EMERGENCY MEDICAL CARE COMMITTEE
CONTRA COSTA COUNTY

Wednesday, March 9, 2016
4:00 – 5:30 p.m.
Contra Costa County Schools Insurance Group Conference Room
550 Ellinwood Way, Pleasant Hill, CA

Agenda

4:00 p.m.  1. Introduction of Members and Guests

4:03     2. Approval of Minutes from December 9, 2015

4:05     3. Comments from the Public
         Members of the public may speak up to 3 minutes each on matters either on or not on this agenda.

4:08     4. Chair’s Report:
         Discussion and Membership Q&A regarding new Bylaws

4:16     5. Fire Chiefs’ Report
         Fire Executive Chief Representative

4:19     6. Members’ Reports

4:22     7. Laura’s Law Update and Psychological Emergencies (5150) Summit Proposal
         Derek Krause, EMS/Logistics, San Ramon Valley Fire Protection District, CCHS Behavioral
         Health Representative TBD

4:30     8. Contra Costa Health Plan (CCHP) Efforts supporting West County since Doctors
         Medical Center Closure - Patricia Tanquary, Executive Director CCHP

         Bob Atlas, EMS Chief CCFPD /Michael Johnson General Manager, Contra Costa AMR

4:55    10. EMS Medical Director’s Report
         David Goldstein, MD, Medical Director, Contra Costa EMS

         Pat Frost, EMS Director, Contra Costa EMS

5:15    12. Review and Approval of 2015 EMS System Plan Objectives
         Pat Frost, EMS Director, Contra Costa EMS

5:20    13. EMS Director’s Report
         Pat Frost, EMS Director, Contra Costa EMS


5:30    15. Adjournment

Reasonable accommodations can be made for persons with disabilities planning to attend the EMCC Meeting by
contacting EMS Staff at least 24 hours in advance at (925) 646-4690.

Any disclosable public records related to an item on a regular meeting agenda and distributed by the County to a
majority of members of the Emergency Medical Care Committee less than 96 hours prior to that meeting are
available for public inspection at 1340 Arnold Drive, Suite 126, Martinez during normal business hours.
Chair Hansen called the meeting to order at 4:04 p.m.

1. Introduction of Members and Guests

2. Approval of September 9, 2015 Meeting Minutes

3. Comments from the Public

   Recognitions for 3 recent Saves in Contra Costa County - Lisa Vajgrt-Smith, CC EMS Emergency Preparedness Techn. Specialist
   1) October 25, 2015: Recognized were officers Hodges and Matsui from Richmond PD who upon arrival immediately activated the EMS system and performed Cardiopulmonary Resuscitation (CPR) until American Medical Response (AMR) arrived.
   2) October 26, 2015: Recognized were bystander Randy Mass from Les Schwab Tire in Brentwood who performed CPR on survivor Rob Kinslow until AMR arrived; AMR crew Steven Curry and Iris Nahm; Brentwood Fire Engine 52’s Sam Somerhaulter, Ross Mcumber, Jeremy Copple (not present).
   3) November 1, 2015: Cardiac arrest at Club Sports San Ramon, where staff performed CPR and utilized the AED until San Ramon Valley Fire arrived. Recognized were Jamie Staton and Eric Hendrickson of Club Sports; firefighters Casey Rivers and Tom Gendron; engineers Wes Fredrickson and Grant Sparkes; Capt. Chris Parsons.

4. Chair’s Report - Kacey Hansen, EMCC Chair

   - Brown Act Member Compliance Update: Chair Hansen reminds members to please get their compliance training done.
   - Joseph Barger, MD, Recognition: Chair Hansen and Member Frost present an award to Dr. Barger upon his retirement after 20 years of service as medical director to the county’s EMS system.

5. Members’ Reports

   Action Item: Approve/Recommend Revised EMCC Bylaws for Board of Supervisors Adoption - Kacey Hansen, Chair

*Alternate
Member Speakman motioned to approve the new EMCC bylaws, seconded by Member Tobias. All in favor; none opposed. Motion passed. Member Frost mentioned that the new bylaws will not be officially enacted until approved by the Board of Supervisors. Once approved, the EMCC will be convening under the new bylaws at the March 2016 meeting.

6. EMCC Annual Report Action: Review/Approve for Submission to the Board of Supervisors - Leticia Andreas, EMCC Staff
   The EMCC Annual Report 2015 draft was motioned to be approved. There was no discussion. Please email any additional comments, updates or changes to EMCC staff by the end of December 2015. If no changes, item will be considered approved, and placed on the Board of Supervisors Agenda in January 2016.

7. Contra Costa County Child Death Report 2008-2012 - Jim Carpenter MD, MPH, Contra Costa Regional Medical Center
   Guest Carpenter handed out the executive summary and press report. Dr. Carpenter has served as chair of the Child Death Review Team since 1988. The team’s focuses on the reasons children are dying and how to prevent their deaths. As many as 32 children die from Sudden Infant Death Syndrome (SIDS). 1/3 of the cases are reviewed by the team, the others are natural causes. The majority of deaths occur in the first year of life; infants under 18 months and teenagers 15-17 years of age have the most deaths. Of these, African-American children have the highest death rate, followed by Latino-Americans. EMS is a part of the Child Death Review Team, and participation helps with prevention and reporting. The team should be producing an annual report, yet does not have the financial means; a prior report from 1997-2001 showed virtually the same findings and recommendations. This report was facilitated with support from Public Health. Member Frost mentioned that one of EMS’ missions is to focus on prevention of unnecessary deaths, with some of our stakeholders having programs such as the new safe sleep campaign. Support through the health plans was another suggestion.

8. LEMSA Clinical and Program Committee Updates - Jesse Allured, EMS Program Coordinator
   - Contra Costa EMS is in the process of overhauling their administrative policies, releasing them end of the week/early next week. They will be effective April 1, 2016.
   - EMS staff is working on improving systems of care meetings.
   - John Muir invited EMS to participate in the international stroke conference.
   - In 2015 from January 1-November 30, 372 Never Events and 154 EMS events occurred in Contra Costa County. Never Events are patient transfer of care times from EMS to ED of less than 60 minutes. EMS events are received from patients and providers by phone, fax, or website link. The EMS Agency works with providers to support appropriate follow-up.

9. Sutter Delta Patient Transfer of Care Delays and EMS System Impacts
   Action: Discussion of Recommendation(s) for next steps - Pat Frost, Contra Costa EMS Director
   - Never Events (transfer of care times > 60 minutes) and transfer of care time by hospital: EMS System performance expectation for all hospitals is a patient transfer time of > 20 minutes, 90% of the time. Hospitals not compliant with expectations include Sutter Delta, Contra Costa Regional Medical Center (CCRMC) Psych Emergency. Extensive outreach has been undertaken with Sutter Delta regarding their high Never Events rates, with response received from director Dori Stevens. EMS will be meeting with Sutter to explore additional solutions.
   - East County is a priority area for improvement as it has fewer fire stations, creating an increased first response role for ambulances.
   - The patient transfer of care public report will be updated in January. It was pointed out by several members that: 1) patient flow is very difficult to manage, and affected by community resources; 2) it is not an emergency department (ED) but a hospital issue; 3) the problem lies with patients who cannot be moved out of the ED; 4) the bottle neck is inpatient hospital discharge. Suggested was for the ambulance providers to invoice the hospital for the wait time if it exceeds an hour; however, this was met with rebuttal from some members stating that any financial disincentive towards the hospitals would not be supported.

10. EMS Director’s Report - Pat Frost, EMS Director
    - The Alliance contract was approved on November 17, and will be the new ambulance provider effective January 1, 2016.
    - The ambulance ordinance is still at county counsel.
    - The LAFCO (Local Agency Formation Commission) municipal service review is in progress, and will update their information regarding EMS and fire service.
    - West County has much improved. Kaiser Richmond is doing an extraordinary job, and EMS continues to work with Alameda, Marin and Solano counties regarding out of county transports associated with the closure of Doctor’s Medical Center.

11. EMS Medical Director's Report - Dr. David Goldstein, EMS Medical Director
    Looking forward to his role. Contact him directly with any issues. Dr. Barger will still be active in the background.

12. Proposed agenda items for March 9, 2016 meeting: Sutter Delta patient transfer of care times, Laura’s Law update, 5150 Summit Proposal, CCHP Health Plan efforts post DMC closure

13. Adjournment at 5:38pm
Contra Costa Emergency Medical Services (EMS) System Performance Expectation

EMS Policy #40: Hospitals designated as an EMS receiving facility in Contra Costa County shall be prepared to receive patients transported by 9-1-1 county ambulance providers and accept these patients upon arrival. The patient transfer of care performance expectation for the EMS System is 20 minute or less; 90% of the time.

Countywide Hospital Performance (January 2015 to Dec 2015)

<table>
<thead>
<tr>
<th>90th Percentile of All Facilities¹</th>
</tr>
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<tbody>
<tr>
<td>Patient Transfer of Care occurs between 23-28 minutes 9 out of 10 times</td>
</tr>
</tbody>
</table>

Description of Patient Transfer of Care (TOC)²

EMS patient transfer of care is known to improve the availability of 9-1-1 ambulances and patient safety. The California Hospital Association and the EMS Administrators of California have proposed the following graphic to describe the intervals associated with patient transfer of care. In Contra Costa County our metric of patient transfer of care or handoff time is equivalent to the ambulance patient offload time interval.

¹ San Ramon Regional Medical Center is not included in the all facilities reporting. San Ramon Regional Medical Center is served primarily by San Ramon Fire Protection District who does not collect this information.

Doctors Medical Center closed its doors at 7:00 AM on 4/21/2015.
The Metrics: How We Measure Hospital Performance

**Transfer of care time interval:** Time from ambulance arrival on hospital premises to documented transfer of care. Transfer of care is defined as the patient being physically off the gurney and EMS personnel having completed an appropriate verbal report to hospital staff (where EMS crew has no further direct patient care duties). Any activity performed after the patient care transfer occurs is not included, e.g. clean up of ambulance and completion of prehospital patient care record.

**Data elements used in reporting:** Arrival of ambulance time is defined as the time the ambulance reaches hospital property and captured as an automated data point using a link to the ambulance CAD (Computer Aided Dispatch). Transfer of care time is the time that the EMS provider documents as the point in time where the patient is both physically off the gurney and the ED staff have received a verbal patient report.

**Fractile Performance:** Measurement of percentage of time interval associated with completed transfer of care (e.g. 90% of patients with transfer of care within 20 minutes).

**Average patient handoff time (min):** The average time in minutes it takes to handoff patients at an individual facility or group of facilities.

**Total number of patients:** The total count of patients transported to the individual facility or group of facilities during the data collection interval.

**90% Percentile (min):** The amount of time (in minutes) associated with patient transfer of care for 9 out of 10 patients for a facility or group of facilities.

**“Never Events” by Facility:** The total count of EMS patient care transfers (handoffs) taking 60 minutes or longer. This information is displayed as a total count by year, year to date and rate per 100 transports for each facility.

**Demographic Patient Data associated with “Never Events”:** These charts and tables capture descriptive information about patients who experience “Never Events” and includes the paramedic’s primary impression, patient’s age, sex, and ethnicity. The data represents a report of a simple count that has not been evaluated for disparities nor compared with the normal demographics seen in hospital emergency departments.
The Standards and Benchmarks

The following are the TOC standards and benchmarks of the Contra Costa County EMS System have been established to support prompt ambulance and ED patient transfer of care times:

- Optimal patient transfer of care time: 15 minutes 90% of the time
- Delayed patient transfer of care: 30 minutes or more
- A “Never Event” for patient transfer of care: 60 minutes or more

The Contra Costa EMS System TOC Safety Initiative: Data Sharing for Improvement

Contra Costa Emergency Medical Services (EMS) recognizes the challenges that many hospital EDs face managing the increase in patient volume associated with many citizens using the ED for primary and urgent care. However, delays in the timely transfer of care of patients, brought by 9-1-1 emergency ambulance, are known to increase risk to the patient and adversely impact the availability of providing emergency ambulance services throughout the county. It is important that all hospitals receiving emergency ambulances recognize the following:

- Everyday a significant number of 9-1-1 patients in Contra Costa experience some level of transfer of care delays when they arrive at the hospital.
- Delays of greater than one hour are considered “Never Events” within the Contra Costa EMS system because they are “preventable”.
- In 2014 “Never Events” affected some 401 patients of all ages and in 2015 that number jumped to 608 patients affected.
- When delays of more than 30 minutes occur, efforts by ED staff closest to the patient need to occur to prevent further delays in patient care.
- When two or more emergency ambulances experience delays greater than 30 minutes (known as stacking) a community’s 9-1-1 ambulance response may be adversely affected.
- Emergency ambulance providers have strict response time performance requirements resulting in stiff financial penalties when delays in response occur.
- Hospitals with inpatient workflow practices that support ED throughput consistently demonstrate shorter patient transfer of care times and experience significantly fewer excessive delays (never events) regardless of spikes in normal day to day ED volume.

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3 Delays in timely transfer of care are also known as “offload” or patient “handoff” delays.
To effectively collaborate and manage the patient safety issues associated with patient handoff delays, transfer of care standards and performance metrics were established for the Contra Costa EMS System. The EMS policy # 40 “EMS Prehospital-Emergency Department Transfer of Care Standards” is available at http://cchealth.org/ems/pdf/policy40.pdf. Contra Costa EMS encourages all of our EMS System partners to use this information to create effective strategies to support timely patient transfer of care.

The Institute of Medicine, National Quality Forum, Centers for Medicare & Medicaid Services, National Association of EMS Physicians and the California Hospital Association/Emergency Medical Services Authority Ambulance Patient Offload Delay Collaborative all recommend establishing benchmarks, metrics and engaging in data sharing to support patient safety between EMS System stakeholders.

The County EMS System standards for patient handoff between ED and 9-1-1 ambulance personnel for all Contra Costa Community Hospitals include:

- Conducting 9-1-1 transported patient handoff as soon as possible upon ambulance arrival;
- Activating appropriate measures to effectively manage ED saturation
- Reducing 9-1-1 ambulance stacking during peak conditions.
- Treating handoff delays of 60 minutes or more as “Never Events”.
- Practicing optimal patient handoff times of 20 minutes or less

The Contra Costa EMS System patient handoff standards were established after 4 years of EMS System stakeholder participation. Beginning in January 1st, 2015, EMS began to post public reports at www.cccems.org website at appropriate intervals. We would like to thank all of our Contra Costa community hospitals for making this a high priority in their organizations. Questions about this report should be directed to Contra Costa EMS by visiting us at www.cccems.org or calling 925 646-4690.

Management of Delays in Patient Transfer of Care

Contra Costa EMS works with emergency ambulance, hospital and ED leadership to assure prompt patient transfer of care in the ED. Prompt transfer of patient care enables timely definitive care and the return of 9-1-1 emergency ambulance assets to availability for the next emergency call. The Contra Costa EMS Agency provides routine reports on patient handoff to hospitals, ambulance providers, the Contra Costa Emergency Medical Care Committee and the County Board of Supervisors.
Contra Costa EMS encourages hospitals to measure overcrowding as part of internal quality and patient safety efforts to improve ED/Hospital throughput. Two resources that have demonstrated value in this area include the use of the California Emergency Department Overcrowding Scale (CEDOCS) or the National Emergency Department Overcrowding Scale (NEDOCS). Both scales provide an objective assessment of ED overcrowding, and may be useful in helping hospitals to reduce ambulance offload delays. These tools incorporate measurement of patient census, ED bed count, ED admits, in-patient bed counts, door-to-bed time in the ED, longest wait for admission and number of patients receiving 1:1 care in the ED. The score provides a measure of overcrowding that can be used to provide an early warning to hospital personnel when overcrowding is worsening. Many hospitals have developed internal response plans to address patient flow based on these overcrowding scores. By managing flow issues early, crowding can be addressed and ambulance offload delays can be minimized or eliminated.

**Report Limitations**

This report is based on computerized dispatch and electronic patient care records for 9-1-1 ambulance data from American Medical Response (AMR). AMR provides approximately 92% of all emergency ambulance transports within the County. The report does not include patient handoff data from Fire ambulance providers, non-emergency ambulance providers or out of county emergency ambulance providers.

Data for patient transfer of care reporting is not available from San Ramon Fire and Moraga Orinda Fire Transport Providers. Transports from these providers may add to the emergency ambulance volume as they provide up to 8% of the emergency ambulance services in the county. In particular San Ramon Regional Medical Center is served almost exclusively by the San Ramon Fire Department and is not included in this report while Kaiser Walnut Creek, John Muir Walnut Creek and Contra Costa Regional Center would be most affected by additional transports provided by fire ambulance providers. As fire department ambulance transfer of care data becomes available in the future it will be included in this report.

ED annual utilization data is based on OSHPD data may not be validated until 6 months into the following year. Data associated with ED volume from OSHPD may change OSHPD updates and validates this information.

Doctor’s Medical Center was closed to emergency ambulance traffic on August, 7, 2014. Data collection on ambulance transfer of care stopped on Aug 7, 2014. On April 21, 2015 the hospital ceased all operations and closed permanently. For more information on the impact of that closure visit cchealth.org/dmc.
Never Events by Hospital: A Simple Count

A Transfer of Care (TOC) Never Event is a patient transfer of care delay of 60 minutes or more. Never Events are serious, largely preventable patient safety incidents. In September of 2014 the Contra Costa EMS began to partner with hospitals to measure and report these events to improve patient safety and support returning ambulances for availability as quickly as possible. The factors that Ambulances support first medical response throughout the Contra Costa EMS System and delays associated with Never Events affect ambulance availability for the next 9-1-1 response in local communities.

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<tr>
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</thead>
<tbody>
<tr>
<td>Contra Costa Regional Medical Center[3]</td>
<td>49</td>
<td>101</td>
<td>52</td>
<td>10</td>
</tr>
<tr>
<td>John Muir-CONCORD</td>
<td>19</td>
<td>8</td>
<td>-11</td>
<td>1</td>
</tr>
<tr>
<td>John Muir-WALNUT CREEK</td>
<td>17</td>
<td>22</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>KAISER ANTI OCH</td>
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<td>19</td>
<td>9</td>
<td>1</td>
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<td>8</td>
<td>19</td>
<td>11</td>
<td>2</td>
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<tr>
<td>SAN RAMON REGIONAL [1]</td>
<td>NA</td>
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</tr>
<tr>
<td>SUTTER DELTA</td>
<td>285</td>
<td>392</td>
<td>107</td>
<td>37</td>
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<tr>
<td><strong>COUNTYWIDE TOTAL</strong></td>
<td><strong>401</strong></td>
<td><strong>608</strong></td>
<td><strong>207</strong></td>
<td><strong>66</strong></td>
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</table>

[1] Reported ambulance TOC never events limited to AMR data. TOC Never Event Data not available for transports provided by San Ramon and Moraga Orinda Fire

Although the numbers for most hospitals have increased the primary reason is that more people are using Emergency Departments and EMS than ever before. In 2014 the countywide hospital never event rate was 0.7 TOC never events per 100 transports and in 2015 that rate increased to 0.9 TOC never events per 100 transports. During that year the EMS experienced a hospital closure, fire station closures in East County while the hospitals have been experienced a surge of patients in their Emergency Departments in 2015. Contra Costa EMS believes that no patient should wait more than an hour on a gurney and our goal is to reduce and whenever possible eliminate patient TOC never events.
Hospital Capacity and EMS Transfer of Care: EMS-ED Utilization 2009-2014

Emergency departments (EDs) have different capacities and utilization. During 2014 and 2015 Contra Costa County Hospitals received 11%-19% of their patients via EMS while over 80% of all patients arrived at the ED, via personal vehicle, for both urgent and routine medical care. EMS transports to Contra Costa Hospitals fluctuate from year to year but are increasing. Typically 10%-12% of all walk-in ED patients require admission for inpatient services. While local data suggests that patients brought by EMS may have admission rates as high as 40% due to their medical condition. During 2014 overall ED admission rates (walk-in and EMS combined) averaged between 9 and 22% in throughout Contra Costa. Although the overall volume of EMS and ED patients are increasing the proportion of EMS transports remain between 15%-16.3%. This suggests increases are most likely associated with the county’s population growth and the increased use of ED services is also associated with more people having access to health insurance under the Affordable Care Act. While ED crowding is a statewide and national problem patients transported by EMS appear not to be the cause.

<table>
<thead>
<tr>
<th>Countywide EMS-ED Annual Utilization</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
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<tbody>
<tr>
<td>County wide ED Encounters (All Hospitals)</td>
<td>371,492</td>
<td>376,719</td>
<td>391,485</td>
<td>424,431</td>
<td>394,217</td>
<td>411,022</td>
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<tr>
<td>County wide EMS Transports (All Providers)</td>
<td>58,292</td>
<td>59,534</td>
<td>61,390</td>
<td>64,527</td>
<td>64,133</td>
<td>64,870</td>
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<tr>
<td>EMS Transport Percent of all ED Encounters</td>
<td>15.7%</td>
<td>15.8%</td>
<td>15.7%</td>
<td>15.2%</td>
<td>16.3%</td>
<td>15.8%</td>
</tr>
<tr>
<td>Number of ED Stations/Beds</td>
<td>227</td>
<td>243</td>
<td>367</td>
<td>267</td>
<td>269</td>
<td>269</td>
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<tr>
<td>Number of ED Encounters per ED station</td>
<td>1,637</td>
<td>1,550</td>
<td>1,067</td>
<td>1,590</td>
<td>1,465</td>
<td>1,528</td>
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<td>Number of EMS Receiving Facilities [4]</td>
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<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>8</td>
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</table>
EMS Transport Percent of all ED Encounters (Visits)

- 2009: 15.7%
- 2010: 15.8%
- 2011: 15.7%
- 2012: 15.2%
- 2013: 16.3%
- 2014: 15.8%
County-Wide ED Encounters (Visits) compared to EMS Transports

- **Red Line**: County wide ED Encounters (All Hospitals)
- **Blue Line**: County wide EMS Transports (All Providers)
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<td>Contra Costa Regional Medical Center[4]</td>
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<td>56,920</td>
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<td>19%</td>
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<td>Doctors Medical Center [5]</td>
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<td>32,407</td>
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<td>52,747</td>
<td>1648</td>
<td>9,345</td>
<td>18%</td>
<td>26</td>
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<td>John Muir-WALNUT CREEK</td>
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<td>45,406</td>
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<tr>
<td>KAISER ANTI OCH</td>
<td>35</td>
<td>45,922</td>
<td>1312</td>
<td>5,259</td>
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<td>15</td>
<td>50,303</td>
<td>3354</td>
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<td>KAISER WALNUT CREEK</td>
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<td>55,128</td>
<td>1060</td>
<td>6,907</td>
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<td>SUTTER DELTA</td>
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<td>54,959</td>
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<td>8,433</td>
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<td>285</td>
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<td>411,022</td>
<td>1528</td>
<td>61,024</td>
<td>15%</td>
<td>167</td>
<td>401</td>
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[2] The American College of Emergency Physicians (ACEP) recommended standard is 2000 visits per ED bed
[3] This data includes all Contra Costa emergency ambulance transport data for San Ramon Fire and Moraga Orinda Fire Departments and AMR.
[4] Includes Contra Costa Regional Emergency Department and Psychiatric Emergency Patient Volume
[5] Doctors Medical Center Closed to EMS Traffic on August 7, 2014
[6] Reported ambulance TOC never events limited to AMR data. TOC Never Event Data not available for transports provided by San Ramon and Moraga Orinda Fire
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<tbody>
<tr>
<td>Contra Costa Regional Medical Center[3]</td>
<td>20</td>
<td>37,905</td>
<td>1,895</td>
<td>9,737</td>
<td>26%</td>
<td>27</td>
<td>74</td>
<td>0.8</td>
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<tr>
<td>Doctors Medical Center [4]</td>
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<td>9,343</td>
<td>374</td>
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<td>NA</td>
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<td>NA</td>
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<tr>
<td>John Muir-CONCORD</td>
<td>32</td>
<td>39,920</td>
<td>1,248</td>
<td>7,746</td>
<td>19%</td>
<td>21</td>
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<tr>
<td>John Muir-WALNUT CREEK</td>
<td>44</td>
<td>29,255</td>
<td>665</td>
<td>6,862</td>
<td>23%</td>
<td>19</td>
<td>20</td>
<td>0.3</td>
</tr>
<tr>
<td>KAISER ANTIOCH</td>
<td>35</td>
<td>37,549</td>
<td>1,073</td>
<td>4,493</td>
<td>12%</td>
<td>12</td>
<td>16</td>
<td>0.4</td>
</tr>
<tr>
<td>KAISER RICHMOND [6]</td>
<td>15</td>
<td>78,434</td>
<td>5,229</td>
<td>6,295</td>
<td>8%</td>
<td>17</td>
<td>8</td>
<td>0.1</td>
</tr>
<tr>
<td>KAISER WALNUT CREEK</td>
<td>52</td>
<td>38,949</td>
<td>749</td>
<td>5,687</td>
<td>15%</td>
<td>16</td>
<td>18</td>
<td>0.3</td>
</tr>
<tr>
<td>SAN RAMON REGIONAL [7]</td>
<td>12</td>
<td>11,501</td>
<td>958</td>
<td>1,513</td>
<td>13%</td>
<td>4</td>
<td>NA</td>
<td>NA</td>
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<tr>
<td>SUTTER DELTA</td>
<td>32</td>
<td>39,734</td>
<td>1,242</td>
<td>7,018</td>
<td>18%</td>
<td>19</td>
<td>303</td>
<td>4.3</td>
</tr>
<tr>
<td>COUNTYWIDE TOTAL [4]</td>
<td>269</td>
<td>322,590</td>
<td>1,199</td>
<td>49,351</td>
<td>15%</td>
<td>135</td>
<td>443</td>
<td>0.9</td>
</tr>
</tbody>
</table>

[1] The American College of Emergency Physicians (ACEP) recommended standard is 2000 visits per one ED bed
[2] This data includes all Contra Costa emergency ambulance transport data for San Ramon Fire and Moraga Orinda Fire Departments and AMR.
[3] Includes Contra Costa Regional Emergency Department and Psychiatric Emergency Patient Volume
[7] Reported ambulance TOC never events limited to AMR data. TOC never event data is not yet available for transports provided by San Ramon and Moraga Orinda Fire
[8] Reflects All EMS Transports to all destinations including out of county destinations
Never Events Demographics: Who are the patients affected?

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>32</td>
<td>235</td>
<td>338</td>
<td>34</td>
<td>639</td>
</tr>
<tr>
<td>Female</td>
<td>30</td>
<td>166</td>
<td>270</td>
<td>32</td>
<td>498</td>
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</table>

Women appear to be affected more than men

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0-9</td>
<td>1</td>
<td>9</td>
<td>7</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td>10-19</td>
<td>5</td>
<td>21</td>
<td>26</td>
<td>2</td>
<td>54</td>
</tr>
<tr>
<td>20-29</td>
<td>7</td>
<td>41</td>
<td>72</td>
<td>6</td>
<td>126</td>
</tr>
<tr>
<td>30-39</td>
<td>5</td>
<td>37</td>
<td>70</td>
<td>10</td>
<td>122</td>
</tr>
<tr>
<td>40-49</td>
<td>8</td>
<td>58</td>
<td>74</td>
<td>8</td>
<td>148</td>
</tr>
<tr>
<td>50-59</td>
<td>10</td>
<td>65</td>
<td>113</td>
<td>6</td>
<td>194</td>
</tr>
<tr>
<td>60-69</td>
<td>10</td>
<td>70</td>
<td>93</td>
<td>10</td>
<td>183</td>
</tr>
<tr>
<td>70-79</td>
<td>8</td>
<td>41</td>
<td>70</td>
<td>9</td>
<td>128</td>
</tr>
<tr>
<td>80-89</td>
<td>4</td>
<td>42</td>
<td>54</td>
<td>10</td>
<td>110</td>
</tr>
<tr>
<td>90-100</td>
<td>4</td>
<td>16</td>
<td>29</td>
<td>4</td>
<td>53</td>
</tr>
<tr>
<td>&gt; 100</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

All ages are affected

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>2</td>
<td>17</td>
<td>15</td>
<td>0</td>
<td>34</td>
</tr>
<tr>
<td>Asian</td>
<td>19</td>
<td>106</td>
<td>159</td>
<td>14</td>
<td>298</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>29</td>
<td>200</td>
<td>291</td>
<td>38</td>
<td>558</td>
</tr>
<tr>
<td>Race</td>
<td>11</td>
<td>49</td>
<td>99</td>
<td>10</td>
<td>169</td>
</tr>
</tbody>
</table>

All ethnicities are affected

14
Understanding the Clinical Characteristics of “TOC Never Event” Patients May Assist Hospitals in Identifying At-Risk Populations

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>15</td>
<td>96</td>
<td>126</td>
<td>11</td>
<td>248</td>
</tr>
<tr>
<td>Other - Sick/Dizzy/Weakness</td>
<td>11</td>
<td>50</td>
<td>71</td>
<td>8</td>
<td>140</td>
</tr>
<tr>
<td>Trauma</td>
<td>5</td>
<td>45</td>
<td>81</td>
<td>9</td>
<td>140</td>
</tr>
<tr>
<td>Behavioral / Psychiatric</td>
<td>7</td>
<td>51</td>
<td>82</td>
<td>13</td>
<td>153</td>
</tr>
<tr>
<td>Neurological</td>
<td>5</td>
<td>36</td>
<td>49</td>
<td>1</td>
<td>91</td>
</tr>
<tr>
<td>Respiratory</td>
<td>4</td>
<td>26</td>
<td>37</td>
<td>6</td>
<td>73</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>5</td>
<td>24</td>
<td>44</td>
<td>5</td>
<td>78</td>
</tr>
<tr>
<td>Toxicological</td>
<td>3</td>
<td>25</td>
<td>52</td>
<td>3</td>
<td>83</td>
</tr>
<tr>
<td>Cardiac</td>
<td>5</td>
<td>17</td>
<td>25</td>
<td>2</td>
<td>49</td>
</tr>
<tr>
<td>Vascular</td>
<td>1</td>
<td>23</td>
<td>31</td>
<td>6</td>
<td>61</td>
</tr>
<tr>
<td>Diabetes</td>
<td>0</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>OB/GYN</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Allergic Reaction</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

Many of these conditions may be minor; however no patient should wait more than 60 minutes for EMS/ED transfer of care.

In California, when 9-1-1 is contacted, the EMS ambulance provider is required by law to take the patient to an ED although up to 60% of all EMS transports are “treat and release” within 24 hours. Future EMS and Hospital partnerships could redirect patients to non 9-1-1 resources and encourage the use of alternative primary or urgent care settings more appropriate for the patient condition. Such options could play an important role in conserving EMS ambulance and ED resources for the sickest of patients. However until the laws governing EMS services would need to change to create alternatives.
“TOC Never Events” Affect a Wide Range of Patient Conditions

Patients with low, moderate or high acuity conditions may experience prolonged patient transfer of care events (wait times on the gurney of an hour or more). Patients with low acuity conditions may be better served by urgent care or same day appointments. However under California law EMS is prohibited from taking patients to any other destination than a hospital ED.

Paramedic primary impressions are not clinical diagnoses and may not reflect the condition of the patient. Paramedic primary impression categories reflect the field paramedic assessment of the patient prior to being evaluated in the ED.

- Trauma “Never Event” data reflect patients who do not have major trauma by paramedic impression
Addendum

Performance Trends by Facility Patient Handoff (TOC) Times 90 Percentile and Average
Patient Handoff Times by Facility (90th Percentile)

John Muir - Concord

February 2015 - January 2016

9,545 Total Transports (795 per Month)

Source: AMR MEDS (ePCR Database)
Patient Handoff Times by Facility (90th Percentile)
John Muir - Walnut Creek
February 2015 - January 2016
8,984 Total Transports (749 per Month)
Source: AMR MEDS (ePCR Database)
Patient Handoff Times by Facility (90th Percentile)
Kaiser - Antioch
February 2015 - January 2016
6,098 Total Transports (508 per Month)
Source: AMR MEDS (ePCR Database)
Patient Handoff Times by Facility (90th Percentile)

Kaiser - Richmond
February 2015 - January 2016
9,440 Total Transports (787 per Month)
Source: AMR MEDS (ePCR Database)

Doctors Medical Center closed its doors at 7:00 AM on 4/21/2015
Patient Handoff Times by Facility (90th Percentile)
Kaiser - Walnut Creek
February 2015 - January 2016
6,803 Total Transports (567 per Month)
Source: AMR MEDS (ePCR Database)
Patient Handoff Times by Facility (90th Percentile)
Contra Costa Regional Medical Center
February 2015 - January 2016
5,518 Total Transports (460 per Month)
Source: AMR MEDS (ePCR Database)
Patient Handoff Times by Facility (90th Percentile)
CCRMC - PES
February 2015 - January 2016
7,862 Total Transports (655 per Month)
Source: AMR MEDS (ePCR Database)
Patient Handoff Times by Facility (90th Percentile)

Sutter Delta Medical Center

February 2015 - January 2016
9,518 Total Transports (793 per Month)

Source: AMR MEDS (ePCR Database)
Average Patient Handoff Times by Facility
February 2015 - January 2016 by Month

22,898 Total Transports
Source: AMR MEDS (ePCR Database)

*Note: CCRMC data may include patients who were actually taken to PES. Contra Costa EMS is working to more accurately identify whether patients were taken to CCRMC ED or PES.
DATE: February 5, 2016

TO: Contra Costa County and City Leadership & EMS System Stakeholders

FROM: Patricia Frost, EMS Director

SUBJECT: Contra Costa County Fire Ambulance Service Transition Update #2

On January 1, 2016 at 0000 hours Contra Costa County Fire Protection District assumed the responsibility for the delivery of emergency ambulance services in Emergency Response Areas I, II and V, as illustrated below.

EMS ambulance services is now provided through a contractor-subcontractor partnership between the district and American Medical Response (AMR) under the new, innovative EMS service delivery model known as the “Alliance.”
A number of changes to the EMS system authorized by the Contra Costa County Board of Supervisors in 2014 were incorporated into the Request for Proposal (RFP) for ambulance services and are now being implemented. Those changes were based upon an independent, third-party review of the county EMS system by an industry consultant, whose charge was to make recommendations to improve efficiency while ensuring sustainable ambulance services without subsidy from the county. The consultant’s study included extensive fiscal and data analysis of community use of EMS services, stakeholder input and changes to our EMS system associated with fire station and hospital closures. The recommendations also took into account the many County EMS system capabilities known to improve patient survival and reduce disability.

Ambulance service level changes implemented under the new Alliance ambulance agreement reflect the following:

- The Contra Costa EMS System has mature capabilities to provide excellent patient care for trauma, stroke, heart attack and cardiac arrest.
- Emergency ambulance response areas were updated and adjusted for population growth and utilization.
- It is anticipated that ambulance response times will remain the same or improve because of updates in the ambulance response zones along with the improvements associated with co-located dispatch.
- Ambulance response zone requirements in West County reflect the demands for increased ambulance hours due to the closure of Doctor’s Medical Center.
- Quick Response Vehicles (which had no transport capability) have been replaced with ambulance hours in both East and West County to assure that more ambulances are available to transport a patient to the hospital promptly.
- Increased emphasis on community first responders, including CPR training and public access defibrillation programs in the community, schools and with law enforcement.
- Adjustments in ambulance staffing in Richmond improves the ability of the ambulance contractor to meet the staffing demands associated with more ambulances on the road. The county’s minimum requirement for ambulance staffing will remain one paramedic and one EMT.
- Recognition that fire agencies with basic life support (BLS) first responders, in Richmond, Crockett and East Contra Costa, are effective in providing life-saving capabilities and plan to add enhanced skills in the future.
- On February 1, 2016 Contra Costa Fire announced implementation of the new co-located Fire-EMS and ambulance dispatch designed to improve EMS and ambulance response times throughout the service area.
- Planned improvements in technology and intra-operability of EMS data systems and emergency communications including prehospital ePCR (electronic patient care record) health information exchange with hospitals.

During the next few months, the EMS Agency will continue to work closely with Contra Costa Fire and AMR to ensure a smooth transition and support the many enhancements promised to communities. It is expected that the changes will be virtually
invisible to the community, with the exception of cosmetic changes to ambulances and uniforms over the next six to 12 months.

Alliance ambulances will be branded in two phases. The first change, illustrated below (white with red stripe), is anticipated to be completed by the end of February 2016.

Afterward, all ambulances approaching the end of their useful lives will be replaced with new vehicles with red-and-black paint (see below).

Alliance ambulance personnel uniforms will also be changing from white to blue shirts, with a new Contra Costa Fire-EMS Alliance patch and logo.
Contra Costa EMS system stakeholders with questions about the transition can contact the EMS Agency at 925-646-4690, or via our EMS reporting form at http://cchealth.org/ems/event-reporting/
DATE: January 5, 2016

TO: Local EMS Administrators
   EMS Medical Directors
   EMS Providers
   Other EMS System Stakeholders

FROM: Howard Backer, MD, MPH, FACEP
       Director

SUBJECT: New State EMS Data System Requirements

Recent legislation, in addition to multiple data initiatives, is driving rapid changes in EMS data systems at the local, state, and national levels. The EMS Authority is providing this guidance to local EMS agencies, EMS providers, and other stakeholders to clarify their responsibilities related to data and quality during 2016.

EMSA has made data quality and analysis a priority over the past 3 years. Stakeholders in the EMS system recently have engaged in discussions with EMSA regarding the strategy and changes around data collection and evaluation. In addition, EMSA recently formed a data advisory group consisting of three local EMS agency administrators and an equal number of medical directors to help determine a cooperative strategy for improving EMS data and its application. The continuation of funding from the Office of Traffic Safety for local data collection efforts and movement to NEMSIS 3.x, the development of EMS performance improvement measures (Core Measures) through one-time funding from the California HealthCare Foundation (CHCF), and the recent grant from the Office of the National Coordinator for Health Information Technology (ONC) to implement local health information exchange projects (Patient Unified Lookup System for Emergencies +EMS) have enhanced data and quality efforts.

In addition, four bills were passed by the legislature and signed by the Governor during 2015 related to data, quality, and the electronic movement of health information: AB503, AB1129, AB1223, and SB19.

EMSA plans to open the California Code of Regulation, Title 22, Division 9, Chapter 12, EMS System Quality Improvement regulations for amendments to implement the newly enacted sections of AB503, AB1129, AB1223 and SB19. This revision would update the regulations to appropriately address data and quality improvement. We will reach out to EMS stakeholder groups to establish a representative task force to assist us in this effort.
While the regulatory process is lengthy, the requirements of the legislation took effect January 1, 2016. Therefore, until the regulations are revised, the following information is provided to local EMS agencies and EMS providers to support the statutory requirements.

**Implementation of AB1129 -- Health and Safety Code 1797.227**

AB 1129, effective January 1, 2016, requires among other provisions that:

1. Each emergency medical care provider uses an electronic health record;
2. The electronic record must be compliant with the current version of NEMSIS and CEMSIS.

For the purposes of this guidance, an *emergency medical care provider* is an entity that is authorized as part of an EMS system by the local EMS agency. At a minimum, every ambulance transport provider (both emergency and non-emergency, including BLS, LALS, and ALS) and every advanced or limited advanced life support entity would fit this definition. Some Local EMS agencies also have specific local system design characteristics involving BLS non-transport first responder entities that also meet this definition.

For the purposes of interpreting the provisions of AB1129, EMSA recognizes that “electronic health record” means electronic Patient Care Report (ePCR). An *electronic health record (EHR)*, as defined by the Office of the National Coordinator for Health Information Technology (ONC), is a digital version of a patient’s paper chart. Further, ONC notes:

> “EHRs are real-time, patient-centered records that make information available instantly and securely to authorized users. One of the key features of an EHR is that health information can be created and managed by authorized providers in a digital format capable of being shared with other providers across more than one health care organization.”

To meet this definition, the electronic health record must have the capability of mobile entry at the patient’s bedside, and incorporate workflow for real-time entry of information. This also means that all EHR systems should be interoperable with other systems, including the functionality to exchange (send and receive) electronic patient health information with other entities, including hospitals, in an HL7 format, using ONC standards. NEMSIS 3 incorporates these format standards.

AB1129 requires that, electronic health record systems must be compliant with the "current version of NEMSIS". The current version of NEMSIS is version 3.3.4 or version 3.4. The sunset date for version 3.3.4 is August 31, 2016. Compliant means a system that has been tested and certified “compliant” by NEMSIS; this certification information is posted on the NEMSIS website at [http://www.nemsis.org/v3/compliantSoftware.html](http://www.nemsis.org/v3/compliantSoftware.html).
A local EMS agency may not mandate that a provider use a specific EHR system, but the EMS provider must use a system that “can be integrated” with the LEMSA system. Therefore, the local EMS agency may require the EMS provider to demonstrate, test, and ensure that the proposed system is compatible with the local EMS agency system at the provider’s cost without a heavy reliance on mapping. The specific system mandate prohibition does not affect agreements in place by January 1, 2016.

Compliance with CEMSIS is determined by meeting any additional requirements by EMSA or California specific criteria that expand or limit the responses for any NEMSIS elements. These will be specified in a subsequent memo or guidance anticipated to be released by April 1, 2016.

**NEMSIS Version 3.4:**

All EMS systems must have a NEMSIS 3.4 compliant system in operation no later than midnight on December 31, 2016. California will use the NEMSIS Version 3.4 as our base data standard effective January 1, 2017. This will allow California to be consistent with the most current version of the national data standard and with AB1129.

The National Highway Safety Administration (NHTSA) and University of Utah have put a final sunset date on the use of NEMSIS Version 2. The submission of NEMSIS Version 2 will conclude at midnight on December 31, 2016 with no further time extension allowed.

**Implementation of AB 503 – Health and Safety Code 1797.122:**

This bill authorizes a health facility to share patient-identifiable information with a defined EMS provider, local EMS agency, and EMSA. This clarifies the California health information privacy law to be consistent with HIPAA, which already allows sharing of treatment, payment, and operations information between covered entities, and also specifies that local EMS agencies and EMSA may receive this information for quality improvement. The intent is to share outcome information on patients to support quality evaluation and performance improvement and the use of health information exchange. This will also enhance the annual EMS Core Measure reporting.

As allowed in the bill, EMSA will set the “minimum standards for the implementation of data collection, including system operation, patient outcome, and performance quality improvement.” These standards will be incorporated into revisions of Chapter 12.
Implementation of AB 1223 – Health and Safety Code 1797.120 and 1797.225:

This bill requires EMSA to adopt standards related to data collection for ambulance patient offload time.

Interim guidance will be developed by EMSA, in collaboration with local EMS agencies, on statewide standard methodology for the calculation and reporting of ambulance patient offload time. Regulation revisions will propose to incorporate the methodology found in the interim guidance.

Implementation of SB 19 – Probate Code 4788:

This bill enacts the California POLST eRegistry Pilot Act. The bill requires the Emergency Medical Services Authority to establish a pilot project, in consultation with stakeholders, to operate an electronic registry system on a pilot basis, to be known as the California POLST eRegistry Pilot, for the purpose of collecting POLST information received from a physician or physician's designee, if non-state funding is received.

The bill requires EMSA to coordinate the development of the POLST eRegistry Pilot, which would be operated by health information exchange networks, by an independent contractor, or by a combination thereof. The main model envisioned for the registry is dependent on use of electronic health records by EMS personnel (as required in AB 1129), and transition to a NEMSIS 3 platform, to link those records to electronic medical records within health systems to send, receive, find, and use POLST information.

Many individuals throughout our EMS system are excited about the potential for increased data quality and consistency, which will lead to new opportunities to evaluate, understand, and improve our EMS system at all levels.

Please contact either Tom McGinnis at Tom.mcginnis@emsa.ca.gov 916-431-3695 or Kathleen Bissell at Kathy.bissell-benabides@emsa.ca.gov 916-431-3687 with any questions concerning this memo.
## 2015 Emergency Medical Services (EMS) System Plan

### System Plan SMART^1^ Objectives

Progress from Last Reporting Period

<table>
<thead>
<tr>
<th>No.</th>
<th>Standard</th>
<th>Meets State Standard</th>
<th>FY 2014-2015 Objectives</th>
<th>Progress to Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.04</td>
<td>Medical Director</td>
<td>Yes</td>
<td>Medical Director Succession Planning as of November 2015</td>
<td>Progress to Date: Met Dr. David Goldstein has fully assumed his responsibilities as the new Local EMS Agency (LEMSA) Medical Director</td>
</tr>
<tr>
<td>1.06</td>
<td>Annual system Plan Update</td>
<td>Yes</td>
<td>Annual EMS System Update to State EMS Authority (EMSA)</td>
<td>Progress to Date: Met submitted EMSA April 2015 New update due July 2016</td>
</tr>
<tr>
<td>1.08</td>
<td>ALS Planning</td>
<td>Yes</td>
<td>EMS System Review and Modernization study integration into emergency ambulance Request for Proposal (RFP) procurement and selection complete by November 2015.</td>
<td>Progress to Date: Met New ambulance provider competitively procured and new contract started January 1, 2016</td>
</tr>
<tr>
<td>1.10</td>
<td>Special Populations</td>
<td>Yes</td>
<td>Exploration of alternative delivery models to match patient need to resource.</td>
<td>Progress to Date: In Progress 1-5 years. Engaged with local Health System partners to explore opportunities.</td>
</tr>
<tr>
<td>1.11</td>
<td>System Participants</td>
<td>Yes</td>
<td>Stakeholder participation in update of ambulance ordinance</td>
<td>Progress to Date: In Progress 12-18 months Draft updated ordinance in review with County Counsel.</td>
</tr>
<tr>
<td>1.13</td>
<td>Coordination</td>
<td>Yes</td>
<td>Exploration of coordination of EMS Dispatch Centers with Nurse Call centers to support appropriate use of 9-1-1</td>
<td>Progress to Date: Not Started Engage stakeholders within 1-5 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Annually evaluate all patient care based on evidence-based care optimizing patient benefit and patient safety.</td>
<td>Progress to Date: Ongoing Annually. Continue to enhance systems of care policies and practices to support improved patient outcomes</td>
</tr>
</tbody>
</table>

^1 SMART: Specific, Measurable, Achievable, Realistic and Timely
<table>
<thead>
<tr>
<th>No.</th>
<th>Standard</th>
<th>Meets State Standard</th>
<th>FY 2014-2015 Objectives</th>
<th>Progress to Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.16</td>
<td>System Finances</td>
<td>Yes</td>
<td>Annually review of costs and fees to support sustainable EMS System and EMS Agency oversight and operations.</td>
<td>Progress to Date: Ongoing Monitor and manage current funding effectively to support sustainable programs and activities.</td>
</tr>
<tr>
<td>1.20</td>
<td>DNR (Do Not Resuscitate)</td>
<td>Yes</td>
<td>Participating on the Steering Committee for Physicians Orders for Life Sustaining Treatment (POLST) with EMS System Stakeholders supporting the conversation project over 12-24 months.</td>
<td>Progress to Date: Ongoing Member of POLST Conversation Project within county.</td>
</tr>
<tr>
<td>1.27</td>
<td>Pediatric Emergency Medical and Critical Care System</td>
<td>Yes</td>
<td>Pediatric EMS for Children (EMSC) System Program Plan update and regulation implementation within 1-5 years.</td>
<td>Progress to date: In progress. State EMSC regulations not final. Active on EMSC Technically Advisory Committee. To begin update of EMSC Program within 12 months.</td>
</tr>
<tr>
<td>1.28</td>
<td>Exclusive Operating Area (EOA)</td>
<td>Yes</td>
<td>Update of county ambulance ordinance within 12-18 months. Update of EOA I, II and V completed as part of system redesign and ambulance procurement.</td>
<td>Progress to date: In progress. Update of ambulance response areas completed as part of ambulance procurement effective January 1, 2016. Ambulance ordinance update in progress.</td>
</tr>
<tr>
<td>2.01</td>
<td>Local EMS Agency Staffing and Assessment of Needs</td>
<td>Yes</td>
<td>EMS System Study and Modernization Project review of EMS staffing needs and workflows to support statutory requirements within 1-2 years.</td>
<td>Progress to date: Ongoing. Re-align staffing in line with required statutory functions, quality and medical oversight.</td>
</tr>
<tr>
<td>2.04</td>
<td>Dispatch Training</td>
<td>Yes</td>
<td>Promote support high quality Emergency Medical Dispatch (EMD) dispatcher training and performance consistent for Center of Excellence Accreditation within 3-5 years.</td>
<td>Progress to date: In progress. Dispatch medical oversight policies consistent with Center of Excellence national standards. EMS procurement supports unified and accredited dispatch.</td>
</tr>
<tr>
<td>2.06</td>
<td>Response</td>
<td>Yes</td>
<td>Contra Costa EMS (CCEMS) has been active in the mitigation for several fire districts with over 7 fire station closures as of May 2013 and an additional 3 station closures planned by Dec 201. Ongoing evaluation based on safety, funding and opportunities for health care reimbursement.</td>
<td>Progress to date: Ongoing Monitoring coordinated response of ambulance and first responders</td>
</tr>
<tr>
<td>2.12</td>
<td>Early Defibrillation</td>
<td>Yes</td>
<td>Continued expansion of public access Automated External Defibrillation (AED) and Law AED programs with integration into dispatch.</td>
<td>Progress to Date: Ongoing. Continue to engage community first responders and citizen responders.</td>
</tr>
<tr>
<td>No.</td>
<td>Standard</td>
<td>Meets State Standard</td>
<td>FY 2014-2015 Objectives</td>
<td>Progress to Date</td>
</tr>
<tr>
<td>-----</td>
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<td>-----------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>5.06</td>
<td>Hospital Evacuation Plan</td>
<td>Yes</td>
<td>Update medical surge and transportation plans for hospitals within 3 years incorporating standardized training with HICS for all hospital facilities with opportunities for integration of first responders with hospital leadership and incident commanders.</td>
<td>Progress to date: In progress  Plan incorporated into Hospital Preparedness Program (HPP) deliverables.</td>
</tr>
<tr>
<td>5.10</td>
<td>Pediatric Emergency and Critical Care System</td>
<td>Yes</td>
<td>Continued networking with pediatric emergency care advocates throughout the local, regional and state EMS systems supporting pediatric emergency care best practices.</td>
<td>Progress to date: Ongoing  CCEMS and Alameda County (ALCO) EMS have collaborative program of active advocacy for emergency preparedness for children.</td>
</tr>
<tr>
<td>5.13</td>
<td>Specialty System Design</td>
<td>Yes</td>
<td>Annual Stroke, STEMI, Trauma and Cardiac Arrest System Evaluation.</td>
<td>Progress to date: Ongoing  Continuous CQI program review and participation in California Stroke Registry, Cardiac Arrest Registry for Enhanced Survival (CARES), Trauma Registry and California EMS Information System (CEMSIS).</td>
</tr>
<tr>
<td>5.14</td>
<td>Public Input</td>
<td>Yes</td>
<td>Active program of engagement with public including quarterly Emergency Medical Care Committee (EMCC) meetings. EMCC bylaw update.</td>
<td>Progress to date: Ongoing  EMCC bylaw update completed as of January 2016. See website cccems.org for details. Public and EMCC comment to be included as part of ambulance ordinance review and update process.</td>
</tr>
<tr>
<td>6.01</td>
<td>QA/QI Program</td>
<td>Yes</td>
<td>Bi-annual public reporting EMS Hospital transfer of care never event monitoring. Implementation of Quality Review Team (QRT) for review of event reports concerning clinical care concerns.</td>
<td>Progress to date: Ongoing  Hospitals public reporting continues. QRT implemented and reviewing cases for trends.</td>
</tr>
<tr>
<td>7.01</td>
<td>Public Education</td>
<td>Yes</td>
<td>Expansion of HeartSafe Communities to include support for CPR, Public Access Defibrillation (PAD), Heart Attack, Stroke and Healthy Lifestyle.</td>
<td>Progress to date: Ongoing  continue countywide expansion of outreach in progress.</td>
</tr>
<tr>
<td>7.03</td>
<td>Disaster Preparedness</td>
<td>Yes</td>
<td>Annual advocacy and implementation of regional pediatric medical surge planning. Develop policies and work with</td>
<td>Progress to date: Ongoing  CCEMS participating in National, regional and statewide efforts supporting</td>
</tr>
<tr>
<td>No.</td>
<td>Standard</td>
<td>Meets State Standard</td>
<td>FY 2014-2015 Objectives</td>
<td>Progress to Date</td>
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<td>------------------------------------------------------------------------------------------------------</td>
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<tr>
<td>8.13</td>
<td>Disaster Medical Response</td>
<td>Yes</td>
<td>Annual Sustain development and recruitment of Contra Costa Medical Reserve Corp volunteers and effectively deploy Medical Reserve Corps (MRC) for medical health response as needed.</td>
<td><strong>Progress to date:</strong> Met  MRC coordinator in place to support training to enable effective deployment of MRC.</td>
</tr>
<tr>
<td>8.15</td>
<td>Interhospital Communications</td>
<td>Yes</td>
<td>Address ongoing gaps in emergency communications e.g. ReddiNet, switch to East Bay Regional Communications System (EBRCS) hospital radio system.</td>
<td><strong>Progress to date:</strong> Ongoing. Annually monitor, support and upgrade as fiscally able interhospital communications</td>
</tr>
<tr>
<td>8.18</td>
<td>Enhanced Level: Specialty Care Systems</td>
<td>Yes</td>
<td>Update of new state regulations for specialty care systems e.g. ST Elevation Myocardial Infarction (STEMI), Stroke, EMSC.</td>
<td><strong>Progress to date:</strong> Ongoing  Annually involved in the development through EMSAAC</td>
</tr>
</tbody>
</table>
## 2016 TIMELINE & ACTIONS TO BE ADDRESSED

All State standards have been met. We plan to address or reassess the following SMART objectives.

<table>
<thead>
<tr>
<th>No.</th>
<th>Standard</th>
<th>Meets State Standard</th>
<th>2016 Objectives</th>
<th>Time Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.06</td>
<td>Annual System Plan Update</td>
<td>Yes</td>
<td>Update Annually.</td>
<td>July 2016</td>
</tr>
<tr>
<td>1.08</td>
<td>ALS Planning</td>
<td>Yes</td>
<td>Support successful ambulance provider transition and monitor for system gaps</td>
<td>July 2016</td>
</tr>
<tr>
<td>1.10</td>
<td>Special Populations</td>
<td>Yes</td>
<td>Exploration of alternative delivery models to match patient need to resource.</td>
<td>1-5 years</td>
</tr>
<tr>
<td>1.11</td>
<td>System Participants</td>
<td>Yes</td>
<td>Stakeholder participation in update of ambulance ordinance.</td>
<td>1-2 years</td>
</tr>
<tr>
<td>1.13</td>
<td>Coordination</td>
<td>Yes</td>
<td>Exploration of EMS dispatch services, exploration of coordination with Nurse Call centers to support appropriate utilization of 9-1-1 services.</td>
<td>1-5 years</td>
</tr>
<tr>
<td>1.14</td>
<td>Policy and Procedure Manual</td>
<td>Yes</td>
<td>Update of prehospital care policies and procedures based on prehospital evidence-based care. Implementation of new American Heart Association Guidelines for ALS.</td>
<td>Annually</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Continue to evaluate policies and standard operating procedures for patient benefit, delay in definite care and patient safety. Revise protocols to control cost while prioritizing patient safety.</td>
<td>Annually</td>
</tr>
<tr>
<td>1.16</td>
<td>System Finances</td>
<td>Yes</td>
<td>Review of fees and costs to support sustainable delivery of EMS services.</td>
<td>Annually</td>
</tr>
<tr>
<td>1.20</td>
<td>Do Not Resuscitate (DNR)</td>
<td>Yes</td>
<td>Participation with “Conversation Project” in Bay Area.</td>
<td>Annually</td>
</tr>
<tr>
<td>1.27</td>
<td>Pediatric Emergency Medical and Critical Care System</td>
<td>Yes</td>
<td>Update of Pediatric EMSC plan and future implementation of State Pediatric EMSC System of Care regulations.</td>
<td>3 years</td>
</tr>
<tr>
<td>1.28</td>
<td>Exclusive Operating Area</td>
<td>Yes</td>
<td>Complete county ambulance ordinance.</td>
<td>1-2 years</td>
</tr>
<tr>
<td>2.01</td>
<td>Local EMS Agency Staffing and Assessment of Needs</td>
<td>Yes</td>
<td>Annual review of EMS Staffing needs and workflows to support statutory requirements.</td>
<td>1-2 years</td>
</tr>
<tr>
<td>2.04</td>
<td>Dispatch Training</td>
<td>Yes</td>
<td>Support high quality EMD and dispatcher training for Center of Excellence Accreditation.</td>
<td>1-5 years</td>
</tr>
<tr>
<td>2.12</td>
<td>Early Defibrillation</td>
<td>Yes</td>
<td>Expand and enhance Public Access AED and Law AED programs within fiscal resources</td>
<td>Annually</td>
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</tr>
<tr>
<td>5.06</td>
<td>Hospital Evacuation Plan</td>
<td>Yes</td>
<td>Update of medical surge and transportation plans for hospitals.</td>
<td>1-3 years</td>
</tr>
<tr>
<td>5.08</td>
<td>Trauma Planning</td>
<td>Yes</td>
<td>Update of trauma plan.</td>
<td>January 2017</td>
</tr>
<tr>
<td>5.10</td>
<td>Pediatric Emergency and Critical Care System</td>
<td>Yes</td>
<td>Continued networking with pediatric emergency care advocates throughout the local, regional and state EMS systems supporting pediatric emergency care best practices.</td>
<td>Annually</td>
</tr>
<tr>
<td>5.13</td>
<td>Specialty System Design</td>
<td>Yes</td>
<td>Stroke, STEMI, Cardiac Arrest, Trauma, EMS for Children System Program Evaluation.</td>
<td>Annually</td>
</tr>
<tr>
<td>5.14</td>
<td>Public Input</td>
<td>Yes</td>
<td>Support EMCC engagement on EMS issues including public input of Ambulance Ordinance.</td>
<td>Annually</td>
</tr>
<tr>
<td>6.01</td>
<td>Quality Assurance (QA)/Quality Improvement (QI) Program</td>
<td>Yes</td>
<td>Evaluate EMS-Hospital data system integration supporting patient safety and prehospital care. Develop Health Information Exchange between EMS ePCR and EPIC (hospital medical record platform)</td>
<td>1-4 years</td>
</tr>
<tr>
<td>7.01</td>
<td>Public Education</td>
<td>Yes</td>
<td>Sustain HeartSafe Communities to include support for CPR, PAD, Heart Attack, Stroke and Healthy Lifestyle.</td>
<td>Annually</td>
</tr>
<tr>
<td>7.03</td>
<td>Disaster Preparedness Promotion</td>
<td>Yes</td>
<td>Continued advocacy and implementation of regional pediatric medical surge planning.</td>
<td>Annually</td>
</tr>
<tr>
<td>8.13</td>
<td>Disaster Medical Response</td>
<td>Yes</td>
<td>Sustain development and recruitment of Contra Costa Medical Reserve Corp volunteers.</td>
<td>Annually</td>
</tr>
<tr>
<td>8.15</td>
<td>Interhospital Communications</td>
<td>Yes</td>
<td>Address ongoing gaps and improvement opportunities for ReddiNet platform to support reliable use by hospitals. Replace old radio system (MEDARS) when sunsets and implement new EBRCS hospital radio system</td>
<td>Annually</td>
</tr>
<tr>
<td>8.18</td>
<td>Enhanced Level: Specialty Care Systems</td>
<td>Yes</td>
<td>Evaluate new regulations for specialty care system implementation when complete. e.g. STEMI, Stroke, EMS for Children.</td>
<td>1-2 years</td>
</tr>
</tbody>
</table>
Contra Costa to Move Ahead with Laura’s Law Program in February

A new program from Contra Costa Health Services (CCHS) will allow the county to request court-appointed outpatient treatment for people with severe mental illness, in accordance with Laura’s Law.

The 2002 state law allows counties to use the civil court system to supervise care for people with mental illness who meet specific legal criteria, which include a history of hospitalization or violence and of declining offered treatment.

The Contra Costa Board of Supervisors passed a plan to implement Laura’s Law, which counties may voluntarily adopt, in 2015. The county’s Assisted Outpatient Treatment (AOT) program begins Feb. 1.

AOT emphasizes voluntary participation, but includes a referral and hearing process for placing individuals in court-ordered treatment, developed in partnership with Contra Costa Superior Court, County Counsel and the Public Defender’s Office.

BHS has hired Mental Health Systems, a nonprofit with experience running similar programs in San Diego County and elsewhere in California, to work with county clinicians in providing treatment to referred patients.

CCHS’ Behavioral Health Services Division (BHS) and its partners will continue to work closely with providers, family and patient advocates and the county Mental Health Commission to ensure AOT is effective, fair and respectful to all involved, Director Cynthia Belon said.

“AOT is critical for community members whose mental health challenges put them or others at risk, and have not yet received the help they need,” Belon said. “This program is a resource to break the cycle of repeated hospitalization or incarceration that many of our potential patients face.”

Program participants collaborate with care providers to develop individualized treatment plans and receive 24-hour access to services. Services may include mental health treatment, medication, access to primary healthcare, substance abuse counseling, counseling regarding benefits and other resources, supportive housing, vocational rehabilitation and family member support.

Requests for an AOT referral come from immediate family members, mental health care providers or law enforcement. A team of specially trained clinicians evaluate all referral
requests, and a care team will repeatedly attempt to communicate with a referred individual to encourage voluntary participation.

A referred individual who will not voluntarily participate may be summoned to a private civil hearing in Contra Costa Superior Court. BHS would present evidence from its evaluation and the court would also hear from the individual and their legal representation, provided by the Public Defender’s Office.

After the hearing, the judge may order the referred individual to participate in the AOT program.

When fully implemented, the program will have capacity to deliver care to as many as 75 patients. The first year of the program will be funded with $2.25 million in Mental Health Services Act funding and about $400,000 from the county’s General Fund.

For more information or updates regarding the AOT program, visit cchealth.org/bhs, or contact Karl Fischer at 925-383-8845.

###
The San Bernardino, California, Terror Attack

Two Emergency Departments’ Response

Carol Lee, MD; Elizabeth Walters, MD; Rodney Borger, MD; Kathleen Clem, MD; Gregory Fenati, DO; Michael Klemenny, MD; Sakona Seng, DO; Ho-Wang Yuen, MD; Michael Neeki, DO; Dustin Smith, MD


Abstract and Introduction

Abstract

On December 2, 2015, a terror attack in the city of San Bernardino, California killed 14 Americans and injured 22 in the deadliest attack on U.S. soil since September 11, 2001. Although emergency personnel and law enforcement officials frequently deal with multi-casualty incidents (MCIs), what occurred that day required an unprecedented response. Most of the severely injured victims were transported to either Loma Linda University Medical Center (LLUMC) or Arrowhead Regional Medical Center (ARMC). These two hospitals operate two designated trauma centers in the region and played crucial roles during the massive response that followed this attack. In an effort to shed a light on our response to others, we provide an account of how these two teaching hospitals prepared for and coordinated the medical care of these victims.

In general, both centers were able to quickly mobilize large number of staff and resources. Prior disaster drills proved to be invaluable. Both centers witnessed excellent teamwork and coordination involving first responders, law enforcement, administration, and medical personnel from multiple specialty services. Those of us working that day felt safe and protected. Although we did identify areas we could have improved upon, including patchy communication and crowd-control, they were minor in nature and did not affect patient care.

MCIs pose major challenges to emergency departments and trauma centers across the country. Responding to such incidents requires an ever-evolving approach as no two incidents will present exactly alike. It is our hope that this article will foster discussion and lead to improvements in management of future MCIs.

Introduction

On December 2, 2015, terrorists attacked the Inland Regional Center (IRC) in San Bernardino, California, killing 14 Americans and injuring 22 in the deadliest attack on U.S. soil since September 11, 2001. The city of San Bernardino is situated approximately 60 miles east of Los Angeles and has a population of 215,000 and a median income of $38,385.[1] Many of its citizens rely on the resources provided by entities such as the IRC, where the shooting occurred. The IRC is a not-for-profit organization that provides services for over 31,000 people with developmental disabilities and their families, including children,[2] and employs nearly 600 people.

The shootings began at approximately 11:00 AM when two terrorists entered a conference hall at the IRC and started shooting. The initial available information was limited and it was unknown to the hospital providers whether the incident represented workplace violence or a terrorist attack. The mode and appearance of the attack, however, was concerning for terrorism. When patients were being treated and transported to the emergency department (ED) by first responders, the shooters had not been apprehended.

Although emergency personnel are familiar with multi-casualty incidents (MCIs), as well as violent acts, the shootings that occurred that day were unprecedented. Since the attack, reports of the heroism of the victims have been well documented in the lay press. In the coming months our medical community will undoubtedly review our system’s response to the attack in depth, including the key roles our community hospitals provided. We applaud the professionalism and valor of the responders in the field and grieve the loss of those who died on site. We wanted the
opportunity to do more. However, in an effort to provide timely information to other emergency physicians who may be preparing for such an event, we are providing an account of how two separate teaching hospital EDs responded to the attack.

Loma Linda University Medical Center and Children's Hospital Response

Loma Linda University Medical Center and Children's Hospital (LLUMC&CH) is a Seventh-day Adventist institution located in Loma Linda, CA, approximately three miles from where the incident occurred. An academic center with 714 beds, it is the only Level I trauma center for adults and children in San Bernardino County and serves the Inland Empire (San Bernardino and Riverside counties). The ED has 38 adult beds, 18 pediatric beds, and four Express Care beds and sees more than 70,000 patients per year.

Activation

LLUMC ED personnel first became aware of the incident when a firefighter, dispatched to the scene, alerted our Mobile Intensive Care Nurse (MICN) directly through a phone call. No "official" notification through our county "Comm Center" or the emergency medical communications network (ReddiNet) had yet been received at the time of this initial call. The County Comm Center was contacted for verification, but none was yet available. On-scene responders estimated that there were at least 20 severely injured patients.

The charge nurse was notified and nursing administration began the emergency response, activating our disaster plan based on the initial call. We established an incident command center in the nursing administration office, which is located away from the ED. The ED was full at the time of the attack and all admitted patients were quickly sent upstairs as per our normal disaster plan. We relocated the remaining patients away from the six adult resuscitation rooms. We also cleared and readied an additional five beds in the pediatric ED to receive critical patients. The pediatric and adult EDs are separate spaces but physically attached making mutual support fluid. Disaster supply carts were brought to the outside triage area located in the adjacent parking lot, staff were assigned specific duties, and handheld phones were distributed to key personnel. A wireless computer set up outside allowed for order entry to the electronic medical record.

The ED attending physician was also aware and with the anticipated number of victims, she contacted the trauma surgeon on call. Additional trauma surgeons were placed on standby and the trauma medical director contacted the operating room (OR) manager who worked to clear rooms for victims. Five ORs were made immediately available with assurances others would become available in short order. There was no resistance to holding planned elective surgeries and ORs were kept on standby for about four hours. This process allowed our patients immediate OR access once it was determined they needed surgery. ED physician leadership was paged to respond to the ED.

Hospital security established a corridor outside the ED and all vehicular traffic was diverted from the area. Access to the ED, as well as other portals of entry to the hospital, was controlled. A small number of non-shooting related patients and one person looking for a family member involved in the shooting were allowed through the corridor to access the ED after being checked by security. A sizeable number of local law enforcement and fire personnel soon arrived, providing a needed additional security and response capability. They also successfully addressed the bomb threat our hospital received later that afternoon. Media were maintained outside the safety corridor and quickly established themselves on the street side opposite the ED entrance. Approximately four media trucks were visible from the entrance of the ER, although more were likely on campus at different locations.

Our disaster plan includes setting up a triage tent outside the ED, including basic supplies. This was completed in less than 20 minutes from the initial activation. Registration personnel prepared patient labels and charts so that incoming patients could be quickly registered, necessary for placing orders and charting, as well as for tracking. Patients already in the waiting room were moved to any available ED beds out of the resuscitation area as well as into an Express Care associated with the ED, and later into the triage tent.
With the activation of the disaster plan, the Department of Environmental Health and Safety, which oversees disaster planning for the medical center and university, was notified. A representative was sent to the ED command center, along with hospital administration, security, public information, information technology, and communications.

Response

At the time of the activation, the ED was staffed with two attending physicians on the adult side and one on the pediatrics side. With the paging of the ED physician leadership, four additional attendings arrived to the ED a short time after the activation. Serendipitously, an emergency medicine (EM) resident education conference was in progress on campus at the time of the attack. An attending physician in the lecture hall had been alerted to the shootings by a CNN "breaking news" text alert and two attendings were already making their way to the ED to investigate when official word was received through the disaster communication system. Physicians at conference were notified and prior to the first patient arriving to the ED, 26 EM residents, three pediatric emergency medicine (PEM) fellows, seven EM attendings, and five PEM attendings arrived in the ED to assist with the response.

Two emergency physicians were assigned to the triage area, along with nursing and ancillary staff. As it was known that the IRC provides services for children, there was concern that there might be pediatric victims as well as adults. Five resuscitation beds in the Peds ED were ready for pediatric or adult patients. A total of 11 resuscitation beds were initially available. Each resuscitation bed was manned with an ED attending and senior EM resident prepared to receive a patient. Two procedure nurses, one nurse for documentation, an ED tech, and a respiratory therapist (RT) were also assigned to each resuscitation bed. Additional physicians were placed on standby in an area out of the resuscitation zone.

The chief of trauma surgery also responded to the ED with another three attending surgeons, approximately five trauma residents, and a trauma nurse practitioner. Three additional surgery attendings, who had been called in, also arrived to the ED giving us immediate access to seven attending surgeons. ED trauma care at our facility is collaborative, and the EM and surgery teams integrated into respective roles smoothly. Patients were placed alternately in the adult and pediatric EDs so that resources would be more evenly distributed. The trauma surgeons determined the order in which they would attend the patients. The on-call surgeon was the last to be assigned, allowing him to be available for other patients not involved in the incident. We had initially notified Comm Center that we would be able to take 10 "immediate" patients, and with the response that was available felt we could treat up to 50 additional patients.

Additional nursing personnel quickly arrived in the ED as well. In addition to implementing our official staffing processes for disasters response, many nurses aware of the attack from other sources came to the ED to assist with the care of patients. Approximately 50 nurses and techs were available. Respiratory therapy successfully mobilized extra personnel so that each resuscitation bed was set up with an RT and ventilator. Another RT was available for providing care to the other patients in the ED. Radiology staffed two auxiliary computed tomography (CT) scanners, and x-ray stood ready with the portable machine. The director of the blood bank responded to the ED with our "Code Black" blood products (O negative and positive blood, cryoprecipitate, FFP, platelets) and two "runners" to obtain more blood products as required. We had been informed that our blood supplier was within the incident area and would not be available to us. The blood inventory was assessed and seemed ample, with 60 units of PRBC immediately available. However without knowing how many victims might need transfusion, contingency plans were made. Our affiliated and other local hospitals were contacted, in case additional blood would be necessary, and transport was placed on standby. The directors of the laboratory and pharmacy, along with a pharmacist, were also available in the ED for immediate access to those services. A pharmacist is regularly physically present in our ED and ensured we had what was needed to respond to the patients' needs.

At the time of the attack approximately 15 patients were in the waiting room. No announcement was initially made to the waiting room regarding the shooting and the waiting patients were moved to other areas. Care to the other patients in the ED was continued by the physician's assistant and nurse practitioner already working in the ED. ED attendings and residents not assigned to the resuscitation teams also continued to see the other patients. During the response
period, multiple other critically ill patients were managed, including a patient with acute stroke, a patient in respiratory failure who required immediate intubation, and a patient with an acute arterial occlusion of the upper extremity. A Level B trauma activation for a motor vehicle accident with multiple serious injuries was already en route to our facility prior to the shooting notification and was successfully stabilized in the ED before admission. We used the time between the arrival of the fourth and fifth shooting victims to see the less acute patients in the triage tent, some of whom were able to be discharged directly from there, albeit without the usual discharge paperwork.

Patient Timeline

The first patient arrived at 11:44 with an anterior chest gunshot wound. The patient was alert but tachypneic. Bedside ultrasound was negative for a pericardial effusion, but concerning for decreased lung sliding. A chest tube was placed in the ED. Although initially hemodynamically stable, during the ED course the patient became hypotensive, underwent multiple transfusions, and was taken emergently to the OR by the trauma team.

Patient number two presented at 11:48 with a laceration to the chest, as well as multiple wounds to the face, arm, and leg. The patient remained alert in the ED, and was hemodynamically stable. A focused assessment with sonography for trauma (FAST) scan was negative, and multiple plain radiographs of chest and extremities showed no fractures, but multiple metallic fragments. The patient continued to have bleeding from leg wounds, concerning for vessel injury. CT angiography showed a possible venous injury and the patient was taken to the OR for exploration and washout.

The third patient arrived at approximately 11:50 in critical condition with multiple gunshot wounds including wounds to the chest, hypotension, and altered mental status. FAST scan was positive for bilateral pneumothoraces. Multiple metallic fragments and rib fractures were seen on plain radiographs. We placed a chest tube and the patient was transfused packed red cells, but persistent hypotension resulted in the patient going directly to the OR for further evaluation.

The fourth patient arrived five minutes later, approximately 11:55, with multiple gunshot wounds to the pelvis and leg. One of these wounds with copious bleeding was sutured in the ED for hemostasis. Radiographs showed multiple pelvic fractures. FAST was positive for blood in the bladder. The patient was given tranexamic acid and underwent massive transfusion protocol for hypotension and was taken immediately to the operating room.

The fifth patient arrived sometime after the initial influx of patients. Before the patient arrived, it was noted that several news helicopters were overhead with high resolution cameras focused on the ED parking lot, in addition to the press stationed at the street opposite the ED entrance. A line of nursing staff used sheets to create a visual barrier while the patient was transported from the ambulance to the ED. This act of compassion was recognized and appreciated by the patient and family. Fortunately the patient's injuries were not immediately life threatening and the patient was admitted to the trauma service rather than the OR.

Discussion of Loma Linda University Medical Center and Children's Hospital Response

This incident underscored the importance of disaster training. With a disaster drill recently conducted in our hospital, the initial set up of the ED with equipment, communications, triage, and security occurred seamlessly. ED providers were familiar with the process and their duties. Having the infrastructure in place served to organize and focus the response.

Assigning treatment teams (triage, resuscitation, existing ED patients) also worked well. With this "zone" perspective, we were able to provide care to the victims as well as to our current ED patients and keep the department running.

Having blood bank immediately available was invaluable. Three of our patients required multiple transfusions, one of whom received multiple blood products.

The presence of the surgery attendings and immediate access to the ORs was crucial. While the patients received stabilizing measures in the ED, since it was unknown exactly how many patients would be received, ED procedures
were minimized and were performed in the OR. This allowed our resuscitation teams to prepare for the arrival of additional patients.

Communication between the key personnel and the hospital incident command worked reasonably well. Access to several handheld phones was key, but having pre-assigned numbers for the various positions, or pocket cards to write in each individual's extension would have been helpful. A major issue, however, was the communication challenges with the on-site command and first responders. We received limited information regarding patient injuries prior to the patients' arrival, which made the planning for care more difficult. Also, there was confusion regarding the number of patients we were receiving. Most of the confusion was related to "unofficial" calls from the scene. Believing that three additional patients were on their way, we held surgeons and operating rooms for extra time before learning that no more patients were being transported. It should be noted that the information received from Reddinet was accurate. From a more personal perspective, incident information from the site was limited, and ED staff was receiving multiple messages from friends and family, even from as far away as Afghanistan. Throughout the hospital, employees were trying to get accurate details. Knowledge that the shooters were still at large only added to the concerns. At one point, it was rumored that two shootings that occurred during the same time frame at other local venues were related to the incident at the IRC. So many hospital employees were attempting to live stream newscasts that our IT department recognized it might slow down hospital communication services. For a short period of time, Internet access was restricted to hospital and emergency operations only. Employees were advised to centralize their access to news, or were able to continue the use of their telecommunications networks.

Safety and crowd control was another concern. The ED was inundated with essential and nonessential personnel offering assistance. This could have impacted efficiency and posed a potential security threat. Staging of additional personnel in an area near but outside the ED is a better option. This would provide access to personnel when needed but would also allow verification of each individual and accountability for who is on site. This is especially important should a second simultaneous incident occur. For example, during our response to the multiple shooting victims our institution received a bomb threat. Because explosive devices had been found at the IRC it was felt to be a credible threat. Notification of staff, patients, and families in the hospital was discussed in the incident command, and it was felt that all should be notified. Our ED executive director informed patients in the waiting room and gave them the option of leaving. Only one patient chose to leave. Senior administrative personnel went to each inpatient unit and informed the charge nurse, who was asked to inform staff, patients and family. Physicians received information about the bomb threat through our communication system about 20 minutes after the initial threat was received. Additionally, an email and text/page was sent to all personnel. Knowing who is in the department and who has already left is crucial for both security and accountability.

Similarly, there should be an established location for family assistance. We had family members calling and arriving to the ED trying to locate potential victims. We were able to divert these calls to our social workers, but this was done ad hoc. There is a plan for family assistance in our disaster plan, but because the hospital was so close to the incident site, this portion of the plan and not been initiated prior to their arrival.

This response, while focused in the ED, was successful only because of the willingness of all of our hospital partners to fully participate in necessary activities to decompress the ED, expedite patient flow, and provide the best care possible to all our patients. Collaboration led to a successful response to a heinous attack.

Arrowhead Regional Medical Center's Hospital Response

Arrowhead Regional Medical Center (ARMC) is a 456-bed university-affiliated teaching hospital operated by the County of San Bernardino. The hospital is located in Colton, California, which is approximately five miles from the scene of the terrorist attack that occurred on December 2, 2015. It is the only American College of Surgeons (ACS) verified level II trauma center in the region. Additionally, it operates a regional burn center, a primary stroke center, a behavioral health center, and a tertiary referral center providing more than 40 specialty care services. ARMC also supports multiple training programs including a four-year EM residency with 33 residents. ARMC's ED is one of the busiest in
the state, handling more than 116,000 patient visits each year.

Activation

On December 2, 2015, ARMC was notified that we had an active shooter scenario in the nearby city of San Bernardino. This notification came to us directly from the city of Colton police department to the ED charge nurse on duty around 11:10 AM, even before the incident was officially posted on the regional emergency broadcast system called ReddiNet at 11:17 AM. Reports were that this was a multi-casualty incident and we were to expect around 12 gunshot wound (GSW) victims. Three ED attending physicians were already on duty that morning; one of them is additionally trained as a tactical medicine SWAT team member. Because we were able to immediately mobilize additional ED attending physicians and residents who were already on the hospital campus attending a weekly lecture, he decided to respond to the scene of shooting along with SWAT team members.

Response

Immediately, we fully staffed our eight trauma beds. Each bed had anesthesia, EM, and trauma surgery personnel. In addition, we converted four of our medical beds into lower acuity trauma beds, bringing our total to 12 available trauma beds. We had three trauma nurses in house that morning, but three additional nurses responded to the call for extra help. The charge nurse also sent five ED nurses into the trauma resuscitation area. An ED tech was placed at each bed.

All together, we had available five EM attending physicians, 20 EM residents, and several physician assistants (PA-C) in the ED. This workforce was divided into receiving and assisting with newly arriving shooting victims and continuing care of existing ED patients. In addition, we had four attending trauma surgeons and eight general surgery residents respond. Overall, we had enough staff to assign at least one attending (either trauma surgeon or EM attending) and two residents to each trauma bay. We had four attending anesthesiologists present, enough to assign two trauma bays to each anesthesiologist. Hospital administration including the medical director and the chief of surgery also responded to the ED.

We assigned two nurses to each trauma bay, preferably using the combination of one trauma nurse paired with an ED nurse. We also notified the RTs to prepare all available vents to be mobilized (we had the ability to place over 30 victims on vents if the need occurred) along with preparation for additional intubation trays and supplies. Additional RTs also responded so that one RT could be assigned to each trauma team.

Beyond our ED, eight operating rooms were placed on standby. All elective non-emergent surgeries were held. Two CT scanners were made available for immediate use and all but emergent CT studies were put on hold. Three X-ray techs were placed in the hallways outside the trauma bays for portable studies. Furthermore, the blood bank, sterile processing, laboratory and pharmacy were also put on alert.

In addition to mobilizing staff and resources in preparation, we asked for assistance from several inpatient services and bed control in order to free up as many ED beds as possible. Particularly, the internal medicine service and pediatric service responded quickly by completing admitting processes for several patients pending admission in the ED. Bed control and hospital administration assigned inpatient beds quickly and facilitated these patients’ movement out of the ED even before the first victim arrived. All patients already in the waiting room or in the ED rooms were seen and evaluated in a usual manner by a separate ED crew. No one was sent home without proper medical evaluation. All discharged patients were provided with usual instructions and follow up. However, during our lockdown period, efforts were made to redirect new, stable patients to other hospitals after confirming that they had the capacity and the capability to treat them. No outside tent was used as we were able to clear a large number of ED beds quickly.

Many ED staff not on duty voluntarily called the charge nurse or the charge physician and offered to report. In addition, many on campus but not necessarily on duty either physically reported to the ED or called in, offering assistance in any way possible. In total, we had more than 70 additional staff members from various services physically show up to the ED. Most of them were re-directed to a separate area where they were asked to wait for further instructions.
our hospital runs disaster drills regularly and we had just completed one within the past month, most of the staff members in the hospital were familiar with their roles and the processes involved in a large-scale disaster.

During the event, we were notified that there might have been shootings at the nearby Patton State Hospital. This report came in directly from one of the SWAT members working in the first shooting scene via a text message to the ED physician in charge. Patton State Hospital is a forensic psychiatric hospital located within the County of San Bernardino. It operates 1,527 beds and typically houses those incompetent to stand trial or found not guilty of a crime by reason of insanity. This immediately raised our concern that possibly a coordinated attack was being carried out on multiple psychiatric/medical/public health facilities operated by government entities. We also received reports that the shooters might have been San Bernardino county employees. At this point, ARMC went on lockdown; no persons were allowed in or out. SWAT members deployed from multiple surrounding cities took posts outside the hospital with snipers on the rooftops. Armed police officers from multiple cities and precincts (including those Colton city police officers already stationed at ARMC) took posts within the hospital. Each ambulance approaching the ED was stopped by law enforcement at the road block outside of the hospital, and occupants in each ambulance were checked by SWAT before being allowed to pull up to the ambulance bay. We were asked to be aware of any persons in the area not wearing hospital badges. At times, none of us knew for sure the identities of the patients we were receiving, but we were assured by the law enforcement that all our patients were pre-screened at the scene before being loaded onto the ambulances.

Patient Timeline

At the end of the event, 14 shooting victims were pronounced dead at the scene and were not transported. We at ARMC received six injured patients: five were transported via EMS and one was driven in by a police officer. In total, 21 patients were transported via EMS to local hospitals: five to ARMC, five to LLUMC, two to Community hospital of San Bernardino, two to Kaiser Hospital Fontana, two to Kaiser Hospital Ontario, two were flown to Riverside County Medical Center, two to San Antonio Community Hospital, and one to St. Bernardine's Medical Center. In all, 22 patients were evaluated and treated, and all survived their injuries. Of the six patients that were brought to ARMC, one went directly to the OR, one was discharged home from the ED, and the rest were admitted to either ICU's or trauma floor units with various injuries. Overall, there were no inpatient fatalities.

Discussion of Arrowhead Regional Medical Center's Response

A week after the event, a debriefing was held; participants included hospital administration, trauma surgeons, anesthesiology and ED attending physicians, along with ED charge and trauma nurses. Overall consensus was that our response was well-organized, well-run, and well-staffed. We were incredibly proud of the teamwork that was displayed and amazed by everyone's willingness to step up and help out in such a challenging situation. However, we identified several issues regarding security/safety, communication, and crowd control that we thought could be improved upon.

First, there was a concern that when everyone in the trauma bay was fully gowned and masked, there was no way to identify the person's role. There should be additional tags or banners with labels (such as "team captain," "airway doctor," "trauma nurses," etc.) to help identify each team member. Anyone without a proper label should be questioned, as there was always a concern of breach of security, where a shooter might unknowingly be allowed access into the ED and cause more casualties or that a shooter could actually be one of the patients. Related to this topic of security, we discussed whether all patients should have been completely undressed at the ambulance bay to check for any hidden weapons or explosive devices before they were allowed inside of the hospital. For this particular incident, every patient was searched beforehand by the law enforcement officials. However, for future scenarios, this should not be assumed and we should consider a more standard way for law enforcement, paramedics, and receiving hospitals to communicate that patients have already been searched and cleared as a potential threat.

Communication was identified as another area that needed improvement. Initial information we received was limited and sometimes inaccurate. We could not verify the exact number of patients we would be receiving, nor the severity of their injuries. Each patient en route was called into the base station, but the information we received was patchy in
terms of their acuity, stability, and types of injuries. Additionally, the first notification came directly from the field and not through the regional emergency communication network, making it difficult for us to confirm its legitimacy.

Finally, crowd control was a major challenge. We estimated that close to 70 people were in the ED/trauma area at one time or another, and it became difficult to identify who was essential and who was not. Non-essential staff members were directed to wait in the cafeteria located one floor below, but more and more people continued to present themselves to the ED throughout the day and in some way hindered security and efficient operation.

Conclusion

MCIs are unique events that bring forth a bevy of challenges to EDs and trauma centers across the country. They test the technical abilities of providers, stretch the resources of multiple hospitals, and rely heavily upon the communication skills at each level of patient care. Responding to such incidents requires an ever-evolving approach, as no two incidents will ever present exactly alike.

While MCIs traditionally are taught and practiced through scenarios involving natural disasters or accidental trauma, it is undeniable that we are currently in an era where it is crucial to prepare ourselves for MCIs of a different nature, namely the active shooter.

In 2015 alone the U.S. experienced the following mass shootings: nine deaths at Emanuel African Methodist Episcopal Church in Charleston South Carolina on June 18; five deaths at a Navy support center in Chattanooga, Tennessee on July 16; nine deaths at Umpqua Community College in Roseburg, Oregon, on October 1; three deaths at a Planned Parenthood clinic in Colorado Springs, Colorado, on November 29; 14 deaths in San Bernardino on December 2.

It is our hope that this article will foster discussion that leads to improvement in our management of MCIs while shedding light on what it was like to manage a live incident while dealing with the possibility of an on-site hospital threat.

References
