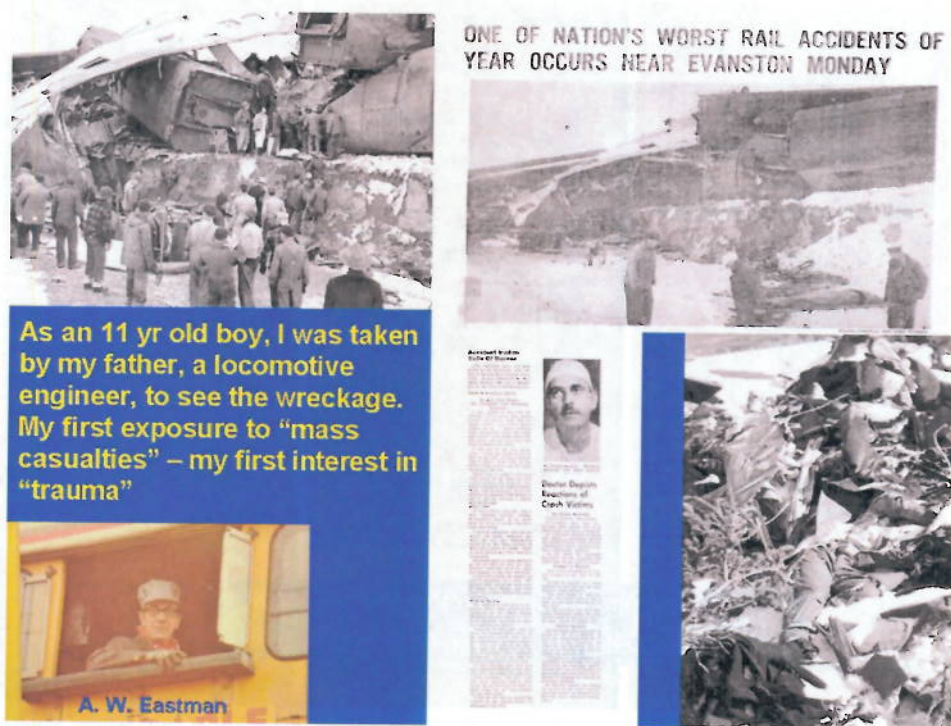


Figure 1. Train wreck, Evanston, WY, November 1951. From the *Unita County Herald*, Evanston, WY, November 16, 1951.

the engineer was a next-door neighbor and friend. This was my first exposure to mass casualty, and it awakened my interest in trauma.

Thanks to Rollo Hanlon, MD, FACS, I was able to go further in my research and find the program of the 1951 Clinical Congress of the American College of Surgeons (Fig. 2). You can see the names of some stellar surgeons leading us at that time: Blalock and Wangenstein and Frank Glenn, among others. Figure 3 shows the Oration on Fractures, given that year by the British Sir Reginald Watson Jones.

Now, if I might fast forward in time 11 years, again using my own experience in the world of trauma to bracket this lecture, I started my internship in 1966 under Dr J Englebert Dunphy, as did several others in this room as you'll see, and under Dr William Blaisdell. I would point out that before 1966 there were no formal trauma centers and certainly no trauma systems in the United States. However, as my good friend J David Richardson points out, there may not have been formal trauma centers in those years, but there were hospitals with surgeons dedicated to the care of injured patients, including his own in Louisville. I think that's an important point because one of the central themes of this lecture is the importance of surgical volunteerism. Trauma centers and trauma systems here and around the world are successful only because of the volunteerism, com-

mitment, and passion of trauma surgeons such as those sitting in this room. The year 1966 was an important one; the monograph, *Accidental Death and Disability: The Neglected Disease of Modern Society* was written.¹ Today, I worry that we may not have come far enough, fast enough, that we will fail to recognize trauma as the neglected disease of the 21st century; this recognition will be part of my call to action.

I had the opportunity to interview Dr Blaisdell at the 2009 Pacific Coast Surgical Association Meeting (Fig. 4) at the Fairmont Hotel in San Francisco, the same hotel that hosted the 1951 Clinical Congress, and I asked him about 1966. He had told us many times, "Everything changed then." It was the advent of Medicaid and Medicare, and psychiatry units closed and emptied their disturbed patients onto the streets. There were drugs and violence. At the time of the Vietnam protests, crimes of violence doubled, which Dr Blaisdell said was the impetus to create a more formal trauma center at the San Francisco General Hospital. If you haven't read it, I would highly recommend Dr. Blaisdell's 1991 Presidential address at the American Association for the Surgery of Trauma on the pre-Medicare role of the city and county hospitals in education and health care.² There were 12 great public hospitals; almost all of the first hospitals in the United States developed as a result of the need for indigent care. These were the primary institu-

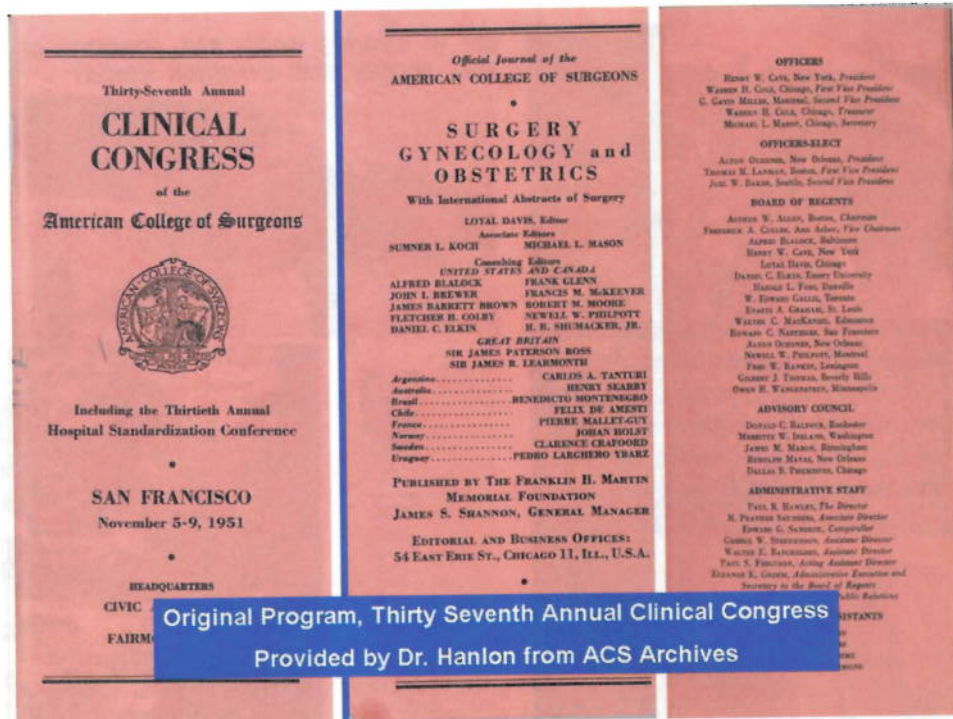


Figure 2. Original program, 37th Annual Regional Clinical Congress. (Courtesy of Dr C Rollins Hanlon, American College of Surgeons Archives).

tions for the care of the injured during most of our country’s history, and the vast majority of advances in trauma care arose from these great public hospitals (Fig. 5). I’m sure there are surgeons in this audience who may see their own beginnings in trauma in one of these hospitals. But the two that are considered to be the first two trauma centers, San Francisco General with Dr Blaisdell, who, was the Scudder orator in 1982, and Cook County, in Chicago with Dr Robert Freeark, who was the orator in 1985. Dr Freeark talked about an “accident hospital,” but he proposed a different kind of hospital: one that would be the focal point of a *system* of care.

I can’t resist commenting on being a boy from Wyoming, going to San Francisco in the 1960s. It was culture shock, with the Grateful Dead, the peace marches, LBJ as President; we were embroiled in the Vietnam War, drugs were rampant, and, as somebody said, “If you remember San Francisco in the 60s, you weren’t there.” I’m using this opportunity to tell you that I do remember San Francisco and I was there. It’s just that I was spending most of my time, like all the other surgical residents with no work hour restrictions, at the San Francisco General Hospital. Our trauma team during the period 1966 to 1972 consisted of George Sheldon and Don Trunkey, Frank Lewis and myself (Fig. 6). Don Trunkey and George Sheldon, being ahead of Frank and me, were chief residents when we were junior

residents, but we too evolved to the position of chief residents at UCSE.

Time doesn’t allow me to talk about all the people who have made seminal contributions to trauma system development in this country but I would be remiss not to mention Dr David Boyd, who made the first effort toward founding trauma systems at a federal level, when he was appointed by the Secretary of Health Education and Welfare to head up the Emergency Medical Services (EMS). There was funding in the 1970s, we had momentum, and David Boyd took advantage of that and had us on our way until the 1980s, when all of that funding and that enabling legislation were eliminated and we went into a slump from which we’re still trying to recover. Dr R Adams Cowley trained some of you at Maryland Shock Trauma, which we acknowledge as the first statewide trauma *system*.

In “Systems of Trauma Care: A Study of Two Counties,”²³ by Drs Donald Trunkey and John West, they compared San Francisco and Orange counties after we all had finished our surgical training in San Francisco. This is a foundational paper because they did the first preventable death study. They showed that the preventable death rate in Orange County was significantly greater than in San Francisco, which had a *de facto* trauma system because all trauma patients in the city and county were taken to the San Francisco General Hospital. It was that paper and the influence

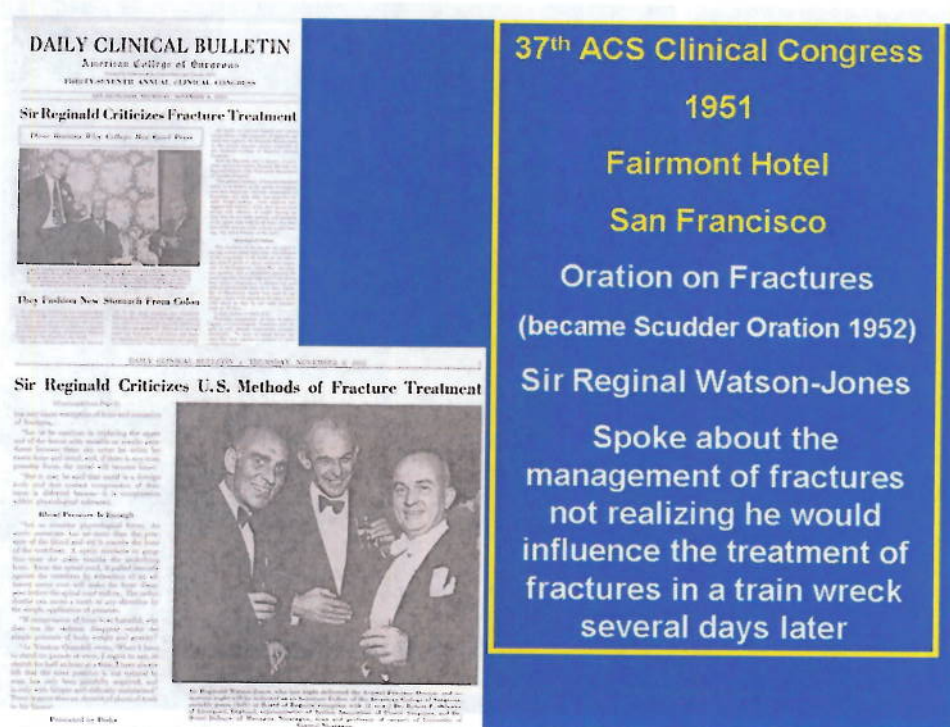


Figure 3. The 37th American College of Surgeons Clinical Congress Oration on Fractures, Sir Reginald Watson-Jones.

of Drs Trunkey and West that led us in San Diego to do our own preventable death study, called “The Amherst Study,” which, incidentally, was funded by the County Board of Supervisors to determine whether we needed a trauma system in San Diego County. When we did our study, we found we had the same unacceptably high preventable death rate, 22%. But guess what? It wasn’t because of one or two bad hospitals. Every one of our hospitals was striving to do the best it could but shared this 22% preventable death rate because we had no trauma system. We did not always have surgeons available; we didn’t always have blood available, or experienced triage nurses, or specialists. However, once the system was instituted, the preventable death rate fell to 1% to 2% and remains there through today. Evidence of the efficacy of a trauma system.

Fortunately, we had surgical champions because no trauma center, let alone system, can ever be created without them. In a slightly biblical reference, let me say that in the beginning there were trauma surgeons. In San Diego those were Richard Virgilio, David Hoyt, and Steve Shackford, and I had the honor of working with them at that time. We were followed by a legion of others who created the San Diego trauma system. Dr Richard Virgilio had come back from Vietnam and made a statement before the Board of Supervisors that a soldier wounded in the rice field in Vietnam has a better chance of survival than a trauma patient in

San Diego, and that launched us. From the beginning, our Medical Audit Committee (MAC) had delegates from the entire system—the 5 designated adult centers, the 1 pediatric center, as well as the medical examiner, surgical specialties, anesthesia, nontrauma hospitals, and county officials—and all gathered on a monthly basis. This has continued uninterrupted for 25 years and is now chaired by Dr Raul Coimbra; it continues to do the work of peer review and quality improvement that I believe holds our system together.

Some of us had the opportunity to participate in creating “The Model Trauma Care System Plan” in 1992.⁴ Drs Ronald Maier and Bill Schwab were two of the key people, and in that document the term *inclusive trauma system* was first used. Emergency room physician Dr Ricardo Martinez was on that committee and later became director of the National Highway Traffic Safety Administration. I give Ricardo credit for coming to one of our breakfast meetings with a napkin on which he had drawn a curve depicting the relationship of the volume of trauma patients stratified by their severity of injury. He said, “You know what we’ve done is focused only on the severely injured patients and only the Level I and II trauma centers.” We had neglected those patients with moderate and minor injuries. An inclusive system must encompass the entire continuum of care including all injured patients. It must go beyond the hos-

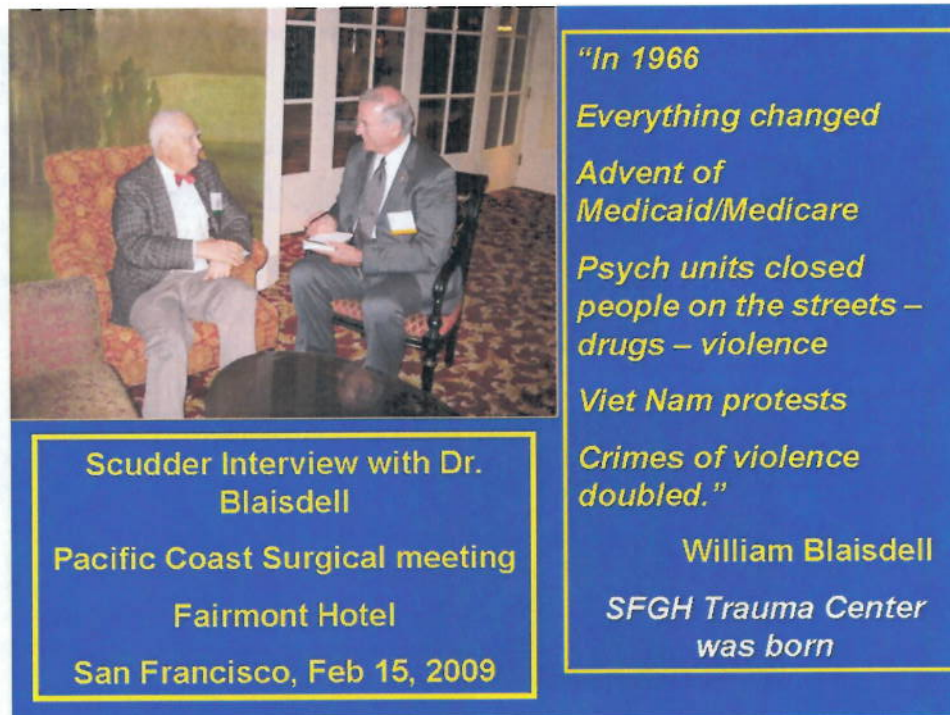


Figure 4. Scudder interview with Dr William Blaisdell, February 15, 2009.

pital, must include prevention, prevention, prevention, and it must address the critical element of rehabilitation and even end of life care.

In 1998, the Skamania Symposium in Washington was

organized by Dr Trunkey and his colleagues. This was a search for evidence supporting trauma system development, which led to the writing, in 2006, of the "Model Trauma System Planning and Evaluation."⁵ Many of the

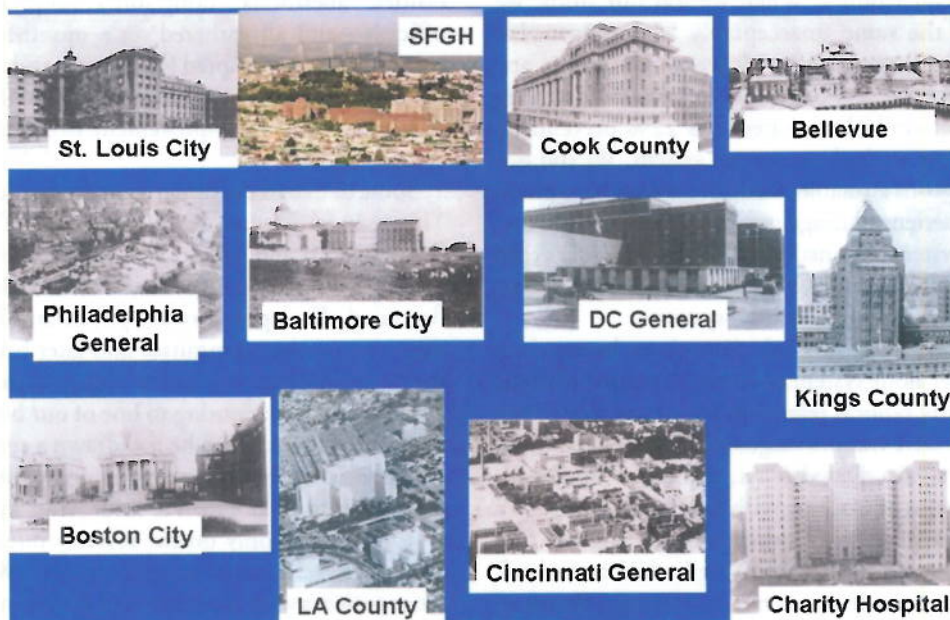


Figure 5. The great public hospitals.

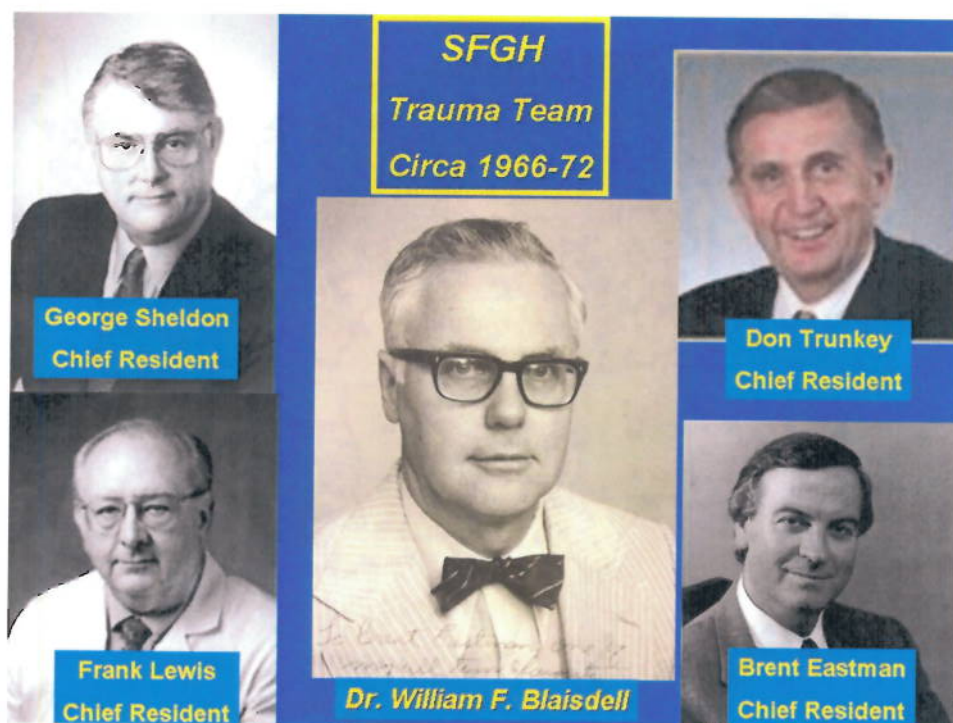


Figure 6. San Francisco General Hospital trauma team circa 1966 to 1972.

people in this room participated in this, which was an extension of the 1992 document. The important thing for you to know about this paper is that it is fundamental to the development of trauma systems today because it incorporates the concept that *injury is a public health problem*. In fact, it may be our worst public health program; it may be our worst global public health problem. So this helps us design systems to take that into account.

What is the current status of trauma systems in the United States? The map in Figure 7 is an update on trauma center status, courtesy of Anthony Carlini from the American Trauma Society, Trauma Information Exchange Program. It shows the distribution of trauma centers and was updated within the last few months, and Anthony was willing to share this. He also provided data to show the progress we've made: a big jump, for example, in Level I and II trauma centers between 1991 and 1992 and then a leveling off.

I realized that we had not had an update on which states in the US had a trauma system so I embarked on a survey with the aid of Dr Peggy Knudson, vice-chair of the Committee on Trauma (COT), who assisted me in asking all 50 state chairs of the COT 3 questions:

1. Does your state have a **state-wide trauma system**?
2. If not, does your state have any **regional systems** or any verified or designated centers?

3. Does your state **collaborate with any other state** in a system of care?

Figure 8 shows the results. This, I believe, is the most current look at this country in terms of states with trauma systems and those who are in the progress of trying to develop trauma systems. Dr Sheldon and his colleagues at the ACS Sheps Health Policy Institute put this into a pie graph, which shows that about two-thirds of the states today have some type of trauma system, which, I would hasten to add, could be a trauma system at the most basic level. All the respondents had to show for a "yes" answer was that their state had a trauma plan and existence of the imperative enabling legislation. On the other hand, they almost all lacked adequate funding for sustainable trauma systems. However, this survey has provided a valuable database because the answers to those 3 questions provide important and useful material from trauma surgeons about their challenges in building systems in their respective states. These data will be shared with the Committee on Trauma for their continued efforts in trauma system development.

Among all of the responses, over 90% said inadequate funding is a major problem because of a lack of support both at state and federal levels. This was particularly emphasized in some of our western states, where, as one state chairman said, "Personal freedom is cherished above all."

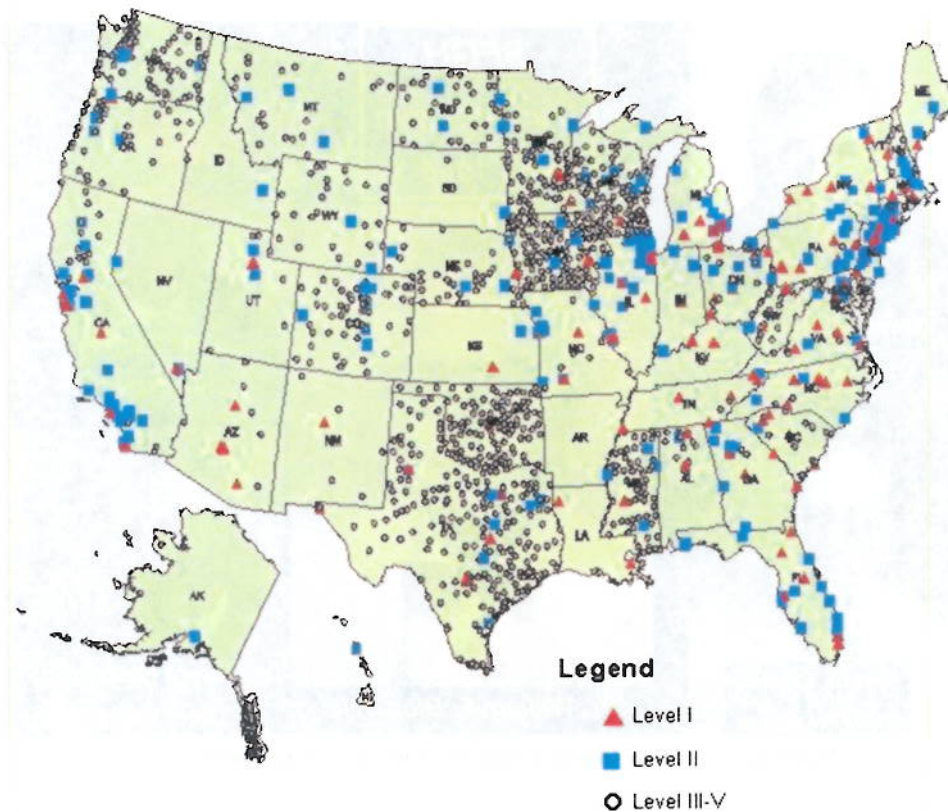


Figure 7. Updated trauma center status, July 2009. (Courtesy of Anthony Carlini, American Trauma Society, Trauma Information Exchange Program).

He said, “We have no trauma system, we have no seatbelt laws, we have no helmet laws.” So there are still tremendous barriers to overcome to accomplish what we need to do in establishing trauma systems everywhere in the country—wherever the dark lands.

The other important thing these data speak to is the need for surgical leadership in the development of any trauma system. We also found that states vary greatly in what they are doing with the development of trauma systems. Some states have only a few verified trauma centers and, by contrast, a state like California has several regions with functioning systems and a plan to merge these regional systems into a state plan. Figure 9 shows the regions—it’s a big state. I acknowledge Jonathan Jones for providing this map, which was meant to represent these 5 regions working together. Dr Coimbra is the leader in our southernmost region, including San Diego; Dr Hoyt is the leader in his region just to the north, and is the person who has led the development of the state-wide plan for California, which will, in the near future, bring these 5 systems together for a truly state wide system (a “system of systems”) comprehensive statewide system or a “system of systems”.

The map in Figure 10 is the centerpiece of this lecture. It is based on unpublished data provided to me by Lee Annett, PhD National Center for Injury Prevention and Control, CDC. I am a member of the CDC’s Scientific Advisory Board and was there a few months ago, saw this map, and asked Dr. Annett if I could use it for this lecture. I would ask you to look carefully and see that this is, first of all, not the returns from the last Presidential election, although the red and blue distribution is similar. This is the death rate per 100,000, which is smoothed, meaning that they took into account the disparity and the discrepancy between counties with varying populations. It’s age adjusted, and this particular map is looking at the death rate per 100,000 for people who die on our roads—not just occupants of cars, but pedestrians and bicyclists as well. I believed that we could do something with these data, and I spoke to Charlie Branas and his colleague, Dr. William Schwab at the University of Pennsylvania, who had done some remarkable work in which they mapped the time to a Level I or II trauma center. I asked if they had ever thought about overlaying their map on death rates to see if there’s any correlation. So they did that, and we have this map, courtesy of the cartographers at the University of Pennsyl-

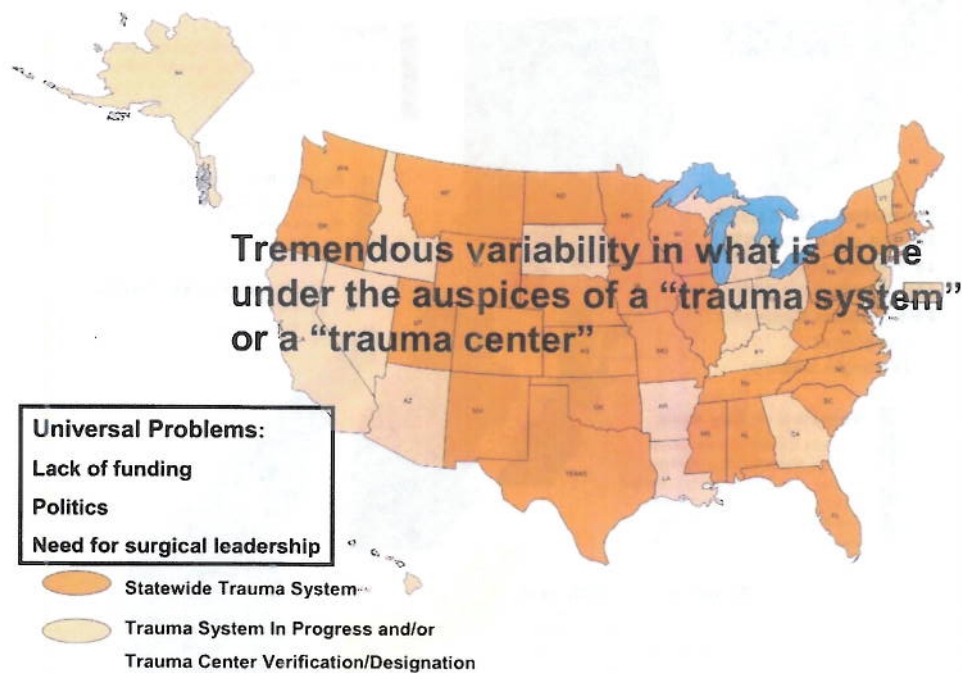


Figure 8. Status of trauma systems in the US, 2009. Based on the American College of Surgeons (ACS) State Chair Survey. (Courtesy of Tom Ricketts, PhD, George Sheldon, MD, FACS, and ACS Sheps Health Policy Institute).

vania (Fig. 11), showing us what we intuitively know: that long travel times equal high death rates. Lack of proximity to a trauma center or the appropriate level of care results in high death rates.

I thought we would take the next step and look at the issue that George Sheldon has made us so aware of: that we have a shortage of surgeons in this country. Some of you remember that Richard Cooper gave the opening address, the American Urological Association Lecture, “The Coming Era of Too Few Physicians,” at the ACS Clinical Congress in 2007 in New Orleans, and he talked about the physician shortage. The striking thing is that we are going to be short 200,000 physicians by the year 2020 and, contrary to much of what is being said in discussions today about health care reform, which is that “we’re only going to be short of primary care physicians,” I submit we’re going to be short of specialists, we’re going to be short of surgeons of every specialty, and we’d better do something about that. One thing I propose we do about it is take the work of George Sheldon and Tom Ricketts demonstrating where we have surgeons and where we don’t (Fig. 12). Big circles are good, little circles are bad. At my request they did the same thing, they took the data from Lee Annett at the CDC; he allowed them to take his map and superimpose the distribution of surgeons in the United States on death rate. Look carefully, there is a lot of dark brown in the center of the country and that means the highest death

rates. These death rates tell us that it is not good to be hurt in rural America. This is added impetus for us to support our surgeons who work diligently in the less populated regions of our country, often without the support and resources of those working in urban and suburban regions. Conversely, we have a concentration of surgeons on both coasts. In Washington D.C. today, some argue that this is just a maldistribution problem, but we disagree. There is going to be an absolute shortage of surgeons in this country, and yes, we must be part of the solution for this surgical problem. For example, we must determine how to provide neurosurgical coverage when there are only 3,000 or 4,000 neurosurgeons in the entire country. I believe this is our responsibility as surgeons. I submit that trauma care in the United States needs a surgeon. We must never let this message die.

We must strongly bring this message to the health care reform debate. One of the central things we have to convey is what we tried to do on the Institute of Medicine Committee on the Future of Emergency Systems. That message is that we have the model for much of what is being debated in the halls of Congress today regarding access, quality, and evidence based medicine—that solution is called an Inclusive Trauma System.

We are the American College of Surgeons of the United States and Canada and, although I haven’t focused on Canada, with the help of Drs Richard Simmons and Sandro

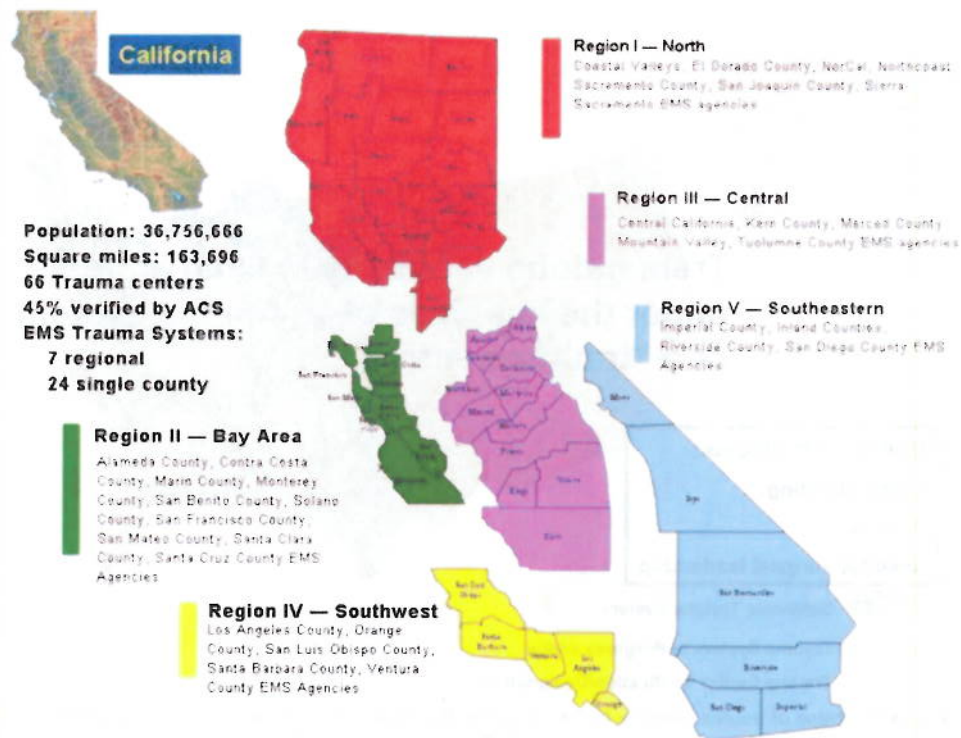


Figure 9. California regional trauma systems. (Courtesy of Jonathan Jones, California Emergency Medical Services (EMS) Agency).

Rizoli, the Canadian regions chiefs of Regions 11 and 12, I was able to get current information on the status of trauma systems and centers in Canada. Those in the audience who are from Canada, and many of us traveling in Canada, should know they, too, have a skew in the distribution of their trauma centers, which tend to mainly lie along the United States border. Dr Simmons was able to give me this information and I won't go into detail except to say that most of the provinces in Canada do have province-wide regionalization or a trauma system. Most of them also have designated and certified trauma centers. The exceptions are the provinces of Saskatchewan and Manitoba. There they have 3 university centers that are *de facto* trauma centers, where seriously injured patients are transported, however they do not have organized provincial trauma systems. Canada has done a superb job with trauma care and has very strong leadership with people like Drs Richard Simmons and Sandro Rizoli as the Canadian region chiefs. Thank you both for providing these data to me. Invoking my metaphor, *wherever the dart lands*, we see the same problems that we have in the US. If that dart happens to land in rural Canada or the Territories, the death rate is unacceptably high and the only solution to that is establishment of a Canadian trauma system(s).

The Trauma System Consultation Committee of the

ACS is critical to the solution of this problem. We formed this committee in 1994, with Dr Wayne Meredith as a founding member. Dr Robert Mackersie took over the chair from me and Dr Michael Rotondo leads it today. The document we put together was fairly basic and was based on the Health Resources and Services Administration (HRSA) document, the 1992 "Model Care Trauma Plan." More recently the Committee on Trauma, led by Avery Nathan and his team, have done an excellent job of creating a more sophisticated document to help our teams when they do state trauma system consultation visits. The goal is to help move any systems, whatever their stage of development, to the next level. In Figure 13, you see the states that have had an ACS Trauma System consultation, those that are lacking, and those that were recently done. This is a significant accomplishment, but it is very labor intensive. We must find a way to do it more efficiently because it's something that the United States desperately needs. We must be available to states like Idaho, if they request our help, to aid them in establishing a trauma system. Dr Winchell did an analysis of this process and concluded that consultations had not managed to solve the funding problem, one of our major challenges, but they have been very helpful in many other areas of trauma system development. I'll not dwell on the many lessons learned from the consul-

Smoothed, age-adjusted death rates per 100,000 population, United States, 2000-2006

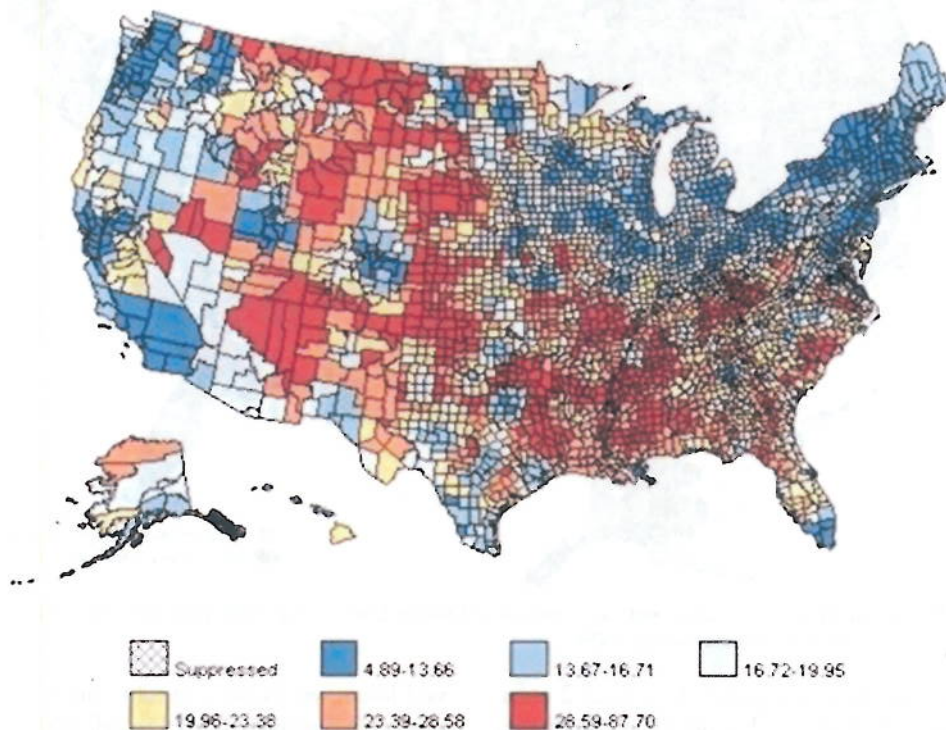


Figure 10. Motor vehicle traffic deaths per 100,000; 2000 to 2006. Smoothed, age-adjusted death rates per 100,000 population (motor vehicle, traffic, unintentional, all races, all ethnicity, both genders, all ages). Age-adjusted rate for United States: 15.31 per 100,000 population. (Unpublished data reproduced with permission of Lee Annett, PhD, Office of Statistics and Programming; National Center for Injury Prevention and Control, Centers for Disease Control).

tation visits except to say that there is important information gleaned, catalogued, and then shared during other consultation visits.

Do trauma systems make a difference? To ask this question would, with this audience, be preaching to the choir, as would my answer when I say, they do and they must make a difference. If we are to decrease the unacceptably high death rates that you have seen in [Figure 10](#), we must establish trauma systems. If we don't do this we run the risk of trauma being "the neglected disease of the 21st century." Ellen McKenzie and colleagues⁶ published an elegant paper in the *New England Journal of Medicine* showing that the risk of death is 25% lower if you have a system that gets you to a trauma center.

So now, with maps and tables and data, I would like to depart from the format of many other Scudder Orations and tell a patient story. According to Carlos Pellegrini, MD, FACS, Chair Department Surgery, University of Washington, the WWAMI system—Washington, Wyoming, Alaska, Montana, and Idaho—started out as an ed-

ucational system in 1972, but it evolved into a trauma system under the leadership of Drs. Carrico, Maier, Jurkovich, and others. I posed the question, "What if the dart landed in this system that's been in place for 25 years? Would the trauma system make any difference to the injured people?" I'll answer my own question and tell you it did make a difference for Johan and Jenna Otter. Johan is an employee at our Scripps Health system in San Diego. He is one of our most valued and beloved managers. Johan came to me a couple of years ago and said that his daughter Jenna, for her high school graduation trip, wanted to take a hike with him and asked where they should go. I suggested my home state and specifically, Jackson Hole, WY. He took my advice partially and they went to Jackson Hole, WY, but they also went to Glacier National Park, MT. This is going to be the story of the Kalispell Regional Medical Center, a small and excellent hospital in Montana, and the Harborview Medical Center, the WWAMI regional Level I trauma center in Seattle.

Johan and Jenna, hiking alone on a cold morning with

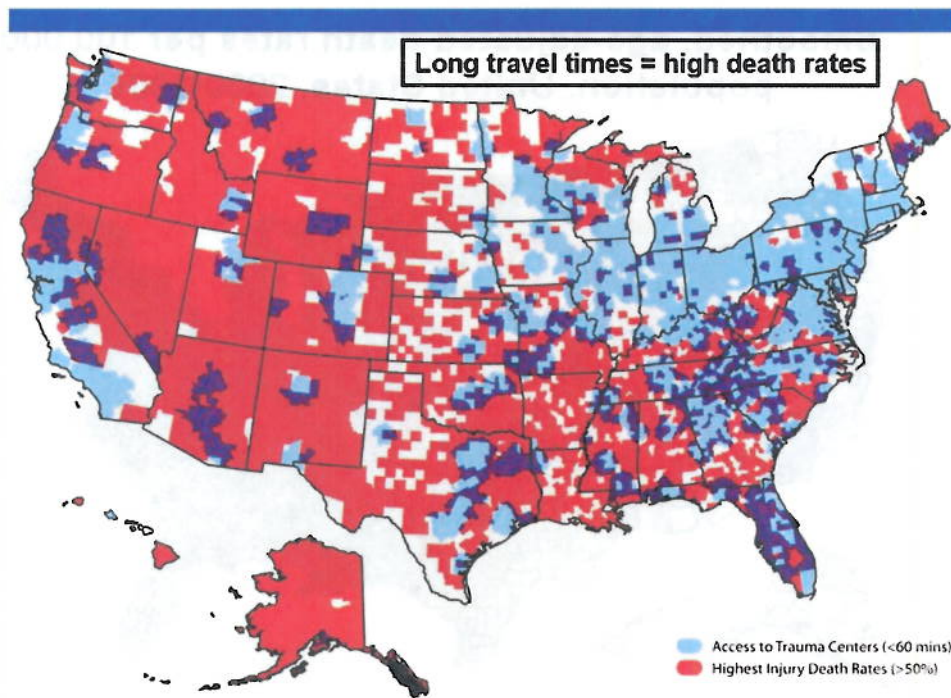


Figure 11. Access to trauma centers. (Courtesy of Charles Branas, PhD, Cartographic Modeling Laboratory, University of Pennsylvania, 2009).

fresh snow, encountered a sow grizzly bear with 2 cubs. Jenna, who is very fit and was bound for a career as a classical/modern dancer, was leading when the mother grizzly came around a bend in the trail. Johan heroically got himself between the bear and his daughter and took the brunt of the attack. Although Jenna was also badly mauled. In trying to escape Jenna fell 50 feet to a ledge below. Johan, fighting with the bear, fell, with the bear, to the same ledge. The bear continued to maul him then moved to Jenna, mauled her, and then returned to the trail and to her cubs.

This trauma scenario demonstrates an inclusive trauma system at its finest. First there was the prehospital component, including a 6-hour heroic helicopter rescue to get both victims off the ledge. Johan and Jenna couldn't see one another, but were talking after they finally established that the bear had left and they were both alive. Johan had a 60% scalp avulsion, an unstable C-spine fracture, multiple vertebral fractures, bites, a claw injury to his right eye with the rectus muscle lacerated, fractured orbit, and some psychological trauma. Jenna had a severe laceration to the right side of her face, fortunately missing the facial nerve, a deep bite in her shoulder, and on and on. They were resuscitated and stabilized at the Kalispell Regional Medical Center. I had a call from Dr Iwerson, the trauma surgeon there, who told me that one of our employees, Johan Otter, was in his emergency room, and was one of the most badly injured survivors of a grizzly bear attack he had ever treated. He

said Johan was awake and told him to call his trauma surgeon, Dr Eastman. I have to tell you Dr Iwerson didn't sound too pleased to call me and in fact, allowed that he thought perhaps he, in Kalispell, MT, had taken care of more grizzly bear attacks than I had in San Diego. I, of course, agreed with that. We also agreed on the next course of action, which was that Jenna could stay in Kalispell, but Johan had to get to the Harborview Level I trauma center. This story has a happy ending and demonstrates the triumph of an inclusive trauma system from rescue to recovery and rehabilitation. Today, we can celebrate one of our exemplary inclusive trauma systems. There are other great trauma systems, but what they've done in the Northwest with leadership from the trauma surgeons at Harborview is a model, especially in the area of rural trauma care. By the way, Johan and Jenna returned to Glacier to finish their hike in August of 2007 with their rescuer, Gary Mosley, who was named Ranger of the Year for his team's heroic effort. Also, far from being defeated by this tragic event, Jenna has now decided to pursue a career in medicine as well as dance. Johan and Jenna Otter are here today as a tribute to all of you who are dedicating your lives, your volunteerism to creating and staffing trauma systems. I'd like to ask Johan and Jenna to please stand, lest anyone still questions whether trauma systems make a difference.

I will not have the time to go into any detail about the global epidemic of trauma, but at that same Pacific Coast

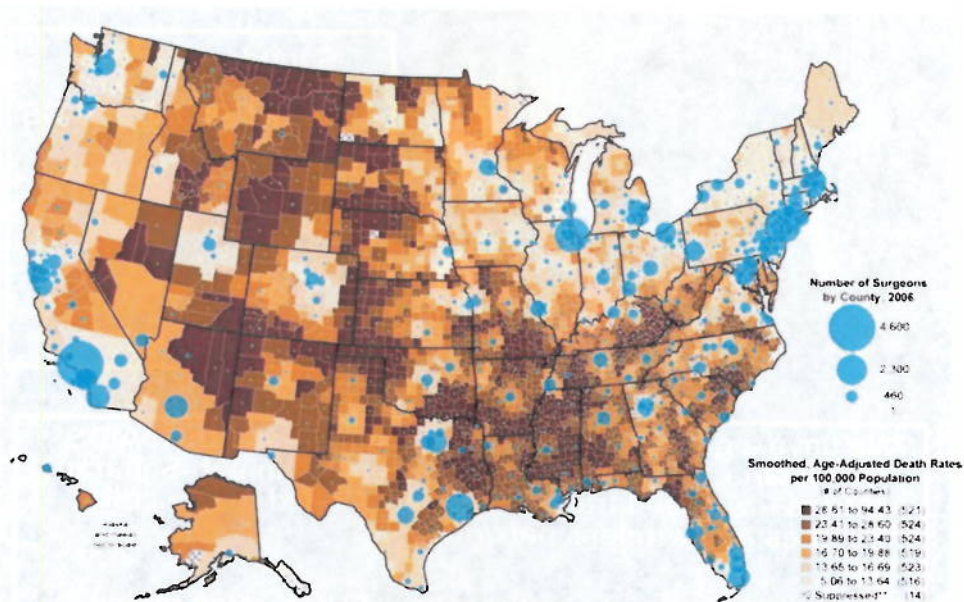


Figure 12. Number of surgeons by county in 2006 combined with smoothed, age-adjusted death rates per 100,000 population (motor vehicle, traffic, unintentional, all races, all ethnicity, both genders, all ages). American College of Surgeons Sheps Health Policy Research Institute – Chapel Hill. (Courtesy of Thomas Ricketts, MD and George Sheldon, MD, 2006).

Surgical Association meeting in San Francisco in February 2009, where I interviewed Dr William Blaisdell, I also had the opportunity to interview Dr Haile Debas, Executive Director, UCSF Global Health Sciences (Fig. 14). He said that “we do have a global endemic of trauma, greater than

AIDS or malaria. Trauma care is rudimentary in sub-Saharan Africa.” “We need trauma systems,” he said, with no prompting from me. “We need to use cell phones, wireless networks, new technology. Global health should be the pillar of our US foreign policy and we should have a *diplo-*

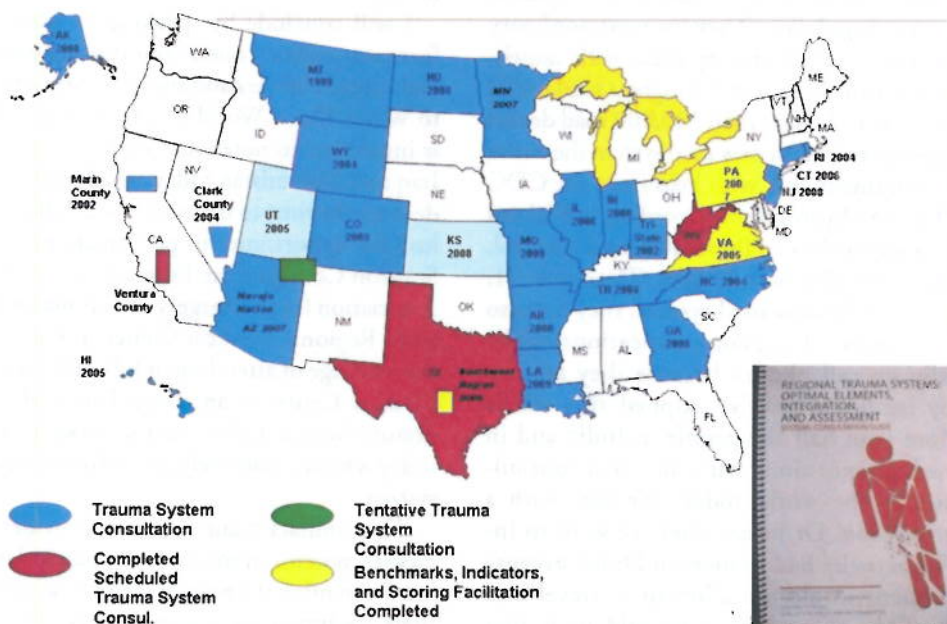


Figure 13. Trauma Systems Evaluation and Planning Committee consultations and facilitations. (Courtesy of Holly Michaels, American College of Surgeons, September 2009).

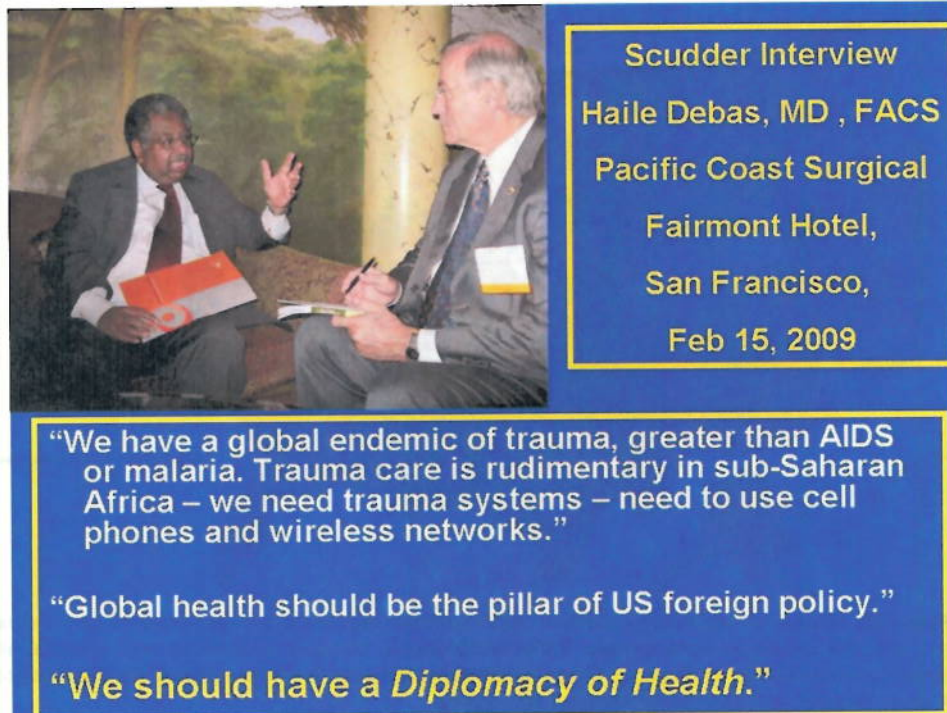


Figure 14. Interview with Dr Haile Debase, MD, FACS, February 15, 2009, regarding the global epidemic of trauma.

macy of health.” I think that our ACS Advanced Trauma Life Support program embodies that principle beautifully.

I had the opportunity, thanks to Dr Richard Hunt, who is here today, to join the team from the CDC to travel twice to the subcontinent of India. India is establishing a trauma system for their vast population. They have extraordinary issues with their roads, such as sharing them with camels, cows, and elephants, which result in the highest road traffic mortality rate in the world: more than 200,000 road deaths per year. India intends to build a new road system the entire length of the subcontinent and, with help from the CDC and the World Health Organization, according to Richard Hunt, CDC, Center for Injury Prevention and Control, National Highways Development Project, (December 31, 2006). In addition to the new road system, they are also building a trauma system. Their communications will be based principally on cell phones because they are not encumbered by landlines; they’ve skipped that whole technology. More than half the people in India and in Pakistan have cell phones along with the other four billion cell phones in the world today. We met with a Pakistani neurosurgeon, Dr Juma, when we went to India last time. We actually had to meet in Dubai because our state department would not allow us to travel into Pakistan. One of the things Dr Juma told us is that Pakistan, too, is depending on new technology in order

to have a trauma system. Dr Juma runs a 3,000-bed hospital in Karachi that sees 2,000 patients a day, including 500 bombing victims a week. So they have a trauma problem of a different magnitude than most of us do.

I will conclude by speaking to what we have learned from our military operations throughout history. We have had surgical leaders and surgical lessons from the Civil War to World War I, World War II, Korea, and Vietnam, but it is important to note what we are relearning in the war in Iraq and Afghanistan today, which is that survival is dependent on the time to definitive care. I, like some of you, have had the opportunity to participate in the Senior Visiting Surgeon Combat Care Program of the ACS and American Association for the Surgery of Trauma (AAST) at the Landstuhl Regional Medical Center in Germany, where I had the privilege of attending in July 2007. Landstuhl Regional Medical Center is an integral part of the Joint Theater Trauma System and we have some surgeons in the audience today who are absolutely central to the development of that system.

This military trauma system provides a model for our civilian systems in this country, particularly in rural America. Remember the map, remember where it’s red (Fig. 10); there are important lessons to learn from this war. In the Joint Theater Trauma System they have critical air



Figure 15. Joint Theater Trauma System.

transport—the Critical Care Air Transport Teams—and they also use video conferencing (Fig. 15), which is technology that must be embraced in our civilian trauma systems. This is one of those technologies that can link us, who are privileged to work in a trauma center, with resources and help us extend ourselves out to others. Every week they have a video trauma conference at the Landstuhl Regional Medical Center, and they review every patient from the previous week: what happened in Iraq? What happened in Afghanistan? What happened in Africa? What was done during the soldier's brief length of stay, usually only 3 to 4 days in Landstuhl, Germany and then on to CONUS (the continental United States), to Bethesda if they're Marines, or to Walter Reed for the Army, or Brooke Air Force Base in San Antonio for the severely burned. Two of the many impressive components of the Joint Theater Trauma System are transport and video conferencing.

So let me conclude with another patient story. I hesitated whether to tell this because I was involved in the care of Corporal William Gadsby only because I happened to be in Landstuhl the night he came in. It was my first night. He came in on a C-17 and was reported to have some serious vascular injuries. Because of my interest in vascular trauma I was asked to help care for this patient. Let me point out that by the time I saw this Marine, his life had already been saved by a Navy Corpsman named Kyle who under fire put on tourniquets while Corporal Gadsby was down and

bleeding to death in the kill zone. Then he was quickly taken to a forward surgical unit, where an immediate, life-saving, right above-knee amputation was performed and a shunt placed in his left superficial femoral artery. Within an hour the patient was moved on to Balad, a combat support hospital where a very good vascular surgeon (I know he was good because I had the opportunity to close the wounds over his graft) did a reverse saphenous vein interposition graft that would have gratified the vascular surgeons in the audience, including Prof Averil Mansfield from England. It was pointed out to me when I saw Corporal Gatsby in Landstuhl, 23 hours postinjury, that he had already had 2 operations and I was strongly advised to reoperate on the patient that night, and not the next morning, because I would be the first surgeon operating on this Marine who was not under fire. We did operate that night, the patient did very well, was transferred back to Bethesda and then on to the San Diego Naval Medical Center for rehabilitation. There I met Corporal Gadsby again, as you'll see, and met his mother, Cheryl Huffman, who later sent me an article in *Reader's Digest* showing her son with his devastating injuries, receiving the last rites in Iraq. However, when I saw him in San Diego he was in so much better shape than he had been in Landstuhl, Germany the first night on the operating table, when he was shaking violently and I asked him if he was cold. One of the more senior surgeons said, "Dr. Eastman the man's not

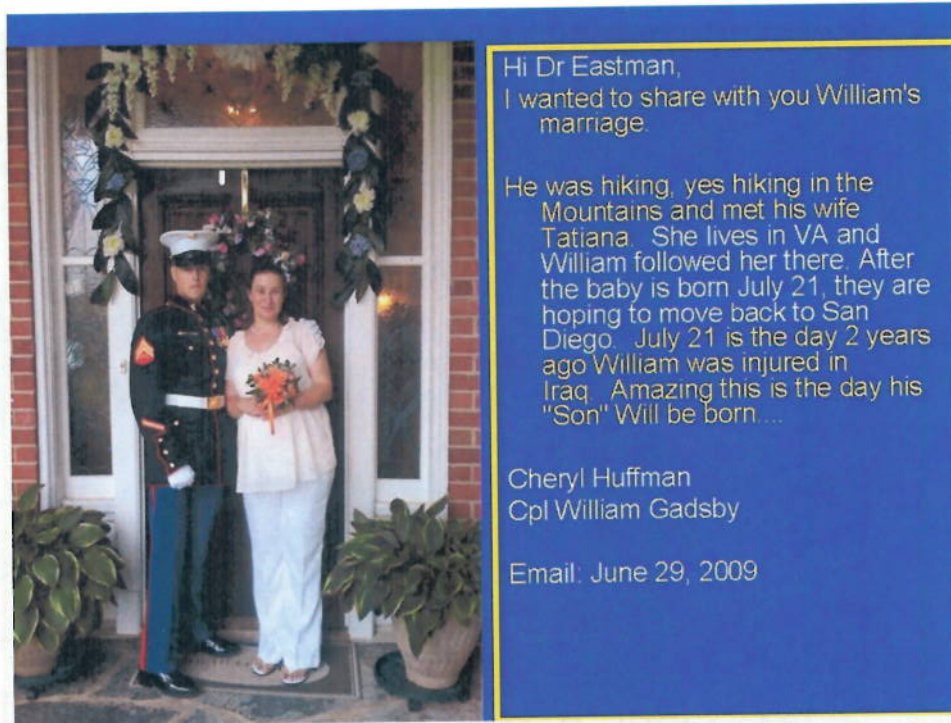


Figure 16. Corporal William Gadsby's marriage. (Courtesy of his mother, Cheryl Huffman).

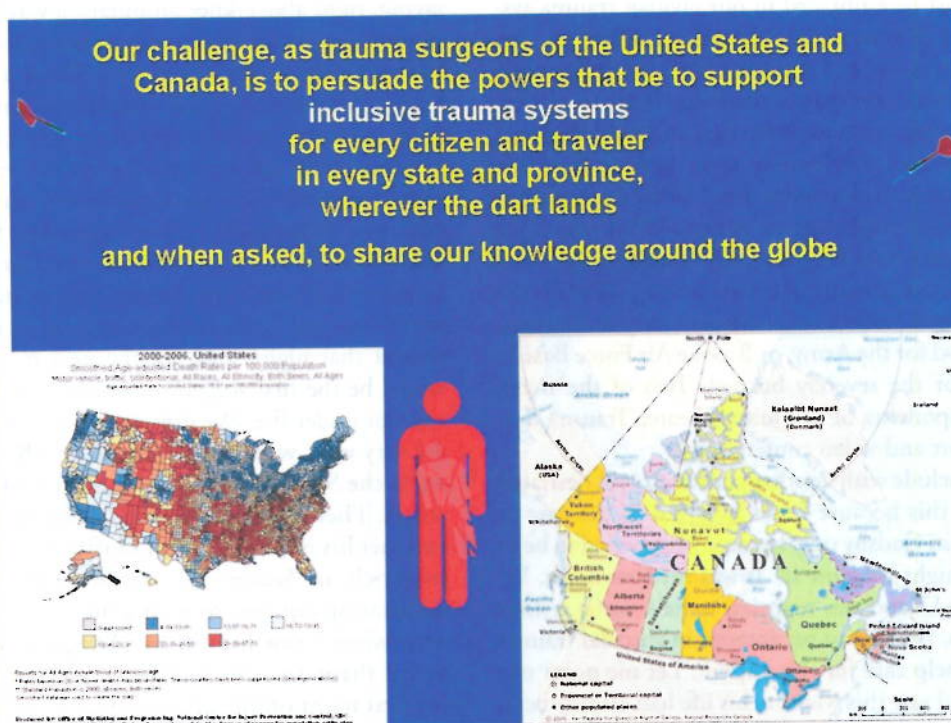


Figure 17. Our challenge: develop inclusive trauma systems in the US, Canada, and around the globe.

cold, he's frightened." But when I asked, "Corporal Gadsby, are you frightened?" he said, "No sir, I haven't been frightened since I was bleeding to death in the kill zone. I'm cold, could you get me a blanket please?" I knew that I was always going to admire and want to stay in touch with Corporal Gadsby. His mother sent me another email last June, saying, "Dr Eastman, I wanted to share with you William's marriage. He was hiking, yes, hiking, in the mountains and met his wife-to-be Tatiana, who lived in Virginia; and William followed her there and they fell in love (Fig. 16). They're expecting a baby and are hoping to move back to San Diego." And here was the most striking part of the message. "William's baby will be born July 21, 2 years to the day after William was injured in Iraq."

To end this lecture on trauma on a happy note, baby Kyle Gadsby, named for the Navy Corpsman who had saved his father's life, was born on July 21, 2009, exactly 2 years to the day his father nearly died in Iraq. I would submit that Kyle looks like a Marine-to-be. I would also say that the Joint Theater Trauma System has components that we should embrace, that we should study, and we should bring into play in the civilian population, just as we're bringing in clinical lessons such as the use of tourniquets, factor VII and the treatment of traumatic brain injury. Equally important are the systems lessons, such as C-CAT and video conferencing.

While I was at Landstuhl, Brigadier General David Rubenstein came over and met with me, and I'd like to share this final quote, which Dr Rubenstein told me is kept in his office. It is a quote from the Mayo brothers, which says, "The only victor in war is medicine." I would certainly concur that most of what we know as trauma surgeons today has been learned from military conflicts. If we must have war, let us continue to learn.

And now I would like to pay tribute to Corporal William Gadsby, a brave Marine and a brave patient. At the same time I wish to recognize all the military surgeons in the audience who continue to care for and save our wounded warriors in Iraq and Afghanistan every single day. So first I would like to ask Corporal William Gadsby, who came today; he had a heck of a time trying to find this room, but I'll tell you he ambulates so well on his above-knee prosthesis that he got here right on time. I asked him if he would come and be a tribute to the military trauma sur-

geons, and to all trauma surgeons in this audience, who care for grievously injured patients every day. So it's really my great, great pleasure to ask William to stand and be recognized.

I now ask all the surgeons who have helped take care of our troops in this war, thousands of William Gadsbys, to also stand, and William, please turn around, because you'll see the people that you most admire. Would all the surgeons here who are the regular military surgeons or who have served in Iraq through the visiting surgeon program please stand?

I'll conclude by saying that our challenge as trauma surgeons of the United States and Canada is to persuade the powers that be to support the development of inclusive trauma systems for every citizen and traveler, in every state and province, wherever the dart lands, and, when asked, to share our knowledge around the globe (Fig. 17), as the American College of Surgeons is doing so well in such areas as Advanced Trauma Life Support. Thank you for allowing me the privilege of presenting this Scudder Oration.

Acknowledgment: I thank Samantha Saunders for her invaluable assistance in preparing this manuscript. I also want to acknowledge my sister, Carol Lamb, of Rock Springs, WY, for her historical research in the archives of Evanston, WY.

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AMERICAN COLLEGE OF SURGEONS COMMITTEE ON TRAUMA
Trauma Systems Evaluation and Planning Committee

Trauma System Consultation Report

State of California

San Diego, CA

March 22 – 25, 2016



AMERICAN COLLEGE OF SURGEONS
Inspiring Quality: Highest Standards, Better Outcomes

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EXECUTIVE SUMMARY

Current Status

California is a large and very diverse state with regard to topography and demography. Ocean, beaches, fertile growing fields, desert, expansive forests, alpine tundra, and high peaks can all be found within the state. Population density and the availability of health care facilities are also widely variable, ranging from highly urban regions to frontier areas. These factors represent a substantial challenge to the development of a comprehensive statewide approach to injury care.

In addition to the wide variability in geography and population between regions, California has a long historical tradition of local autonomy and control with limited central governance. For the emergency medical services (EMS) and trauma systems, this decentralized model of leadership and control has resulted in 33 highly autonomous local emergency medical service agencies (LEMSAs) that hold primary administrative and operational responsibility for the provision of injury care. For example the authority for trauma center designation is at the LEMSA level versus the state level. In practice, California is served by 33 individual trauma systems. The American College of Surgeon's (ACS) trauma system consultation team found a high degree of variability in the degree of trauma system development between the LEMSAs, reflecting their differing geography, population density, and healthcare resources, as well as political and economic climate. Further, hospital participation in the trauma system is voluntary, and as a result fewer than 25% of the state's acute care hospitals have a formal role, despite the intended design for an inclusive system at the state level. The LEMSAs operate in functional isolation with minimal guidance and limited integration within an overarching state trauma system. In support of the EMS Authority and the LEMSAs a voluntary regional infrastructure is evolving, consisting of five Regional Trauma Coordinating Councils, each comprised of several LEMSAs that form a functional or geographic group. The role and structure of these councils is not well defined or regulated, and significant variability in the composition, focus, and function was noted.

California has a long history of commitment to trauma system development, and several individual LEMSAs have been at the forefront of progress at a national level. Consistent with the tradition of local governance, the state's EMS Authority has limited authority and very limited resources (monetary and personnel) for trauma system development, integration, and oversight. As a result, the significant progress made over time is largely the result of the high level of cooperation and volunteer effort between individual stakeholders and individual institutions. The longstanding State Trauma Advisory Council (STAC) has enjoyed a stable composition and stable leadership, enabling it to be a major factor in this cooperation, and it is instrumental in the continued progress of the California trauma system.

The STAC recently led a lengthy process of assessing the trauma system components and creating a well-written trauma system plan, based on an inclusive trauma system model. The plan envisions a state-wide trauma system with greater uniformity and integration of care across the LEMSA's. However, limited central authority and very limited resources at the state level will challenge the trauma system stakeholders to fully implement the plan on its intended scale.

Although California has numerous state data resources, the very limited personnel and monetary resources hinder the state's ability to use these data to monitor trauma system performance and to drive improvement. The prehospital registry system is incompletely developed and not yet fully implemented. In addition, the linkage of prehospital data to the state

trauma registry data is not yet functional. The available population-based data from various sources (e.g., hospital discharge data) are not being used to their best advantage, in large part due to lack of central resources for database maintenance and data analysis. The leadership of the California trauma system functionally lacks the data necessary to measure the efficiency, effectiveness, and impact of the trauma system on an ongoing basis.

Advantages and Assets

- The state has a long history of leadership in trauma systems development
- The long history of dedicated volunteerism across the broad stakeholder group has been a key to past progress
- Stakeholders are engaged and energetic
- The EMS Authority is engaged and supportive
- A group of strong historical trauma centers has supported trauma system development
- Overall, the state's population has fairly good coverage by the Level I and II trauma centers
- A decentralized local governance model addresses local needs
 - The county, or a small group of counties, may well be the best geopolitical unit for an operational trauma system
 - Several LEMSAs have exemplary systems in place
- A well-written trauma plan was recently updated
- Broad enabling legislation with regulatory authority exists
- Funding sources are established in current statute
- The state hospital association is active and engaged
- The prehospital data collection system is evolving
- The statewide trauma registry is evolving
- Stakeholders have good access to epidemiologic data
- A wide range of injury prevention activities are conducted statewide
- The state resourcefully uses grant funding

Challenges and Vulnerabilities

- California is a large and heterogeneous state
- A high degree of variability in injury care exists across the state
- Minimal resources are available to support the trauma system at level of the EMS Authority
- Regulations are dated and do not set specific standards and requirements in key areas
- Limited active guidance is provided to LEMSAs by the EMS Authority
- A lack of functional trauma system integration exists
- The LEMSAs are functionally isolated from one another
- The trauma system has heavy dependence on volunteer effort at both the local, regional, and state level
 - Volunteer resources appear to be stretched to their limit
- The current trauma system is an incomplete embodiment of an inclusive model
 - Limited interaction exists with non-designated facilities
 - Data collection from non-designated facilities does not occur
- Variability in the trauma center designation process exists
 - Designation is not consistently based on need
- The utilization of available data is limited

- No standing process exists for statewide monitoring of trauma system performance
- Minimal system level process improvement is performed
- The public has little awareness of the trauma system at the state level
- Dependence on grant funding threatens continuity of key functions

Themes

- California is a microcosm of the nation
 - A broad spectrum of geography, demographics, development exist
 - Unity needs to be created from diversity
- Federalism is the recommended model
 - Central governance needs to be strengthened to create a better balance between state and LEMSA control
- Sometimes you need rules
- Volunteer effort alone is insufficient for continued progress
 - You have reached the limit
- Sometimes you have to re-allocate resources
 - Think catalyst - A small investment will reap large benefits
- Inclusive means inclusive, nobody can opt out
- You have created a vision, share it
 - Engage the public and the legislature
- You have the authority, use it
- Use the data you have while collecting better data
- Succession planning is essential – No one lives/works forever
- Do not be held back by *perceived* barriers
- Starting is the hardest part

PRIORITY RECOMMENDATIONS

Injury Epidemiology

- Create an injury report template for Local Emergency Medical Services Agencies (LEMSAs), and provide a list of EpiCenter queries to use to complete the injury report.

Statutory Authority

- **Update regulations to set specific standards and requirements for trauma system implementation, and to address changes to be consistent with the proposed *California State Trauma Plan, 2015*.**
- Establish in regulation scalable minimum operational standards based on the size and resource capabilities of the urban, suburban, and rural LEMSAs.

System Leadership

- Establish basic quality and activity reporting standards and report templates for the LEMSAs to ensure that the California Emergency Medical Services (EMS) Authority, State Trauma Advisory Committee (STAC) and Performance Improvement and Patient Safety (PIPS) subcommittee receive sufficient data to assess state trauma system performance.
- Formalize the structure and charge of the Regional Trauma Coordinating Committees (RTCCs) and continue to develop their function, especially in domains of clinical practice guidelines and quality assurance programs

Coalition Building and Community Support

- Collaborate with the Trauma Managers Association of California in their efforts to roll out a state-wide media campaign to educate the public about the trauma system.

Trauma System Plan

- Obtain approval for the *California State Trauma Plan, 2015* in as expeditious a manner as possible, while gaining broad stakeholder feedback.
- Establish a timeline and begin implementation of the key elements of the trauma system plan.
- Identify sufficient funding for the timely implementation of the trauma system plan.

Financing

- Identify and seek a stable and sustainable funding source to support California trauma system planning, oversight, and evaluation at the state level.
- Produce a report of the costs, value of the trauma system and trauma care, and the importance of maintaining trauma center readiness to treat persons with severe injuries in California.

Definitive Care Facilities

- Establish EMS Authority guidelines to standardize the trauma center designation process across LEMSAs.
- Exercise the authority of the LEMSAs to designate trauma centers based upon needs of the population served.
 - Provide EMS Authority guidelines for needs-assessment methodology.
 - Provide EMS Authority guidelines for metrics of trauma center need that are additional to the 350,000-population rule.
- Exercise the authority of the LEMSAs to collect data from all acute care facilities in their region.

System-Wide Evaluation and Quality Assurance

- Expedite the adoption of the state *Performance Improvement and Patient Safety (PIPS) Plan* in collaboration with appropriate state advisory committees, LEMSAs, RTCCs and other trauma system stakeholders.
- Monitor the performance measures, especially timeliness of secondary transfers and under- and over-triage, and address trends in deviation of care through the PIPS plan process.

TRAUMA SYSTEM ASSESSMENT

Injury Epidemiology

Purpose and Rationale

Injury epidemiology is concerned with the evaluation of the frequency, rates, and pattern of injury events in a population. Injury pattern refers to the occurrence of injury-related events by time, place, and personal characteristics (for example, demographic factors such as age, race, and sex) and behavior and environmental exposures, and, thus, it provides a relatively simple form of risk-factor assessment.

The descriptive epidemiology of injury among the whole jurisdictional population (geographic area served) within a trauma system should be studied and reported. Injury epidemiology provides the data for public health action and becomes an important link between injury prevention and control and trauma system design and development. Within the trauma system, injury epidemiology has an integral role in describing the root causes of injury and identifying patterns of injury so that public health policy and programs can be implemented. Knowledge of a region's injury epidemiology enables the identification of priorities for directing better allocation of resources, the nature and distribution of injury prevention activities, financing of the system, and health policy initiatives.

The epidemiology of injury is obtained by analyzing data from multiple sources. These sources might include vital statistics, hospital administrative discharge databases, and data from emergency medical services (EMS), emergency departments (EDs), and trauma registries. Motor-vehicle crash data might also prove useful, as would data from the criminal justice system focusing on interpersonal conflict. It is important to assess the burden of injury across specific population groups (for example, children, elderly people and ethnic groups) to ensure that specific needs or risk factors are identified. It is critical to assess rates of injury appropriately and, thus, to identify the appropriate denominator (for example, admissions per 100,000 population). Without such a measure, it becomes difficult to provide valid comparisons across geographic regions and over time.

To establish injury policy and develop an injury prevention and control plan, the trauma system, in conjunction with the state or regional epidemiologist, should complete a risk assessment and gap analysis using all available data. These data allow for an assessment of the "injury health" of the population (community, state, or region) and will allow for the assessment of whether injury prevention programs are available, accessible, effective, and efficient.

An ongoing part of injury epidemiology is public health surveillance. In the case of injury surveillance, the trauma system provides routine and systematic data collection and, along with its partners in public health, uses the data to complete injury analysis, interpretation, and dissemination of the injury information. Public health officials and trauma leaders should use injury surveillance data to describe and monitor injury events and emerging injury trends in their jurisdictions; to identify emerging threats that will call for a reassessment of priorities and/or reallocation of resources; and to assist in the planning, implementation, and evaluation of public health interventions and programs.

Optimal Elements

I. There is a thorough description of the epidemiology of injury in the system jurisdiction using population-based data and clinical databases. **(B-101)**

- a. There is a thorough description of the epidemiology of injury mortality in the system jurisdiction using population-based data. **(I-101.1)**
- b. 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, rural, and others), incidence, prevalence, mechanism, manner, intent, mortality, contributing factors, determinants, morbidity, injury severity (including death), and patient distribution using any or all the following: vital statistics, ED data, EMS data, hospital discharge data, state police data (data from law enforcement agencies), medical examiner data, trauma registry, and other data sources. The description is updated at regular intervals. **(I-101.2)**
Note: Injury severity should be determined through the consistent and system-wide application of one of the existing injury scoring methods, for example, Injury Severity Score (ISS).
- c. There is comparison of injury mortality using local, regional, statewide, and national data. **(I-101.3)**
- d. Collaboration exists among EMS, public health officials, and trauma system leaders to complete injury risk assessments. **(I-101.4)**
- e. The trauma system works with EMS and public health agencies to identify special at-risk populations. **(I-101.7)**

II. Collected data are used to evaluate system performance and to develop public policy. **(B-205)**

- a. Injury prevention programs use trauma management information system data to develop intervention strategies. **(I-205.4)**

III. The trauma, public health, and emergency preparedness systems are closely linked. **(B-208)**

- a. 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. **(I-208.1)**

IV. The jurisdictional lead agency, in cooperation with the other agencies and organizations, uses analytic tools to monitor the performance of population-based prevention and trauma care services. **(B-304)**

- a. The lead agency, along with partner organizations, prepares annual reports on the status on injury prevention and trauma care in the state, regional, or local areas. **(I-304.1)**
- b. The trauma system management information system database is available for routine public health surveillance. There is concurrent access to the databases (ED, trauma, prehospital, 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. **(I-304.2)**

Current Status

The California Department of Public Health (CDPH) Safe and Active Communities (SAC) Branch has multiple epidemiologists, one of whom prepared the overview of injuries in California for the pre-review questionnaire (PRQ). The provided report was based predominantly on vital records, the hospital discharge dataset, and the emergency department dataset, but some data from the state trauma registry were also included. The report described injuries by mortality, morbidity, age group, intent, traumatic brain injury, and payer for 2013. Information was not provided about comparisons of injury incidence, mortality, and morbidity between counties or regions of the state, or changes over time. A special fact sheet on motor vehicle-related injury data was produced in 2013.

It was reported that the CDPH has not prepared a comprehensive injury report since about 2005 when the state last had funding for this effort. Current SAC Branch epidemiology efforts are tied to health issues for which grant funding has been awarded. It is not known if any of the state epidemiologists have specific training in injury epidemiology. Such specialization is important when preparing a comprehensive description of injury. This involves the integration of population-based and clinical datasets that illustrate the larger focus of injury control, including the association between severe injuries and the importance for trauma center care. It would be beneficial for the epidemiologist working with the state trauma system to learn injury epidemiology skills, such as International Classification of Diseases, 9th edition (ICD-9, or future version with ICD-10) injury severity score (ISS) mapping using hospital discharge data, the application of geographical information system (GIS) mapping that might help regions to target injury prevention efforts, and identifying patients who should have been taken to a trauma center.

California has a web-based epidemiologic resource, EpiCenter, for individuals to obtain injury and other public health data for their county or region. This resource has a tutorial to help novice users. Some technical assistance is available when needed. It is not known how aware the injury control community is about this resource, but it is likely that individuals without injury data expertise have little knowledge of this resource. The larger Local Emergency Medical Services Agencies (LEMSAs) are more likely to have epidemiologist support to use EpiCenter effectively. However, many LEMSAs have no epidemiologist support to help them compare their county or regional injury data with the state data. It would be helpful to the LEMSAs to have a template for an injury report that could be obtained from EpiCenter, and identification of the individual queries that could be used to fill the template. While epidemiology resources are limited at the SAC, the state has several Schools of Public Health with epidemiology programs. The SAC Branch or the EMSA trauma system program could potentially seek an epidemiology graduate student to assist with creating a comprehensive report on injuries in California or a report template using EpiCenter data.

Recommendations

- Develop a comprehensive report of injuries for the state of California, with comparisons of the injury problem in rural, suburban, and urban counties.
 - Obtain a template for a comprehensive state injury report from a state with a CDC Core Injury Grant.
 - Prepare an executive summary of the injury report including key information and graphics for use in educating elected officials and the public.

- Seek opportunities for the epidemiologist that collaborates with the trauma system program to obtain additional skills in injury epidemiology.
- **Create an injury report template for the Local Emergency Medical Services Agencies, and provide a list of EpiCenter queries to use to complete the injury report.**
 - **Include a list of queries from the emergency medical services (EMS) and trauma registries when those are included in the set of databases used by EpiCenter.**
- Consider seeking an injury epidemiology graduate student from a School of Public Health to support development of additional injury data reports and report templates.

Indicators as a Tool for System Assessment

Purpose and Rationale

In the absence of validated national benchmarks, or norms, the benchmarks, indicators and scoring (BIS) process included in the Health Resources and Services Administration's *Model Trauma System Planning and Evaluation* document provides a tool for each trauma system to define its system-specific health status benchmarks and performance indicators and to use a variety of community health and public health interventions to improve the community's health status. The tool also addresses reducing the burden of injury as a community-wide public health problem, not strictly as a trauma patient care issue.

This BIS tool provides the instrument and process for a relatively objective state and sub-state (regional) trauma system self-assessment. The BIS process allows for the use of state, regional, and local data and assets to drive consensus responses to the BIS. It is essential that the BIS process be completed by a multidisciplinary stakeholder group, most often the equivalent of a state trauma advisory committee. The BIS process can help focus the discussion on various system strengths and weaknesses, can be used to set goals or benchmarks, and provides the opportunity to target often limited resources and energies to the areas identified as most critical during the consensus process. The BIS process is useful to develop a snapshot of any given system at a moment in time. However, its true usefulness is in repeated assessments that reveal progress toward achieving various benchmarks identified in the previous application of the BIS. This process further permits the trauma system to refine goals to be attained before future reassessments using the tool.

Optimal Element

I. Assurance to constituents that services necessary to achieve agreed-on goals are provided by encouraging actions of others (public or private), requiring action through regulation, or providing services directly. **(B-300)**

Current Status

The Benchmark, Indicator, and Scoring (BIS) tool has been used appropriately to assist in the development of two key documents pertaining to trauma system development in California. The first, titled *California Statewide Trauma Planning: Assessment and Future Development*, was published in 2006 by the Emergency Medical Services (EMS) Authority. It is notable that this document included very contemporary guidance from the Health Resources and Services Administration (HRSA) *Model Trauma System Planning and Evaluation* publication that contains the BIS and recommendations from the Institute of Medicine's *Future of Emergency Care* series, also published in 2006.

The BIS was completed by the 16-member State Trauma Advisory Committee (STAC), and the findings and recommendations were submitted in the *California Statewide Trauma Planning: Assessment and Future Development* document to the EMS Authority director for approval.

The BIS findings were informally monitored and updated periodically between 2006 and 2013. In 2013 the BIS was formally reviewed and scores were updated. Again this process relied on

the STAC, and the findings helped to frame priorities for the *California State Trauma Plan, 2015*, which is in the final state review and approval process.

Scoring for many of the BIS elements showed improvement between the two measurement periods. One example is assuring the public welfare by enforcing regulations pertaining to trauma care. Other indicators were resistant to change such as securing funding to continue the planning, development and evaluation of the trauma system in EMS Authority.

Recommendations

- Continue to use the Benchmarks, Indicators, and Scoring (BIS) tool to monitor ongoing trauma system performance improvement effort.
- Create a schedule for periodic BIS re-assessment.
- Expand the number of stakeholders involved in the future BIS re-assessment and consensus process, perhaps capitalizing on the annual trauma summit as a venue.
- Encourage utilization of the BIS by the LEMSAs.
 - Train facilitators to conduct the BIS for LEMSAs

TRAUMA SYSTEM POLICY DEVELOPMENT

Statutory Authority and Administrative Rules

Purpose and Rationale

Reducing morbidity and mortality due to injury is the measure of success of a trauma system. A key element to this success is having the legal authority necessary to improve and enhance care of injured people through comprehensive legislation and through implementing regulations and administrative code, including the ability to regularly update laws, policies, procedures, and protocols. In the context of the trauma system, comprehensive legislation means the statutes, regulations, or administrative codes necessary to meet or exceed a pre-described set of standards of care. It also refers to the operating procedures necessary to continually improve the care of injured patients from injury prevention and control programs through post-injury rehabilitation. The ability to enforce laws and rules guides the care and treatment of injured patients throughout the continuum of care.

There must be sufficient legal authority to establish a lead trauma agency and to plan, develop, maintain, and evaluate the trauma system during all phases of care. In addition, it is essential that as the development of the trauma system progresses, included in the legislative mandate are provisions for collaboration, coordination, and integration with other entities also engaged in providing care, treatment, or surveillance activities related to injured people. A broad approach to policy development should include the building of system infrastructure that can ensure system oversight and future development, enforcement, and routine monitoring of system performance; the updating of laws, regulations or rules, and policies and procedures; and the establishment of best practices across all phases of intervention. The success of the system in reducing morbidity and mortality due to traumatic injury improves when all service providers and system participants consistently comply with the rules, have the ability to evaluate performance in a confidential manner, and work together to improve and enhance the trauma system through defined policies.

Optimal Elements

I. Comprehensive state statutory authority and administrative rules support trauma system leaders and maintain trauma system infrastructure, planning, oversight, and future development. **(B-201)**

- a. The legislative authority states that all the trauma system components, emergency medical services (EMS), injury control, incident management, and planning documents work together for the effective implementation of the trauma system (infrastructure is in place). **(I-201.2)**
- b. Administrative rules and regulations direct the development of operational policies and procedures at the state, regional, and local levels. **(I-201.3)**

II. The lead agency acts to protect the public welfare by enforcing various laws, rules, and regulations as they pertain to the trauma system. **(B-311)**

- a. Laws, rules, and regulations are routinely reviewed and revised to continually strengthen and improve the trauma system. **(I-311.4)**

Current Status

The State of California has enabling legislation that provides broad authority for the EMS Authority. In 1980 the Emergency Medical Services System and Prehospital Emergency Care Personnel Act (SB 125) was passed. The Act provided the foundation for EMS in California by creating the EMS Authority, effective January 1, 1981, and adding Division 2.5 to the Health and Safety Code (H&SC), Sections 1797-1799.

The statute established the Commission on EMS with 18 commissioners representing many California EMS constituent groups. The Governor appoints twelve commissioners, and the Senate Rules Committee and the Speaker of the Assembly each appoint three. The Act also includes language addressing the LEMSAs and EMS providers.

The statute requires the following eight functional areas of the state's EMS system development to be addressed:

- Manpower and training
- Communications
- Transportation
- Assessment of hospitals and critical care centers
- System organization and management
- Data collection and evaluation
- Public information and education
- Disaster response

The EMS Authority is charged with developing and implementing EMS systems throughout California (H&SC 1797.102-105). It also has the responsibility for developing a statewide trauma system. The state is to be commended for using a consensus approach involving its many stakeholders and the public in developing and regulating the statewide system.

The state currently has a two-tier structure for managing and regulating the statewide EMS and trauma system. The EMS Authority is the lead agency for establishing minimum statewide standards and overall monitoring of the statewide system. LEMSAs are the lead agency for the EMS system at the county, regional, or local level, and a LEMSA is mandated for any county or multi-county region that chooses to implement an EMS program. Each LEMSA has regulatory authority.

California is a large and diverse state with highly urbanized counties, suburban counties, and many rural and isolated counties. The state currently has 33 LEMSAs with local statutory authority to manage its EMS system. Each LEMSA has varying capabilities associated with factors such as the county population and local government capacity. Resources to meet the population's needs for trauma care and EMS differs depending on the LEMSA and county resources. Establishing a regulatory environment with one minimum standard is difficult and challenging with such diversity.

There are broad differences in the service needs and management resources required for the urban areas compared to suburban and rural. Given this diversity and uniqueness, consideration should be given to developing regulations with a more scalable approach while maintaining a standard that ensures the residents and visitors of the state have access to and receive appropriate emergency medical and trauma services. For example, regulations for

criteria for the Level III trauma center designation process could require strict adherence to ACS Level III trauma center criteria for all urbanized LEMSAs, but have more flexible criteria for Level III trauma centers in rural LEMSAs that lack higher level trauma center resources.

The state currently allows for exemptions in statute. While exemptions to minimum standards may be necessary in some cases, clearly written non-subjective criteria for regulatory exemptions should be codified in regulations.

California currently has a peer review law identified as §1157, Statute-Evidence Code. During this trauma system consultation (TSC) visit several hospitals and LEMSA's expressed concern that the current statute may not be broad enough or written with the specificity to provide all the necessary protection for an effective peer review process. In addition, five RTCCs have been established since this statute was enacted. While peer review conducted by the RTCCs may be protected, it is suggested that the statute be reviewed and amended as needed to address all areas of concern.

California has three funding sources specifically for EMS and trauma currently in statute. In 2001 the legislature enacted AB 430 (Cardenas), which created the Trauma Care Fund subject to legislature appropriation from the State's General Fund. While this law has not been repealed, the state legislature has not appropriated funds since 2005/06. The state experienced good progress for the 3 years funding was appropriated, including the establishment of 20 new trauma centers, predominantly in the rural areas.

The Maddy Fund, §1797.98a-g (derived from surcharge on traffic fines), is available for uncompensated care, but is not specific to trauma patient claims. However, the Richie Fund component of the Maddy Fund is dedicated to the improvement of pediatric trauma care, which can also include reimbursement for uncompensated care. Unless re-enacted the Richie Fund section in statute will expire on January 1, 2017.

Although these statutes were enacted for a specific purpose, it is now critical that the state reassess these laws. With the federal Affordable Care Act, uncompensated care may no longer be the preferred method for trauma center reimbursement. A determination of all costs associated with sustaining the EMS and trauma system should be made, including operating expenses within the EMS Authority. Other allocation strategies for funding to support trauma care should be considered to continue to meet the needs of California's residents and visitors. Efforts to revise the statutes should be made.

Recommendations

- Assure that the performance improvement process is protected from discovery, when conducted at all levels of the trauma system, including the Regional Trauma Coordinating Committees.
- Review existing funding statutes, regulations, and processes, including the Maddy EMS Fund, State Trauma Fund, and the Richie Fund, to ensure adequate funding and the appropriate distribution of funds to provide sustainability of the statewide EMS and trauma system.

- **Update regulations to set specific standards and requirements for trauma system implementation, and to address changes to be consistent with the proposed *California State Trauma Plan, 2015*.**
- **Establish in regulation scalable minimum operational standards based on the size and resource capabilities of the urban, suburban, and rural Local Emergency Medical Services Agencies (LEMSAs).**

System Leadership

Purpose and Rationale

In addition to lead agency staff and consultants (for example, trauma system medical director), there are other significant leadership roles essential to developing mature trauma systems. A broad constituency of trauma leaders includes trauma center medical directors and nurse coordinators, prehospital personnel, injury prevention advocates, and others. This broad group of trauma leaders works with the lead agency to inform and educate others about the trauma system, implements trauma prevention programs, and assists in trauma system evaluation and research to ensure that the right patient, right hospital, and right time goals are met. There is a strong role for the trauma system leadership in conveying trauma system messages, building communication pathways, building coalitions, and collaborating with relevant individuals and groups. The marketing communication component of trauma system development and maintenance begins with a consensus-built public information and education plan. The plan should emphasize the need for close collaboration between coalitions and constituency groups and increased public awareness of trauma as a disease. The plan should be part of the ongoing and regular assessment of the trauma system and be updated as frequently as necessary to meet the changing environment of the trauma system.

When there are challenges to providing the optimal care to trauma patients within the system, the leadership needs to effect change to produce the desired results. Broad system improvements require the ability to identify challenges and the resources and authority to make changes to improve system performance. However, system evaluation is a shared responsibility. Although the leadership will have a key role in the acquisition and analysis of system performance data, the multidisciplinary trauma oversight committee will share the responsibility of interpreting those data from a broad systems perspective to help determine the efficiency and effectiveness of the system in meeting its stated performance goals and benchmarks. All stakeholders have the responsibility of identifying opportunities for system improvement and bringing them to the attention of the multidisciplinary committee or the lead agency. Often, subtle changes in system performance are noticed by clinical care providers long before they become apparent through more formal evaluation processes.

Perhaps the biggest challenge facing the lead agency is to synergize the diversity, complexity, and uniqueness of individuals and organizations into an integrated system for prevention of injury and for the provision of quality care for injured patients. To meet this challenge, leaders in all phases of trauma care must demonstrate a strong desire to work together to improve care provided to injured victims.

Optimal Elements

- I. 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 other citizen organizations. **(B-202)**
- II. Collected data are used to evaluate system performance and to develop public policy. **(B-205)**

III. Trauma system leaders, including a trauma-specific statewide multidisciplinary, multiagency advisory committee, regularly review system performance reports. **(B-206)**

IV. 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. **(B-207)**

Current Status

The California trauma system organization has two separate tiers of system leadership, both very different in nature, authority, and visibility. This situation presents both advantages and significant challenges. At a functional level, California is comprised of 33 individual trauma systems, defined by the LEMSA. This includes 26 individual counties, and 7 multi-county groups, including two LEMSAs in which the counties are not all physically contiguous. The overarching state leadership in the EMS Authority has a broad integrative charge to collect data and to assess the needs in each trauma region, to develop guidelines, and to review the specific plans developed by each LEMSA. Within this structure, the drive to create and optimize a regional system, its design and implementation, day-to-day operations, and quality assurance are all the responsibility of leaders at the local level.

The size and the heterogeneity of the state, the very limited trauma-specific resources in the EMS Authority, as well as local tradition, have created a situation in which each LEMSA is essentially its own trauma system. In most cases this LEMSA is largely independent of other LEMSAs. Additionally, the LEMSAs function without substantial policy input, direction, or technical assistance from the EMS Authority. As a result, the LEMSAs vary dramatically in size, resources, and degree of development. Large urban counties are highly organized and functional systems, while rural LEMSAs have minimal resources, including several that do not have designated trauma centers at any level within their boundaries.

The leadership resources and stakeholder engagement in the individual LEMSA exhibit similar variability. It was difficult for the TSC team to assess the full spectrum of LEMSA leadership issues as the size of the state and limited resources for travel also worked against a full representation of the smaller and more rural LEMSAs during the TSC visit. The rural LEMSA constituencies were underrepresented compared to larger, well-established LEMSAs, essentially all of which had multiple stakeholders at the TSC visit. While the large and well-established LEMSA coincide with the population distribution of the state, further development and expansion of trauma care capability into less populated regions will require active engagement and nurturance of smaller and less well-resourced LEMSAs.

The EMS Authority is advised by the STAC, a well-established group that has been very active in the development of the state trauma plan and the development of state-level regulations. The STAC is largely composed of representatives and stakeholders from large and well-established LEMSAs, with relatively little representation from smaller and more rural LEMSAs. This may simply reflect the relative number of engaged stakeholders available for participation, but it works against increased involvement of smaller LEMSAs in the state-level system.

The EMS Authority and the STAC are tasked with monitoring the overall function of the trauma system, both in the aggregate and at the level of the individual LEMSA. Neither group has been able to effectively perform this function due to a lack of good data. The current statewide databases for hospital and prehospital care are not used on a regular basis to run statewide queries. The individual LEMSAs vary widely in their reporting ability and the frequency with

which such reports are generated and shared with the EMS Authority. As a result, the STAC and the EMS Authority are challenged to understand the day-to-day functioning of the trauma system on a statewide basis, and they are currently unable to measure trauma system-level performance. The EMS Authority is limited in its ability to gather data from the LEMSAs, both due to the permissive nature of current regulations, and the lack of dedicated EMS Authority staff to perform data collection and analysis.

The strong local structure of system leadership has worked well in several large urban LEMSAs that are fortunate to be associated with leading academic trauma centers and a large group of experienced and committed trauma system stakeholders. The placement of the lead agencies within county government, which is much more accessible and nimble than state government, has facilitated the establishment of strong county-level systems that have served as models of system development on a national scale. Yet this same local structure has made progress difficult in smaller and more rural areas, which lack such high-level facilities, resources, and experienced and motivated leadership. The limited staffing at the EMS Authority, along with permissive regulations makes it difficult to provide motivation and assistance to the rural LEMSAs. The implementation of five RTCCs has been effective to some degree in providing leadership training and technical assistance to smaller LEMSAs, and in improving cooperation between LEMSAs. However, the utility of the RTCCs has been limited by the lack of a clear mandate and resource support for their activities.

Recommendations

- **Establish basic quality and activity reporting standards and report templates for the Local EMS Agencies (LEMSAs) to ensure that the California Emergency Medical Services (EMS) Authority, State Trauma Advisory Committee (STAC) and Performance Improvement and Patient Safety (PIPS) subcommittee receive sufficient data to assess state trauma system performance.**
 - **Consider scalable reporting standards for LEMSAs based upon size, activity, available resources, and degree of system development.**
 - **Include information about the organizational structure, staffing, and financial resources of the individual LEMSAs.**
- Use LEMSA data and state registry data to create aggregate system-wide performance reports on regular ongoing basis
- Use LEMSA reports and system reports to educate the public and elected officials regarding trauma system accomplishments, as well as the need for future development.
- Increase representation from Level III and Level IV trauma centers, non-designated acute care facilities, and the smaller LEMSAs on the STAC.
- Use input from the RTCCs and system performance reports to identify LEMSAs in need of leadership support and technical assistance.
- **Formalize the structure and charge of the Regional Trauma Coordination Committees (RTCCs) and continue to develop their function, especially in domains of clinical practice guidelines and quality assurance programs.**

- **Seek resources to provide administrative and liaison support to the RTCCs in support of these goals.**

Coalition Building and Community Support

Purpose and Rationale

Coalition building is a continuous process of cultivating and maintaining relationships with constituents (interested citizens) in a state or region who agree to collaborate on injury control and trauma system development. Key constituents include health professionals, trauma center administrators, prehospital care providers, health insurers and payers, data experts, consumers and advocates, policy makers, and media representatives. The coalition of key constituents comprises the trauma system's stakeholders. The involvement of these key constituents is important for the following:

- Trauma system plan development
- Regionalization: promoting collaboration rather than competition between trauma centers
- System integration
- State policy development: authorizing legislation and regulations
- Financing initiatives
- Disaster preparedness

The coalition should be effectively organized through the formation of multidisciplinary state and regional advisory groups to coordinate trauma system planning and implementation efforts. Constituents also communicate with elected officials and policy leaders regarding the development and sustainability of the trauma system. Information and education are needed by constituents to be effective partners in policy development for trauma system planning. Regular communication about the status of the trauma system helps these key partners to recognize needs and progress made with trauma system implementation.

One of the most effective ways to educate elected officials and the public is through an organized public information and education effort that may involve a media campaign about the burden of injury in the state and the need for trauma system development. Information and education are important to reduce the incidence of injury in all age groups and to demonstrate the value of an effective trauma system when a serious injury occurs.

Optimal Element

I. 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. **(B-207)**

Current Status

The EMS Authority utilized the STAC and other constituents in the process to update the state trauma system plan. They also included the STAC Project Subcommittee, RTCCs, EMS Administrators of California, and the EMS Medical Association of California. The STAC is both multidisciplinary and broad-based in its representation. However, the membership of the committee does not include representation from non-designated acute care facilities, elected officials, injury prevention, or rehabilitation. During preparation of the PRQ, the trauma system

manager identified the importance of developing a closer relationship with injury prevention and rehabilitation programs to support trauma system development.

At the regional level, California has established five trauma regions based on routine patient flow patterns. The RTCCs serve as regional coalitions for trauma system development and collaboration. Each region defines its own membership. Unfortunately, some of the regions do not have representation from non-designated acute care facilities, leaving a key aspect of local system development unrecognized and exclusive. Ultimately, this exclusion can greatly impact efforts to improve patient care through system evaluation.

The chairperson of each RTCC serves on the STAC, and this facilitates reporting about regional activities and issues. Various approaches are taken by the RTCCs to promote trauma system development. For example, the American College of Surgeons (ACS) Rural Trauma Team Development Course (RTTDC) has been promoted in rural areas to address the timeliness of transfers. In turn, urban members of the RTCCs help to review cases and provide resources to the LEMSAs within their neighboring counties.

The LEMSAs appear to have broad-based representation of stakeholders on their guidance committees, although non-designated acute care facilities may be less actively involved.

Some LEMSAs also provide information to the public regarding the EMS and trauma system; however, the efforts were reported to be sporadic and could be more aggressive in seeking media attention. Some of the LEMSA activities were listed in the annual trauma plan status reports. A best practice cited involved a LEMSA holding an EMS banquet. This forum served to inform community members of the EMS system and to recognize selected EMS personnel for their service. In turn, the EMS Authority also hosts an annual EMS recognition program; however, a trauma system award is not clearly specified or recognized.

The Monterey County LEMSA conducted a question and answer session for concerned citizens regarding trauma center designation. The session served to educate the public about the benefits of having a designated trauma center available to them. Trauma centers also educate the public about the trauma system and conduct injury prevention activities. For example, the University of California Davis Medical Center developed a child passenger safety education program for diverse populations, in partnership with local family resource centers. Other trauma centers reported conducting injury prevention programs, as well as trauma survivor recognition reunions.

Ultimately, the key to mobilizing the state trauma system coalition rests with the state trauma system manager who attends organizational meetings regularly and has integrated the trauma system plan into other strategic plans such as Highway Safety, PIPS, and the EMS Challenge Area. The state trauma system manager participates with regional meetings as time and travel funds permit, and shares state-of-the-state information. However, the trauma system program staff consists of only one person, limiting opportunities to expand the trauma system coalition and enhance integration with injury prevention, rehabilitation, emergency management, and public health. Not stifled by this limitation, the state trauma system manager has leveraged networking with other organizations to assist in educating the public and in coalition building.

The Trauma Managers Association of California (TMAC) is another well-established organization providing leadership in trauma system development. The membership is inclusive and open to anyone interested in trauma care. There are 46 Trauma program managers participating along with representation from 13 of the 33 LEMSAs. The state trauma system

manager is also a member of this organization. TMAC is active in strategic planning and in educating other LEMSAs and hospitals about the trauma system through their website. TMAC created a listserv where members can address trauma system issues or matters requiring immediate attention. This listserv can also be tapped to recruit stakeholders to support legislative action work. TMAC recently formed a subcommittee to develop and roll out a statewide campaign.

The California Hospital Association (CHA) has an EMS/Trauma Committee that serves in an advisory capacity to the CHA Board of Trustees. This committee provides an opportunity to educate and inform CHA members on trauma system development and to gather input and support for future goals and objectives. The state trauma system manager is also a member of this committee. The CHA also hosts an annual Symposium, Leadership Conference, and Health Policy Day with legislators, all in an effort to educate and inform.

Another well-established conference is the annual state trauma summit. This is an efficient forum for the EMS Authority to educate policymakers, key trauma stakeholders and system leadership. This conference serves as an opportunity for the EMS Authority to provide updates of the state and national trauma system. They have also developed a website to inform policymakers about various activities and regulations.

Most of the communication with various organizations occurs through meetings, list-serves, conferences, electronic documents available on websites, and by Facebook and Twitter pages. Though the public can access these sources for information, no state effort to implement an organized and targeted media campaign educating the public about the trauma system has occurred within the EMS Authority or by other trauma system stakeholder organizations.

Additional assistance would be beneficial to coordinate, develop, and mobilize a multidisciplinary statewide trauma system coalition to inform the public and elected officials about the challenges faced by the trauma system. It is likely that an experienced coalition coordinator exists in one of the larger LEMSAs who could help develop a strategic plan for this purpose.

Recommendations

- **Collaborate with the Trauma Managers Association of California in their efforts to roll out a statewide media campaign to educate the public about the trauma system.**
 - Consider engaging graduate student(s) from a communications or marketing program to support this effort.
 - Develop a one page fact sheet to summarize the updated goals in the *California State Trauma Plan, 2015* and publish it on the Emergency Medical Services (EMS) Authority website.
 - Integrate the executive summary from the comprehensive trauma injury report recommended in the Injury Epidemiology section.
- Expand representation on the State Trauma Advisory Committee (STAC) to include non-designated acute care facilities, public member(s) and elected officials.

- Develop subcommittees to the STAC around targeted issues to increase the number of engaged trauma stakeholders.
- Cultivate relationships with public health, injury prevention, rehabilitation, emergency management organizations, EMS providers, transport agencies, public safety, and academic institutions to expand the trauma system coalition.
 - Identify an individual in California with past leadership success in building a local or regional trauma coalition to guide the development of a state-based trauma coalition.
- Support regional collaboration to enhance system integration and performance improvement
- Compile the Local EMS Agency Trauma System Activity Reports recommended in the System Leadership section, and post the document to the EMS Authority website.
- Expand the state EMS annual recognition program to include a category specific to the trauma system.

Lead Agency and Human Resources within the Lead Agency

Purpose and Rationale

Each trauma system (state, regional, local, as defined in state statute) should have a lead agency with a strong program manager who is responsible for leading the trauma system. The lead agency, usually a government agency, should have the authority, responsibility, and resources to lead the planning, development, operations, and evaluation of the trauma system throughout the continuum of care. The lead agency, empowered through legislation, ensures system integrity and provides for program integration with other health care and community-based entities, namely, public health, EMS, disaster preparedness, emergency management, law enforcement, social services, and other community-based organizations.

The lead agency works through a variety of groups to accomplish the goals of trauma system planning, implementation, and evaluation. The ability to bring multidisciplinary, multiagency advisory groups together to accomplish trauma system goals is essential in developing and maintaining the trauma system and is part of providing leadership to evolving and mature systems.

The lead agency's trauma system program manager coordinates trauma system design, the adoption of minimum standards (prehospital and in-hospital), and provides for overall system evaluation through performance indicator assessment and assurance. In addition to a trauma program manager, the lead agency must be sufficiently staffed to actively participate in each phase of development and in maintaining the system through a clearly defined structure for decision making (policies and procedures) and through proactive surveillance and evaluation. *Minimum* staffing usually consists of a trauma system program manager, data entry and analysis personnel, and monitoring and compliance personnel. Additional staff resources include administrative support and a part-time commitment from the public health epidemiology service to provide system evaluation and research support.

Within the leadership and governance structure of the trauma system, there is a role for strong physician leadership. This role is usually fulfilled by a full- or part-time trauma medical director within the lead agency.

Optimal Elements

- I. Comprehensive state statutory authority and administrative rules support trauma system leaders and maintain trauma system infrastructure, planning, oversight, and future development. **(B-201)**
 - a. The legislative authority (statutes 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. **(I-201.1)**
 - b. The lead agency has adopted clearly defined trauma system standards (for example, facility standards, triage and transfer guidelines, and data collection standards) and has sufficient legal authority to ensure and enforce compliance. **(I-201.4).**
- II. Sufficient resources, including financial and infrastructure-related, support system planning, implementation, and maintenance. **(B-204)**

Current Status

The state of California has a two-tier structure for administrative leadership. The lead agency for the state trauma system is the EMS Authority, a department of the Health and Human Services Agency. Each county or region designates a LEMSA that serves as the lead agency for the implementation and operation of its local trauma system. The EMS Authority has one full time equivalent (FTE) position dedicated to the trauma system program with some limited support from other administrative leadership positions within the agency. Some rural counties join together for administrative support to provide a multi-county LEMSA. The number LEMSA employees vary among the 33 local systems. Currently no statewide report or information is available to validate whether each LEMSA has sufficient staff to effectively manage their local system.

The EMS Authority state trauma system manager is the primary point of contact in the agency, having the responsibility for the overall coordination and management of the trauma system. The LEMSAs and trauma centers rely heavily on the state trauma system manager for assistance, particularly in the area of data support, including analysis and reporting. As reported by many participants during the TSC consultation, the workload and expectations of for the person in this position are overwhelming. No succession plan was reported to exist should this position become vacant. The TSC team concurred with the opinion of many in TSC participants that insufficient personnel resources exist in the EMS Authority dedicated to supporting the statewide trauma system.

A strength of the trauma system includes the number of stakeholders, many of whom volunteer their time to assist in the development of the statewide trauma system. One example of this is the creation of the five RTCCs. These committees function as a conduit between the LEMSAs and the EMS Authority and the STAC to aid in statewide trauma system development and standardization. The RTCC membership is currently drawn from trauma system partners within each region to include, but not be limited to, LEMSA trauma system coordinators, EMS directors and administrators, trauma center directors, trauma program managers (TPMs), non-designated acute care facility representatives, EMS providers, and other trauma partners. The state trauma system manager attends each region's Annual Summit and provides a state-of-the-state presentation. It is clear the RTCCs provide valuable and worthwhile support for the trauma system. In order to sustain this good work and structure, the EMS Authority should assess resources within its current structure and provide the necessary liaison support. Such support will enable the RTCCs to be more effective in promoting trauma system development in the rural and less developed LEMSAs.

Data management is a critical component of the trauma system. Currently, limited information technology (IT) support is provided by the EMS Authority. In addition, the EMS Authority borrows the services of an epidemiologist from the CDPH on a part-time basis. Thus the ability to respond to queries from trauma centers entering or uploading data to the state trauma registry, or to provide data analysis and reporting for the trauma system is very limited. At the LEMSA level, likewise, IT support is limited and varied. The EMS Authority should assess current staff resources and commit adequate personnel for data management support, data analysis, and reporting for the statewide EMS and trauma information systems.

Several state agencies, as well as, external resources provide services that can complement and assist in the development and management of the state trauma system. The CDPH SAC Branch, the location of the state injury prevention program, would be a good partner for data analysis. The California State Transportation Agency is currently engaged in addressing many

EMS issues, and it is collecting and analyzing data for the *California Strategic Highway Safety Plan 2015-2019*. Resources invested for this project by the EMS Authority may also inform data management needs and approaches for the EMS and trauma information systems. Rehabilitation specialists may also have valuable information to share regarding services provided to trauma survivors. The EMS Authority will need to assess its resources and dedicate sufficient staff to coordinate and support this effort.

The state trauma system is fortunate to have many stakeholders and individuals enthusiastically supporting it and volunteering their time to assist the EMS Authority and the LEMSAs in the continued development of California's trauma system. It is imperative that their support and participation is recognized and those sufficient personnel resources are dedicated to support and sustain their efforts.

Recommendations

- Review the current organization structure in Emergency Medical Services (EMS) Authority and dedicate adequate resources for agency trauma system functions.
 - Ensure adequate personnel for data management, data analysis, and reporting for the statewide EMS and trauma information systems.
 - Provide liaison support to the Regional Trauma Coordinating Committees.
- Develop a staff succession plan to ensure trauma system stability in the event of future personnel changes.
- Identify and collaborate with other state agencies and external resources to enhance trauma system development.

Trauma System Plan

Purpose and Rationale

Each trauma system, as defined in statute, should have a clearly articulated trauma system planning process resulting in a written trauma system plan. The plan should be built on a completed inventory of trauma system resources identifying gaps in services or resources and the location of assets. It should also include an assessment of population demographics, topography, or other access enhancements (location of hospital and prehospital resources) or barriers to access. It is important that the plan identify special populations (for example, pediatric, elderly, in need of burn care, ethnic groups, rural) within the geographic area served and address the needs of those populations within the planning process. A needs assessment (or other method of identifying injury patterns, patient care review/preventable death study) should also be completed for initial trauma system planning and updated periodically as needed to assess system changes over time.

The trauma system plan is developed by the lead trauma agency based on the results of a needs assessment and other data resources available for review. It describes the system design, integrated and inclusive, with adopted standards of care for prehospital and hospital personnel and a process to regularly review the plan over time. The plan is built on input from trauma advisory committees (or stakeholder groups) that assist in analyzing data, identifying resources, and developing system standards of care, including system policies and procedures and overall system design. Ideally, although every stakeholder group may not be satisfied with the plan or system design, the plan, to the extent possible, should be based on consensus of the advisory committees and stakeholder groups. These advisory groups should be able to review the plan before final adoption and approve the plan before it is submitted to the lead agency with authority for plan approval.

The trauma system plan is used to guide system development, implementation, and management. Each component of the trauma system (for example, prehospital, hospital, communications, and transportation) is clearly defined and an established service level identified (baseline) with goals for enhancement (benchmark). Within the plan are incorporated other planning documents used to ensure integration of similar services and build collaboration and cooperation with those services. Service plans for emergency preparedness, EMS, injury prevention and control, public health, social services, and mental health are examples of services for which the trauma system plan should include an interface between agencies and services.

Optimal Element

- I. 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 incident management. The written trauma system plan is developed in collaboration with community partners and stakeholders. **(B-203)**
 - a. 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. For example, the plan includes references to regulatory standards and documents and includes methods of data collection and analysis. **(I-203.4)**

Current Status

State Trauma System Plan

California developed its first comprehensive trauma system plan (TSP) in 2015, defining three major goals:

- Timely access to trauma care,
- Delivery of optimal trauma care, and
- Community health and wellness.

Trauma system planning followed a robust process beginning in 2005 and culminated with the current TSP in 2015. Early in the process, the EMS Authority published an analysis entitled *California Statewide Trauma Planning: Assessment and Future Direction* in 2006, which was based upon completion of the HRSA *Model Trauma System Planning and Evaluation* (MTSPE) document BIS self-evaluation tool. The BIS evaluates the status of 113 key indicators of an inclusive mature trauma system. Between 2006 and 2015, statewide annual trauma summits were held to refine the goals of the trauma system and its plan. Data collection for the California Emergency Medical System Information System (CEMSIS), the state trauma registry, began in 2009 to further inform TSP development. The trauma system planning process continued in 2010 with direction from the EMS Authority to the STAC to produce the current TSP. The STAC again utilized the BIS self-evaluation tool, as well as the ACS *Regional Trauma Systems: Optimal Elements, Integration, and Assessment* document to assist with the identification and description of the key components of the trauma system in California. All of these resources are solid foundations for formulation of a trauma system plan.

While the STAC consists of stakeholders with multiple roles in the trauma system representing several organizations, these individuals are appointed, and by definition are already very engaged in trauma care. A potential concern is that the actual conceptual design input for the TSP came from the STAC, which is a relatively small group of stakeholders. However, elements of the plan's development were addressed at several well-attended annual trauma summit meetings. Furthermore, broad vetting of the TSP is being completed for overall stakeholder engagement and approval prior to final enactment and implementation. Additionally, the deployment of the five RTCCs to assist with the development of the written TSP, in collaboration with the STAC, was an excellent strategy for the engagement of stakeholders from all regions.

Overall, the initial implementation goals of the TSP are written somewhat conservatively to ensure success at the outset, which is likely to be a good strategy going forward. The TSP relies on a data structure that is not yet fully operational, which is a relative weakness. No statewide injury report has been prepared since 2010, due to lack of funding. Such a report, with specific comparisons to national and neighboring state injury rates, patterns, and outcomes, would help inform priorities for plan execution going forward, although this should not hinder approval of the TSP.

The TSP was distributed for public comment to all trauma partners throughout the state for review, comment, and suggested revisions. The TSP was also reviewed by the EMS Authority Director and Deputy Director for final review prior to seeking approval by the Department of Finance and the Health and Human Services Agency Secretary. Although the request for final approval signature was scheduled for March 2016 from the Department of Finance and the

Health and Human Services Agency, agency representatives recommended delay for final approval until the TSC report was provided. This would enable the integration of significant recommendations into the TSP.

Local Trauma System Plans

The local trauma systems have high variability in their maturity. LEMSA participation in the trauma system is voluntary, but currently all 33 LEMSAs have elected to participate. Participation dictates that the LEMSA complete a trauma plan and submit it to the EMS Authority. Local trauma plans are designed to meet *minimum* standards and to address both short- and long-term needs of the local trauma system, including the number and location of trauma centers. The EMS Authority process for reassessment of LEMSA trauma plans is to review a brief LEMSA update submitted annually. The EMS Authority has limited capacity to review more detailed trauma plan updates if this were to be required.

LEMSAs are not required to perform regular re-assessment of population needs for trauma services or trauma centers. Additionally, no formal engagement in the trauma system is required of non-designated acute care facilities. Each of these activities would be helpful in bringing all LEMSAs into alignment with the overall goals of uniform quality, performance improvement standards, and timeliness of care across the system. In summary, the heterogeneity and operational independence of the LEMSAs is a relative weakness that will be addressed by successful execution of the state TSP. This will not necessarily reduce their local authority or freedom to operate and meet local community needs. The EMS Authority and the LEMSAs need sufficient financial and human resources to accomplish this through data collection and analysis, reporting, and oversight mechanisms.

The *California State Trauma Plan, 2015* is an excellent, well-developed document providing direction for the future of trauma system development in the state. The plan appropriately focuses on regional and statewide leadership, coordination of systems performance improvement, and further integration of local trauma systems.

Recommendations

- **Obtain approval for the *California State Trauma Plan, 2015* in as expeditious a manner as possible, while gaining broad stakeholder feedback.**
- **Establish a timeline and begin implementation of the key elements of the trauma system plan.**
- **Identify sufficient funding for the timely implementation of the trauma system plan.**

System Integration

Purpose and Rationale

Trauma system integration is essential for the daily care of injured people and includes such services as mental health, social services, child protective services, and public safety. The trauma system should use the public health approach to injury prevention to contribute to reducing the entire burden of injury in a state or region. This approach enables the trauma system to address primary, secondary, and tertiary injury prevention through closer integration with community health programs and mobilizing community partnerships. The partnerships also include mental health, social services, child protection, and public safety services. Collaboration with the public health community also provides access to health data that can be used for system assessment, development of public policy, and informing and educating the community.

Integration with EMS is essential because this system is linked with the emergency response and communication infrastructure and transports severely injured patients to trauma centers. Triage protocols should exist for treatment and patient delivery decisions. Regulations and procedures should exist for online and off-line medical direction. In the event of a disaster affecting local trauma centers, EMS would have a major role in evacuating patients from trauma centers to safety or to other facilities or to make beds available for patients in greater need.

The trauma system is a significant state and regional resource for the response to mass casualty incidents (MCIs). The trauma system and its trauma centers are essential for the rapid mobilization of resources during MCIs. Preplanning and integration of the trauma system with related systems (public health, EMS, and emergency preparedness) are critical for rapid mobilization when a disaster or MCI occurs. The extensive impact of disasters and MCIs on the functioning of trauma centers and the EMS and public health systems within the affected region or state must be considered, and joint planning for optimal use of all resources must occur to enable a coordinated response to an MCI. Trauma system leaders need to be actively involved in emergency management planning to ensure that trauma centers are integrated into the local, regional, and state disaster response plans.

Optimal Elements

- I. 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 incident management. The written trauma system plan is developed in collaboration with community partners and stakeholders. **(B-203)**
 - a. The trauma system plan has established clearly defined methods of integrating the trauma system plan with the EMS, emergency, and public health preparedness plans. **(I-203.7)**
- II. The trauma, public health, and emergency preparedness systems are closely linked. **(B-208)**

Current Status

The California Standardized Emergency Management System (SEMS), which is compatible with the National Incident Management System (NIMS), coordinates all of the state's emergency

management, based upon a hierarchical responsibility that begins locally. Locally, the Medical Health Operational Area Coordinators (MHOACs), Regional Disaster Medical Health Coordinators (RDMHCs), and Regional Disaster Medical Health Specialists (RDMHSs) are strengths of the system. The RDMHSs plan regional drills, request resources when needed for major events, coordinate prevention activities, and serve as subject matter experts for other coalitions. While the six-region system works well as evidenced by the well-coordinated responses to a number of mass casualty incidents, the trauma system is not well-integrated into the regional infrastructure for emergency management, and the disaster mutual aid regional borders are slightly different from the five-region structure of the RTCCs. The trauma centers are not as involved with emergency management planning as would ideally occur. Implementation of the *California State Trauma Plan* should focus on reducing siloes in this area.

While integration with a variety of other related services exists at the trauma center and LEMSA level, essentially no integration at the statewide level occurs with the following key aspects of the trauma system: injury prevention, mental health, social services, child protective services, public safety, and law enforcement. Minimal integration with other agencies in the CDPH was reported at the statewide level, despite the EMS Authority placement in the state agency organizational structure under the Department of Health and Human Services.

The coalition-based *California Strategic Highway Safety Plan* (SHSP) is a strong example of an integrated project within the system, involving interagency cooperation for the overall goal of reducing traffic-related injury, disability, and death.

The state has other specialty acute care facilities addressing time-sensitive conditions, such as stroke and ST elevation myocardial infarction (STEMI). Some of these acute care facilities are also designated trauma centers. No information was provided during the TSC regarding any current or anticipated state-level planning or policy development for these specialty care centers. Collaboration with stakeholders for these time-sensitive conditions may be beneficial when attempting to obtain adequate resources for trauma system development.

Recommendations

- Integrate the trauma centers and EMS in the development of *regional* emergency, disaster, surge capacity, and mass casualty planning based upon risk, population, and bed census assessments.
- Collaborate with the California Department of Public Health's Safe and Active Communities Branch to develop a needs-based, integrated, statewide injury prevention program.
- Devise mechanisms to disseminate best practices in integrated trauma care, mental health services, social services, child protective services, public safety, and law enforcement to all trauma stakeholders statewide.
- Develop a long-range plan of collaboration for specialized regional centers treating trauma and other time-sensitive conditions, such as stroke and ST elevation myocardial infarction (STEMI), capitalizing on shared resources.

Financing

Purpose and Rationale

Trauma systems need sufficient funding to plan, implement, and evaluate a statewide or regional system of care. All components of the trauma system need funding, including prehospital, acute care facilities, rehabilitation, and prevention programs. Lead agency trauma system management requires adequate funding for daily operations and other important activities such as advisory committee meetings, development of regulations, data collection, performance improvement, and public awareness and education. Adequate funding to support the operation of trauma centers and their state of readiness to care for seriously injured patients within the state or region is essential. The financial health of the trauma system is essential for ensuring its integrity and its improvement over time.

The trauma system lead agency needs a process for assessing its own financial health, as well as that of the trauma system. A trauma system budget should be prepared, and costs should be reported by each component, if possible. Routine collection of financial data from all participating health care facilities is encouraged to fully identify the costs and revenues of the trauma system, including costs and revenues pertaining to patient care, administrative, and trauma center operations. When possible, the lead agency financial planning should integrate with the budgets and costs of the EMS system and disaster, rehabilitation, and prevention programs to enable development of a comprehensive financial health report.

Trauma system financial planning should be related to the trauma plan outcome measures (for example, patient outcome measures such as mortality rates, length of stay, and quality-of-life indicators). Such information may demonstrate the value added by having a trauma system in place.

Optimal Elements

- I. Sufficient resources, including financial and infrastructure-related, support system planning, implementation, and maintenance. **(B-204)**
 - a. Financial resources exist that support the planning, implementation, and ongoing management of the administrative and clinical care components of the trauma system. **(I-204.2)**
 - b. Designated funding for trauma system infrastructure support (lead agency) is legislatively appropriated. **(I-204.3)**
 - c. Operational budgets (system administration and operations, facilities administration and operations, and EMS administration and operations) are aligned with the trauma system plan and priorities. **(I-204.4)**
- II. The financial aspects of the trauma systems are integrated into the overall performance improvement system to ensure ongoing fine tuning and cost-effectiveness. **(B-309)**
 - a. Collection and reimbursement data are submitted by each agency or institution on at least an annual basis. Common definitions exist for collection and reimbursement data and are submitted by each agency. **(I-309.2)**

Current Status

California is fortunate to have some funding sources to support the state trauma system; however, these funds are extremely limited with regard to supporting the state trauma system operations. The federal Preventive Health and Human Services Block grant funds are used to support the salary of the state trauma system manager, office expenses, limited travel, and the annual trauma summit. For the current fiscal year, a portion of the ACS TSC was also funded by this block grant. Every year the EMS Authority collaborates with the CDPH to determine the distribution of federal block grant funds, but priorities of the U.S. Congress or the CDPH could change, making funding for the trauma system program vulnerable. The trauma system has no formal budget. No funding is available to support the RTCCs.

In 2001, the trauma system was successful in having the state legislature pass the Trauma Care Fund to support uncompensated care. Funds were appropriated from the State's General Fund for 3 years; but no additional appropriations were made after the 2005-2006 budget year. A small residual balance in this fund was identified recently, and it was used to help support costs associated with the TSC. This Trauma Care Fund statute has not been repealed and has no expiration. No effort was reported by TSC participants to seek restoration of funding through this statute in recent years, and no legislative champion for the California trauma system was reported.

The EMS Authority has successfully leveraged grant funding to support many of its programs. For example, National Highway Traffic Safety Administration (NHTSA) funds through the Highway Safety Program were obtained to establish the EMS and trauma registries. The federal Centers for Disease Control and Prevention (CDC) and Assistant Secretary for Preparedness and Response (ASPR) emergency preparedness grants support the EMS Authority's Disaster Medical Services Division. The EMS Authority has worked with the Office of Rural Health, potentially to support the RTCCs; however, funds available have been inadequate for that purpose. Some Office of Rural Health funds were used to offer the RTTDC to rural acute care facilities.

The Maddy Emergency Medical Services Fund was established by statute in 1998, and gives counties the option to establish a fund. Fees are added to fines for motor vehicle violations. The funding allocation formula specifies the distribution for hospitals providing disproportionate trauma and emergency medical services, physician payment for emergency care and stabilization of patients, uncompensated emergency care, discretionary funds for emergency medical services, and administration of the fund. It is reported that more than \$100 million dollars are collected annually by the 47 counties that have established a fund. In 2014 the Legislature amended the Maddy Fund, requiring participating counties to submit to the EMS Authority an accounting of funds collected and how they were used. A compiled report will then be submitted to the Legislature. The EMS Authority was not provided any funding for this monitoring responsibility.

Significant concern was expressed by TSC participants that the Affordable Care Act will have a significant impact on distribution of the Maddy Fund, as it reduces the number of individuals without healthcare coverage and the amount of uncompensated care. The financial challenge now facing trauma centers is undercompensated care, especially for insured individuals covered by MediCal. The statute does not address payment for undercompensated care.

More recently the Legislature passed the "Richie Fund" portion of the Maddy Fund, which places additional fees on the motor vehicle violations. The allocation formula for this portion of

the Maddy Fund must be used to support pediatric trauma care in all trauma centers, to support pediatric trauma centers, or to improve access to and coordination of pediatric trauma care. The distribution of the Richie Fund portion of the Maddy Fund is not tied specifically to uncompensated care. Of important note, the Richie Fund has an expiration date of January 1, 2017, unless the Legislature extends the date.

The Kid's License Plate fund is associated with a fee for a vanity car license plate that is used to support injury prevention programs. It was reported that an estimated \$45 million was collected through this program, which is managed by the CDPH SAC Branch.

Multicounty LEMSAs with 3 or more counties are eligible for additional state funding from the state general fund to support LEMSA operations. A local match is required.

Strategies for revision of funding statutes that specify uncompensated care as part of the allocation formula should be developed. Some states successfully persuaded elected officials to fund trauma center readiness costs, rather than uncompensated care. Such readiness costs may include on-call physician pay, equipment, and emergency department staffing to ensure that services are available 24 hours a day, every day. This funding strategy was illustrated in the statute language associated with the Richie Fund.

Rural Flexibility grant funding from the federal HRSA Office of Rural Health Policy is another potential funding source that could be leveraged to help support the development of trauma care capability in the state's 33 critical access hospitals.

Recommendations

- **Identify and seek a stable and sustainable funding source to support California trauma system planning, oversight, and evaluation at the state level.**
- **Produce a report of the costs, the value of the trauma system and trauma care, and the importance of maintaining trauma center readiness to treat persons with severe injuries in California.**
 - **Use information within the Cost and Value Trauma Report to inform elected officials and the public about the importance of the trauma system and the challenges in sustaining the existing trauma center resources.**
- **Revise the Maddy Fund allocation formula to focus on readiness costs of emergency departments and trauma centers rather than uncompensated care.**
 - **Seek an extension of the Richie Fund portion of the Maddy Fund prior to its expiration on January 1, 2017.**
- **Seek other sources of funding to support development of trauma care capabilities in rural California acute care facilities, such as the Rural Flexibility grant program.**

TRAUMA SYSTEM ASSURANCE

Prevention and Outreach

Purpose and Rationale

Trauma systems must develop prevention strategies that help control injury as part of an integrated, coordinated, and inclusive trauma system. The lead agency and providers throughout the system should be working with business organizations, community groups, and the public to enact prevention programs and prevention strategies that are based on epidemiologic data gleaned from the system.

Efforts at prevention must be targeted for the intended audience, well defined, and structured, so that the impact of prevention efforts is system-wide. The implementation of injury control and prevention requires the same priority as other aspects of the trauma system, including adequate staffing, partnering with the community, and taking advantage of outreach opportunities. Many systems focus information, education, and prevention efforts directly to the general public (for example, restraint use, driving while intoxicated). However, a portion of these efforts should be directed toward emergency medical services (EMS) and trauma care personnel safety (for example, securing the scene, infection control). Collaboration with public service agencies, such as the department of health is essential to successful prevention program implementation. Such partnerships can serve to synergize and increase the efficiency of individual efforts. Alliances with multiple agencies within the system, hospitals, and professional associations, working toward the formation of an injury control network, are beneficial.

Activities that are essential to the development and implementation of injury control and prevention programs include the following:

- A needs assessment focusing on the public information needed for media relations, public officials, general public, and third-party payers, thus ensuring a better understanding of injury control and prevention
- Needs assessment for the general medical community, including physicians, nurses, prehospital care providers, and others concerning trauma system and injury control information
- Preparation of annual reports on the status of injury prevention and trauma care in the system
- Trauma system databases that are available and usable for routine public health surveillance

Optimal Elements

- I. 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. **(B-207)**
 - a. The trauma system leaders (lead agency, advisory committees, and others) inform and educate constituencies and policy makers through community development activities, targeted media messaging, and active collaborations aimed at injury prevention and trauma system development. **(I-207.2)**

II. The jurisdictional lead agency, in cooperation with other agencies and organizations, uses analytic tools to monitor the performance of population based prevention and trauma care services. **(B-304)**

- a. 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. **(I-304.1)**

III. The lead agency ensures that the trauma system demonstrates prevention and medical outreach activities within its defined service area. **(B-306)**

- a. The trauma system is active within its jurisdiction in the evaluation of community based activities and injury prevention and response programs. **(I-306.2)**
- b. The effect or impact of outreach programs (medical and community training and support and prevention activities) is evaluated as part of a system performance improvement process. **(I-306.3)**

Current Status

Prevention

It was reported that the CDPH has not prepared a comprehensive injury prevention plan with priorities for intervention since about 2006 when CDC funding was available. A final report of accomplishments associated with the last plan was published in 2010, and this report offered additional strategic directions for the following five priorities: older adult falls; older adult poisoning due to medication errors; motor vehicle driver and occupant injuries for ages 14 to 20 years; pedestrian safety, walkability, and universal liability; and child maltreatment. No statewide injury prevention coalition was reported to be currently active by the CDPH SAC injury program.

The *California Strategic Highway Safety Plan 2015-2019*, coordinated by the California State Transportation Agency, addresses many important injuries on state highways and public roads. The EMS Authority is an active participant in the plan and its focus areas are associated with trauma system priorities, including:

- Increase involvement by EMS leaders in the plan.
- Develop strategies to improve the time to definitive care
- Improve data regarding the time of the crash.
- Improve access to information to enable interoperability of communications systems between all responders to crash sites
- Develop guidance documents to share with EMS providers to increase crash scene safety.

Injury prevention activities are a significant focus at the Level I and Level II trauma centers, and the injury prevention coordinators in these centers often coordinate or participate in injury prevention activities within their LEMSA. Local injury prevention coalitions do exist for many focus areas such as: Safe Kids, Injury Free Coalition, Mothers Against Driving Drunk, and Students Against Destructive Decisions. The TMAC recently expanded its membership to include injury prevention coordinators. This membership category will potentially facilitate mentoring opportunities for new injury prevention coordinators. The statewide communication made possible by the TMAC has the potential to promote wider use of evidence-based injury prevention and evaluation strategies.

Selection of prevention priorities by the trauma centers is often informed by review of injury mechanisms for patients in the trauma center's registry. A wide range of injury prevention strategies have been implemented by the LEMSAs and trauma centers, including specific attention to older adult falls, child pedestrian safety, car safety seats, minority youth violence, water safety, equestrian safety, and preventing alcohol-related crash injuries in teen drivers. A few counties have used evidence-based strategies and then evaluated outcomes associated with their injury prevention efforts.

Injury prevention is not a significant focus of all LEMSAs, particularly those in more rural counties. However, it is likely that fire and EMS agencies, acute care facilities, trauma program managers, and injury prevention coalitions actively participate in sponsoring injury prevention efforts. Both the CDPH SAC Branch and the EMS Authority websites have links to injury prevention resources for interested advocates.

Outreach

Trauma centers have assumed a large role in education outreach to acute care facilities that do not have trauma center designation. The TMAC assumed the role of mentoring new TPMs, to help them establish policies and procedures, learn about the PIPS process, and assist with trauma registry issues.

Funding was obtained from the Office of Rural Health to offer the RTTDC to rural facilities since 2012. To date 7 courses have been offered, and 2 more courses are scheduled in 2016. The majority of these courses have been offered in critical access hospitals. Some pediatric trauma centers collaborate with air medical providers to take pediatric trauma education out to the rural facilities. Other trauma centers sponsor continuing medical education conferences within their region.

Efforts have been made to provide the annual trauma summit in a location that is more accessible to the rural health providers.

No funding is available to support outreach to the non-designated rural acute care facilities, including the state's 33 critical access hospitals. These facilities are important for an inclusive trauma system, as they are often the initial hospital destination for injured patients. These facilities need guidance and technical assistance to ensure that they are integrated into the trauma system. Technical assistance should focus on initial resuscitation and stabilization, re-triage criteria for transfer, appropriate facility to receive the injured patient, inter-facility transport options, who to call for inter-facility transfer, submission of data elements to the trauma registry, and inclusion in the performance improvement (PI) process. A dedicated outreach coordinator to support this process would be beneficial, especially if travel funds to visit the facilities exist.

Recommendations

- Create an injury prevention plan in collaboration with the California Department of Public Health that identifies priorities for intervention.
- Share the injury prevention plan and its priorities with Local EMS Agencies (LEMSAs) and trauma centers.
 - Encourage LEMSAs and trauma centers to develop strategies to address state priority injury prevention issues.

- Collaborate with the California Hospital Association to identify a strategy and potential funding mechanisms for technical assistance and outreach to non-designated acute care facilities in rural communities to assist them to become a trauma-participating hospital.
 - Develop a special recognition program for non-designated acute care facilities that submit trauma data as trauma participating hospitals.
- Seek funding for continued provision of the Rural Trauma Team Development Course to rural acute care facilities to assist them become a trauma participating facility.

Emergency Medical Services

Purpose and Rationale

The trauma system includes, and/or interacts with, many different agencies, institutions, and systems. The EMS system is one of the most important of these relationships. EMS is often the critical link between the injury-producing event and definitive care at a trauma center. Even though at its inception the EMS system was a very broad system concept, over time, EMS has come to be recognized as the prehospital care component of the larger emergency health care system. It is a complex system that not only transports patients, but also includes public access, communications, personnel, triage, data collection, and quality improvement activities.

The EMS system medical director must have statutory authority to develop protocols, oversee practice, and establish a means of ongoing quality assessment to ensure the optimal provision of prehospital care. If not the same individual, the EMS system medical director must work closely with the trauma system medical director to ensure that protocols and goals are mutually aligned. The EMS system medical director must also have ongoing interaction with EMS agency medical directors at local levels, as well as the state EMS for Children program, to ensure that there is understanding of and compliance with trauma triage and destination protocols.

Ideally, a system should have some means of ensuring whether resources meet the needs of the population. To achieve this end, a resource and needs assessment evaluating the availability and geographic distribution of EMS personnel and physical resources is important to ensure a rapid and appropriate response. This assessment includes a detailed description of the distribution of ground ambulance and aeromedical locations across the region. Resource allocations must be assessed on a periodic basis as needs dictate a redistribution of resources. In communities with full-time paid EMS agencies, ambulances should be positioned according to predictable geographic or temporal demands to optimize response efficiencies. Such positioning schemes require strong prehospital data collection systems that can track the location of occurrences over time. Periodic assessment of dispatch and transport times will also provide insight into whether resources are consistent with needs. Each region should have objective criteria dictating the level of response (advanced life support [ALS], basic life support [BLS]), the mode of transport, and the disposition of the patient based on the location of the incident and the severity of injury. A mechanism for case-based review of trauma patients that involves prehospital and hospital providers allows bidirectional information sharing and continuing education, ensuring that expectations are met at both ends. Ongoing review of triage and treatment decisions allows for continuing quality improvement of the triage and prehospital care protocols. A more detailed discussion of in-field (primary) triage criteria is provided in the section titled: System Coordination and Patient Flow (p 20) (White Book).

Human Resources

Periodic workforce assessments of EMS should be conducted to ensure adequate numbers and distribution of personnel. EMS, not unlike other health care professions, experiences shortages and maldistribution of personnel. Some means of addressing recruitment, retention, and engagement of qualified personnel should be a priority. It is critical that trauma system leaders work to ensure that prehospital care providers at all levels attain and maintain competence in trauma care. Maintenance of competence should be ensured by requiring standards for credentialing and certification and specifying continuing educational requirements for all prehospital personnel involved in trauma care. The core curricula for First Responder,

Emergency Medical Technician (EMT) Basic, EMT-Intermediate, EMT Paramedic, and other levels of prehospital personnel have an essential orientation to trauma care for all ages. However, trauma care knowledge and skills need to be continuously updated, refined, and expanded through targeted trauma care training such as Prehospital Trauma Life Support®, Basic Trauma Life Support®, and age-specific courses. Mechanisms for the periodic assessment of competence, educational needs, and education availability within the system should be incorporated into the trauma system plan.

Systems of excellence also encourage EMS providers to go beyond meeting state standards for agency licensure and to seek national accreditation. National accreditation standards exist for ground-based and air medical agencies, as well as for EMS educational programs. In some states, agency licensure requirements are waived or substantially simplified if the EMS agency maintains national accreditation.

EMS is the only component of the emergency health care and trauma system that depends on a large cadre of volunteers. In some states, substantially more than half of all EMS agencies are staffed by volunteers. These agencies typically serve rural areas and are essential to the provision of immediate care to trauma patients, in addition to provision of efficient transportation to the appropriate facility. In some smaller facilities, EMS personnel also become part of the emergency resuscitation team, augmenting hospital personnel. The trauma care system program should reach out to these volunteer agencies to help them achieve their vital role in the outcome of care of trauma patients. However, it must be noted that there is a delicate balance between expecting quality performance in these agencies and placing unrealistic demands on their response capacity. In many cases, it is better to ensure that there is an optimal BLS response available at all times rather than a sporadic or less timely response involving ALS personnel. Support to volunteer EMS systems may be in the form of quality improvement activities, training, clinical opportunities, and support to the system medical director.

Owing to the multidisciplinary nature of trauma system response to injury, conferences that include all levels of providers (for example, prehospital personnel, nurses, and physicians) need to occur regularly with each level of personnel respected for its role in the care and outcome of trauma patients. Communication with and respect for prehospital providers is particularly important, especially in rural areas where exposure to major trauma patients might be relatively rare.

Integration of EMS within the Trauma System

In addition to its critical role in the prehospital treatment and transportation of injured patients, EMS must also be engaged in assessment and integration functions that include the trauma system and also public health and other public safety agencies. EMS agencies should have a critical role in ensuring that communication systems are available and have sufficient redundancy so that trauma system stakeholders will be able to assess and act to limit death and disability at the single patient level and at the population level in the case of mass casualty incidents (MCIs). Enhanced 911 services and a central communication system for the EMS/trauma system to ensure field-to-facility bidirectional communications, inter-facility dialogue, and all-hazards response communications among all system participants are important for integrating a system's response. Wireless communications capabilities, including automatic crash notification, hold great promise for quickly identifying trauma-producing events, thereby reducing delays in discovery and decreasing prehospital response intervals.

Further integration might be accomplished through the use of EMS data to help define high-risk geographic and demographic characteristics of injuries within a response area. EMS should

assist with the identification of injury prevention program needs and in the delivery of prevention messages. EMS also serves a critical role in the development of all-hazards response plans and in the implementation of those plans during a crisis. This integration should be provided by the state and regional trauma plan and overseen by the lead agency. EMS should participate through its leadership in all aspects of trauma system design, evaluation, and operation, including policy development, public education, and strategic planning.

Optimal Elements

- I. The trauma system is supported by an EMS system that includes communications, medical oversight, prehospital triage, and transportation; the trauma system, EMS system, and public health agency are well integrated. **(B-302)**
 - a. 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. **(I-302.1)**
 - b. There is a clearly defined, cooperative, and ongoing relationship between the trauma specialty physician leaders (for example, trauma medical director within each trauma center) and the EMS system medical director. **(I-302.2)**
 - c. There is clear-cut legal authority and responsibility for the EMS system medical director, including the authority to adopt protocols, to implement a performance improvement system, to restrict the practice of prehospital care providers, and to generally ensure medical appropriateness of the EMS system. **(I-302.3)**
 - d. The trauma system medical director is actively involved with the development, implementation, and ongoing evaluation of system dispatch protocols to ensure they are congruent with the trauma system design. These protocols include, but are not limited to, which resources to dispatch, for example, ALS versus BLS, air ground coordination, early notification of the trauma care facility, pre-arrival instructions, and other procedures necessary to ensure that resources dispatched are consistent with the needs of injured patients. **(I-302.4)**
 - e. The retrospective medical oversight of the EMS system for trauma triage, communications, treatment, and transport is closely coordinated with the established performance improvement processes of the trauma system. **(I-302.5)**
 - f. There is a universal access number for citizens to access the EMS/trauma system, with dispatch of appropriate medical resources. There is a central communication system for the EMS/trauma system to ensure field- to- facility bidirectional communications, inter-facility dialogue, and all-hazards response communications among all system participants. **(I-302.7)**
 - g. There are sufficient and well-coordinated transportation resources to ensure that EMS providers arrive at the scene promptly and expeditiously transport the patient to the correct hospital by the correct transportation mode. **(I-302.8)**
- II. The lead trauma authority ensures a competent workforce. **(B-310)**
 - a. In cooperation with the prehospital certification and licensure authority, set guidelines for prehospital personnel for initial and ongoing trauma training, including trauma-specific courses and courses that are readily available throughout the state. **(I-310.1)**

- b. In cooperation with the prehospital certification and licensure authority, ensure that prehospital personnel who routinely provide care to trauma patients have a current trauma training certificate, for example, Prehospital Trauma Life Support or Basic Trauma Life Support and others, or that trauma training needs are driven by the performance improvement process. **(I-310.2)**
- c. Conduct at least 1 multidisciplinary trauma conference annually that encourages system and team approaches to trauma care. **(I-310.9)**

III. The lead agency acts to protect the public welfare by enforcing various laws, rules, and regulations as they pertain to the trauma system. **(B-311)**

- a. Incentives are provided to individual agencies and institutions to seek state or nationally recognized accreditation in areas that will contribute to overall improvement across the trauma system, for example, Commission on Accreditation of Ambulance Services for prehospital agencies, Council on Allied Health Education Accreditation for training programs, and American College of Surgeons (ACS) verification for trauma facilities. **(I-311.6)**

Current Status

The EMS Authority completed a system inventory of the EMS providers (emergency medical technician [EMT]–basic, Advanced EMT, Paramedic), EMS transport services (ground ambulances, air medical services, specialty transport service) and Public Safety Answering Points (PSAPs) in California.

The EMS regulations clearly articulate the Scope of Practice, Local Optional Scope of Practice, and Trial Scope of Practice for EMS providers. This establishes a level of standardized practice throughout out the state while allowing for latitude by the local medical directors, as well as allowing the flexibility to conduct research trials. These practice scopes should be revised on a periodic basis to ensure that they remain current with modern practice. Regulations also set forth the requirements for initial certification/licensure, continuing education, and recurrent certification/licensure of prehospital providers. California utilizes the National Registry of Emergency Medical Technicians (NREMT) for written and skills examinations at all levels (EMT-Basic, Advanced-EMT, and Paramedic) for initial certification/licensure. Once initial certification is attained hourly requirements are specified for continuing medical education (CME), which are robust and match national benchmarks. However, no specific trauma or pediatric trauma requirements for CME or recertification are specified. Re-certification/re-licensure (performed every two years) is accomplished at the local level as determined by the LEMSA medical director who oversees their practice. Further assurance of competence for paramedics occurs at the local level (overseen by the EMS medical director) wherein providers must be “accredited” to practice in that jurisdiction.

Training programs for EMS providers must adhere to the curriculum as established by the U. S. Department of Transportation (US DOT) National Standard Curriculum for EMT-Basic, Advanced EMT, and Paramedic. Paramedic training programs must be accredited by the Commission on Accreditation of Allied Health Education Professions (CAAHEP). This provides assurance of a comprehensive and robust educational program for EMS professionals.

Transporting agencies (ground ambulances, air medical services, and critical care transport services) must be registered with the state. They are encouraged to utilize national accrediting

organizations, such as the Commission on Accreditation of Ambulance Services (CAAS) or the Commission on Accreditation of Medical Transport Systems (CAMTS), as a means to optimize operations and clinical care.

Emergency transport vehicle inspection and licensure are not uniformly performed by personnel with medical expertise. This has implications for adherence to the requirements regarding medical equipment, as well as the tracking of emergency medical resources available for trauma systems planning and improvement.

Public Safety Communications provides the state with emergency communications via the universal 911 access number. This access portal is provided to 452 individual PSAPs across the state. The PSAPs answer calls to 911 and dispatch medical resources (ambulances), in addition to providing pre-arrival instructions to callers. Some urban, high volume PSAPs use robust, national dispatch protocols and pre-arrival instructions, such as Emergency Medical Dispatch (EMD), and a quality performance program (e.g., ProQA) to monitor, assess, and optimize dispatch operations. Smaller PSAPs and those in rural areas do not utilize these tools and are a source of variance in this aspect of emergency care. LEMSAs are not uniformly monitoring or assessing this point of entry into the emergency care system. Plans to upgrade the current 911 system to Next Generation 911 were reported by TSC participants. Next Generation 911 will route emergency calls to the closest PSAP and more accurately triangulate caller location. The new system will improve the efficiency of operations and speed of emergency response; however the timeframe for upgrade was not reported.

Medical oversight of EMS occurs at two levels. Oversight at the county or LEMSAs level occurs by offline medical control. This encompasses physician oversight of triage, treatment protocols, performance improvement (PI), and credentialing. This aspect of medical oversight needs to clearly delineate trauma system improvement initiatives to the LEMSAs, which may in turn submit data reports to the EMS Authority for overall trauma system assessment. The second level of medical oversight occurs at base hospitals by way of radio or cell phone communications between the EMS provider and a physician or nurse in the Emergency Department. The LEMSAs encourage EMS providers to utilize the CDC *Guidelines for Field Triage of Injured Patients*. This assists EMS providers to determine the appropriate destination hospital for trauma patients. LEMSAs have the latitude to modify the field triage guidelines based upon local resource availability, topography, and weather conditions. The levels of over- and under-triage for trauma patients are not readily available to the EMS Authority or the RTCCs. Even at the local level, these data are not uniformly available to each LEMSAs or trauma center. These data are collected and analyzed to a greater degree in the urban areas than in rural areas.

EMS providers transporting patients to hospitals (either trauma centers or non-trauma centers) are required to leave a patient care record at the facility. No uniform, electronic platform exists for these reports, and some agencies, especially those in rural environments, utilize hand written records. This lack of uniformity leads to data loss and hampers system improvement and planning, especially as it relates to over- and under-triage. Some trauma centers and non-trauma centers reported difficulty in obtaining prehospital data. This has negative effects for the required trauma center data reporting to the National Trauma Data Bank (NTDB), and it also impedes patient tracking along the continuum of trauma care.

The noncontiguous distribution of counties in the rural LEMSAs (North Coast EMS, North California EMS,) may not be ideal for trauma system oversight, monitoring, and PI.

Recommendations

- Establish benchmarks for over- and under-triage of trauma patients.
- Assess the over- and under-triage rate for each Local EMS Agency (LEMSA), and identify and close gaps with established benchmarks.
- Collaborate with the California Highway Patrol to incorporate medical equipment standards for transport vehicle licensure.
- Assure all EMS patient data are included in hospital medical records (trauma centers and non-trauma centers), as well as trauma registries.
- Ensure that all LEMSAs medical directors report their clinical performance improvement initiatives to the EMS Authority.

Definitive Care Facilities

Purpose and Rationale

Inclusive trauma systems are the systems that include all acute health care facilities, to the extent that their resources and capabilities allow and in which the patient's needs are matched to hospital resources and capabilities. Thus, as the core of a regional trauma system, acute care facilities operating within an inclusive trauma system provide definitive care to the entire spectrum of patients with traumatic injuries. Acute care facilities must be well integrated into the continuum of care, including prevention and rehabilitation, and operate as part of a network of trauma-receiving hospitals within the public health framework. All acute care facilities should participate in the essential activities of a trauma system, including performance improvement, data submission to state or regional registries, representation on regional trauma advisory committees, and mutual operational agreements with other regional hospitals to address inter-facility transfer, educational support, and outreach. The roles of all definitive care facilities, including specialty hospitals (for example, pediatric, burn, severe traumatic brain injury [TBI], spinal cord injury [SCI]) within the system should be clearly outlined in the regional trauma plan and monitored by the lead agency. Facilities providing the highest level of trauma care are expected to provide leadership in education, outreach, patient care, and research and to participate in the design, development, evaluation, and operation of the regional trauma system.

In an inclusive system, patients should be triaged to the appropriate facility based on their needs and facility resources. Patients with the least severe injuries might be cared for at appropriately designated facilities within their community, whereas the most severe should be triaged to a Level I or II trauma center. In rural and frontier systems, smaller facilities must be ready to resuscitate and initiate treatment of the major injuries and have a system in place that will allow for the fastest, safest transfer to a higher level of care.

Trauma receiving facilities providing definitive care to patients with other than minor injuries must be specifically designated by the state or regional lead agency and equipped and qualified to do so at a level commensurate with injury severity. To assess and ensure that injury type and severity are matched to the qualifications of the facilities and personnel providing definitive care, the lead agency should have a process in place that reviews and verifies the qualifications of a particular facility according to a specific set of resource and quality standards. This criteria-based process for review and verification should be consistent with national standards and be conducted on a periodic cycle as determined by the lead agency. When centers do not meet set standards, there should be a process for suspension, probation, revocation, or de-designation.

Designation by the lead agency should be restricted to facilities meeting criteria or statewide resource and quality standards and based on patient care needs of the regional trauma system. There should be a well-defined regulatory relationship between the lead agency and designated trauma facilities in the form of a contract, guidelines, or memorandum of understanding. This legally binding document should define the relationships, roles, and responsibilities between the lead agency and the medical leadership from each designated trauma facility.

The number of trauma centers by level of designation and location of acute care facilities must be periodically assessed by the lead agency with respect to patient care needs and timely access to definitive trauma care. There should be a process in place for augmenting and restricting, if necessary, the number and/or level of acute care facilities based on these periodic

assessments. The trauma system plan should address means for improving acute care facility participation in the trauma system, particularly in systems in which there has been difficulty addressing needs.

Human Resources

The ability to deliver high-quality trauma care is highly dependent on the availability of skilled human resources. Therefore, it is critical to assess the availability and educational needs of providers on a periodic basis. Because availability, particularly of subspecialty resources, is often limited, some means of addressing recruitment, retention, and engagement of qualified personnel should be a priority. Periodic workforce assessments should be conducted. Maintenance of competence should be ensured by requiring standards for credentialing and certification and specifying continuing educational requirements for physicians and nurses providing care to trauma patients. Mechanisms for the periodic assessment of ancillary and subspecialty competence, educational needs, and availability within the system for all designated facilities should be incorporated into the trauma system plan. The lead trauma centers in rural areas will need to consider teleconferencing and telemedicine to assist smaller facilities in providing education on regionally identified needs. In addition, lead trauma centers within the region should assist in meeting educational needs while fostering a team approach to care through annual educational multidisciplinary trauma conferences. These activities will do much to foster a sense of teamwork and a functionally inclusive system.

Integration of Designated Trauma Facilities within the Trauma System

Designated trauma facilities must be well integrated into all other facets of an organized system of trauma care, including public health systems and injury surveillance, prevention, EMS and prehospital care, disaster preparedness, rehabilitation, and system performance improvement. This integration should be provided by the state and/or regional trauma plan and overseen by the lead agency.

Each designated acute care facility should participate, through its trauma program leadership, in all aspects of trauma system design, evaluation, and operation. This participation should include policy and legislative development, legislative and public education, and strategic planning. In addition, the trauma program and subspecialty leaders should provide direction and oversight to the development, implementation, and monitoring of integrated protocols for patient care used throughout the system (for example, TBI guidelines used by prehospital providers and non-designated transferring centers), including region specific primary (field) and secondary (early transfer) triage protocols. The highest level trauma facilities should provide leadership of the regional trauma committees through their trauma program medical leadership. These medical leaders, through their activities on these committees, can assist the lead agency and help ensure that deficiencies in the quality of care within the system, relative to national standards, are recognized and corrected. Educational outreach by these higher levels centers should be used when appropriate to help achieve this goal.

Optimal Elements

- I. Acute care facilities are integrated into a resource efficient, inclusive network that meets required standards and that provides optimal care for all injured patients. **(B-303)**
 - a. The trauma system plan has clearly defined the roles and responsibilities of all acute care facilities treating trauma and of facilities that provide care to specialty populations (for example, burn, pediatric, SCI, and others). **(I-303.1)**

- II. To maintain its state, regional, or local designation, each hospital will continually work to improve the trauma care as measured by patient outcomes. **(B-307)**
- a. The trauma system engages in regular evaluation of all licensed acute care facilities that provide trauma care to trauma patients and of designated trauma hospitals. Such evaluation involves independent external reviews. **(I-307.1)**
- III. The lead trauma authority ensures a competent workforce. **(B-310)**
- a. As part of the established standards, set appropriate levels of trauma training for nursing personnel who routinely care for trauma patients in acute care facilities. **(I-310.3)**
 - b. Ensure that appropriate, approved trauma training courses are provided for nursing personnel on a regular basis. **(I-310.4)**
 - c. In cooperation with the nursing licensure authority, ensure that all nursing personnel who routinely provide care to trauma patients have a trauma training certificate (for example, Advanced Trauma Care for Nurses, Trauma Nursing Core Course, or any national or state trauma nurse verification course). As an alternative after initial trauma course completion, training can be driven by the performance improvement process. **(I-310.5)**
 - d. In cooperation with the physician licensure authority, ensure that physicians who routinely provide care to trauma patients have a current trauma training certificate of completion, for example, Advanced Trauma Life Support® (ATLS®) and others. As an alternative, physicians may maintain trauma competence through continuing medical education programs after initial ATLS completion. **(I-310.8)**
 - e. Conduct at least 1 multidisciplinary trauma conference annually that encourages system and team approaches to trauma care. **(I-310.9)**
 - f. As new protocols and treatment approaches are instituted within the system, structured mechanisms are in place to inform all personnel about the changes in a timely manner. **(I-310-10)**

Current Status

California is a large and heterogeneous state in terms of geography, population distribution, and resource availability. The state has approximately 435 acute care facilities, including 33 critical access hospitals. California currently recognizes six levels of trauma centers, adult Levels I, II, III, and IV, and pediatric Levels I and II. The EMS Authority reports a total of 76 designated trauma facilities:

- 13 Level I adult centers,
- 37 Level II adult centers,
- 13 Level III adult centers,
- 9 Level IV adult centers,
- 6 Level I pediatric centers, and
- 10 Level II pediatric centers.

Twelve facilities have dual pediatric and adult designations. The Level I and Level II trauma center locations coincide with the major population distribution. None are located in the northern third of the state or along the eastern state border. As a result, according to 2010 data, the trauma system provides Level I or Level II trauma center coverage to about 98% of the

population and 55% of the land area, compared to a national average of Level I and II trauma centers covering 90% of population and 35% of land area.

The EMS Authority does not designate trauma centers; instead, the 33 LEMSAs have this authority and responsibility. Each LEMSA submits a policy to the EMS Authority that outlines the designation and de-designation process in their trauma plan, which is reviewed by the EMS Authority to ensure that the process adheres to statutory and regulatory language. Acute care facilities submit an application to the LEMSA, and if requirements are complete, an internal or external site visit is performed to verify the application.

Some variability exists among the LEMSAs relative to the designation process. Some LEMSAs require trauma center verification by the ACS for Level I and II trauma centers as part of the designation process. Most LEMSAs require an ACS visit even if ACS verification is not obtained. In some cases the LEMSA performs a simultaneous visit with the ACS team as part of the designation process. The designation process site visit for Level III and IV trauma facilities may be more commonly performed by local or in-state reviewers. In remote and rural areas interested acute care facilities should be offered technical assistance to encourage their participation in the trauma system. However, in more urban areas that are within reasonable time and distance access to Level I and II trauma centers, Level III trauma centers should also be held to ACS verification standard.

California has not yet experienced wide spread proliferation of trauma centers where they are potentially not needed. The criterion, established in statute, used to determine need for a Level I or II trauma center is one per 350,000 population. It was reported by TSC participants that this criterion alone is not always adequate. Expanded criteria should be developed and applied to help with future determinations of need for additional Level I and II trauma centers. Potential metrics could include time and distance from existing trauma centers, the need for increased surge capacity, anticipated volume, and the protection of Level I trauma centers to be able to meet their training and research obligations.

While data submission is required from both, designated trauma centers and all acute care facilities, it was reported that the receipt of data from some Level III and Level IV trauma centers and the non-designated acute care facilities is not consistently provided. Trauma system performance measures vary by LEMSA. In more populous counties the PI process is robust, but it is less robust in more rural environments. Simple measures such as over- and under-triage, adherence to destination guidelines, delays in transfer, and multi-institution transfers should be measured consistently across LEMSAs.

Recommendations

- **Establish Emergency Medical Services (EMS) Authority guidelines to ensure uniformity of the trauma center designation process across Local EMS Agencies (LEMSAs).**
 - **Use the American College of Surgeons' (ACS) verification process for all Level I and Level II trauma centers**
 - **Use the ACS verification process for Level III trauma centers operating in proximity to higher-level trauma centers within a LEMSA.**

- **Modify the designation process for Level III and Level IV trauma centers operating in a LEMSA without a higher level trauma center, or in areas of a LEMSA not served by other trauma centers, to focus on resource enhancement and to encourage participation in the trauma system.**
- **Exercise the authority of the LEMSAs to designate trauma centers based upon the needs of the population served.**
 - **Provide EMS Authority guidelines for needs-assessment methodology.**
 - **Provide EMS Authority guidelines for metrics of trauma center need that are additional to the 350,000 population rule.**
- **Exercise the authority of the LEMSAs to collect data from all acute care facilities in their region.**
- Regularly analyze the interaction between definitive care facilities, within and across the LEMSAs, including the following metrics:
 - Primary (field to initial hospital) transport and secondary (inter-facility transfer) over-triage and under-triage
 - Delays in transfer
 - Multi-step transfers
 - Mortalities occurring outside of Level I and Level II trauma centers.

System Coordination and Patient Flow

Purpose and Rationale

To achieve the best possible outcomes, the system must be designed so that the right patient is transported to the right facility at the right time. Although on the surface this objective seems relatively straightforward, patients, geography, and transportation systems often conspire to present significant challenges. The most critically injured trauma patient is often easy to identify at the scene by virtue of the presence of coma or hypotension. However, in some circumstances, the patients requiring the resources of a Level I or II center may not be immediately apparent to prehospital providers. Primary or field triage criteria aid providers in identifying which patients have the greatest likelihood of adverse outcomes and might benefit from the resources of a designated trauma center. Even if the need is identified, regional geography or limited air medical (or land) transport services might not allow for direct transport to an appropriate facility.

Primary triage of a patient from the field to a center capable of providing definitive care is the goal of the trauma system. However, there are circumstances (for example, airway management, rural environments, inclement weather) when triaging a patient to a closer facility for stabilization and transfer is the best option for accessing definitive care. Patients sustaining severe injuries in rural environments might need immediate assessment and stabilization before a long-distance transport to a trauma center. In addition, evaluation of the patient might bring to light severe injuries for which needed care exceeds the resources of the initial receiving facility. Some patients might have specific needs that can be addressed at relatively few centers within a region (for example, pediatric trauma, burns, severe TBI, SCI, and reimplantation). Finally, temporary resource limitations might necessitate the transfer of patients between acute care facilities.

Secondary triage at the initial receiving facility has several advantages in systems with a large rural or suburban component. The ability to assess patients at non-designated or Level III to V centers provides an opportunity to limit the transfer of only the most severely injured patients to Level I or II facilities, thus preserving a limited resource for patients most in need. It also provides patients with lesser injuries the possibility of being cared for within their community.

The decision to transfer a trauma patient should be based on objective, prospectively agreed-on criteria. Established transfer criteria and transfer agreements will minimize discussions about individual patient transfers, expedite the process, and ensure optimal patient care. Delays in transfer might increase mortality, complications, and length of stay. A system with an excess of transferred patients might tax the resources of the regional trauma facility. Conversely, inappropriate retention of patients at centers without adequate facilities or expertise might increase the risk of adverse outcomes. Given the importance of timely, appropriate inter-facility transfers, the time to transfer, as well as the rates of primary and secondary over-triage basis, and corrective actions should be instituted when problems are identified. Data derived from tracking and monitoring the timeliness of access to a level of trauma care commensurate with injury type and severity should be used to help define optimal system configuration.

A central communications center with real-time access to information on system resources greatly facilitates the transfer process. Ideally, this center identifies a receiving facility, facilitates dialogue between the transferring and receiving centers, and coordinates inter-facility transport.

To ensure that the system operates at the greatest efficiency, it is important that patients are repatriated back to community hospitals once the acute phase of trauma care is complete. The process of repatriation opens up the limited resources available to care for severely injured patients. In addition, it provides an opportunity to bring patients back into their local environment where their social network might help reintegrate patients into their community.

Optimal Elements

- I. The trauma system is supported by an EMS system that includes communications, medical oversight, prehospital triage, and transportation; the trauma system, EMS system, and public health agency are well integrated. **(B-302)**
 - a. 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 a major trauma patient. **(I-302.6)**
 - b. 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 communications, inter-facility dialogue, and all-hazards response communications among all system participants. **(I-302.7)**
 - c. There is a procedure for communications among medical facilities when arranging for inter-facility transfers, including contingencies for radio or telephone system failure. **(I-302.9)**
- II. Acute care facilities are integrated into a resource-efficient, inclusive network that meets required standards and that provides optimal care for all injured patients. **(B-303)**
 - a. 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 that the patients are expeditiously transferred to the appropriate system-defined trauma facility. **(I-303.4)**

Current Status

The universal 911 number for citizens to access the EMS system is present, but migration to a more robust emergency communications system (Next Generation 911) is on hold due to legacy issues and funding. Even then, the widespread adoption of this technology into the rural areas will be slow. Until this transition is completed, gaps and shortfalls in locating cell phone callers and routing calls to the closest PSAP may impede access to the emergency care system.

For emergency dispatch, the use of EMD, pre-arrival instructions, and dispatch PI tends to be employed only in urban areas with high trauma volumes. Rural areas and regions with low trauma volumes not using these operational approaches and tools experience less efficient patient flow, and they are unable to execute PI activities. Dispatch is the point at which basic and advanced life support or air medical services are operationalized, thus this is an important determinant in the use of transport assets for the trauma patient.

Most LEMSA's encourage EMS providers to utilize the CDC field triage guidelines for injured patients. This assists EMS providers in determining the appropriate destination hospital for trauma patients. Individual LEMSA's have the latitude to modify these guidelines based upon local resource availability, topography, and weather conditions.

When triage guidelines are tightly followed, as in urban LEMSAs with larger populations, the trauma system is able to report their rates of over- and under-triage. Rural LEMSA's with smaller volumes may have difficulty in determining these rates, thus limiting the appropriate tracking of patients within the trauma system.

Trauma centers and other acute care facilities are required to have transfer agreements with specialty facilities able to provide care for spinal cord injury (SCI), reimplantation, burns, pediatric trauma patients, and repatriation. Of note, no similar transfer agreement requirement exists for the patient with traumatic brain injury (TBI). Re-triage guidelines exist to identify critically ill patients who may benefit from expedited transfer from a non-designated hospital to a trauma center. It is not clear if transfers between facilities or expediting transfers of critical patients are tracked, thus making it difficult to determine the re-triage rate (movement of trauma patients between hospitals).

No statewide or central communication system exists to assist in the transfer of trauma patients between facilities. This may best be facilitated at the level of the LEMSA who could develop a streamlined communications network and assure timely acceptance of patient transfers. Such a process would limit the need for health professionals to make multiple calls to effect a patient transfer.

Recommendations

- Utilize Local EMS Agency (LEMSA) data to develop benchmarks for the state and regional over- and under-triage rates, analyze data, and develop process improvement strategies to address gaps.
- Collaborate with the epidemiologist to use administrative data (hospital discharge dataset) to obtain death rates and the frequency of emergency department treatment and hospital admission for any patients with trauma diagnoses in non-designated facilities.
- Develop a process to track the movement of patients through the continuum of trauma care.
- Consider using a patient tracking system that could be implemented on a regular basis as well as in the event of a disaster.
- Utilize LEMSA level data to develop benchmarks for system and regional level secondary transfer rates, analyze data, and develop process improvement strategies to address gaps.

Rehabilitation

Purpose and Rationale

As an integral component of the trauma system, rehabilitation services in acute care and rehabilitation centers provide coordinated care for trauma patients who have sustained severe or catastrophic injuries, resulting in long-standing or permanent impairments. Patients with less severe injuries may also benefit from rehabilitative programs that enhance recovery and speed return to function and productivity. The goal of rehabilitative interventions is to allow the patient to return to the highest level of function, reducing disability and avoiding handicap whenever possible. The rehabilitation process should begin in the acute care facility as soon as possible, ideally within the first 24 hours. Inpatient and outpatient rehabilitation services should be available. Rehabilitation centers should have CARF (Commission of Accreditation of Rehabilitation Facilities) accreditation for comprehensive inpatient rehabilitation programs, and accreditation of specialty centers (SCI and TBI) should be strongly encouraged.

The trauma system should conduct a rehabilitation needs assessment (including specialized programs in SCI, TBI, and for children) to identify the number of beds needed and available for rehabilitation in the geographic region. Rehabilitation specialists should be integrated into the multidisciplinary advisory committee to ensure that rehabilitation issues are integrated into the trauma system plan. The trauma system should demonstrate strong linkages and transfer agreements between designated trauma centers and rehabilitation facilities located in its geographic region (in or out of state). Plans for repatriation of patients, especially when rehabilitation centers across state lines are used, should be part of rehabilitation system planning. Feedback on functional outcomes after rehabilitation should be made available to the trauma centers.

Optimal Elements

- I. 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. **(B-308)**
 - a. The lead agency has incorporated, within the trauma system plan and the trauma center standards, requirements for rehabilitation services, including inter-facility transfer of trauma patients to rehabilitation centers. **(I-308.1)**
 - b. Rehabilitation centers and outpatient 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 performance improvement processes. **(I-308.2)**
- II. A resource assessment for the trauma system has been completed and is regularly updated. **(B-103)**
 - a. The trauma system has completed a comprehensive system status inventory that identifies the availability and distribution of current capabilities and resources. **(I-103.1)**

Current Status

The EMS Authority completed a system status inventory of rehabilitation resources within California. An estimated 2,470 inpatient rehabilitation beds are provided by 80 facilities, licensed as general acute care, physical rehabilitation, or pediatric beds. These facilities are distributed across the state with 15 facilities in the northern region, 11 in the central region, and 54 facilities in the southern region. Pediatric facilities have a total of 92 licensed rehabilitation beds. Rehabilitation resources in the adjoining states of Oregon, Nevada, and Arizona, especially those in nearby urban centers were not reported. Inpatient rehabilitation beds provide specialized care for SCI and TBI. Rehabilitation capacity for ventilator-dependent patients is available, but data limitations preclude an accurate assessment of resource gaps.

The California Code requires all designated Level I, II, III, and Pediatric Level I and II trauma centers to provide rehabilitation services. These services may be provided at the individual trauma centers or through written transfer agreements. State regulations require physical therapy, occupational therapy, and speech-language therapies; however, no guidance exists regarding the early integration of these modalities into the acute treatment plans for trauma patients. The LEMSA's are responsible for monitoring trauma center compliance with state regulations. The degree to which this is overseen at the local level is unknown.

The trauma registry, which is compliant with the NDTB, contains data fields for rehabilitation. However, the level of compliance with reporting these elements is not known. The use of variable rehabilitation measures for patient functional outcomes contributes to difficulties in reporting and standardizing assessments to compare outcomes across regions or the overall trauma system. Stakeholders (trauma centers) reported difficulty in obtaining rehabilitation data, even from rehabilitation units within their own facilities. Disparate reporting lines for rehabilitation data as it relates to functional outcomes and disposition (reported to the California Hospital Association) and cost data (reported to the Centers for Medicare and Medicaid Services) make it difficult to gain a full understanding of this component of trauma care from a system wide perspective.

Access to rehabilitation services is highly variable and dependent upon the needs of the patient, their insurance status, and the availability of rehabilitation resources within the region. Most large, urban trauma centers integrate rehabilitation early in the treatment care plan (typically beginning on the first day of hospitalization) while small, non-urban centers find this more problematic. All trauma centers reported difficulty with obtaining access to the rehabilitation services for the uninsured, underinsured, and undocumented population.

The average wait for a rehabilitation bed for patients with TBI, SCI, or multiple trauma are 17 days, 25 days, and 18 days respectively. Some patients with protracted waits are transferred to skilled nursing facilities or long-term care facilities to free up acute care beds and to simultaneously obtain some level of rehabilitation services.

Rehabilitation is not well integrated into the state trauma system planning, and rehabilitation specialists currently do not participate at any level (state, region, local) within the trauma system. These specialists are not represented in the stakeholder groups participating in the day-to-day operations of the trauma system (LEMSA, EMSA, etc.), nor does rehabilitation have representation in the work groups and committees who advise the State EMS Authority (RTCC, STAC, TMAC, etc.). A local rehabilitation champion (Director of Physical Medicine and Rehabilitation, Cedars-Sinai Medical Center) with experience in professional rehabilitation

organizations at both the state and national levels may serve as a resource in fully integrating this important component of trauma care.

Recommendations

- Perform a comprehensive inventory of trauma rehabilitation resources within California and neighboring states on a regular basis.
- Perform a gap analysis to identify shortfalls in trauma rehabilitative services.
- Identify special populations that may be disproportionately impacted by unavailable rehabilitation services.
- Utilize trauma rehabilitation data, such as functional outcomes and costs, to inform injury prevention programs across the state.
- Integrate rehabilitation specialists at all levels of the trauma system.
 - Assure active participation at the state, regional, and local level trauma system planning and evaluation.
 - Encourage trauma centers to partner with rehabilitation services internal and external to their centers.

Disaster Preparedness

Purpose and Rationale

As critically important resources for state, regional, and local responses to MCIs, the trauma system and its trauma centers are central to disaster preparedness. Trauma system leaders need to be actively involved in public health preparedness planning to ensure that trauma system resources are integrated into the state, regional, and local disaster response plans. Acute care facilities (sometimes including one or more trauma centers) within an affected community are the first line of response to an MCI. However, an MCI may result in more casualties than the local acute care facilities can handle, requiring the activation of a larger emergency response plan with support provided by state and regional assets.

For this reason, the trauma system and its trauma centers must conduct a resource assessment of its surge capacity to respond to MCIs. The resource assessment should build on and be coupled to a hazard vulnerability analysis. An assessment of the trauma system's response to simulated incident or tabletop drills must be conducted to determine the trauma system's ability to respond to MCIs. Following these assessments, a gap analysis should be conducted to develop statewide MCI response resource standards. This information is essential for the development of an emergency management plan that includes the trauma system.

Planning and integration of the trauma system with plans of related systems (public health, EMS, and emergency management) are important because of the extensive impact disasters have on the trauma system and the value of the trauma system in providing care. Relationships and working cooperation between the trauma system and public health, EMS, and emergency management agencies support the provision of assets that enable a more rapid and organized disaster response when an event occurs. For example, the EMS emergency preparedness plan needs to include the distribution of severely injured patients to trauma centers, when possible, to make optimal use of trauma center resources. This plan could optimize triage through directing less severely injured patients to lower level trauma centers or non-designated facilities, thus allowing resources in trauma centers to be spared for patients with the most severe injuries. In addition, the trauma system and its trauma centers will be targeted to receive additional resources (personnel, equipment, and supplies) during major MCIs.

Mass casualty events and disasters are chaotic, and only with planning and drills will a more organized response be possible. Simulation or tabletop drills provide an opportunity to test the emergency preparedness response plans for the trauma system and other systems and to train the teams that will respond. Exercises must be jointly conducted with other agencies to ensure that all aspects of the response plan have the trauma system integrated.

Optimal Elements

- I. An assessment of the trauma system's emergency preparedness has been completed, including coordination with the public health agency, EMS system, and the emergency management agency. **(B-104)**
 - a. There is a resource assessment of the trauma system's ability to expand its capacity to respond to MCIs in an all-hazards approach. **(I-104.1)**

- b. There has been a consultation by external experts to assist in identifying current status and needs of the trauma system to be able to respond to MCIs. **(I-104.2)**
- c. The trauma system has completed a gap analysis based on the resource assessment for trauma emergency preparedness. **(I-104.3)**

II. The lead agency ensures that its trauma system plan is integrated with, and complementary to, the comprehensive mass casualty plan for natural and manmade incidents, including an all-hazards approach to planning and operations. **(B-305)**

- a. The EMS, the trauma system, and the all-hazards medical response system have operational trauma and all-hazards response plans and have established an ongoing cooperative working relationship to ensure trauma system readiness for all-hazards events. **(I-305.1)**
- b. All-hazards events routinely include situations involving natural (for example, earthquake), unintentional (for example, school bus crash), and intentional (for example, terrorist explosion) trauma-producing events that test the expanded response capabilities and surge capacity of the trauma system. **(I-305-2)**
- c. The trauma system, through the lead agency, has access to additional equipment, materials, and personnel for large-scale traumatic events. **(I-305.3)**

Current Status

The EMS Authority has clear statutory authority to plan and implement guidelines for EMS disaster response. The agency is required to coordinate through LEMSAs and hospitals, and to assist in the development of the EMS component of the State Emergency Plan. The Health and Medical Emergency Operations Manual includes an assessment of immediate medical needs and coordination of resources, personnel, in-patient and emergency care, patient distribution, and integration with fire and EMS.

The EMS Authority along with the CDPH utilizes the 6 mutual aid regions, established by Cal OES, which are closely aligned with the 5 trauma regions. For purposes of administering the funds from the Hospital Preparedness Program (HPP) in California each of the 58 counties represent a healthcare coalition. This may make coordination between healthcare coalitions, mutual aid regions and trauma regions very challenging. Most states have developed regional (multi-county) healthcare coalitions. It was also unclear to the TSC team if the HPP funds provided to the healthcare coalitions were being well distributed to the hospitals and EMS agencies.

The state and regions follow the Standardized Emergency Management System (SEMS) and the NIMS. The hospitals utilize the Hospital Incident Command System (HICS) for command and control of a disaster response. Disasters are recognized at the lowest level beginning with the field, local government, operational area, region, and then the state. Each operational area has a MHOAC and each region has an RDMHC. It was stated that the RDMHC program works with the operational areas within the region to ensure that EMS public health and injury prevention, special populations, and emergency management are integrated into the disaster planning process.

No formal assessment of the hospitals, trauma centers, EMS provider resources and capabilities occur at the state level because the infrastructure for the state is decentralized. Though the capabilities of trauma centers have been determined through the trauma center designation process with the LEMSAs, this information is not shared with the EMSA. The LEMSAs submit their trauma plan to the EMS Authority, but inclusion of a disaster preparedness component for the local trauma system, is not required. The local disaster plans required by the Public Health Preparedness Program and the Hospital Preparedness Program are submitted to the CDPH.

Hospitals, public health, and LEMSAs participate in an annual Statewide Medical and Health exercise that is sponsored by the CDPH and the EMS Authority. These exercises have numerous partners involved including the CHA, long-term care facilities, emergency management, public safety and healthcare facilities. After action reports are generated from these exercises and generally shared at the local level.

The CDPH developed the California Department of Public Health Standards and Guidelines for Healthcare Surge During Emergencies. An all hazards approach has been taken for planning purposes, and the plan can address requests for personnel, equipment and supplies. Though the trauma system is not specifically addressed in the plan, the emergency healthcare providers (hospital and EMS) are included. Likewise, hospitals and EMS providers are integrated into the overall Public Health and Medical Emergency Operations Manual, but again, the trauma centers are not specifically addressed. It was reported that bed capacity has been tested, but managing patients needing immediate surgical intervention is a very limited capability.

The state has developed several medical assets that have either been strategically located or can be readily deployed when needed. Examples of the medical assets include 42 Disaster Medical Support Units which serve as command vehicles for Ambulance Strike Teams; California Medical Assistance Teams, consisting of approximately 200 members and three support caches; and Mission Support Teams. In addition, EMSA manages the Disaster Healthcare Volunteer Program, consisting of over 21,000 volunteers, which includes 44 Medical Reserve Corps teams. EMSA's Mobile Field Hospital (MFH) Program is unfunded and the MFHs can no longer be deployed as general acute care facilities. However, the MFH structures (tents only) remain viable and may be deployed to support shelter operations and other low acuity patient care needs.

Various resource management systems are utilized in the state. Some LEMSAs use EM Systems/ Resources for real-time communications and resource management. Others LESMAs utilize the ReddiNet, which provides them with the capability to manage ambulance and patient destinations. Users can view current emergency department status within the region and use the system for routine patient care decisions regarding diversion and transfers. This system can be used in the event of a mass casualty incident to query bed availability, as well as, the availability of additional resources such as ventilators, medications, and supplies. The communications system is linked with emergency management and public health officials as well.

With regard to patient triage and tracking during a disaster, the START triage system is the most predominant. As with many states, various patient tracking methods are used, but issues continue to plague this vital function. The Los Angeles LEMSA reported that they have a policy in place to send the most severely injured patients to the highest level trauma centers, leaving the moderate and minor patients being transported to other hospitals. Proliferation and

standardized use of this type of policy for determining patient destination in a time of disaster was not clear.

A joint Advisory Committee provides advice regarding disaster planning and response to both the EMS Authority and the CDPH. However, little integration of disaster planning and response appears to occur with the STAC. It was not clear to the TSC team that the STAC receives formal reporting of disaster planning activities, information about the status of available medical assets, or lessons learned from exercises and responses to real disasters.

Recommendations

- Require incorporation of local EMS agency (LEMSA) disaster plans with the LEMSA trauma plans for submission to the EMS Authority, along with annual disaster updates.
- Encourage LEMSA disaster medical response plans to include guidelines that direct less severely injured patients to non-designated acute care facilities when possible, allowing trauma centers to receive the most severely injured patients.
- Provide updated information to the State Trauma Advisory Committee and the Regional Trauma Coordinating Committees annually on the state disaster activities and the status of medical assets available to the trauma system.
- Utilize disaster management systems to assess hospital capacity and capability for specialized care.
- Integrate aspects of the *California State Trauma Plan, 2015* into the state medical response plan.
- Recognize appropriate aspects of the trauma system within all state medical response plans.
- Utilize Hospital Preparedness Program funding to assist the trauma system with disaster planning and exercises.

System-wide Evaluation and Quality Assurance

Purpose and Rationale

The trauma lead agency has responsibility for instituting processes to evaluate the performance of all aspects of the trauma system. Key aspects of system-wide effectiveness include the outcomes of population based injury prevention initiatives, access to care, as well as the availability of services, the quality of services provided within the trauma care continuum from prehospital and acute care management phases through rehabilitation and community reintegration, and financial impact or cost. Intrinsic to this function is the delineation of valid, objective metrics for the ongoing quality audit of system performance and patient outcomes based on sound benchmarks and available clinical evidence. Trauma management information systems (MISs) must be available to support data collection and analysis.

The lead agency should establish forums that promote inclusive multidisciplinary and multiagency review of cases, events, concerns, regulatory issues, policies, procedures, and standards that pertain to the trauma system. The evaluation of system effectiveness must take into account the integration of these various components of the trauma care continuum and review how well personnel, agencies, and facilities perform together to achieve the desired goals and objectives. Results of customer satisfaction (patient, provider, and facility) appraisals and data indicative of community and population needs should be considered in strategic planning for system development. System improvements derived through evaluation and quality assurance activities may encompass enhancements in technology, legislative or regulatory infrastructure, clinical care, and critical resource availability.

To promote participation and sustainability, the lead agency should associate accountability for achieving defined goals and trauma system performance indicators with meaningful incentives that will act to cement the support of key constituents in the health care community and general population. For example, the costs and benefits of the trauma system as they relate to reducing mortality or decreasing years of productive life lost may make the value of promoting trauma system development more tangible. A facility that achieves trauma center verification/designation may be rewarded with monetary compensation (for example, ability to bill for trauma activation fees) and the ability to serve as a receiving center for trauma patients. The trauma lead agency should promote ongoing dialog with key stakeholders to ensure that incentives remain aligned with system needs.

Optimal Elements

- I. The trauma 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. **(B-301)**
 - a. The lead trauma authority ensures that each member hospital 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. **(I-301.1)**

II. The jurisdictional lead agency, in cooperation with other agencies and organizations, uses analytic tools to monitor the performance of population based prevention and trauma care services. **(B-304)**

III. The financial aspects of the trauma system are integrated into the overall performance improvement system to ensure ongoing fine tuning and cost-effectiveness. **(B-309)**

- a. Financial data are combined with other cost, outcome, or surrogate measures, for example, years of potential life lost, quality-adjusted life years, and disability adjusted life years; length of stay; length of intensive care unit stay; number of ventilator days; and others, to estimate and track true system costs and cost- benefits. **(I-309.4)**

Current Status

The California EMS Authority is mandated, by statute, to draft regulations that include the requirements for the care of trauma patients to ensure the integration of the trauma care system with the existing EMS system. These regulations address patient care guidelines, flow patterns, trauma center resources, a data collection system to assess operations and outcomes, and the periodic performance evaluation of the trauma system and its components. Performance improvement activities are required by Trauma Centers, LEMSAs, EMS providers and the EMS Authority.

Authority for quality assurance activities is well established for the LEMSAs. They are required to develop quality assurance plans for review and approval by the EMS Authority. The plan must include clinical care and patient outcomes. In addition, designated trauma centers are required to perform PI and demonstrate their capability through the verification process. The trauma centers also participate in local and regional PI review processes.

The EMS Authority and the STAC utilized the HRSA *Model Trauma System Planning and Evaluation* document to evaluate the status of the various system components. This public health approach to trauma system assessment laid the foundation for trauma system evaluation. The BIS process identified priorities and opportunities for improvement within the trauma system evaluation. These priorities were integrated into the *California State Trauma Plan, 2015* and the proposed *State Performance Improvement and Patient Safety Plan*.

The trauma stakeholders and staff are to be commended for their efforts in developing a draft PIPS plan and identifying performance measures, even though they are vaguely defined. The plan suggests that the EMS Authority and the STAC would provide leadership in implementing the PI process at the state level. This effort would include the establishment of a PIPS Subcommittee that would report to the STAC. Membership of the subcommittee has been outlined in the PIPS plan, and it appears to be multi-disciplinary in nature. The plan also proposes specific structure, process and outcome measures; a vision, mission and purpose; structure and operating procedures; documentation; authority; and confidentiality.

The draft PIPS plan lists the current trauma system evaluation goals and objectives that are prioritized in the state's trauma system plan. The PIPS plan also includes the two trauma core measures listed in the State Core Measures Project. These two measures are identified as scene time for severely injured trauma patients and direct transport to designated trauma centers for severely injured trauma patients meeting criteria.

Because trauma system development is decentralized in California, 33 LEMSAs have clear statutory authority for trauma system development, including system evaluation. LEMSA's must develop a trauma system plan and submit the plan to the EMS Authority for review and approval. The LEMSA plan must address quality improvement and system evaluation, including the responsibilities of the multi-disciplinary trauma peer review committee.

Evidence was provided that PI processes are being conducted. The larger LEMSAs have more resources, and the PI reviews are more robust. For example, the Los Angeles LEMSA conducts PI with 14 trauma centers and EMS providers. This LEMSA collected prospective data and looks at variability. PI efforts focused on TBI, splenic injury, and gunshot wounds. This LEMSA is evolving into a consortium and seeking the opportunity to create an ACS Trauma Quality Improvement Program (TQIP) Collaborative to obtain risk-adjusted data. Another example was Ventura County where the LEMSA developed a trauma audit committee, which has expanded to include other counties. The Ventura County LEMSA targeted reviews on pelvic fractures and the rate of drug testing with trauma patients.

In conducting a review of the 33 LEMSA trauma plans and status reports, significant variability was noted in the trauma system evaluation process, including committee review structures, terminology used in the process, as well as, the measures, indicators or filters used for patient care review. Though decentralization provides local flexibility, it can create greater variability in practice. Without some standardization in processes and common terminology, it is difficult to make comparisons and assess care across LEMSAs and regions. However, several LEMSA status reports demonstrated an integration of the EMS Authority and identified core quality measures into their plans and activities. Many of the trauma plans indicated that local PI review was conducted on trauma deaths and activations to help identify issues. This led to the development of best practices where policies regarding immediate transfers were established.

Of particular note is the involvement of several trauma centers and the EMS Authority in a Highway Safety project/study to improve the timeliness of care for victims of traffic-related incidents. This project appears to be promising in identifying ways to improve timeliness of transfers for injured patients.

Though trauma centers and EMS provider agencies are involved with PI activities, involvement by non-designated acute care facilities, dispatch centers, and rehabilitation centers is sporadic.

To further assess trauma care across jurisdictional lines, the EMS Authority has established five RTCCs. However, the RTCCs do not have statutory or regulatory authority for this role. They serve to conduct system case reviews that may cross LEMSA jurisdictional boundaries and provide some outreach education. Since the RTCCs have no authority to implement resolutions to patient care issues identified within a region or LEMSA, they submit cases that may have statewide implications to the EMS Authority for review. In turn, the Director of EMS Authority may refer the case to the STAC.

Stakeholder participants at the TSC expressed concerns regarding the PI process and confidentiality associated with sharing information, both with the Health Insurance Portability and Privacy Act requirements and protection for the PI process explicitly provided in statute. This is of greatest concern for the RTCC PI processes since the five regions are not formally recognized in statute or regulation. For now, the providers in the RTCCs are reviewing cases with de-identified data, and the PI process is conducted in a manner to promote discussion and learning.

An essential aspect of system evaluation involves data. To successfully evaluate the state trauma system, the data need to be inclusive of all participants within the system including trauma centers, non-designated acute care facilities, EMS, rehabilitation, and dispatch centers. Trauma data collection and submission from non-designated acute care facilities were reported to be issues, and linking the data from various sources has not been accomplished. LEMSAs in larger, urban settings, reported utilizing their data to assess under- and over-triage. However, little has been done at the state level to determine if the right patient arrives at the right facility in the right amount of time. The state needs additional resources for data analysis and data system management to further the coordination of state and regional level PI.

The EMS Authority is exploring the possibility of creating of a California Statewide TQIP Collaborative to provide risk-adjusted benchmarking outcomes for trauma center, prehospital, and transfer processes. This resource would greatly enhance the EMS Authority's ability to provide comparative reports to trauma system participants. Fiscal and human resources are needed to support this effort.

The EMS Authority has the capability to run data reports regarding under- and over-triage and transfers on 2014 data for the 68 trauma centers. However, data from all acute care facilities are not collected at the state level. EMS patient care reports are not linked with trauma registry data and other system data sources. Therefore, a statewide system evaluation inclusive of trauma triage, transport, treatment, and transfer practices by all providers for all trauma patients, and for all types of injuries remains incomplete. See Appendix D for other potential trauma system measures and a strategy for monitoring system performance.

Recommendations

- **Expedite the adoption of the state *Performance Improvement and Patient Safety (PIPS) Plan* in collaboration with appropriate state advisory committees, local EMS agencies (LEMSAs), the Regional Trauma Coordinating Committees (RTCCs), and other trauma system stakeholders.**
 - **Solidify the state core trauma performance improvement measures within the state PIPS plan to include structure, process, outcome and patient safety metrics.**
 - **Consider incorporating the best practices, processes and metrics identified from LEMSAs with well-established PIPS plans.**
- Establish a multi-disciplinary state PIPS Subcommittee taking into consideration the urban, suburban and rural clusters of trauma centers, regions, hospital network affiliations, and Committee on Trauma representation.
- Encourage the LEMSAs to incorporate the state PIPS trauma performance measures as a minimum into their trauma plans.
- Identify additional staffing resources to assume responsibility for the overall implementation of the state PIPS program to ensure integration with regional and LEMSA trauma system plans and other relevant state plans.

- Seek funding opportunities to establish an inclusive data collection system representing all participants including dispatch, EMS providers, non-designated acute care facilities, trauma centers, rehabilitation centers, and medical examiners.
- Ensure data submission compliance by all trauma system participants.
- Utilize existing educational forums to provide information on the state PIPS plan, with an emphasis on the PIPS structure, process and metrics.
- Seek funding to support a California State Collaborative to provide risk-adjusted benchmarking outcomes.
- Continue to encourage the adoption of standardized trauma triage and transfer guidelines statewide.
- **Monitor the performance measures, especially timeliness of secondary transfers and under- and over-triage, and address trends in deviation of care through the PIPS plan process.**

Trauma Management Information Systems

Purpose and Rationale

Hospital-based trauma registries developed from the idea that aggregating data from similar cases may reveal variations in care and ultimately result in a better understanding of the underlying injury and its treatment. Hospital-based registries have proven very effective in improving trauma care within an institution but provide limited information regarding how interactions with other phases of health care influence the outcome of an injured patient. To address this limitation, data from hospital-based registries should be collated into a regional registry and linked such that data from all phases of care (prehospital, hospital, and rehabilitation) are accessible in 1 data set. When possible, these data should be further linked to law enforcement, crash incident reports, ED records, administrative discharge data, medical examiner records, vital statistics data (death certificates), and financial data. The information system should be designed to provide system-wide data that allow and facilitate evaluation of the structure, process, and outcomes of the entire system; all phases of care; and their interactions. This information should be used to develop, implement, and influence public policy.

The lead agency should maintain oversight of the information system. In doing so, it must define the roles and responsibilities for agencies and institutions regarding data collection and outline processes to evaluate the quality, timeliness, and completeness of data. There must be some means to ensure patient and provider confidentiality is in keeping with federal regulations. The agency must also develop policies and procedures to facilitate and encourage injury surveillance and trauma care research using data derived from the trauma MIS. There are key features of regional trauma MISs that enhance their usefulness as a means to evaluate the quality of care provided within a system. Patient information collected within the management system must be standardized to ensure that noted variations in care can be characterized in a similar manner across differing geographic regions, facilities, and EMS agencies. The composition of patients and injuries included in local registries (inclusion criteria) should be consistent across centers, allowing for the evaluation of processes and outcomes among similar patient groups. Many regions limit their information systems to trauma centers. However, the optimal approach is to collect data from all acute care facilities within the region. Limiting required data submission to hospitals designated as trauma centers allows one to evaluate systems issues only among patients transported to appropriate facilities. It is also important to have protocols in place to ensure a uniform approach to data abstraction and collection. Research suggests that if the process of case abstraction is not routinely calibrated, practices used by abstractors begin to drift.

Finally, every effort should be made to conform to national standards defining processes for case acquisition, case definition (that is, inclusion criteria), and registry coding conventions. Two such national standards include the National Highway Traffic Safety Administration's National Emergency Medical Services Information System (NEMSIS), which standardizes EMS data collection, and the American College of Surgeons National Trauma Data Standard, which addresses the standardization of hospital registry data collection. Strictly adhering to national standards markedly increases the value of state trauma MISs by providing national benchmarks and allowing for the use of software solutions that link data sets to enable a review of the entire injury and health care event for an injured patient.

To derive value from the tremendous amount of effort that goes into data collection, it is important that a similar focus address the process of data reporting. Dedicated staff and resources should be available to ensure rapid and consistent reporting of information to vested parties with the authority and vision to prevent injuries and improve the care of patients with injuries. An optimal information reporting process will include standardized reporting tools that allow for the assessment of temporal and/or system changes and a dynamic reporting tool, permitting anyone to tailor specific “views” of the information.

Optimal Elements

I. There is an established trauma MIS for ongoing injury surveillance and system performance assessment. **(B-102)**

- a. There is an established injury surveillance process that can, in part, be used as an MIS performance measure. **(I-102.1)**
- b. Injury surveillance is coordinated with statewide and local community health surveillance. **(I-102.2)**
- c. There is a process to evaluate the quality, timeliness, completeness, and confidentiality of data. **(I-102.4)**
- d. There is an established method of collecting trauma financial data from all health care facilities and trauma agencies, including patient charges and administrative and system costs. **(I-102.5)**

II. The trauma 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. **(B-301)**

- a. The lead trauma authority ensures that each member hospital 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. **(I-301.1)**
- b. Prehospital care providers collect patient care and administrative data for each episode of care and not only provide these data to the hospital, but also have a mechanism to evaluate the data within their own agency, including monitoring trends and identifying outliers. **(I-301.2)**
- c. Trauma registry, ED, prehospital, rehabilitation, and other databases are linked or combined to create a trauma system registry. **(I-301.3)**
- d. The lead agency has available for use the latest in computer/technology advances and analytic 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 programs within the trauma system. **(I-301.4)**

Current Status

The development of the current information system began in 2008 as a demonstration project funded through the Office of Traffic Safety. Prehospital data are captured at the state level in the CEMSIS. The data are stored by the Inland Counties EMS agency contractually utilizing ImageTrend™ software. The CEMSIS-EMS database currently contains more than 1.3 million

records, which are compliant with current data standards of the National EMS Information System (NEMSIS).

The trauma registry data are collected and managed under the same contractual process, and data also stored at Inland Counties EMS agency. The product is known as CEMSIS-Trauma. Data are currently being collected from 73 of 76 trauma centers. The data are compliant with the current National Trauma Data Standard (NTDS), although it was reported that variation in interpretation of the data fields may exist between trauma centers. The number of data fields may be expanded at the LEMSA or individual trauma center level, but these additional fields are not submitted to the CEMSIS-Trauma. Due to a software vendor change in 2012, legacy data from 2008-2012 are not currently included in the registry. CEMSIS-Trauma currently contains more than 65,000 records dating from 2013 to the present. This number represents only a fraction of injured patients in California. The aggregate data are submitted 3 to 6 months post event, although it was noted that in some cases data are submitted on a more contemporary basis.

No data linkage between CEMSIS-EMS and CEMSIS-Trauma has occurred at the state level. Some data linkage was reported by various LEMSAs. Of note is a project in the Los Angeles LEMSA in which a unique alphanumeric identifier is attached to the prehospital record that is transposed to the hospital record, allowing absolute record matching. Little formal linkage has occurred between CEMSIS-Trauma and other external databases such as motor vehicle crash, law enforcement, uniform billing (UB04) hospital discharge data, rehabilitation, vital records, or dispatch.

Optimism about future linkage between CEMSIS-EMS and CEMSIS-Trauma is centered on the fact that both databases use the ImageTrend software and are warehoused at the Inland Counties EMS agency. Such linkage may have to be completed via contract with the vendor since the EMS Authority currently does not have sufficient data and statistical resources readily available to complete the process internally.

Recommendations

- Continue to clean and validate the California EMS Information System (CEMSIS)-Trauma data.
- Mentor and train trauma registrars to reduce the variability in interpretation of data fields.
- Run routine reports from CEMSIS-EMS and CEMSIS-Trauma on a regularly scheduled basis, correct and refine the reports.
- Query the databases to help answer specific performance improvement questions of interest, such as rates of over- and under-triage, and re-triage.
- Consider expansion of the unique record identifier project in Los Angeles County and/or explore Arkansas' trauma band project to aid in record linkage and patient tracking.
 - Seek preparedness funding to support the project.
- Continue CEMSIS-Trauma and CEMSIS-EMS linkage efforts at various local EMS agencies with an eye toward eventual statewide expansion.

Research

Purpose and Rationale

Overview of Research Activity

Trauma systems are remarkably diverse. This diversity is simply a reflection of authorities tailoring the system to meet the needs of the region based on the unique combination of geographic, economic, and population characteristics within their jurisdiction. In addition, trauma systems are not fixed in their organization or operation. The system evolves over years in response to lessons learned, critical review, and changes in population demographics. Given the diversity of organization and the dynamic nature of any particular system, it is valuable when research can be conducted that evaluates the effectiveness of the regional or statewide system. Research drives the system and will provide the foundation for system development and performance improvement. Research findings provide value in defining best practices and might alter system development. Thus, the system should facilitate and encourage trauma-related research through processes designed to make data available to investigators. Competitive grants or contracts made available through lead authorities or constituencies should provide funds to support research activities. All system components should contribute to the research agenda. The extent to which research activities are required should be clearly outlined in the trauma system plan and/or the criteria for trauma center designation.

The sources of data used for research might be institutional and regional trauma registries. As an alternative, population-based research might provide a broader view of trauma care within the region. Primary data collection, although desirable, is expensive but might provide insights into system performance that might not be otherwise available.

Trauma Registry–based Research

Investigators examining trauma systems can use the information recorded in trauma registries to great advantage to determine the prevalence and annual incidence rate of injuries, patterns of care that occur to injured patients in the system's region, and outcomes for the patients. These data can be compared with standards available from other trauma registries, such as the NTDB. Such comparisons can then enable investigators to determine if care within their region is within standards and can allow for benchmarking. Initiating and sustaining injury prevention initiatives is a vital goal in mature trauma systems. Investigators can take a leadership role in performing research using trauma registry data that identify emerging threats and instituting public health measures to mitigate the threats. For example, a recent surge in death and disability related to off -road vehicles can be identified and the scope of the problem defined in terms of who, where, and how riders are injured, and then, through presentations and publications, the public can be informed of a new threat.

Trauma system administrators have a responsibility to control investigators' access to the registry. The integrity and reliability of data in a trauma systems registry are essential if accurate research and valid conclusions are to be reached using the data. Trauma system administrators should have a process that screens data entered into the system's composite registry from individual institutions. There should be a mechanism that ensures that the information is stored in a secure manner. Investigators who seek access to the trauma registry must follow a written policy and procedure that includes approval by an authorized institutional review board. Trauma registry data may include unique identifiers, and system administrators must ensure that patient confidentiality is respected, consistent with state and federal regulations.

Population-based Trauma System Research

A major disadvantage of using only trauma registry data to conduct research that evaluates injured patients in a region is the bias resulting from missing data on patients not treated at trauma centers. Specifically, most registry data are restricted to information from hospitals that participate in the trauma system. Although ideally all facilities participate in the form of an inclusive system, many systems do not attain this goal. Thus, a population-based data set provides investigators with the full spectrum of patients, irrespective of whether they have been treated in trauma centers or non-designated centers or were never admitted to the hospital owing to death at the scene of incident or because their injuries were insufficiently severe to require admission. The state and national hospital discharge databases are examples of population-based data. These discharge databases contain information that was abstracted from medical records for billing purposes by hospital employees who enter these data into an electronic database. For investigators seeking a wider perspective on the care of injured patients in their region, these more inclusive data sets, compared with registries, are essential tools. Other population-based data that may be of help include mortality vital statistics data recorded in death certificates. Selected regions might have outpatient data to capture patients who are assessed in the ED and then released.

Investigators can use these population-based data to study the influence of a regional trauma system on the entire spectrum of patients within its catchment area.

Participation in Research Projects and Primary Data Collection

Multi-institutional research projects are important mechanisms for learning new knowledge that can guide the care of injured patients. Investigators within trauma systems can participate as coinvestigators in these projects. Investigators can participate by recruiting patients into prospective studies, being leaders in the design and administration of grants, and preparing manuscripts and reports. Evidence of this collaboration is that investigators within a trauma system are recognized in announcements of grants or awards. Lead agency personnel should identify and reach out to resources within the system with research expertise. These include academic centers and public health agencies.

Measures of Research Activity

Research can be broadly defined as hypothesis-driven data analysis. This analysis leads the investigators to a conclusion, which might become a recommendation for system change. Full manuscripts published in peer reviewed research journals are an exemplary form of research activity. Research reported in annual reviews or in public information formats intended to inform the trauma system's constituency can also be considered legitimate research activity.

Optimal Elements

- I. The trauma 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. **(B-301)**
 - a. The lead agency has available for use the latest in computer/technology advances and analytic 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 programs within the trauma system. **(I-301.4)**

II. The lead agency ensures that the trauma system demonstrates prevention and medical outreach activities within its defined service area. **(B-306)**

- a. The trauma system has developed mechanisms to engage the general medical community and other system participants in their research findings and performance improvement efforts. **(I-306.1)**
- b. The effect or impact of outreach programs (medical community training/support and prevention activities) is evaluated as part of a system performance improvement process. **(I-306.3)**

III. To maintain its state, regional, or local designation, each hospital will continually work to improve the trauma care as measured by patient outcomes. **(B-307)**

- a. The trauma system implements and regularly reviews a standardized report on patient care outcomes as measured against national norms. **(I-307.2)**

Current Status

California has a long history of publishing trauma systems research dating back to the *Systems of trauma care: A study of two counties* published in 1979 by West JG, Trunkey DD, Lim RC. This was followed by other reports of the California experience such as *Impact of regionalization: The Orange County experience* by West JG, Cales RH, and Gazzaniga, AB in 1983. The interest in trauma systems issues continues today with recent publications concerning identification of low-risk pediatric abdominal injury and over/under triage as examples.

California has research nodes for both the Pediatric EMS for Children Applied Research Network (PECARN) and Resuscitation Outcomes Consortium (ROC). A significant number of well-qualified researchers are available at academic institutions and trauma centers to continue systems research. Improvements in the availability and fidelity of CEMSIS-EMS and CEMSIS-Trauma data will support additional examination of trauma systems issues facing the state.

No agenda exists that outlines priorities for trauma systems level research for the state.

Recommendations

- Encourage continued investigation of issues that may help inform trauma system evaluation and planning in California and the nation.
- Ensure unencumbered access to CEMSIS-EMS and CEMSIS-Trauma data to qualified researchers.
- Develop a research agenda with priority topics identified.

APPENDIX A: ACRONYMS

ACS – American College of Surgeons
ASPR – Assistant Secretary for Preparedness and Response

BIS – benchmarks, indicators, and scoring

CAAHEP – Commission on Accreditation of Allied Health Education Professions
CAAS – Commission on Accreditation of Ambulance Services
CAMTS – Commission on Accreditation of Medical Transport Services
CDC – Centers for Disease Control and Prevention
CDPH – California Department of Public Health
CEMSIS – California Emergency Medical System Information System
CHA – California Hospital Association
CME – continuing medical education

EMD – Emergency Medical Dispatch
EMS – emergency medical services
EMSA – Emergency Medical Services Authority
EMT – emergency medical technician

FTE – full time equivalent

GIS – geographical information system

H&SC – Health and Safety Code
HICS – Hospital Incident Command System
HPP – Hospital Preparedness Program
HRSA – Health Resources and Services Administration

ICD-9 – International Classification of Diseases, 9th edition
ISS – injury severity score
IT – information technology

LEMSA – local emergency medical services agency

MHOAC – Medical Health Operational Area Coordinators
MTSPE – Model Trauma System Planning and Evaluation

NEMSIS – National EMS Information System
NHTSA – National Highway Traffic Safety Administration
NIMS – National Incident Management System
NREMT – National Registry for Emergency Medical Technicians
NTDB – National Trauma Data Bank
NTDS – National Trauma Data Standard

PECARN – Pediatric EMS Care Applied Research Network

PI – performance improvement

PIPS – performance improvement and patient safety

PRQ – pre-review questionnaire

PSAP – public safety answering point

RDMHC – Regional Disaster Medical Health Coordinator

RDMHS – Regional Disaster Medical Health Specialist

RTCC – regional trauma coordinating committee

RTTDC – Rural Trauma Team Development Course

SAC – Safe and Active Communities

SCI – spinal cord injury

SEMS – Standardized Emergency Management System

SHSP – State Highway Safety Plan

STAC – State Trauma Advisory Committee

STEMI – ST elevation myocardial infarction

TBI – traumatic brain injury

TMAC – Trauma Managers Association of California

TPMs – trauma program managers

TQIP – trauma quality improvement program

TSC – trauma system consultation

TSP – trauma system plan

APPENDIX B: METHODOLOGY

The California EMS Authority requested this trauma system consultation, which was conducted under the auspices of the American College of Surgeons (ACS), Trauma System Consultation (TSC) program. The multidisciplinary trauma system consultation team consisted of: two trauma/general surgeons, one emergency physician, a state EMS/trauma director, a trauma program manager, two trauma systems consultants, and the ACS trauma systems program manager and additional supervisory staff. Biographical sketches for team members are included as Appendix C of this report.

The primary objective of the ACS trauma system consultation was to guide and help promote a sustainable effort in the graduated development of an inclusive and integrated system of trauma care for the California. The format of this report correlates with the public health framework of assessment, policy development, and assurance outlined in the ACS *Regional Trauma Systems Optimal Elements, Integration, and Assessment: System Consultation Guide*. Prior to the visit, the TSC team reviewed the ACS Pre-Review Questionnaire (PRQ) submitted by the EMS Authority, along with a number of additional supporting documents. Information available on government websites was also viewed.

The TSC team convened in San Diego, CA, on March 22 – 25, 2016, to review the California state trauma system. The meetings during the four-day visit consisted of plenary sessions during which the TSC team engaged in interactive dialogue with a broad range of representative trauma system participants. There was also an opportunity for informal discussion with the participants and time devoted to questions and answers. During the survey, the TSC team also met in sequestered sessions for more detailed reviews and discussion, and for the purpose of developing team consensus on the various issues, preparing a report of their findings, and developing recommendations for future development of the trauma system in California. This report was developed independently of any other trauma system consultations or assessments.

APPENDIX C: REVIEWER BIOGRAPHIES

ROBERT J. WINCHELL, MD, FACS

Role: Surgeon, Team Leader

Dr. Winchell received his undergraduate degree from the California Institute of Technology, his M.D. from Yale University, and did his internship, General Surgery residency, and Trauma and Critical Care Fellowship at the University of California, San Diego, where he remained on the faculty as Associate Professor of Clinical Surgery in the Division of Trauma through 1999. After leaving the University of California, Dr. Winchell established and subsequently directed the Tacoma Trauma Center in Tacoma, Washington, which continues to operate successfully as a joint venture between two previously competing hospitals. In 2001, Dr. Winchell moved to the Maine Medical Center and assumed the role of Head of the Division of Trauma and Burn Surgery in 2004. He remained in that position for 10 years, also serving as an Associate Professor of Surgery at the Tufts University School of Medicine. Under his direction, Maine Medical Center became a verified Level I trauma center for the first time in 2007. After leaving Maine, Dr. Winchell served as Chief of Trauma and Visiting Professor of Surgery at the University of Texas Health Science Center at Houston and Chief of Trauma at Memorial Hermann -Texas Medical Center until assuming his current post. In July 2015, Dr. Winchell joined the faculty in the Department of Surgery at Weill Cornell Medical College as Chief of the Division of Trauma, Burns, Acute and Critical Care and Director of the Trauma Center at New York-Presbyterian Weill Cornell Medical Center.

Dr. Winchell has been deeply interested and involved in the development and evolution of trauma systems for his entire career. He has been involved in trauma center and trauma systems design and operation in a wide variety of settings covering the spectrum of system development. He was instrumentally involved in leadership roles with both the day-to-day operations and ongoing development of the San Diego County trauma system for over ten years and served as chair of the San Diego and Imperial County Committee on Trauma. He participated in the leadership, operation and ongoing development of the Washington state trauma system, serving on the state advisory board, and as chair of the Southwest EMS region. During Dr. Winchell's tenure in Maine, he helped to develop the Maine state system, serving as a member of the state advisory board and as a chairman of the Maine State Committee on Trauma. In Texas, he served on the Trauma Systems subcommittee of the Governor's EMS and Trauma Advisory Council. Dr. Winchell is a leader in international trauma systems development, and the founding representative from the American College of Surgeons to the World Health Organization's Global Alliance for the Care of the Injured.

In parallel to his clinical and research work, Dr. Winchell has had the honor to serve the American College of Surgeons Committee on Trauma for almost 20 years, first as a State Chair for San Diego County and for Maine, and currently as a member and part of the Executive Committee. His leadership and forethought have been instrumental to the Trauma Systems consultation program of the COT since 2006, and he currently serves as Chair of the Trauma Systems Evaluation and Planning Committee. In that role, he has conducted expert consultation in 18 states and regions, serving as team leader for 14 of these, and has also participated in trauma systems work internationally. Dr. Winchell is also a senior reviewer for the trauma center verification program of the College. He has participated in 18 state and regional trauma system consultations.

Dr. Winchell has dedicated almost two decades to the advancement care of the injured as a part of national public health policy, and the implementation of state and regional trauma systems based upon and supported by that policy.

Dr. Winchell is Board certified in General Surgery, with added qualifications in Surgical Critical Care. He is a Fellow of the American College of Surgeons as well as a member of the American Association for the Surgery of Trauma, the Association for Academic Surgery, the Southwest Surgical Congress, the Society of Critical Care Medicine and the New England Surgical Society. Dr. Winchell is author of more than 50 scientific papers and book chapters, and has given over 100 regional, national and international

presentations. He is an ad hoc reviewer for the Journal of Trauma and Acute Care Surgery, the Archives of Surgery and the World Journal of Surgery.

SHELLY D. TIMMONS, MD, PhD, FACS, FAANS

Role: Surgeon

Shelly D. Timmons is a neurological surgeon the Geisinger Health System (GHS) in Pennsylvania (2010 to present). She is Director of Neurotrauma for the Geisinger Health System, which includes a Level I Trauma Center in Danville, PA and two Level II Trauma Centers in Wilkes-Barre, PA and Scranton, PA. She is Associate Director for Neurosciences of the Adult Intensive Care Unit at Geisinger Medical Center in Danville, PA. Dr. Timmons also serves as the Program Director for a new residency training program in neurological surgery at GHS, recently accredited by the Accreditation Council on Graduate Medical Education in 2013. She is a Clinical Associate Professor in the Department of Neurosurgery at Temple University.

Dr. Timmons is board certified by the American Board of Neurological Surgery and has certification in Neurocritical Care from the Society of Neurological Surgeons Committee on Advanced Subspecialty Training. She holds a variety of professional organizational positions, including Director-at-Large for the American Association of Neurological Surgeons (AANS) Board of Directors, AANS Representative to the Board of Governors of the American College of Surgeons, Chair of the Neurosurgery Advisory Council of the American College of Surgeons, Past Chair of the Joint Section on Neurotrauma and Critical Care of the American Association of Neurological Surgeons (AANS) and the Congress of Neurological Surgeons (CNS), Chair of the Washington Committee of the AANS and CNS, and Secretary of the Pennsylvania Neurosurgical Society. Dr. Timmons has chaired several neurotrauma and emergency neurosurgery committees for the AANS, the Washington Committee, the Council of State Neurosurgery Societies and others, and has frequently served as a liaison for trauma-related issues to outside entities on behalf of the AANS, including the Department of Homeland Security and the Institute of Medicine. She served on the American College of Surgeons Committee on Trauma for eight years, two as a special member, and maintains active involvement with the COT via the Verification and Review Committee and the Trauma Systems Consultation Committee, having served as a reviewer for the States of Hawaii and Missouri and Clark County, Nevada. She serves on the Centers for Disease Control National Center for Injury Prevention and Control Board of Scientific Counsellors, and on the Board of Directors of ThinkFirst, a neurological injury prevention organization.

Dr. Timmons has been a clinical researcher for a number of years, and has participated as principal investigator in numerous clinical trials related to traumatic brain injury through local, industry, and NIH funding mechanisms. She has published and lectured on a variety of topics related to traumatic brain injury, neurocritical care, spinal cord injury, blunt vascular injury, and health care delivery throughout her career. Her primary research interests include clinical trials in traumatic brain injury, multi-modality monitoring in neurocritical care (in particular traumatic brain injury), prognostication in traumatic brain injury, diagnosis and treatment of blunt vascular injury, and optimal organization of healthcare delivery for brain-injured patients.

Dr. Timmons obtained undergraduate degrees from the University of Illinois at Urbana-Champaign in Honors Biology (BS 1987) and Rhetoric (BA 1988). She obtained her medical degree from the University of Illinois at Urbana-Champaign in Honors Biology (BS 1987) and Rhetoric (BA 1988). She obtained her medical degree from the University of Illinois College of Medicine at Peoria in 1991. She completed her residency training in neurological surgery at the University of Tennessee Health Science Center-Memphis from 1991 to 1997, during which time she served as Administrative Chief Resident from 1996-97. She later (2002) earned her Ph.D., also at UTHSC, in the Department of Anatomy and Neurobiology where she studied noradrenergic modulation of calcium channels in rat sensorimotor cortical pyramidal neurons via G-proteins in the laboratory of Robert C. Foecking, Ph.D.

Prior to assuming her current position, she practiced for thirteen years as a neurological surgeon with Semmes-Murphey Clinic in Memphis, TN. During that time, she was Assistant (1997-2008) and then

Associate Professor of Neurosurgery (2008-2011), Chief of the Neurotrauma Division of the University of Tennessee Health Science Center Department of Neurosurgery (1997-2010), and Chief of Neurosurgery at the Regional Medical Center at Memphis/Elvis Presley Memorial Trauma Center (1997-2010).

DREXDAL PRATT, CEM, CPM

Role: State EMS Director

Mr. Pratt retired as Director of the Division of Health Service Regulation (DHSR) in the North Carolina Department of Health and Human Services (DHHS) in January 2016. His division managed the all healthcare facility regulatory activities within the DHHS and included the Office of Emergency Medical Services and Trauma and the Assistant Secretary for Preparedness and Response (ASPR) Hospital Preparedness Cooperative Agreement.

Mr. Pratt is a graduate of the Institute of Government at the University of North Carolina at Chapel Hill, the EMS Management Institute at the University of North Carolina at Charlotte, and Forsyth Technical Community College. He is also a Certified Emergency Manager (CEM) and a Certified Public Manager (CPM).

Mr. Pratt joined the North Carolina Office of Emergency Medical Services in 1987 as a Regional Coordinator. He was promoted through the ranks, first to Regional Supervisor, and then to Chief of the agency in 1999. In August 2010 Mr. Pratt was promoted to the Director position of DHSR. Mr. Pratt served two terms as Chair of the Region I EMS Advisory Council. He received the National Association of County Commissioner's Achievement Award for coordinating the development of the Stokes County NC computer-aided dispatch program.

He has served as a Commissioner on the Governor's State Emergency Response Commission and served as Chairman of the Commission's Homeland Security Medical Committee. In addition, Mr. Pratt served as Secretary of the North Carolina Medical Care Commission, and Commissioner on the North Carolina Radiation Protection Commission.

In October 2009 Mr. Pratt received the North Carolina Medical Society's John Huske Anderson Award. This award recognizes individuals for whose contributions have made a positive impact on the medical profession and the public health. In addition, Mr. Pratt was presented the Order of the Long Leaf Pine in October 2010 from Governor Beverly Perdue. This is the highest civilian honor presented by the Governor and is presented to individuals who have a proven record of extraordinary service to the state.

KATHY J RINNERT, MD, MPH, FACEP

Role: ED Physician

Dr. Rinnert began her career in emergency medicine and emergency medical services (EMS) in the early 1980's as a Nationally Registered Paramedic in a five-county, rural EMS agency in the Allegheny Mountains of Southeast Ohio. She completed medical school at the Ohio State University, followed by an internship in Internal Medicine at Loyola University, and residency training in Emergency Medicine at the University of Chicago. Following residency, Dr. Rinnert completed a two-year fellowship in Emergency Medical Services (EMS) at the University of Pittsburgh. She simultaneously obtained a Master's in Public Health at the Graduate School during her tenure in Pittsburgh.

Dr. Rinnert is currently a Professor of the Department of Emergency Medicine at the University of Texas Southwestern Medical Center at Dallas (UTSWMC). Additionally, she is the Director of the EMS Fellowship Program and the EMS Medical Director. She was previously the Associate Medical Director for the UTSW/BioTel EMS system, encompassing sixteen municipalities and their fire-based EMS and Public Safety agencies. In this capacity, she oversaw the out-of-hospital practice of over 1700 paramedics operating in urban, suburban, and rural environments. Dr. Rinnert directs the Center for Government Emergency Medical Security Services (GEMSS) at the UTSWMC, which provides academic and clinical

tactical support to government agencies. At the Center, she directs both the EMS and GEMSS fellowship programs, which provide post-doctoral training in these subspecialty areas of emergency medicine.

Dr. Rinnert has special interest and expertise in trauma, injury prevention and control, air medical transport, tactical EMS, urban search and rescue, and domestic preparedness for weapons of mass effect (WME) and counterterrorism. She is a member of the Board of Directors for the Commission on Accreditation of Ambulance Services (CAAS), the national body for accreditation of EMS agencies in the United States and Canada. Dr. Rinnert is an active grant reviewer for the Centers for Disease Control and Prevention-National Institute for Occupational Safety and Health (CDC-NIOSH) and trauma systems consultant to the American College of Surgeons Committee on Trauma (ACS-COT).

JOLENE R. WHITNEY, MPA

Role: Trauma Program Manager

Jolene R. Whitney has worked with the Bureau of Emergency Medical Services and Preparedness, Utah Department of Health for 35 years. She spent the first 6 years of her career as a regional EMS consultant. She became Assistant Training Coordinator in 1986. She has been a program manager for EMS systems and trauma system development since 1991. She is currently serving as the Director of Specialty Care and Performance Improvement. She also served as Deputy Director for the Bureau for seven years, which included managing 22 staff and several programs including Trauma System Development, state grants program, fiscal reporting, Chemical Stockpile Emergency Preparedness, EMS Strike teams, ED, Trauma and Prehospital databases, CISM, medical direction coordination, EMS Licensing and Operations, and EMS for Children.

Ms. Whitney has a Master in Public Administration from Brigham Young University and a B.S. in Health Sciences, with an emphasis in Community Health Education from the University of Utah. She was certified as an EMT-Basic in 1979. She also obtained certification as an EMT instructor and became certified as an EMT III (Intermediate) in 1983.

Ms. Whitney is a co-author of eight publications on preventable trauma mortality, domestic violence, challenges of rural trauma in the western states, pediatric vital signs, Crisis Standards of Care Framework and Toolkit and medical surge capacity planning. She served as Chair, Vice Chair and Regional Representative for the State Trauma Managers Council with the National Association of State EMS Officials. She served on the Highway Information and Traffic Safety Committee for NASEMSO and participated in the development of a rural MCI assessment tool. She is a member of the American Trauma Society, Utah Public Health Association, International Association of Emergency Managers and Utah Emergency Managers Association.

In 2010, Ms. Whitney participated on an Institute of Medicine planning committee and served as a panel Chair for a Rural Response to MCI workshop. She also served on the IOM Crisis Standards of Care Committee which developed the CSC Framework and Toolkit. She recently participated on the IOM planning committee and workshops for Regional Disaster Response Coordination to Support Health Outcomes. Ms. Whitney spent 250 hours in the Olympic Command Center and served as the hospital liaison for the 2002 Winter Olympics in Salt Lake City, Utah. She has completed the ICS training for 100, 200, 300, 700 and 800 series. She assisted in the development of the Utah DMAT-1 and has served as a member of the team since its inception in 2010.

She has served on several national committees and teams, including 10 state EMS system assessments for NHTSA, 8 trauma system consultations for the American College of Surgeons, reviewed rural trauma grant applications for HRSA, contributed to the HRSA model trauma system plan, the National Trauma Data Standards, the NASMESO trauma system planning guide, and the NHTSA curriculum for an EMT refresher course.

NELS D. SANDDAL, REMT, PHD

Role: Technical Advisor

Dr. Sanddal is the former Manager of the American College of Surgeons (ACS) Trauma Systems and Verification Programs. Upon his retirement in January 2016 he continues to work closely with the Trauma Systems Program as a consultant to the ACS COT Trauma Systems Evaluation and Planning Committee.

Prior to his position at the ACS, Dr. Sanddal served as President of the Critical Illness and Trauma Foundation (CIT), in Bozeman, Montana for 25 years. He worked as the training coordinator for the EMS and Injury Prevention Section of the Montana Department of Public Health and Human Services in the late 1970's. He served as the Chairperson of the National Council of State EMS Training Coordinators and as the lead staff member for that organization, and similarly for the National Association of EMT.

Dr. Sanddal completed his undergraduate work at Carroll College, received his Master's degree from Montana State University and his doctorate in Health Science from Walden University. He has been a co-investigator for numerous state or regional rural preventable trauma mortality studies and has conducted additional research in the areas of training for medical personnel, suicide, and rural injury prevention and control. Nels served on the Institute of Medicine's Committee on the Future of Emergency Care in the U.S. Healthcare System.

He received his EMT training in Boulder, Montana, in 1973 and has been an active EMT with numerous volunteer ambulance services since that time and has managed three EMS agencies. When he is at his home in Montana, Nels responds with the Gallatin River Ranch Volunteer Fire Department where he serves as the Chief EMS Officer and Assistant Fire Chief.

JANE W. BALL, RN, DRPH

Role: Technical Advisor

Dr. Ball has served as a consultant to the Trauma Systems Evaluation and Planning Committee of the American College of Surgeons Committee on Trauma since 2006. As such, she has participated on more than 20 state and regional trauma system consultations. She was the Director of the National Resource Center (NRC) at the Children's National Medical Center in Washington, D.C. from 1991 through 2006. The NRC provided support to two Federal Programs in the U. S. Department of Health and Human Services' Health Services and Resources Administration (HRSA): the Emergency Medical Services for Children (EMSC) Program and the Trauma-Emergency Medical Services Systems Program. As director of the NRC, she participated in the development of the HRSA Model Trauma Systems Evaluation and Planning document. She also provided technical assistance to states regarding strategic planning, providing guidance in securing funding, developing and implementing grants, developing injury prevention plans and programs, building coalitions, shaping public policy, conducting training, and producing educational resource materials.

Dr. Ball has authored numerous articles and publications as well as several health care textbooks, including Mosby's Guide to Physical Examination (8 editions), Child Health Nursing (3 editions), Pediatric Nursing: Caring for Children (6 editions), Maternal and Child Nursing Care (4 editions), and Pediatric Emergencies: A Manual for Prehospital Care Providers (2 editions). One of these texts, Pediatric Nursing: Caring for Children, received the 1999 and 2001 Robert Wood Johnson Foundation Last Acts Coalition Outstanding Specialty Book Award. Child Health Nursing was recognized as an American Journal of Nursing Book of the Year in 2010. As an expert in the emergency care of children, Dr. Ball has frequently been invited to join committees and professional groups that address the unique needs of children.

Dr. Ball served as the President of the National Academies of Practice, an organization composed of distinguished health care practitioners from 10 disciplines that promote education, research, and public policy related to improving the quality of health care for all through interdisciplinary care.

Dr. Ball graduated from the Johns Hopkins Hospital School of Nursing. She obtained her master's degree and doctorate in Public Health from John Hopkins University School of Hygiene and Public Health. She is a Certified Pediatric Nurse Practitioner. She received the Distinguished Alumni Award from the Johns Hopkins University in 2010.

MARIA ALVI, MHA

Role: ACS Staff (Trauma Systems and Quality Programs Manager)

Ms. Alvi joined the American College of Surgeons (ACS) Trauma Department as the Trauma Systems and Quality Programs Manager in May 2015. In this role, Ms. Alvi provides administrative support to the COT subcommittees of Trauma Systems Evaluation and Planning, Advocacy and Injury Prevention and Control. She also serves as the program manager for the Trauma Systems Consultation Program, the BIS Facilitation Program, and other Trauma Systems and Quality initiatives.

Prior to joining the ACS, Ms. Alvi worked as a healthcare consultant at Truven Health Analytics for 2 years, providing data reporting support to US clients, through the company's trademarked financial, marketing and clinical programs. Her focus at Truven also allowed her to assist with critical analysis and assessment of client data towards improving health outcomes in their patients, and better management of their healthcare programs.

In December 2013, Ms. Alvi earned her Masters of Healthcare Administration (MHA) from UIC School of Public Health in Chicago. As part of her curriculum, she also completed a Preceptorship at Cook County Health and Hospitals System (CCHHS). Through this opportunity, Ms. Alvi employed her strategic planning and program management skills to clinical programs and non-clinical initiatives at John H Stroger Hospital of Cook County and CCHHS.

Although interested in clinical sciences (pre-med curriculum), and licensed as an EMT-B for the State of Illinois until June 2012, Ms. Alvi found her passions truly lay within healthcare management. Ms. Alvi serves as a volunteer member on the ACHE CHEF Communications Committee, is a Young Professional member for the Chicago Council on Global Affairs, and partakes in various early careerist, networking and charitable events throughout the greater Chicago area.

MELANIE NEAL

Role: Observer – ACS Staff (Manager, TQIP/NTDB)

Ms. Neal has been with the American College of Surgeons for thirteen years, and is the Manager of the National Trauma Data Bank (NTDB) and the Trauma Quality Improvement Program (TQIP). In this position, she provides strategic direction and high level management for scientific, business, and product operations areas.

In addition, Ms. Neal works with a variety of data and quality initiatives of the Committee on Trauma, which support the mission of the COT to improve care for the injured patient. She represents the COT programs of the ACS on this consultation.

Ms. Neal has a Master's degree in Social Science Research Methods.

JIMM DODD

Role: Observer – ACS Staff (Program Manager, TQIP)

Jimm joined the American College of Surgeons (ACS) Trauma Department as the Trauma Quality Improvement Programs Manager in July 2015. In this role he is responsible for Performance Improvement and Patient Safety for TQIP facilities.

Prior to joining ACS, Jimm served in the US Army and US Army Reserves as a medical officer commanding hospitals in support of Operation Iraqi Freedom and Operation Enduring Freedom. He was selected to work on a special task force developing procedures and policies for the integration of Army medicine into State and Local disaster planning and response. He also served on various committees developing initiatives for returning Veterans who were transitioning into civilian careers, creating programming to facilitate their transition. During his time in the military Jimm served as a flight paramedic and an independent duty medic. Jimm still serves in the Army Reserves as a staff officer with CEMARS-G at Fort Sheridan, Illinois.

Jimm graduated from Western Carolina University, in Cullowhee North Carolina, with a Bachelor's degree in Emergency Medical Care. He has completed his Masters in Organizational Leadership with a concentration in Servant Leadership from Gonzaga University, in Spokane Washington. Jimm served as a NREMT- P within the EMS community at various systems during his time in the Army. With his education Jimm has had the opportunity to teach future leaders in Army medicine and apply combat experience to help shape the Army healthcare system.

Jimm was recognized for his combat duty while serving through being awarded the Bronze Star Medal, Meritorious Service Medal and Army Commendation Medals.

APPENDIX D: SAMPLE SYSTEM PATIENT SAFETY MEASURES



UTAH TRAUMA PROGRAM			
Utah Patient Safety Trauma Initiative			
	Process Measures	Performance Measures	Outcome Measures
	9. Trauma pts transported by EMS without ambulance report in medical record	2. Trauma pt. with > 1 inter hospital transfer prior to definitive care	1. Trauma Patients who die >one hour and < 24 hours ED arrival
		3. Ground transport with ED RTS <= 5.5 and scene transport time > 20 min	7a. Trauma pts who die with TRISS > 50%
		4. Trauma pts ISS >15 and EMS scene time > 20 min	7b. Trauma pts who live with TRISS < 50%
		5. Transferred pts ISS > 15 and transfer time > 6 hrs. for rural and > 4 hrs. for urban to definitive care	
		6. Trauma pts with ISS >15 and ED time > 2hours	
		10. Trauma pts < 13 yrs. with ED GCS <= 8, intubation or ISS >15 not transferred to regional pediatric trauma center	
		8. Trauma patients with ISS > 15 discharged from non-state designated trauma centers	
Patient Safety Events	Types of Errors	Key Process Factors	Measures
Medication errors	Dose, route, wrong med		
Hand off/transfer errors	Miscommunication of information, loss of continuity, OR delays		
Device related errors	Device failure, lack of needed device, wrong device		
Diagnostic errors	Failure to recognize, wrong interpretation of results, incomplete diagnosis		
Triage errors	Failure to appropriately assess level of need, too low of classification, too high of classification		
Hemorrhage			
Airway management/control			
CNS/C-spine			
Fluid Resuscitation			

APPENDIX E: SAMPLE SYSTEM PERFORMANCE MEASURES



Trauma Audit Dashboard

User Manual

Draft Date: November 17, 2015

1. Where to Find the Trauma Audit Dashboard

The Trauma Audit Dashboards can be found by going to the Utah Trauma Registry homepage, <http://www.utahtrauma.org/>, and clicking on “Registry Members” in the left side navigation panel. Links to the Trauma Audit Dashboards are located at the bottom on this page under the heading “Access to Trauma Audit Dashboards”. Currently there are two dashboards available; the permissions for each are described below.

2. Trauma Audit Dashboard Description

The goal of the audit dashboard is to give hospitals a way to gain insights into specific patient groups in the Utah Trauma data set. The visualizations provided in the dashboard highlight patients, within individual hospitals, whose injury attributes or care offered “triggered” an audit filter. Descriptions of the audit filters are provided below. *Triggering an audit filter does not equate to the likelihood of suboptimal care.* On the contrary, these audit filters are designed to help hospital representatives identify areas where performance assessments might prove fruitful. The Audit Dashboard is separated into two dashboards:

- 1. State Level Dashboard:** gives detailed information on all aspects of the trauma audit filters, for all hospitals. Access is restricted to key individuals within the Utah Bureau of EMS and Preparedness.
- 2. Hospital Level Dashboard:** gives detailed information on all aspects of the trauma audit filters, only for the hospital for which a user has been granted access. Access is restricted to individual hospitals. The hospital view also provides an overall view of statewide findings for purposes of comparison.

2.1 Overview of the Audit Filters

The following defines the different patient groups represented across the ten audit filters (represented as tabs in the dashboard).

Audit Filter	Definition
Patients who Die Between 1 and 24 Hours After Admission	[DC Disposition Code] is 'D', and the difference between [Ed Adm Date Time] and [Discharge Date Time] is less than one hour or greater than 24 hours.
Patients who have More than One Transfer	[Transport Destination 2] is a value for a hospital.
Patients with RTS < 5.5 and Scene Transport Time > 20 minutes	RTS (calculated) less than 5.5 and [Scene Transport Time] greater than 20 minutes.
Patients with ISS > 15 and Scene Time > 20 minutes	[Injury Severity Score] greater than 15 and [Scene Time] greater than 20 minutes.

Patients with ISS > 15 and Long Transport Time	[Injury Severity Score] greater than 15 and [Scene Transport Time] greater than 6 hours for a rural place of injury or greater than 4 hours for an urban place of injury. Rural/urban distinction is determined by county, with Davis, Salt Lake, Utah, and Weber as "Urban" and Beaver, Box Elder, Cache, Carbon, Daggett, Duchesne, Emery, Garfield, Grand, Iron, Juab, Kane, Millard, Morgan, Piute, Rich, San Juan, Sanpete, Sevier, Summit, Tooele, Uintah, Wasatch, Washington, and Wayne as "Rural".
Patients with ISS > 15 and ED Time > 2 hours	[Injury Severity Score] greater than 15 and the difference between [Ed Adm Date Time] and [Ed Dc Date Time] is greater than 2 hours.
TRISS Values and Unexpected Outcomes	Defines two groups of patients: 1. TRISS (calculated) less than or equal to 50% and [Outcome] is 'A' 2. TRISS (calculated) greater than or equal to 50% and [Outcome] is 'D'
Patients with ISS > 15 Discharged from a Non- Designated Hospital	[Injury Severity Score] is greater than 15 and Trauma Center Level (calculated) is 'Non-designated'
Patients Transported by EMS with No Ambulance Report	[Transport Mode] is 'FIX' or 'AMB' or 'HELI' and [Trip Form1] is NULL or 'N'
Patients under 13 Years with GCS < 8, Intubation, or ISS > 15 not at Primary Children's	[Age in Years] is less than 13 and ([Glasgow1] less than 8 or [Injury Severity Score] greater than 15 or [Ed Airway] is 'ORAL' or [Ed Airway] is 'ORALETT' or [Comp Type1] is 'INTUB' or [Comp Type2] is 'INTUB' or [Comp Type3] is 'INTUB' or [Comp Type4] is 'INTUB') and [Hospital Name] is not 'Primary Children's'

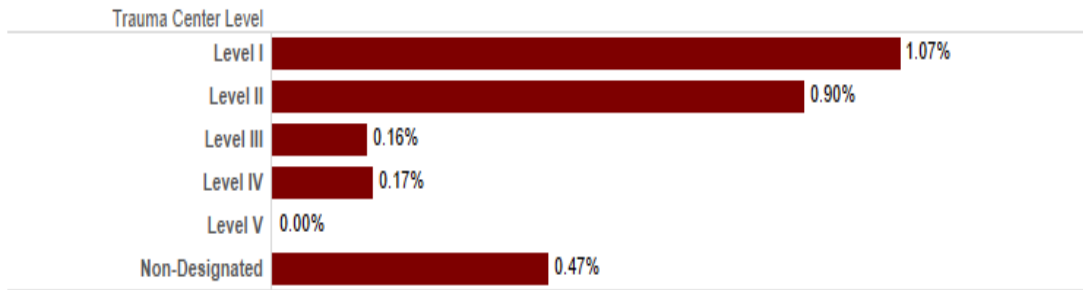
Each audit filter is represented as a tab in the dashboard. The tabs appear at the top of the screen and can be used to move through different audit filters. The small arrows on the ends of the tab bar can be used to scroll through the different tabs one-by-one or to move directly to the first or last audit filter.



For each audit filter, two visualizations are provided. On the left side of the screen is a statewide set of visualizations that provide some comparative information on each patient group. On the right side of the screen are similar visualizations specific to patients treated at the authenticating hospital. In other words, patients triggering the audit filter, treated at your hospital, appear on the right side. Similar patients across the state, triggering the audit filter, appear on the left side of the screen.

2.2 Comparison of Audit Filter to Total Trauma Population

Near the top of a dashboard, we have a visualization designed to show how the patient sample described under the audit filter is distributed throughout the trauma data set:



This visualization shows the percentage of the total Utah registry population that meets the audit filter criteria for each level of trauma center designation, as well as the current hospital, which will appear underneath. Note that for all remaining visualizations on the page, you will only see specific data associated with the hospital for which you authenticated, as well as statewide for the trauma center designations.

This visualization can be used as a filter to control the rest of the dashboard. To see only information on a specific trauma center designation, click on either the label or the bar for that designation. To exit the filtering, click on the bar or label a second time. Any filtering selected in this visualization will only affect visualizations under the heading “Breakdown for Selected Trauma Center Level” on the left side of the dashboard.

2.3 Age Clusters

This visualization is present twice on each tab, once under “Breakdown by Selected Trauma Center Level” (i.e., statewide data) and once under “Breakdown by Selected Hospital”. It shows age demographic information for each group using 10 year age groups, i.e. “0-9”, “10-19”, “20-29”, and so on. The larger and darker colored bubbles represent more patients. Hovering over a bubble will bring up the following tooltip, which provides more information about that bubble, in this case, the age group and a count of patients in that group:

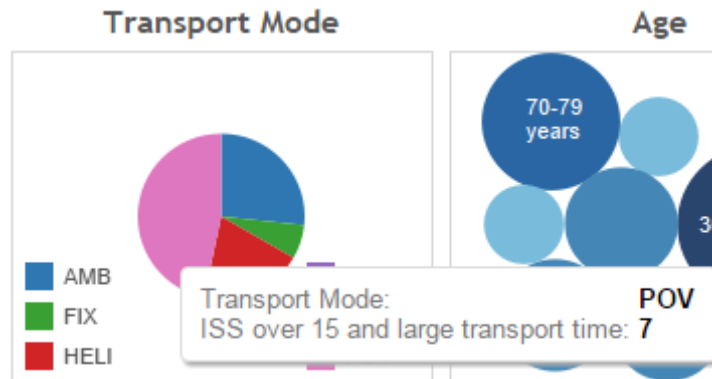


Additionally, this visualization can also be used as a filter for the corresponding side of the dashboard. Clicking once on a bubble will filter all visualizations on the side of the dashboard it is located under (Hospital or Trauma Center Level) to show only patients contained in that age group. Click on the bubble again to exit the filter.

2.4 Transport Mode Pie Chart

This visualization shows up twice on each tab, once under “Breakdown by Selected Trauma Center Level” (i.e., statewide data) and once under “Breakdown by Selected Hospital”. It displays information on how patients were transported to the hospital. The codes used in this visualization, AMB, FIX, HELI, LAW, OTH, and POV represent Ambulance, Fixed Wing, Helicopter, Law Enforcement Vehicle, Other and Personal Vehicle, respectively. As in other

visualizations, hovering over a pie slice will bring up a tooltip with more information, such as the number of patients in that slice:



Additionally, this visualization can also be used as a filter for the corresponding side of the dashboard. Clicking once on a slice will filter that side of the dashboard to just that transport group. Click on the slice again to exit the filter.

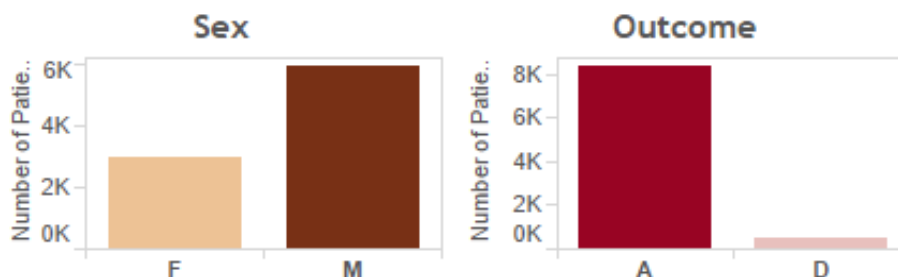
2.5 Sex Bar Chart

This visualization shows up twice on each tab, once under “Breakdown by Selected Trauma Center Level” and once under “Breakdown by Selected Hospital”. It displays demographic information on patient sex. As in other visualizations, hovering over a bar will bring up the tooltip with further information.

Like other visualizations in this dashboard, it can be used as a filter. Clicking on a bar will filter all the visualizations on that side of the dashboard, clicking again will remove the filter.

2.6 Outcome Bar Chart

This visualization shows up twice on each tab, once under “Breakdown by Selected Trauma Center Level” and once under “Breakdown by Selected Hospital”. It shows hospital outcomes for patients in the given audit group. The codes A and D represent “Alive” and “Dead” respectively. This visualization does not show up for every audit filter, the reason behind this is that some audit filters incorporate patient outcome in the audit filter definition.



Like other visualizations in this dashboard, it can be used as a filter. Clicking on a bar will filter all the visualizations on that side of the dashboard, clicking again will remove the filter.

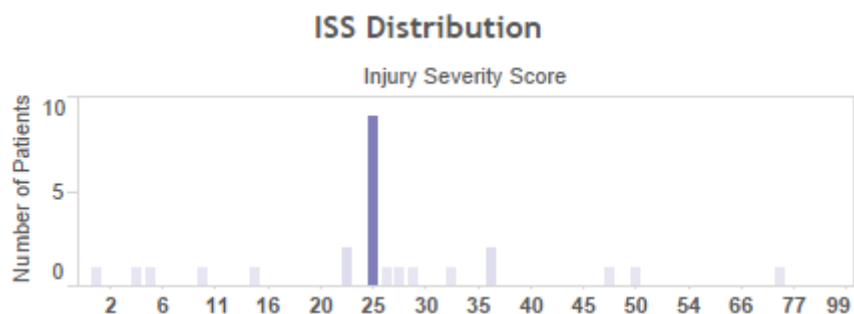
2.7 Cause of Injury Tree Map

This visualization shows up twice on each tab, once under “Breakdown by Selected Trauma Center Level” and once under “Breakdown by Selected Hospital”. It shows the different values for cause of injury for patients in the given audit group. The definition for the cause codes can be found in the Utah Trauma Registry Data Dictionary. As in other visualizations, hovering over a block in the tree map will bring up the tooltip with further information.

Like other visualizations in this dashboard, it can be used as a filter. Clicking on a block will filter all the visualizations on that side of the dashboard, clicking again will remove the filter.

2.8 ISS Distribution

This visualization shows up twice on each tab, once under “Breakdown by Selected Trauma Center Level” and once under “Breakdown by Selected Hospital”. It shows the distribution of ISS scores for patients in the given audit group. Both darker colors and taller bars indicate more patients with that given score. As in other visualizations, hovering over a bar will bring up the tooltip with further information.



Like other visualizations in this dashboard, it can be used as a filter. Clicking on a bar will filter all the visualizations on that side of the dashboard, clicking again will remove the filter.

2.9 Tracking Numbers List (Hospital Specific)

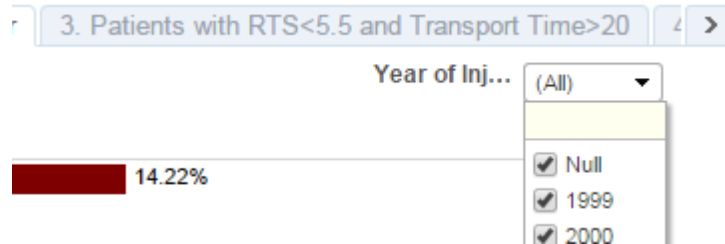
On the bottom right side of the dashboard, a visualization lists the Utah Trauma Registry Tracking Numbers reported by the selected hospital that populate the visualization currently available. In other words, this list provides a way to identify the specific patients that are included in the current visualization. Clicking on a given tracking number will filter the hospital specific side of the dashboard to show detailed information from that single patient record. Clicking a second time will leave the filter. This tracking number list only shows information on patient records submitted to the Utah Trauma Registry from the authenticated hospital. Tracking numbers from other hospitals are NOT listed.

2.10 Additional Drop Down Filters

In addition to the filtering options in the visualizations, there are a couple of drop down filters provided:

- Year
- TRISS/Outcomes Selector

The year drop down menu appears in the top right of every tab. This is a multi-select dropdown menu, which means the user can look at any year or combination of years desired by unchecking the relevant boxes.



The TRISS/Outcomes Selector is found only the tab “7. TRISS Outcomes”. It is located at the top of the dashboard at the center.



Clicking on the arrows at the right of this selector will switch between this dashboard’s two views, “TRISS<50%, Outcome=A” and “TRISS>50%, Outcome=D”.

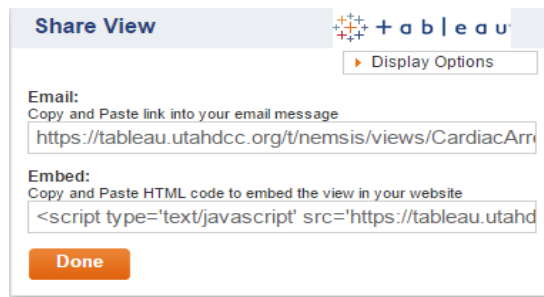
3 Tableau Toolbar

All Tableau dashboards share the same toolbar at the bottom of the view. Note that while most dashboards will have the same selections, some items may differ based on user permissions.

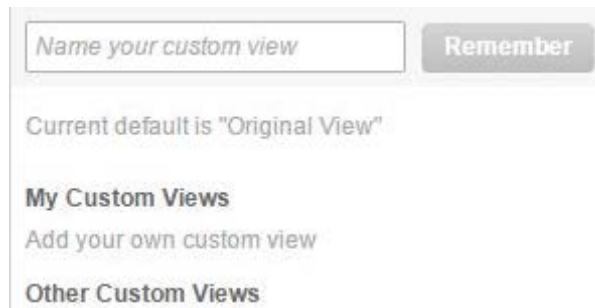


3.1 Share and Remember my changes

The left side of the toolbar contains three options to help manipulate and share data. “Share” provides links to email the dashboard visualization to another person or to embed the dashboard in a website.



“Remember my changes” provides a way to save any filtering or selections you may have made while using the dashboard, for use when you revisit the dashboard.



3.2 Export, Revert, Pause Updates and Refresh

The middle set of buttons provides several options to help explore the dashboard. “Export” provides options to save the dashboard as an image or PDF. “Revert” returns the dashboard to its original filtering position (which in this case is no filters). “Pause Updates” is useful when you want to look at a complicated set of filters. Normally every time a filter selection is made, the dashboard will automatically update the data to reflect the selection. Clicking the Pause Updates button will prevent this from happening, enabling the user to implement several filters and have the visualization update all at once. Once multiple filtering selections are made, automatic updates can be resumed by clicking the button a second time, or clicking the refresh button to the right to refresh the data just once.



Export, Revert, Pause Updates and Refresh buttons.

3.3 Subscribe and Download



The last two icons in the Tableau toolbar are Subscribe (small mail icon) and Download. Subscribe will sign you up for email notifications as changes are made to the dashboard and Download will allow you to download a copy of the workbook to open on Tableau Desktop. In the future, more information will be made available regarding use of Tableau Desktop.

APPENDIX F: STATE PARTICIPANTS LIST

#	Name	Title	Organization
1	Adams, Christy	Trauma Prevention Coordinator	UC Davis Med Center
2	Almadhyan, Abdulmajeed	EMS/Disaster Fellow	UC Irvine Med Center
3	Anderson, Reba	Event Planner	EMSA
4	Ayers, Kathi	Trauma Program Manager	Sharp Memorial Hospital
5	Backer, Howard	Director, EMS Authority	EMSA
6	Bartleson, BJ	VP, Nursing & Clinical Services	CA Hospital Association
7	Barton, Bruce	Director, Riverside County	Riverside County EMS Agency
8	Blough, Lois	Director, Trauma Services	Community Regional MC
9	Chapman, Joanne	Trauma Systems Coordinator	Coastal Valleys EMS Agency
10	Chidester, Cathy	Director, EMS Agency	Los Angeles County EMS Agency
11	Cruz-Manglapus, Gilda	Trauma Program Manager	Henry Mayo Newhall Hospital
12	Cryer, H. Gill	Trauma Director	UCLA Medical Center
13	Cunningham, Connie	Executive Director, Emergency & Trauma	Loma Linda Medical Center
14	Diaz, Linda	Trauma Manager	Santa Clara County EMS
15	Doucet, Jay	Medical Director, Surgical ICU	UC San Diego Med Center
16	Gardina, Les	Manager, EMS Agency	San Diego EMS Agency
17	Gausche-Hill, Marianne	Ems Medical Director	Los Angeles County EMS Agency
18	Gawlik, Melanie	Trauma Service Director	Scripps Memorial La Jolla
19	Goldman, Jay	Medical Director, Emergency Services	Kaiser
20	Gough Smith, Robynn	Chief Administrative Officer	Surgical Affiliated Mgmt Group
21	Haddock, Katy	Trauma System Manager	Ventura County EMS Agency
22	Harley, Jim		Radys Children's Hospital
23	Hinsdale, Jim	Executive Medical Director	California Shock/Trauma Air Rescue
24	Holmes, James	Vice Chair, Research	UC Davis Med Center
25	Hotz, Heidi	Trauma Program Manager	Cedars-Sinai Medical Center
26	Johnson, Craig	Manager, Resp9onse Resource Unit	EMSA
27	Kennedy, Frank	Trauma Director	Sharp Healthcare

28	Kissell, Shanna	Trauma Manager	Riverside County EMS Agency
29	Maas, Frank	Emergency/Trauma Director	Children's Orange County
30	Makersie, Robert	Trauma Director	San Francisco General Med Ctr
31	Margulies, Dan	Chief, Trauma/Emergency/Surgical ICU	Cedars-Sinai Med Center
32	McCord, Brian	Senior Director, Trauma/Emergency/Critical Care	Scripps Mercy
33	McGinnis, Tom	Chief, EMS Systems	EMSA
34	Mzahim, Bandr		UC Irvine Med Center
35	Newton, Chris	Trauma Director	Children's Oakland
36	O'Neill, Kevin		San Benito County EMS Agency
37	Pierson, James	Chief Operations Officer	Medic Ambulance
38	Pinnette, Vickie	Executive Director	SSV EMS Agency
39	Ponce, Santa	Trauma Program Manager	Kern Medical Center
40	Preciado, Leigh	Trauma Registrar	Scripps Health La Jolla
41	Roberts, Mark	Data Manager	ICEMA
42	Roberts, Pamela	Director, Physical Medicine & Rehabilitation	Cedars-Sinai Med Center
43	Schoenheit, Candy	EMSC/Trauma System Coordinator	San Diego EMS Agency
44	Serrano, Jan	Manager, Emergency & Trauma Services	Arrowhead MC
45	Shatz, David	Trauma Surgeon	UC Davis Med Center
46	Sherck, John	Trauma Surgeon	Regional Medical Center, San Jose
47	Sinz, Bonnie	Trauma Coordinator	EMSA
48	Skinner, Ruby	Trauma Medical Director	Kern Medical Center
49	Smiley, Dan	Chief Deputy Director	EMSA
50	Smith, Myron		Hall Ambulance
51	Smith, Renee	Trauma Program Director	St. Francis Medical Center
52	Spain, David	Trauma Director	Stanford Medical Center
53	Steele, John	Trauma Program Medical director	Palomar Med Center
54	Stratton, Sam	Medical Director	Orange County EMS Agency
55	Thomas, Desiree	Trauma Program Director	Long Beach Memorial
56	Trask, Sean	Chief, EMS Personnel	EMSA

57	Tufuoh, Nana	Research Scientist	EMSA
58	Tyler, Robin	Trauma Program Manager	Harbor/UCLA Med Center
59	Venezio, Heather	Trauma Program Director	North Bay Med Center
60	Weivoda, Kristin	EMS Administrator	Yolo County EMS Agency
61	Wirtz, Steve	Chief, Injury Surveillance and Epidemiology	CDPH
62	Woodfall, Michelle	Trauma Program Director	Stanford Medical Center
63	Woods, Amber	Trauma Manager	Kaweah Delta Medical Center
64	Wraa, Cheryl	Grant Manager	North Coast EMS Agency
65	Yates, Judith	Senior Vice President	Hospital Association San Diego/ Imperial
66	Yoshida McMath, Christine	Speciality Care Coordinator	ICEMA

June 7, 2017

TO: EMS/Trauma Committee Members

FROM: Heather Venezia, Trauma Program Director, North Bay Medical Center

SUBJECT: TMAC Update

SUMMARY

- Waiting on the Title 22 trauma regulations rewrite to begin
- TMAC Conference June 29 Mission Viejo - See attached flyer and Agenda
- TMAC general membership meeting June 30 Mission Viejo
- February meeting – great presentations
 - Trauma APP Program Development in Academic Setting to Optimize Comprehensive Clinical Care – Michelle Woodfall, TPD Stanford
 - Utilization of TXA in the Pre-Hospital Setting – Shanna Kissel, Trauma Nurse Coordinator/Clinical Supervisor, Riverside County EMS Agency
 - Great discussion of PI projects from the various facilities
 - HgA1C standard testing for a trauma panel to diagnose diabetes and facilitate follow up in the clinic.
 - Geriatric activation criteria
 - Pediatric rapid triage

ACTION REQUESTED

- Information only.

Attachments: TMAC Conference flyer and agenda



TMAC Conference 2017: Navigating through the Challenges in Trauma Care

Thursday, June 29, 2017

Location: Mission Hospital
27700 Medical Center Rd.
Mission Viejo, CA. 92691

The Trauma Managers Association of California (TMAC) is a membership-based, non-profit organization whose members represent Trauma Program Managers/Directors, Trauma Nurse and PI Coordinators, Advanced Practice Nurses, Injury Prevention Coordinators, and EMS leaders in California .

This annual TMAC Conference will provide an opportunity to network with trauma experts across this continuum and their influential leaders. The course speakers are healthcare professionals that impact trauma care on a global scale. CEU's will be offered. **Registration only \$100!** To register for this exciting event, please visit <https://tmac2017conference.eventbrite.com>

Program Topic Highlights Include:

- *The Model Trauma System: Straight from the ACS*
- *Culture of Safety Taxonomy in Trauma: What do I need to know?*
- *TEG : Bringing it to your Trauma Center*
- *County of San Diego: 30 Plus Years as a Trauma System!*
- *EMS Spinal Motion Restriction Policies: A Trauma Surgeon's Perspective*
- *Slips, Trips and Falls: A Multidisciplinary Countrywide Fall Prevention Program*
- *Bringing up a Pediatric Trauma Center*

Additional information can be found on our site at traumamanagersca.org



TMAC Conference Schedule June 29, 2017

0700-0800	Registration / Vendor Fair / Continental Breakfast
0800-0810	TMAC President Welcome: Desiree Thomas, MSN, RN, Long Beach Memorial
Session One: <i>Moderator: Eileen Hoover, RN – Trauma Program Manager, Santa Clara Valley Medical Center</i>	
0810-0845	If Bobby Kennedy was brought to a Trauma Center – Mark Eastham MD, Neurosurgeon
0845-0915	TEG : Bringing it to your Trauma Center – Mary Kay Bader RN, MSN, CCNS, FAHA, Neuroscience/Critical Care, Mission Hospital
0915-0945	The Model Trauma System : Straight from the ACS – Robert Winchell, MD, FACS, Chair, Trauma Systems Evaluation and Planning, ACS-COT
0945-1000	Panel Discussion
1000-1015	Break / Exhibitor Fair
Session Two: <i>Moderator: Robin Tyler, RN – Trauma Program Manager, Harbor - UCLA</i>	
1015-1045	Bringing up a Pediatric Trauma Center – David L. Gibbs MD, FACS, FAAP, Medical Director, CHOC Trauma Program
1045-1115	Slips, Trips and Falls: A Multidisciplinary Countywide Fall Prevention Program - Thomas K. Duncan, DO, FACS, FICS, Trauma Medical Co-Director, Ventura County Medical Center
1115-1145	EMS Spinal Motion Restriction Policies: A Trauma Surgeon’s Perspective – Robert Winchell, MD, FACS, Chair, Trauma Systems Evaluation and Planning, ACS-COT
1145-1200	Panel Discussion
1200-1300	Lunch / Networking / Exhibitors
Session Three: <i>Moderator: Nick Mannering, RN – Trauma Program Manager, Mission Hospital in Mission Viejo, Orange County</i>	
1300-1330	County of San Diego: 30 Plus Years of MAC....and Still Going Strong! – Candy Schoenheit, RN, San Diego County EMS Quality Assurance Specialist
1330-1400	Implementation of Early Mobilization Program in Your Trauma Center – Dina Elias, RN, MSN, CCRN, CCNS
1400-1415	Break / Exhibitor Fair
1415-1515	Culture of Safety Taxonomy in Trauma: What do I Need to Know? – Kathleen Martin, Trauma Program Manager, Lankenau Medical Center
1515-1530	Panel Discussion
1530-1545	Final Thoughts/Wrap Up/Evaluations / Adjourn



June 7, 2017

TO: EMS/Trauma Committee Members
FROM: BJ Bartleson, VP Nursing & Clinical Services
SUBJECT: JC Thrombectomy Ready Hospital

SUMMARY

Many hospitals have assembled the equipment and personnel necessary to become a designated Comprehensive Stroke Center through JC and or AHA, however, do not have enough endovascular procedures to be eligible for designation. The JC has released standards for field review (attached), and will be finalized sometime this summer.

ACTION REQUESTED

- Information and feedback

DISCUSSION QUESTIONS

1. Are you aware of any hospitals working on stroke center designation that this may be applicable to?
2. Do you have any comments on the proposed requirements?

Proposed Advanced Certification Requirements for Thrombectomy-capable Stroke Center Disease-Specific Care Certification Program

Program Management (DSPR)

DSPR.1

1 The program defines its leadership roles.

Elements of Performance for DSPR.1

2 1. The program identifies members of its leadership team.

Requirement Specific to Thrombectomy-capable Stroke Center Certification

3 a. The organization identifies a medical director who has knowledge and experience in the care of
4 patients with stroke to provide administrative leadership and clinical guidance to the program.

5 2. The program defines the accountability of its leader(s).

6 3. The program leader(s) guides the program in meeting the mission, goals, and objectives.

7 4. The program leader(s) identifies, in writing, the composition of the interdisciplinary team.

8 5. The program leader(s) participates in designing, implementing, and evaluating care, treatment, and
9 services.

Requirement Specific to Thrombectomy-capable Stroke Center Certification

10 a. The thrombectomy-capable stroke center documents the roles and responsibilities for
11 members of the core stroke team.

12 6. The program leader(s) provides for the uniform performance of care, treatment, and services.

13 7. The program leader(s) makes certain that practitioners practice within the scope of their licensure,
14 certification, training, and current competency.

15 8. The program leader(s) monitors the performance of the program's interdisciplinary team as it relates to
16 achievement of the program's mission, goals, and objectives.

DSPR.2

17 The program is collaboratively designed, implemented, and evaluated.

Elements of Performance for DSPR.2

18 1. The interdisciplinary team designs the program.

19 2. The interdisciplinary team implements the program.

20 3. The interdisciplinary team evaluates the program.

21 4. The interdisciplinary team uses the results of the program evaluation to improve performance.

Disease-Specific Care Certification Program

DSPR.3

22 The program meets the needs of the target population.

Elements of Performance for DSPR.3

23 1. The leader(s) defines, in writing, the program's mission and scope of service.

24 2. The leader(s) approves the program's mission and scope of service.

25 3. The program identifies its target population.

26 4. The services provided by the program are relevant to the target population.

Requirements Specific to Thrombectomy-capable Stroke Center Certification

27 a. The thrombectomy-capable stroke center collaborates with emergency medical services (EMS)
28 providers to make certain of the following:

29 - The program has access to treatment protocols utilized by EMS providers and pre-hospital
30 personnel for emergency stroke care.

31 - The program has access to stroke protocols utilized by EMS providers that address transport of
32 patients suspected of having a stroke to stroke centers, in accordance with law and regulation.

33 b. The thrombectomy-capable stroke center has the capacity to perform mechanical
34 thrombectomy for the treatment of ischemic stroke 24 hours a day, 7 days a week.

35 c. The thrombectomy-capable stroke center has a stroke unit or designated beds for the acute
36 care of stroke patients, and dedicated neuro-intensive care beds for complex stroke patients that
37 are available 24 hours a day, 7 days a week.

38 Note: Stroke units can be defined and implemented in a variety of ways. The stroke unit does not
39 have to be a specific enclosed area with beds designated only for acute stroke patients; it may be
40 a specified unit or number of beds to which most stroke patients are admitted.

41 d. The thrombectomy-capable stroke center performs the following types of imaging 24 hours a
42 day, 7 days a week:

43 - Catheter angiography

44 - Computed tomography (CT) of the head

45 - Computed tomography angiography (CTA)

46 - Magnetic resonance imaging (MRI), including diffusion-weighted MRI

47 - Magnetic resonance angiography (MRA)

48 e. The thrombectomy-capable stroke center has a written agreement for transfer with at least one
49 comprehensive stroke center that includes the following:

50 - Contact names

51 - Contact phone numbers

52 - Allows for timely transfer 24 hours a day, 7 days a week

DSPR.4

53 The program follows a code of ethics.

Elements of Performance for DSPR.4

54 1. The program protects the integrity of clinical decision making.

55 2. The program respects the patient's right to decline participation in the program.

56 3. The program has a process for receiving and resolving complaints and grievances in a timely manner.

Disease-Specific Care Certification Program

DSPR.5

57 The program determines the care, treatment, and services it provides.

Elements of Performance for DSPR.5

- 58 1. The program defines in writing the care, treatment, and services it provides.
 - 59 2. The program communicates to the patient the care, treatment, and services it provides.
 - 60 3. The program provides care, treatment, and services to patients in a planned and timely manner.
-

Requirements Specific to Thrombectomy-capable Stroke Center Certification

- 61 a. The thrombectomy-capable stroke center has the ability to complete initial laboratory tests on
62 site 24 hours a day, 7 days a week.
63 Note: Laboratory tests include a complete blood cell count with platelet count, coagulation studies
64 (such as prothrombin time and international normalized ratio), blood chemistries, and troponin.
65 b. The thrombectomy-capable stroke center performs advanced imaging with multimodal imaging
66 capabilities for the following when indicated by patient need:
67 - Carotid duplex ultrasound
68 - Transcranial ultrasonography
69 - Transesophageal echocardiography (TEE)
-

- 70 4. The program complies with applicable law and regulation.
 - 71 5. The program informs the patient and family about how to access care, treatment, and services,
72 including after hours (if applicable).
 - 73 6. The program has a process to provide emergency/urgent care.
-

Requirements Specific to Thrombectomy-capable Stroke Center Certification

- 74 a. The organization has written documentation on the process used to notify the designated
75 practitioners who respond to patients with an acute stroke.
 - 76 b. A practitioner knowledgeable in the diagnosis and treatment of stroke responds to the patient's
77 bedside within 15 minutes of notification.
78 Note: The organization may choose to maintain a consistent team or group of practitioners for this
79 purpose, or it may choose to rotate this responsibility as needed. These practitioners may include
80 physicians, nurse practitioners, and physician assistants as determined by the organization.
 - 81 c. Emergency department licensed independent practitioners have 24-hour access either in
82 person or via telemedicine to a physician who can provide timely, informed consultation for
83 complex stroke care when additional clinical expertise is needed.
 - 84 d. Telemedicine is available to assist the TSC in evaluating the following:
85 - Critical care patients
86 - Patients who may require transfer to a comprehensive stroke center
-

Disease-Specific Care Certification Program

- 87 7. The program provides the number and types of practitioners needed to deliver or facilitate the delivery
88 of care, treatment, and services.

Requirements Specific to Thrombectomy-capable Stroke Center Certification

- 89 a. For thrombectomy-capable stroke centers that provide neurosurgical services, a written plan
90 for neurosurgical coverage and a neurosurgical call schedule is readily available to staff.
91 b. The following practitioners and staff are available 24 hours a day, 7 days a week:
92 - Emergency physicians
93 - A physician privileged to perform mechanical thrombectomy is available on site within 45
94 minutes, 24 hours a day, 7 days a week
95 - Neurointensivist
96 - Diagnostic radiologist with complex stroke experience
97 - Physician privileged to interpret computed tomography (CT) and magnetic resonance imaging
98 (MRI) of the brain
99 - Certified radiology and MRI technologists
100 - At least one endovascular catheterization laboratory technician and one endovascular registered
101 nurse
102 c. Practitioners with neurocritical care privileges provide on-site, 24-hour care to patients in the
103 dedicated neuro-intensive care beds.
104 Note 1: Fellows with neurocritical care and cerebrovascular experience are acceptable for
105 meeting this requirement. Additionally, residents with neurocritical care and cerebrovascular
106 experience, as determined and documented by the director of the residency program and medical
107 director of the thrombectomy-capable stroke center, are acceptable for meeting this requirement.
108 Note 2: Advanced practice nurses (APNs) or physician assistants (PAs) with neurocritical care
109 and cerebrovascular experience are acceptable for meeting this requirement as an alternative to
110 physicians, when the following conditions are met:
111 - APN or PA has additional education in neurocritical care and cerebrovascular care and has a
112 minimum level of experience, as determined by the organization.
113 - Physicians with neurology, endovascular, and critical care experience are available for clinical
114 backup 24 hours a day, 7 days a week.
115 Note 3: Training in cerebrovascular and neurocritical care can be demonstrated through
116 completion of a comprehensive educational program focusing on neurological emergencies. One
117 example of this is Emergency Neurological Life Support (ENLS) certification or equivalent for
118 providers covering neurointensive care beds.
119 d. Physical therapy and occupational therapy practitioners are available six days a week and on
120 call the seventh day to perform patient assessments during the acute stroke phase.
121 e. One or more speech-language pathologists who are qualified to perform patient swallowing
122 function assessments during the acute stroke phase are available seven days a week.

- 123 8. The program evaluates services provided through contractual arrangement to make certain the care,
124 treatment, and services are consistently provided in a safe, quality manner. This evaluation is
125 documented.

- 126 9. Variables such as staffing, setting, or payment source do not affect outcomes of care, treatment, and
127 services.

Disease-Specific Care Certification Program

DSPR.6

128 The program has current reference and resource materials.

Elements of Performance for DSPR.6

129 1. Practitioners have access to reference materials, including clinical practice guidelines, in either hard
130 copy or electronic format.

Requirement Specific to Thrombectomy-capable Stroke Center Certification

131 a. Protocols and care paths (preprinted or electronic documents) are available in the emergency
132 department, acute care areas, and stroke unit for the acute assessment and treatment of patients
133 with ischemic or hemorrhagic stroke.

134 2. Reference materials and resources are current and evidence based.

DSPR.7

135 The program's facilities are safe and accessible.

136 Note: The program may use the organization's plan and processes for safety and accessibility if they
137 address the program's unique needs and target population.

Elements of Performance for DSPR.7

138 2. The program implements strategies to minimize security risks.

139 6. The program implements strategies to minimize the risk of fire and address fire safety-related issues.

140 7. The program identifies activities to minimize risks associated with medical equipment used in the
141 program.

142 8. The program implements activities to minimize risks associated with medical equipment used in the
143 program.

Delivering or Facilitating Clinical Care (DSDF)

DSDF.1

144 Practitioners are qualified and competent.

Elements of Performance for DSDF.1

145 1. Practitioners have education, experience, training, and/or certification consistent with the program's
146 scope of services, goals and objectives, and the care provided.

Requirements Specific to Thrombectomy-capable Stroke Center Certification

147 a. The organization's clinical staff has knowledge of the process used to notify designated
148 practitioners of the need to respond to patients with an acute stroke.

149 b. Emergency department practitioners demonstrate knowledge of IV thrombolytic therapy
150 protocols for acute stroke, including the following:

151 - Treatment during the first three hours after the patient was last known to be well

152 - Indications for use of IV thrombolytic therapy

153 - Contraindications to IV thrombolytic therapy

154 - Education to be provided to patients and families regarding the risks and benefits of IV
155 thrombolytic therapy

156 - Signs and symptoms of neurological deterioration post IV thrombolytic therapy

157 c. Emergency department practitioners demonstrate knowledge of mechanical thrombectomy
158 protocols for acute stroke.

159 d. Registered nurses working in the stroke unit or the ICU that contains dedicated neuro-intensive
160 care beds for complex stroke patients are knowledgeable about the stroke scale * used in the
161 organization.

162 Footnote *: An example of a stroke scale is the National Institutes of Health Stroke Scale (NIHSS).

163 2. The program verifies each practitioner's licensure using a primary source verification process upon hire
164 and at licensure expiration.

165 3. The program assesses practitioner competency at time of hire. This assessment is documented.

166 4. Orientation provides information and necessary training pertinent to the practitioner's responsibilities.
167 Completion of the orientation is documented.

168 5. The program assesses practitioner competence on an ongoing basis. This assessment is documented.

169 6. The program identifies and responds to each practitioner's program-specific learning needs.

Disease-Specific Care Certification Program

- 170 7. Ongoing in-service and other education and training activities are relevant to the program's scope of
171 services.

Requirements Specific to Thrombectomy-capable Stroke Center Certification

- 172 a. Members of the core stroke team, as defined by the organization, receive at least eight hours
173 annually of continuing education in stroke care or other equivalent educational activity.
174 b. The medical director of the thrombectomy-capable stroke center program receives at least
175 eight hours annually of continuing education in stroke care or other equivalent educational activity
176 if he or she is not board certified in neurology.
177 c. Nurses working in the emergency department, as identified by the organization, are required to
178 complete two hours of education per year on cerebrovascular disease, including acute stroke
179 care.
180 d. Emergency department staff, as identified by the organization, participates in educational
181 activities related to stroke diagnosis and treatment a minimum of twice a year.
182 Note: This requirement does not include emergency physicians. For more information, refer to
183 Standard MS.12.01.01 in the Hospital E-dition of the Comprehensive Accreditation Manual for
184 Hospitals.
185 e. Nurses providing stroke care, as identified by the organization, are required to attend a
186 minimum of eight hours of education per year on cerebrovascular disease and stroke.
187 Note: Nurses providing stroke care include nurses working in the stroke unit, ICU that contains
188 the dedicated neuro-intensive care beds for complex stroke patients, endovascular
189 catheterization laboratory, and patient care units.
-

DSD.F.2

- 190 The program develops a standardized process originating in clinical practice guidelines (CPGs) or
191 evidence-based practice to deliver or facilitate the delivery of clinical care.

Elements of Performance for DSD.F.2

- 192 1. The selected clinical practice guidelines are evaluated for their relevance to the target population.
193 2. The selected clinical practice guidelines are based on evidence that is determined to be current by the
194 clinical leaders.

Requirements Specific to Thrombectomy-capable Stroke Center Certification

- 195 a. The thrombectomy-capable stroke center has written protocols based on clinical practice
196 guidelines, including:
197 - Protocols for emergent care of patients with ischemic stroke, including IV thrombolytic therapy
198 and endovascular interventions
199 - Protocols for emergent care of patients with hemorrhagic stroke, including indications for
200 transfer to a comprehensive stroke center
201 b. The dysphagia screen used by the program is an evidence-based bedside testing protocol
202 approved by the organization.
-

- 203 3. The program leader(s) and practitioners review and approve clinical practice guidelines prior to
204 implementation.

Requirements Specific to Thrombectomy-capable Stroke Center Certification

- 205 a. Protocols for emergent care of patients with ischemic or hemorrhagic strokes are reviewed for
206 current evidence at least annually using an interdisciplinary approach.
207 b. The thrombectomy-capable stroke center reviews EMS protocols at least annually.
-

- 208 4. Practitioners are educated about clinical practice guidelines and their use.

Disease-Specific Care Certification Program

- 209 5. The program demonstrates evidence that it is following the clinical practice guidelines when providing
210 care, treatment, and services.

Requirement Specific to Thrombectomy-capable Stroke Center Certification

- 211 a. The organization's formulary or medication list must include an IV thrombolytic therapy
212 medication approved by the US Food and Drug Administration for the treatment of ischemic
213 stroke.

- 214 6. The program implements modifications to clinical practice guidelines based on current evidence-based
215 practice.
-

DSD.F.3

- 216 The program is implemented through the use of clinical practice guidelines selected to meet the patient's
217 needs.

Elements of Performance for DSD.F.3

- 218 1. The program establishes an interdisciplinary team based on the patient's assessed needs and
219 direction from clinical practice guidelines.
- 220 2. The assessment(s) and reassessment(s) are completed according to the patient's needs and clinical
221 practice guidelines.

Requirements Specific to Thrombectomy-capable Stroke Center Certification

- 222 a. An emergency department practitioner performs an assessment for a suspected stroke patient
223 within 15 minutes of patient arrival in the emergency department.
224 - The NIH Stroke Scale (NIHSS) is used in the assessment of patients with acute stroke.
225 - Ongoing assessment(s) of the patient are completed in accordance with the program's acute
226 stroke protocols.
- 227 b. A blood glucose level is completed for any patient presenting with stroke symptoms.
- 228 c. The hospital has the ability to perform and read a non-contrast computed tomography of the
229 head (head CT) within 45 minutes of patient presentation with stroke symptoms.
- 230 d. Laboratory tests, electrocardiogram (ECG), and chest x-ray are completed within 45 minutes of
231 patient presentation with stroke symptoms, if ordered by the practitioner.
232 Note: Laboratory tests may include a complete blood cell count with platelet count, coagulation
233 studies (such as prothrombin time and international normalized ratio), blood chemistries, and
234 troponin.
- 235 e. All patients exhibiting stroke symptoms are screened for dysphagia prior to receiving any oral
236 intake of medication, fluids, or food.
- 237 f. The stroke unit or designated beds has the capability of continuously and simultaneously
238 monitoring the following:
239 - Blood pressure
240 - Heart rate and rhythm, with automatic arrhythmia detection
241 - Respirations
242 - Oxygenation via pulse oximetry or another modality
- 243 g. The stroke program provides for early assessment of rehabilitation needs for all patients
244 admitted with stroke.
- 245 h. The thrombectomy-capable stroke center has a process to notify medical staff and other
246 personnel about the deterioration of a stroke patient, which may include, but is not limited to,
247 changes in vital signs and neurological status.
-

Disease-Specific Care Certification Program

- 248 3. The program implements care, treatment, and services based on the patient's assessed needs.

Requirements Specific to Thrombectomy-capable Stroke Center Certification

- 249 a. Brain magnetic resonance imaging (MRI), magnetic resonance angiogram (MRA), and
250 computed tomography angiogram (CTA) scans are interpreted within two hours of completion, if
251 these tests are ordered to be completed as soon as possible.
252 b. The completion of laboratory tests, electrocardiogram (ECG), and chest x-ray should not delay
253 the administration of IV thrombolytic therapy.
254 c. Rehabilitation therapy is initiated as indicated by the patient assessment and may include
255 speech-language pathology services, physical therapy, occupational therapy, or any combination
256 of these therapies.
-

DSD.F.4

- 257 The program develops a plan of care that is based on the patient's assessed needs.

Elements of Performance for DSD.F.4

- 258 1. The plan of care is developed using an interdisciplinary approach and patient participation.
259 2. The program individualizes the plan of care for each patient.
260 3. The individualized plan of care is based on the patient's goals and the time frames to meet those goals.
261 4. The individualized plan of care reflects coordination of care with other programs, as determined by
262 patient comorbidities.
-

Requirements Specific to Thrombectomy-capable Stroke Center Certification

- 263 a. Based on prognosis and the patient's individual needs and preferences, patients are referred to
264 palliative care when indicated.
265 b. Based on prognosis and the patient's individual needs and preferences, patients are referred to
266 hospice or end-of-life care when indicated.
267 c. Based on prognosis, individual needs, and consultation with the family, patients are referred to
268 community resources to facilitate integration into the community such as:
269 - Outpatient therapy, including physical therapy, occupational therapy, and speech-language
270 pathology services
271 - Support groups
272 - Social services
273 - Vocational rehabilitation
274 - Behavioral health services
275 - Family therapy services
276 - Respite care services
-

- 277 5. The program explains the plan of care to the patient in a manner he or she can understand.
278 6. The program informs patients of all potential consequences of not complying with recommended care,
279 treatment, and services.
280 7. The program informs patients of their responsibility to provide information to facilitate treatment and
281 cooperate with practitioners.
282 8. The program continually evaluates, revises, and implements revisions to the plan of care to meet the
283 patient's ongoing needs.

Disease-Specific Care Certification Program

DSDF.5

284 The program manages comorbidities and concurrently occurring conditions and/or communicates the
285 necessary information to manage these conditions to other practitioners.

Elements of Performance for DSDF.5

286 1. The program coordinates care for patients with multiple health needs.

Requirements Specific to Thrombectomy-capable Stroke Center Certification

287 a. Protocols for care related to patient referrals demonstrate that the program does the following:
288 - Addresses processes for receiving transfers
289 - Addresses processes for transferring patients to another facility
290 - Evaluates the receiving organization's ability to meet the individual patient's and family's needs
291 b. For thrombectomy-capable stroke centers that treat and transfer acute stroke patients, written
292 documentation includes time parameters and transfer procedures.

293 2. Patients with comorbidities and co-occurring conditions needing clinical and/or psychosocial care,
294 treatment, and services are managed by the program's practitioners or referred to other practitioners
295 for care.

296 3. The program's practitioners communicate to other practitioners important information regarding co-
297 occurring conditions and comorbidities needed to manage the patient's conditions.

DSDF.6

298 The program initiates discharge planning and facilitates arrangements for subsequent care, treatment, and
299 services to achieve mutually agreed upon patient goals.

Elements of Performance for DSDF.6

300 1. In preparation for discharge, the program discusses and plans with the patient and family the care,
301 treatment, and services that are needed in order to achieve the mutually agreed upon self-
302 management plan and goals.

Requirement Specific to Thrombectomy-capable Stroke Center Certification

303 a. Post-hospital care is coordinated based on the assessment of the patient's and family's
304 identified needs such as the following:
305 - Acute rehabilitation
306 - Long term acute care
307 - Skilled nursing/subacute care
308 - Outpatient services
309 - Home care
310 - Respite services
311 - Palliative care

312 2. In preparation for discharge, the program considers the patient's anticipated needs and goals when
313 identifying the setting and practitioners for continuing care, treatment, and services.

314 3. In preparation for discharge, the program communicates the patient's needs and goals to other
315 practitioners who will continue to support the patient in achieving the desired outcomes.

Disease-Specific Care Certification Program

- 316 4. The program provides education and serves as a resource, as needed, to practitioners who are
317 assuming responsibility for the patient's continued care, treatment, and services.

Requirements Specific to Thrombectomy-capable Stroke Center Certification

- 318 a. The thrombectomy-capable stroke center provides educational activities to pre-hospital
319 personnel, as defined by the organization.
320 b. The thrombectomy-capable stroke center provides at least two stroke public education
321 activities per year.
-

Supporting Self-Management (DSSE)

DSSE.1

- 322 The program involves patients in making decisions about managing their disease or condition.

Elements of Performance for DSSE.1

- 323 1. The program involves patients in decisions about their care, treatment, and services.
324 2. The program assesses the patient's readiness, willingness, and ability to engage in self-management
325 activities.
326 3. The program assesses the family and/or caregiver's readiness, willingness, and ability to provide or
327 support self-management activities when needed.

Requirements Specific to Thrombectomy-capable Stroke Center Certification

- 328 a. The patient's family members, including the primary caregiver, have been assessed to
329 determine their readiness to provide care to the patient.
330 b. For patients returning home, the family members receive a comprehensive assessment to
331 determine their skills, capacities, and resources to provide post-hospital care.
-
- 332 4. The program utilizes the assessment of the patient and family and/or caregiver to guide the
333 development of a self-management plan.
334 5. Patients and practitioners mutually agree upon goals.
-

DSSE.2

- 335 The program addresses the patient's self-management plan.

Elements of Performance for DSSE.2

- 336 1. The program promotes lifestyle changes that support self-management activities.
337 2. The program evaluates barriers to lifestyle changes.
338 3. The program engages family and community support structures in the patient's self-management plan,
339 as directed by the patient.
340 4. The program assesses and documents the patient's response to recommended lifestyle changes.
341 5. The program addresses the education needs of the patient regarding disease progression and health
342 promotion.
343 6. The program revises the self-management plan according to the patient's assessed needs.

Disease-Specific Care Certification Program

DSSE.3

344 The program addresses the patient's education needs.

Elements of Performance for DSSE.3

- 345 1. The program's education materials comply with recommended elements of care, treatment, and
346 services, which are supported by literature and promoted through clinical practice guidelines and
347 evidence-based practice.
- 348 2. The program presents content in an understandable manner according to the patient's level of literacy.
- 349 3. The program presents content in a manner that is culturally sensitive.
- 350 4. The program makes initial and ongoing assessments of the patient's comprehension of program-
351 specific information.
- 352 5. The program addresses the education needs of the patient regarding his or her disease or condition
353 and care, treatment, and services.

Requirements Specific to Thrombectomy-capable Stroke Center Certification

- 354 a. For patients returning home, education is provided to the patient and family on post-hospital
355 care.
- 356 b. Education and resources are provided to the patient and family about durable medical
357 equipment (DME), when indicated.
- 358 c. Education and resources are provided to the family about respite care, when indicated.
- 359 d. Financial resource information is provided to the patient and family, when indicated.
-

Clinical Information Management (DSCT)

DSCT.1

360 Patient information is confidential and secure.

Elements of Performance for DSCT.1

- 361 1. Patients are made aware of how data and information related to them will be used by the program.
- 362 2. The program discloses health information only as authorized by the patient or as otherwise consistent
363 with law and regulation.
- 364 3. Records and information are safeguarded against loss, destruction, tampering, and unauthorized
365 access or use.
- 366 4. The program identifies, in writing, who is authorized to access, use, and disclose patient information.
- 367 5. The program defines a process for responding to a violation of confidentiality or security.
- 368 6. The program implements its process for addressing a violation of confidentiality or security.
-

DSCT.2

369 Information management processes meet the program's internal and external information needs.

Elements of Performance for DSCT.2

- 370 1. Data are easily retrieved in a timely manner without compromising security and confidentiality.
- 371 2. The program uses aggregate data and information to support leadership decisions.
- 372 3. The program uses aggregate data and information to support operations.

Disease-Specific Care Certification Program

373 4. The program uses aggregate data and information to support performance improvement activities.

374 5. The program uses aggregate data and information to support patient care.

DSCT.3

375 Patient information is gathered from a variety of sources.

Elements of Performance for DSCT.3

376 1. Information is gathered directly from the patient and family.

377 2. Information is gathered from relevant practitioners and/or health care organizations.

DSCT.4

378 The program shares information with relevant practitioners and/or health care organizations about the
379 patient's disease or condition across the continuum of care.

Elements of Performance for DSCT.4

380 1. The program shares information directly with the patient.

381 2. The program shares information with relevant practitioners and/or health care organizations to facilitate
382 continuation of patient care.

Requirement Specific to Thrombectomy-capable Stroke Center Certification

383 a. The results of diagnostic imaging and laboratory testing are communicated and available to the
384 ordering physician and stroke team as applicable.

DSCT.5

385 The program initiates, maintains, and makes accessible a medical record for every patient.

Elements of Performance for DSCT.5

386 1. All relevant practitioners have access to patient information as needed.

387 2. The medical record contains sufficient information to identify the patient.

388 3. The medical record contains sufficient information to support the diagnosis.

389 4. The medical record contains sufficient information to justify the care, treatment, and services provided.

Requirements Specific to Thrombectomy-capable Stroke Center Certification

390 a. Documentation indicates the reason eligible ischemic stroke patients did not receive IV
391 thrombolytic therapy.

392 b. Documentation indicates the reason eligible ischemic stroke patients did not receive
393 mechanical thrombectomy.

394 5. The medical record contains sufficient information to document the course and results of care,
395 treatment, and services.

Requirement Specific to Thrombectomy-capable Stroke Center Certification

396 a. Stroke program practitioners document all assessments and interventions provided for stroke
397 patients, including date and time, in accordance with the organization's policy.

398 6. The medical record contains sufficient information to facilitate continuity of care.

399 7. The program reviews its medical records for completeness and accuracy.

Disease-Specific Care Certification Program

Performance Measurement (DSPM)

DSPM.1

400 The program has an organized, comprehensive approach to performance improvement.

Elements of Performance for DSPM.1

401 1. The program leader(s) identifies goals and sets priorities for improvement in a performance
402 improvement plan.

Requirements Specific to Thrombectomy-capable Stroke Center Certification

403 a. The program monitors its ability to administer IV thrombolytic therapy within 60 minutes to
404 eligible patients presenting for stroke care.

405 b. The program will meet its administration of IV thrombolytic therapy within 60 minutes to eligible
406 patients presenting for stroke care at least 50% of the time.

407 c. The program will select a minimum of two relevant patient care data elements related to
408 mechanical thrombectomy to be monitored for internal or external benchmarking each year.

409 Note: The data elements may be chosen from information being monitored and documented in
410 the stroke log. This is an addition to stroke core measures and the monitoring of performance of
411 IV thrombolytic therapy.

412 2. The program leader(s) involves the interdisciplinary team and other practitioners across disciplines
413 and/or settings in performance improvement planning and activities.

Requirements Specific to Thrombectomy-capable Stroke Center Certification

414 a. Stroke performance measures are analyzed by the stroke team and organization's quality
415 department.

416 b. The stroke program has a specified committee that meets a minimum of twice per year to
417 evaluate protocols and practice patterns as indicated.

418 3. The program has a written performance improvement plan.

419 4. The program leader(s) shares the program performance improvement plan with organizational
420 leadership.

421 5. The program collects data related to its target population to identify opportunities for performance
422 improvement.

Requirements Specific to Thrombectomy-capable Stroke Center Certification

423 a. The thrombectomy-capable stroke center has documentation to reflect tracking of performance
424 measures and indicators.

425 b. The thrombectomy-capable stroke center collects data on, at a minimum, the following adverse
426 patient outcomes:

427 - All causes of death within 72 hours of mechanical thrombectomy

428 - Symptomatic intracerebral hemorrhage following mechanical thrombectomy

Disease-Specific Care Certification Program

- 429 6. The program analyzes its performance measurement data to identify opportunities for performance
430 improvement.

Requirements Specific to Thrombectomy-capable Stroke Center Certification

- 431 a. The thrombectomy-capable stroke center evaluates IV thrombolytic therapy data through the
432 quality improvement process and by the stroke team.
433 b. The thrombectomy-capable stroke center demonstrates a 24-hour post-procedure stroke and
434 death rate of less than or equal to one percent for diagnostic catheter angiography.
435 Note: Clinically silent acute lesions detected on diffusion-weighted magnetic resonance imaging
436 (MRI) should not be included as complications.
437 c. The program monitors its IV thrombolytic complications, which include symptomatic
438 intracerebral hemorrhage and serious life-threatening systemic bleeding.
439 Note 1: Symptomatic intracerebral hemorrhage is defined by a completed computed tomography
440 (CT) within 36 hours that shows intracerebral hemorrhage along with a physician's note indicating
441 clinical deterioration due to intracerebral hemorrhage.
442 Note 2: Serious, life-threatening systemic bleeding is defined as bleeding within 36 hours from the
443 administration of IV thrombolytic therapy that required multiple transfusions and was
444 accompanied by a physician's note attributing IV thrombolytic therapy as the reason for multiple
445 transfusions.
446 d. The thrombectomy-capable stroke center program has a multidisciplinary program-level review
447 that will focus on at least the following adverse patient outcomes:
448 - All causes of death within 72 hours of mechanical thrombectomy
449 - Symptomatic intracerebral hemorrhage following mechanical thrombectomy
450 Note: A multidisciplinary program-level review is defined as a review at the program level to
451 assess causes of patient adverse outcomes with the aim of decreasing the incidence of such
452 outcomes.

-
- 453 7. The program documents actions taken to achieve improvement.

Requirements Specific to Thrombectomy-capable Stroke Center Certification

- 454 a. The thrombectomy-capable stroke center has documentation to reflect the specific
455 interventions taken to improve stroke performance measurement data.
456 b. The thrombectomy-capable stroke center has documentation to reflect the implementation and
457 reevaluation of the interventions taken to improve stroke performance measurement data.

-
- 458 8. The program determines if improvements have been achieved and are being sustained.

Requirement Specific to Thrombectomy-capable Stroke Center Certification

- 459 a. The thrombectomy-capable stroke center demonstrates that its interventions have sustained
460 improvements in stroke care.
-

DSPM.2

- 461 The program maintains data quality and integrity.

Elements of Performance for DSPM.2

- 462 1. The program uses standardized data, definitions, and measure specifications in a consistent manner.
463 2. Data collection is timely, accurate, complete, and relevant to the program.
464 3. The program minimizes data bias.
465 4. The program monitors data reliability and validity.
466 5. The program uses sampling methodology based on measurement principles.
467 6. The program uses data analysis tools.

Disease-Specific Care Certification Program

DSPM.3

- 468 The program collects measurement data to evaluate processes and outcomes.
469 Note: Measurement data must be internally trended over time and may be compared to an external data
470 source for comparative purposes.

Elements of Performance for DSPM.3

- 471 1. The program selects valid, reliable performance measures that are relevant to the target population
472 and based on clinical practice guidelines or other evidence-based practice.
473 2. The program collects data related to processes and/or outcomes of care.

Requirements Specific to Thrombectomy-capable Stroke Center Certification

- 474 a. The program utilizes a stroke registry or similar data collection tool to monitor the data and
475 measure outcomes.
476 b. The stroke team log includes at least the following information:
477 - Practitioner response time to acute stroke patients
478 - Door to IV tissue plasminogen activator (tPA) time
479 - Door to time of skin puncture for mechanical thrombectomy
480 - Disposition of patient

- 481 3. The program collects patient satisfaction data relevant to its target population.
482 4. Data are aggregated at the program level.

Requirement Specific to Thrombectomy-capable Stroke Center Certification

- 483 a. The thrombectomy-capable stroke center monitors the percentage of complex stroke patients
484 who were discharged home and received a follow-up phone call by a member of the
485 organization's stroke team within seven days of discharge.

- 486 5. The program reports aggregated data results to The Joint Commission at defined intervals.
487 6. The program communicates to staff and organizational leaders the identified improvement
488 opportunities.

Requirement Specific to Thrombectomy-capable Stroke Center Certification

- 489 a. The thrombectomy-capable stroke center publicly reports outcomes related to interventional
490 procedures, as determined by the organization.

- 491 7. The program incorporates identified improvement opportunities into the performance improvement plan.
492 8. The program demonstrates improvement in processes and patient outcomes.

DSPM.4

- 493 The program collects and analyzes data to determine variance from the clinical practice guidelines.

Elements of Performance for DSPM.4

- 494 1. The program tracks data variances at the patient level.
495 2. The program evaluates variances that affect program performance and outcomes.
496 3. The program uses data analysis to modify performance improvement activities in support of clinical
497 practice guidelines.

Disease-Specific Care Certification Program

DSPM.5

498 The program evaluates patient satisfaction with the quality of care.

Elements of Performance for DSPM.5

- 499 1. The program evaluates patient satisfaction with and perception of quality of care at the program level.
500 2. Patient satisfaction data are utilized for program-specific performance improvement activities.
-

DSPM.6

501 The program has a sentinel event process that includes identifying, reporting, managing, and tracking
502 sentinel events.

Elements of Performance for DSPM.6

- 503 1. A process exists for identifying sentinel events related to the program.
504 2. A process exists for internally tracking sentinel events if and when they occur.
505 3. A process exists for analyzing sentinel events as they relate to program activity.
506 4. The program leader(s) implements changes to the program based on the analysis of sentinel events.



June 7, 2017

TO: EMS/Trauma Committee Members
FROM: BJ Bartleson, VP Nursing & Clinical Services
SUBJECT: ECSI Update and Call to Action

SUMMARY

The Emergency Care Systems Initiative (ECSI) requires letters of support from relevant organizations who would benefit from this program to solicit funding from outside sources. CHA has multiple handouts and materials if you are interested in using them to obtain support letters from your organizations. Attached are: 1) script, 2) letter template, 3) ECSI Stakeholder List 4) ECSI flyer, and, 5) background paper, to assist you in getting organizational support.

The letter informs the potential funder that your organization would benefit from this initiative and supports CHA requesting outside funding to support the work.

ACTION REQUESTED

- Letters of support from each member's association

DISCUSSION

CHA and the regional associations are actively working on the prefunding phase of ECSI. This work entails obtaining stakeholder support through recommendation letters. CHA is looking for both short and long term funding to initiate and fulfill the ECSI mission and vision.

ECSI Vision

California will lead the nation in emergency care services evidenced by unsurpassed emergency medical care, injury prevention, and disaster response, optimizing the health of our communities

ECSI Mission

To advance and accelerate California's emergency care services through a coordinated statewide approach using the public health model as a roadmap for change

ECSI Focus Statement

The Emergency Care Systems Initiative will redefine emergency care by bringing key stakeholders together to develop a roadmap for change.

DISCUSSION QUESTIONS

1. How will my organization be involved and or benefit from ECSI?
2. Who else is not on the list that needs to be included?
3. Are there funding sources we can recommend to CHA?

**Emergency Care Systems Initiative
ECSI External Stakeholder Request for Letters of Support**

April 2017

Funding the Emergency Care Systems Initiative (ECSI) requires letters of support from relevant organizations. CHA and Regional Association staffs, along with regional vice presidents, should reach out to groups that would benefit from this program. In addition to the attached stakeholder list, prospective beneficiaries include:

- Emergency medical services committees
- Local emergency medical services agencies (LEMSAs)
- California Department of Public Health (CDPH)
- Behavioral health groups
- Fire departments
- Ambulance services

When reaching out to stakeholders:

1. Explain ECSI objectives and deliverables and answer questions as needed.
 - PowerPoint slides with more information are available in ECSI Dropbox folder.
2. Describe potential benefits, including:
 - LEMSA , ambulance and fire departments – fewer ambulance patient offload delays
 - CDPH – improved patient safety
 - Behavioral health groups – care for patients in a more appropriate environment
 - County public health departments – care for patients in the right place with a focus on primary care and prevention
 - Payers – improved beneficiary care coordination, efficiency and lower costs
3. Ask how they would like to participate in the consortium.
4. Ask if they would be willing to write a letter of support to submit to funders.
 - If yes, share the attached support letter template.
 - If they cannot write a letter of support without organizational approval, ask if they would be willing to obtain a letter of support through their organization’s formal approval process to accompany the ECSI’s formal grant request.

These efforts should continue until all letters have been submitted to the funding provider. After funding is obtained, CHA and the Regional Associations will convene a stakeholder meeting to begin the process of creating the ECSI consortium.



<< Place on organization letterhead >>

<<Date>>

California Hospital Association
Attn: BJ Bartleson, RN, MS, NEA-BC
1215 K Street, Suite 800
Sacramento, CA 95814

Dear BJ:

<<Insert name of organization>> would like to express our support for the Emergency Care Systems Initiative (ECSI) sponsored by the California Hospital Association, Hospital Council of Northern and Central California, Hospital Association of Southern California and the Hospital Association of San Diego and Imperial Counties. It is critical that we address California's emergency care system through a consensus-driven approach where all stakeholders' perspectives are considered and an effective roadmap for change is developed.

Californians are turning to hospital emergency departments in record numbers, often because they cannot get the care or assistance they need elsewhere. Caring for patients in the appropriate setting can lower costs and improve patients' well-being.

We urge you to fund this initiative so we can engage all stakeholders, identify root causes, align solutions and effect change in a coordinated, data-driven effort.

Sincerely,

STAKEHOLDERS

A. Healthcare

1. Federal

- a. American Hospital Association (AHA)
- b. US Department of Health and Human Services (HHS)
- c. Centers for Medicare and Medicaid (CMS)
- d. American Medical Association (AMA)
- e. American Dental Association (ADA)

2. State

- a. California Department of Health Care Services (DHCS)
- b. California Hospital Association (CHA)
- c. CHA Emergency Services/Trauma Committee
- d. CHA Center for Behavioral Health
- e. CHA Rural Healthcare Center
- f. CHA Center for Post-Acute Care
- g. California Association of Health Plans (CAPH)
- h. California Emergency Nurses Association (ENA)
- i. Association of California Nurse Leaders (ACNL)
- j. California American College of Emergency Physicians (California ACEP)
- k. California Association of Public Hospitals (CAPH)
- l. California Association of Health Facilities (CAHF)
- m. California Children's Hospital Association (CCHA)
- n. State Community Health Center Consortia
- o. California Health Clinics (CPCA)
- p. California Medical Association (CMA)

3. Regional/Local

- a. Hospital Council of Northern and Central California (HC)
- b. Hospital Association of Southern California (HASC)
- c. Hospital Association of San Diego and Imperial Counties (HASIC)
- d. Trauma Hospital(s) Representation
- e. Community Hospital(s) Representation
- f. Rural Hospital(s) Representation

- g. Critical Access Hospital(s) Representation
 - h. Psychiatric Hospitals
 - i. Local Community Health Center Consortia
 - j. County Clinic Consortia
 - k. Local EMS groups
 - l. Local Medical Societies
4. Local LEMSA Directors, Medical Directors
- B. Public Health**
1. Federal
 2. State
 - a. California Department of Public Health (CDPH)
 - b. California Behavioral Healthcare Directors Association (CBHDA)
 - c. California Public Health Association (CPHA)
 - d. California State Association of Counties (CSAC)
 - e. California Welfare Directors Association (CWDA)
 3. Regional/Local
 - a. County Director of Public Health
 - b. County Director of Behavioral Health
 - c. County Director of Social Services
- C. Public Safety**
1. Federal
 2. State
 - a. Emergency Services Authority (EMSA)
 - b. Emergency Medical Services Administrator Association (EMSAAC)
 - c. Emergency Medical Directors Association (EMDAC)
 - d. State Law Enforcement, Police and Sheriff
 - e. California Professional Firefighters
 - f. California Association of Firefighters
 - g. California Fire Chiefs
 - h. California Ambulance Association
 3. Regional/Local
 - a. Local EMS Agency Directors

- b. City and County Fire Chiefs
- c. City and County Law Enforcement, Police and Sheriff
- d. Local Ambulance providers

D. Health Care Consumers

- 1. Federal
 - a. AARP
 - b. NAMI
 - c. Veterans Associations
- 2. State
 - a. NAMI State Chapters
 - b. AARP – California
- 3. Local
 - a. County/Region based chapters of consumer advocate organizations

E. Health Care Payers

- 1. Federal
- 2. State
 - a. California Association of Health Plans
 - b. California Behavioral Health Directors Association (CBHDA)
 - c. California Department of Health Care Services (DHCS)
 - d. Local Health Plans of California (LHPC)
- 3. Local
 - a. CEOs of local initiative Medi-Cal managed care plans

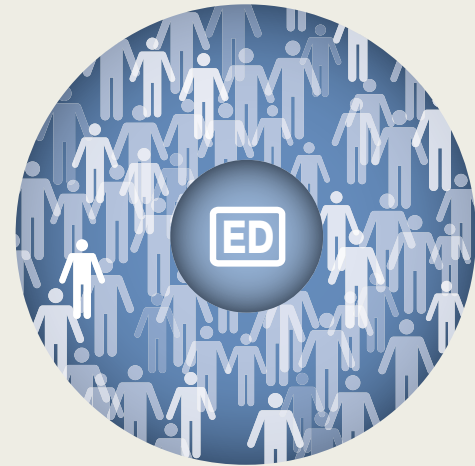
Emergency Care Systems Initiative

Californians are turning to hospital emergency departments in record numbers, often because they cannot get the care or assistance they need elsewhere. These people are in need of help, but many do not need emergency medical treatment.

How do we get people appropriate care and preserve emergency departments for those truly needing life saving care?

It is a daunting question that demands our attention. It is a societal problem that is compromising patient care, increasing health care costs, and crippling hospital emergency services.

The time for action is NOW.



14 Million Visits
were made to California EDs in 2015

What will the Emergency Care Systems Initiative do?

- 1 Convene a Consortium**
All stakeholders must come together. This work will require the support of LEMSAs, hospitals, doctors, ambulance companies, behavioral health providers, police, community partners, post-acute care providers and others. Hospitals cannot and should not try to solve the problem alone.
- 2 Gather Data and Information**
Who is coming to the emergency departments and why? Where are there gaps in services in our communities? How do we connect people to the right care and services? We must get to the root of the problem and gather objective data.
- 3 Find Solutions**
Examining the findings and having input from all stakeholders will lead us to solutions. There won't be an easy answer. We must be innovative and consider new ways of doing things.
- 4 Take Action**
Our conclusions will help us drive policy. Armed with data, and the consensus and support of stakeholders, we can promote changes to improve California's overburdened emergency care system.

Californians Deserve the Right Care, at the Right Time, at the Right Place

Caring for patients in the appropriate setting can lower costs and improve patient well-being. It is the right thing to do for Californians.

Will you join in this work?

The Emergency Care Systems Initiative will require the commitment and participation of providers, thought leaders, advocacy groups, government agencies and others. We invite you to join California's hospital associations in this important work.

Contact:

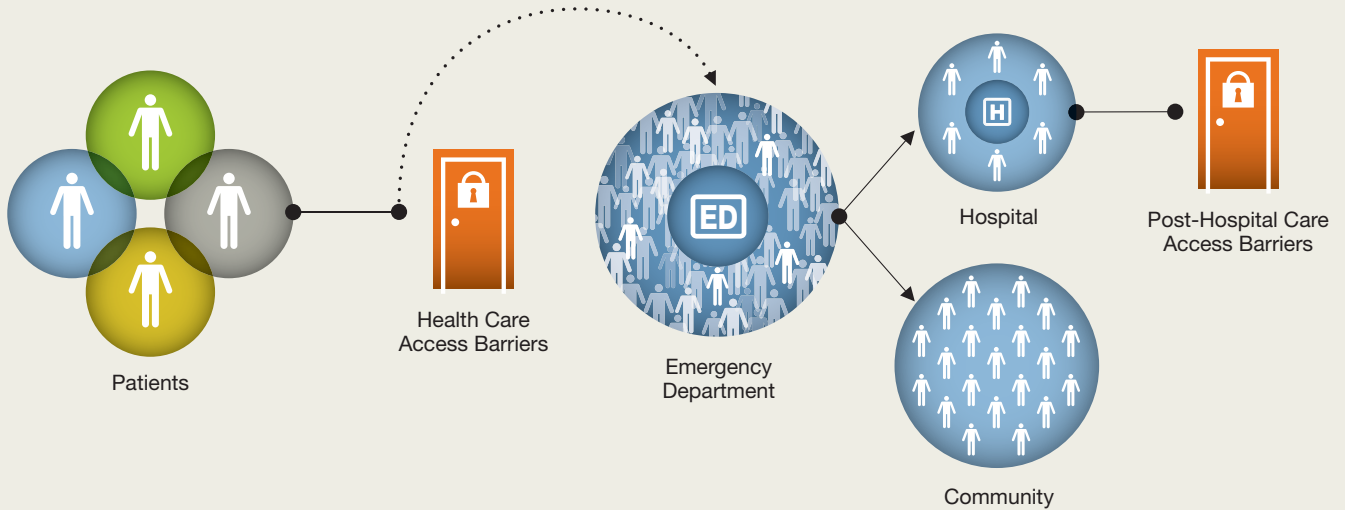
BJ Bartleson, RN, MS, NEA-BC
Vice President, Nursing & Clinical Services
California Hospital Association
(916) 552-7537
bjbartleson@calhospital.org

Representing California's 400 hospitals and health systems and 95 percent of patient beds



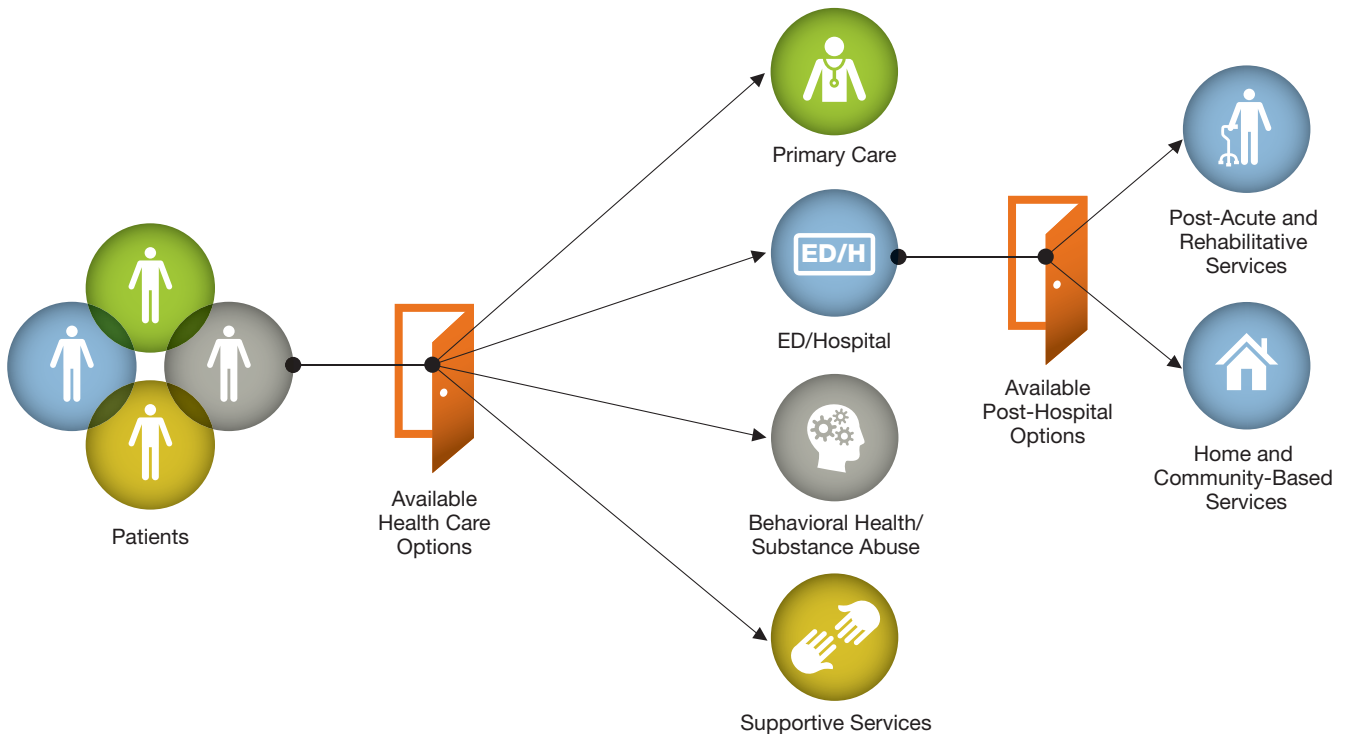
The Problem: Poor access, impacted Emergency Departments

When patients can't get the care they need, they often turn to hospital emergency departments (EDs) as a last resort. However, hospital EDs are not the right place for many patients — particularly for individuals in need of behavioral health or substance abuse treatment. In addition, some patients stay in hospitals longer than necessary due to the lack of available post-acute care and supportive services in the community.



The Solution: Open the door to access

Caring for patients in the appropriate setting can lower costs and improve patients' well-being. Help preserve EDs for those truly needing emergent, life-saving treatment.



Californians deserve the right care, at the right time, at the right place.



Emergency Care Systems Initiative

- **California’s emergency care system is at a breaking point with increasing ED visits and diversion hours.**
- **Demand for ED services is outpacing capacity.**
- **The ECSI will convene a consortium of stakeholders, gather data and information, find solutions and take action.**
- **The solution is to care for patients in the appropriate setting, resulting in lower costs and improved patient well-being.**

Issue

The demand for hospital emergency department (ED) services is outpacing current ED capacity, despite increased beds and innovative programs within and outside hospital EDs. Californians are turning to hospital EDs in record numbers because they cannot get the care they need elsewhere. California EDs have become the last resort for care due to a myriad of access barriers, including insufficient primary care access, and lack of essential mental health and substance use disorder resources, post-acute and rehabilitative services, and home- and community-based services. This places extraordinary demands on hospitals and their EDs, as well as the entire emergency care system, leaving gaps in care delivery and threats to quality and patient safety. Most importantly, it compromises California’s emergency systems core mission — to be prepared at all times for emergent trauma, illness, disaster and mass casualty incidents.

How can Californians access appropriate care, and preserve EDs and our statewide emergency system for those who truly need lifesaving care?

This is both a daunting question that demands our attention and a societal problem that compromises patient care, increases health care costs and overburdens California’s emergency care system.

Position

CHA and the regional associations — the Hospital Council of Northern and Central California, the Hospital Association of Southern California and the Hospital Association of San Diego and Imperial Counties — have created the Emergency Care Systems Initiative (ECSI), which will work to alleviate emergency system pressures and ED crowding with a roadmap for change. Solving systemic and site-specific problems requires setting ambitious goals within an organized framework that will engage stakeholders, identify root causes, and align solutions and change in a coordinated, data-driven effort. Systemic changes can relieve ED crowding as evidenced by Washington state’s “ER is for Emergencies”¹ statewide collaborative, which in one year effectively decreased overall ED visits by 9 percent, reduced frequent ED user visits by 10 percent, decreased the rate of narcotic drugs prescribed by 34 percent and saved an estimated \$33 million.

¹ www.wsha.org/quality-safety/projects/er-is-for-emergencies

Emergency Care Systems Initiative

- **California's emergency care system is at a breaking point with increasing ED visits and diversion hours.**
- **Demand for ED services is outpacing capacity.**
- **The ECSI will convene a consortium of stakeholders, gather data and information, find solutions and take action.**
- **The solution is to care for patients in the appropriate setting, resulting in lower costs and improved patient well-being.**

The ECSI will produce:

- California Emergency Care Systems Report Card
- Consensus document on the state of California's emergency care systems, including a stakeholder agreement on the definition of future emergency care services
- Emergency services metrics for access, quality, safety, prevention, trauma, disaster preparedness and costs
- Toolkit of solutions and best practices to be used at the local, regional and statewide level along with a regional emergency care systems networking site for continued monitoring and performance improvement activities
- Public and provider websites to inform stakeholders of activity
- Strategic advocacy plan with policy recommendations for local, regional, state and federal policymakers

To accomplish this, ECSI will:

- Convene a consortium of stakeholders representing health care, public safety, public health, consumers, payers and government agencies
- Gather data and information to connect citizens to the right care at the right place at the right time
- Find solutions through stakeholder consensus and objective data
- Take action to drive policy and advocacy. Armed with data and stakeholder consensus, we can promote changes to improve California's overburdened emergency care system.

Analysis

Since 2011, California's ED encounters have increased by 15 percent to more than 14 million visits in 2015. Despite a 10 percent increase in ED bed capacity, many urban EDs are stressed by the demand. While ED inpatient admissions remain flat, the biggest cohort of ED patient visits is those that do not result in inpatient admissions. ED crowding is evidenced by a 20 percent spike in patients who left without being seen and ED diversion hours that rose by 15 percent since 2011. Also, statewide ambulance patient offload delay hours are increasing in many urban areas due to hospital ED boarding (patients awaiting inpatient bed placement), inaccessible behavioral health care and lack of accessible care in the community. One million ED visits annually or 1,000 patients each day across the state are behavioral health ED visits that require prolonged ED lengths of stay — sometimes hours to weeks — due to limited statewide behavioral health services.

Many innovative efforts are being implemented to mitigate ED crowding issues. However, these solutions will not fix the root cause of the problem. The answer is to objectively define the barriers and misaligned incentives embedded in our care delivery system and create collective solutions across the health care continuum so that patients obtain care in the appropriate setting from the right provider at the right time. Solving these problems will decrease ED crowding, lower health care costs, improve provider and patient satisfaction, and promote an optimally healthy California.

Contact:

BJ Bartleson
CHA vice president,
nursing and clinical services

(916) 552-7537 or
BJbartleson@calhospital.org



Protecting San Francisco Emergency Services

Diagnosing and Addressing the Challenges of San Francisco's EDs







Executive Summary (1/2)

- San Francisco's emergency rooms are a vital and scarce resource – organized, staffed and designed to provide core emergency services
- This resource is under strain – at any given time, at least one emergency department (and often two or more) is unable to accept patients and is forced to divert them to another facility
- Multiple efforts are underway across the public and private sector to add more capacity and create programs and alternative destinations
- Moving forward will require a coordination of efforts to grow the system capacity sustainably while addressing the root drivers of demand for the emergency services
- This report recommends the Hospital Council do the following:
 - **CONTINUE** to support/promote lower-acuity settings that serve substance abuse-related as well as psychiatric needs (i.e. Sobering Center, Dore Urgent Care Center)
 - **CATALYZE** the creation of additional lower-acuity behavioral/mental health capacity necessary to alleviate the strain on the ED while ensuring high-quality care in an appropriate setting
 - As a first step towards this objective, **ESTABLISH** a Behavioral Health ED Task Force whose charter is to evaluate how much and what type of additional lower-acuity capacity serving substance abuse-related and psychiatric conditions is needed in the city, where it should be located, and how it should be funded. The task force should make its recommendations to the Council by April 2017
 - **EMPOWER** the Local Emergency Management Agency to triage and transport patients in a way that optimizes care continuity and capacity
 - **DIRECT** the Post-Acute Care Collaborative to focus on programs that will speed the discharge and transition of patients ready to move to a post-acute care site
 - **INFORM** key stakeholders on the Report findings

Executive Summary (2/2)

- This document provides a detailed analysis of the current ED utilization and diversion, a range of national case studies and a comprehensive set of recommendations for the Council
- Supporting the recommendations, the report notes that despite efforts by the hospitals, City, and health plans—e.g., increasing capacity, providing alternate care settings, and utilizing telemedicine—the demand for services continues to outpace supply because:
 - **Strained public resources:** Public resources are challenged outside the control of hospitals, including a shortage of affordable housing, transportation, addiction treatment, as well as unsustainably low reimbursement levels. For example, Medi-Cal reimburses the physician as little as \$23 for some primary care visits – making many physicians reluctant to accept Medi-Cal
 - **Insufficient Mental Health Resources:** An increasing number of people are involuntarily detained in the emergency room, with each of these “5150” detentions lasting as long as 72 hours. For voluntary patients, appropriately specialized emergent, urgent, and community based sites have been created but are operating at capacity
 - **Insufficient Post-Acute Capacity:** Shortage of post-acute beds create a “backflow” of patients: inpatient beds remain occupied and the ED must board patients that need to be admitted
 - **Limited Use of Alternatives:** Although options such as urgent care centers, community clinics, telemedicine and nurse lines are becoming increasingly available, their adoption is still limited
 - **Limited Flexibility of Ambulance Routing:** The routing of patients does not always maximize the continuity of care or capacity utilization

Emergency rooms are a vital resource, particularly for the most vulnerable

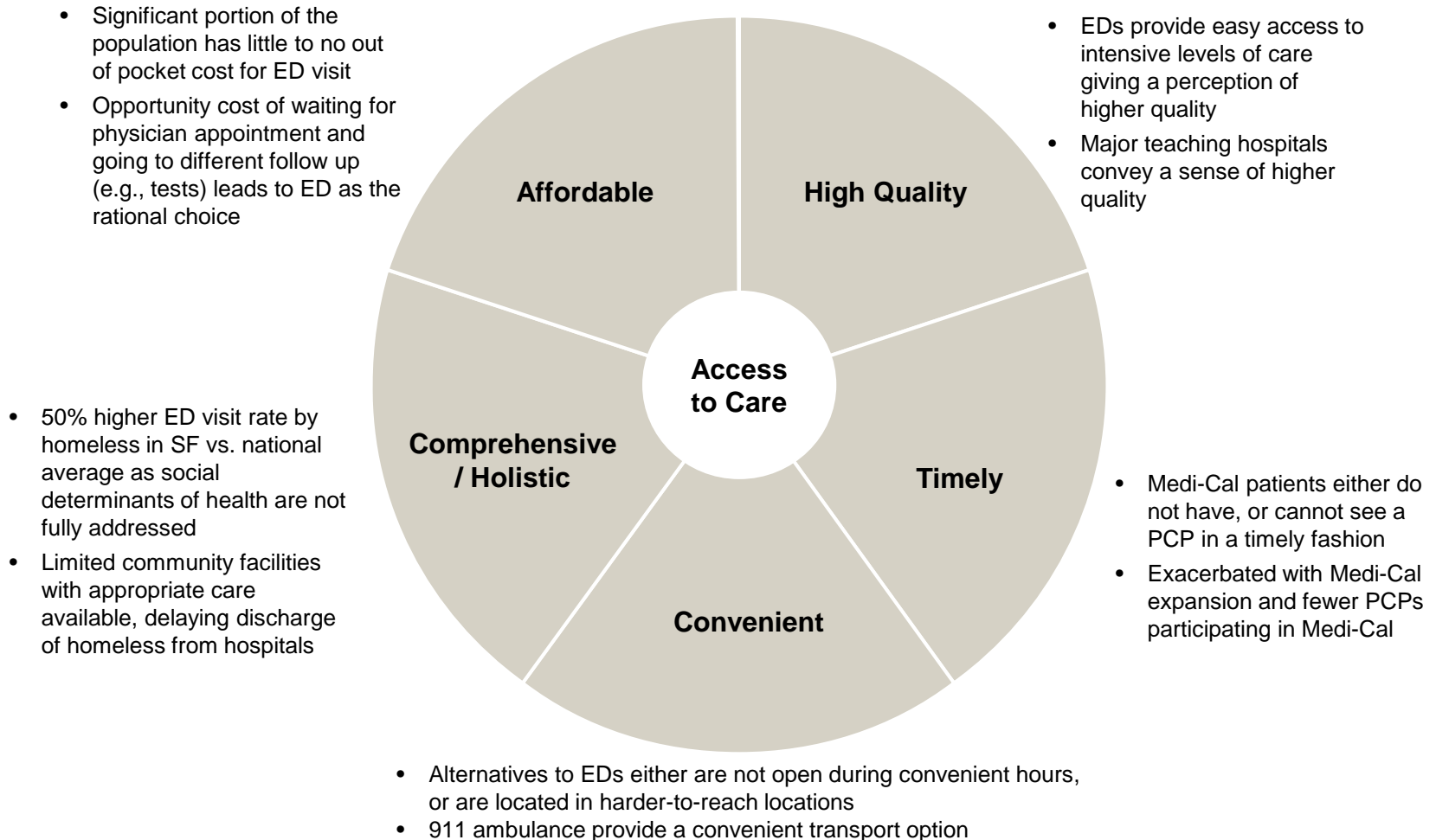
Patient “Personas”	Diego Insured by employer	Margaret Medi-Cal Enrollee	Jinn Li Medicare Enrollee	Harry Homeless, Addiction Issue	Sam Struggling with mental illness	Sofia Infant <1 year old
						
Reason for Visit	Injuries	Pre-existing, previously undiagnosed or unmanaged illness	Multiple chronic illnesses, likely to result in being admitted	Untreated conditions, multiple non- clinical needs	Behavioral disorders with frequent flare-ups	Early childhood infections and complications
Annual Visits For Every 100 Visits	Every 7 years 28 visits (~10 for injuries)	Every other year 26 visits	Every other year 21 visits	Twice a year 8 visits	N/A 7 visits	Every other year 2 visits
For Every 100 Hours	<28 hours	< 24 hours	< 27 hours	< 13 hours	< 19 hours	< 2 hours

Focus of recommendations

- 1) Based on 2014 OSHPD ED usage data; homeless ED visit count from on CCMS homeless urgent/emergent services user data for FY14-15; mental illness count from Budget and Legislative Analyst Policy Analysis Report for Jail and Mental Health, 05/25/2016, retrieved from sfbos.org
- 2) Homeless counts based on CCMS urgent/emergent services user data; Medi-Cal counts exclude homeless with Medi-Cal, which are included in homeless category
- 3) OSHPD Encounter Data, and enrollment data from CA DHCS website http://www.dhcs.ca.gov/dataandstats/statistics/Pages/RASD_Enrollment_by_Geographic_Region.aspx
- 4) Mental health counts from Policy Analysis Report for Jail and Mental Health, 05/25/2016, retrieved from sfbos.org; share of visits for other personas adjusted assuming equal distribution in private, Medi-Cal and Medicare and homeless to avoid duplicate counts
- 5) Share of ED capacity calculated as share of total LoS based on 268000 visits and average LoS of 300 minutes (ZSFGH average LoS used as proxy for SF average LoS)
- 6) Image credit for Infant <1 year old: "FreeImages.com/Anissa Thompson", Retrieved from <http://www.freeimages.com/photo/family-closeness-2-1438590>

For many San Franciscans, emergency services represent the best available care destination

Need for ED alternatives that are...

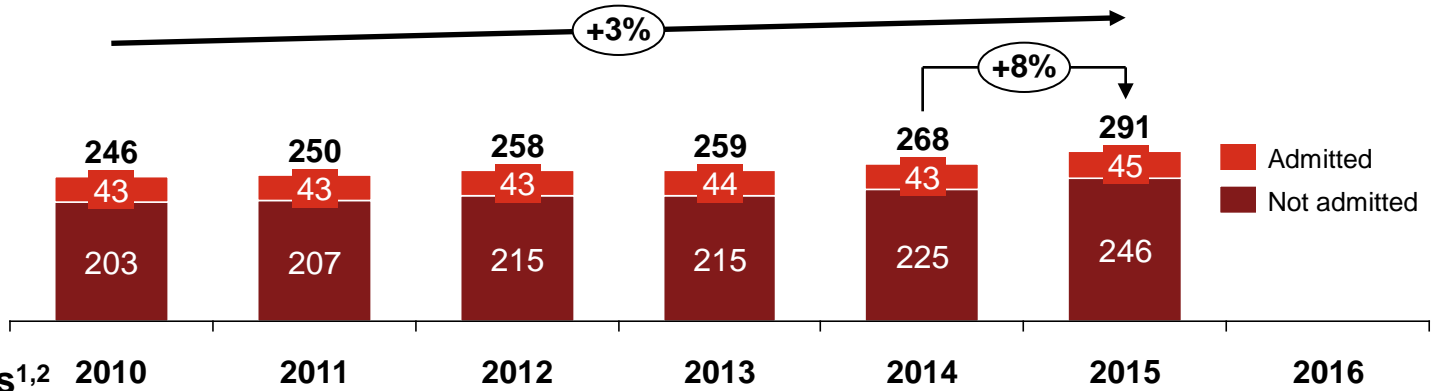


The city's hospitals are adding more emergent care capacity but demand for services continues to outpace supply

SF Yearly ED

Visits

(Thousands)^{1,2}



Total

ED Stations^{1,2}

	2010	2011	2012	2013	2014	2015	2016
Total Addition	NA	2 (CPMC - Davies)	13 (St. Mary's)	4 (UCSF)	-	19 (UCSF – Mission Bay) ³	34 (ZSFGH)
Total Reduction	NA	12 (St. Mary's)	-	-	-	4 (UCSF – Parnassus)	
Total	157	147	160	164	164	179	213

Discussion

- The growth in ED visits has outpaced the 1% annual population growth rate in San Francisco, with a substantial bump from 2014-15 driven primarily by Medi-Cal patients
- Most of the growth in ED visits came from non-admitted patients, suggesting an increasing number of lower-acuity visits that may not need treatment in an emergency room setting
- Recently added ED stations at UCSF and ZSFGH may provide some relief but the changes are too recent to quantify their impact

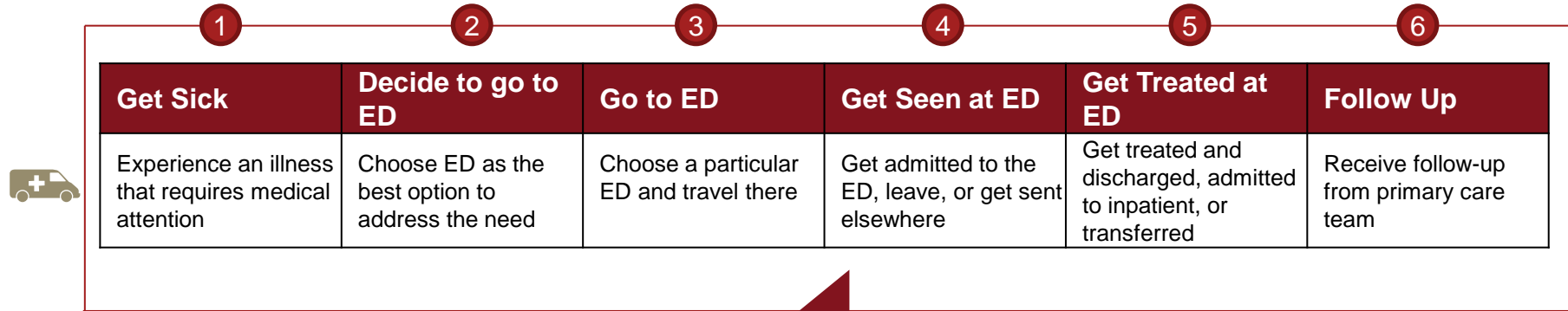
1) Total number overstates the capacity currently in use – the number of staffed beds is lower. Source: OSHPD ED visit data from 2010 to 2015; <http://oshpd.ca.gov/HID/Find-ED-Data.html>

2) Admitted counts are for in-patient admissions from ED in the same hospital, non-admitted counts include transfers to other hospitals

3) When UCSF added 19 pediatric ED stations in Mission Bay in 2015, they removed 4 pediatric ED stations from Parnassus campus, which were added in 2013

Breakdowns occur throughout the “patient journey”

Patient Journey

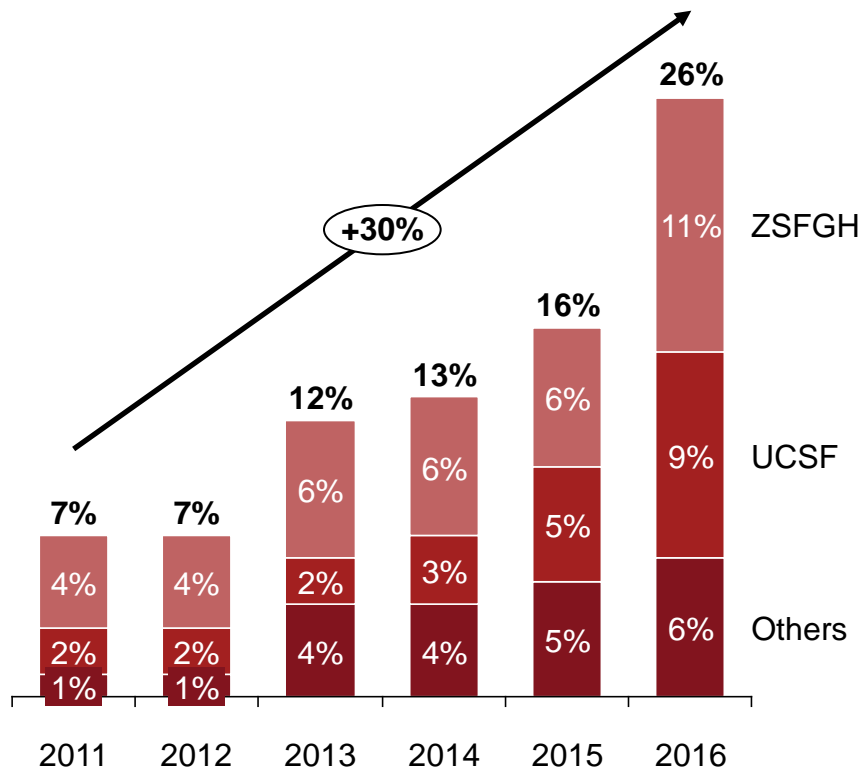


Systemic and Structural Issues

<p>10% of ED visits may be preventable through more proactive primary, chronic and mental health, and addressing social determinants of health</p> <p><i>“Primary care is not very accessible, leaving patient health unmanaged until they need to use the ED”</i></p>	<p>40% of ED visits may be avoidable if an appropriate, convenient, affordable alternative is offered</p> <p><i>“Segments of population are just comfortable getting all care at an ED”</i></p>	<p>Diversion (city average 26%), awareness of options, and transport availability may prevent optimal ED selection</p> <p><i>“It is common for multiple hospitals to be on diversion”</i></p>	<p>High occupancy in the ED may produce long wait times (30 min average)</p> <p><i>“Boarding is common in the ED due to delay in discharge to post-acute or in-patient bed unavailability”</i></p>	<p>Lack of availability of inpatient (ZSFGH at 97%) or post-acute capacity can increase time in the ED</p> <p><i>“We do not have enough psych capacity in the city to move patients out of the ED”</i></p>	<p>Lack of follow-up can result in readmission</p> <p><i>“For many Medi-Cal patients, we do not have the information to contact their PCP post-discharge”</i></p>
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The resulting overcrowding increasingly forces emergency rooms to “divert” patients to another facility

SF ED Diversion Rate Weighted by ED Capacity at Hospitals with Diversion^{1,2,3}



Discussion

- Diversion in San Francisco is a growing problem
 - ZFSGH has had historically high diversion rates compared to the rest of San Francisco and its rates have recently grown at an unprecedented pace
 - Other hospitals such as UCSF have seen dramatic increases as well since the introduction of the ACA and its Medi-Cal expansion
- The reason for the diversion is fundamentally a mismatch of demand and supply
 - At ZSFGH, the 95% - 99% occupancy rate of inpatient beds and temporary challenges from the move to their new facility likely contributed^{3,4}
 - Shortage of post-acute beds, create a “backflow” resulting in inpatient beds remaining occupied longer, leading to boarding in the ED and diversions across the SF hospitals
 - Increases in low-acuity visits due to Medi-Cal have likely been concentrated at ZSFGH and UCSF
- High diversion rate affects continuity of care for patients, creates logistical challenges for EMS transport, strains hospital operations, and leaves the city with less spare capacity in the event of a large-scale emergency

1) Diversion data obtained from SF DEM office, ZSFGH diversion data is adjusted to include trauma override hours, 2016 hours are from January to July

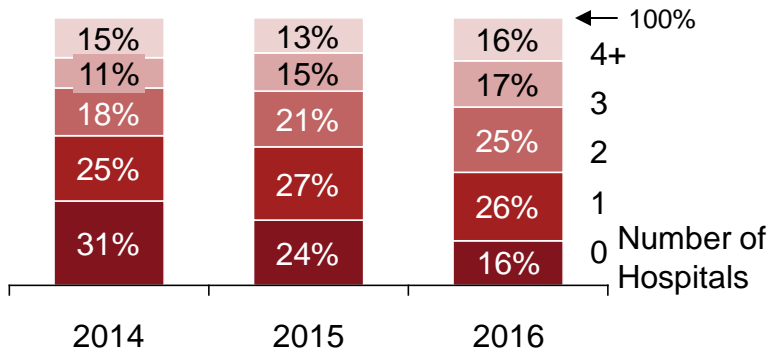
2) Diversion rate calculated from hours spent on diversion divided by total number of hours of operation and then adjusted for weights based on number of ED stations available

3) ZSFGH addition of new ED stations in May 2016 calculated for partial year

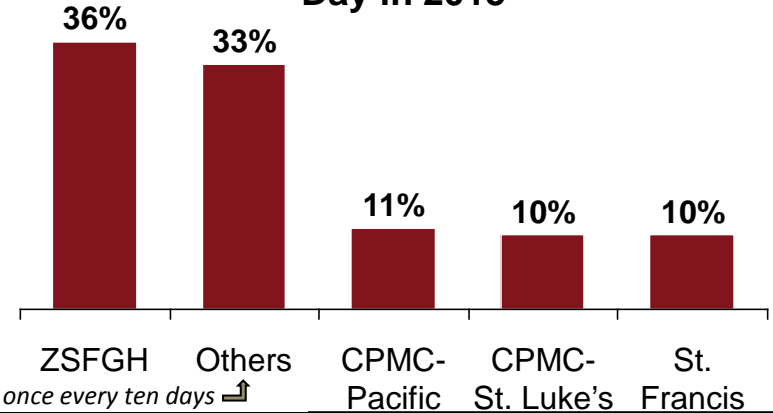
4) 2016 ZSFGH occupancy rate from SF City Performance Cards; <http://sfgov.org/scorecards/zsfg-occupancy-rate>

Consequently, at any given time, at least one hospital (and often two or more) is unable to accept patients

Percentage of Time when Multiple Hospitals are Simultaneously on Diversion¹



First Hospital to Activate Diversion on any Day in 2015¹



Hospitals that are first to go on diversion less frequently than once every ten days ↗

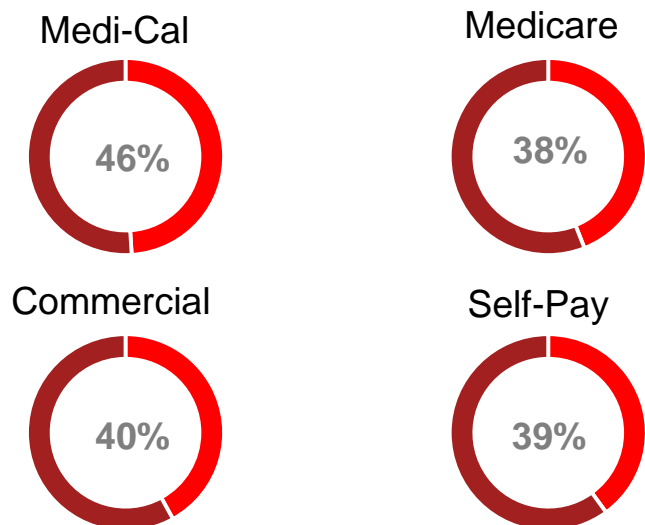
Discussion

- Diversion not just a single-hospital issue; in fact, more than half of the time, two or more hospitals are on diversion simultaneously
 - While ZSFGH is often the first to go on diversion, CPMC – Pacific, CPMC – St. Luke's, and St. Francis Memorial have also been first to go on diversion a significant proportion of the time¹
 - More hospitals going on diversion simultaneously may indicate some credence to the domino effect of diversion among hospitals, but generally the high rate of diversion seems to be driven by the increasing rate of ED visits and challenges in finding in-patient or post-acute discharge options for patients
- Overall, the data suggest that this is a systemic issue of insufficient supply across all hospitals meeting seemingly insatiable demand for ED services
 - Challenges in finding in-patient or post-acute discharge options for patients
 - Multiple "5150" patients occupying stations at smaller EDs for up to 24 hours
 - Medi-Cal beneficiaries using the ED as way to conveniently address primary care needs

1) Source: Diversion data provided by SF DEM

Emergency services often stand in to fill gaps in the continuum of care, such as lack of access to primary care

Potentially Avoidable ED visits¹



Physician Access Challenges²

Plan	CAHPS Survey Rating	
	Getting needed care (Access)	Getting care quickly (Timeliness)
SF Health Plan	Below 25 th percentile (1 star)	Below 25 th percentile (1 star)
Anthem Blue Cross Partnership - SF	Below 25 th percentile (1 star)	Below 25 th percentile (1 star)

Physician participation in Medi-Cal across California has dropped from 69% to 63% between 2013 and 2015³

Only 50% of Bay Area PCPs and 64% of Bay Area specialists are accepting new Medi-Cal patients⁴

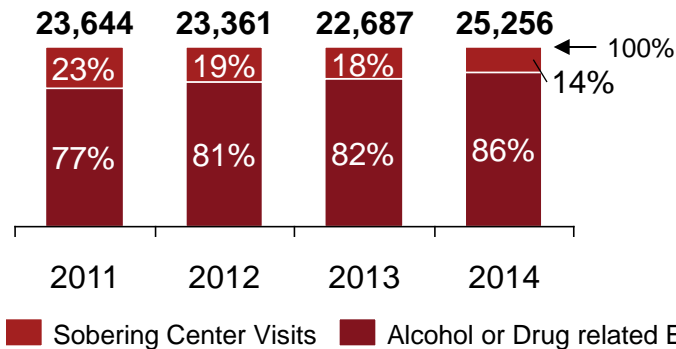
Discussion

- Previously uninsured patients, who became eligible for Medi-Cal in 2014, may be used to receiving care at ED and may benefit from greater awareness of alternative options
- Limited access and long wait times for primary care may be driving Medi-Cal patients to keep seeking care at Emergency Departments for non-emergency and low acuity conditions
- A significant portion of new Medi-Cal enrollees are low income working adults, who are unable to visit a physician during work hours

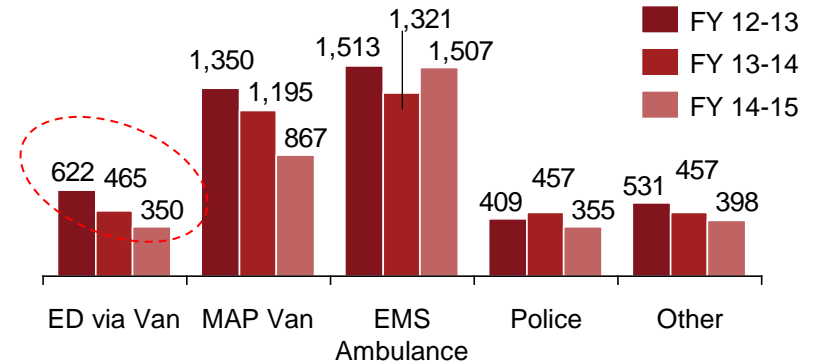
1) Potentially Avoidable visits defined as non-emergent, emergent-PCP treatable and ED care needed-preventable visits from 2010- 2014 ED encounters classified using NYU ED Algorithm 2) CAHPS survey report for SF Medi-Cal Health Plans; <http://www.dhcs.ca.gov/dataandstats/reports/Pages/MMCDQualPerfMsrRpts.aspx>
 3) CHCF.org ACA411 project; <http://www.chcf.org/aca-411> 4) Report: "Physician Participation in Medi-Cal is not keeping pace with growth in enrollment", Janet Coffman, 08/04/16

Compounding the issue are social challenges outside of the direct control of hospitals, such as substance abuse

Alcohol-/Drug-Related Visits between ED and Sobering Center^{1,2}



Sobering Center Arrivals²



Discussion

- Up to 10% of ED visits are drug and alcohol related, a portion of which could be handled at the sobering center to help relieve ED crowding
- Sobering center provides an effective alternative to ED for inebriated patients, helping to reduce 3,500 to 4,000 ED visits annually (~1%-2%), but even as alcohol related ED visits have increased, its overall use as well as incoming patients transferred from ED have declined
- Sobering center can be made more effective by providing a faster transport solution for redirected patients from ED, co-locating the sobering center with shelter and detox clinics, and providing case management services for continuation of care for the patients
- Proposed EMS policy change to stop taking patients to sobering center will put additional load on EDs and have undesirable outcomes on overall ED utilization and performance

1) OSHPD Public Use Files for ED encounters from 2010 to 2014

2) San Francisco Sobering Center, Annual Report, 2012 - 2015

Gaps in mental health care place a large burden on Psychiatric Emergency Services (PES) at ZSFGH

Interview comments by hospital staff while discussing psych emergencies and “5150” holds¹

“Ambulance traffic has gone up in recent years”

“In-patient psych beds are limited, resulting in longer patient stays in ER”

“ZSFGH has the only psych ER and it is frequently in overcrowded status”

“Going on divert is the only way we can keep patients from bringing in more 5150s”

Discussion

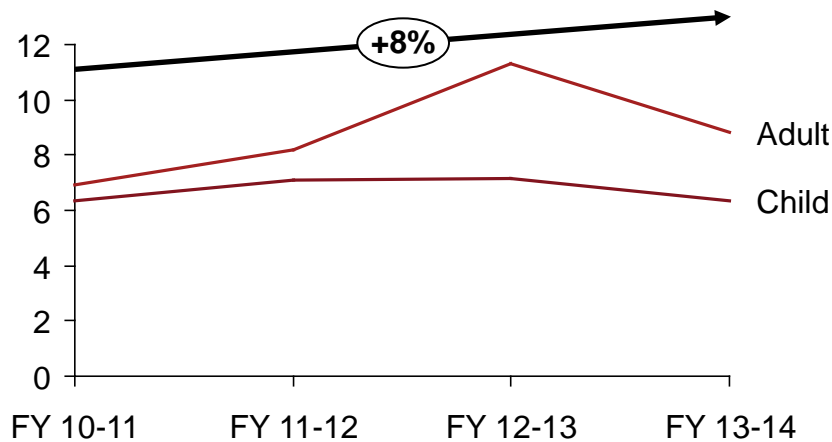
- Limited availability of psych beds for “5150” patients in the city, with ZSFGH PES being the only psych emergency facility, is putting stress on the system
- The city has seen a 27% rise in “5150” holds from FY10-11 to FY 13-14, while the PES capacity has not increased
- PES was on condition red for over quarter of hours in 2016 (January to August)²
- More dedicated facilities like PES are needed in the city to stabilize and manage “5150” hold patients
- Laura’s Law went into effect late last year and should help with ensuring that mental health patients get court ordered outpatient treatment, but its impact remains to be seen

1) Comments from hospital staff interviews conducted as part of this study

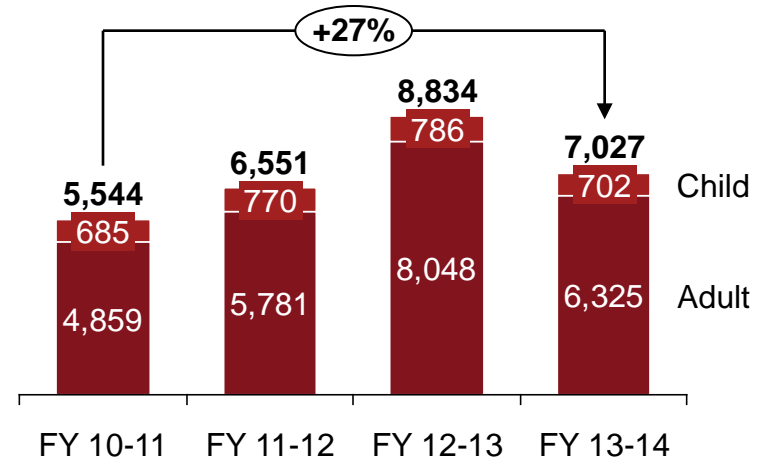
2) Data provided by ZSFGH PES

Of particular concern are so-called “5150” patients, who may be held for up to 72 hrs.

“5150” detentions per 1,000 population¹



“5150” detentions count¹



Discussion

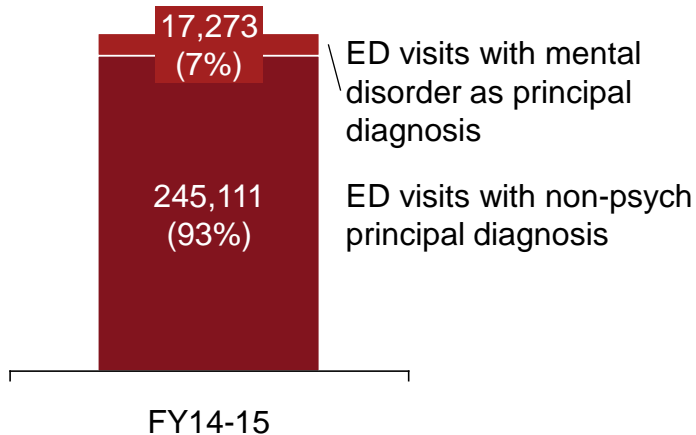
- Even after a small drop between FY 12-13 and FY 13-14, the total number of “5150” involuntary detentions for mental disorders are significantly higher than a few years ago, putting stress on the city’s Psychiatric Emergency Services and EDs
- Each “5150” hold can last up to 72 hours, keeping the ED station occupied and unavailable to other patients
- Assuming an average stay of 19 hours, “5150” involuntary holds would have taken up ED station time equivalent to 10% of ED capacity in 2014; if PES treated half of these patients, the remaining would still use ~5% of ED capacity²
- Higher rate of involuntary detention, especially among adults, is possibly indicative of gaps in access to mental health resources

1) Involuntary detention statistics: <http://www.dhcs.ca.gov/services/MH/Pages/InvoluntaryDetention-MH.aspx>

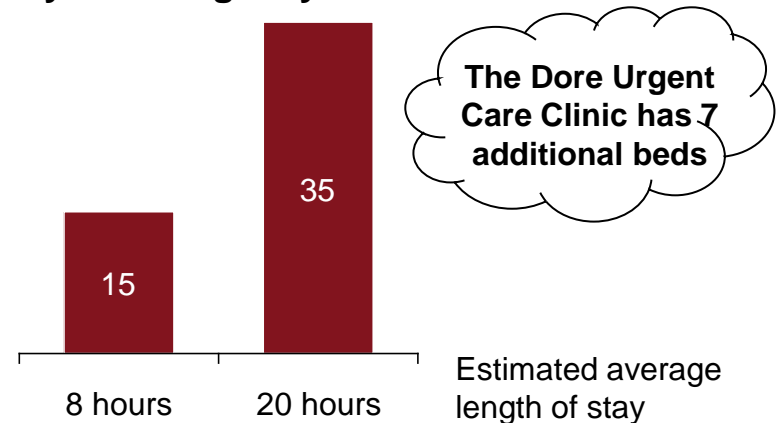
2) Calculations based on 268,000 ED visits in 2014 from OSHPD data and using 300 min average length of stay based data provided by ZSFGH

While appropriate specialized sites to handle urgent and emergent psychiatric needs exist, they are also over capacity

Psych Related ED visits¹



Estimated Range of Capacity Gap in Psych Emergency Beds²



Discussion

- Almost 7% of patients in SF EDs are psych patients, whose needs can be provided for in a more efficient manner in a psychiatric emergency unit but end up staying for exceedingly long periods in ED for lack of alternatives
- PES has 18 beds¹, and had 7,700 patients³ in 2015 with an average length of stay of 19 hours³, which would imply ~93% utilization in ideal conditions with even distribution of patient arrival
- The high utilization rate coupled with unpredictable arrival rate of patients in real world conditions frequently puts PES at capacity, and unable to accept patients from EDs

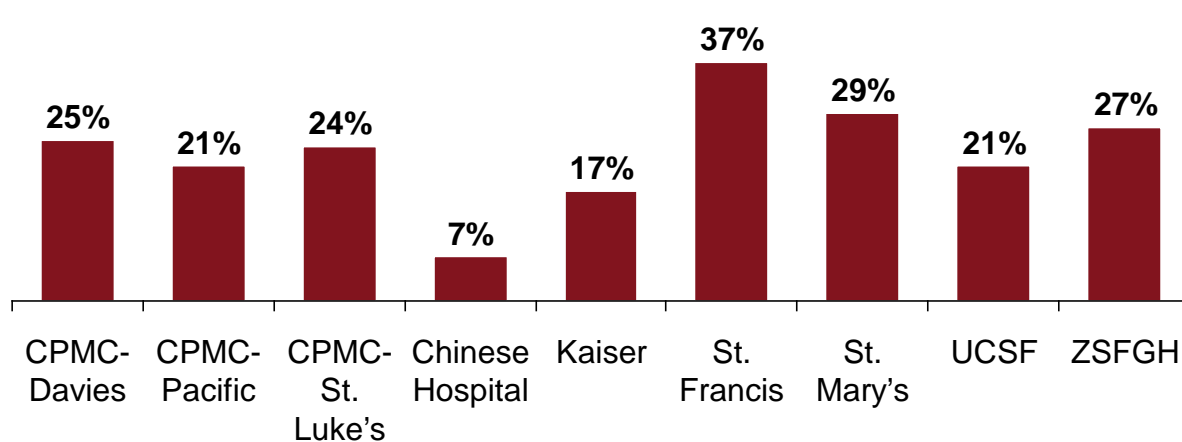
1) Data from Budget and Legislative Analyst Policy Analysis Report for Jail and Mental Health, 05/25/2016, retrieved from sfbos.org

2) Estimate based on 80% utilization of beds and average length of stay ranging from 8 hours to 20 hours, and assuming that 50% (~3,800) of 7,700 PES patients were transferred from EDs and remaining 50% were direct arrivals at PES, that would still leave 13,000 (of the total ~17,000) psych patients arriving at ED

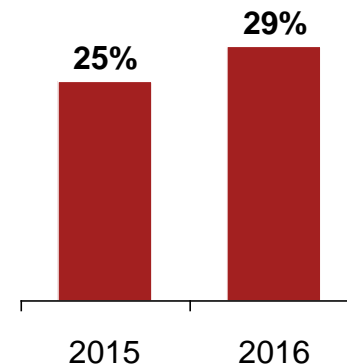
3) PES data provided by ZSFGH; possible duplication between PES encounters and psych ED visits if patient was transferred from ED to PES

More patients are now being brought to ED by ambulances than before

Percentage of ED Patients Arriving by Ambulance in 2015¹



Percentage of ED Patients Arriving by Ambulance^{1,2}



Discussion

- Analysis and interviews indicate that the number of ED patients arriving via ambulance is increasing – while the number of patients admitted from the ED is not – suggesting that ambulances may be bringing in a larger number of lower-acuity patients
- Interviews also indicate that suboptimal ambulance routing occurs - for example, with patients undergoing treatment at one hospital being brought to an emergency room of another, without any accompanying records
- Experience from other communities such as Colorado and Washington indicates that greater empowerment of the emergency services, along with better data sharing, can improve routing, care continuity and capacity utilization

1) Ambulance transport counts from SF DEM, ED visits count for 2015 from OSHP, 2016 full year ambulance transport count extrapolated from 58,158 transports completed in first 8 months, 2016 ED visits extrapolated based on 3% CAGR and 291,000 visits in 2015

2) St. Luke's ambulance transport patient percentage is 42% in 2016, ZSFGH's ambulance transport patient percentage is 25% in 2016, based on data provided by respective hospitals

Multiple programs are already underway in the city

Illustrative Examples of Programs Underway

Hospital Programs	SF City/County Programs	Health Plan Programs
<ul style="list-style-type: none">• Increased ED bed capacity• Colocation of urgent care center with EDs• Pediatric after hours nurse advice line• Streamlined ED Flow and fast tracking in EDs• Appointment scheduling assistance for primary care• Urgent care clinic partnership• Tenderloin HIP	<ul style="list-style-type: none">• Sobering Center• Respite Center• Whole person care grant application• Dore Urgent Care Center• Laura's Law (Assisted Outpatient Treatment)• High utilizer tracking/ HUMS management• EMS-6 project for paramedic triage	<ul style="list-style-type: none">• SF Health Plan - Telemedicine Pilot• SF Health Plan - Electronic Data Interchange (EDI)• Blue Shield of California – Telemedicine• United Health Group provides nurse line for consultation and mobile app to search for urgent care centers• Kaiser Permanente provides easy access to onsite urgent care center located close to the ED



These efforts may not be sufficient with demand continuing to outpace supply as SF can expect ~305,000 to ~340,000 ED visits by 2020 with the current growth rates, but they are a step in the right direction and will provide some assistance in balancing the demand and supply equation for ED services.

Solving the demand-supply challenge requires a sustained effort, supported by broader community engagement

Next Steps



Drive a Policy Agenda

- Continue to support/promote lower-acuity settings that serve substance abuse-related as well as psychiatric needs (i.e. Sobering Center, Dore Clinic)
- Empower the Local Emergency Management Agency to triage and transport patients in a way that optimizes care continuity and capacity
- Direct the Post-Acute Care Collaborative to focus on programs that will speed the discharge and transition of patients ready for post-acute care
- Support high utilizer case management, increased availability of alternatives to ED, and consumer education



Launch a Behavioral Health ED Task Force

- Create a cross-functional task force with representation from the City, behavioral health and public health leaders as well as ED physicians and operators
- Working under the auspices of the Council, the task force will identify the type, quantity, location and funding of additional behavioral and mental health capacity needed to relieve the strain on the EDs
- The task force is to make a recommendation to the Council on the available options and their relative merits – and to lead the detail design of the selected option

The Behavioral Health ED Task Force will identify the additional capacity needed to relieve the strain on the ED

Charter for the ED Task Force

Objective	<ul style="list-style-type: none"> • Under the auspices of the Hospital Council, identify the type, quantity, location and funding of additional behavioral and mental health capacity needed to relieve the strain on the EDs 		
Major Functions	<ul style="list-style-type: none"> • Set priorities, guiding principles and boundary conditions • Document existing capacity and capacity utilization in the city • Document the relevant rules and regulations • Lay out the full range of options in terms of capacity type and location • Document the current capacity, staffing and beds • Evaluate the relative benefits of each option in terms of impact on quality, experience, and ED utilization • Discuss reimbursement/financing options and perform cost/benefit analysis • Refine the options and align on the preferred option to be recommended to the Council • Test recommendation with external stakeholders • Enhance recommendations with case studies from other markets • Make the recommendation to the Council by April • Based on the Council decisions, revise and refine the recommendation by creating a financial model, an implementation roadmap, and governance recommendations 		
Members	<ul style="list-style-type: none"> • ED physician leaders • ED operations leaders 	<ul style="list-style-type: none"> • Behavioral, mental and public health experts 	<ul style="list-style-type: none"> • Representatives from relevant public sector bodies in advisory capacity
Operations	<ul style="list-style-type: none"> • Regular recurring meetings hosted at member facilities • Report-outs 		
Guiding Principles	<ul style="list-style-type: none"> • Use evidence-based and result oriented approach • Foster the spirit of sharing and collaboration 	<ul style="list-style-type: none"> • Seek buy-in from all members • Act in the best interest of community 	

BEHAVIORAL HEALTH EMERGENCY DEPARTMENT TASK FORCE

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EDIE (aka PreManage ED)

Eliminate avoidable risk.

“This is exactly the solution we’ve been waiting ten years for; I knew someone would come along and do this!”

*Ben Zaniello MD MPH
Chief Medical Officer
Vice President, Product
baz@collectivemedicaltech.com*

–Rod Hochman
CEO, Providence St. Joseph Health

*Gabe Waters
Vice President, Network Development
gabe.waters@collectivemedicaltech.com*



Discussion Topics

Collective Medical Overview

EDIE

“[EDIE] helps to form the network and connection with all of the area’s other hospitals that we did not have access to before. Improves case management throughout the whole continuum of care (hospitals, PCP, insurance) for patients, that beforehand was not being managed.”

– ED Social Worker, Adventist

Our Mission

Eliminate avoidable risk.

CMT's definition of risk: medically-unnecessary...

- (Re)Admissions
- Length of stay
- Patient work-ups

The Problem

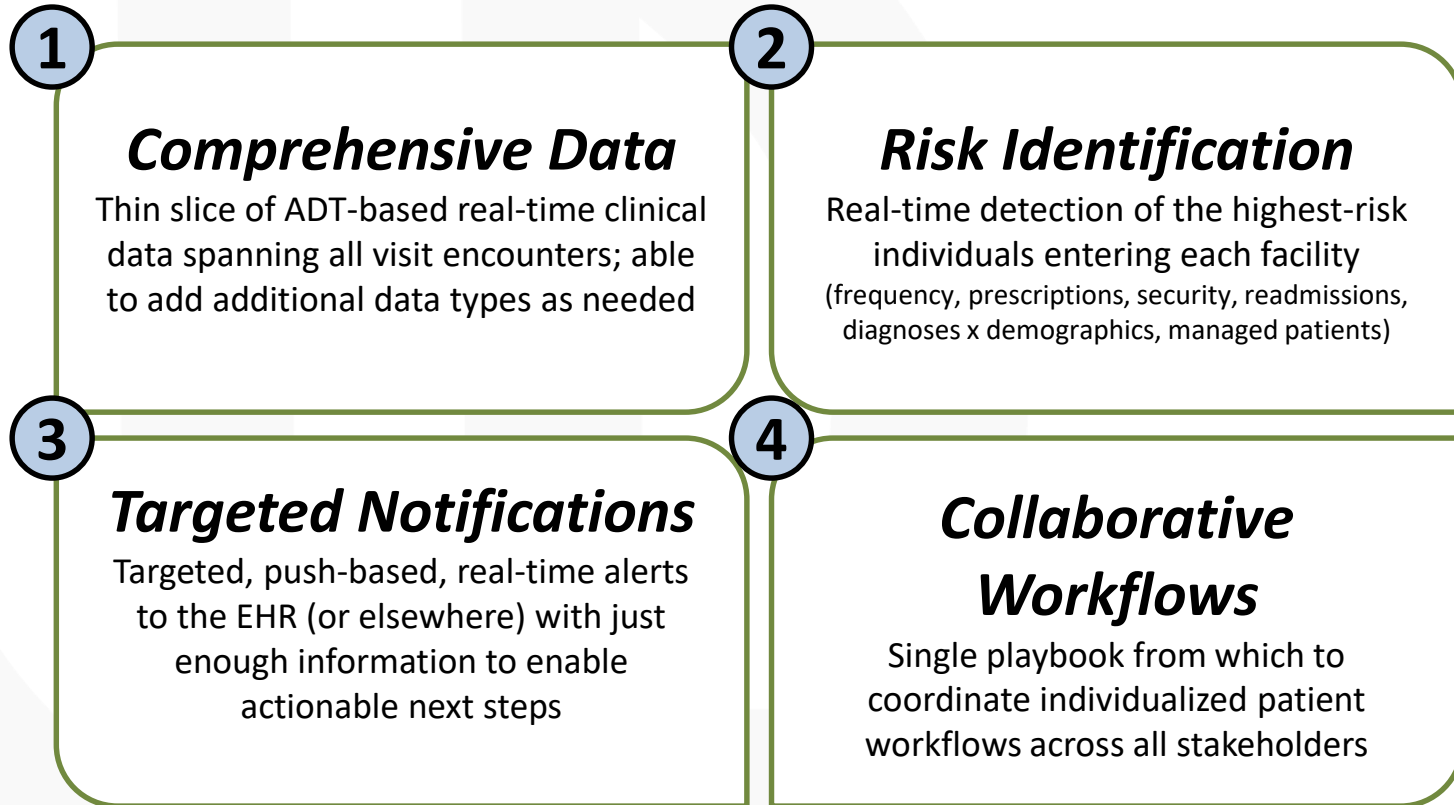
Situation

- Small number of patients generate a disproportionate volume of visits (e.g., <5% of patients w/ ~21% ED visits)
 - Many span multiple facilities and care settings
 - Hard to know when / how to coordinate appropriately
 - Hospitals generally reimbursed poorly for these visits

Complications

- Cross-channel / system coordination extremely difficult
 - Too much data, not enough insight
 - Poor workflow integration
- Providers and plans lack timely knowledge of where their patients are, much less which represent imminent future-state risk and require proactive engagement
- By the time a patient enters the acute healthcare continuum, we've missed our multiple opportunities to intervene and redirect much earlier in the risk lifecycle

The EDIE Platform



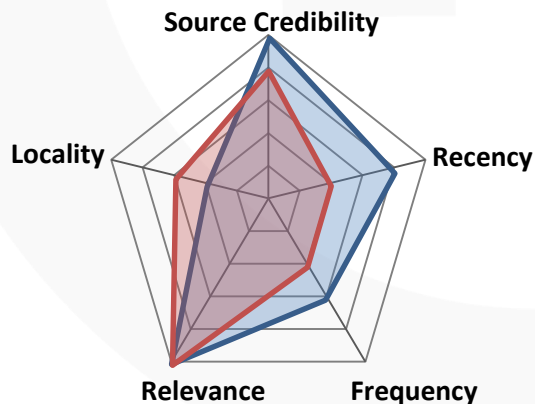
Collaborative Care Management Network

Location / Provider / Facility / Payer agnostic

Risk Identification, Data Types, Reporting & Analytics

Risk Identification

- Real time
- Patient archetype driven
- Encounter based
 - Prior encounters an excellent predictor of subsequent risk
- High-accuracy patient identification and provider attribution



- Aggregate rank
- Example: Manual entry

Data Types (we care about)

- Iterative approach, expands based on clinical consensus
 - Encounter (ED, IP, OP)
 - PDMP / Rx (as available)
 - Security
 - Readmissions
 - Diagnoses
 - Demographics
 - Care relationships (e.g., in active case management)
 - Care plans / guidelines
 - Claims (if available and as needed)
- Not a full clinical record, to emphasize insight over data

Reporting & Analytics

- Off-the-shelf reports, in tool
 - Census, utilization, patient archetypes, etc.
- Custom queries, ad hoc
 - Based on any individual or cross-tabulated data types
- Reporting time frame, frequency, destination(s) determined by end-user
 - Specific to respective TPO-based patient population

EDIE not only drives real-time visibility into patient activity across the care continuum, but then enables collaborative care delivery efforts on behalf of those patients most in need

Identification

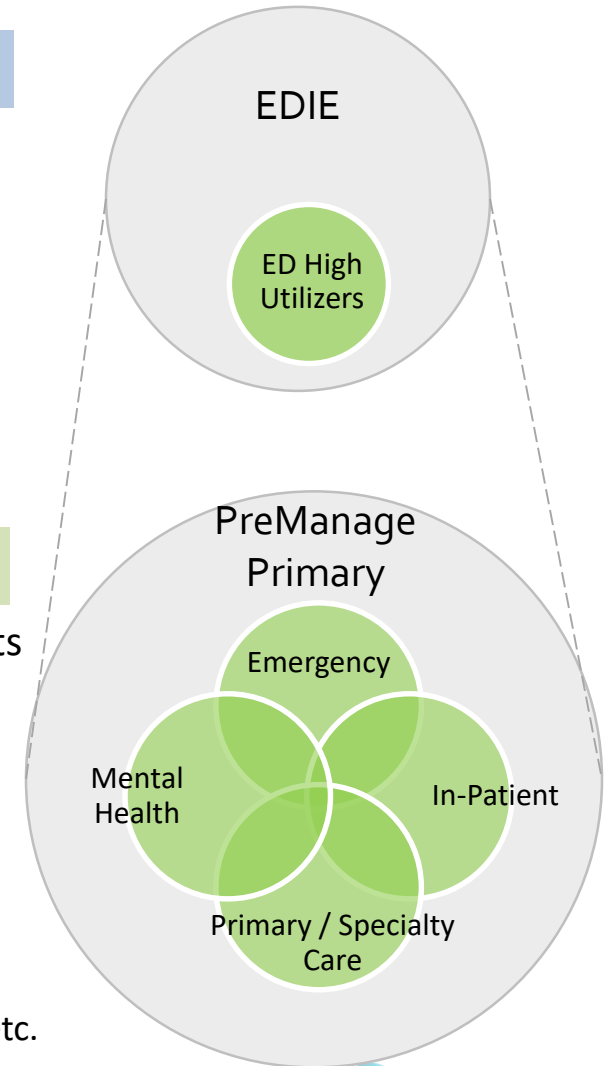
EDIE (aka PreManage ED): Hospital Partnerships

- Notifications to ED Providers for ED/In-Patient visits
- Shared platform for ED care coordination information
 - High utilization / complex ED patients
- **Specific User Base** (ED Physicians & Care Managers)
- **Focused Population** (High Utilization / Complex ED Patients)

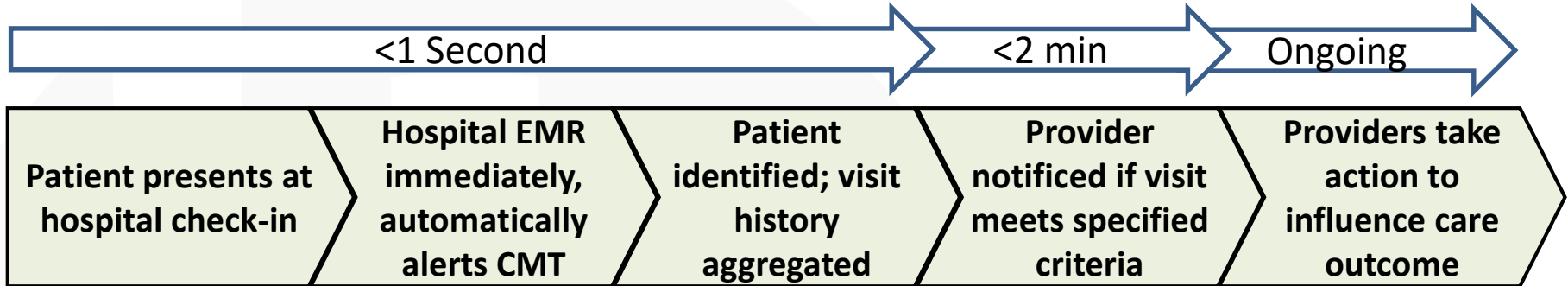
Prevention

PreManage Primary: Payer/Provider + Partnerships

- Notifications to multiple parties across ED/ In-/Out-patient visits
- Shared platform for all care coordination information; complimentary Service to EDIE built on same technology
- **Broad User Base** (Primary / Specialty Care, CCOs, CBOs, Health Plans, Care Coordinators, Social Workers, ED Guides, others)
- **Entire Population** (Active patient population or member base)
 - Medical Homes, Mental Health, Medical Groups, Juvenile, Security, etc.



Typical workflow: Real-time situational awareness



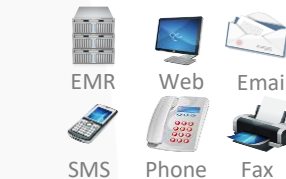
- Patient checks in with hospital registration
- Hospital records core identification and demographic info



- EDIE directly integrated with the hospital EHR; no add'l data entry required
- Patient registration data immediately sent from hospital to CMT



- EDIE identifies patient (even if key information missing from patient's hospital record)
- EDIE cross-references patient with prior ED and In-Patient visit history across systems



- If visit triggers a pre-set criterion, EDIE notifies provider
- Notifications contain visit history, diagnoses, prescriptions, guidelines, and other clinical meta data + patient-specific plan of care



- Provider has the information in hand before she sees patient
- Patient-provider information asymmetry is closed; able to make informed care decision
- Additional stakeholders with patient stewardship notified in order to proactively engage



EDIE ALERT 05/27/2016 04:12 AM Darwin, Charles (DOB: 02/12/1909)

This patient has registered at the **Henry Medical Center Emergency Department**. You are being notified because this patient has recommended Care Guidelines. For more [information](#) please login to EDIE and search for this patient by name.

Care Providers

Provider	Type	Phone	Fax	Service Dates
Ben A Zaniello MD	Primary Care	(206) 555-1213	(206) 555-1212	Current
Robert Osler MD	Cardiology	(206) 231-3125	(206) 231-3126	Current
Sarah Jung PHD	Psychology	(206) 782-2342	(206) 782-2343	Current

ED Care Guidelines from Henry Medical Center

Last Updated: Wed March 17 10:35:40 MDT 2016

Care Recommendation:

Patient's pain is cardiac related; please use nitroglycerin (CHF and cardiac protocols) for pain. Please do not use controlled substances in the ER unless there are new findings as patient is very sensitive to opiates.

Additional Information:

1. Please see ECG attached below for pre-existing cardiac pathology.
2. Cardiologist office responds to overnight pages.

These are guidelines and the provider should exercise clinical judgment when providing care.

Care Histories

Behavioral

03/4/2016 Wallace Memorial Hospital

- Anxiety

Imaging

- Last angiogram 11/12/15 due to chest pain with no new findings

Security Events

Date	Location	Type	Specifics
2/24/2016	Wallace Mem Hosp	Verbal	• Patient needed sedatives due to delusions and agitation.

Security Events (18 Mo.)		Count
Verbal		1
Total		1

Washington PDMP Report

Rx Details (6 Mo.)

Fill Date	Drug Description	Qty.	Prescriber	CS	MED	Rx Summary (12 Mo.)	Count
2016-02-12	CLONAZEPAM 0.5	30	Ben Zaniello, MD	3	60.0	CS II-V Rx	0
2016-01-28	CLONAZEPAM 0.5	30	Ben Zaniello, MD	3	60.0	CS-II Rx	0
2016-01-14	CLONAZEPAM 0.5	30	Ben Zaniello, MD	3	60.0	Quantity Dispensed	120
2015-12-31	CLONAZEPAM 0.5	30	Ben Zaniello, MD	3	60.0	Unique Prescribers	2
						Long Acting Opioids	0

Rx Risk Assessment: **High**

Recent Visit Summary

Visit Date	Location	Type	Diagnoses
03/04/2016	Wallace Memorial Hospital	Inpatient	- Anxiety, CHF
12/21/2015	St. Patrick's Hospital	Procedure	- Arrhythmia
ED Visit Dates	Location	Type	Diagnoses
04/18/2016	Henry Medical Center	Emergency	- Shortness of Breath
03/04/2016	Wallace Memorial Hospital	Emergency	- Fever, unspecified
12/21/2015	St. Patrick's Hospital	Emergency	- Medication side effect - Chest Pain
03/03/2015	Sisters of Mercy Centralia Hospital	Emergency	- Shortness of Breath

E.D. Visit Count (1 Yr.)

Sisters of Mercy Centralia Hospital	4
Henry Medical Center	37
Wallace Memorial Hospital	6
Total	47

Note: Visits indicate total known visits.

The above information is provided for the sole purpose of patient treatment. Use of this information beyond the terms of Data Sharing Memorandum of Understanding and License Agreement is prohibited. In certain cases not all visits may be represented. Consult the aforementioned facilities for additional information.
© Mon May 27 04:12:35 MDT 2016 Collective Medical Technologies, Inc. - Salt Lake City, UT - info@collectivemedicaltech.com

EDIE Alert Descriptions

Care Provider Information: Having the details for a patient's care providers immediately available helps to inform the conversation with the patient, and helps to ensure that the patient gets to the right care in the right setting.

Care Recommendations: Patient-centered guidelines designed by treating providers and case managers give clinicians bite-sized pieces of the patient's care coordination puzzle without having to hunt down loads of historical records.

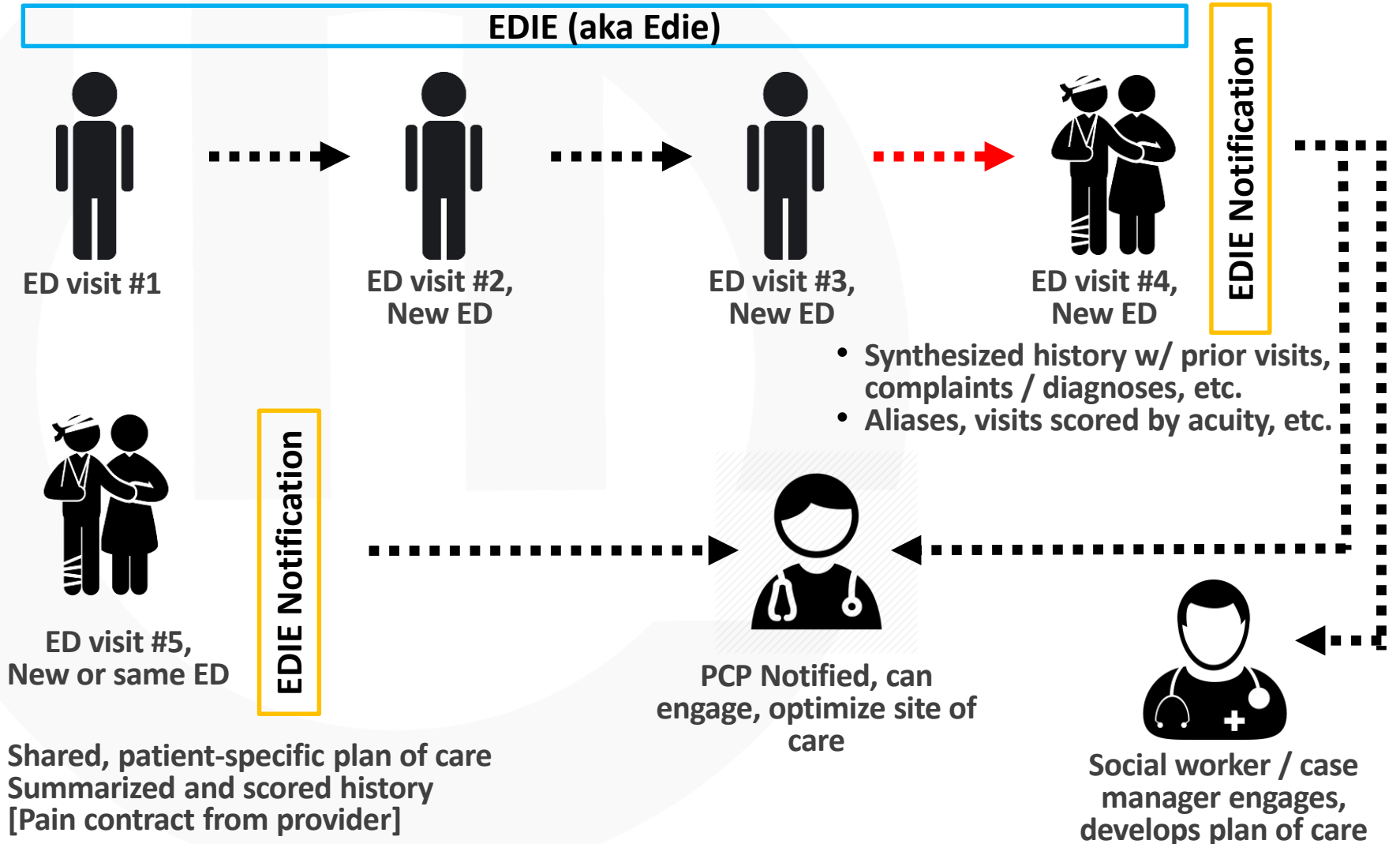
Care History Information: Clinical information contributed by any ED that a patient has visited, condensed down to date of the event, hospital where the information came from, relevant notes and diagnoses, and chronic condition, surgical, and relevant mental and behavioral health history information. This is the longitudinal patient view boiled down to only the essentials that will help paint a clearer picture.

Security Event Details: Knowing if a patient has been a security threat in the past, to himself or others, is a critical piece of information. EDIE Community ED can alert you and your hospital's security staff of the date of any security-related event, where the event occurred, the type of event, and any relevant details surrounding the event.

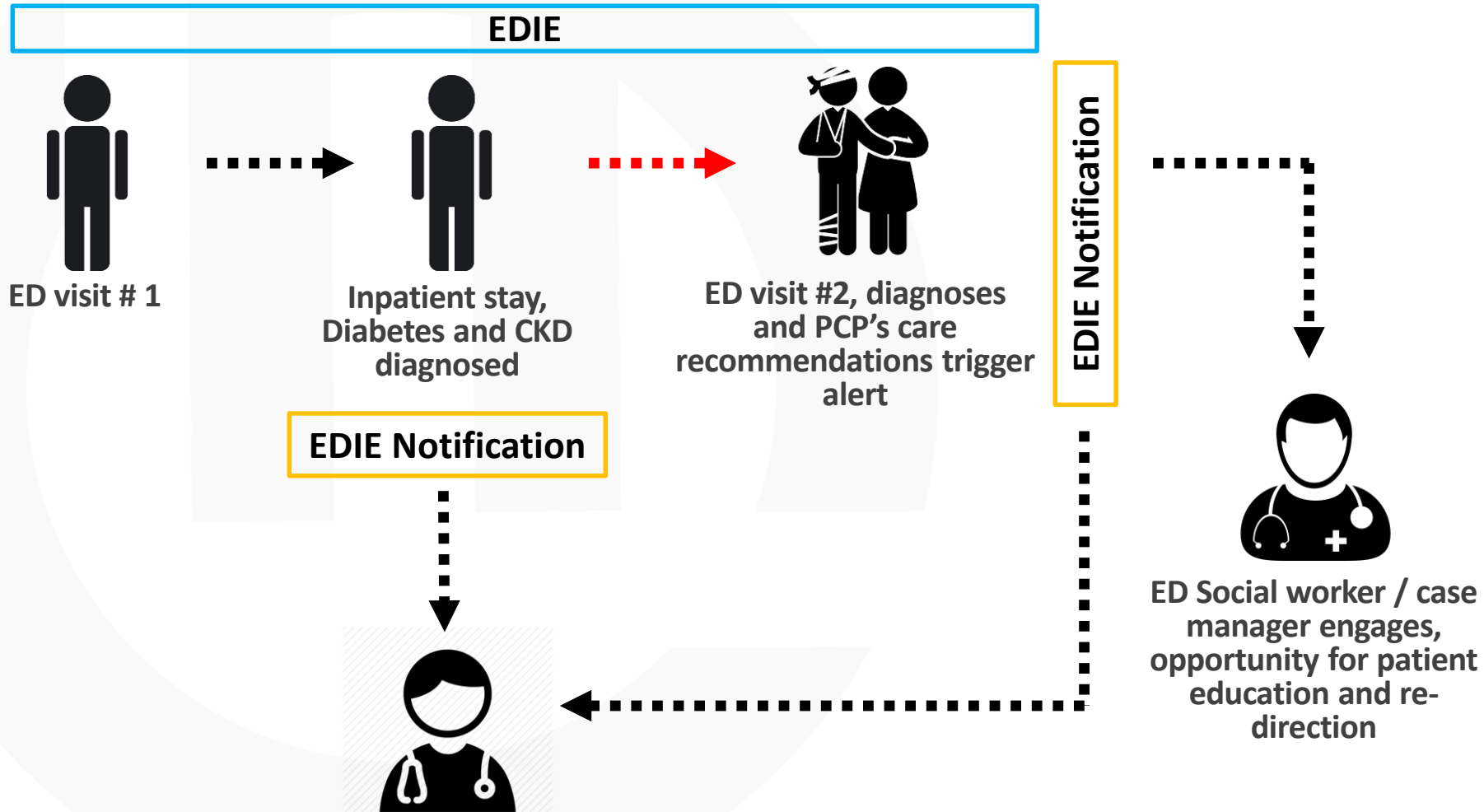
PDMP Information (if avail): EDIE Notifications can display narcotics prescription information from state PDMP databases—where permitted by applicable law—thus eliminating the need for ED clinicians to query yet another database while giving them a valuable perspective on a patient's recent prescription history.

Visit History: Seeing how many total ED and In-Patient visits your patient has had in the last 12 months, the reasons for the visits, and the locations of the visits gives you a clearer understanding of long-term ED-utilization patterns, helping to kick-start an objective conversation with the patient.

Patient scenario: opioid-seeking ED high-utilizer

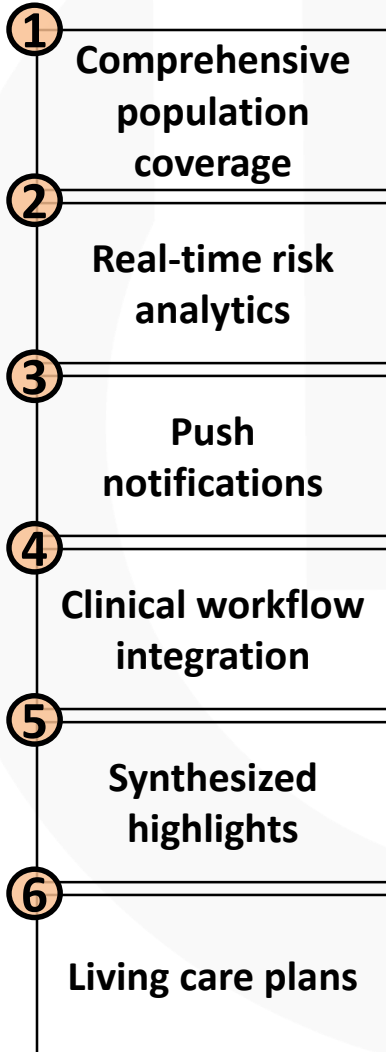


Patient scenario: newly diagnosed Diabetic with Chronic Kidney Disease (CKD)



- PCP creates shared, patient-specific plan of care
- Engages patient for follow-up visits

How EDIE Enhances the Value of the HIE



- Must systematically apply to all patients, irrespective of insurance coverage, opt-in status, or origin geography to function without bias; requires broad geographic coverage to operate optimally
- Must distill signal from noise to avoid notification fatigue and determine risk relevance on a relative situational basis in order to maintain physician trust
- Cannot require physicians to query for information; must push content as high-risk patients present and otherwise remain silent
- Cannot require physicians to access additional portal outside of EHR; must present high-value content at first point of physician engagement, before patient interaction, in order to influence medical decision
- Must present minimum-necessary information <90 seconds or risk losing physician attention with subsequent loss of follow-on engagement
- Must enable on-the-ground case managers and social workers to collaborate on a single, living care guideline else static files become buried with loss of high-value information embedded within broader clinical record

EDIE reaches multiple distinct high-cost, high-needs patient populations and enables providers to eliminate their associated medically-unnecessary risk

- **Readmissions**: Automatically flag 0/15- and 0/30-day readmissions, with context, from any source
- **Chronic Disease**: Example- Real-time care guideline and corresponding medical history detailing how to treat a patient with asthma under acute situations such as an asthma attack
- **Severe Medication Allergies**: Care guideline to provide clear direction on which medications NOT to prescribe vis-à-vis an allergic reaction
- **Pediatric HU**: Example- Seattle Children's creating care guideline to help non-emergent pediatric ED high-utilizers shift to alternative care settings through parent education, etc.
- **Security Events**: Real-time notification of a patient who has presented as prior threat to him/herself or hospital staff
- **Complex Needs**: Guideline to detail prior health issues that may not be apparent while assessing the patient in the ED
- **Homelessness** (in development): Instruction on how to best handle the needs of a homeless patient where there is no apparent emergency and what resources they have access to
- **Behavioral Health**: Behavioral health guideline, created by a patient's behavioral health provider, presented to a provider when a patient presents in the ED (e.g., mental health crisis plan)
- **Intellectual Disabilities**: Care guideline shares needed health information about a patient that may not be able to communicate this information on his/her own
- **Other ED as PCP**: Identify other high utilizers for additional case management education regarding ED alternatives

EDIE Outcomes Across State and Individual Entities

State-level Data (WA)

- 10% drop in total Medicaid ED visits year-over-year (~\$34M in savings) with significant credit given to EDIE and in addition saw:
 - 27% reduction in opioid related deaths (2008-2013)
 - 24% Reduction in ED visits with opiate Rx

Community-level Data (Tri Cities, WA)

- Controlled study indicates EDIE drove ~32% reduction in high-utilizer visits (5+/12 months) in study cohort vs. control; study intended to isolate impact of EDIE alone, controlling for covariant efforts


EDIE outcomes across State and Individual entities, cont.

System-level Data (WA, OR-based entities)

- *Large integrated health system:*
 - 60% reduction in ED readmissions and 40% reduction in IP readmissions for complex patient population
 - Telephonic-based outreach center doubled the number of members repatriated daily
- *Large Medicare payer:* 50% reduction in ED high utilizers
- *Mid-size commercial population:* 30-day IP readmission rate reduction from 25% to 6%
- *Regional behavioral health provider:* focused on the NQF-endorsed quality measure for 7-day follow up after a mental health-related hospitalization and used EDIE to achieve a follow up rate of 99% on 7-day follow up.
- *Academic-based ACO:* after 6 months on EDIE saw outreach following an ED visit shift from an average of 45 days to just 7 days; outreach following an inpatient stay dropped from an average of 30 days to an average of 4 days

San Diego Shared Emergency Case Management

March 10, 2017
San Diego County Medical Association
Emergency Medicine Oversight Commission



Introduction

- ◆ Roneet Lev, MD – Emergency Medicine Oversight Commission
- ◆ BJ Bartelson, RN – California Hospital Association
- ◆ Sayone Thihalolipavan, MD – San Diego Public Health

Case Presentation

- ◆ C.W. is a 27 year old man with residence in Spring Valley. He had over 70 ED visits in 2016. He has behavioral health issues, but the last 10 ED visits were related to pain. CURES shows small quantity prescriptions, presumed from emergency departments. His father says he is a “pathological liar.”
- ◆ Health plan wants to develop a plan to help patient and decrease ED visits.

EDIE Presentation

- ◆ Benjamin Zaniello, MD MPH
- ◆ Gabe Waters

San Diego Health Connect

◆ Dan Chavez

◆ Mark Branner

Round Table Introduction and Questions

Community Resources

- ◆ 1. What are the community resources?
- ◆ 2. Does San Diego need a list of these resources?

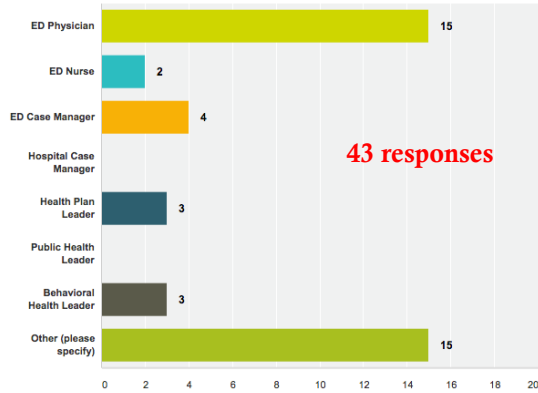
Community Resources

- ◆ Anne Jensen, EMT-P, Program Coordinator of RAP, the Resource Allocation Program
- ◆ Officer John Liening, Program Coordinator of SIP, Serial Inebriated Program
- ◆ Susan Bower, MSW, MPH, Whole Person Wellness Project and Project One
- ◆ Julianne Howell, Ph.D., Project 25 and Live Well San Diego

Survey Answers

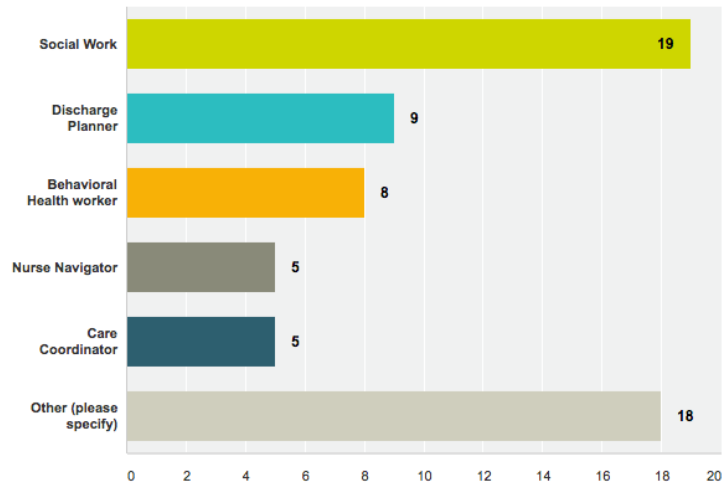
Position

Answered: 42 Skipped: 1



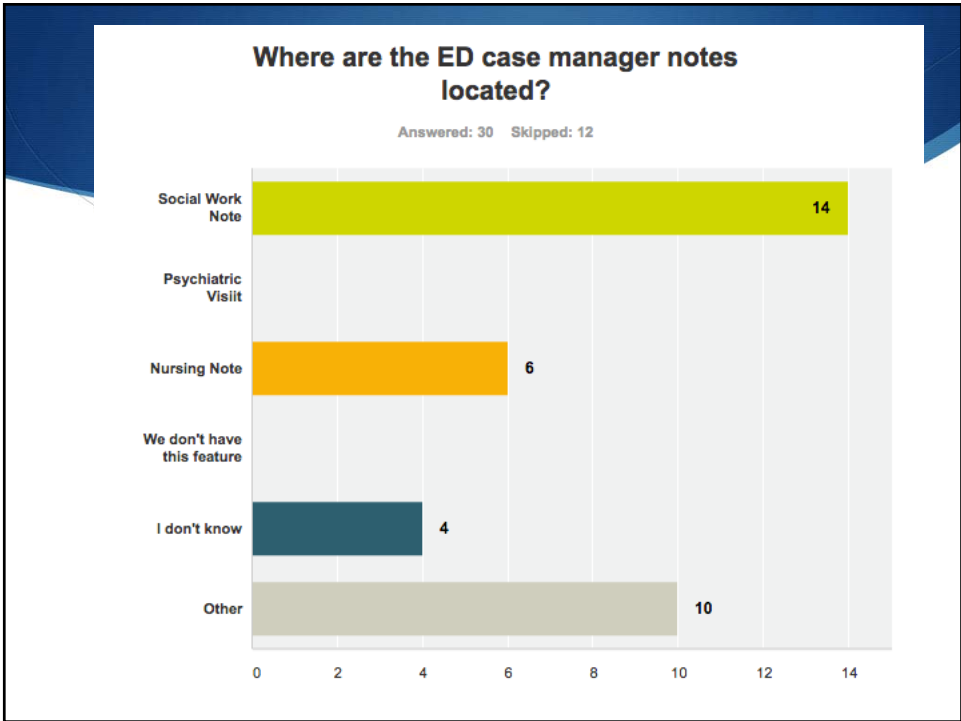
Which of the following services and terminology do you use for ED case management?

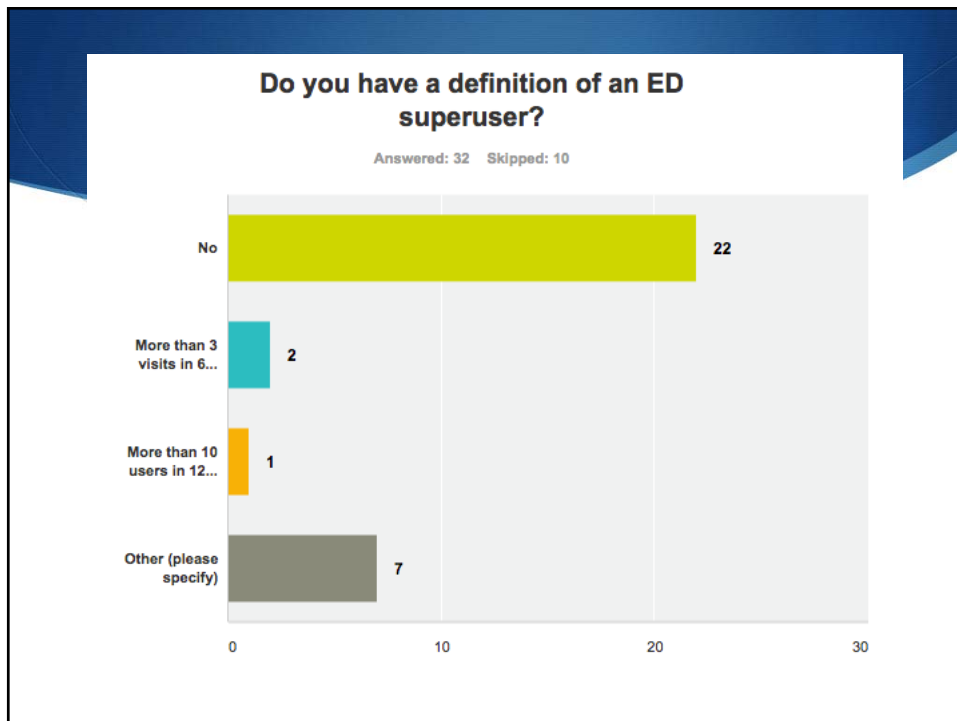
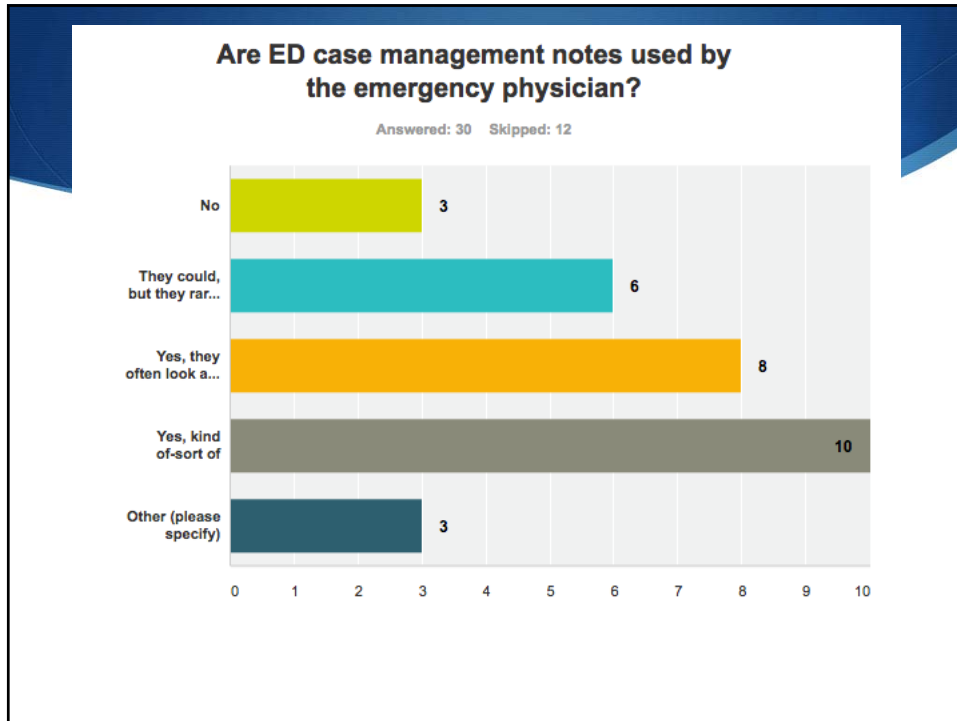
Answered: 34 Skipped: 8

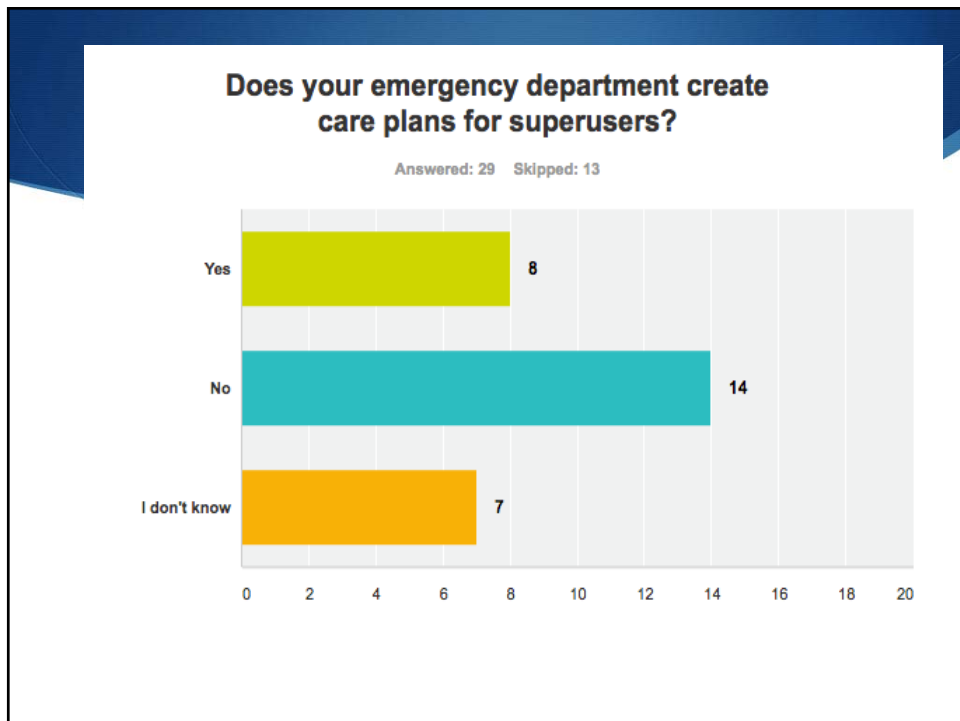
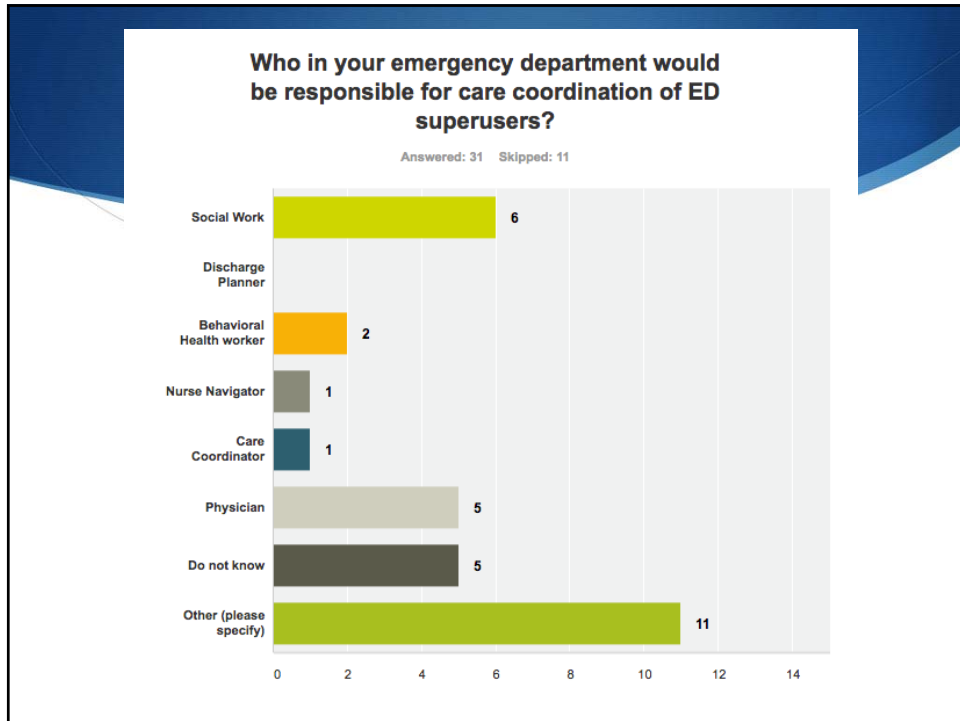


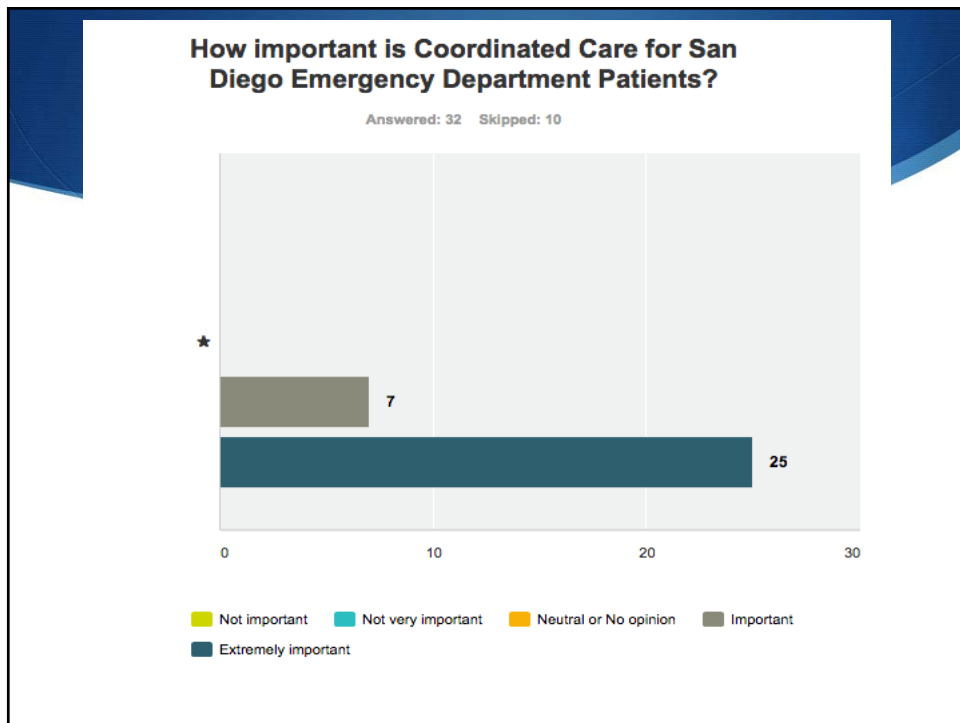
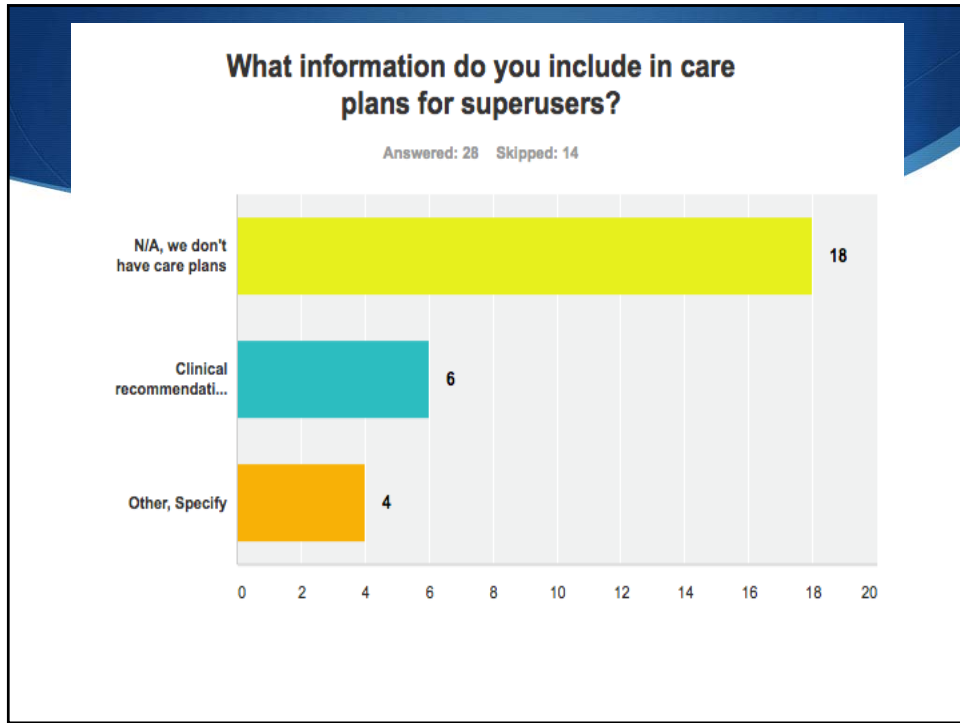
What information is documented by your ED case manager?

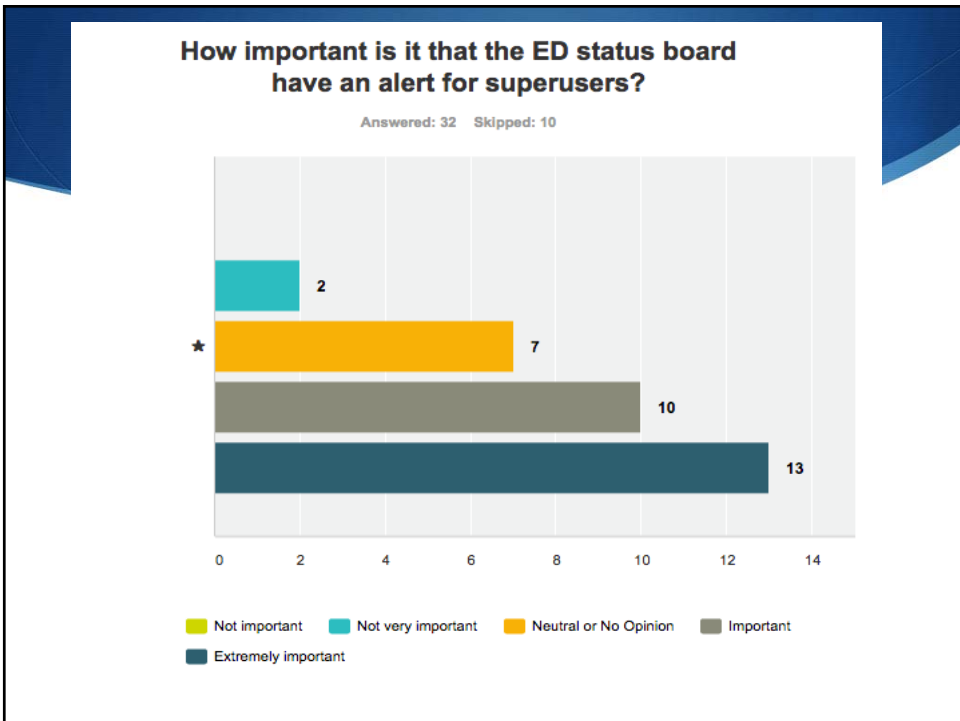
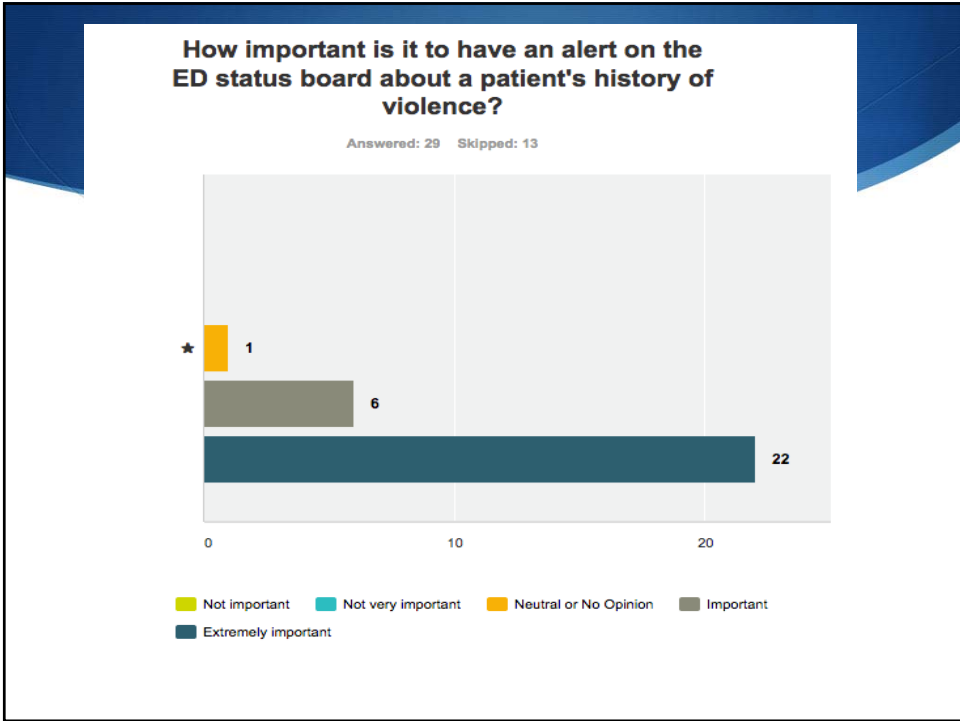
- ◆ Psychiatric coordination: Tele Psych, CMH, Psych Facilities
- ◆ Transfer communication
- ◆ Social services: housing, family support
- ◆ Medical Necessity/ Utilization Review/ Insurance Coverage
- ◆ Placement: SNF, Home Health, or other
- ◆ Discharge Needs/ Planning; Transportation, Scheduling appointments
- ◆ Social Issues
- ◆ CPS/ APS Reporting

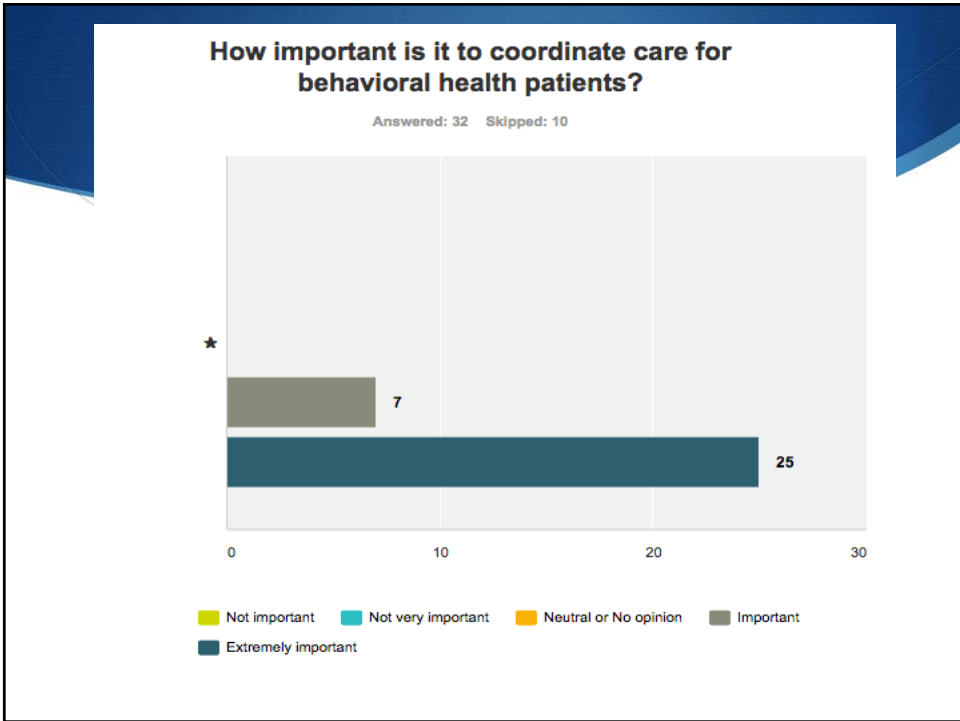
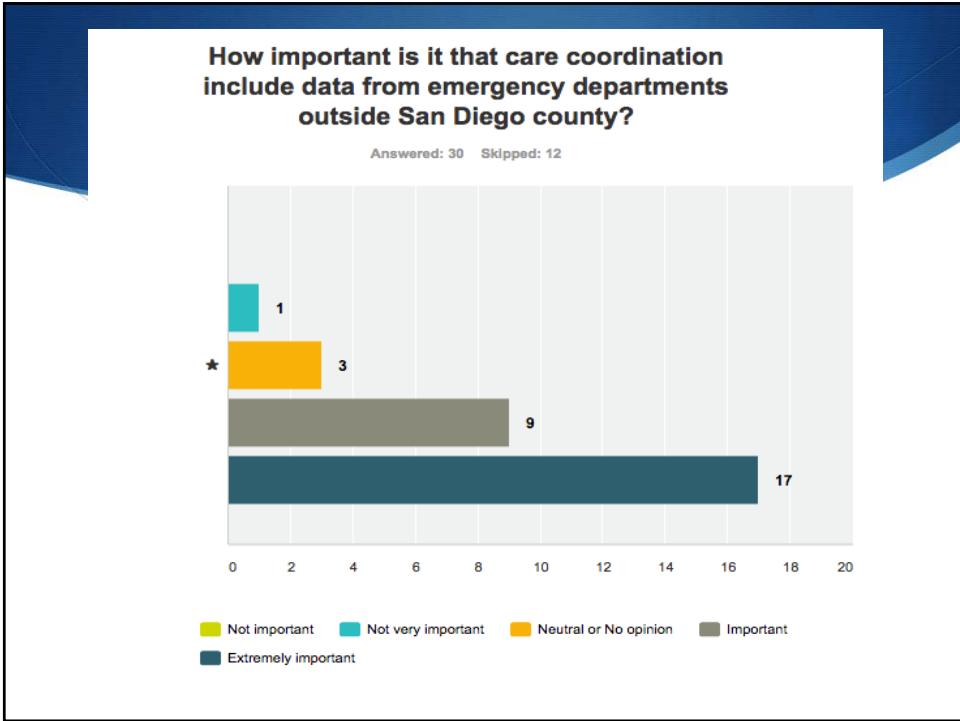


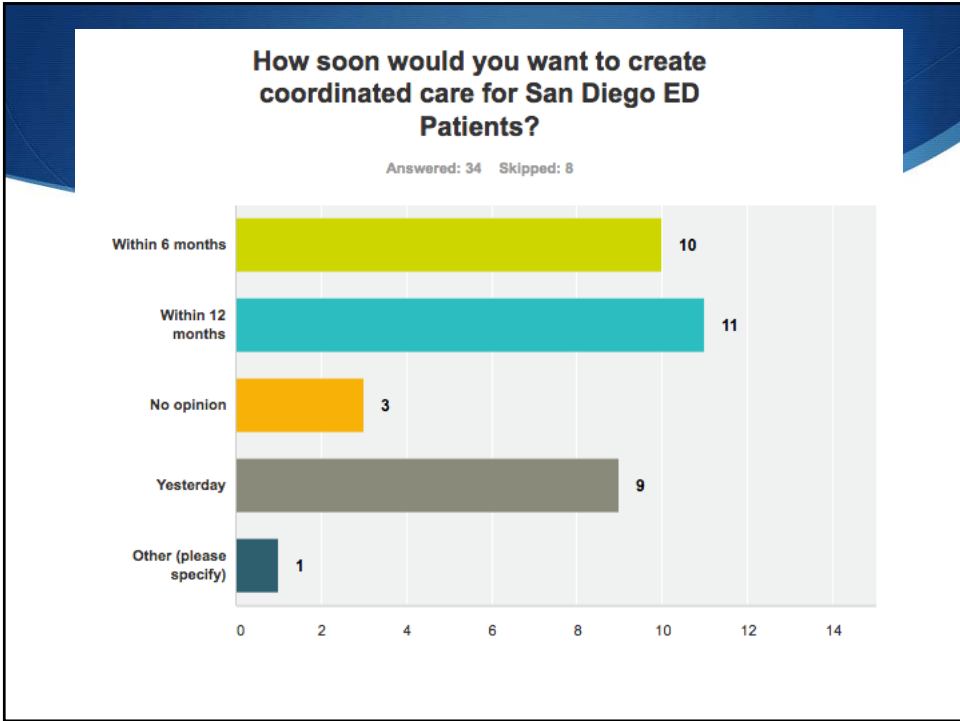












Group Discussion

- ◆ 1. Do we want a unified approach for Emergency Department Case Management in San Diego?
- ◆ 2. What are the priority for unified case management?
 - ◆ a. Clinical Coordination for Superusers?
 - ◆ b. Clinical Coordination for Behavioral Health Superusers?
- ◆ 3. What are Priority Features

Please Complete Survey with the Agenda

Next Steps

- ◆ Mission Statement
- ◆ Insure All Stakeholders Represented
- ◆ Technology Update Meeting
- ◆ Clinical Care Coordination Meeting




Shared Case Management Project

San Diego Health Connect Update

March 10, 2017




SAN DIEGO HEALTH CONNECT
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"The results of our study leave no doubt that HIE access improves quality of healthcare and operational efficiency...While common sense tells us that access to the patient's entire medical history would benefit both the patient and the healthcare provider, my co-authors and I have confirmed that it does by conducting one of the first empirical investigations into the benefits of HIE use at the individual patient level."


- Emre Demirezen, SUNY

The Effects of Health Information Exchange Access on Healthcare Quality and Efficiency: An Empirical Investigation – Feb. 10, 2017




SAN DIEGO HEALTH CONNECT
Better Information • Better Care

2




HIE Status Update



3

San Diego Health Connect Highlights

- 4.4 million patients properly identified
- 2.8 million patients to share information
- 21 of 23 hospitals participating
 - 16 of 18 federally qualified health centers
- Over 20.0 million messages per month through the HIE
- 55 participants, 115 Direct participants
- First 2 health plans signed, AMR signed
- Palomar and Sharp live, Tri-City go-live 3Q17



4

HIE Requirements



- For high value HIE performance, SDHC requires the following from its participants:
 - Patient matching
 - Patient consent
 - ADT (admission, discharge, transfer) Messages
 - Clinical data
 - High uniform content
 - High uniform quality



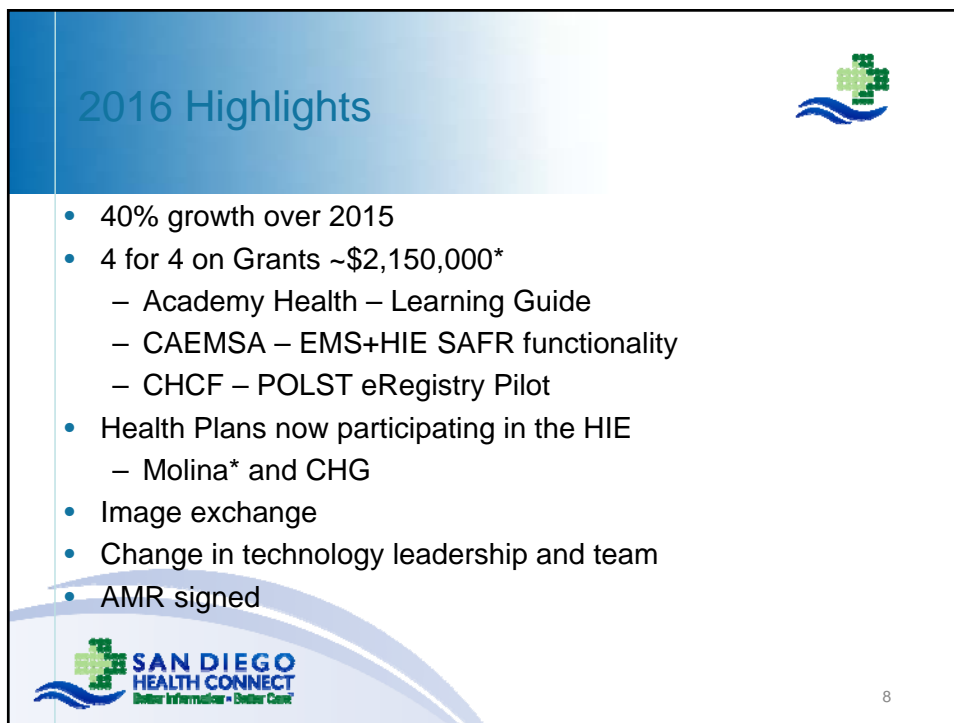
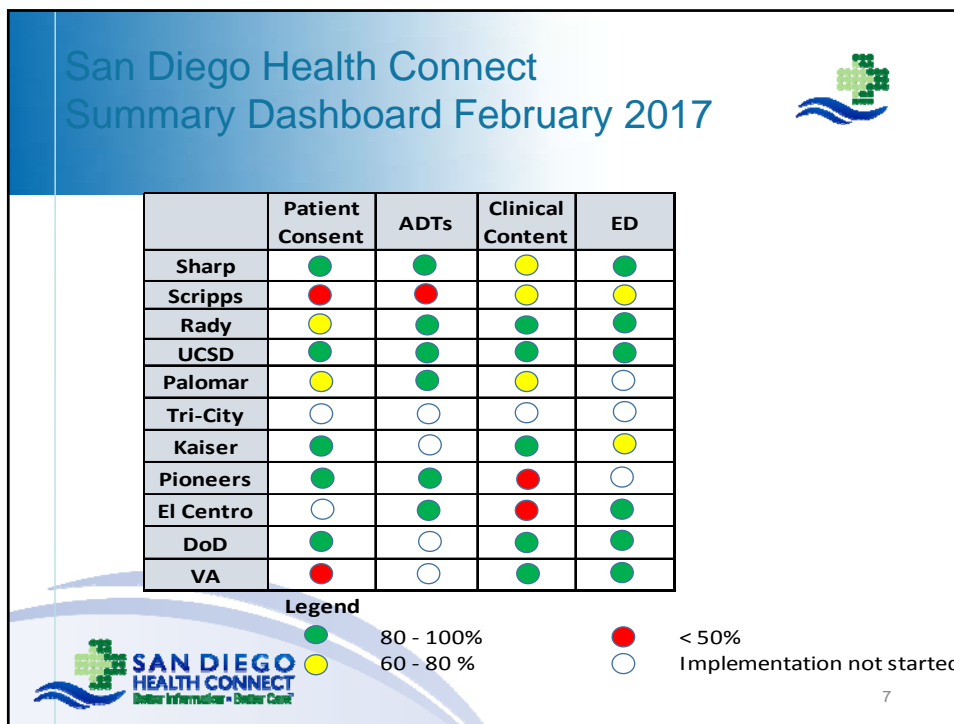
5

Patient Clinical Information Currently Available




- | | |
|-----------------------------------|--------------------------------|
| • Demographics | • Immunizations |
| • Encounters | • Labs |
| • Problem List/Coded
Diagnosis | • Progress Notes |
| • Allergies | • Discharge Summaries |
| • Medications | • Imaging Narrative
Reports |






2017 Plans


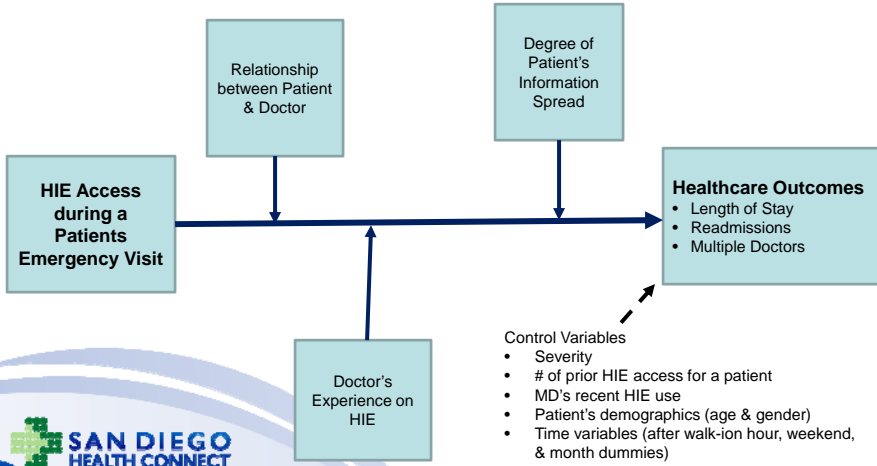


- Tri-City go-live
- Grant delivery
- Image exchange
- More health plan participation
- New initiatives
 - Behavioral Health
 - Referrals
- Refine technology infrastructure
 - Performance, data consistency and quality




9

HIE Effectiveness

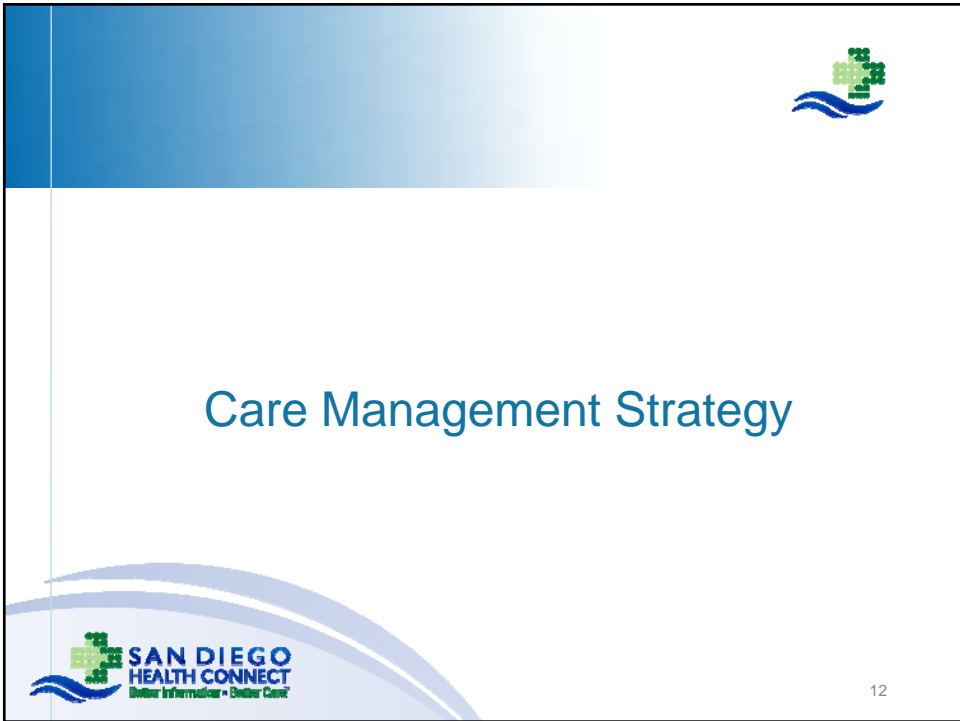
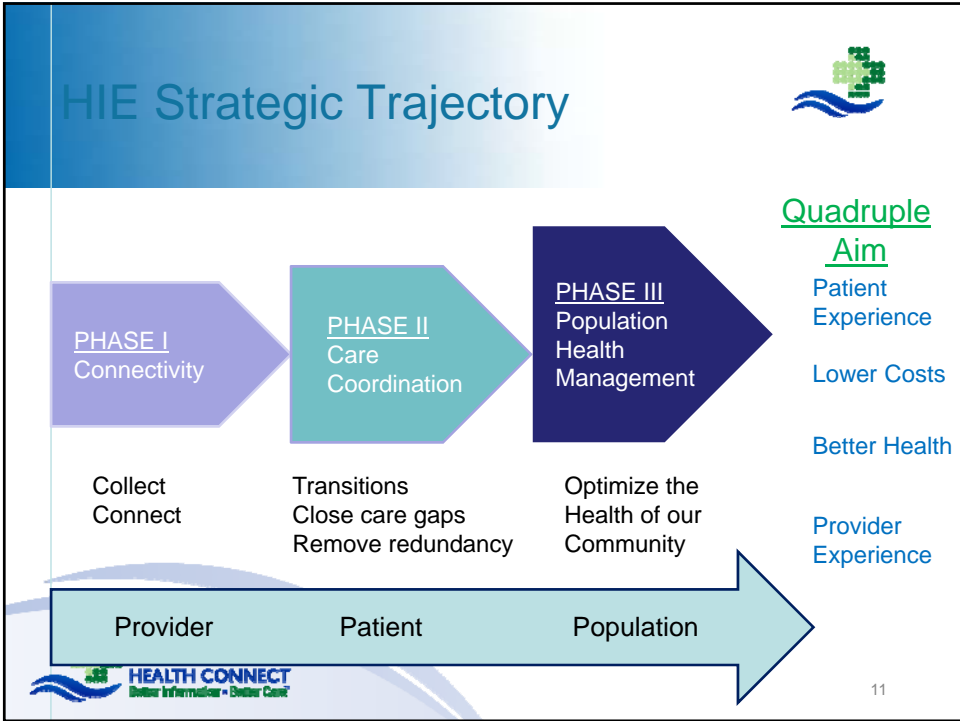



```


    graph LR
      A[HIE Access during a Patients Emergency Visit] --> B[Healthcare Outcomes]
      C[Relationship between Patient & Doctor] --> B
      D[Degree of Patient's Information Spread] --> B
      E[Doctor's Experience on HIE] --> B
      F[Control Variables] -.-> B
      subgraph B [Healthcare Outcomes]
        B1[Length of Stay]
        B2[Readmissions]
        B3[Multiple Doctors]
      end
      subgraph F [Control Variables]
        F1[Severity]
        F2[# of prior HIE access for a patient]
        F3[MD's recent HIE use]
        F4[Patient's demographics (age & gender)]
        F5[Time variables (after walk-in hour, weekend, & month dummies)]
      end
  
```




10



The Care Management Challenge



- Lack of knowledge and consensus
- Absence of standards or tools
- Best practice still evolving
- Healthcare ≠ social services
- Lack of multi-sector coordination – Who does what? Who is in charge?
- Rigid and various technology systems
- Sharing data across sectors is a major challenge



13

Coordinated Cross Sector Care Management - A Requirement



Many Programs Require Case Management

- Be There
- CACHI
- Whole Person Wellness
- Project One for All
- Data Driven Justice



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COMMUNITY INFORMATION EXCHANGE
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14

SDHC Care Management Strategy



- In development
- Health plan participation and grants
- Referral workgroup
- Behavioral health workgroup
- Infrastructure collaboration
- Make versus buy decision



15

Care Management High Level Requirements



- Single Sign-On
- Maintain patient context throughout workflow
- Closed loop referrals
- Referral coordinators and care teams directed
- Primary care & health plan case mgmt. part of the workflow
- Automate and connect the process as much as possible
- Manage daily tasks across patient lists
- Patient centric care plans



16

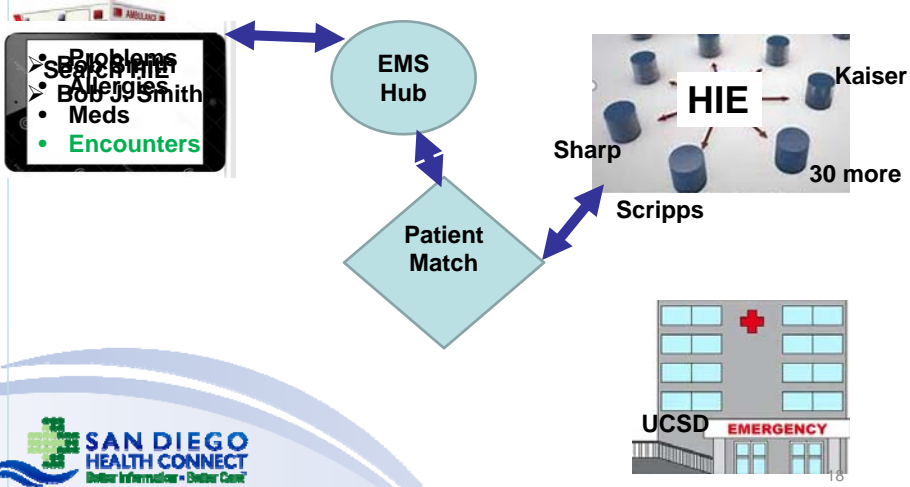



EMS Grant = SAFR




17

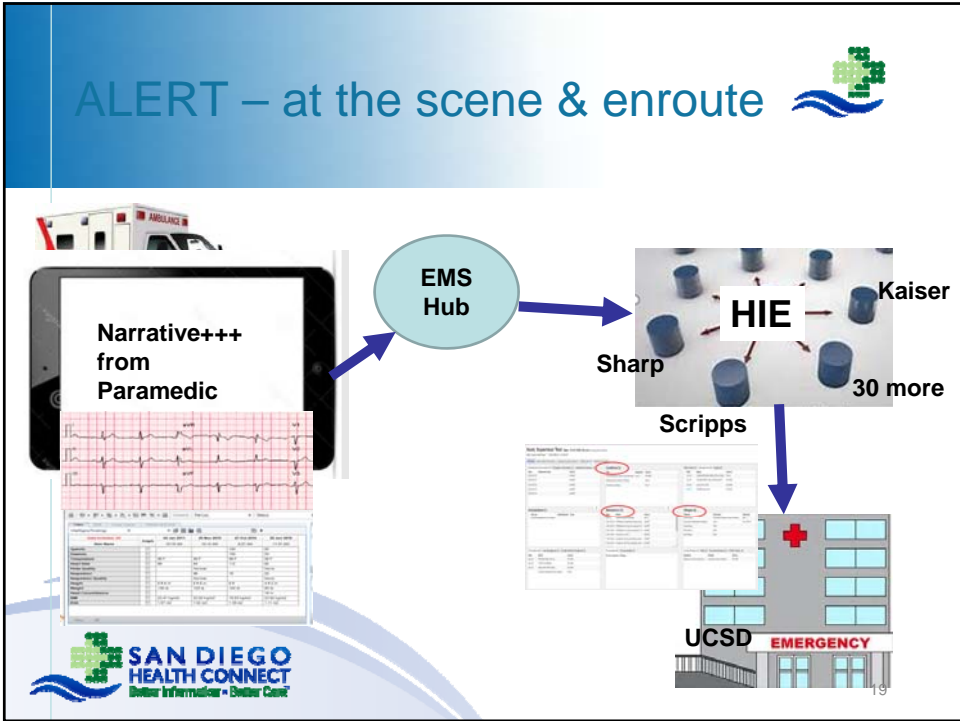
SEARCH



The diagram illustrates a data integration workflow. On the left, a mobile device displays patient information for Bob J. Smith, including Problems, Allergies, Meds, and Encounters. This data is sent to an EMS Hub, which then connects to a Patient Match system. The Patient Match system is linked to a Health Information Exchange (HIE) that includes Kaiser, Sharp, and Scripps, with a note for '30 more' providers. Finally, the data is shared with UCSD Emergency, represented by a hospital building icon.



18



CMT and SDHC functions

The slide features the San Diego Health Connect logo at the bottom left, which includes the text 'SAN DIEGO HEALTH CONNECT' and the tagline 'Better Information • Better Care'.

A Venn diagram with two overlapping circles. The left circle is purple and labeled 'CMT'. The right circle is teal and labeled 'SDHC'. The intersection of the two circles is white. A list of shared features is positioned above the intersection. The slide includes a logo in the top right and bottom left corners, and the number '21' in the bottom right corner.

- Complementary
- Synergistic
- Focused Care management
- Notifications
- Clinical data
- Frequent utilizers
- PDMP access

CMT

- Smart notifications
- Nation-wide
- ED efficient
- Tightly Focused Workflow
- Curated Content
- Care Summary

SDHC

- ADT notify
- SD-wide
- Entire ecosystem
- EMS integration
- Longitudinal record
- Patient matching

21

Community Care Management Considerations

A slide titled 'Community Care Management Considerations' with a list of 10 bullet points. The slide includes a logo in the top right corner and the 'SAN DIEGO HEALTH CONNECT' logo in the bottom left corner, along with the number '22' in the bottom right corner.

- Time to change and impact
- Regional vs. National network
- Consent messaging – confusing, inconsistent, TBD
- Data sharing outside of region
- 2 unique, disparate views of the patient data
- Self determination, community-based standards
- Continuity with the rest of California
- Health plan influence
- Some providers are excluded
- Community based referrals and linkages

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Better Information • Better Care

22

June 7, 2017

TO: EMS/Trauma Committee Members

FROM: Heather Venezia, Trauma Program Director, North Bay Medical Center

SUBJECT: EMSC Update

SUMMARY

- EMSC Educational Forum – November 9, 2017 – DoubleTree Sacramento
- Discussion around federal budget and uncertainty of funding going forward
- Waiting on guidelines to be released
- Subcommittees designated:
 - Committee structure and mission - **Bernie Dannenberg / Ron Dieckmann**
 - Educational Forum – **Wendy Chapman / Heidi Wilkening**
 - Pre-hospital pain management – **Shira Schlessinger / Marianne Gausche-Hill**
 - Prevention / Core mission – **Patrice Christensen (Steve Barrow) / Farid Nasr / Jim Harley**
 - Update current guidelines – **Heidi Wilkening – check last revision on each / Bernie Dannenberg**
 - Regulations implementation – www.pedsready.org[pedsready.org] - Peds Ready / Site visit materials for LEMSAs – **Nancy McGrath / John Holcroft / Cynthia Frankel / Marianne Gausche-Hill**
 - Color coding – standardize formulation in the county to appropriately dose children in the field – **Marianne Gausche-Hill**
 - Trauma/peds re-triage – **Heather Venezia / Candy Schoenheit / Bob Dimand / Linda Diaz / John Holcroft**
 - Pediatric Data / Performance Indicators – **Mike DeLaby / Louis Bruhnke / Ray Johnson / Bob Dimand / Shira Schlessinger**
 - Spreadsheet / list serve of pediatric experts – **Ray Johnson / Jim Harley / Marianne Gausche-Hill**
 - Pediatric Surge – **Bob Dimand / Ray Johnson / Cynthia Frankel / Pat Frost**

ACTION REQUESTED

- Information only



June 7, 2017

TO: EMS/Trauma Committee Members
FROM: BJ Bartleson, VP Nursing & Clinical Services
SUBJECT: Community Paramedicine Update

SUMMARY

On March 24th, Cal ACEP held a policy briefing called, “Community Paramedicine, Should Patients Face a Barrier to Emergency Care”. While their review focused on the lack of sufficient data, particularly for alternate destination, they did share one slide that spoke to legitimate opportunities to decrease ED crowding: extended primary care hours and locations, improved access to insurance, behavioral health care expansion, improved community based care, etc. This slide was directly aligned with our objectives for ECSI.

AB 820 (Gipson) legislation dealing with alternate destination has been made a two year bill. AB 1650(Mainsien) Community Paramedicine legislation except for alternate destination is on suspense file at the time of this memo writing.

ACTION REQUESTED

- Information and feedback

DISCUSSION

Cal ACEP is willing to collaborate on ECSI; however have concerns with the validity of the present community paramedicine pilot program data results, particularly with the alternate destination model. We will continue to work with them to discuss program outcomes moving forward and encourage their strong involvement in the ECSI initiative.

DISCUSSION QUESTIONS

1. What other ways can we engage Cal ACEP on community paramedicine progress?



COMMUNITY PARAMEDICINE: SHOULD PATIENTS FACE A BARRIER TO EMERGENCY CARE?

March 24, 2017 from 12-1PM

Capitol Event Center

1020 11th Street, Second Floor, Sacramento, CA

Join the California Chapter of the American College of Emergency Physicians for a policy briefing on the risks of diverting patients from the emergency department. Lunch will be provided.

**RSVP to Kelsey McQuaid at
kmcquaid@californiaacep.org**

HEALER

They Make House Calls

Alameda's community paramedics reduce readmission rates and frequent 911 users.

By Andrea A. Firth

Patrick Corder, a firefighter and paramedic with the Alameda Fire Department and Emergency Services, doesn't wait for people to call 911. He calls them first. On a typical Monday morning in late March, his call list was growing quickly. There was the 81-year-old woman with chronic obstructive pulmonary disease who needed help getting in to see a primary-care physician, and the 46-year-old man with pneumonia who had been discharged from the hospital on Friday but had not picked up his antibiotic yet, plus the 73-year-old man recently hospitalized with sepsis, a life-threatening infection, who had fainted at home the week before due to a medication side effect.

Most critical this day, Corder wanted to locate a



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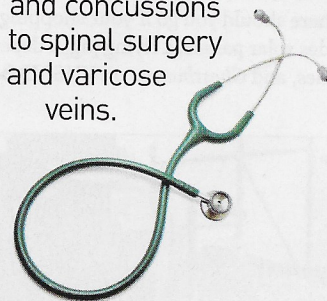
Family Nurse Practitioner (MSN-FNP)
samuelmerritt.edu/nursing/fnp_nursing_online

DOCTOR of NURSING PRACTICE (DNP)

samuelmerritt.edu/nursing/dnp

Ask the Experts

Advice from local medical specialists about a range of conditions, from acne and concussions to spinal surgery and varicose veins.



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OaklandMagazine.com/AskTheExperts
AlamedaMagazine.com/Ask-The-Experts

Alameda firefighter paramedics Patrick Corder, left, and Armando Baldizan, check their equipment in their response truck before heading out on calls.

56-year-old homeless man with a host of chronic disorders including congestive heart failure. There had been a fire in a transitional housing unit in the city over the weekend, a place where this man sometimes stayed, and Corder wanted to be sure he was safe.

Corder and his colleague Armando Baldizan work full time as Alameda's community paramedics and are part of a statewide initiative that is studying ways the paramedic's role can be expanded to facilitate better use of emergency care resources and improve the delivery of primary-care medicine to underserved populations. "It's a complete shift in our job function," said Corder. "In the 911 setting, we react and transport to the ER. As community paramedics, we are proactive. The focus is prevention. We meet with patients where they are."

Corder, Baldizan, and three other members of the department started training as community paramedics in January 2015. Since June 2015, they have enrolled 184 patients in the program. They focus on two groups: "Familiar Faces" are patients who call 911 frequently—over 20, 50, even 200 times a year; and "The Chronic Six"—are patients who are discharged from Alameda Hospital with acute myocardial infarction (a heart attack), congestive heart failure, chronic obstructive pulmonary disease, pneumonia,

diabetes, and sepsis, which are all disorders with a high risk for complications. The goals of Alameda's program are to reduce the frequent callers' use of emergency services and curb hospital readmissions.

They quickly identified about 60 familiar faces in Alameda at the start. "We know these folks from dealing with them, sometimes almost on a daily basis," said Baldizan. Mostly men, homeless, with unaddressed health problems like cirrhosis, heart failure, HIV, hepatitis, and skin conditions from living out in the elements, like psoriasis and cellulitis, often mentally ill and abusing alcohol. Often the 911 call and trip to the ER are not what's needed, explained the paramedics. The patients need to visit a primary-care physician or help with managing medications and dealing with substance abuse. The lack of housing for these individuals is a big contributing factor to their health-care needs, too, the paramedics said. Since the community paramedics have started reaching out and working with this group directly, the number of frequent 911 callers in the city is down to about 25.

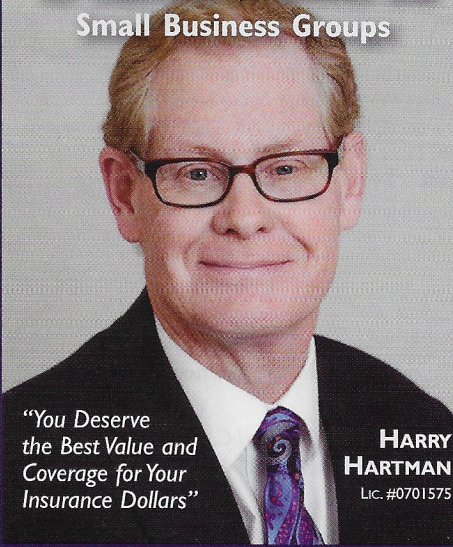
As Corder and Baldizan talked about the city's new model for community paramedicine, the fax machine in their office repeatedly spit out paper, referrals from the social workers at Alameda Hospital, who identify several patients each week who may live alone, may not have anyone checking in on them, and need support managing their health care. Patients leave the hospital with a care plan, but putting the plan in place can be

hit or miss without help, said Corder. "Our goal is to do a home visit in 72 hours of discharge."

On the first visit, the paramedics reconcile the patient's medication, provide education about the patient's diagnoses, and make sure follow-up appointments are made. Plus, they do a home safety check—if the client, for example, needs grab rails in the bathroom, they make a referral to a senior fall prevention program. Medicare and Medicaid don't provide reimbursement for hospital readmissions within 30 days of discharge, so the cost of treating these patients is a significant factor to the health system. So far, only seven patients in the program have been readmitted to the hospital within 30 days of discharge, a readmission rate of less than 4 percent.

The two-year Community Paramedicine program was originally funded through Alameda's Measure A and Alameda County EMS. The program has been extended through November 2017 and Alameda Health System, Alameda City EMS, and the city of Alameda have also contributed to the \$1.25 million annual cost. Although he can't say how this will happen just yet, Chief Rick Zombeck of the Alameda EMS said he hopes to get authorization for the Community Paramedicine program to continue. "Our paramedics have clearly demonstrated that they can handle this expanded role," said Zombeck. "This gives the paramedic the opportunity to do more, to be of greater service. And we've seen already the benefit it provides our community."

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June 7, 2017

TO: EMS/Trauma Committee Members

FROM: BJ Bartleson, VP Nursing & Clinical Services
Bruce Barton, Riverside LEMSA Director

SUBJECT: APOT

SUMMARY

LEMSA's and hospitals with APOT/D issues have been actively working on APOT tracking and monitoring and processes for performance improvement. Mr. Barton has been key in establishing APOT metrics for individual LEMSA's, as well as working with EMSA on the next phase of LEMSA to EMSA data collection. Mr. Barton will describe how this next phase in the APOT work will occur.

ACTION REQUESTED

- Information and discussion

DISCUSSION

While many hospitals and LEMSA's have been collecting APOT, many more are coming on board, as well as looking at ways to perfect their performance with technology, audits and collaboration. The guidelines and metrics (attached) are being discussed at multiple state, regional and local levels.

DISCUSSION QUESTIONS

1. What questions and concerns do you have with the present process?
2. Are there ways to improve the data collection to connect performance improvement initiatives with outcomes?

AMBULANCE PATIENT OFFLOAD TIME APOT-1 SPECIFICATIONS

Approved by EMS Commission 12-14-16 (Rev 11-17-2016)

MEASURE SET	Ambulance Patient Offload Time	
SET MEASURE ID #	APOT-1	
PERFORMANCE MEASURE NAME	Ambulance Patient Offload Time for Emergency Patients	
Description	What is the 90 th percentile for Ambulance Patient Offload Time at the Hospital Emergency Department?	
Type of Measure	Process	
Reporting Value and Units	Time (Minutes and Seconds)	
Continuous Variable Statement (Population)	Time (in minutes) from time ambulance arrives at the hospital until the patient is transferred to hospital emergency department care. All 911 emergency ambulance transports to the ED with eTimes available are included.	
Inclusion Criteria	Criteria (NEMESIS 3.4)	Data Elements (NEMESIS 3.4)
	<ul style="list-style-type: none"> All events for which eResponse.05 “type of service requested” has value recorded of 911 Response (Scene)¹ <p>AND</p> <ul style="list-style-type: none"> All events in eDisposition.21 “Type of Destination” with the value of 4221003, “Hospital-Emergency Department”; <p>AND</p> <ul style="list-style-type: none"> eTimes.11 “Patient Arrived at Destination Date/Time” values are logical and present <p>AND</p> <ul style="list-style-type: none"> eTimes.12 “Destination Patient Transfer of Care Date/Time” values are logical and present² 	<ul style="list-style-type: none"> Type of Service Requested (eResponse.05) Type of Destination (eDisposition.21) Patient Arrived at Destination Date/Time (eTimes.11) Destination Patient Transfer of Care Date/Time (eTimes.12) <p>(See APOT 2 and Guidance for criteria for eTimes.12)</p>

¹ Initial year of reporting to EMSA will include only 911, but LEMSA may choose to also monitor APOT for IFT, 7-digit and other transports to the ED

² It is recommended to configure eTimes.12 “Destination Patient Transfer of Care Date/Time” in NEMESIS 3.4 with a signature block. If a system does not accommodate a signature block or a signature is not obtained for operational reasons, a time stamp on the ePCR based verbal acknowledgement of EMS patient report by ED medical personnel is sufficient.

AMBULANCE PATIENT OFFLOAD TIME APOT-1 SPECIFICATIONS

Approved by EMS Commission 12-14-16 (Rev 11-17-2016)

Exclusion Criteria	None	
Indicator Formula Numeric Expression	The formula is the 90 th Percentile of the given numbers or distribution in their ascending order.	
Example of Final Reporting Value (number and units)	19 minutes, 34 seconds (19:34)	
Sampling	No	
Aggregation	Yes	
Minimum Data Values	Not Applicable	
Data Collection Approach	Retrospective data sources for required data elements include administrative data and pre-hospital care records. Variation may exist in the assignment of coding; therefore, coding practices may require evaluation to ensure consistency.	
Suggested Display Format & Frequency	Process control or run chart by month	
Suggested Statistical Measures	90 th Percentile Measurement. Aggregate measure of central tendency and quantile (fractile) measurement to determine the span of frequency distributions.	
Trending Analysis	Yes	
Benchmark Analysis	(TBD)	
Reporting Notes	<p>Report aggregate values by:</p> <ol style="list-style-type: none"> 1) LEMSA 2) Individual hospital <p>Report the 90 percentile time calculated and the denominator (number of 911 transports to emergency department with time stamp data available)</p> <p>Report Quarterly, within 2 months of the end of the quarter:</p> <ul style="list-style-type: none"> • June 1 for period of January 1 through March 31; • September 1 for period of April 1 through June 30; • December 1 for period of July 1 through September 30; • March 1 for period of October 1 through December 31 	

AMBULANCE PATIENT OFFLOAD TIME—APOT-2 SPECIFICATIONS

Approved by EMS Commission 12-14-16 (Rev 11-17-2016)

MEASURE SET	Extended Ambulance Patient Offload Time	
SET MEASURE ID #	APOT-2	
PERFORMANCE MEASURE NAME	Duration of Ambulance Patient Offload Time for Patients transported to the Emergency Department by 911 response emergency ambulance ¹	
Description	<p>2.1: What percentage of patients transported by EMS personnel experience a transfer of care within 20 minutes of arrival at the Hospital Emergency Department?</p> <p>2.2: What percentage of patients transported by EMS personnel experience a transfer of care between 21 - 60 minutes of arrival at the Hospital Emergency Department?</p> <p>2.3: What percentage of patients transported by EMS personnel experience a transfer of care between 61 - 120 minutes after arrival at the Hospital Emergency Department?</p> <p>2.4: What percentage of patients transported by EMS personnel experience a transfer of care between 121 - 180 minutes after arrival at the Hospital Emergency Department?</p> <p>2.5: What percent of patients transported by EMS personnel experience a transfer of care greater than 180 minutes after arrival at the Hospital Emergency Department?</p>	
Type of Measure	Process	
Reporting Value and Units	(%) Percentage	
Denominator Statement (population)	Number of patients who were transported to a hospital emergency department by EMS Personnel. Include only 911 response transports with eTimes.11 and eTimes.12 available.	
Denominator Inclusion Criteria	<u>Criteria (NEMSIS 3.4)</u>	<u>Data Elements (NEMSIS 3.4)</u>
	<p>All events for which eResponse.05 "Type of Service Requested" has value recorded of 911 Response (Scene);</p> <p><u>AND</u></p> <p>eDisposition.21 "Type of Destination" has value of 4221003, "Hospital-Emergency Department";</p> <p><u>AND</u></p>	<ul style="list-style-type: none"> • Type of Service Requested (eResponse.05) • Type of Destination (eDisposition.21) • Patient Arrived at Destination Date/Time (eTimes.11) • Destination Patient Transfer of Care Date/Time (eTimes.12)

1 The first year of reporting to EMSA will focus on 911 response units; however, LEMSAs may choose to also monitor IFT, 7-digit and other transports to the ED.

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	eTimes.11 “Patient Arrived at Destination Date/Time” values are logical and present <u>AND</u> Destination Patient Transfer of Care Date/Time (eTimes.12) values are logical and present ²	
Exclusion Criteria	None	
	<u>Criteria</u> ³	<u>Data Elements</u>
Numerator Statement (sub-population)	<p>2.1: What percentage of patients transported by EMS personnel experience a transfer of care within 20 minutes of arrival at the Hospital Emergency Department?</p> <p>2.2: Number of patients who were transported to a hospital emergency department by EMS Personnel and had their care transferred within 20 - 60 minutes after their arrival to the Emergency Department.</p> <p>2.3: Number of patients who were transported to a hospital emergency department by EMS Personnel and had their care transferred 61-120 minutes after their arrival to the Emergency Department.</p> <p>2.4: Number of patients who were transported to a hospital emergency department by EMS</p>	<ul style="list-style-type: none"> • Type of Service Requested (eResponse.05) • Type of Destination (eDisposition.21) • Patient Arrived at Destination Date/Time (eTimes.11) • Destination Patient Transfer of Care Date/Time (eTimes.12)

² It is recommended to configure ePCR programs so that the signature block timestamp is collected as eTimes.12 “Destination Patient Transfer of Care Date/Time” in NEMSIS 3.4. If a system does not accommodate a signature block or a signature is not obtained for operational reasons, a time stamp on the ePCR based verbal acknowledgement of EMS patient report by ED medical personnel is sufficient.

³ Transfer to hospital care and end of APOT interval should include the following:

- Verbal patient report is given by transporting EMS personnel and acknowledged by ED medical personnel
- Patient is transferred off the EMS gurney
- Clock stop is documented through a timestamp that is captured as eTimes.12 in NEMSIS 3

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	<p>Personnel and had their care transferred 121 - 180 minutes after their arrival to the Emergency Department.</p> <p>2.5: Number of patients transported by EMS personnel that experience a transfer of care greater than 180 minutes after arrival at the Hospital Emergency Department.</p>	
Numerator Inclusion Criteria	<u>Criteria</u>	<u>Data Elements</u>
	<p>All events for which eResponse.05 “type of service requested” has value recorded of “911 response (Scene)”;</p> <p><u>AND</u></p> <p>eTimes.12 “Destination Patient Transfer of Care Date/Time” values are logical and present</p>	<ul style="list-style-type: none"> • Type of Service Requested (eResponse.05) • Type of Destination (eDisposition.21) • Patient Arrived at Destination Date/Time (eTimes.11) • Destination Patient Transfer of Care Date/Time (eTimes.12)
Exclusion Criteria	<u>Criteria</u>	<u>Data Elements</u>
	None	
Indicator Formula Numeric Expression	<p>The formula is to divide (/) the numerator (N) by the denominator (D) and then multiply (x) by 100 to obtain the (%) value the indicator is to report. Therefore the indicator expressed numerically is $N/D = \%$</p>	
Example of Final Reporting Value (number and units)	15%	
Sampling	No	

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Aggregation	Yes	
Minimum Data Values	Not Applicable	
Data Collection Approach	<ul style="list-style-type: none"> Retrospective data sources for required data elements include administrative data and pre-hospital care records. Variation may exist in the assignment of coding; therefore, coding practices may require evaluation to ensure consistency. 	
Suggested Display Format & Frequency	Process control or run chart by month	
Suggested Statistical Measures	Mean (x); Mode (m)	
Trending Analysis	Yes	
Reporting Notes	<p>Report aggregate values by:</p> <ol style="list-style-type: none"> 1) LEMSA 2) Individual hospital <p>Report the % calculated and the denominator used to calculate (number of 911 transports with time stamp data available)</p> <p>Report Quarterly, within 2 months of the end of the quarter:</p> <ul style="list-style-type: none"> • June 1 for period of January 1 through March 31; • September 1 for period of April 1 through June 30; • December 1 for period of July 1 through September 30; • March 1 for period of October 1 through December 31 	

Ambulance Patient Offload Time (APOT) Standardized Methods for Data Collection and Reporting

Approved by EMS Commission 12-14-16 (Rev 11-21-2016)

Purpose

To provide recommendations/guidelines to Local EMS Agencies (LEMSAs) for implementing standardized methodologies for Ambulance Patient Offload Time (APOT) data collection and reporting to the EMS Authority (EMSA) in accordance with AB 1223 (O'Donnell, 2015. See appendix A for entire text of bill.)

Background

Health and Safety Code 1797.120 now requires EMSA to develop a standard methodology for calculation of, and reporting by, a LEMSA of ambulance patient offload time.

Health and Safety Code 1797.225 establishes that a LEMSA may adopt policies and procedures for calculating and reporting ambulance offload time. Those policies and procedures must be based on the statewide standard methodology developed pursuant to 1797.120. LEMSAs that adopt patient off-loading policies and procedures must also establish criteria for reporting and quality assurance follow-up for a patient off load time that exceeds the standard.

1. Definitions

Ambulance arrival at the Emergency Department (ED) - the time ambulance stops at the location outside the hospital ED where the patient will be unloaded from the ambulance.

Ambulance Patient Offload Time (APOT) - the time interval between the arrival of an ambulance patient at an ED and the time the patient is transferred to the ED gurney, bed, chair or other acceptable location and the emergency department assumes the responsibility for care of the patient.¹

Ambulance Patient Offload Time (APOT) Standard – the time interval standard established by the LEMSA within which an ambulance patient that has arrived in an ED should be transferred to an ED gurney, bed, chair or other acceptable location and the ED assumes the responsibility for care of the patient.

Non-Standard Patient Offload Time – the ambulance patient offload time for a patient exceeds the standard period of time designated by the LEMSA.² (See *Standards* below.)

Ambulance transport – the 911 response emergency ambulance transport of a patient from the prehospital EMS system to an approved EMS receiving hospital.³

APOT 1 - an ambulance patient offload time interval measure. This metric is a continuous variable measured in minutes and seconds then aggregated and reported at the 90th percentile.

APOT 2 - an ambulance patient offload time interval process measure. This metric demonstrates the incidence of ambulance patient offload times expressed as a percentage of total EMS patient transports within a twenty (20) minute target and exceeding that time in reference to 60, 120 and 180 minute time intervals,.

¹ Health and Safety Code Division 2.5, Chapter 3, Article 1, Section 1797.120 (b).

² Health and Safety Code Division 2.5, Chapter 4, Article 1, Section 1797.225(c)(1).

³ For the first year of reporting to EMSA, this will be limited to 911 response; however, LEMSAs may choose to also track APOT for all Inter-facility transports, 7-digit response, and other patient transports to the ED.

Ambulance Patient Offload Delay (APOD) - the occurrence of a patient remaining on the ambulance gurney and/or the emergency department has not assumed responsibility for patient care beyond the LEMSA approved APOT standard. (Synonymous with non-standard patient offload time)

AVL/GPS - Automated Vehicle Location/Global Position System

CEMSIS - California Emergency Medical Services Information System

CAD - Computer Aided Dispatch

Clock Start – the timestamp that captures when APOT begins. This is captured in the NEMSIS 3.4 data set as the time the patient/ambulance arrives at destination/receiving hospital at the location outside the hospital ED where the patient will be unloaded from the ambulance (eTimes.11).

Clock Stop – the timestamp that captures when APOT ends. This is captured in the NEMSIS 3.4 data set as destination patient transfer of care date/time (eTimes.12).

ePCR – Electronic Patient Care Report

Emergency Department (ED) Medical Personnel – an ED physician, mid-level practitioner (e.g. Physician Assistant, Nurse Practitioner) or Registered Nurse (RN).

EMS Personnel – Public Safety First Responders, EMTs, AEMTs, EMT-II and/or paramedics responsible for out of hospital patient care and transport consistent with the scope of practice as authorized by their level of credentialing.

NEMSIS – National Emergency Medical Services Information System

MDC – Mobile Data Computer

Timestamp - a continuous variable that captures a date and time on a twenty-four (24) hour clock.

Transfer of Patient Care - the transition of patient care responsibility from EMS personnel to receiving hospital ED medical personnel. (See criteria below in Measurement Methods.)

Verbal Patient Report - The face to face verbal exchange of key patient information between EMS personnel and ED medical personnel provided that is presumed to indicate transfer of patient care.

Written EMS Report - The written report supplied to ED medical personnel that details patient assessment and care that was provided by EMS personnel. Electronic report (ePCR) is now required by Health and Safety Code 1797.227.

2. LEMSA Standards

In adopting policies and procedures for calculating and reporting APOT, a LEMSA must do the following⁴:

- a. Use the statewide standard methodology for calculating and reporting APOT developed by the EMSA.
- b. Establish criteria for the reporting of, and quality assurance follow-up for a non-standard patient offload time

Standard Offload Time

For purposes of local policy and quality improvement activities, each LEMSA may determine its own local system standard for comparison against APOT-1 (90th percentile of APOT time intervals). A survey of LEMSAs in 2015 indicated that LEMSAs measuring at that time had standard times that varied from predominantly between fifteen (15) and thirty (30) minutes with a range of ten (10) to forty-five (45) minutes. LEMSAs may develop the standard time using statistical techniques based on current or initial measures and in collaboration with health care partners.

Non-Standard Offload Time

“Non-standard patient offload time” is a time interval that is poorly defined in statute. For the purposes of statute implementation, it will be interpreted to mean any time interval that exceeds the APOT standard established by the LEMSA. Many LEMSAs currently define this as Ambulance Patient Offload Delay (APOD) consistent with the metrics and definitions contained in The Ambulance Patient Offload Toolkit⁵.

Best Practice Example/Recommendation: LEMSAs should adopt the definition of non-standard patient offload time as synonymous with APOD. The associated quality improvement activity required in the statute⁶ may be a graduated response that includes but would not be limited to measurement, monitoring, and a process consistent with the Toolkit. Refer to Section 6 below for recommendation of an APOT that would be considered a threshold event.

3. Measurement Methods

APOT is defined in statute as a time interval, therefore process controls must be established for collecting the beginning and ending timestamps to be utilized for the calculation of the time interval.

Clock Start (eTimes.11, “Patient Arrived at Destination Date/Time”)

The clock start timestamp is straightforward and most commonly defined as the time the ambulance arrives at the ED and stops at the location outside the hospital ED where the

⁴ Health and Safety Code Division 2.5, Chapter 4, Article 1, Section 1797.225(b)(1) and (2).

⁵ Toolkit to Reduce Ambulance Patient Offload Delays in the Emergency Department: Building Strategies for California Hospital and Local Emergency Services Agencies, 2014
<http://www.emsa.ca.gov/Media/Default/PDF/Toolkit-Reduce-Amb-Patient.pdf>

⁶ Health and Safety Code Division 2.5, Chapter 4, Article 1, Section 1797.225(b)(2)

patient will be unloaded from the ambulance. LEMSAs currently collect this timestamp in several ways:

- Ambulance provider Computer Aided Dispatch (CAD) systems with two-way radio voice communication or Mobile Digital Communicator (MDC);
- Systems with Automated vehicle location/Global positioning systems (AVL/GPS) capability;
- ePCR or other commercial data collection system (e.g. FirstWatch, ReddiNet, EMSsystems).

It is advantageous to have an ePCR system that is integrated with the provider agency CAD and/or other data collection systems for single point data retrieval.

Clock Stop (eTimes.12. “Destination Patient Transfer of Care Date/Time”)

Capturing a timestamp for clock stop is more complex since the statute establishes two processes as the end point of APOT: *when the patient is transferred to the emergency department gurney, bed, chair or other acceptable location **and** the emergency department has assumed the responsibility for care of the patient.* This means that LEMSAs must establish a process control(s) with an associated data collection tool that can capture the completion of both under a single timestamp (clock stop). This needs to be defined as an event, not a process, for the purpose of collecting an accurate timestamp as to when transfer of care occurred.

Transfer of care criteria should include the following:

- Verbal patient report is given by transporting EMS personnel and acknowledged by ED medical personnel⁷
- The patient is moved off of the EMS gurney
- Clock stop is documented through a timestamp that is captured as eTimes.12 “Destination Patient Transfer of Care Date/Time” in NEMSIS 3.

Completion of the ePCR is not a requirement for Clock Stop.

In accordance with Health and Safety Code 1798.0, this is the responsibility of the local EMS agency Medical Director, because it determines when EMS medical direction terminates and EMS personnel may legally and ethically leave the patient.⁸

To avoid disagreement on time interval validity, it is recommended that LEMSAs, with hospital input, agree on the procedural implementation of these criteria for transfer of patient care that is synonymous with “acceptance of patient care responsibility” by hospital ED medical personnel.

Best Practice Example/Recommendation: Process controls that provide for the alignment of these two events, transfer of care and removal of the patient from the ambulance gurney, allow for the collection of a single timestamp. Optimally, documenting the completion of these two events should be accomplished with the signature of ED medical personnel on the

⁷ Verbal report must include a structured and complete report with the following information:

Chief complaint; initial vital signs; pertinent history and exam findings; laboratory tests (e.g., glucose) and copy of ECG; interventions and treatment provided in the field; current vital signs and status.

⁸ HSC 1798.0 (Medical Director Responsibilities)

(a) The medical direction and management of an emergency medical services system shall be under the medical control of the medical director of the local EMS agency. This medical control shall be maintained in accordance with standards for medical control established by the authority.

ePCR and a validation or closed call rule within the ePCR program for the associated timestamp.

4. Data Collection and Documentation Options

An electronic patient care report (ePCR) or reporting system is a critical element of APOT data collection and required for an EMS provider to report data to the LEMSA. It is presumed that a LEMSA will adopt policies and procedures for the collection and reporting of APOT data collected from EMS providers that are using an ePCR in compliance with State law⁹. Data elements defined in APOT-1 and APOT-2 are consistent with NEMSIS version 3 and CEMSIS (California Data Dictionary).

The CAD systems are utilized to record two-way radio communications or information transmitted via MDC between the field and dispatch centers. CAD is utilized by most EMS providers to capture dispatch data and provide, critical information related to EMS operations. CAD data has historically provided much of the information needed to determine APOT. Accurate capture of data for statewide APOT reporting requires standardized CAD, data elements and definitions compliant with the NEMSIS 3.4 data standards. Newer systems combined with the updated NEMSIS data set for CAD provide integration with ePCR systems utilizing data elements defined in NEMSIS 3.4 and CEMSIS.

Examples of data collection and documentation tools currently in use include:

- A wide variety of CAD platforms
- ePCR without CAD integration
- ePCR with CAD integration
- First Watch – Transfer of Care (TOC) Module
- ReddiNet
- EMSsystems

Best Practice Example/Recommendation: LEMSA's encourage/require all EMS providers to implement digital CAD data migration into ePCR platforms during transition to NEMSIS 3.4. This will provide for data analysis from a single source.

5. Data Validation, Local EMS System Reporting, and Data Analysis

Data collection systems, processes, analysis, reporting should be developed as a collaborative effort between the LEMSA, EMS provider(s) and hospitals. Local EMS systems that have identified negative system impacts due to APOD should utilize common language and metrics established by this document to define and measure APOT in the development of action plans to decrease or eliminate APOD. During discussions with the statewide ambulance patient offload coalition in 2012 and in subsequent surveys, some agencies did not recognize that they had a problem or realize the extent of the problem until they initiated measurement.

Measurement and data analysis should be followed by action planning, if indicated. Systems that demonstrate improvement in ambulance patient offload delay (APOD) have

⁹ Health and Safety Code Division 2.5, Chapter 4, Article 1, Section 1797.227

consistently had high degree of collaboration between hospital and local EMS providers, and successful implementation of process improvement activities.

Examples currently utilized by LEMSAs include:

- Formation of ad-hoc or standing committees and workgroups
- Standardized definitions and nomenclature for APOT
- Collaborative development and review of performance reports by hospital and system
- Collaborative analytical and process control methodology (e.g. Six Sigma)
- Inclusion of APOT indicators in the LEMSA EMS Quality Improvement Plan

There is no requirement for a LEMSA to collect and report APOT. A LEMSA that *“adopts policies and procedures for calculating and reporting ambulance patient offload time shall”*:

- Use the standard methodology,
- Establish criteria for providers to report the data,
- Utilize the data by establishing criteria for quality assurance follow-up for their local definition of a nonstandard patient offload time, and
- Report the data to EMSA.

Since EMS providers are obligated by a different statute to report patient data in electronic format to the LEMSA, local reporting is not an issue. The LEMSA may choose to display the data in a format of their choice.

Best Practice Example/Recommendation: LEMSAs should generate standardized monthly APOT reports utilizing the APOT-1 and APOT-2 methodology. Although initial state reporting requirements will be limited to emergency ambulance transports resulting from 911 response, LEMSAs may choose to include all ambulance transports, including 7-digit and interfacility transfers. Monthly or quarterly reports should be sent to EMS system stakeholders followed by periodic working meetings utilizing contemporary statistical process control analytics (e.g., Six Sigma) for data validation, CQI drill-down and action planning.

6. Criteria for Quality Assurance Follow-up

LEMSAs that adopt policies and procedures related to APOT must also establish criteria for the reporting and quality assurance follow-up for non-standard patient offload time.¹⁰ It is recommended that the LEMSA adopt definitions for events with triggers linked to the LEMSA EMS Quality Improvement Program (EQIP).

Triggers for specific quality assurance or quality improvement actions could include but are not be limited to:¹¹

- Occurrence of extended APOD, for example, more than one hour (APOT-2)

¹⁰ Health and Safety Code Division 2.5, Chapter 4, Article 1, Section 1797.225(b)(2)

¹¹ Toolkit to Reduce Ambulance Patient Offload Delays in the Emergency Department: Building Strategies for California Hospital and Local Emergency Services Agencies, 2014
<http://www.emsa.ca.gov/Media/Default/PDF/Toolkit-Reduce-Amb-Patient.pdf>

- Occurrence of APOD with the patient decompensating or worsening in condition
- Occurrence of APOD with an associated patient complain
- Occurrence of APOD with associated delayed ambulance response(s) to other calls in the community
- Facility or system performance below established fractile (e.g. 90%) for compliance to the LEMSA's APOT standard

Best Practice Example/Recommendation: LEMSAs may establish an APOT that exceeds sixty (60) minutes as a threshold event that would trigger a response that may include engaging an EMS supervisor and hospital executive, the immediate transfer care and removal of the patient from the ambulance gurney, reporting to the effected entities, and quality assurance follow-up by the ambulance provider agency, the hospital and the LEMSA. As with the definition of Standard time, each LEMSA may determine its own threshold triggers.

7. Reporting to EMSA

EMSA has developed two (2) Indicator Specification Sheets (ISS) similar to the Core Measures specifications to provide guidance to LEMSAs on how to voluntarily submit the APOT data with the Core Measures. LEMSAs collecting ambulance patient offload times shall use the standard methodology when collecting the appropriate data to measures APOT. The two new ISS forms are included with this guidance and serve as the statewide standard methodology to extract and report APOT data and the reporting format.

In summary, these are:

- Aggregate data, but include the denominator (number of runs) for each data value
 - Total by LEMSA for the reporting period
 - Stratify by hospital--denominators are needed to provide context for hospital results.
 - Report quarterly on specified dates
- a. APOT-1: The number reported is the APOT in minutes for transfer of care of 90% of ambulance patients and the number of ambulance runs included in the report.
 - b. APOT-2: The number reported is the percentage of ambulance patients transported by EMS personnel with an offload time within twenty (20) minutes and those transports with an ambulance patient offload delay beyond 20 minutes. APOD is further stratified by sixty (60) minute intervals up to one hundred eighty (180) minutes then any APOT exceeding one hundred eighty (180) minutes. Twenty minutes has been selected as the target standard for statewide reporting consistency based on precedence from other systems outside of California, as well as experience of some of the California LEMSAs. Nothing in this measure limits the LEMSA from selecting their preferred standard and non-standard time for local discussion and performance improvement processes.

Appendix A: Language of AB 1223 (O'Donnell, 2015)

SECTION 1. Section 1797.120 is added to the *Health and Safety Code*, to read:

1797.120.

- (a) The authority shall develop, using input from stakeholders, including, but not limited to, hospitals, local EMS agencies, and public and private EMS providers, and, after approval by the commission pursuant to Section 1799.50, adopt a statewide standard methodology for the calculation and reporting by a local EMS agency of ambulance patient offload time.
- (b) For the purposes of this section, “ambulance patient offload time” is defined as the interval between the arrival of an ambulance patient at an emergency department and the time that the patient is transferred to an emergency department gurney, bed, chair, or other acceptable location and the emergency department assumes responsibility for care of the patient.

SEC 2. Section 1797.225 is added to the *Health and Safety Code*, to read:

1797.225.

- (a) A local EMS agency may adopt policies and procedures for calculating and reporting ambulance patient offload time, as defined in subdivision (b) of Section 1797.120.
- (b) A local EMS agency that adopts policies and procedures for calculating and reporting ambulance patient offload time pursuant to subdivision (a) shall do all of the following:
 - (1) Use the statewide standard methodology for calculating and reporting ambulance patient offload time developed by the authority pursuant to Section 1797.120.
 - (2) Establish criteria for the reporting of, and quality assurance followup for, a nonstandard patient offload time, as defined in subdivision (c).
- (c) (1) For the purposes of this section, a “nonstandard patient offload time” means that the ambulance patient offload time for a patient exceeds a period of time designated in the criteria established by the local EMS agency pursuant to paragraph (2) of subdivision (b).
- (2) “Nonstandard patient offload time” does not include instances in which the ambulance patient offload time exceeds the period set by the local EMS agency due to acts of God, natural disasters, or manmade disasters.



June 7, 2017

TO: EMS/Trauma Committee Members

FROM: BJ Bartleson, VP Nursing & Clinical Services
Carla Schneider, Emergency Director, Hoag Hospital

SUBJECT: C. Diff

SUMMARY

Hoag hospital has been working towards zero deficits with C.diff patient infections. They have identified that many hospitals are transferred between long term care facilities and the hospital and have noted inconsistent practices with sporicidal solutions.

ACTION REQUESTED

- Information and support from committee members to discuss a solution where all pre-hospital members have standard cleaning protocols that include a sporicidal agent to prevent the spread of C. difficile.

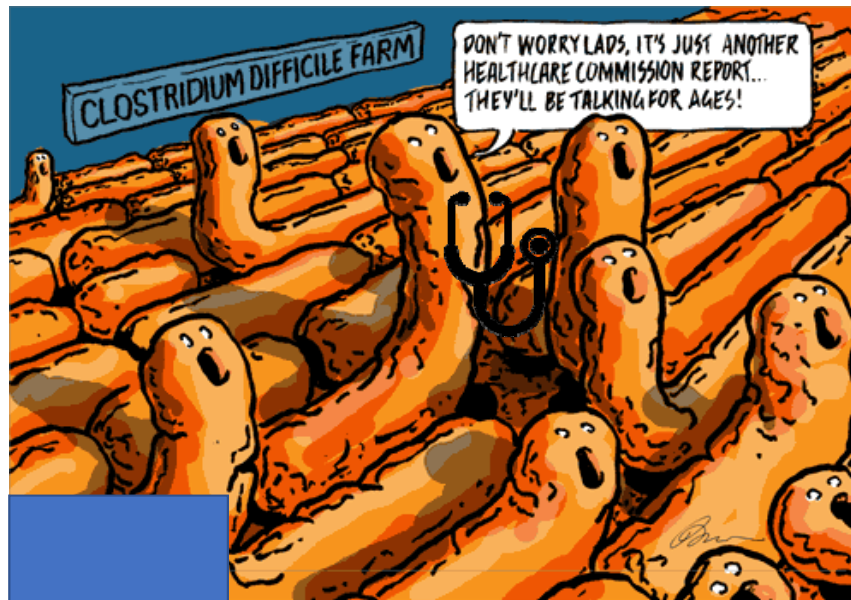
DISCUSSION

During the last several meeting the committee has discussed that prehospital providers use various standards of ambulance cleaning policies after patient transport.

DISCUSSION

1. How are prehospital cleaning policies determined?
2. How would we go about educating and or developing an opportunity for all policies to include a sporicidal agent?
3. Are there cost issues?

California Hospital Association EMS/Trauma Committee June 7, 2017



Carla E. Schneider, RN, MSN, CEN, MICN

All About Clostridium Difficile (C-diff)

- C-diff bacteria causes an infection that creates inflammation of the colon
- S/S: fever, loss of appetite, nausea, watery diarrhea, abd pain & tenderness
- In the U.S., care of C-diff places a burden on healthcare system, with cost in excess of \$3.2 billion/yr.
- CDC's most recent figure for C-diff associated deaths is growing, & survey completed in 2011 reflected over 500,000 infections and over 29,300 deaths/yr.
- Patients with C-diff can shed spores even when not having symptoms
- C-diff spores shed in stool & without necessary hygiene precautions, spores transfer to hands and finally surfaces
- handwashing with soap and water is the only way to prevent spread as c diff is resistant to hand gel & spores can live on inanimate surfaces for up to 30-60 days

(Fernanda, 2015)

Why Focus on Prevention by EMS Providers?

- Often patients have compromised immune systems, example include: young children, the elderly, patients with cancer, & victims of serious injuries including burns (Augustine, 2013)
- 65% of all residents from long term care facilities have a multidrug resistant organism, like MRSA or C-diff (Facility Guidance, 2015)
- The spores transferred to surfaces can survive outside the body for months and are highly resistant to cleaning agents (Fernanda, 2015)
- Use of appropriate cleaning agents for equipment between patients will prevent both EMS providers and patients from health care associated infection (Augustine, 2013)
- Stopping the spread of multi-drug resistant organisms saves lives

Review of Pre-Hospital Infection Prevention Policies; Both County Accredited and Private EMT/Paramedics

Excerpts:

When EMT's are dispatched or come into contact with C-diff ...de-con gurney with PDI Sani-Cloth Bleach Germicidal Disposable Wipe (Shoreline)

Ambulance service providers shall be required to demonstrate satisfactory compliance with all infectious disease, blood- born and airborne pathogen control plans as required by federal and state regulations (OCEMS Policy #720.60)

*"...generally we use an alcohol based wipe to clean them but when there is known C-diff we try to use bleach wipes however those are not always available to us. I would say that it is **NOT** common practice for bleach to be used during clean up on every patient with diarrhea." (Costa Mesa Firefighter)*

...Common sense, experience, and a common basis of practices and informational controls are the best allies in keeping exposures to a minimum. The policies in this section should be viewed as guidelines, where individual personnel are aware of all areas of concern and approach each situation with informed caution and sense. (CMFD, Standard Operating Procedures)

Consider the Following Recommendations for EMS Providers:

- Review of C-diff , including risk of healthcare associated infections among patients and health-care providers (Fleming,2009)
- Update policies to reflect the use of an EPA registered sporicidal cleaning solutions for equipment between patients (<http://www.epa.gov/sites/production/files/2017>)
- Education and training on use of sporicidal solutions for disinfecting equipment, based on manufacturers recommendations including use of personal protective equipment (Fleming, 2009)

REFERENCES

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Fleming, J., (2009). EMS equipment and transport vehicle cleaning and disinfection: challenges & best practices. *EMS World*. Retrieved from: <http://www.emsworld.com/article/10320653/ems-equipment-and-transport-vehicle-cleaning-and-disinfection-challenges-best-practices>

Augustine, J., [Infectious exposure in EMS: The dirty business of keeping clean. *EMS 1 News*](https://www.ems1.com/health-and-wellness/articles/1440871-Infectious-exposure-in-EMS-The-dirty-business-of-keeping-clean). Retrieved from: <https://www.ems1.com/health-and-wellness/articles/1440871-Infectious-exposure-in-EMS-The-dirty-business-of-keeping-clean>

Facility Guidance for Control of Carbapenem-resistant Enterobacteriaceae (2015) retrieved from: <https://www.cdc.gov/hai/research/cdc-mdro-project.html>

Margaret c. diff. John c. diff. Randall c. diff. Sol c. diff.
Kathleen c. diff. Aini c. diff. Rex c. diff.
Blenda c. diff. Arden c. diff. Paul c. diff.

First do no harm...

Donald c. diff. Duane c. diff. Xiying c. diff.
Michael c. diff. Joseph c. diff. Guip c. diff.
Dorothy c. diff. Patricia c. diff. Delia c. diff. Kathleen c. diff.

Tonia, 42

C.diff.

My battle with *C. diff* began in January 2015 after taking three doses of Clindamycin prophylactically. I may have picked up the spore during a stay in the critical care unit or while visiting a family member in the ICU. I may have even picked it up while grocery shopping. I will never know.

It is now the end of August as I'm writing this story. I am not sure if my battle is over. When I was first diagnosed, I was admitted to the hospital and started on Vancomycin. A week after finishing the Vancomycin, my symptoms returned and I was instead put on Flagyl. In February, I had to have emergency surgery for multiple bowel obstructions; this required antibiotics. A week after surgery, the *C. diff* was back. I was again put on Vancomycin, and needed to be hospitalized three more times.

In April, the doctor said, "Stop the meds and let's see what happens." After following these instructions, I was admitted two times for pancreatitis (most likely caused by all of the Vancomycin). In July, I tested positive again, and I was again admitted due to severe side effects of the Vancomycin. I was just tested again yesterday due to some symptoms, but the test was negative.

I struggle daily with stomach pain, fatigue, food intolerance, and a level of anxiety I have never experienced before in my life. This is a horrible infection and a true cure cannot come soon enough. No one should have to suffer through this, or lose their life, or the life of a loved one to this wretched bacterium. Something needs to be done, and very, very soon.

Judy, 72yo

C.diff.

Our mom went to the hospital when she was having difficulty breathing. She was admitted for a lung infection and treated with antibiotics for 8 days. Our family was not prepared for the torment that the following months would bring.

She began to experience uncontrollable diarrhea which resulted in severe dehydration and was later diagnosed with *c.diff.* We knew little about it but learned very quickly. It became second nature for our family to put on protective gowns and gloves before visiting her room.

She received a prolonged course of powerful antibiotics by mouth and enemas. When those didn't work, the Doctors recommended colon removal surgery. She lost so much weight and eventually had to have a feeding tube inserted. Being confined to the hospital and debilitated with *C. diff* was excruciating for our mother. It deprived her from the thing she loved the most, time with her kids and grand kids.

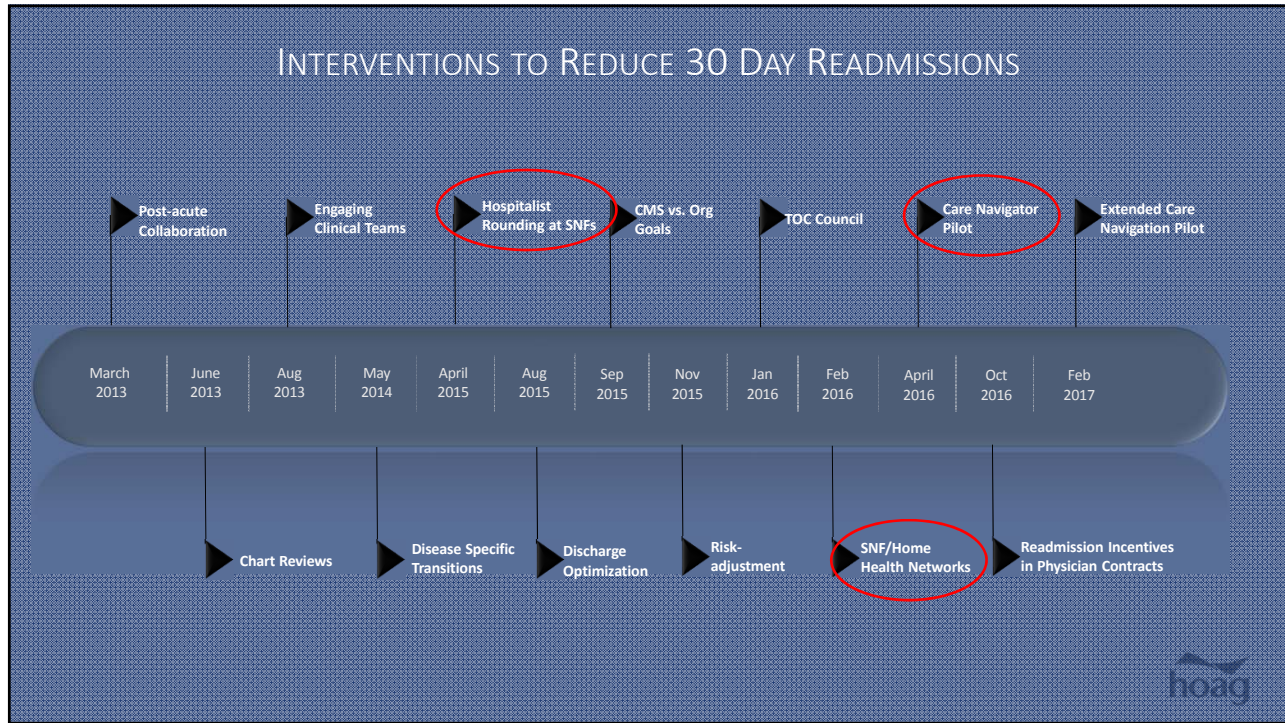
We lost her just six months after it all began. She was the matriarch of our family. We hope that in telling her story we can bring awareness to this devastating condition.

HOAG'S READMISSION REDUCTION PROGRAM & ED OVERCROWDING MANAGEMENT

JASON ZEPEDA

EMS/TRAUMA COMMITTEE MEETING
JUNE 7, 2017

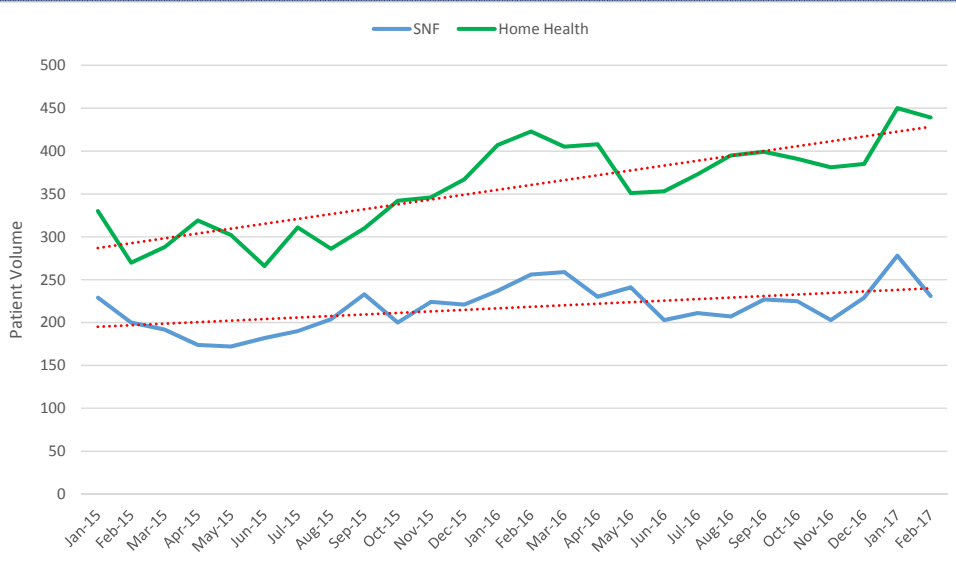




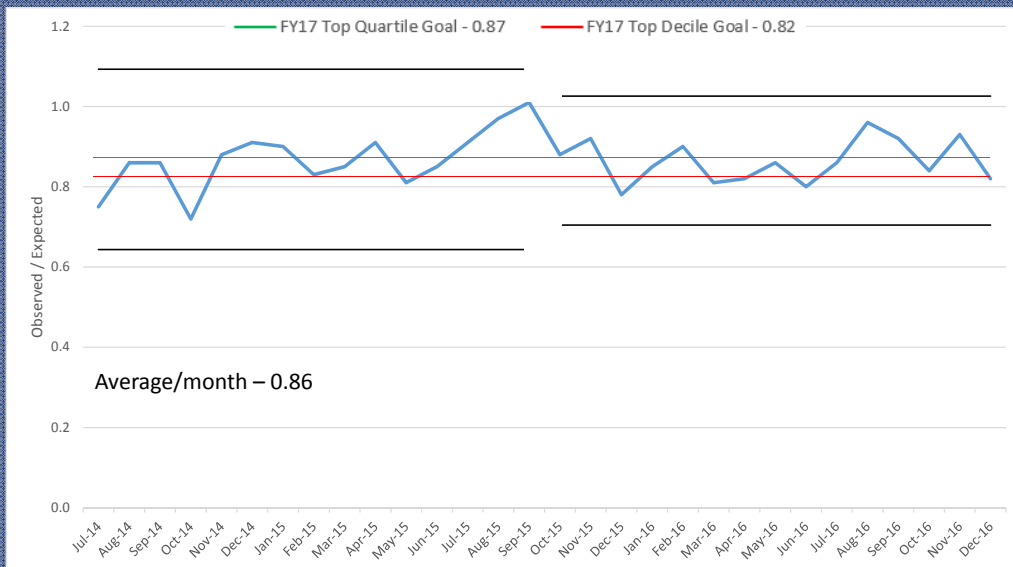
30 DAY INPATIENT READMISSIONS – CY16

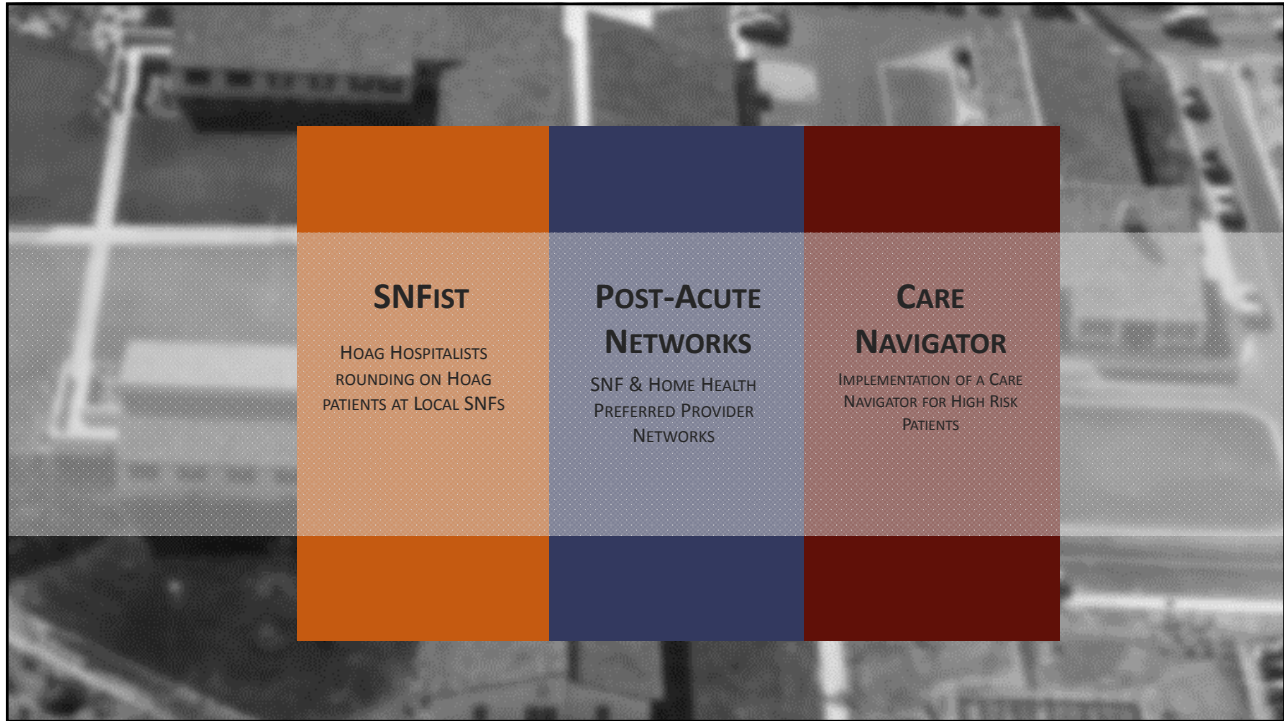
Discharge Disposition	Discharge Disposition Rate	Readmit Rate	o:e Ratio
Home no Services	71%	6%	0.79
Home Health	13%	18%	1.14
SNF	7.5%	19%	0.97
Other	8.5%	7%	0.37

SNF & HOME HEALTH TRANSITION VOLUME




INPATIENT OBSERVED / EXPECTED READMISSIONS JULY 2014 – DEC 2016






SNFIST ROUNDING



PARTNERSHIP WHERE A HOAG HOSPITALIST
ROUNDS ON HOAG PATIENTS AT PARTNER SNFS


- 12 MDs ROUNDING AT 7 SNFs
- AVG DAILY CENSUS: 60 – 80 RESIDENTS
- ROUNDING MODEL
 - SEE PATIENTS WITHIN 24-48 HRS OF ADMISSION
 - MORE FREQUENT VISITS (2-3x/WEEK)
 - DISCHARGE SUMMARIES (SENT TO PCPS AND SPECIALISTS)
 - PARTICIPATE IN QA COMMITTEES
 - COMMUNICATE W/PCPS AND SPECIALISTS
 - EXAMPLES OF IMPROVED CARE: URINARY RETENTION/BLADDER SCANNER, HAND HYGIENE, ANTIMICROBIAL STEWARDSHIP





SNF NETWORK

PREFERRED PROVIDERS
FOR SKILLED NURSING

Preventing Poor Outcomes
Well managed transitions can improve health & decrease costs



Hospital


SNF


Home

←
→

- Seven Partner SNFs
- Launched Feb 2016
 - Request for Proposal
- Clinical Education
- Transition Process
 - Acute to SNF
 - SNF to Home Health
- Lab Testing
- SNFist Rounding
- 1:1 Joint Operating Council Meetings
 - Administrator, DON, Liaison
- Data Sharing
 - Performance Dashboard



SNF PERFORMANCE METRICS

Quality Indicators	<ul style="list-style-type: none"> -Pressure Injuries, Falls, UTIs -Psychotropic Medication Usage -Readmissions & ED Visits (CMS) -Physical Function Improvement
Regulatory Indicators	<ul style="list-style-type: none"> -Survey Results -Complaints -Staffing Ratios -STAR Rating
Utilization Indicators	<ul style="list-style-type: none"> -Turnover & LOS -Readmissions (Hospital) -Medicare Spend Per Beneficiary

HHA NETWORK

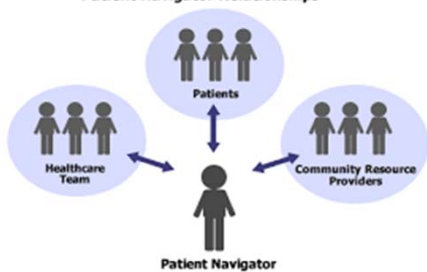
PREFERRED PROVIDERS
FOR HOME HEALTH
AGENCIES



- Five Partner SNFs
- Launched Jan 2016
 - Request for Proposal – 29 HHAs
- Clinical Education
- Transition Process
 - Acute to Home Health
 - SNF to Home Health
- Lab Testing
- Referral Equality
 - Volume & Payor
- Caregiver Shortage
- Data Sharing



Patient Navigator Relationships



- Care Navigator Pilot → “Non-Clinical” Care Transition Issues
 - Goals:
 - “Why” patients readmit
 - Reduce Hospital Encounters
- Operational Details
 - 75 patients
 - Senior, Medicare FFS
 - Readmission History
 - Non-Disease Specific
 - Sociodemographic Challenges
 - May 1st 2016 – Aug 31st 2016
 - LCSW
 - Telephone Based Interventions



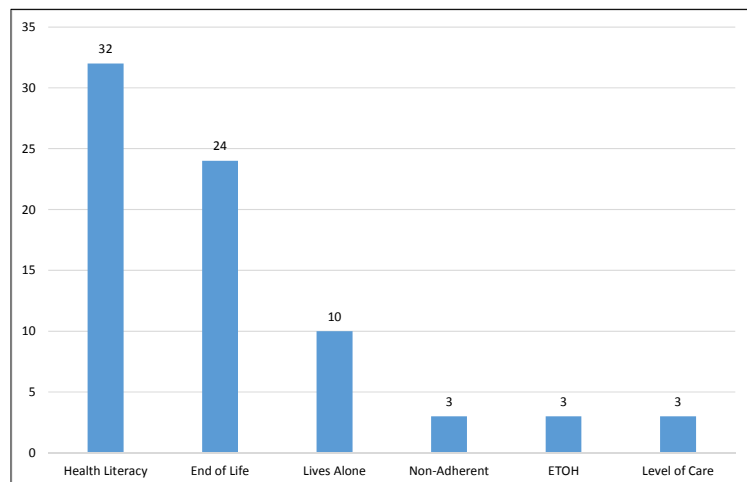
Care Navigator Interventions

- Relationship Building → Face to Face & Telephone
- Advocating for Patients
- Making PCP Appointments
- Improve Problem Solving and Coping Skills
- Referrals to Community Resources
- Supportive Counseling
- Addressing Substance Abuse
- Coordination with Post-Acute Services

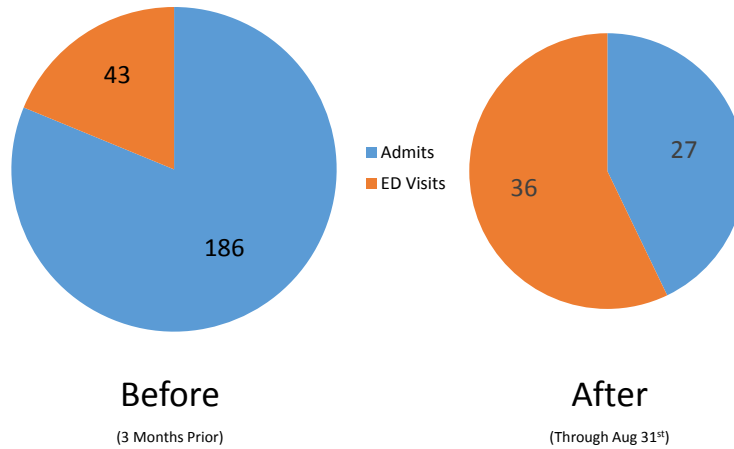


Admission Drivers

- Based on LCSW Assessment
- Main Driver
- Medicare vs. MediCal
- Focused Interventions



Results – Before and After Intervention



Next Steps – Moving Forward

- 18 Month Extension
 - 2 FTEs
 - Inpatient / Outpatient Referrals
 - Payer Agnostic
- Center for Navigation & Patient Advocacy
- Telehealth
- Increase Coordination Among Navigators



hoag

ED KAIZEN EVENT

- Rapid, focused application of Lean methods
- Reduce/eliminate waste in particular area of the business
- 3 – 5 day event
- Clear objective and scope
- Changes implemented quickly – action bias
- Everyone is involved



KAIZEN DETAILS

- Kaizen Event Duration
 - Four Days; 8:00am – 5:00pm
- Kaizen Planning
 - ED Observations, Data, Current State, Team Training
- Team Members
 - 12 Project Team Members (10 ED Staff)
 - Physician, Physician Assistant, Medical Scribe, Nurses, ECT, Registration, IT, EPMO, PI
- Scope
 - Disposition to Left ED
 - Homebound Patients
- Current State (CY15)
 - 62% of patients = “Dispo to Left ED” time of 30 min or less
- Objective
 - 75% of patients = “Dispo to Left ED” time of 30 min or less



KAIZEN AGENDA



- Day 1
 - Current State Observations
- Day 2
 - Failure Mode and Effect Analysis
 - Brainstorm solutions
 - Plan for pilot implementations
- Day 3
 - Coach staff on new processes
 - Implement and solicit feedback
- Day 4
 - Review data from pilots
 - Develop implementation plan for successful pilots



KAIZEN RESULTS

- 45 Potential Failure Points
 - Current State Mapping & Observations
- 6 Pilot Process Improvements
 - Determined & Implemented by Team
 1. Click "Dispo" after ACIs Completed
 2. RN to Collect Ride Status on Initial Assessment
 3. Confirm Meds & Excuse Notes Up Front
 4. RN to Discuss w/MD if Discharge Isn't Ready (30 sec Huddle)
 5. Scribe to Notify RN when ACIs are Ready
 6. Physician No Longer Required to Initial ACIs

Improvements Increased On-Time Discharges over 10%
Consistently Maintain 75% Goal



THANK YOU AND QUESTIONS





**CALIFORNIA
HOSPITAL
ASSOCIATION**

*Providing Leadership in
Health Policy and Advocacy*

June 7, 2017

TO: EMS/Trauma Committee Members

FROM: BJ Bartleson, VP Nursing & Clinical Services

SUBJECT: Legislation

SUMMARY

Attached is the CHA EMS Legislative list. High priority bills are SB 432, AB 1650, AB 820, SB 687.

ACTION REQUESTED

- Information and Feedback on particular legislative issues

CA AB 263	<p>AUTHOR: Rodriguez [D] TITLE: Emergency Medical Services Workers: Working Conditions INTRODUCED: 01/31/2017 LAST AMEND: 05/03/2017 DISPOSITION: Pending COMMITTEE: Assembly Appropriations Committee HEARING: 05/26/2017 SUMMARY:</p> <p>Relates to the Emergency Medical Services System and the Prehospital Emergency Medical Care Personnel Act. Requires an employer that provides emergency medical services as part of an emergency medical services system or plan to authorize and permit its employees to take prescribed rest periods. Requires a specified report concerning violent incidents involving EMS providers.</p> <p>STATUS:</p> <p>05/10/2017 In ASSEMBLY Committee on APPROPRIATIONS: To Suspend File.</p> <p>INDEX: 35, 57 ISSUES: BJ, GBS* LOBBYIST: CD, KAS* POSITION: F, X</p>
CA AB 340	<p>AUTHOR: Arambula [D] TITLE: Early and Periodic Screening, Diagnosis, and Treatment INTRODUCED: 02/07/2017 DISPOSITION: Pending COMMITTEE: Assembly Appropriations Committee HEARING: 05/26/2017 SUMMARY:</p> <p>Requires that screening services under a specified Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) Program include screening for trauma. Requires the adoption of tools and protocols for screening children for trauma.</p> <p>STATUS:</p> <p>04/05/2017 In ASSEMBLY Committee on APPROPRIATIONS: To Suspend File.</p> <p>INDEX: 35, 65 ISSUES: AK*, DBR, SL LOBBYIST: AH, BG* POSITION: F</p>
CA AB 437	<p>AUTHOR: Rodriguez [D] TITLE: At-Risk Persons: First Responders INTRODUCED: 02/13/2017 LAST AMEND: 04/26/2017 DISPOSITION: Pending COMMITTEE: Assembly Appropriations Committee HEARING: 05/26/2017 SUMMARY:</p> <p>Requires the Attorney General to establish and maintain within the Violent Crime Information Center a Voluntary Online At-Risk Community Network for purposes of providing information to first responders in order to prevent harmful interactions between first responders and seniors or persons with disabilities. Provides for broadcast of a Be on the Lookout bulletin within its jurisdiction under circumstances upon which a person in the network is missing or needs assistance.</p> <p>STATUS:</p> <p>05/17/2017 In ASSEMBLY Committee on APPROPRIATIONS: To Suspend File.</p> <p>INDEX: 31, 35</p>

	ISSUES:	BJ, SL*
	LOBBYIST:	AH*, CD
	POSITION:	F
CA AB 451	AUTHOR:	Arambula [D]
	TITLE:	Health Facilities: Emergency Services and Care
	INTRODUCED:	02/13/2017
	LAST AMEND:	04/06/2017
	DISPOSITION:	Pending
	LOCATION:	Senate Health Committee
	SUMMARY:	Specifies that an acute hospital, regardless of whether it maintains an emergency department, is required to provide emergency care and services to relieve or eliminate a psychiatric emergency medical condition. Prohibits a general acute care hospital or an acute psychiatric hospital from requiring that a patient be in custody as a result of a mental health disorder causing him or her to be a danger to others or himself or herself, or is gravely disabled.
	STATUS:	
	05/24/2017	To SENATE Committee on HEALTH.
	INDEX:	35, 77
	ISSUES:	BJ, SL*
	LOBBYIST:	AH*, CD
	POSITION:	O/A, X
CA AB 545	AUTHOR:	Bigelow [R]
	TITLE:	Joint Powers Agreements: County of El Dorado
	INTRODUCED:	02/13/2017
	DISPOSITION:	Pending
	LOCATION:	Senate Governance and Finance Committee
	SUMMARY:	Authorizes a private, nonprofit hospital in the County of El Dorado to enter into a joint powers agreement with a public agency. Prohibits nonprofit hospitals and public agencies participating in the agreement from reducing or eliminating any emergency services without a public hearing.
	STATUS:	
	05/24/2017	To SENATE Committees on GOVERNANCE AND FINANCE and HEALTH.
	INDEX:	15, 35
	ISSUES:	AM, PW*
	LOBBYIST:	CD*, KAS
	POSITION:	F
CA AB 583	AUTHOR:	Wood [D]
	TITLE:	Emergency Medical Air Transportation
	INTRODUCED:	02/14/2017
	DISPOSITION:	Pending
	COMMITTEE:	Assembly Appropriations Committee
	HEARING:	05/26/2017
	SUMMARY:	Extends the dates of the Emergency Medical Air Transportation Act so that the assessment of the penalties will terminate January 1, 2028, and any moneys unexpended and unencumbered in the Emergency Medical Air Transportation Act Fund on June 30, 2029, will transfer to the Federal Fund. Extends the operation of the Emergency Medical Air Transportation Act.
	STATUS:	
	05/10/2017	In ASSEMBLY Committee on APPROPRIATIONS: To Suspense File.
	INDEX:	35
	ISSUES:	BJ

LOBBYIST: CD
POSITION: S, X

CA AB 735

AUTHOR: Maienschein [R]
TITLE: Swimming Pools: Automated External Defibrillators
INTRODUCED: 02/15/2017
LAST AMEND: 03/30/2017
DISPOSITION: Pending
COMMITTEE: Assembly Appropriations Committee
HEARING: 05/26/2017
SUMMARY:

Requires public swimming pools that are required to provide lifeguard services and that charge a direct fee to provide an Automated External Defibrillator during pool operations. Requires every K-12 school with a swimming pool onsite to provide an AED during pool operations.

STATUS:

04/26/2017 In ASSEMBLY Committee on APPROPRIATIONS: To Suspense File.

INDEX: 35
ISSUES: BJ
LOBBYIST: CD
POSITION: F

CA AB 820

AUTHOR: Gipson [D]
TITLE: Emergency Medical Services Authority: Task Force
INTRODUCED: 02/15/2017
LAST AMEND: 03/23/2017
DISPOSITION: Pending
LOCATION: Assembly Health Committee
SUMMARY:

Authorizes the Emergency Medical Services Authority to establish a task force to develop a report evaluating alternative destinations to a general acute care hospital for first responders to transport a patient who may be a danger to himself, herself, or others or gravely disabled as a result of a mental health disorder. Requires the report to be published on the authority's Internet Web site.

STATUS:

03/23/2017 To ASSEMBLY Committee on HEALTH.
03/23/2017 From ASSEMBLY Committee on HEALTH with author's amendments.

03/23/2017 In ASSEMBLY. Read second time and amended. Re-referred to Committee on HEALTH.

INDEX: 35
ISSUES: BJ
LOBBYIST: CD
POSITION: S, X

CA AB 909

AUTHOR: Steinorth [R]
TITLE: Emergency Response: Trauma Kits
INTRODUCED: 02/16/2017
LAST AMEND: 05/02/2017
DISPOSITION: Pending
COMMITTEE: Assembly Appropriations Committee
HEARING: 05/26/2017
SUMMARY:

Requires a person or entity that supplies a trauma kit to provide the acquirer with all information governing the use and maintenance of the kit. Applies specific exemptions from civil liability to a lay rescuer or person who renders emergency care or treatment by the use of a trauma kit and to a person or

entity that provides emergency first aid, trauma, or similar training in the use of a trauma kit to a person who renders emergency care.

STATUS:

05/17/2017 In ASSEMBLY Committee on APPROPRIATIONS: To
Suspense File.

INDEX: 35
ISSUES: BJ*, LR
LOBBYIST: CD
POSITION: F

CA AB 1116

AUTHOR: Grayson [D]
TITLE: Peer Support and Crisis Referral Services Act
INTRODUCED: 02/17/2017
LAST AMEND: 04/20/2017
DISPOSITION: Pending
COMMITTEE: Assembly Appropriations Committee
HEARING: 05/26/2017
SUMMARY:

Creates the Peer Support and Crisis Referral Services Act. Defines peer support team as a local critical incident response team composed of individuals from the emergency services professions, mental health professions, and other fields who have completed a training course developed by certain emergency agencies. Establishes a privilege for communications between emergency service personnel and peer support team members or staff of a crisis hotline or referral service.

STATUS:

05/17/2017 In ASSEMBLY Committee on APPROPRIATIONS: To
Suspense File.

INDEX: 31, 35
ISSUES: BJ, CLH*
LOBBYIST: CD, KAS*
POSITION: F

CA AB 1204

AUTHOR: Mayes [R]
TITLE: Public Health: Emergency Prescriptions
INTRODUCED: 02/17/2017
LAST AMEND: 03/28/2017
DISPOSITION: Pending
LOCATION: Assembly Health Committee
SUMMARY:

Authorizes a licensed physician to prescribe a one-month supply of a life-saving medication to a patient to be stored for the use of that patient in case of a natural disaster or other emergency.

STATUS:

03/28/2017 From ASSEMBLY Committee on HEALTH with author's
amendments.

03/28/2017 In ASSEMBLY. Read second time and amended.
Re-referred to Committee on HEALTH.

INDEX: 35
ISSUES: BJ
LOBBYIST: CD
POSITION: F

CA AB 1650

AUTHOR: Maienschein [R]
TITLE: Emergency Medical Services: Paramedicine
INTRODUCED: 02/17/2017
LAST AMEND: 04/20/2017
DISPOSITION: Pending
LOCATION: Assembly Appropriations Committee

SUMMARY:

Creates the Community Paramedic Program in the Emergency Medical Services Authority to provide specified services, such as case management services and linkage to nonemergency services for frequent EMS system users, through local community paramedic programs. Requires the authority to develop criteria to qualify services for participation in the program, develop an application process for local EMS agencies seeking to participate in the program, and to review and approve applications for participation.

STATUS:

05/10/2017 In ASSEMBLY Committee on APPROPRIATIONS: To
Suspense File.

INDEX: 35
ISSUES: BJ
LOBBYIST: CD
POSITION: S, X

CA SB 398

AUTHOR: Monning [D]
TITLE: Acquired Brain Trauma
INTRODUCED: 02/15/2017
LAST AMEND: 04/06/2017
DISPOSITION: Pending
FILE: 63
LOCATION: Senate Second Reading File
SUMMARY:

Relates to a program of services for persons with acquired traumatic brain injury. Makes that program operative indefinitely. Requires the Department of Rehabilitation to pursue all sources of funding and by authorizing the department to require that service providers meet specified program and operational certification standards in order to receive ongoing funding.

STATUS:

05/25/2017 From SENATE Committee on APPROPRIATIONS: Do pass.
(7-0)

INDEX: 35, 65
ISSUES: AK*, AO, DBR
LOBBYIST: BG*, CD
POSITION: F

CA SB 432

AUTHOR: Pan [D]
TITLE: Emergency Medical Services
INTRODUCED: 02/15/2017
LAST AMEND: 04/24/2017
DISPOSITION: Pending
LOCATION: ASSEMBLY
SUMMARY:

Requires a health facility to give a certain notice immediately upon determining that the person to whom prehospital emergency medical care personnel provided emergency medical or rescue services is diagnosed as being afflicted with a specified disease or condition and to give notice to the county health officer with the name and telephone number of the personnel. Requires at alternative notification if this information has not been provided to the facility.

STATUS:

05/15/2017 In SENATE. Read third time. Passed SENATE. *****To
ASSEMBLY. (37-1)

INDEX: 35
ISSUES: BJ*, LR, SL
LOBBYIST: CD
POSITION: O, X

CA SB 687

AUTHOR: Skinner [D]

TITLE: Health Facilities: Emergency Centers: Attorney General
INTRODUCED: 02/17/2017
LAST AMEND: 05/03/2017
DISPOSITION: Pending
FILE: 96
LOCATION: Senate Second Reading File
SUMMARY:

Applies existing notice and consent requirements to a nonprofit corporation that operates or controls a health facility plans to sell, transfer, lease or otherwise dispose of the assets resulting from the reduction or elimination of emergency medical services provided at a licensed emergency center after the consent of the Attorney General. Prohibits the Department of Public Health from licensing a stand-alone emergency room or freestanding emergency center that is not part of a general acute care hospital.

STATUS:

05/25/2017 From SENATE Committee on APPROPRIATIONS: Do pass.
(5-2)

INDEX: 24, 35
ISSUES: AM*, LR, SL
LOBBYIST: CD, KAS*
POSITION: O, X

CA SB 792

AUTHOR: Wilk [R]
TITLE: Local Government: Measure B Oversight Commission
INTRODUCED: 02/17/2017
DISPOSITION: Pending
FILE: 181
LOCATION: Senate Second Reading File
SUMMARY:

Creates the Measure B Oversight Commission and requires a certain report regarding the County of Los Angeles trauma network and the special tax levied on all improved parcels in the County to provide funding for the Countywide System of Trauma Centers, Emergency Medical Services, and Bioterrorism Response. Requires the posting of certain information on an Internet Web site.

STATUS:

05/25/2017 From SENATE Committee on APPROPRIATIONS: Do pass as amended. (7-0)

INDEX: 109, 35
ISSUES: AM*, BJ
LOBBYIST: BG*, KAS
POSITION: F

AMENDED IN SENATE MAY 26, 2017

AMENDED IN SENATE MARCH 20, 2017

SENATE BILL

No. 185

Introduced by Senator Hertzberg

**(Coauthors: Senators Anderson, Atkins, Beall, Bradford, Galgiani,
Wieckowski, and Wiener)**

(Coauthors: Assembly Members Chiu, Cristina Garcia, and Reyes)

January 25, 2017

An act to amend Section 1463.007 of the Penal Code, and to amend Sections 12807, 13365, 40508, 40509, 40509.5, and 40903 of, and to add Sections 40500.5 and 42003.5 to, the Vehicle Code, relating to infractions.

LEGISLATIVE COUNSEL'S DIGEST

SB 185, as amended, Hertzberg. Crimes: infractions.

Under existing law, a judgment that a person convicted of an infraction be punished by a fine may also provide for the payment to be made within a specified time or in specified installments. Existing law requires a court, in any case when a person appears before a traffic referee or judge of the superior court for adjudication of a violation of the Vehicle Code, upon request of the defendant, to consider the defendant's ability to pay, as specified.

This bill would require the court, in any case involving an infraction filed with the court, to determine whether the defendant is indigent for purposes of determining what portion of the statutory amount of any associated fine, fee, assessment, or other financial penalties the person can afford to pay. The bill would provide that the defendant can demonstrate that he or she is indigent by providing specified information, including attesting to his or her indigent status under

penalty of perjury. Because a violation thereof would be a crime, the bill would impose a state-mandated local program.

The bill would require the court to reduce the base fine and associated fees by 80% if the court establishes that the defendant is indigent, and to provide alternatives to immediate payment of the sentence, including a payment plan option. The bill would require the court to determine the amount a defendant can afford to pay per month by using a payment calculator developed by the Judicial Council, as specified. For persons not found to be indigent, the bill would require that the monthly payment not exceed 5% of the defendant's family monthly income, as provided. For defendants found to be indigent, the bill would require that monthly payments be \$0 until the defendant's financial circumstances change, and would require the remaining amount owed to be discharged after 48 months in the interest of justice.

Existing law authorizes any county or court to implement a "comprehensive collection program" as a separate revenue collection activity, and requires the program to meet certain criteria, one of which is that the program engages in specified activities in collecting fines or penalties. One of those activities is initiating suspensions or holds for driver's licenses, as specified.

This bill would delete initiating suspensions or holds for driver's licenses from the list of activities the program may engage in. The bill would require the program to provide a payment plan option based on the debtor's ability to pay and requires the program to notify the defendant of his or her right to an indigency determination for infractions.

Existing law requires, whenever a person is arrested for any nonfelony violation of the Vehicle Code, or for a violation of an ordinance of a city or county relating to traffic offenses and he or she is not immediately taken before a magistrate, the arresting officer to prepare in triplicate a written notice to appear in court or before a person authorized to receive a deposit of bail, as specified. Existing law further requires the officer to deliver one copy of the notice to appear to the arrested person, and the arrested person in order to secure release must give his or her written promise to appear in court or before a person authorized to receive a deposit of bail.

This bill would require the court to send the defendant a reminder notice of his or her promise to appear in court and would require the reminder notice to include specified information, including an appearance date and location and the right to an indigency determination.

Existing law authorizes the court to notify the Department of Motor Vehicles when a person has failed to appear or failed to pay a fine or bail, with respect to various violations relating to vehicles. Existing law requires the department to suspend, and prohibits the department from issuing or renewing, a person's driver's license upon receipt of one of those notices, as specified.

~~This bill would instead require the court to issue a notice to the defendant that he or she must appear in court within 60 days, as specified, if the person has failed to appear, and authorizes the court to notify the department only when the defendant does not appear within those 60 days. The bill would also repeal the provisions authorizing the court to notify the department of a failure to pay a fine or bail. The bill would repeal certain provisions prohibiting the department from issuing or renewing a person's driver's license upon receipt of a notice of a defendant's failure to pay, with respect to designated violations.~~

Existing law provides that a person willfully violating his or her written promise to appear or a lawfully granted continuance of his or her promise to appear in court or before a person authorized to receive a deposit of bail, or willfully failing to pay bail in installments or a certain lawfully imposed fine, as specified, is guilty of a misdemeanor.

The bill would instead provide that a person willfully violating his or her written promise to appear or a lawfully granted continuance of his or her promise to appear in court or before a person authorized to receive a deposit of bail is guilty of an ~~infraction if it is on more than one case in the past 5 years. The bill would require, for the first occurrence of any of these violations, the person to be instructed to appear before a judge or a clerk of the court to schedule a new hearing date within 60 days of the willful violation. The bill would make it an infraction to fail to appear within these 60 days.~~ *infraction*. By changing the definition of a crime, this bill would impose a state-mandated local program. This bill would repeal the misdemeanor for willfully failing to pay bail in installments or a lawfully imposed fine.

This bill would declare that its provisions do not alter existing law related to suspension of the privilege to operate a motor vehicle in connection with violations relating to reckless driving or driving under the influence of alcohol or drugs, as specified.

The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement.

This bill would provide that no reimbursement is required by this act for a specified reason.

Vote: majority. Appropriation: no. Fiscal committee: yes.
 State-mandated local program: yes.

The people of the State of California do enact as follows:

1 SECTION 1. The Legislature finds and declares that this act
 2 shall not be interpreted to alter existing law regarding suspension
 3 of the privilege to operate a motor vehicle in connection with any
 4 of the following violations:

5 (a) Reckless driving, pursuant to Section 23103 of the Vehicle
 6 Code.

7 (b) Reckless driving proximately causing bodily injury to a
 8 person, pursuant to Sections 23104 and 23105 of the Vehicle Code.

9 (c) Driving under the influence of alcohol, drugs, or both,
 10 pursuant to Section 23152 of the Vehicle Code.

11 (d) Driving under the influence of alcohol, drugs, or both, and
 12 causing bodily injury to another person, pursuant to Section 23153
 13 of the Vehicle Code.

14 SEC. 2. Section 1463.007 of the Penal Code is amended to
 15 read:

16 1463.007. (a) Notwithstanding any other law, any county or
 17 court that operates a comprehensive collection program may deduct
 18 the costs of operating that program, excluding capital expenditures,
 19 from any revenues collected under that program. The costs shall
 20 be deducted before any distribution of revenues to other
 21 governmental entities required by any other law. Any county or
 22 court operating a comprehensive collection program may establish
 23 a minimum base fee, fine, forfeiture, penalty, or assessment amount
 24 for inclusion in the program.

25 (b) Once debt becomes delinquent, it continues to be delinquent
 26 and may be subject to collection by a comprehensive collection
 27 program. Debt is delinquent and subject to collection by a
 28 comprehensive collection program if any of the following
 29 conditions are met:

30 (1) A defendant does not post bail or appear on or before the
 31 date on which he or she promised to appear, or any lawful
 32 continuance of that date, if that defendant was eligible to post and
 33 forfeit bail.

1 (2) A defendant does not pay the amount imposed by the court
2 on or before the date ordered by the court, or any lawful
3 continuance of that date.

4 (3) A defendant has failed to make an installment payment on
5 the date specified by the court.

6 (c) For the purposes of this section, a “comprehensive collection
7 program” is a separate and distinct revenue collection activity that
8 meets each of the following criteria:

9 (1) The program identifies and collects amounts arising from
10 delinquent court-ordered debt, whether or not a warrant has been
11 issued against the alleged violator.

12 (2) For infraction violations, the program provides a payment
13 plan option based on the debtor’s ability to pay, pursuant to
14 subdivision (a) of Section 42003.5 of the Vehicle Code, if
15 applicable. ~~Notwithstanding subdivision (a), the comprehensive~~
16 ~~collection program shall not assess an administrative fee for~~
17 ~~entering into a payment plan or making recurring payments~~
18 ~~pursuant to subdivision (a) of Section 42003.5.~~ The program is
19 responsible for ~~notifying the defendant of his or her right to an~~
20 ~~indigency determination.~~ *sending the notice described in*
21 *subdivision (c) of Section 40500.5 to the defendant.*

22 (3) The program complies with the requirements of subdivision
23 (b) of Section 1463.010.

24 (4) The program engages in each of the following activities:

25 (A) Attempts telephone contact with delinquent debtors for
26 whom the program has a telephone number to inform them of their
27 delinquent status and payment options.

28 (B) Notifies delinquent debtors for whom the program has an
29 address in writing of their outstanding obligation within 95 days
30 of delinquency.

31 (C) Generates internal monthly reports to track collections data,
32 such as age of debt and delinquent amounts outstanding.

33 (D) Uses Department of Motor Vehicles information to locate
34 delinquent debtors.

35 (E) Accepts payment of delinquent debt by credit card.

36 (5) The program engages in at least five of the following
37 activities:

38 (A) Sends delinquent debt to the Franchise Tax Board’s
39 Court-Ordered Debt Collections Program.

1 (B) Sends delinquent debt to the Franchise Tax Board’s
2 Interagency Intercept Collection Program.

3 (C) Contracts with one or more private debt collectors to collect
4 delinquent debt.

5 (D) Sends monthly bills or account statements to all delinquent
6 debtors.

7 (E) Contracts with local, regional, state, or national skip tracing
8 or locator resources or services to locate delinquent debtors.

9 (F) Coordinates with the probation department to locate debtors
10 who may be on formal or informal probation.

11 (G) Uses Employment Development Department employment
12 and wage information to collect delinquent debt.

13 (H) Establishes wage and bank account garnishments where
14 appropriate.

15 (I) Places liens on real property owned by delinquent debtors
16 when appropriate.

17 (J) Uses an automated dialer or automatic call distribution
18 system to manage telephone calls.

19 SEC. 3. Section 12807 of the Vehicle Code is amended to read:
20 12807. The department shall not issue or renew a driver’s
21 license to any person:

22 (a) When a license previously issued to the person under this
23 code has been suspended until the expiration of the period of the
24 suspension, unless cause for suspension has been removed.

25 (b) When a license previously issued to the person under this
26 code has been revoked until the expiration of one year after the
27 date of the revocation, except where a different period of revocation
28 is prescribed by this code, or unless the cause for revocation has
29 been removed.

30 (c) When the department has received a notice pursuant to
31 subdivision (a) of Section 40509 or subdivision (a) of Section
32 40509.5, unless the department has received a certificate as
33 provided in those sections.

34 SEC. 4. Section 13365 of the Vehicle Code is amended to read:
35 13365. (a) Upon receipt of notification of a violation of
36 subdivision (a) of Section 40508, the department shall take the
37 following action:

38 (1) If the notice is given pursuant to subdivision (a) of Section
39 40509, if the driving record of the person who is the subject of the
40 notice contains one or more prior notifications of a violation issued

1 pursuant to Section 40509 or 40509.5, and if the person's driving
2 privilege is not currently suspended under this section, the
3 department shall suspend the driving privilege of the person.

4 (2) If the notice is given pursuant to subdivision (a) of Section
5 40509.5, and if the driving privilege of the person who is the
6 subject of the notice is not currently suspended under this section,
7 the department shall suspend the driving privilege of the person.

8 (b) A suspension under this section shall not be effective before
9 a date 60 days after the date of receipt, by the department, of the
10 notice given specified in subdivision (a), and the notice of
11 suspension shall not be mailed by the department before a date 30
12 days after receipt of the notice given specified in subdivision (a).

13 The suspension shall continue until the suspended person's
14 driving record does not contain any notification of a violation of
15 subdivision (a) of Section 40508.

16 SEC. 5. Section 40500.5 is added to the Vehicle Code, to read:

17 40500.5. (a) (1) The court shall send the defendant a reminder
18 notice of his or her promise to appear in court. The court shall send
19 this reminder notice, via ~~certified~~ United States Postal Service
20 ~~mail, return receipt requested,~~ *mail* to the address shown on the
21 notice to appear described in subdivision (a) of Section 40500
22 unless the defendant otherwise notifies the court of a different
23 address.

24 (2) ~~The court may satisfy the requirement described in paragraph~~
25 ~~(1) by sending the reminder notice by regular United States Postal~~
26 ~~Service mail and by sending~~ *shall also send* the notice
27 electronically, including, but not limited to, by email or text
28 message, to the defendant if he or she provided an email address
29 or telephone number to the court or to the law enforcement officer
30 at the time of signing the written promise to appear described in
31 subdivision (a) of Section 40504.

32 (3) Failure to receive the reminder notice does not relieve the
33 defendant of his or her obligation to appear in court by the date
34 stated in the notice to appear.

35 (b) In addition to information obtained from the notice to appear,
36 the reminder notice to appear shall contain at least the following
37 information:

38 (1) An appearance date and location.

39 (2) Whether a court appearance is mandatory or optional.

40 (3) The total bail amount and payment options.

- 1 (4) The notice about traffic school required under subdivision
- 2 (d) of Section 42007, if applicable.
- 3 (5) Notice that a traffic violator school will charge a fee in
- 4 addition to the administrative fee charged by the court.
- 5 (6) The potential consequences for failure to appear, including,
- 6 but not limited to, a driver’s license hold or suspension, a civil
- 7 assessment of up to three hundred dollars (\$300), a new charge
- 8 for failure to appear, a warrant of arrest, or some combination of
- 9 these consequences, if applicable.
- 10 (7) The potential consequences for failure to pay a fine,
- 11 including, but not limited to, a civil assessment of up to three
- 12 hundred dollars (\$300), a new charge for failure to pay a fine, a
- 13 warrant of arrest, or some combination of these consequences, if
- 14 applicable.
- 15 (8) The right to an indigency determination, including clear
- 16 language about how the defendant can request the determination,
- 17 what that determination will entail, the availability of an installment
- 18 payment plan, the availability of a reduction of the amount owed
- 19 by 80 percent, and any documents needed by the court to make a
- 20 determination about the defendant’s ability to pay.
- 21 (9) Notice of the option to pay bail through community service
- 22 and installment plans.
- 23 (10) Contact information for the court, including the court’s
- 24 Internet Web site.
- 25 (11) Information regarding trial by declaration, informal trial,
- 26 if available, and telephone or Internet Web site scheduling options,
- 27 if available.
- 28 (12) Requirements and procedures for correctable violations.
- 29 ~~(e) After a case has been adjudicated, the court shall send the~~
- 30 ~~defendant a reminder notice regarding payment of fines no later~~
- 31 ~~than 30 days before the payment deadline. The court shall send~~
- 32 ~~this reminder notice to the address shown on the notice to appear~~
- 33 ~~unless the defendant otherwise notifies the court of a different~~
- 34 ~~address.~~
- 35 ~~(d) In addition to information obtained from the notice to appear,~~
- 36 ~~the reminder notice to pay shall contain at least the following~~
- 37 ~~information:~~
- 38 ~~(1) The total payment due and the fine payment deadline.~~
- 39 ~~(2) Clear instructions about how the defendant can make~~
- 40 ~~payments.~~

1 ~~(3) Clear instructions about how the defendant can request an~~
2 ~~extension of the fine payment deadline.~~

3 ~~(4) The potential consequences for failure to pay a fine,~~
4 ~~including, but not limited to, a civil assessment of up to three~~
5 ~~hundred dollars (\$300), a new charge for failure to pay a fine, a~~
6 ~~warrant of arrest, or some combination of these consequences, if~~
7 ~~applicable.~~

8 ~~(5) The right to request an indigency determination if there are~~
9 ~~changed circumstances that can affect the defendant's ability to~~
10 ~~pay, including language about how the defendant can request the~~
11 ~~determination, what that determination will entail, the availability~~
12 ~~of an installment payment plan or any other available alternative,~~
13 ~~including, but not limited to, community service, and the~~
14 ~~submission of any documents needed by the court to make a~~
15 ~~determination about the defendant's ability to pay.~~

16 ~~(6) Contact information for the court, including the court's~~
17 ~~Internet Web site.~~

18 ~~(e) If the defendant willfully defaults on payment after coming~~
19 ~~into compliance with an installment payment plan, the court shall~~
20 ~~send the defendant a notice that he or she has failed to make one~~
21 ~~or more payments and has 60 days to either resume making~~
22 ~~payments or to request that the court modify the payment amount.~~
23 ~~The court shall send this notice to all of the defendant's known~~
24 ~~mailing addresses, including, but not limited to, the address on the~~
25 ~~notice to appear and the last known address recorded by the~~
26 ~~Department of Motor Vehicles. This notice shall contain the~~
27 ~~following information:~~

28 ~~(1) The defendant's right to request a modification of the~~
29 ~~installment payment.~~

30 ~~(2) The availability of an installment payment plan.~~

31 ~~(3) The defendant's right to request an indigency determination.~~

32 ~~(4) Clear language about how the defendant can request an~~
33 ~~indigency determination and what that determination will entail.~~

34 ~~(5) Documents needed by the court to make an indigency~~
35 ~~determination.~~

36 ~~(f)~~

37 ~~(c) (1) If the court refers a case to a comprehensive collection~~
38 ~~program, as described in Section 1463.007 of the Penal Code, as~~
39 ~~delinquent debt, the comprehensive collection program shall send~~
40 ~~a notice to the defendant containing the following information:~~

- 1 (A) The availability of an installment payment plan.
- 2 (B) The defendant’s right to request an indigency ~~determination.~~
- 3 *determination if the court has not already made a determination,*
- 4 *or, if due to changed circumstances, the defendant seeks a new*
- 5 *indigency determination pursuant to subdivision (h) of Section*
- 6 *42003.5.*
- 7 (C) Clear language about how the defendant can request an
- 8 indigency determination and what that determination will entail.
- 9 (D) Documents needed by the court to make an indigency
- 10 determination.

11 (2) If the case is unadjudicated, the comprehensive collection
 12 program shall send a notice to the defendant containing information
 13 about how the defendant can schedule a hearing for adjudication
 14 of the underlying charges or charges without payment of the bail
 15 amount.

16 SEC. 6. Section 40508 of the Vehicle Code is amended to read:

17 40508. (a) (1) A person willfully violating his or her written
 18 promise to appear ~~on more than one case within the past five years,~~
 19 or willfully violating a lawfully granted continuance of his or her
 20 promise to appear in court or before a person authorized to receive
 21 a deposit of bail ~~on more than one case in the past five years,~~ is
 22 guilty of an infraction regardless of the disposition of the charge
 23 upon which he or she was originally arrested.

24 (2) A person willfully ~~violating his or her written promise to~~
 25 ~~appear for the first time, or willfully violating a lawfully granted~~
 26 ~~continuance of his or her promise to appear in court or before a~~
 27 ~~person authorized to receive a deposit of bail for the first time, is~~
 28 ~~not guilty of an infraction. The person shall be instructed to appear~~
 29 ~~before a judge or a clerk of the court to schedule a new hearing~~
 30 ~~date within 60 days of the willful violation. A person failing to~~
 31 ~~appear within the 60 days is guilty of an infraction. *failing to pay*~~
 32 *bail in installments as agreed to under Section 40510.5 or a*
 33 *lawfully imposed fine for a violation of a provision of this code or*
 34 *a local ordinance adopted pursuant to this code, within the time*
 35 *authorized by the court and without lawful excuse having been*
 36 *presented to the court, on or before the date the bail or fine is due,*
 37 *is guilty of an infraction regardless of the full payment of the bail*
 38 *or fine after that time.*

39 (b) A person willfully failing to comply with a condition of a
 40 court order for a violation of this code, other than for failure to

1 appear or failure to pay a fine, is guilty of a misdemeanor,
2 regardless of his or her subsequent compliance with the order.

3 (c) If a person convicted of an infraction fails to pay bail in
4 installments as agreed to under Section 40510.5, or a fine or an
5 installment thereof, within the time authorized by the court, the
6 court may, except as otherwise provided in this subdivision,
7 impound the person's driver's license and order the person not to
8 drive for a period not to exceed 30 days. Before returning the
9 license to the person, the court shall endorse on the reverse side
10 of the license that the person was ordered not to drive, the period
11 for which that order was made, and the name of the court making
12 the order. If a defendant with a class C or M driver's license
13 satisfies the court that impounding his or her driver's license and
14 ordering the defendant not to drive will affect his or her livelihood,
15 the court shall order that the person limit his or her driving for a
16 period not to exceed 30 days to driving that is essential in the
17 court's determination to the person's employment, including the
18 person's driving to and from his or her place of employment if
19 other means of transportation are not reasonably available. The
20 court shall provide for the endorsement of the limitation on the
21 person's license. The impounding of the license and ordering the
22 person not to drive or the order limiting the person's driving does
23 not constitute a suspension of the license, but a violation of the
24 order constitutes contempt of court.

25 SEC. 7. Section 40509 of the Vehicle Code is amended to read:
26 40509. (a) Except as required under subdivision (b) of Section
27 40509.5, if a person has violated a written promise to appear or a
28 lawfully granted continuance of his or her promise to appear in
29 court or before the person authorized to receive a deposit of bail,
30 or violated an order to appear in court, including, but not limited
31 to, a written notice to appear issued in accordance with Section
32 40518, the magistrate or clerk of the court ~~shall issue a notice to~~
33 ~~the defendant that he or she is required to appear in court within~~
34 ~~60 days for any violation of this code, or any violation that can be~~
35 ~~heard by a juvenile traffic hearing referee pursuant to Section 256~~
36 ~~of the Welfare and Institutions Code, or any violation of any other~~
37 ~~statute relating to the safe operation of a vehicle, except violations~~
38 ~~not required to be reported pursuant to paragraphs (1), (2), (3), (6),~~
39 ~~and (7) of subdivision (b) of Section 1803. The notice shall include~~
40 ~~notice of the defendant's right to an indigency determination. If~~

1 ~~the defendant does not appear within 60 days of the original date,~~
2 ~~the magistrate or clerk of the court~~ may give notice of the failure
3 to appear to the department for any violation of this code, or any
4 violation that can be heard by a juvenile traffic hearing referee
5 pursuant to Section 256 of the Welfare and Institutions Code, or
6 any violation of any other statute relating to the safe operation of
7 a vehicle, except violations not required to be reported pursuant
8 to paragraphs (1), (2), (3), (6), and (7) of subdivision (b) of Section
9 1803. If thereafter the case in which the promise was given is
10 adjudicated or the person who has violated the court order appears
11 in court or otherwise satisfies the order of the court, the magistrate
12 or clerk of the court hearing the case shall sign and file with the
13 department a certificate to that effect and any driver's license hold
14 shall be removed. The court shall not issue a bench warrant for a
15 failure to appear.

16 (b) (1) Notwithstanding subdivision (a), the court may notify
17 the department of the total amount of bail, fines, assessments, and
18 fees authorized or required by this code, including Section 40508.5,
19 that are unpaid by any person.

20 (2) Once a court has established the amount of bail, fines,
21 assessments, and fees, and notified the department, the court shall
22 not further enhance or modify that amount.

23 (3) This subdivision applies only to violations of this code that
24 do not require a mandatory court appearance, are not contested by
25 the defendant, and do not require proof of correction certified by
26 the court.

27 (c) With respect to a violation of this code, this section is
28 applicable to any court that has not elected to be subject to the
29 notice requirements of subdivision (c) of Section 40509.5.

30 (d) Any violation subject to Section 40001, which is the
31 responsibility of the owner of the vehicle, shall not be reported
32 under this section.

33 SEC. 8. Section 40509.5 of the Vehicle Code is amended to
34 read:

35 40509.5. (a) Except as required under subdivision (b), if, with
36 respect to an offense described in subdivision (d), a person has
37 violated his or her written promise to appear or a lawfully granted
38 continuance of his or her promise to appear in court or before the
39 person authorized to receive a deposit of bail, or violated an order
40 to appear in court, including, but not limited to, a written notice

1 to appear issued in accordance with Section 40518, the magistrate
2 or clerk of the court shall issue a notice to the defendant that he
3 or she is required to appear in court within 60 days for a violation
4 of this code, a violation that can be heard by a juvenile traffic
5 hearing referee pursuant to Section 256 of the Welfare and
6 Institutions Code, or a violation of any other statute relating to the
7 safe operation of a vehicle, except violations not required to be
8 reported pursuant to paragraphs (1), (2), (3), (6), and (7) of
9 subdivision (b) of Section 1803. The notice shall include notice
10 of the defendant's right to an indigency determination. If the
11 defendant does not appear within 60 days of the original date, the
12 magistrate or clerk of the court may give notice of the failure to
13 appear to the department for any violation of this code, or any
14 violation that can be heard by a juvenile traffic hearing referee
15 pursuant to Section 256 of the Welfare and Institutions Code, or
16 any violation of any other statute relating to the safe operation of
17 a vehicle, except violations not required to be reported pursuant
18 to paragraphs (1), (2), (3), (6), and (7) of subdivision (b) of Section
19 1803. If thereafter the case in which the promise was given is
20 adjudicated or the person who has violated the court order appears
21 in court and satisfies the order of the court, the magistrate or clerk
22 of the court hearing the case shall sign and file with the department
23 a certificate to that effect and any driver's license hold shall be
24 removed. The court shall not issue a bench warrant for a failure
25 to appear, except as provided in subdivision (d).

26 (b) If a person charged with a violation of Section 23152 or
27 23153, or Section 191.5 of the Penal Code, or subdivision (a) of
28 Section 192.5 of that code has violated a lawfully granted
29 continuance of his or her promise to appear in court or is released
30 from custody on his or her own recognizance and fails to appear
31 in court or before the person authorized to receive a deposit of
32 bail, or violated an order to appear in court, the magistrate or clerk
33 of the court shall give notice to the department of the failure to
34 appear. If thereafter the case in which the notice was given is
35 adjudicated or the person who has violated the court order appears
36 in court or otherwise satisfies the order of the court, the magistrate
37 or clerk of the court hearing the case shall prepare and forward to
38 the department a certificate to that effect.

39 (c) Except as required under subdivision (b), the court shall mail
40 a courtesy warning notice to the defendant by first-class mail at

1 the address shown on the notice to appear, at least ~~60~~ 20 days
2 before sending a notice to the department under this section.

3 (d) If the court notifies the department of a failure to appear
4 pursuant to subdivision (a), no arrest warrant shall be issued for
5 an alleged violation of subdivision (a) of Section 40508, unless
6 one of the following criteria is met:

7 (1) The alleged underlying offense is a misdemeanor or felony.

8 (2) The alleged underlying offense is a violation of any provision
9 of Division 12 (commencing with Section 24000), Division 13
10 (commencing with Section 29000), or Division 15 (commencing
11 with Section 35000), required to be reported pursuant to Section
12 1803.

13 (3) The driver’s record does not show that the defendant has a
14 valid California driver’s license.

15 (4) The driver’s record shows an unresolved charge that the
16 defendant is in violation of his or her written promise to appear
17 for one or more other alleged violations of the law.

18 (e) Except as required under subdivision (b), in addition to the
19 proceedings described in this section, the court may elect to notify
20 the department pursuant to subdivision (b) of Section 40509.

21 (f) This section is applicable to courts that have elected to
22 provide notice pursuant to subdivision (c). The method of
23 commencing or terminating an election to proceed under this
24 section shall be prescribed by the department.

25 (g) A violation subject to Section 40001, that is the
26 responsibility of the owner of the vehicle, shall not be reported
27 under this section.

28 SEC. 9. Section 40903 of the Vehicle Code is amended to read:

29 40903. (a) Any person who fails to appear as provided by law
30 and who has not shown good cause for a failure to appear within
31 20 days of the appearance date may be deemed to have elected to
32 have a trial by written declaration upon any alleged infraction, as
33 charged by the citing officer, involving a violation of this code or
34 any local ordinance adopted pursuant to this code.

35 (b) Notwithstanding Division 10 (commencing with Section
36 1200) of the Evidence Code, testimony and other relevant evidence
37 may be introduced in the form of a notice to appear issued pursuant
38 to Section 40500, a notice of parking violation issued pursuant to
39 Section 40202, a notice of delinquent parking violation issued
40 pursuant to Section 40206, a business record or receipt, a sworn

1 declaration of the arresting officer, or a written statement or letter
2 signed by the defendant.

3 SEC. 10. Section 42003.5 is added to the Vehicle Code, to
4 read:

5 42003.5. (a) (1) In any case involving an infraction filed with
6 the court, ~~the court shall~~ *each defendant is eligible for, and shall*
7 *be informed of his or her eligibility for, the court to determine*
8 whether the defendant is indigent for purposes of establishing the
9 amount he or she can afford to pay. For purposes of this section,
10 a defendant is indigent if any of the following criteria is satisfied:

11 (A) ~~The defendant's net income is at or below 250 percent of~~
12 ~~the federal poverty level by family size.~~ *defendant meets the income*
13 *criteria set forth in subdivision (b) of Section 68632 of the*
14 *Government Code.*

15 (B) ~~The defendant receives benefits or services from~~
16 ~~CalWORKs, CalFresh, Supplemental Security Income (SSI), State~~
17 ~~Supplementary Payment (SSP), Cash Assistance Program for~~
18 ~~Immigrants (CAPI), In-Home Supportive Services (IHSS), General~~
19 ~~Relief (GR), General Assistance (GA), Medi-Cal, extended foster~~
20 ~~care benefits, child care assistance administered by the State~~
21 ~~Department of Education, Unemployment Insurance, or health~~
22 ~~care provided under Part 5 (commencing with Section 17000) of~~
23 ~~Division 9 of the Welfare and Institutions Code.~~ *any of the public*
24 *benefits listed in subdivision (a) of Section 68632 of the*
25 *Government Code.*

26 (C) The defendant, as individually determined by the court,
27 cannot pay court fees without using money that normally would
28 pay for the common necessities of life for the defendant and his
29 or her family.

30 (2) The defendant can demonstrate that he or she is indigent by
31 providing any of the following information:

32 (A) Proof of income from a pay stub, bank statement, rent and
33 grocery receipts, or other form of evidence of earnings.

34 (B) Eligibility cards or electronic benefit cards or other forms
35 of evidence for the programs described in subparagraph (B) of
36 paragraph (1).

37 (C) Attesting to his or her indigent status under penalty of
38 perjury.

39 (b) (1) If the court establishes that the defendant is indigent for
40 purposes of this section, the court shall reduce the base fine, penalty

1 assessments, any state or local fees, and any civil assessments by
2 80 percent on all charges pending against the defendant.

3 (2) If a defendant's indigent status is found to have been
4 willfully fraudulent, his or her fines and fees reduction shall be
5 overturned and the full amount of fines and fees shall be restored.

6 (c) This section does not limit the discretion of a judicial officer
7 to suspend or reduce fines and fees where appropriate or to dismiss
8 actions in the interest of justice under Section 1385 of the Penal
9 Code.

10 (d) The court shall conduct the indigency determination as soon
11 as possible ~~but no later than 20 days~~ prior to determining whether
12 a person willfully failed to pay. Defendants whose cases are
13 adjudicated in court shall receive a determination on the same day
14 as their court appearance. ~~A person who is indigent shall not be
15 determined to have willfully failed to pay a fine.~~

16 (e) The court shall provide alternatives to immediate payment
17 of the sentence for any infraction violation filed with the court,
18 including a reasonable payment plan option for the remaining
19 amount owed after any reduction due to indigency or other reasons
20 are applied. "Reasonable payment plan" for a person who is not
21 found to be indigent means monthly payments that are not more
22 than 5 percent of a defendant's family monthly income, excluding
23 deductions for essential living expenses. "Essential living
24 expenses" means, for purposes of this subdivision, expenses for
25 rent or house payment and maintenance, food and household
26 supplies, utilities and telephone, clothing, medical and dental
27 payments, insurance, school or child care, child or spousal support,
28 transportation and auto expenses, including insurance, gas, and
29 repairs, installment payments, laundry and cleaning, and other
30 extraordinary expenses. A defendant who is found to be indigent
31 under subdivision (a) ~~above~~ shall be placed on a zero dollar (\$0)
32 payment per month until his or her financial circumstances change.
33 The court shall allow payments for more than 90 days if necessary
34 to establish a reasonable plan in cases subject to Section 42007.
35 If, after 48 months, an indigent defendant's financial circumstances
36 have not changed, the court shall, in the interest of justice,
37 discharge the remaining amount owed. The court shall determine
38 the amount a defendant can afford to pay per month by using a
39 payment calculator to be developed by the Judicial Council. This
40 calculator shall be developed in consultation with stakeholders,

1 including advocates for indigent defendants. The Judicial Council
2 shall revise the calculator annually to reflect any increase in the
3 California Necessities Index. An administrative fee shall not be
4 assessed to enter into a payment plan or alternatives to payment.

5 (f) A defendant found indigent under subdivision (a) whose
6 fines and fees have been reduced or who has entered into a
7 reasonable payment plan under subdivision (e), or both, shall
8 inform the court if his or her income substantially changes before
9 the fines and fees are completely paid or discharged in the interest
10 of justice, whichever occurs first. If a defendant does not inform
11 the court of any changes in their income, the court shall presume
12 that the defendant remains indigent.

13 (g) If the court provides community service as an alternative to
14 payment of the fines and fees, any calculation of the requisite
15 number of hours must occur after the appropriate reductions due
16 to indigency have been made pursuant to subdivision (e). A sign-up
17 fee shall not be assessed in order to participate in community
18 service. Community service shall include participation in programs
19 required to receive public benefits, mental health services, job
20 training, educational programs, or other social services programs
21 deemed eligible by the court. If the defendant elects community
22 service, community service shall be performed in the county of
23 the defendant's choice. The number of hours of community service
24 shall be calculated at a rate of 150 percent of the state minimum
25 wage or the local minimum wage, whichever is higher. The court
26 shall accept, in full satisfaction of the fine, fee, and assessment,
27 performance of a number of community service hours
28 corresponding to the base fine. The court shall take into
29 consideration the ability of the defendant to perform community
30 service and community service shall not conflict with employment,
31 education, government-mandated activities, or any other obligation
32 disclosed by the defendant.

33 (h) A person who enters into a payment plan with the court and
34 whose net income is subsequently reduced may, at any time after
35 the judgment, request from the court a change in the payment plan
36 due to his or her inability to pay the payment currently required.

37 (i) The court shall issue and file with the Department of Motor
38 Vehicles the appropriate certificate pursuant to Section 40509 for
39 any person who is determined to be indigent and enrolls in a
40 reasonable payment plan. The certificate shall indicate that the

1 participant has appeared in court, made a payment, or otherwise
2 satisfied the court, if the driving privilege of that participant was
3 suspended pursuant to Section 13365.

4 (j) The court shall issue and file with the Department of Motor
5 Vehicles the appropriate certificate pursuant to Section 40509 for
6 any person in good standing in a comprehensive collection program
7 pursuant to subdivision (c) of Section 1463.007 of the Penal Code
8 demonstrating that the person has appeared in court, made a
9 payment, or otherwise satisfied the court, if the driving privilege
10 was suspended pursuant to Section 13365.

11 (k) A person who has missed the deadline to pay or appear on
12 a citation shall be granted an ability to pay determination that meets
13 the requirements above, without first paying any bail, fine, or fee.
14 If thereafter the person enters into or resumes a payment plan, the
15 magistrate or clerk of the court hearing the case shall sign and file
16 with the department a certificate to that effect and any driver's
17 license hold shall be removed.

18 (l) The defendant may request at any time that the court review
19 the payment plan if the defendant believes there was an error in
20 the plan's calculation. The court shall affirm, reverse, or modify
21 any such judgment or order or direct a new trial or further
22 proceeding.

23 SEC. 11. No reimbursement is required by this act pursuant to
24 Section 6 of Article XIII B of the California Constitution because
25 the only costs that may be incurred by a local agency or school
26 district will be incurred because this act creates a new crime or
27 infraction, eliminates a crime or infraction, or changes the penalty
28 for a crime or infraction, within the meaning of Section 17556 of
29 the Government Code, or changes the definition of a crime within
30 the meaning of Section 6 of Article XIII B of the California
31 Constitution.

O



May 9, 2017

The Honorable Lorena Gonzalez Fletcher
Chair, Assembly Appropriations Committee
State Capitol, Room 2114
Sacramento, CA 95814

SUBJECT: AB 583 (Wood) – SUPPORT

Dear Assemblymember Gonzalez Fletcher:

The California Hospital Association (CHA), representing over 400 hospitals and health systems, is writing to support AB 583 (Wood). This bill would extend the operation of the Emergency Medical Air Transportation Act until January 1, 2030.

The Emergency Medical Air Transportation Act (EMATA) authorizes a \$4 fee on Vehicle Code violations, and violations of local ordinances adopted pursuant to the Vehicle Code, other than parking offenses. The revenue from these fees goes to the EMATA Fund. The authority to collect this fine sunsets on January 1, 2018.

Hospitals across the state rely on air ambulance services to provide lifesaving emergency transportation to the most critically injured patients – often patients injured in motor vehicle accidents who need immediate care at specialized trauma centers. In addition, air ambulance providers deliver a vital transportation service between rural areas and urban tertiary care centers. They are the statewide essential link for disaster response and homeland security.

Air ambulance services are provided regardless of a patient's ability to pay. Medi-Cal reimbursement for air ambulance services is far below the cost of providing it. Air ambulance providers do not receive disproportionate share or Maddy Emergency Medical Services indigent funding. It is important to note that eighty percent of EMATA funds are matched with federal dollars. Failure to renew the EMATA would cost the state \$8 million in matching federal funds and reduce Medi-Cal funding by approximately \$2 million annually, both of which would need to be replaced with money from the State General Fund.

AB 583 seeks to extend the sunset date until 2030, continuing critical funding for air ambulance services and preventing funding from reverting back to 1993 levels. This essential lifesaving

service needs to be maintained at current funding levels to meet the continued emergency care needs of California citizens.

For these reasons, CHA respectfully asks for your "AYE" vote on AB 583.

Sincerely,

A handwritten signature in cursive script that reads "Connie Delgado".

Connie Delgado
Chief Legislative Advocate

CD:dlv

cc: The Honorable Jim Wood
The Honorable Members of Assembly Appropriations Committee
Lisa Murawski, Consultant, Assembly Appropriations Committee
Peter Anderson, Consultant, Assembly Republican Caucus



April 20, 2017

The Honorable Lorena Gonzalez Fletcher
Assembly Appropriations Committee
State Capitol, Room 2114
Sacramento, CA 95814

SUBJECT: AB 1650 (Maienschein) – SUPPORT

Dear Assemblymember Gonzalez Fletcher:

The California Hospital Association (CHA), representing over 400 hospitals and health systems, is writing to support AB 1650 (Maienschein). This bill would authorize the state EMS Authority (EMSA) to develop the Community Paramedicine Program, and authorize local EMS agencies (LEMSAs) to implement one or more of four community paramedicine program models if they opt to participate. EMSA, in conjunction with the Office of Statewide Health Planning and Development (OSHPD), would be charged with developing criteria to participate in the program. In addition, the LEMSA medical director would be required to oversee local community paramedicine programs.

California hospitals are leaders in providing emergency services and are essential partners in collaborative innovation with state and local governmental agencies to improve access to health care, quality of care, and public health. CHA and its regional hospital association partners (RAs) work closely with EMSA and the LEMSAs to implement new and efficient means to provide improved health care to California citizens. We share a common interest in efficiently deploying today's health care workforce by using innovative models of care delivery. Community Paramedicine is one such innovation.

CHA and the RAs have been active partners in the California OSHPD Workforce Pilot Project #173, initiated in 2014. Six types of Community Paramedicine models, in 13 sites, are being tested in a pilot program that waives existing regulations that limit paramedics to providing care in emergency situations, during ambulance transports, and while working in a hospital. The 13 community paramedicine pilot programs enrolled a total of 1,462 patients through September 2016, collecting 12-14 months of data. The paramedic professionals working in the pilot programs continue to operate at all times under physician medical control, either directly or by protocols developed by physicians experienced in EMS and emergency care.

AB 1650 is focused on the four most successful pilots to date: Post-Discharge, Frequent EMS Users, Directly Observed Therapy for Tuberculosis, and Hospice. The post-discharge programs, which sought to reduce hospital readmissions by ensuring follow-up care in the home, enrolled the largest number of patients (922); the tuberculosis programs enrolled the smallest (29).

It is very important to point out that no adverse patient outcome is attributable to any pilot program work and no health care professionals were displaced. These programs demonstrate the value of interdisciplinary teams with paramedics, physicians, nurses, behavioral health professionals and social workers to fill the existing gaps in the health care safety net.

1. The Post-Discharge pilot program decreased hospital readmissions within 30 days of discharge in four of the five sites, meaning that the enrolled patients maintained better health in the month following their discharge due to the paramedics' interventions. In addition, four sites achieved cost savings for payers due to reductions in readmissions. Participating hospitals also reduced their exposure to CMS penalties for excessive readmissions.
2. Two of the Frequent EMS User programs achieved reductions in 911 calls, ambulance transports, and ED visits among enrolled patients, due to paramedics assisting patients to obtain nonemergency services such as housing, food and social services that had led to inappropriate ED use. These two programs achieved cost savings and decreased the amount of uncompensated care furnished by ambulance providers and hospitals (35% of the enrolled patients were uninsured).
3. The Directly Observed Therapy for Tuberculosis program demonstrated that patients observed by community paramedics were more likely to complete their TB medication therapy than patients who received directly observed treatment from TB clinic community health workers. Importantly, no additional costs were incurred; the paramedics provided oversight while already on duty to respond to traditional 911 calls.
4. The Hospice program enhanced the EMS and hospice agencies' ability to honor patients' wishes to receive care at home at the end of life. This program also reduced ambulance transports to an ED from 80 percent to 36 percent and achieved savings for payers by reducing unnecessary ambulance transports, ED visits and hospital admissions.

The Community Paramedicine pilot programs described above demonstrate that paramedics can provide safe, effective and cost-efficient services beyond their traditional role. Community Paramedicine is able to improving patient satisfaction and care coordination, while decreasing health care costs by reducing ambulance transports, ED visits, and hospital admissions.

Thirty-three other states operate community paramedicine programs today. Research demonstrates that community paramedics improve the efficiency and effectiveness of the health care system. California's current EMS infrastructure, with local LEMSAs and EMSA statewide oversight, is well-positioned to support implementation of community paramedicine models while assuring patient safety.

CHA and its member hospitals appreciate the author and sponsor's leadership on this issue to optimize existing resources and improve care and treatment of California citizens. CHA asks for your "AYE" vote on AB 1650.

Sincerely,

Connie Delgado
Chief Legislative Advocate

CD:dlv

cc: The Honorable Brian Maienschein
The Honorable Members of Assembly Appropriations Committee
Lisa Murawski, Consultant, Assembly Appropriations Committee
Kirk Feely, Consultant, Assembly Republican Caucus

AMENDED IN SENATE APRIL 24, 2017
AMENDED IN SENATE MARCH 20, 2017

SENATE BILL

No. 432

Introduced by Senator Pan

February 15, 2017

An act to amend Section 1797.188 of the Health and Safety Code, relating to emergency medical services.

LEGISLATIVE COUNSEL'S DIGEST

SB 432, as amended, Pan. Emergency medical services.

Existing law, the Emergency Medical Services System and the Prehospital Emergency Medical Care Personnel Act, establishes the Emergency Medical Services Authority. The authority is responsible for the coordination and integration of all statewide activities concerning emergency medical services. The act requires all health facilities to notify prehospital emergency *medical* care personnel who have provided emergency medical or rescue services and have been exposed to a person afflicted with a disease or condition that they have been exposed and should contact the county health officer under specified conditions.

This bill would require the health facility to give that notice immediately upon determining that the person to whom the prehospital emergency *medical* care personnel provided emergency medical or rescue services is diagnosed as being afflicted with a disease or condition, as specified, and to give notice to the county health ~~officer~~: *officer with the name and telephone number of the prehospital emergency medical care personnel*. The bill would alternatively require the health facility, if they do not notify the prehospital emergency care personnel under ~~these conditions~~, *circumstances in which the names and telephone numbers of the personnel have not been provided to the*

facility, as specified, to notify the designated officer, as defined, of the employer of the prehospital emergency care personnel and the county health officer, and would require the designated officer to notify the prehospital emergency care ~~personnel~~ personnel, if a determination is made that notification is necessary.

Vote: majority. Appropriation: no. Fiscal committee: yes.
State-mandated local program: no.

The people of the State of California do enact as follows:

1 SECTION 1. Section 1797.188 of the Health and Safety Code
2 is amended to read:

3 1797.188. (a) As used in this section:

4 (1) “Prehospital emergency medical care person or personnel”
5 means any of the following: an authorized registered nurse or
6 mobile intensive care nurse, emergency medical technician-I,
7 emergency medical technician-II, emergency medical
8 technician-paramedic, lifeguard, firefighter, or peace officer, as
9 defined or described by Sections 1797.56, 1797.80, 1797.82,
10 1797.84, 1797.182, and 1797.183, respectively, or a physician and
11 surgeon who provides prehospital emergency medical care or
12 rescue services.

13 (2) “Reportable disease or condition” or “a disease or condition
14 listed as reportable” means those diseases prescribed by Subchapter
15 1 (commencing with Section 2500) of Chapter 4 of Title 17 of the
16 California Administrative Code, as may be amended from time to
17 time.

18 (3) “Exposed” means at risk for contracting the disease, as
19 defined by regulations of the state department.

20 (4) “Health facility” means a health facility, as defined in
21 Section 1250, including a publicly operated facility.

22 (5) “Designated officer” has the same meaning as used in the
23 Ryan White Comprehensive AIDS Resources Emergency Act of
24 1990 (Public Law 101-381).

25 (b) In addition to the communicable disease testing and
26 notification procedures applicable under Chapter 3.5 (commencing
27 with Section 120260) of Part 1 of Division 105, all prehospital
28 emergency medical care personnel, whether volunteers, partly
29 paid, or fully paid, who have provided emergency medical or rescue
30 services and have been exposed to a person afflicted with a disease

1 or condition listed as reportable, which can, as determined by the
2 county health officer, be transmitted through oral contact or
3 secretions of the body, including blood, shall be notified that they
4 have been exposed to the disease and should contact the county
5 health officer in accordance with the following:

6 (1) If the prehospital emergency medical care person, who has
7 rendered emergency medical or rescue services and ~~has~~ *believes*
8 *that he or she may have* been exposed to a person afflicted with a
9 reportable disease or condition, *and* provides the health facility
10 with his or her name and telephone number at the time the patient
11 is transferred from that prehospital emergency medical care person
12 to the admitting health facility; or the party transporting the person
13 afflicted with the reportable disease or condition provides that
14 health facility with the name and telephone number of the
15 prehospital emergency medical care person who provided the
16 emergency medical or rescue services, the health facility, upon
17 determining that the person to whom the prehospital emergency
18 medical care person provided the emergency medical or rescue
19 services is diagnosed as being afflicted with a reportable disease
20 or condition shall immediately notify the prehospital emergency
21 medical care person and report the name and telephone number
22 of the prehospital emergency medical care person to the county
23 health officer.

24 (2) If the prehospital emergency medical care person who has
25 rendered emergency medical or rescue services and has been
26 exposed to a person afflicted with a reportable disease or ~~condition~~
27 ~~does not provide condition, but has not provided~~ the health facility
28 with his or her name and telephone number pursuant to paragraph
29 (1), the health facility, upon determining that the person to whom
30 the prehospital emergency medical care person provided the
31 emergency medical or rescue services is diagnosed as being
32 afflicted with a reportable disease or condition, shall immediately
33 notify the designated officer of the employer of the prehospital
34 emergency medical care person and the county health officer. The
35 designated officer shall *make a determination if a notification to*
36 *the prehospital emergency medical care person is necessary, and*
37 *if so, shall* immediately notify the prehospital emergency medical
38 care person.

39 (c) The county health officer shall immediately notify the
40 prehospital emergency medical care person who has provided

1 emergency medical or rescue services and has been exposed to a
2 person afflicted with a disease or condition listed as reportable,
3 which can, as determined by the county health officer, be
4 transmitted through oral contact or secretions of the body, including
5 blood, upon receiving the report from a health facility pursuant to
6 paragraph (1) of subdivision (b). The county health officer shall
7 not disclose the name of the patient or other identifying
8 characteristics to the prehospital emergency medical care person.

9 Nothing in this section shall be construed to authorize the further
10 disclosure of confidential medical information by the health
11 facility, the designated officer, or any prehospital emergency
12 medical care personnel described in this section except as otherwise
13 authorized by law.

14 In the event of the demise of the person afflicted with the
15 reportable disease or condition, the health facility or county health
16 officer shall notify the funeral director, charged with removing the
17 decedent from the health facility, of the reportable disease prior
18 to the release of the decedent from the health facility to the funeral
19 director.

20 Notwithstanding Section 1798.206, violation of this section is
21 not a misdemeanor.

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**CALIFORNIA
HOSPITAL
ASSOCIATION**

*Providing Leadership in
Health Policy and Advocacy*

June 7, 2017

TO: EMS/Trauma Committee Members

FROM: BJ Bartleson, VP Nursing & Clinical Services
Neal Cline, Enloe Hospital

SUBJECT: Enloe Post Debrief on Oroville Spillway Evacuation

SUMMARY

Mr. Cline will be presenting on the Oroville Spillway evacuation and lessons learned.

ACTION REQUESTED

- Information



**CALIFORNIA
HOSPITAL
ASSOCIATION**

*Providing Leadership in
Health Policy and Advocacy*

June 7, 2017

TO: EMS/Trauma Committee Members
FROM: BJ Bartleson, VP Nursing & Clinical Services
SUBJECT: ED Forum

SUMMARY

CHA is planning its third annual ED Forum in Riverside, California on December 6 at the Mission Inn Hotel and Spa, Mission Inn Hotel & Spa, and Riverside Convention Center. Input from the committee is requested for speakers, type of programming and best practices to focus on.

CHA will be submitting “Save the Date” Flyers” along with Innovations and poster request flyers.

ACTION REQUESTED

- Discussion on what content, ideas and speakers should be scheduled

building tomorrow together

Emergency Services Forum

Dec 7, 2016 in Riverside



With more Californians insured, the pressure is on to provide the care our patients need and deserve. No blueprint exists to fix our complicated delivery system. It's up to us to create real and lasting change through partnerships and innovative practices.

The Emergency Services Forum lays the foundation for change by convening industry thought leaders, and sharing innovative practices and programs. Take a few minutes to review the program agenda — this event will provide you with the knowledge and ideas to inspire and lead change at your facility.

Back-to-Back Events for Providers: Dec. 5 – 6, Behavioral Health Care Symposium

Interested in behavioral health care issues? Arrive two days early to attend the annual Behavioral Health Care Symposium. Day one focuses on behavioral health care policy and pressing issues. Day two is a blended format for both behavioral health care providers and ED professionals.

Learn more or register at:

www.calhospital.org/emergency-services-forum

8:00 – 9:00 a.m. | Keynote Session

Envisioning the Future of Emergency Care Through Delivery System Reform

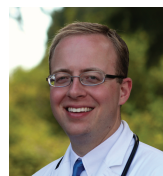


Brendan Carr, MD, MS, Associate Dean, Sidney Kimmel Medical College, and Vice Chair, Department of Emergency Medicine, Thomas Jefferson University

Prepare to shed old ways of thinking about care delivery and explore how ERs can be leaders in innovative care practices. Learn how, through ACA reforms, physicians can deliver care that's right for patients while working within new reimbursement models.

9:00 – 10:00 a.m. | General Session

ER is for Emergencies Campaign — A Study of Success



Carol Wagner, RN, MBA, Senior Vice President, Patient Safety, Washington State Hospital Association; and the Hon. Nathaniel Schlicher, MD, JD, FACEP, President, Washington Chapter, American College of Emergency Physicians

Washington state ERs had problems: high utilizer patients were suffering from uncoordinated care, delaying access to care for other patients and increasing state Medicaid costs. To address the issues, key stakeholders developed practices that reduced ER visits by 9.9%, frequent visitors by 11% and scheduled drug prescription visits by 24%. Learn about their change process and program to redirect care to the appropriate setting.

10:15 – 11:15 a.m. | Breakout Sessions (choose one)

Taking Health Care Reform to the Next Level — ACA and MACRA Impact on E-Care Delivery

Laura Medford-Davis, MD, Emergency Medicine Physician, University of Pennsylvania, Department of Emergency Medicine

This session will provide ED practitioners with the information needed to thrive in our changing environment. Learn about ACA and MACRA to help provide better care and anticipate future ED system demands.

APOD 2.0 Strategies for Implementation

Jan Remm, Regional Vice President, Riverside and San Bernardino Counties, HASC; Bruce Barton, EMS Administrator, Riverside County EMS Agency; and Julie Curtis, Associate Chief Nursing Officer, and Karina Kilian, Director of Emergency Services, HCA Healthcare

AB 1223 was passed to address ambulance patient offload delay and guidelines are in development that will assist hospitals and LEMSAs in APOD quality performance improvement. Learn what to expect from the upcoming guidelines and hear about best practices to streamline delivery.

11:30 a.m. – 12:15 p.m. | General Session

Three-Way Exchange on the Future of Emergency Services

Marc Futernick, MD, FACEP, Medical Director, Emergency Department, California Hospital Medical Center and Past President, California ACEP; Ricardo Martinez, MD, FACEP, Chief Medical Officer, Adeptus Health; and Lawrence Stock, MD, FACEP, Vice Chairman, Emergency Department, Antelope Valley Hospital and President, California ACEP

Explore the impact of value-based purchasing on care coordination, ways information exchanges can be leveraged to improve care and how economics will drive future ED utilization.

1:15 – 2:15 p.m. | Keynote Session

Visionary Perspective on Health Care in EDs



Ian Morrison, PhD, Author, Consultant and Futurist

Ian Morrison, an internationally known author, consultant and futurist, has a few thoughts on where we are headed that just might shake up our vision of the future. Combining research and health care forecasting with his incisive Scottish wit, Morrison will help ED providers explore and understand their role

in the evolution of health care.

2:30 – 3:30 p.m. | General Session

Current and Emerging Infectious Diseases in the ED

Matthew Zahn, MD, Medical Director, Division of Epidemiology and Assessment, Orange County Health Care Agency

Last year it was Ebola. This year it's Zika, West Nile and Meningococcal disease. This session will bring you current on emerging infectious diseases and help you prepare your staff to respond to a public health outbreak. Learn which emerging infectious diseases may be coming your way and how to conduct the appropriate infection control response.

3:30 – 4:30 p.m. | Closing Session

Reading the Signs: Identifying Victims of Human Trafficking

Sandra Morgan, PhD, RN, Director, Global Center for Women and Justice, Vanguard University

Nearly 90% of human trafficking survivors sought health care while being trafficked and more than 63% went to an ED. Understanding the signs of sex or labor trafficking are key to properly identifying victims and taking appropriate steps for safe intervention. Learn how to ID potential victims, spot traffickers' control and coercion techniques, and more.

Registration Form

**Behavioral Health Care Symposium
plus Emergency Services Forum**

building tomorrow together

Three Ways to Register

Online: Register online at www.calhospital.org/behavioral-symposium or www.calhospital.org/emergency-services-forum

Mail: California Hospital Association
Education Department
1215 K Street, Suite 800
Sacramento, CA 95814

Fax: Fax your registration to (916) 552-7506

Questions? Visit www.calhospital.org/behavioral-symposium, www.calhospital.org/emergency-services-forum or call (916) 552-7637.

Payment:

- Check enclosed. Make check payable to CAHHS/CHA
 Credit card (check one): VISA MC AMEX

Card Number: _____

Name on Card: _____

Expiration Date: _____ Security Code: _____

Billing Address: _____

City: _____ State: _____ Zip: _____

Authorizing Signature: _____

Registrant Information *(Register by Nov. 4 and save \$100)*

Registrant 1:

Name: _____

Title: _____

Organization: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: _____

Email (required): _____

Cc Email (optional): _____

Special Lunch Requests: Vegetarian Food Allergies: _____

Special Accommodations Pursuant to ADA: _____

Nursing License # (required for CEs): _____

CEs: Behavioral/Social Work Compliance Health Care Executives
 Nursing (# required) _____

Registrant 2:

Name: _____

Title: _____

Organization: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: _____

Email (required): _____

Cc Email (optional): _____

Special Lunch Requests: Vegetarian Food Allergies: _____

Special Accommodations Pursuant to ADA: _____

Nursing License # (required for CEs): _____

CEs: Behavioral/Social Work Compliance Health Care Executives
 Nursing (# required) _____

Day(s) Attending and Tuition:

Please check one:

Behavioral Symposium plus Emergency Services Forum:

(Monday, Tuesday and Wednesday)

Member Rate.....\$725 Nonmember Rate.....\$880

Behavioral Symposium only: (Monday and Tuesday)

Member Rate.....\$495 Nonmember Rate.....\$650

Behavioral Symposium day two plus Emergency Services Forum:

(Tuesday and Wednesday)

Member Rate.....\$525 Nonmember Rate.....\$680

Emergency Services Forum only: (Wednesday)

Member Rate.....\$325 Nonmember Rate.....\$420

Day(s) Attending and Tuition:

Please check one:

Behavioral Symposium plus Emergency Services Forum:

(Monday, Tuesday and Wednesday)

Member Rate.....\$725 Nonmember Rate.....\$880

Behavioral Symposium only: (Monday and Tuesday)

Member Rate.....\$495 Nonmember Rate.....\$650

Behavioral Symposium day two plus Emergency Services Forum:

(Tuesday and Wednesday)

Member Rate.....\$525 Nonmember Rate.....\$680

Emergency Services Forum only: (Wednesday)

Member Rate.....\$325 Nonmember Rate.....\$420

Registration tuition (all registrants)..... \$ _____

Registration after Nov. 4 (add \$100 per registrant) \$ _____

Total tuition \$ _____



June 7, 2017

TO: EMS/Trauma Committee Members
FROM: BJ Bartleson, VP Nursing & Clinical Services
SUBJECT: ED Forum

SUMMARY

CHA is planning its third annual ED Forum in Riverside, California on December 6 at the Mission Inn Hotel and Spa, Mission Inn Hotel & Spa, and Riverside Convention Center. Input from the committee is requested for speakers, type of programming and best practices to focus on.

CHA will be submitting “Save the Date” Flyers” along with Innovations and poster request flyers.

ACTION REQUESTED

- Discussion on what content, ideas and speakers should be scheduled



June 7, 2017

TO: CHA EMS/T Committee

FROM: BJ Bartleson, RN, VP Nursing & Clinical Services

SUBJECT: Health Information Technology for EMS (HITEMS) Program

SUMMARY

For the past several years, EMSA has been actively working on a Health Information Exchange Grant from the Office of the National Coordinator for Health Information Technology. The goal of the grant was to provide funding and technical assistance for local entities to send, receive, find, and use electronic patient information. The work to date has focused on EMS SAFR activates (search, alert, file, reconcile), POLST e-registry and Access, and disaster response for patient search and tracking functions.

EMSA is now submitting a proposal to the California Department of Health Care Services (DHCS) to build upon the existing ONC work and continue to develop a statewide approach to HIE for EMS and disaster response. Funding would be used to complete HIE on boarding and to design and implement HIE architecture. The proposal will allow hospitals and eligible professionals to achieve meaningful use objectives, such as transitions of care, counter-alerting and medication reconciliation.

(See attached Health Information Technology for EMS (HITEMS) Program Medi-Cal Funding and Matching Options Summary)

ACTION REQUESTED

➤ **Information and Discussion**

DISCUSSION QUESTIONS

- 1) What are the outcomes to date of the EMSA HIE ONC grant activity?**
- 2) What hospitals have been involved and how?**
- 3) What barriers have there been with adoption, interoperability and information exchange?**
- 4) How does this work connect with the current emergency department information exchange initiatives, and with HIE's or hospitals that aren't involved?**

EMERGENCY MEDICAL SERVICES AUTHORITY

10901 GOLD CENTER DR., SUITE 400
 RANCHO CORDOVA, CA 95670
 (916) 322-4336 FAX (916) 324-2875



**Health Information Technology for EMS (HITEMS) Program
 Medi-Cal Funding and Matching Options Summary
 Version: May 3, 2017**

Funding to emergency medical services for the development of health information exchange and interoperability is now available via Medi-Cal (Medicaid) through a process established by the California Department of Health Care Services (DHCS). The State of California Emergency Medical Services Authority (EMSA) has submitted a proposal to develop a statewide approach to implement health information exchange (HIE) for two critical components of the health care system: Emergency medical services (EMS) and disaster response. Funding would be used to complete HIE onboarding and to design and implement HIE architecture. This program is estimated to be up to \$40 million and last through September 30, 2021.

The proposal focuses upon two primary integrated use cases, and several sub-cases, to incorporate interoperable health information technology tools and services to allow for hospitals and eligible professionals to achieve meaningful use objectives, such as transitions of care, counter-alerting, and medication reconciliation:

(1) Emergency Medical Services

- 1a. Daily Operations for Search, Alert, File, and Reconcile (SAFR) activities
- 1b. POLST eRegistry and Access
- 1c. Community Paramedicine and Mobile Integrated Healthcare
- 1d. EMS analytics

(2) Disaster response

- 2a. Disaster Professional Patient Search
- 2b. Patient Tracking

These use cases would utilize national standards that facilitate health information exchange and build upon the HIE work already accomplished in California under previous HIE funding, including the lessons learned in ONC Project.

PROJECTIONS:

It is anticipated that with project would be over \$40 million (\$10 million per year) and continue through September 30, 2021. Matching funds (estimated to be over \$4 million) would be obtained from counties and non-profit Foundations.

Funding Plan:

To achieve the necessary funding match, the following sequential steps would be required:

1. A cash match (Non-Federal funds) from multiple sources would be identified.

2. "Matching" funds from non-profit Foundations, Counties, Health Departments* (), would be transferred to EMSA. *Note: Redirection of existing use of Maddy EMS Fund for data and information purposes and count toward CPE may be allowable in some cases.
3. EMSA would enter into an Interagency Agreement with DHCS to allow for an Intergovernmental Transfer (IGT) to DHCS.
4. DHCS would approve and match with Federal funding upon invoice and send back to EMSA.
5. EMSA would provide funding to local entities for Interoperability and HIT planning for EMS upon invoice.
6. EMSA would maintain HITEMS coordination, operations and statewide HIT compliance for EMS and disaster objectives.

Three major components are proposed as part of the 4 year plan:

- State HITEMS Coordination (\$3 million)
- Contracts for EMS, POLST, and Community Paramedic Integration (\$34 million)
- Disaster Operations Integration (\$4 million)

State HITEMS Coordination:

State project coordination is estimated to be approximately \$3 million (\$750,000 annually). This would allow for HIE coordination, grant administration, technical assistance, and data analytics.

Contracts for EMS integration for EMS, POLST, and Community Paramedics:

It is estimated that up to 33 contracts (each LEMSA) at an average of \$1 million each to allow for EMS providers to onboard to hospitals, HIEs, long term care facilities, behavioral health providers, and social services providers. This would allow for:

- EMS daily operations to implement the SAFR model for EMS providers,
- POLST eRegistry access and community integration,
- Community Paramedicine/Mobile Integrated Healthcare, and
- EMS analytics.

Disaster Operations Integration:

The creation of interoperability for disaster operations will include:

- Patient Unified Lookup System for Emergencies onboarding to HIEs,
- HIE to HIE Interoperability,
- Patient Matching,
- Patient Tracking.

MATCHING FUNDS:

It is anticipated that over \$4 million in matching funds will come to EMSA from local County fund sources and the California HealthCare Foundation. This \$4 million over 4 years will allow for the 90/10 match to yield up to \$40 for HIE implementation.

Matching Sources:

1. Maddy EMS Funds

Utilize unallocated (Fund Balance) Maddy EMS Fund from the Discretionary EMS Account

2. California HealthCare Foundation

Utilize unspent ePOLST Registry money for matching purposes

3. County General Fund

Utilize CPE as fund source

4. EMSA General Fund

Redirect EMSA GF sources

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Thursday, May 18, 2017

Bipartisan legislation would create new option for rural hospitals

Urge your senators to cosponsor S. 1130

Sens. Charles Grassley (R-IA), Amy Klobuchar (D-MN) and Cory Gardner (R-CO) introduced the Rural Emergency Acute Care Hospital (REACH) Act, which would allow critical access hospitals and small rural hospitals with 50 or fewer beds to convert to rural emergency hospitals (REHs) and continue providing necessary emergency and observation services at reimbursement rates of 110 percent of reasonable costs. The legislation also provides enhanced reimbursement rates for the transportation of patients to acute care hospitals in neighboring communities.

Please contact your senators and urge them to cosponsor S. 1130, which is an important first step toward ensuring access in certain rural areas. While the AHA [supports](#) the REACH Act, more needs to be done, and the AHA is eager to work with Congress to take additional action.

For example, a REH has the potential to improve access to care for all vulnerable communities, not just those in rural areas. There is also a continued need to ensure access to more than just emergency and observation services in these communities. For example, innovative approaches are needed to support access to primary care, psychiatric and substance use treatment, post-acute and diagnostic services. To that end, we urge Congress to consider the [recommendations](#) made by the AHA's Task Force on Ensuring Access in Vulnerable Communities that would preserve such access.

***AHA Rural Hospital Policy Forum
Register Today!***

Please join AHA President & CEO Rick Pollack in Washington, D.C., July 19-20 for the [2nd Annual AHA Rural Hospital Policy Forum](#) to hear firsthand from members of Congress and key staff about federal actions to address critical issues facing rural hospitals. AHA Executive Vice President Tom Nickels will moderate a Congressional staff panel and provide an update on AHA advocacy priorities, including extending special rural payment programs and ensuring access in vulnerable communities through expanded telehealth and alternative payment models. See the attached [flyer](#) for more details including hotel and [registration](#) information.

http://www.bakersfield.com/news/bakersfield-memorial-s-er-for-children-first-in-the-valley/article_299917fc-159c-5daf-9263-73f5c9ab991b.html

Bakersfield Memorial's ER for children first in the valley

BY HAROLD PIERCE hpierce@bakersfield.com Mar 30, 2017



Felix Adamo/The Californian

Nancy Carr adjusts the tie of Bakersfield Memorial Hospital President/CEO Jon Van Boening before the start of opening festivities for the new Robert A. Grimm Children's Pavilion for Emergency Services.

Bakersfield Memorial Hospital unveiled a \$5 million emergency center exclusively for children Thursday, part of an aggressive vision to bolster pediatric healthcare throughout the region where there have been limited services.

When The Robert A. Grimm Children's Pavilion for Emergency Services opens next month, it will be the only emergency room between Los Angeles and Madera dedicated to serving kids.

"We have doctors, nurses, physician's assistants trained in pediatrics to work with these patients with whatever illness or injury they have, and it also provides a healing and peaceful waiting room atmosphere away from other patients," Bakersfield Memorial Hospital President and CEO Jon Van Boening said.

The seven-bed facility, which has space for an additional five gurneys, could care for as many as 60 or 70 kids every day.

"And we're ready for them," Van Boening said. "We have the facilities, the equipment and the staff ready to take care of those kids."

The pediatric pavilion features a separate entrance to the hospital away from the general emergency room and a colorful kid-friendly waiting room.

Staffers at the facility will be able to treat everything from minor allergies and broken bones to gallbladder surgeries and burst appendices, Ken Keller, chief operating officer at Bakersfield Memorial, said.

Construction of the wing was funded by community donations, including a multi-million dollar gift from the Robert A. and Kari L. Grimm Family Foundation. It donated another \$1 million to Bakersfield Memorial Hospital Thursday.

The unveiling of the pavilion comes as Bakersfield Memorial forges a partnership with Valley Children's Medical Group to open the Eagle Oaks Specialty Care Center in southwest Bakersfield.

Keller said it's part of a "vision to bring full-service capability" in pediatrics to Bakersfield.

"The affiliation with Valley Children's is part of a larger picture and deepens our pediatric capabilities in Bakersfield," Keller said, stressing the importance of having full-service pediatric facilities locally, rather than referring patients out of town for health care.

The Eagle Oaks facility will bring scores of needed pediatric specialists to town, however children needing treatment for such things as advanced childhood cancer, congenital anomalies and birth defects will likely still be referred to Valley Children's Hospital in Madera, Keller said.

MORE INFORMATION



+2

Pediatric healthcare center coming to southwest Bakersfield

A graphic for the 'EMERGENCY CARE INNOVATION OF THE YEAR AWARD'. The top half features a blurred photograph of medical staff in blue scrubs pushing a gurney with a patient in a hospital hallway. The right side of the graphic has a dark blue background with white text. The title 'EMERGENCY CARE INNOVATION OF THE YEAR AWARD' is written in a serif font. Below the title, it says 'SPONSORED BY' followed by three logos: PHILIPS BlueJay CONSULTING, URGENT MATTERS, and Schumachergroup. At the bottom of the graphic, a dark blue banner contains the text 'SUBMIT YOUR INNOVATION NOW!' in white, bold, sans-serif font.

EMERGENCY CARE
INNOVATION
OF THE YEAR
AWARD

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**SUBMIT YOUR INNOVATION
NOW!**

2017 Emergency Care Innovation of the Year Award

Sustaining, promoting, and improving quality in emergency care requires a team across departments, from the hospital, and community.

The **Emergency Care Innovation of the Year Award** sponsored by [Urgent Matters](#), [Philips Blue Jay Consulting](#), and [Schumacher Clinical Partners](#), was created in 2013 to highlight successes in emergency care.

- We are looking for team-based approaches that deliver excellence in medical care, excellence in service, and sustainable strategies for EM practices.
- [Submissions](#) must include a measurable assessment of the effectiveness of the intervention.

- The winning team will present their innovation at the American College of Emergency Physicians Scientific Assembly in Washington D.C. on October 28, 2017.

[Submission Instructions](#)

[Download Submission Form](#)

[Read about Last Year's Winners](#)

Submissions will be accepted until 11:59PM on July 31, 2016.

Please send all submissions to urgentmatters@gwu.edu



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