EMS Liaison Committee
Thursday, October 11, 2018 at 0900 hours
Health Plan of San Joaquin - Community Room
7751 S. Manthey Road
French Camp, CA 95231

A G E N D A

1. Welcome - Call to Order

2. EMS Administrator’s Report (no attachment)

3. System Organization and Management
   A. EMS Maddy Fund

4. Staffing and Training
   A. EMS Personnel

5. Response and Transport
   A. Emergency Ambulance Service Performance
   B. Basic Life Support Ambulance Response in EMS System
   C. Treatment Protocol Revision Update (no attachment)

6. Facilities and Critical Care
   A. Stroke System Implementation Report
   B. Trauma System Report
   C. STEMI System Report
   D. Ambulance Patient Offload Delay Report
   E. Hospital Impact Cluster Report

7. Data Collection and System Evaluation
   A. Quality Improvement Report
   B. CARES Report

8. Disaster Medical

9. Hospital and Prehospital Care Service Provider Reports - Roundtable

10. Public Comment

11. Next Meeting – Thursday, January 10, 2019

A full agenda packet will not be provided at the meeting. A full agenda packet may be viewed or downloaded from the EMS Agency’s website at www.sjgov.org/ems.
DATE: October 4, 2018

TO: EMS Liaison Committee

PREPARED BY: Natisha Plummer, Accounting Technician I

SUBJECT: EMS Maddy Fund

RECOMMENDED ACTION:

Receive information on the EMS Maddy Fund.

FISCAL IMPACT:

The EMS Agency’s FY17-18 budget includes revenue for administering the EMS Maddy Fund. By statute administrative fees are capped at 10% of annual Maddy Fund revenue.

DISCUSSION:

EMS Maddy Fund

In 1987, legislature found that emergency medical service providers incurred higher costs for their services than providers of other medical services, but often received little to no payment from patients. In response, the Maddy Fund (SB 12) was established to provide revenue to compensate physicians and medical facilities for emergency services provided to medically indigent patients during the first 48 hours of continuous service.

The EMS Maddy Fund is derived from county penalty assessments for various criminal offenses and motor vehicle violations, traffic violator school fees and revenue from taxes on tobacco products deposited in the State’s Cigarette and Tobacco Products Surtax Fund. EMS Maddy Fund revenue, minus administrative costs, is proportioned as follows: 58% for eligible physicians and surgeons in a general acute care hospital providing basic or comprehensive emergency services; 25% to San Joaquin General Hospital for providing disproportionate trauma and emergency medical services; and 17% to the San Joaquin County EMS Agency for capital projects.
FY 2016/17

Physician and surgeon claims are due from providers and payments are disbursed on a quarterly basis. A total of $151,048.23 was disbursed to participating physicians through FY 2016/17.

<table>
<thead>
<tr>
<th>FY 2016/17</th>
<th>Amount Disbursed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qtr 1</td>
<td>$47,133.16</td>
</tr>
<tr>
<td>Qtr 2</td>
<td>$33,654.73</td>
</tr>
<tr>
<td>Qtr 3</td>
<td>$32,324.00</td>
</tr>
<tr>
<td>Qtr 4</td>
<td>$37,936.34</td>
</tr>
<tr>
<td>Total:</td>
<td>$151,048.23</td>
</tr>
</tbody>
</table>

FY 2017/18

Provider agreements for 2017/18 were sent to participating providers in July 2017. Claims for the third quarter of FY 2017/18 were due from providers on 7/31/18, payment date is pending.

<table>
<thead>
<tr>
<th>FY 2017</th>
<th>Amount Disbursed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qtr 1</td>
<td>$35,698.19</td>
</tr>
<tr>
<td>Qtr 2</td>
<td>$38,052.20</td>
</tr>
<tr>
<td>Qtr 3</td>
<td>$31,213.37</td>
</tr>
<tr>
<td>Qtr 4</td>
<td>n/a</td>
</tr>
<tr>
<td>Total:</td>
<td>$104,963.76</td>
</tr>
</tbody>
</table>
DATE: October 4, 2018

TO: EMS Liaison Committee

PREPARED BY: Christine Tualla, EMS Specialist

SUBJECT: EMS Personnel Report

RECOMMENDED ACTION:

Receive information on EMS Personnel activities.

DISCUSSION:

The following is a summary of the number of EMS personnel currently certified, accredited, or approved to practice in San Joaquin County; and the EMS personnel application activity of the SJCEMSA between July 1, 2018, and September 30, 2018.

**EMR Certification Total:** 23

- Applications processed
- Initial Certification: 24
- Re-certification: 68
- Active Probation: 3
- Denied/Revoked Since January 2017: 3

**EMT Certification Total:** 848

- Applications processed
- Initial Certification: 24
- Re-certification: 68
- Reciprocity Certification: 1
- Active Probation: 7
- Active Suspension: 3
- Denied/Revoked Since January 2017: 3

**Paramedic Accreditation Total:** 378

- Applications processed
- Initial Accreditation: 14
- Re-accreditation: 38
- Active Probation: 1
**EMS Dispatcher Accreditation Total:** 77
- Applications processed:
  - Initial Accreditation: 5
  - Re-accreditation: 6
  - Active Probation: 1
  - Denied/Revoked Since January 2017: 1

**MICN Authorization Total:** 62
- Applications processed:
  - Initial Authorization:
  - Re-authorization:
  - Active Probation:
  - Active Suspension: 2
  - Denied/Revoked Since January 2017:

**Paramedic Field Internship Authorization Total:** 15
- Applications processed:
  - Initial Authorization: 8
  - Extended Authorization: 2

**Paramedic Preceptor Authorization Total:** 46
- Allocation by ALS provider organization:
  - American Medical Response: 23
  - Escalon Community Ambulance: 1
  - Manteca District Ambulance: 5
  - Ripon Consolidated Fire District: 3
  - Stockton Fire Department: 7
  - Tracy Fire Department: 7

Each July, the SJCEMSA accepts applications for Paramedic Preceptor authorization. Applicants are required to complete an eight (8) hour paramedic preceptor training course and be approved by a peer review panel.
DATE: October 4, 2018

TO: EMS Liaison Committee

PREPARED BY: Shahloh Jones-Mitchell, EMS Analyst

SUBJECT: Report on Emergency Ambulance Service Performance

RECOMMENDED ACTION:

Receive information on emergency ambulance performance for American Medical Response (AMR), Manteca District Ambulance (MDA), Escalon Community Ambulance (ECA) and Ripon Consolidated Fire District (RCFD).

FISCAL IMPACT:

The 2018-2019 San Joaquin County EMS Agency budget includes ground and air ambulance monitoring and permit fees totaling $852,877 to offset the costs associated with monitoring compliance and evaluating performance. Emergency and non-emergency ambulance service providers operate without subsidies from San Joaquin County. San Joaquin County sets the allowable billing rates for emergency ambulance service through a competitively awarded performance agreement to AMR and by non-competitively awarded performance agreements with MDA, ECA, and RCFD. Non-emergency ambulance service rates are unregulated and may be established by each non-emergency ambulance service provider based on market conditions.

DISCUSSION:

SJCEMSA publishes bi-monthly reports on the exclusive emergency ambulance provider service contract compliance for AMR, MDA, ECA, and RCFD. These reports primarily focus on service provider response time performance and other related measures included in their respective ambulance service contract. Copies of these performance reports are available on the SJCEMSA’s website at:

Compliance Review by Provider:

A summary analysis of 2018’s 2nd Quarter prehospital performance for each ALS ambulance provider is shown below.

**AMR**

AMR’s Red Lights and Sirens (RLS) call volume was 11,263 with a combined compliance percentage of 89.39% for the 2nd quarter of 2018. The RLS call volume in the chart below is a decrease of nearly 2% compared to the 2nd quarter of 2017.

![American Medical Response 2nd Quarter April thru June 2018 RLS Compliance Snapshot](image)

AMR’s Non Red Lights and Sirens (NRLS) call volume was 6,179 with an overall compliance of 96.38%. NRLS call volume decreased 1.5% compared to the 2nd quarter of 2017.
AMR's 2nd quarter combined RLS and NRLS call volume was 17,442 with an overall compliance of 91.87%. The call volume for ALS-IFT and CCT-IFT was 258 and 30 respectively.

**MDA**

MDA's RLS call volume for the 2nd quarter of 2018 was 1466 with an overall compliance of 95.63%.

MDA's Non Red Lights and Sirens call volume was 733 with an overall compliance of 98.73%.
MDA’s 2nd quarter combined call volume was 2199 with an overall compliance of 96.68%.

**Escalon Community Ambulance**

ECA’s RLS call volume for the 2nd quarter of 2018 was 168, with an overall compliance of 92.77%.

**Ripon Consolidated Fire Department**
RCFD’s total RLS call volume for the 2nd quarter of 2018 was 239 with an overall compliance of 97.08%.
DATE: October 4, 2018
TO: EMS Liaison Committee
PREPARED BY: Rick Jones, EMS Analyst
SUBJECT: Report on BLS Ambulance Response to 911 Calls

RECOMMENDED ACTION:

Receive information on the use of basic life support (BLS) ambulances responding to emergency ambulance requests.

FISCAL IMPACT:

Potential for system wide cost savings through increased efficiency.

DISCUSSION:

As demonstrated by 2017-18 statewide flu and influenza like illness (ILI) epidemic that resulted in a marked increase in patients seeking care in emergency departments, it is prudent to continue to anticipate occasional sudden increases in requests for ambulance services in San Joaquin County through the 911 system. SJCEMSA Policy Memorandum No. 2018-02 increased the availability of ambulance transport resources by allowing all emergency ambulance service providers to use BLS ambulances to respond to:

1) Emergency requests for service classified by the Valley Regional Emergency Communications Center (VRECC) through the Medical Priority Dispatch System (MPDs) as Protocol 26 (Sick Person) Alpha and Omega; and
2) Any emergency request for service if no advanced life support ambulance is immediately available for assignment.

SJCEMSA continues to evaluate the use of BLS ambulances in the emergency ambulance system. The table below shows the number of instances that a BLS ambulance was dispatched to low acuity calls by patient complaint type during two three month periods. There was a significant reduction in the use of BLS ambulances in the emergency ambulance system and a reduction in the different patient complaint types between the two three month periods (528 cases vs 320 cases).
SJCEMSA staff randomly audited 8% of the corresponding patient care records (PCRs) and found that BLS care and transport satisfactorily met the needs of the patient in each instance.
Review of 911 System Call Types with BLS Ambulance Services Response

<table>
<thead>
<tr>
<th>Complaint Reported by Dispatch</th>
<th>Feb 1, 2018 thru May 31, 2018</th>
<th>June 1, 2018 thru Aug 31, 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal Pain/Problems</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Back Pain (Non-Traumatic)</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Chest Pain (Non-Traumatic)</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Convulsions/Seizure</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Falls</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Heart Problems/AICD</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>No Other Appropriate Choice</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Psychiatric Problem/Abnormal Behavior/Suicide Attempt</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Sick Person (Alpha and Omega)</td>
<td>311</td>
<td>212</td>
</tr>
<tr>
<td>Stab/Gunshot Wound/Penetrating Trauma</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Unconscious/Fainting/Near-Fainting</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Unknown Problem/Person Down</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Transfer/IFT/Palliative Care</td>
<td>191</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>528</strong></td>
<td><strong>320</strong></td>
</tr>
</tbody>
</table>

**Summary:**

The use of BLS ambulances to respond to likely low acuity medical incidents and to potentially high acuity medical incidents during periods of high demand appears to be a safe and effective use of limited prehospital care resources.
DATE: October 4, 2018

TO: EMS Liaison Committee

PREPARED BY: Rick Jones, MPA

SUBJECT: Stroke System of Care Implementation Update

RECOMMENDED ACTION:

Receive information on the stroke system of care in San Joaquin County.

FISCAL IMPACT:

The San Joaquin County EMS Agency (SJCEMSA) receives $25,000 per year from each designated stroke center to offset the costs associated with stroke system planning, implementation, and evaluation.

DISCUSSION:

On May 25, 2018, the SJCEMSA announced the creation of specialty stroke system of care designed to ensure that patients experiencing signs and symptoms of an acute stroke are provided with rapid access to evaluation and treatment at primary stroke centers located throughout San Joaquin County.

Adventist Health Lodi Memorial, Doctors Hospital Manteca, Kaiser Hospital Manteca, San Joaquin General Hospital, St. Joseph’s Medical Center, Sutter Tracy Community Hospital applied for and received designation as primary stroke centers following a ten month implementation process. A site survey by SJCEMSA staff is scheduled with Dameron Hospital on October 17, 2018. All seven San Joaquin County hospitals will be designated primary stroke centers upon successful completion of the survey process and ratification of an agreement between Dameron Hospital and San Joaquin County.

Data collection efforts by the SJCEMSA are in the early stages. Hospitals began submitting data on September 17, 2018 for the month of July. The table below the number of patients transported by ambulance to hospitals in San Joaquin County that result in stroke alerts at each hospital in July, 2018.
## Number of Stroke Alerts by Hospital from Ambulance Transports in July 2018

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Number of Patients Transported by Ambulance Resulting in In-Hospital Stroke Alerts</th>
<th>Number of Prehospital Stoke Alerts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adventist Lodi Memorial</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Dameron Hospital</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Doctors Hospital Manteca</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Kaiser Hospital Manteca</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>San Joaquin General Hospital</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>St Joseph's Medical Center</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>Sutter-Tracy Community Hospital</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>
DATE: October 4, 2018
TO: EMS Liaison Committee
PREPARED BY: Amanda Petroske, EMS Trauma Coordinator
SUBJECT: Trauma System Report

RECOMMENDED ACTION

Receive information on the Trauma System of San Joaquin County.

FISCAL IMPACT

State law allows local EMS agencies to recoup the costs associated with the development of a trauma system plan and ongoing monitoring of the trauma system in the fees charged for designating trauma centers. The trauma center monitoring fee totals $238,000 and will offset the costs associated with monitoring the trauma center contract, legal fees, and a site team verification of San Joaquin General Hospital (SJGH) by the American College of Surgeons (ACS) Committee on Trauma. Revenue from the trauma center designation fee is included in the approved 2018-19 EMS budget.

DISCUSSION

Trauma Center Verification

San Joaquin General Hospital (SJGH) has been verified as a Level III Trauma Center through April 20, 2021 by the American College of Surgeons (ACS) Committee on Trauma (COT). This achievement recognizes the trauma center's dedication to providing optimal care for injured patients.

Verified trauma centers must meet the essential criteria that ensure trauma care capability and institutional performance, as outlined by the American College of Surgeons' Committee on Trauma in its current Resources for Optimal Care of the Injured Patient manual. The ACS-COT's verification program does not designate trauma centers. Rather, the program provides confirmation that a trauma center has demonstrated its commitment to providing the highest quality trauma care for all injured patients. The actual establishment and the designation of trauma centers is the responsibility of the San Joaquin County EMS Agency (SJCEMSA).

SJGH was originally designated as a level III trauma center by SJCEMSA in August 2013, in accordance with state statute and regulations.
SJGH Trauma Process Improvement and Patient Safety Program

The SJGH Trauma Services Department holds meetings of its multidisciplinary Trauma Process Improvement and Patient Safety (PIPS) Committee each month. The objective of a trauma PIPS program is to improve patient outcomes, eliminate problems, and reduce variation in patient care. All trauma centers are expected to systematically and critically scrutinize their trauma care using performance measurements as a means to validate and improve patient care and provide clinicians with the tools to remain competent with current medical best practice. While there is no precise prescription for a PIPS program, such programs must demonstrate a continuous process of monitoring, evaluating, and improving the performance of the trauma program. As part of its PIPS program, SJGH collects and evaluates information related to trauma activations and follows each trauma patient through their hospitalization and disposition. The charts below show a summary of the data regularly evaluated by the SJGH Trauma PIPS Committee.

Revisions to the Trauma System Policies

On July 1, 2018, SJCEMSA revised EMS Policy No. 4709, Trauma Center Service Areas and EMS Policy No. 5215, Trauma Patient Destination to direct all major trauma patients including adults, pediatrics, burns, and isolated neurologic trauma to SJGH.

Earlier this spring the San Joaquin County EMS Agency (SJCEMSA) conducted a public comment process on proposed revisions to EMS Policy No. 5215, Trauma Patient Destination. SJCEMSA was seeking comments on proposed revisions directing pediatric major trauma patients in the then existing northern catchment area to be transported to SJGH and pediatric major trauma patients in the southern catchment area transported to either Doctors Medical Center Modesto or Memorial Medical Center Modesto. Following the conclusion of the public comment period SJCEMSA made the decision to eliminate the northern and southern catchment areas making SJGH the primary trauma center for all adult and pediatric major trauma patients.

After the final policy was published several prehospital service providers have expressed concern regarding the elimination of the southern catchment area. SJCEMSA issued a memorandum on June 6, 2018, explaining the basis for these revisions. The following is a summary of the basis for these revisions.

It is a settled argument in the medical literature that severely injured patients do better when treated within an organized trauma system that transports patients without delay to trauma surgeons with immediate access to specialized trauma surgical services. It is with this understanding that SJCEMSA developed the SJC trauma system in 2012.

Since 2013, with the designation of SJGH as a level III trauma center SJCEMSA has conducted reviews of all major trauma patient deaths, inter-facility transfers, pediatrics, and other identified complications through the San Joaquin County Trauma Audit Committee.
In 2017, SJCEMSA initiated an in-depth review on the effect of air ambulances on major trauma patients with a special emphasis on pediatric trauma patients. This review was two-fold. First, SJCEMSA undertook a review of overall air ambulance utilization comparing transport times from scene to trauma centers (e.g. SJGH and UCDMC). Second, through the SJCTAC process, every pediatric case was reviewed to determine outcomes. SJCTAC found that severely injured pediatric patients had an increased likelihood of survival when pediatric patients were: 1) transported by ground ambulance without delay; and 2) transported to the closest trauma center regardless of level of designation (I, II, III or type, adult vs. pediatric). SJCTAC determined that severely injured pediatric patients in San Joaquin County benefit from rapid access to trauma surgeons and operating suites over any other factor. As a result of this determination, SJCEMSA drafted changes to the trauma destination policy to direct all pediatric patients to SJGH in the northern catchment area or DMC/MMC in the southern catchment area.

In extensive discussion with Dr. Kennedy, Trauma Medical Director and his colleagues at SJGH the following courses of action were identified for the management of major pediatric trauma patients: 1) If the pediatric patient requires immediate surgery they go directly to the OR for life-saving intervention, and are then transferred from the post anesthesia care unit (PACU) by Critical Care Transport (ground or air) to UCDMC for admission to the pediatric intensive care unit (PICU); 2) If the pediatric patient does not require surgery but requires admission then the patient is stabilized in the emergency department and then transferred to UCDMC; 3) if the pediatric patient does not require admission then the patient is treated and discharged home with no advanced pediatric trauma service being needed.

SJCEMSA had intended to have pediatric trauma patients in the former southern catchment area (south of Highway 120 in the Escalon and Ripon ambulance service areas) transported and treated at Stanislaus County trauma centers. Dr. Shafer, the SJCEMSA Medical Director, met with the members of the Stanislaus TAC to discuss this change in SJCEMSA policy. The Stanislaus County TAC disagreed with SJCEMSA’s changes in trauma destinations stating that no pediatric patients would be accepted by Stanislaus County trauma centers. SJCEMSA found the opinions expressed by leadership of the Stanislaus County TAC and the refusal to cooperate with SJCEMSA policy to accept pediatric trauma patients from the field to be incompatible with the best interest of major trauma patients in San Joaquin County.

SJCEMSA made the decision to eliminate the southern catchment area for both pediatric and adult patients after consulting with the Mountain Valley EMS Agency. The primary reason SJCEMSA made the decision to eliminate the southern catchment area is to prevent confusion on where severely injured patients should be transported and ultimately reduce the potential for life threatening transport delays.
SJCEMSA is continuing to study this issue including researching actual ambulance transport times using data from the VRECC CAD and GIS computer based mapping algorithms for both San Joaquin County and Stanislaus County.

Trauma Education

San Joaquin General Hospital in the preparation for an increased number of pediatric trauma patients has decided to prepare all hospital staff with increased education to better care for pediatric patients. San Joaquin General continues to offer Pediatric Advanced Life Support and now will be offering Pediatric Care after Recitation (PCAR). The first course for PCAR will be offered November 8th and 9th at the Health Plan of San Joaquin building. Non San Joaquin General employee tuition cost will be $335. SJGH welcomes healthcare workers of outside entities to attend.

Trauma Systems Data
<table>
<thead>
<tr>
<th>Trauma Volume &amp; Utilization</th>
<th>Definition</th>
<th>Total YTD</th>
<th>Qtr 1 2018</th>
<th>Qtr 2 2018</th>
<th>Qtr 3 2018</th>
<th>Qtr 4 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Month B Complete</td>
<td>Complete month in registry</td>
<td>509</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Total Patients in Registry</td>
<td>Total Patients listed at time of Injury</td>
<td>2590</td>
<td>275</td>
<td>259</td>
<td>312</td>
<td>309</td>
</tr>
<tr>
<td>Total Tier 1’s Actualized</td>
<td>Total Tier 1’s Called</td>
<td>254</td>
<td>23</td>
<td>20</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>Total Tier 2’s Actualized</td>
<td>Total Tier 2’s Called</td>
<td>130</td>
<td>12</td>
<td>16</td>
<td>12</td>
<td>22</td>
</tr>
<tr>
<td>Total Tier 3’s Actualized</td>
<td>Total Tier 3’s Called</td>
<td>2045</td>
<td>216</td>
<td>279</td>
<td>251</td>
<td>246</td>
</tr>
<tr>
<td>Total Other/Non-Actualizations</td>
<td>Total Not Activated listed as Other</td>
<td>63</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Total Burn Actualizations</td>
<td>Total Patients that went to in-hospital burn center</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Total Pediatric Actualizations</td>
<td>Total Patients who were 90+ Admissions</td>
<td>44</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Total Admissions to ICU from ED</td>
<td>Patient from ED to ICU</td>
<td>137</td>
<td>15</td>
<td>15</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Total Admissions to the Floor from ED</td>
<td>Patient from ED to Total Non-Critical Patients/Unit</td>
<td>604</td>
<td>68</td>
<td>75</td>
<td>108</td>
<td>92</td>
</tr>
<tr>
<td>Total Admissions to the OR from the ED</td>
<td>Patient from ED to OR</td>
<td>157</td>
<td>18</td>
<td>17</td>
<td>15</td>
<td>21</td>
</tr>
<tr>
<td>Total Number of Admissions</td>
<td>Number of Trauma Pts. Admitted to Hospital</td>
<td>5098</td>
<td>129</td>
<td>163</td>
<td>136</td>
<td>126</td>
</tr>
<tr>
<td>Disposition</td>
<td>Female of patients</td>
<td>1594</td>
<td>147</td>
<td>149</td>
<td>156</td>
<td>168</td>
</tr>
<tr>
<td>Total Admissions from ED</td>
<td>Discharged from the ED</td>
<td>1194</td>
<td>147</td>
<td>149</td>
<td>156</td>
<td>168</td>
</tr>
<tr>
<td>Total Pediatric Admissions</td>
<td>Total Pediatric Patients Admitted</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Total Pediatric Transfers Out</td>
<td>Total Pediatric Patients Transferred for ICU</td>
<td>4</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Total Transfers Out</td>
<td>Total Transfers Out for Higher Level of Care</td>
<td>37</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Total Burn Transfers Out</td>
<td>Total Burn Patients Transferred for ICU</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Total Transfers In</td>
<td>Total Transfers In for a Higher Level of Care</td>
<td>131</td>
<td>5</td>
<td>7</td>
<td>21</td>
<td>18</td>
</tr>
<tr>
<td>Mechanisms</td>
<td>Mechanisms for majority of patients</td>
<td>122</td>
<td>4</td>
<td>9</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>Motor Vehicle Accidents (MVA)</td>
<td>Total number of motor vehicle accidents</td>
<td>122</td>
<td>4</td>
<td>9</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>Motorcycle Accidents</td>
<td>Total number of motorcycle accidents</td>
<td>156</td>
<td>18</td>
<td>9</td>
<td>17</td>
<td>21</td>
</tr>
<tr>
<td>Scoliosis</td>
<td>Total number of scoliosis injuries</td>
<td>64</td>
<td>9</td>
<td>6</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>Falls</td>
<td>Falls including elderly ground level falls</td>
<td>151</td>
<td>180</td>
<td>95</td>
<td>117</td>
<td>102</td>
</tr>
<tr>
<td>Assaults</td>
<td>Patients assaulted with traumatic injuries</td>
<td>105</td>
<td>9</td>
<td>7</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>Auto vs. pedestrian</td>
<td>Pedestrian or bicyclist vs. on roadway</td>
<td>174</td>
<td>21</td>
<td>24</td>
<td>24</td>
<td>18</td>
</tr>
<tr>
<td>Total Trauma Patients requiring Surgery</td>
<td>Trauma Pts. that had surgery</td>
<td>283</td>
<td>54</td>
<td>55</td>
<td>56</td>
<td>47</td>
</tr>
<tr>
<td>Length of Stay - Median</td>
<td>Median Length of Stay for All Trauma Pts.</td>
<td>13</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Length of Stay in ICU</td>
<td>Median Length of Stay for Trauma ICU Pts.</td>
<td>17</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Massive Transfusion Protocol (MTP)</td>
<td>MTP initiated</td>
<td>11</td>
<td>7</td>
<td>5</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>
DATE: October 4, 2018

TO: EMS Liaison Committee

PREPARED BY: Rick Jones, MPA, EMS Analyst
              Shahloh Jones-Mitchell, EMS Analyst

SUBJECT: STEMI 2018 2nd Quarter Review

RECOMMENDED ACTION:

Receive information on the STEMI System in San Joaquin County for April 1, 2018 through June 30, 2018.

FISCAL IMPACT:

The San Joaquin County EMS Agency (SJCEMSA) receives $25,000 per year from each designated STEMI center to offset the costs associated with STEMI system planning, implementation, and evaluation.

DISCUSSION:

The SJCEMSA developed and implemented a system to identify “heart attack” patients experiencing an ST elevated myocardial infarction (STEMI) and to direct these patients to specially designated hospitals staffed and equipped with cardiac catheter laboratories capable of providing immediate “life-saving” intervention. The ability of SJCEMSA to evaluate the STEMI system relies upon data measuring the performance of prehospital and hospital timeliness and adherence to policies and procedures.

The STEMI system of care began with the designation of St. Joseph’s Medical Center and Dameron Hospital as the two STEMI Receiving Centers (SRCs) in San Joaquin County beginning April 1, 2012.

The following Quality Indicators, used as a means to measure the effectiveness of the STEMI system in San Joaquin County, rely upon data derived from both prehospital and in-hospital sources.

Prehospital Quality Indicators include measurement of the following:

1. Accurate and complete documentation
2. Time spent on-scene
3. Appropriate use of 12 lead ECGs (Pts correctly identified as possible cardiac patients)
4. Identification of STEMI patients (using criteria set forth in SJCEMSA policy)
5. Timely and correct notification of SRCs for patients identified as having STEMI
6. Efficacy of ECG transmission

In-Hospital Quality Indicators include measurement of the following:
1. Timeliness of in-hospital STEMI alert in response to prehospital STEMI alert
2. Efficacy of prehospital STEMI identification method (e.g. percentage of false positives)
3. Timeliness of prehospital alert and ED arrival to cath lab/balloon times

Data Analysis

The data in this report is derived from a review of patient care reports and in-hospital care at each SRC. The focus of this process is appropriate STEMI documentation, 12-lead ECG interpretation and application, and whether timely and correct notification of SRCs for patients identified as having STEMI has occurred.

Data collected for this report that comprise “N” contains two subsets: 1) Ambulance transports with STEMI patients identified in the prehospital setting and 2) ambulance transports that arrive at SRCs that were not identified as possible STEMI patients in the prehospital setting. When cases from both subsets are included, they can be broken into the following categories:

<table>
<thead>
<tr>
<th>Reporting Categories</th>
<th>SJMC</th>
<th>Dameron</th>
</tr>
</thead>
<tbody>
<tr>
<td>True Positive</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>False Positive</td>
<td>42</td>
<td>3</td>
</tr>
<tr>
<td>Evolving Subsequent</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>False Negative</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Atypical Presentation</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>True Negative</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>68</td>
<td>8</td>
</tr>
</tbody>
</table>

Cases in the second subset include those reported as True Negative, NA, False Negative, and Evolving Subsequent. **True Negative** are cases in which the SRC concurred with the prehospital finding of no STEMI, but were included for review because the case appeared to be cardiac in nature. **False Negatives** and **Evolving Subsequent** include those cases in which the prehospital ECG did not indicate a STEMI, but was determined to be a STEMI sometime after arriving at the STEMI Receiving Center.
SRC STEMI Alert Performance Report

The premise for alerting a SRC of a STEMI patient in the prehospital setting is to provide the hospital with early notification in order to ensure that the cardiac cath lab team is prepared to provide the care necessary to perfuse the heart and stop heart muscle cell death. The goal is that upon receipt of a STEMI alert from the prehospital setting, the SRCs will immediately call an internal STEMI alert.

Charts 1 and 2 show SJMC and Dameron Hospital’s In-Hospital STEMI Alert performance for the 2nd quarter of 2018.

**Chart 1**

**Range of Elapsed Time from Prehospital STEMI Alert to In-Hospital STEMI alert at SJMC**

2nd Quarter April thru June 2018

- Average: 5 min
- 90th %ile: 12 min
- Cancelled alert times were captured in "N"
- Average: 0.05

**Chart 2**

**Range of Elapsed Time from Prehospital STEMI Alert to In-Hospital STEMI alert at Dameron**

2nd Quarter April thru June 2018

- Average: 1.5 min
- 90th %ile: 2.75 min
- Average: 0.02
Transmission of ECGs from the Prehospital Setting

In order to minimize on-scene delays in the prehospital setting caused by waiting for the completion of an ECG transmission, SJCEMSA policy did not require that prehospital personnel transmit an ECG to the STEMI Receiving Center. Instead, paramedics were encouraged to transmit ECGs to the SRC during transport whenever possible. As shown in the table below, on average there has been over an eighty-six percent success rate in transmissions. The increase in ECG transmissions is attributed to improvements in ECG transmission technology.

Chart 3

<table>
<thead>
<tr>
<th>Month</th>
<th>Percentage of Prehospital ECGs Transmitted with STEMI Alerts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apr</td>
<td>71.4%</td>
</tr>
<tr>
<td>May</td>
<td>93.3%</td>
</tr>
<tr>
<td>Jun</td>
<td>96%</td>
</tr>
</tbody>
</table>
Ratio of True Positive to False Positive Alerts

False Positive cases are shown by month in Chart 4 below. False Positive cases occurred 67.7% of the time in the 2nd quarter of 2018, which is a 6% increase compared to 2017.

Chart 4

As summarized in Table 2 shows the ratio of True Positive and False Positive cases at each SRC for the 2nd quarter of 2018.

<table>
<thead>
<tr>
<th>Cases with Prehospital STEMI Alerts</th>
<th>SJMC</th>
<th>Dameron</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>True Positive</td>
<td>20</td>
<td>1</td>
<td>21</td>
</tr>
<tr>
<td>False Positive</td>
<td>41</td>
<td>3</td>
<td>44</td>
</tr>
</tbody>
</table>
The impact of the high number of false positive cases has been moderated by timely transmission of ECGs. While 8 of the 44 ECG False Positive cases were not transmitted, 22 of the False Positive cases were transmitted simultaneously or prior to the STEMI alert called in by prehospital personnel. Of the remaining 14 False Positive cases, the elapsed time from prehospital STEMI alert to ECG transmission to the hospital averaged only 9 minutes and ranged from 3 minute to 29 minutes. This data strongly suggests that timely ECG transmission is routine and effective. ECG transmission is required as of July 1, 2018.

Chart 5

<table>
<thead>
<tr>
<th>Month</th>
<th>ECGs Transmitted with STEMI Alerts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apr</td>
<td>20</td>
</tr>
<tr>
<td>May</td>
<td>14</td>
</tr>
<tr>
<td>Jun</td>
<td>24</td>
</tr>
</tbody>
</table>
Return of Spontaneous Circulation

Per EMS Policy No. 5201, Medical Patient Destination, medical patients with a return of spontaneous circulation (ROSC) shall be transported to the closest STEMI receiving center. SJMC and Dameron reported (14) patients transported by ambulance due to ROSC for the 2nd quarter of 2018. Patient outcomes are categorized below by whether they remained in the emergency department, or were moved to the cath lab.

<table>
<thead>
<tr>
<th>Pt. Not Moved to Cath Lab</th>
<th>Pt. Moved to Cath Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Expired in ED</td>
<td>1 Moved to CCL with no PCI Attempted</td>
</tr>
<tr>
<td>2 Admitted to hospital</td>
<td>4 Successful PCI</td>
</tr>
<tr>
<td></td>
<td>2 Successful PCI but Expired</td>
</tr>
</tbody>
</table>
Time Spent On-Scene

Chart 7

The SJCEMSA policy that directs patient care in the prehospital setting (EMS Policy No. 5719, ALS Chest Pain) directs prehospital providers to “initiate rapid transport to a STEMI receiving center.” Chart 7 above shows the elapsed time from patient contact to the initiation of transport for all patients that were determined to have a STEMI in the prehospital setting. Cardiac arrest is the typical cause of extended on-scene times.

Volume of Cath Lab Interventions Originating via 911 System

The number of patients identified in the prehospital setting as STEMI patients exceed the number of patients that ultimately receive care in a cardiac cath lab, usually a percutaneous intervention (PCI), for two reasons. First, the identification of STEMI patients in the prehospital setting relies upon the analysis of each patient’s 12-Lead ECG by the computer in each device. Upon arrival at the emergency department at the SRC, or upon review of an
ECG transmitted from the prehospital setting, the emergency department physician either confirms or cancels the SRC STEMI alert. Second, some patients confirmed at the SRC as a STEMI patient may not be candidates for PCI for a variety of reasons related to their particular medical condition.

SJMC received 64 prehospital STEMI alerts and performed 13 reperusions in the cath lab during the 2nd quarter of 2018 (Chart 8). Dameron Hospital received 4 STEMI alerts and performed 1 cath lab intervention during the same period.

**Door to Balloon Times**

The door to balloon time (door to reperfusion success) for the cath lab intervention at Dameron hospital was extended beyond the goal of 90 minutes due to the complication of the necessity to perform multiple procedures (154 minutes). Chart 8 shows the elapsed time from arrival of an ambulance patients at SJMC’s emergency department until completion of a Percutaneous Intervention (PCI) in the hospital cardiac cath lab. This data only includes those cases in which a STEMI alert was initiated in the prehospital setting. As shown in Chart 8 below, SJMC consistently met or exceed the ACC/AHA ≤ ninety (90) minute the door to balloon time (D2B) interval minimum standard.

**Chart 8**
DATE: October 4, 2018

TO: EMS Liaison Committee

PREPARED BY: Shahloh Jones-Mitchell, EMS Analyst

SUBJECT: Report on Ambulance Patient Off-load Delays

**RECOMMENDED ACTION:**

Receive information on Ambulance Patient Off-load Delays (A POD) occurring in San Joaquin County.

**FISCAL IMPACT:**

The estimated financial loss of ambulance availability to the EMS system caused by hospitals encumbering emergency ambulances by refusing to accept patients and delaying the ability of ambulances to promptly return to service is calculated to be $478,641 for the months of April 2018, May 2018, and June 2018.

**DISCUSSION:**

Health and Safety Code, Section 1797.120 requires the state EMS Authority (EMSA) to develop a standard methodology for calculation of, and reporting of ambulance patient offload times (APOT) by local EMS agencies (LEMSAs).

Health and Safety Code, Section 1797.225 mandates LEMSAs to adopt policies and procedures for calculating and reporting ambulance offload time based on standards established by EMSA.

EMSA’s standardized model to measure APOT includes the following definitions:

**Ambulance Patient Offload Time (APOT)** - the time interval between the arrival of an ambulance patient at an ED and the time the patient is transferred to the ED gurney, bed, chair or other acceptable location and the emergency department assumes the responsibility for care of the patient.

The adoption of this definition ensures uniformity of measurement for comparison purposes statewide, and establishes a more accurate method to determine transfer of care time at the ED than used prior to 2017. This APOT report follows the standardized model recommended...
by the EMS Commission and adopted by the EMSA utilizing the categories defined as APOT-1 and APOT-2.

a. APOT-1: The number reported is the APOT in minutes for transfer of care of 90% of ambulance patients and the number of ambulance runs included in the report.

b. APOT-2: The number reported is the percentage of ambulance patients transported by EMS personnel with an offload time within twenty (20) minutes and those transports with an ambulance patient offload delay beyond 20 minutes. APOD is further stratified by sixty (60) minute intervals up to one hundred eighty (180) minutes then any APOT exceeding one hundred eighty (180) minutes. Twenty minutes has been selected as the target standard for statewide reporting consistency based on precedence from other systems outside of California, as well as experience of some of the California LEMSAs.

The APOT standard adopted by the San Joaquin County EMS Agency (SJCEMSA) is twenty (20) minutes. An APOT delay (APOD) shall be deemed to have occurred when the APOT interval exceeds this standard.

Goal

SJCEMSA’s goal is for every patient care transfer between ambulance personnel and emergency department personnel to occur within 20 minutes thereby allowing ambulances to return to service. SJCEMSA believes this is an attainable goal for all receiving hospitals.

Patient Care Impact

When an ambulance is kept at an emergency department over 20 minutes due to an ambulance patient offload delay, this impacts the ability of the EMS system to meet demand and may adversely impact the care of the patient waiting on an ambulance gurney.

While definitive patient outcome data is not available to support the claim that offload delays are deleterious to patient care, one way in which the impact of offload delays can be measured is through an analysis of ambulance response compliance data. Such an analysis indicates that offload delays directly reduce the number of ambulances available to respond to emergencies with response times required for contract compliance. The reduction in available ambulance services caused by offload delays can be measured in two ways: the relative increase in the number of exemption requests and the real impact of off-load delays on ambulance response time compliance.

---

1 The process for determining response time compliance includes a review of late response exemption requests to determine if a delay in response may be attributed to factors outside of the control of the ambulance provider. If an exemption request is approved (e.g. fog, train crossings, road construction) those responses are not included in response time compliance calculations.
Increase in Ambulance Response Compliance Exemptions: When the frequency and length of offload delays reach a trigger point, an ambulance provider may request an exemption from meeting ambulance response compliance requirements. An offload delay exemption trigger is activated when all of the following occurs:

- There are a minimum of 3 ambulances delayed at one or more Stockton area hospital (Dameron, St. Joseph’s Medical Center, San Joaquin General Hospital) for a time period > 50 minutes for each ambulance.
- There are five (5) or fewer ambulances available in the greater Stockton area (Status 5 or less).
- The three (3) ambulances referenced above must have been delayed at hospitals during the 50 minutes prior to the call in which an exemption is being sought.
- Ambulance staffing must be at or above the contracted minimum staffing levels.

The EMS system continues to experience a profound impact on ambulance availability and response caused by ambulance patient offload delays (APODs) at emergency departments. The inability of emergency departments to readily accept ambulance patients has a direct negative effect on the availability of ambulances to respond to emergency requests. APODs continue to rob the EMS system of efficiency and steals precious response-time minutes from acutely ill and injured patients. During the first quarter of 2018, hospital caused APODs continued to decrease monthly response-time compliance by more than 6%.

Ambulance Patient Off-load Delay Performance

The performance of the seven hospitals in San Joaquin County during the first quarter of 2018 is shown in the table and chart below. Table 1 shows the volume of ambulance patient off-loads by each hospital and the number of minutes required to off-load patients at the 90th percentile (APOT-1) during the first quarter of 2018.

Table 1

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Number of Off-loads</th>
<th>90th Percentile APOT Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Joseph’s Medical Center</td>
<td>5986</td>
<td>57:04</td>
</tr>
<tr>
<td>San Joaquin General Hospital</td>
<td>3200</td>
<td>36:00</td>
</tr>
<tr>
<td>Adventist Health Lodi Memorial Hospital</td>
<td>1857</td>
<td>27:00</td>
</tr>
<tr>
<td>Dameron Hospital</td>
<td>1549</td>
<td>33:00</td>
</tr>
<tr>
<td>Doctors Hospital Manteca</td>
<td>902</td>
<td>31:00</td>
</tr>
<tr>
<td>Sutter-Tracy Community Hospital</td>
<td>866</td>
<td>30:00</td>
</tr>
<tr>
<td>Kaiser Hospital Manteca</td>
<td>758</td>
<td>34:32</td>
</tr>
</tbody>
</table>

*Data not entered on PCR*
Chart 1 shows the volume of ambulance patient offload times stratified within APOT-2 intervals (0-20; 21-60; 61-120; 121-180; >180) during the second quarter of 2018 for each hospital.

Table 2 shows a detailed count of the volume and percentage within each APOT-2 interval per hospital.

<table>
<thead>
<tr>
<th>Hospital</th>
<th>≤20</th>
<th>&gt;20 to 60</th>
<th>&gt;60 to 120</th>
<th>&gt;120 to 180</th>
<th>&gt;180</th>
<th>Total Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Josephs Medical Center</td>
<td>2116</td>
<td>3330</td>
<td>468</td>
<td>64</td>
<td>8</td>
<td>5986</td>
</tr>
<tr>
<td>San Joaquin General Hospital</td>
<td>1998</td>
<td>1151</td>
<td>46</td>
<td>4</td>
<td>1</td>
<td>3200</td>
</tr>
<tr>
<td>Adventist Health Lodi Memorial Hospital</td>
<td>1405</td>
<td>446</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>1857</td>
</tr>
<tr>
<td>Dameron Hospital</td>
<td>994</td>
<td>541</td>
<td>13</td>
<td>1</td>
<td>0</td>
<td>1549</td>
</tr>
<tr>
<td>Doctors Hospital Manteca</td>
<td>676</td>
<td>214</td>
<td>11</td>
<td>1</td>
<td>0</td>
<td>902</td>
</tr>
<tr>
<td>Sutter-Tracy Community Hospital</td>
<td>587</td>
<td>275</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>868</td>
</tr>
<tr>
<td>Kaiser Hospital Manteca</td>
<td>508</td>
<td>236</td>
<td>13</td>
<td>1</td>
<td>0</td>
<td>758</td>
</tr>
</tbody>
</table>
Financial Impact

Every minute that an ambulance must remain at a hospital emergency department longer than 20 minutes (A POD), the financial impact to the 9-1-1 system is approximately $3.00 per minute for 155,627 cumulative APOT minutes which cost the system $478,641 during the second three months of 2018. The breakdown of cost of APOD by hospital is shown below in Chart 2.

Chart 2

![Ambulance Patient Off-Load Delay (APOD) Cost during 2nd Quarter 2018](chart)

- St. Josephs Medical Center: $288,282
- San Joaquin General Hospital: $84,405
- Adventist Health Lodi Memorial Hospital: $30,174
- Dameron Hospital: $33,708
- Doctors Hospital Manteca: $15,891
- Sutter-Tracy Community Hospital: $11,322
- Kaiser Hospital Manteca: $14,859

Any ambulance patient off-load that exceeded twenty (20) minutes (APOD) is used in the calculation to determined cost shown herein. For example, AMR's cost to staff one ambulance for one hour (unit hour) is $180.00.
DATE: October 4, 2018

TO: EMS Liaison Committee

PREPARED BY: Shahloh Jones-Mitchell, EMS Analyst
Rick Jones, MPA, EMS Analyst

SUBJECT: Hospital Impact Clusters in San Joaquin County

RECOMMENDED ACTION:

Review data based on Hospital Impact Clusters (HIC) causing a decrease in the volume of available ambulances for additional system calls due to the back-up of Ambulance Patient Off-load Delays (APOD) in San Joaquin County.

Definitions:

**Hospital Impact Cluster (HIC)** – An occurrence with a minimum time-line of one hour during which five or more ambulances are waiting to off-load their patients at an individual hospital.

**Average Hospital Cluster (AHC)** – The average number of Hospital Impact Clusters per day per month at an individual hospital.

**Sequential HIC Events** – A series of HICs measured by 2 hours, 3 hours, and 4 plus hours.

**Ambulance Patient Offload Delay (APOD)** - the occurrence of a patient remaining on the ambulance gurney and/or the emergency department has not assumed responsibility for patient care beyond the LEMSA approved APOT standard. (Synonymous with non-standard patient offload time)

Discussion:

The likelihood that there will be emergency requests with a delayed ambulance response increases when multiple (or clusters) of ambulances are waiting to off-load patients at hospitals. It is therefore important to define an ambulance cluster and to then measure “clusters” of ambulances unavailable to respond to medical emergencies over time. This report refers to the “Hospital Impact Cluster” or “HIC”. A Hospital Impact Cluster is defined as occurrences of five or more ambulances off-loading patients at a single hospital during an entire hospital.
There is a high degree of variation in the ability of each of the 7 hospitals in San Joaquin County to effectively respond to sudden increases in ambulance patient volume. The three hospitals in San Joaquin County that receive the highest ambulance patient volume are (not coincidentally) the only hospitals that experience ambulance clusters. The table below shows the total number of Hospital Impact Clusters (HIC Count) per Month and the average number of hospital clusters (AHC) per day each month during the 2nd quarter of 2018.

<table>
<thead>
<tr>
<th>Months in 2018</th>
<th>April</th>
<th>May</th>
<th>June</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td># of Off-loads</td>
<td>HIC Count</td>
<td>AHC Per Day</td>
</tr>
<tr>
<td>St. Joseph’s Medical Center</td>
<td>1921</td>
<td>131</td>
<td>4</td>
</tr>
<tr>
<td>San Joaquin General Hospital</td>
<td>1039</td>
<td>27</td>
<td>1</td>
</tr>
<tr>
<td>Adventist Lodi Memorial Hospital</td>
<td>643</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>

As shown above, St. Joseph’s Medical Center (the busiest hospital with 40% of system ambulance patient off-loads), continues to experience the most hospital impact cluster events. Clusters occur at a rate that is disproportionate to the number of ambulance patient off-loads at each hospital. For example, while SJMC has nearly double the number of off-loads than SJGH, SJMC has nearly five time the number HICs each month. Such a finding suggests that there may be an ambulance patient off-load volume (as measured each hour) that when exceeded is a tipping point that overwhelms the hospital’s ability to manage off-loads in a timely manner. The data also suggests that these events can, if not rapidly addressed, create a self-sustaining environment as more ambulances arrive during sequential hours.

The three charts below represent each month of the second quarters volume by hour of the day and the number of clusters that occurred in each hour for St. Joseph’s Medical Center. These charts suggest that SJMC’s ability to manage ambulance patient off-loads and avoid clusters begins to degrade when call volume exceeds 60 to 80 calls per hour.
The question of whether there are Sequential HIC Events is particularly relevant to the premise that increases in the number of ambulances involved in a HIC and increases in the duration of HICs, the greater the negative impact on the availability of ambulances to respond to emergencies in the San Joaquin County EMS System.

In the month of April there were ten multi-hour HIC occurrences (2 consecutive hours), eight triple hour occurrences, and two occurrences where clusters lasted 4 plus consecutive hours (10am – 3pm). In May there were thirteen multi-hour HIC occurrences, seven triple hour occurrences and one occurrence lasting four hours. June had seventeen multi-hour HIC occurrences, seven triple hour occurrences and 4 four-hour occurrences between the hours of 9 am and 4pm.

**Conclusion**

The data in this report supports the premise that local EMS systems experience the greatest negative impact from APODs when clusters of unavailable ambulances reach a significant percentage of total scheduled EMS system ambulances during an hour or longer.

The findings in this report specifically about the timing and frequency of HICs raises questions that may pertinent for further study. In particular, it is evident that when the volume of ambulance patient off-loads reaches a certain level (60-80) the clusters tend to occur within a similar range of hours and frequently become sequential HIC events. Are these occurrences associated with shift change at the hospital? What are the staffing levels at the ED? During those times of high off-load volume when there are few clusters, what
behaviors are ED staff engaged in to respond successfully to the high volume and avoid clusters? Further analysis will be required to determine the relevance of these questions.
DATE: October 4, 2018

TO: EMS Liaison Committee

PREPARED BY: Matthew R. Esposito, MSc, MICP,

SUBJECT: Additional 2019 Key Performance Indicators

RECOMMENDED ACTION:

Receive information on CQI Council activities and revisions to key performance indicators (KPIs).

DISCUSSION:

The current list of key performance indicators (KPIs) collected by each ALS transport and ALS non-transport EMS provider focuses on measuring the frequency and success of select patient care skills. In response to input from key personnel from each ALS EMS provider, new KPIs have been added to be included in the 2019 CQI Work Plans. In 2018, the KPI list was largely, quarterly submission of statistics and rates. The additional KPIs for 2019 are less about the report of rates and more about reporting on what was done by the ALS transport and ALS non-transport EMS providers with those statistics and rates.

<table>
<thead>
<tr>
<th>Current 2018 KPI list</th>
<th>Additional KPIs for 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Advanced Airway Skills</td>
<td>1. Narcotics usage</td>
</tr>
<tr>
<td>a. OTI success rate</td>
<td>a. Correct usage</td>
</tr>
<tr>
<td>b. Use of ETTI</td>
<td>b. Correct dose</td>
</tr>
<tr>
<td>c. Identifying Cormack-Lehan grades</td>
<td>2. Documentation</td>
</tr>
<tr>
<td>d. Appropriate use of supraglottic airways</td>
<td>a. Impression matches PCR</td>
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<tr>
<td>e. Use of End title CO2</td>
<td>b. Drug dose</td>
</tr>
<tr>
<td>2. Quarterly skills maintenance</td>
<td>c. PCR reviews statistics</td>
</tr>
<tr>
<td>3. Documentation of stroke activation</td>
<td>3. Against Medical Advice calls</td>
</tr>
<tr>
<td>4. 12 lead on ROSC patients</td>
<td>a. Number of AMA’s</td>
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<td>5. STEMI</td>
<td>b. Number of AMA’s reviewed</td>
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<td>6. Hemostatic dressing use</td>
<td>4. Training performed by topic and hour</td>
</tr>
<tr>
<td></td>
<td>a. Cardiac</td>
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<td>b. Respiratory</td>
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<td>c. Trauma</td>
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<td>d. Pediatric</td>
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Narcotics usage

The most effective way to determine appropriate use and if necessary make system changes is to bring to the forefront of our minds, the actual pre hospital narcotics usage rate in San Joaquin County. Additionally the focus will be on if narcotics are used according to policy with regards to the correct patient situation as well as the correct dose. With that KPI available on a quarterly basis as confirmation of adhesion to currently policy, it can be used in conjunction with current medical studies on narcotics usage, to provide a frame work to make an objective assessment of current treatment policy in San Joaquin County.

Documentation

Each ALS department or ambulance service will report on their PCR review process method, and the number of PCRs reviewed. These reviews will determine whether the prehospital Primary Impressions and care provided align, whether the correct medication and dose was provided and whether the documentation matches the PCR documentation rubric used by that ALS prehospital provider.

Against Medical Advice calls

Against Medical Advice (AMA) calls can be the most challenging and often the riskiest call pre hospital staff can be involved in. For this reason, AMA calls require great attention to detail not only in patient care but also in the documentation of that patient care. In 2017 there were 83,000 EMS ambulance responses to scene calls originating from 911, of which twenty two (22) percent of those 911 calls either ended as no medical need or AMA. With the inherent risk associated with this call type, this needs to be evaluated to determine if 22% is normal and if field personal are adhering to policies related to AMA and no medical need situations. To do this Ambulance companies and ALS fire departments will not only submit their individual AMA and no medical need rates on a quarterly basis, but also will submit how many were reviewed for accuracy of documentation, if policy was followed and if the AMA or no medical need was appropriate.
Training performed by topic and hour

In 2019 not only will ambulance company and ALS fire department’s be submitting quarterly EMS education and training hours, those hours will be categorized into six (6) different KPIs:

1. Cardiac
2. Respiratory
3. Trauma
4. Pediatric
5. Pharmacology
6. Miscellaneous medical

This requirement does not mandate what type of training is conducted at each ALS service provider, since each have different EMS training needs. The goal of this KPI set is to assist the SJCEMSA Medical Director to determine whether current training efforts may need to be modified to stay current with the most recent medicine.

CES Activity

With an emphasis on education ambulance service providers and ALS fire departments will be required to report on activities in their respective CES departments pertaining to the number and outcomes of performance reviews, gap identification, and gap closure. By counting the number of investigations, number of coaching’s or one to one training, and number of performance improvement plans initiated as a KPI set, the activity of each ALS provider CES activity can be evaluated.
DATE: October 4, 2018

TO: EMS Liaison Committee

PREPARED BY: Rick Jones, MPA

SUBJECT: Cardiac Arrest Registry to Enhance Survival (CARES) Program

RECOMMENDED ACTION:

Receive information on the development of the CARES program in San Joaquin County.

FISCAL IMPACT:

The San Joaquin County EMS Agency (SJCEMSA) pays an annual fee of $3,433.00 for its portion of the State of California’s cost to administer the CARES program. There are no fees for hospital or prehospital participants.

DISCUSSION:

CARES is a collaborative effort of the Centers for Disease Control and Prevention (CDC) and Emory University, Woodruff Health Sciences. The ultimate goal of CARES is to improve survival from sudden cardiac death. The registry is designed to assist local EMS systems to identify who is affected, when and where cardiac events occur, which elements of the system are functioning properly and which elements are not, and how changes can be made to improve cardiac arrest outcomes. CARES utilizes an internet database system that reduces time involved in registering out-of-hospital cardiac arrest (OHCA) events, tracking patient outcomes with hospitals prospectively, and response time intervals associated with EMS responders.

The CARES system:

- Uses a secure Web database with restricted access for authorized users.
- Has software that collects and links data sources to create a single de-identified record for each OHCA event.
- Uses a simple, HIPAA-compliant methodology to protect confidentiality.
- Accepts a variety of input methods, such as uploaded data files or online data entry.
- Collects 9-1-1 computer-aided dispatch data for EMS response times.
Allows longitudinal, internal benchmarking of key performance indicators.

The State of California has selected the Coastal-Valleys EMS Agency to administer the Cares program and assist local EMS agencies in participating in CARES.

**San Joaquin County CARES Program Development Process Steps**

SJCEMSA will request that each hospital and ALS ambulance provider identify a primary contact for CARES participation and submit that person’s contact information. SJCEMSA will facilitate training that explains how to submit data to the CARES registry via a 15-20 minute Webex session hosted by the State CARES Coordinator. Our goal is to complete the implementation process for CARES and have 100% participation by all hospitals and ALS providers by July 1, 2019.