San Joaquin County
Emergency Medical Services
System Assessment

APRIL 25, 2024

*In cooperation with the San Joaquin County
EMS Agency & System Stakeholders*

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**HEALTHCARE
STRATEGISTS**

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EXECUTIVE SUMMARY

The consulting team from Healthcare Strategists, Inc. (HCS) is comprised of emergency medical services (EMS) experts with no less than 35 years of industry experience. They met with over 40 EMS stakeholders from throughout the County, in addition to spending considerable time in the field observing the system at work. The San Joaquin County EMS Agency (SJCEMSA) and all stakeholders were open and engaging in sharing their agencies' demographics, strengths, and opportunities for improvement. Only one agency could not make time to meet.

HSC consultants found that the County EMS system comprises highly trained individuals working in all aspects of EMS. They share a mission and vital role in providing the prehospital continuum of care for people in need. The current SJCEMSA Director is working hard to overcome some of the previous trust issues; he has increased the trust of many stakeholder groups through his philosophy of being transparent in all interactions.

The system highlights include:

➢ 100% implementation of Medical Priority Dispatch System® (MPDS) and Emergency Medical Dispatch (EMD)
➢ The use of the same ePCR software (ImageTrend) for all ambulance transport providers
➢ Clinical oversight and performance

The current system faces challenges that require strategic solutions, including:

➢ Response time delays
➢ Significant ambulance patient off-load time (APOT) delays
➢ Limited ALS Ambulance resources
➢ Public/private field provider patient care coordination
➢ Lack of field communication and coordination between first responders and private ambulance providers

Key recommendations for consideration include a combination of those that could be implemented before the new RFP, while others will need to wait for the next RFP or provider agreement:

➢ Address and mitigate the consequences of the concerns about current ambulance response times. This should involve improving dispatch protocols, optimizing resource allocation and system status plans, refining the current tiered response model, enhancing communication and coordination between EMS providers, and implementing strategies to reduce response time variability.

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➢ Address response time challenges in Zones X-21 (Lodi) and X-26 (South County). AMR has begun the steps to mitigate these issues by locating a deployment center in each of these zones while simultaneously prioritizing them in its deployment plans, most recently updated in February 2024.

➢ SJCEMSA should consider creating a separate Exclusive Operating Area (EOA) for what is currently known as Zone X-26, servicing the area covering the cities of Tracy and Mountain House in the next RFP.

➢ The deployment plan for BLS units within the 911 system should be adjusted to prioritize at least one basic life support (BLS) unit in Zones X-21 and X-26.

➢ The SJCEMSA should continue to review the current exemption policy. Exemptions are meant to accommodate specific "one-off" situations that cannot be predicted and are outside the provider's control. All exemptions should be carefully evaluated, regulated, and monitored to minimize the adverse effects and prioritize patient safety and well-being as currently performed by SJCEMSA.

➢ It is incumbent upon ambulance service providers to monitor APOT times and take corrective action when crews have transferred their patients to ED staff but fail to advise dispatch that they are available for service. This will increase available ambulances, reduce response times, increase first responder satisfaction, and improve patient care.

➢ SJCEMSA should continue to consult with the County Counsel to analyze EMS Policy #4985 concerning EMTALA. Further evaluation is needed on the policy language allowing crews to remove a patient from the hospital to another hospital before a medical screening exam is completed. SJCEMSA should collaborate with the ED directors and hospital leadership to facilitate a better approach to the transfer of patient care.

➢ To support an effective tiered-response program that all EMS providers trust, SJCEMSA should include a discussion on tiered-response within its currently established CQI Council as a standing agenda item. While a 100% audit of all BLS responses to 911 calls by the ambulance provider is ideal, at a minimum, it should be mandatory for every referral to an advanced life support (ALS) unit or that required the firefighter/paramedic to accompany the BLS unit. The audit should compare the MPDS category to the ALS interventions performed; committee recommendations would be forwarded to the EMS medical director for approval before dispatch implementation.

➢ SJCEMSA should consider not including ALS inter-facility transports (IFT) and critical care transports (CCT) in future exclusive operating areas to permit additional providers that will increase the capacity of services available to hospitals. The use of non-911 providers for ALS non-emergency IFT and CCT should be carefully evaluated and regulated to ensure patient safety, quality of care, and adherence to applicable regulations and standards.

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➢ SJCEMSA should review its current version of Policy #5001 as it relates to predesignating division group supervisors without knowing or assuring their qualifications.

➢ AMR management should meet its contractual obligations by ensuring the required number of supervisors are on duty and deployed primarily in the field, not at the AMR administrative office. SJCEMSA should monitor for compliance. Future contracts should specify a minimum percentage of field time in the supervisor job description.

➢ The County should explore the use of behavioral health triage to alternate destination programs to alleviate the current strain on local EDs and assist with the APOT challenges currently facing the EMS system. An obstacle to implementing these services is the lack of sufficient facilities within the County.

➢ Mitigate the consequences of the current delayed APOT by establishing an APOT committee consisting of representatives of the hospitals and transport providers in the County to support the implementation of APOT improvements.

INTRODUCTION

The County is in the Central Valley of California; it is one of the 58 counties in the state and covers an area of approximately 1,426 square miles. It is bordered by Sacramento County to the north, Alameda County to the west, Stanislaus County to the south, and Calaveras and Amador counties to the east. The County has a population of 789,410 residents.[1] The County seat is Stockton, which is also the largest city.

The local economy is diverse and includes agriculture, manufacturing, healthcare, education, and services sectors. Agriculture plays a significant role in the County's economy, with crops like cherries, walnuts, tomatoes, and asparagus. The Port of Stockton, located on the San Joaquin River, is an important regional transportation hub.

California law requires each county to establish a local EMS program and to create a local EMS agency (LEMSA) to oversee that program. California's LEMSAs exercise the most direct authority over EMS workplaces by planning, enforcing, and granting exclusive operating contracts with EMS provider organizations.

The County EMS system is a coordinated network of EMS providers responsible for ensuring timely and effective care for individuals experiencing medical or traumatic emergencies. It relies on well-trained emergency medical technicians (EMTs), paramedics, ambulance services, medical facilities, and excellent communication centers which are recognized as Accredited Centers of Excellence (ACE) in the use of MPDS, clinical oversight, quality improvement with

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[1] United States Census Bureau, 2021

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transparent performance measures and reporting, collaboration between agencies, financial responsibility, innovative strategies and solutions, and a solid regulatory framework to provide comprehensive emergency medical care to the residents of the County.

Throughout 2017 and 2018, EMS professionals, stakeholders, and public members shared ideas through collaborative encounters to update the National EMS Advisory Council (NEMSA) "EMS Agenda for the Future," initially released in 1996. The new vision, the "EMS Agenda 2050", aims to unite everyone with a role in EMS around a singular purpose: a people-centered EMS system. EMS Agenda 2050 provides a framework and vision for the next generation of EMS Advancement.[2] This EMS System of the future includes the following qualities:

- Adaptable & Innovative
- Inherently Safe & Effective
- Integrated & Seamless
- Reliable & Prepared
- Socially Equitable
- Sustainable & Efficient

In this new system, EMS professionals must be prepared to play a more significant role in managing a patient's and the community's health. Achieving this vision will require deliberate actions of stakeholders at every level of EMS: individuals, EMS services of all models and sizes, public officials from local regulators to the federal government, and national associations. It will require "bold collaboration with our partners: our communities, local volunteers, payers, healthcare systems, social services, public health, and partners in public safety." The guiding principles illustrated in EMS Agenda 2050 should guide all our decisions, from day-to-day EMS care and operations to system-wide strategic efforts like this system assessment and the upcoming RFP.

The County requested the services of HCS to provide consulting services for a comprehensive EMS system assessment of the County EMS system, the development and management of a competitive process for advanced life support (ALS) ambulance services within the County's exclusive operating area(s) (EOAs), and assistance with the negotiation and establishment of an agreement with the selected ambulance provider(s).

HCS developed a three-phase approach to achieve the County's goals. Phase one consists of a high-level system assessment and stakeholder input process. Phase two is the ambulance EOA procurement development, and phase three is the development of a contract for services with the awarded provider(s). This report describes the findings and recommendations of phase one. The information and recommendations identified in this first phase will be the foundation for the subsequent two phases.

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[2] https://www.ems.gov/assets/EMS-Agenda-2050.pdf

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The SJCEMSA requested the EMS system assessment to address each of the following subject areas, first identifying the current state and any recommendations for each:

1. Use the Medical Priority Dispatch System (MPDS®) for prioritized and tiered response and non-response.

2. Use of communications system, including dispatch and communications practices and configuration.

3. Response time and outlier performance standards, including a population-based analysis of the existing urban, suburban, rural, and wilderness zones.

4. Clinical oversight and performance measures.

5. Integration and use of Advance Life Support (ALS) and Basic Life Support (BLS) first responders.

6. Deployment of ambulance response resources.

7. Data and performance reporting requirements.

8. EMS provider staffing and schedules relative to fatigue and crew/patient safety.

9. Integration of bi-directional health exchange between prehospital providers and receiving facilities' emergency departments.

10. Assess feasibility for future community paramedic and mobile healthcare demands, including:
    a. Efficacy of on-scene treat and release.
    b. Efficacy of alternate destinations within San Joaquin County.
    c. Efficacy of 911 triage for non-response.

11. EMS system financial analysis, including:
    a. Evaluation of incumbents' audited financials.
    b. Payor mix.
    c. Cost containment strategies.

12. Other areas of interest warranting discussion (from the HCS team):
    a. APOT delays
    b. Use of non-911 ALS & CCT providers
    c. Public/private ALS field provider patient care coordination
    d. EMS Agency overview

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Method of Assessment

The HCS consulting team comprises EMS consulting experts with over 35 years of industry experience. The consultants met with EMS stakeholders throughout the County and spent considerable field time observing the system at work. All providers were open and engaging in sharing their agencies' demographics, strengths, and opportunities for improvement.[3] There was only one exception, Escalon Ambulance, who was unavailable to participate after numerous attempts to meet.

Materials Reviewed

- ALS Ambulance Provider EOA 2006 and 2016 Request for Proposals
- American Medical Response's (AMR) ALS Ambulance Provider EOA Proposal
- Ambulance Provider EOA Agreements
- Ambulance Provider Response Time Compliance Data
- Ambulance Provider Mutual Aid Assistance Data
- Ambulance Provider Financial Reports
- APOT Data
- SJCEMSA Policies and Procedures
- EMS Agency Fees from multiple agencies

Field Observations

- AMR
- Manteca District Ambulance (MDA)
- Stockton Fire Department (SFD)
- Lodi Fire Department
- Montezuma Fire Department
- Woodbridge Fire Department
- Manteca City Fire Department
- South County Fire Authority
- Adventist Hospital-Lodi
- Adventist Hospital-Dameron
- St. Joseph's Medical Center
- Doctors Hospital Manteca
- Sutter Tracy Hospital
- Kaiser Manteca
- San Joaquin County General Hospital
- Stockton Fire Department Emergency Dispatch Center (SFD EDC)
- Valley Regional Emergency Communications Center (VRECC)

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[3] We were unable to connect with Escalon Community Ambulance.

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Interviews Completed

- EMS Medical Director
- SJCEMSA Leadership
- AMR Leadership
- MDA Leadership
- Ripon Consolidated Fire District Leadership
- Woodbridge Fire District Leadership
- Lathrop-Manteca Fire District Leadership
- Lodi Fire Department Leadership
- SFD Leadership
- SFD EDC Leadership
- South County Fire Authority Leadership
- San Joaquin County EMS Chiefs
- Valley Regional Emergency Center Leadership
- Emergency Department Managers
- Non-Emergency Ambulance Providers
- Members of the Board of Supervisors
- San Joaquin County Office of Emergency Services (OES) Leadership

DISCUSSIONS, FINDINGS, AND RECOMMENDATIONS

1. Use of the Medical Priority Dispatch System (MPDS®)

Dispatchers are the first link in the chain of survival between the public and the healthcare system. Dispatchers are critical in identifying emergencies and non-emergencies early, assigning appropriate resources, and providing life-sustaining interventions like dispatcher-assisted CPR. However, it is essential to point out that EMD training and protocols alone will not guarantee the delivery of this vital component of the EMS system. Only through monitoring compliance with EMD protocols and the ability of the communications center to measure and correct performance can the objectives of EMD be obtained.

MPDS® is a proprietary EMD program used by 71% of the major U.S. cities. Jeff Clawson, MD, originally developed MPDS®, which is now guided by the International Academy of Emergency Dispatch (IAED). Using EMD by professionally trained dispatchers helps ensure the timely delivery of potentially lifesaving care.[4] To become certified in EMD, dispatchers must complete 24 hours of classroom training, obtain a CPR certification, and achieve a passing score on the final exam.

EMD is a system that:
- Includes a set of scripted, focused questions for rapid assessment
- Categorizes and prioritizes emergency calls
- Identifies patients who require rapid care
- Provides "zero-minute" response time to initiate lifesaving support
- Has a goal to provide an appropriate and timely prehospital response
- Measures effectiveness when linked with electronic patient care reports (ePCRs)
- Constantly reviews itself for quality improvement opportunities

With MPDS®, 911 callers are asked a series of scripted questions that include the patient's level of consciousness, age, chief complaint, and other complaint-specific questions. The answers allow 911 calls to be categorized into one of five levels, Alpha through Echo. Alpha is non-emergent (e.g., possible broken toe), and Echo is life-threatening (e.g., cardiac arrest). A sixth category, Omega, is gaining popularity for calls that may not require a 911 response and can be referred to a nurse or other healthcare provider for an alternate destination (e.g., urgent care center, clinic).

The five main categories are further delineated into 37 complaint-based protocols, which are further classified and may be assigned a numerical subgroup and a modifier, providing responders with more specific details. The consistent and predictable use of a uniform, medically managed, and supported EMD protocol ensures each 911 caller receives instructions

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[4] www.emergencydispatch.org

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consistent with current standards of care. The categories allow the EMS Medical Director to recommend lights and siren for life-threatening classifications. A retrospective review of critical clinical interventions performed per MPDS classification will enable recommendations to be adjusted as needed.

Findings: Both Valley Regional Emergency Communication Center (VRECC) and Stockton Fire Departments Emergency Dispatch Center (SFD EDC) have well-developed quality improvement (QI) programs, and their use of MPDS protocols reflect a culture of excellence and commitment to delivering high-quality emergency dispatch services to the community. During site visits, HCS consultants were thoroughly impressed with the dispatcher and management's knowledge and professionalism. Both centers maintain ACE accreditation, which is "reserved for high-performing agencies that consistently work to achieve excellence."[5]

Recommendations: SJCEMSA and all Dispatch Centers should continue with their well-established EMD protocols. An ongoing review of lights and siren use by MPDS classification is warranted to reduce the driving risk to the crew and the public.

2. Use of Communications System, including Practices and Configuration

Two dispatch centers manage 911 medical requests within the County – VRECC, operated by AMR, and SFD EDC. Historically, VRECC was the only 911 EMD dispatch center until the passage of AB 438, which allowed fire departments to opt out of a consolidated dispatch center. SFD elected to do so and expand the EDC to include the additional demands. Through interviews with VRECC leadership, they expressed that they did not notice any cost savings when SFD opted out of using VRECC, as they continue to be responsible for dispatching all of the ambulances in the County. Because the majority of calls dispatched are medical, there was no appreciable savings when not including the first responder unit.

VRECC: It serves as a secondary public safety answering point (PSAP), handling transfers from primary PSAPs when medical services are required. These responsibilities include dispatching all ALS ambulances, some BLS ambulances across San Joaquin and Stanislaus counties, and fire resources for 13 fire districts. Key technologies utilized include VESTA for the phone system, RapidDeploy for cell caller location, Motorola Elite Radio consoles, MPDS protocols for call processing, a version of CentralSquare computer-aided dispatch (CAD) known as Tri-Tech, and third-party software, KTRAC, for system status management (SSM) of ambulances. The center is ACE-accredited and accredited for emergency fire dispatch (EFD); this is a newer standard to provide pre-arrival instructions for fire calls. There is a CAD-2-CAD connection between VRECC, SFD EDC, and the Turlock Police Dispatch Center.

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[5] https://www.emergencydispatch.org/what-we-do/accreditation

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SFD EDC: It serves as a secondary PSAP for the City of Stockton, Lodi, Manteca, Lathrop, and the South County Fire Authority, encompassing areas like Tracy. The center receives transfers from primary PSAPs within its coverage area as part of its operational workflow. SFD EDC's primary responsibility is dispatching fire resources to emergencies in most cities. It does not manage ambulances. The center uses MPDS protocols to process medical calls and is ACE-accredited. The dispatch system operates on a different version of CentralSquare CAD called Tiburon. The center utilizes Tablet Command for real-time unit location tracking to enhance situational awareness and streamline operations. This software enables dispatchers and fire officers to monitor and coordinate response efforts effectively, ensuring timely assistance to those in need. Like VRECC, the center uses Motorola Elite radio consoles and RapidDeploy for caller location.

Finding: More than one dispatch center handling EMS needs within a county is common and is the predominant model in many communities. One concern mentioned during stakeholder meetings is the limited visibility of the activities and availability of resources in the other center. This challenge can lead to a lack of situational awareness, making it difficult to allocate and coordinate resources effectively in real-time. It may also result in inefficient resource utilization and longer response times. Multiple dispatch centers are more expensive as they duplicate hardware, software, personnel, and management costs.

Recommendation: To streamline the dispatch process, reduce costs, and increase resource tracking, the County may consider a single emergency communications center that manages all EMS (both first response and transport) resources countywide. Any consideration would need to consider the provisions of Assembly Bill 438.

Finding: The ambulance providers in the County share a common web platform that provides the real-time status and location of all the ambulances; however, that platform is not shared with the fire agencies or public dispatch centers. Similarly, fire resources are not visible to the ambulance services.

Recommendation: It is valuable for all centers to have real-time visibility of ambulance and FRALS unit status and location. At a minimum, this can be partially accomplished today by allowing the VRECC platform to be visible to SFD EDC.

Finding: The fire departments being dispatched by the SFD EDC use tablet software known as "Tablet Command." The ambulance providers and remaining fire departments dispatched by VRECC use "Inform Mobile" mobile data terminals.

Recommendation: Ensure ambulance and fire resources are mutually visible for superior resource tracking between responding first responders and ambulances. Sharing information between existing platforms or selecting a common platform are potential solutions. This recommendation will increase situational awareness for providers and their leadership.

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3. Clinical Oversight and Performance

EMS clinical oversight and performance refers to the processes and systems to ensure that prehospital providers deliver high-quality patient care and meet established performance standards. The task involves monitoring and evaluating the clinical performance of EMS providers, including their adherence to protocols, guidelines, and best practices. This oversight ensures that EMS providers deliver safe and effective emergency care to patients. It may involve reviewing ePCR data, conducting case reviews, and providing feedback and education to EMS providers. This data is used to identify areas for improvement and implement strategies to enhance overall performance.

Clinical oversight and performance tracking also involve continuous quality improvement (CQI) initiatives, which drive overall system improvement through training and education on systemic issues. CQI aims to enhance the quality and safety of EMS care through ongoing assessment, analysis, and improvement of processes and practices. Quality improvement activities may include regular audits, training and education programs, and implementing evidence-based practices.

By implementing effective clinical oversight and performance management strategies, EMS agencies can ensure that the providers deliver the highest standard of care to patients in emergencies. This approach improves patient outcomes and increases public trust in the EMS system.

Findings: The SJCEMSA Medical Director, Dr. Shafer, is satisfied with the elements within the current ambulance contracts and did not feel any quality items should be removed. Dr. Shafer identified that additional quality elements should be added to a new contract. The current contract has many valuable, clinically oriented features that should continue. The current contract requires the measurement of key performance indicators (KPIs); however, the Medical Director perceives that there is not enough bandwidth with existing clinical education staff to follow up on KPI findings with robust CQI. Dr. Shafer believes incentives or penalties should be tied to working towards achieving and maintaining KPI measures rather than focusing only on hitting a set KPI score, as this can lead to a lack of true transparency of data and obscure issues that are present. Dr. Shafer would prefer some accountability in the new contract to ensure that CQI activities are employed consistently.

Recommendation: The future contract should include sufficient staff dedicated to performing nationally recognized CQI processes as outlined by the Institute for Healthcare Improvement (IHI) and the National Association of EMS Physicians (NAEMSP). It should include sufficient resources to conduct training and education on KPI findings.

Finding: The SJCEMSA Medical Director is interested in exploring the development of an Advanced EMT (AEMT) program and incorporating it into the tiered-response program. Dr. Shafer wants to look at ways to create a more robust field response that meets the different

levels of care needed by patients. In addition to this, the tiered-response program can help maintain a full workforce.

Recommendation: SJCEMSA should explore the development of an AEMT program. It will increase the capabilities of existing EMTs, enhance system capacity, and improve the workforce pool. For example, if firefighter/paramedics ride with patients with an IV, an AEMT on the ambulance could assume patient care. While this will take time to develop, the next contract should include flexibility, allowing AEMTs and other innovations to be implemented without contract revisions.

Finding: HCS consultants reviewed the Cardiac Arrest Registry to Enhance Survival (CARES) Report for 2022. CARES is a collaborative data collection and analysis representing approximately 51% of the population nationwide, with data from more than 2,300 EMS agencies and over 2,500 hospitals.[6] The goal of CARES is to improve patient survival from sudden cardiac death. The report identified that the County's EMS providers (i.e., prehospital dispatch centers, first responders, fire departments, ambulance transport providers, hospitals, and specialty care facilities) performed at a high capacity and delivered superior cardiac survival outcomes (see Attachment B).

Recommendation: SJCEMSA should continue participating in CARES and compare its data elements related to patient survival from sudden cardiac arrest rates. Any clinical improvement opportunities identified should be implemented with the necessary education.

4. Integration of ALS and BLS (both EMT and AEMT) First Responders

Area fire departments respond to emergency medical calls with BLS and ALS level care. The following are the fire departments that provide first response according to the level of service in the County.

San Joaquin County Fire Services		
Fire Department	**ALS**	**BLS**
Clements Fire Department		❖
Collegeville Fire District		❖
Escalon Fire Department		❖
Farmington Fire District		❖
French Camp Fire Department		❖
Lathrop-Manteca Fire Department	Plan Approved – Not Implemented	❖
Liberty Fire District		❖
Linden Peters Fire Department		❖

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[6] www.myCares.net

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Fire Department	ALS	BLS
Lodi Fire Department	Plan Approved – Not Implemented	❖
Mokelumne Fire Department		❖
Manteca Fire Department		❖
Montezuma Fire Department		❖
Ripon Consolidated Fire District	❖	
South County Fire Authority	❖	
Stockton Fire Department	❖	
Woodbridge Fire District		❖
Thornton Fire Department		❖
Waterloo Morada Fire Department		❖

Finding: It does not appear that there is robust joint training and education between ambulance and first responder staff.

Recommendation: Integrating ALS and BLS first responders is essential for providing a comprehensive and efficient EMS System. By fully incorporating first responders into training, the EMS systems can leverage each provider's medical skills and capabilities to deliver high-quality patient care. Attention should be placed on collaborative training, which will support greater on-scene patient care.

5. Deployment of Ambulance Response and Transport Resources

Deployment and System Status Management Plans

Deployment and system status management (SSM) plans are strategies used in EMS systems to optimize service delivery to patients and workload for staff; each serves a different purpose. Deployment plans refer to how many ambulances to staff per hour of day and day of week. This is typically based on historical call volume per hour and geographic coverage needs. SSM plans are a dynamic approach to moving the deployed ambulance resources within the service area. Significant software optimization of historical call demand combined with human intelligence drives the SSM plans to predict and place units to meet the response time standards of the EMS system.

EMS systems can optimize response times by implementing deployment plans based on data analysis and demand patterns. This means that emergency care can reach patients more quickly, reducing the time between emergency and medical care.

A well-designed SSM plan is required to allocate and manage ambulance deployment effectively. This ensures that the right resources are available at the right time and in the right place, thus improving response times and influencing patient outcomes.

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By regularly reviewing and updating the SSM and deployment plans, EMS providers and their regulators can identify areas for improvement and implement evidence-based practices. This fosters a culture of continuous learning and improvement within the EMS system.

Finding: Most providers' deployment plans were on file with SJCEMSA but not the required SSM plans (see Attachment A), including all of the components stipulated in their provider agreements. AMR and MDA's SSM plans were reviewed and found incomplete; they do not meet their contractual obligations. Escalon and Ripon Fire do not require an SSM plan, as each service is a single ambulance. The table to the right shows the number of ALS ambulances deployed within the respective zones. However, providers indicated that the peak deployment numbers may fluctuate depending on staffing availability.

ALS Ambulance Deployment		
Provider	Minimum	Maximum
AMR	15	25
Manteca	4	6
Ripon Fire	1	1
Escalon	1	1

Recommendations: Providers should comply with their agreements and submit updated deployment and SSM plans regularly, at least annually, or when a change in the system requires deployment plans to be adjusted. SJCEMSA staff should review all plans for accuracy and completeness to meet the specific zone(s) needs.

Response Zone Structure
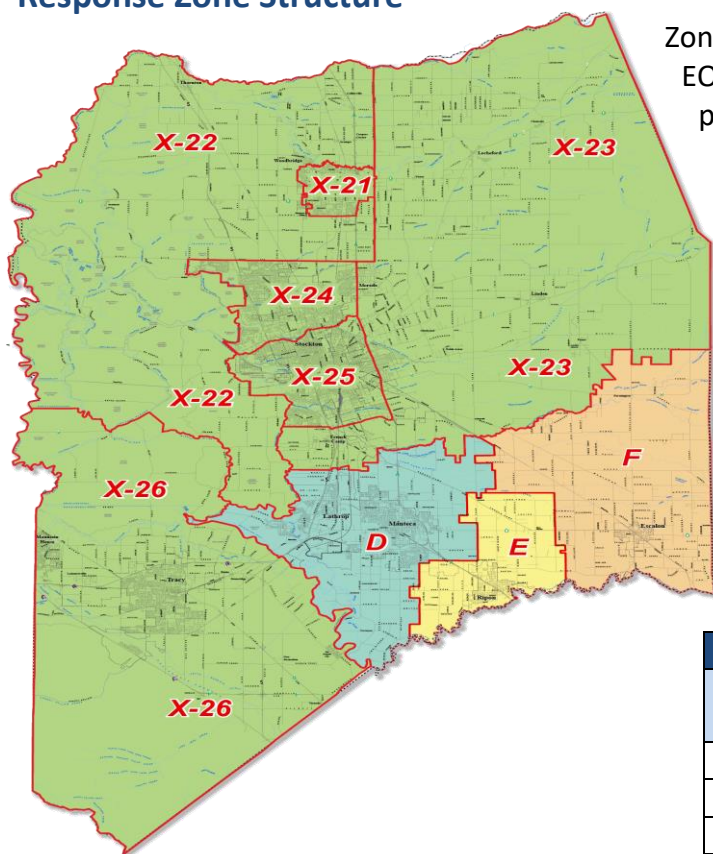
Zones X-21 through X-26 are included in one EOA that AMR won during the last RFP process. The providers for EOAs encompassing Zones D, E, and F have 1797.224 rights and, therefore, were not competitively bid at that time.

The County is currently divided into nine response zones. Currently, AMR deploys all of its ambulances from one deployment center in Stockton, MDA utilizes three centers, and RFD and ECA each deploy from a single station, respectively (see table).

Provider Zones and Deployment Centers		
Provider	Zones	Deployment Centers
AMR	X	1
Manteca	D	3
Ripon Fire	E	1
Escalon	F	1

Finding: A review of the available information, as well as feedback from stakeholder interviews, indicated that Zones X-21 and X-26 were at times left uncovered, as the AMR units needed to drive to and from these zones to complete shift changes at the single deployment center located on West Lane in Stockton (X-25), a 20 to 30-minute drive from Tracy (X-26) and a 15-minute drive from Lodi (X-21). A review of AMR's 2023 deployment plan revealed when unit availability was being depleted, it favored placing units at post locations within the Stockton area and drawing units away from Lodi and South County. AMR has adjusted its posting plan several times over the last 12 months, most recently updated in the February 2024 plan, which has placed a higher priority on Zone X-26.

Recommendation: Response times could improve by locating a deployment center in Zones X-21 (Lodi) and X-26 (South County) while simultaneously prioritizing these zones in the deployment plan.

Recommendation: The population density has increased substantially throughout the County, particularly in the south county. SJCEMSA should consider creating a separate EOA with specific response time requirements for what is now known as Zone X-26 service areas covering the cities of Tracy and Mountain House. A separate EOA historically served this region; however, the lower population density dictated combining with larger zones for economies of scale. The increase in population may address this prior weakness.

Exemptions

It is common for EMS agencies to build allowances into agreements for unpredictable and uncontrollable events that impact the ambulance providers' ability to meet the response times – known as exemptions. Response time exemption policies should be used for one-off events rather than what is a constant within the EMS system, i.e., APOT.

Finding: The County red lights and siren (RLS) response time compliance data for 2023 show that the ALS ambulance providers typically meet their contractual obligations (i.e., 90%); however, most require exemptions to do so. The current system provider agreements offer these exemptions; the results are actual response times below the intended threshold. The 90th percentile performance before exemptions for AMR in 2023 ranged between 9:15 and 10:03 minutes each month compared to the contractual requirement of 7:29 minutes for the urban zones. This performance requirement is more stringent than every other counties' standards before exemptions, except San Mateo County. Setting a stringent response time standard but then forgiving up to 28% of the responses sets an unrealistic expectation for the public and the first responders. AMR and the other ALS ambulance providers meet their contract requirements; however, the overuse of exemptions leads to the perceptions described during the stakeholder interviews and observed during ride-alongs.

HCS consultants reviewed the data associated with the granting of exemptions for the 2023 calendar year, which revealed the following:
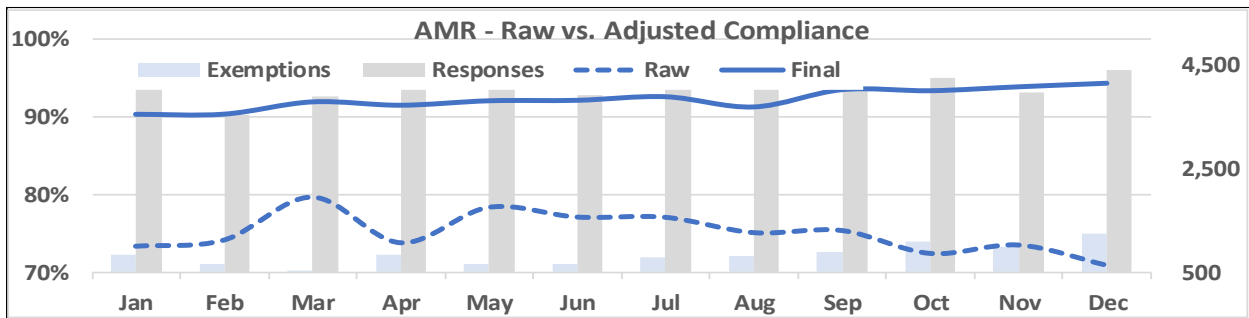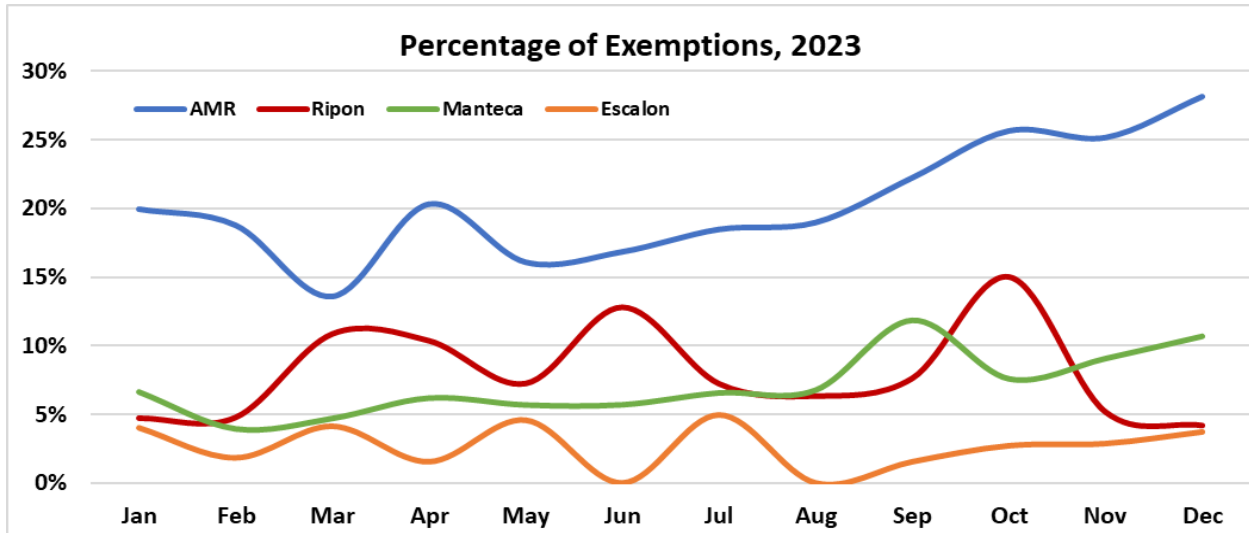
Percentage of Exemptions, 2023

AMR - Raw vs. Adjusted Compliance

Compliance	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
AMR, raw vs. adjusted compliance												
Raw	73.37%	74.17%	79.68%	73.82%	78.37%	77.12%	77.09%	75.12%	75.39%	72.45%	73.53%	70.93%
Final	90.20%	90.22%	91.79%	91.36%	91.93%	91.99%	92.45%	91.14%	93.35%	93.22%	93.72%	94.18%
Exemptions	832	664	526	827	663	660	778	805	885	1,089	994	1,232
Responses	4,172	3,538	3,873	4,072	4,124	3,920	4,213	4,244	3,982	4,247	3,951	4,379
% Exempt	20%	19%	14%	20%	16%	17%	18%	19%	22%	26%	25%	28%
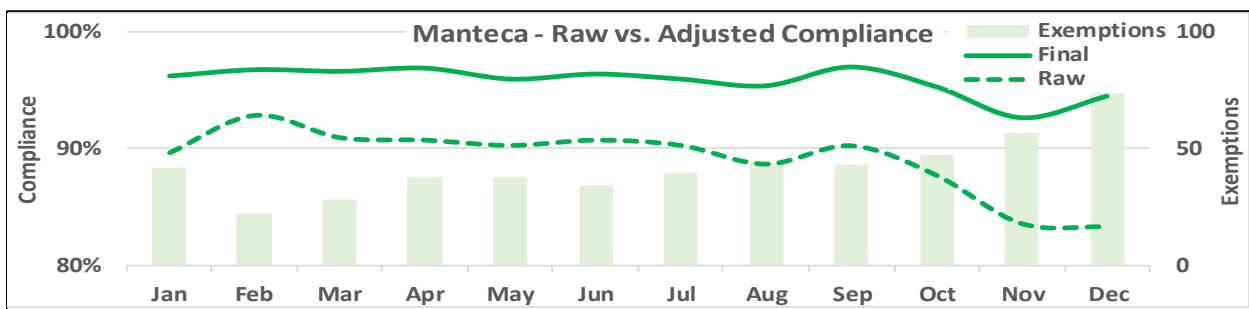
Manteca - Raw vs. Adjusted Compliance

Compliance	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Manteca, raw vs. adjusted compliance, 2023												
Raw	89.67%	92.84%	90.94%	90.73%	90.28%	90.73%	90.28%	88.69%	90.25%	87.74%	83.62%	83.34%
Final	96.24%	96.78%	96.64%	96.91%	95.98%	96.41%	95.98%	95.41%	97.01%	95.32%	92.69%	94.52%
Exemptions	42	22	28	38	38	34	40	44	43	47	57	74
Responses	634	559	596	615	669	597	610	651	636	620	629	693
% Exempt	7%	4%	5%	6%	6%	6%	7%	7%	7%	8%	9%	11%

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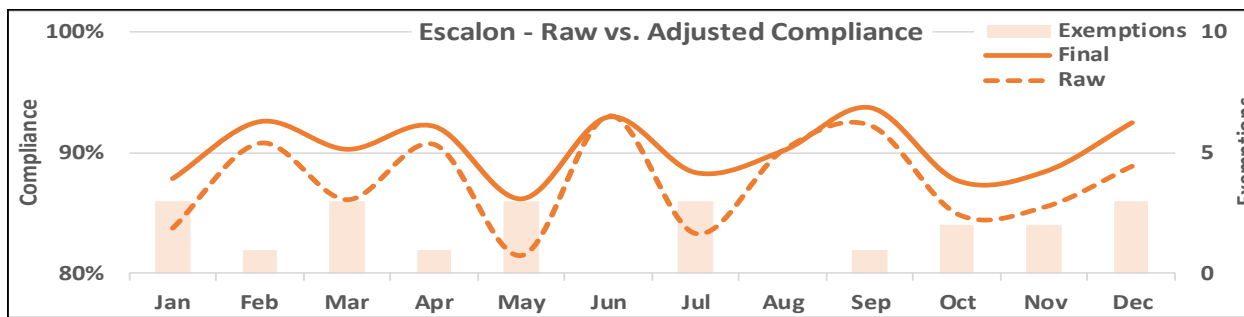
Escalon, raw vs. adjusted compliance, 2023

Compliance	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Raw	83.78%	90.74%	86.11%	90.63%	81.54%	92.98%	83.33%	90.16%	92.19%	84.93%	85.51%	88.85%
Final	87.84%	92.59%	90.28%	92.19%	86.15%	92.98%	88.33%	90.16%	93.75%	87.67%	88.41%	92.50%
Exemptions	3	1	3	1	3	-	3	-	1	2	2	3
Responses	74	54	72	64	65	57	60	61	64	73	69	80
% Exempt	4%	2%	4%	2%	5%	-	5%	-	2%	3%	3%	4%
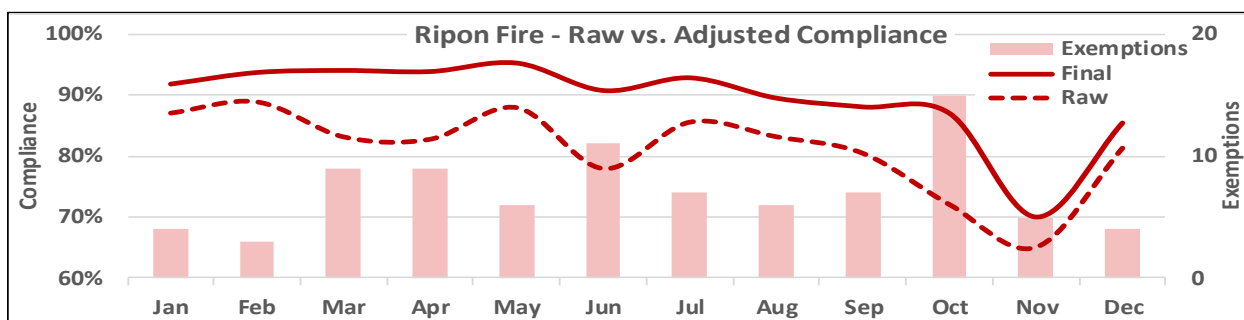
Ripon Fire, raw vs. adjusted compliance, 2023

Compliance	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Raw	87.06%	88.89%	83.13%	82.76%	87.95%	77.91%	85.57%	83.16%	80.43%	72.00%	64.95%	81.29%
Final	91.76%	93.65%	93.98%	93.80%	95.18%	90.70%	92.78%	89.47%	88.04%	87.00%	70.10%	85.42%
Exemptions	4	3	9	9	6	11	7	6	7	15	5	4
Responses	85	63	83	87	83	86	97	95	92	100	97	96
% Exempt	5%	5%	11%	10%	7%	13%	7%	6%	8%	15%	5%	4%

Finding: When reviewing the percentage of exemptions granted in surrounding counties (see chart below), it was determined that a significantly higher number of exemptions are being granted than other EMS agencies, particularly regarding Zones X-21 through X-26.

Exemptions Granted						
County	Santa Cruz	Merced	Stanislaus	Yolo	Fresno	San Joaquin
Population	273,213	277,680	550,660	220,500	999,101	816,805
APOT > 30 min. (per EMSA data)	No	Yes	Yes	Yes	Yes	Yes
Responses Aug-23 - Jan-24	16,531	12,084	37,990	13,693	N/A	25,003
Exemptions approved	220	256	1,103	830	N/A	5,956
Exemption %	1.33%	2.12%	2.60%	6.06%	6.36%	23.80%

Source: EMS Agency interviews

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Recommendation: The SJCEMSA should continue to review the current exemption policy. Exemptions are meant to accommodate specific "one-off" situations that cannot be predicted and are outside the provider's control. All exemptions should be carefully evaluated, regulated, and monitored to minimize the adverse effects and prioritize patient safety and well-being. The exemption approach should be updated in future provider agreements.

Ambulance Response Times

Response times are the most visual and significant influence on EMS system design. How long the ambulance takes to arrive is part of the patient experience and impacts the first responder's on-scene commitment and overall task time. It is also the most substantial factor in the cost of designing a system. Roughly 80% of ambulance expenses are related to field staffing. Shorter response times require more unit (i.e., ambulance) hours and more employees. However, the revenue does not improve with response times. There is a lack of clinical evidence to support faster response times. Many systems use MPDS to allow longer response times when not clinically justified based on historical data, such as critical interventions performed per MPDS category or lights and siren transports to the hospital. Studies have shown a four-fold increase in traffic collisions when using lights and siren, causing a risk to public safety and counter to the mission of EMS Systems.

A common theme expressed during stakeholder meetings was frustration with the extended ambulance response times being experienced daily. The response time data review, as well as on-scene observations by HCS consultants, validate these concerns. The stakeholders' trust in the EMS system has been eroded because of these concerns, which has led to decreased confidence in the system's ability to provide timely and effective emergency care. These ambulance response time delays can have significant consequences on prehospital time for patients, including:

1. **Prolonged time to receive advanced medical interventions**
   ALS ambulances are equipped with advanced medical equipment and highly trained personnel to provide critical care to patients. Delayed response times cause patients to wait longer for these advanced interventions. This delay can be crucial in time-sensitive emergencies such as cardiac arrest, trauma, heart attacks, and stroke, where timely interventions and transport can significantly improve patient outcomes.

2. **Increased stress and anxiety for patients and their families**
   When ALS ambulance response times are delayed, patients and their families may experience increased stress and anxiety. Waiting for medical assistance during an emergency can be distressing. The uncertainty and fear associated with the extended response times can exacerbate the emotional impact on patients and their loved ones.

3. **Potential impact on overall EMS system performance**
   Delayed ambulance response times can also have broader implications for the overall performance of the EMS system. Prolonged prehospital times can result in delayed availability of ambulances for other emergencies, leading to a cascading effect on the entire

system. It can strain EMS resources, compromise response times for other patients, and impact the community's ability to provide timely care.

Finding: HCS surveyed surrounding counties and compared them with the County's response time requirements. One difference is that the response time clock in the County starts when the call is ready to be dispatched and in the VRECC queue to assign a unit, while most counties start the clock when the ambulance is alerted to the call. While this may not be a significant amount of time, it is outside the control of the non-AMR ambulance providers.

The County response times are some of the fastest for the EMS systems reviewed. Only Sonoma County has a higher standard for its urban response zone. The higher payor mix in Sonoma County (i.e., 50% greater private insurance)[7] may financially support the additional unit hours for this standard. As discussed previously, the actual San Joaquin EMS system response times are much higher than the adjusted compliance due to the significant use of exemptions.

911 Response Time 90% Standard, Urban Zones						
County	Date of RFP	Clock Starts	Emergency		Non-Emergency	
Sonoma	2023	Unit Dispatch		6:59		11:59
San Joaquin	2014	Call Ready for Dispatch	AMR	7:29		14:59
			Manteca	7:29		14:59
			Ripon	8:00		N/A
			Escalon	8:00		N/A
Santa Clara	2011	Unit Dispatch	Critical	7:59	Moderate	7:59
					Low	12:59
Santa Barbara	2022	Unit Dispatch	Critical	7:59		14:59
			Urgent	10:59		
Napa	2021	Unit Dispatch	Critical	8:00		20:00
			Urgent	12:00		
Monterey	2020	Call Transfer	Critical	8:00		12:00
			Urgent	10:00		
Solano	2010	Call Transfer	Critical	9:00		
Alameda	2024	Call Transfer	Critical	10:00	Moderate	20:00
			Urgent	14:00	Low	30:00
San Bernardino	2023	Unit Dispatch		9:59		15:59
San Mateo	2015	Unit Dispatch		12:59		22:59

Notes: Sonoma and Santa Clara counties define P-1 as Charlie, Delta, and Echo calls types; Some counties allow first responder ALS (FRALS) to slow the clock, not included here
Source: Review of EMS agreements

Recommendation: The response time standard for ambulance providers should start when the unit is dispatched. It is unfair to hold the non-AMR providers to the time it takes VRECC (i.e., AMR) to handle the call; that is outside their control. A separate dispatch call processing standard should be incorporated into any authorized ambulance dispatch center agreements.

Findings: HCS consultants spent time in the field with public and private providers observing response times, most notably in the County's north and south, encompassing response zones X-21 through X-26. Consultants validated the stakeholders' concerns about delays during ride-alongs.

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[7] Sonoma County Emergency Ground Ambulance Services RFP, November 3, 2022

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Recommendation: Response times drive system costs. They should be applied where they provide value and balance with the costs and risks associated with the crews and the public when driving with lights and siren. The system savings can be redirected to tiered response options, community paramedic programs, lower ambulance rates, public CPR classes, public AED distribution, and other solutions positively impacting community health and patient outcomes.

Tiered Response

To reduce the strain on response times for ALS units, SJCEMSA allows a tiered-response model where BLS units are dispatched to urgent, but not life-threatening emergencies.

Finding: The system is experiencing much longer response times to calls, particularly in Zone X-26 (i.e., South County), as these BLS units are sent several times from Stockton. It was observed that this occurs even when ALS ambulances are available within X-26 and would meet the response time standard. Reviewing the data for tiered BLS response units from December 1, 2023, to January 18, 2024, for Zones X-21 through X-26 reveals that the response time compliance without exemptions averages 77% compliance rather than the required 90% compliance requirement.

Recommendation: The deployment plan for BLS units within the 911 system needs to be adjusted to prioritize at least one BLS unit for Zones X-21 and X-26.

Finding: HCS consultants received feedback from stakeholders that 30% of the time when a BLS unit is sent to a 911 call, the paramedic from the first responder ALS (FRALS) engine needs to accompany the BLS ambulance to the hospital because of the patient's needs, thereby placing the fire engine out of service. During the SJCEMSA interviews, it was identified that no data had been presented for CQI review to change dispatch protocols and improve the tiered-response system.

Recommendation: The stakeholders' observations of FRALS transporting with BLS should be reported, quantified, and corrected where inappropriate through the existing CQI process. Once identified, SJCEMSA should conduct a thorough quality review of the use of the determinants contained within Policy #3202 and review all 911 ambulance calls assigned to a BLS unit that required the firefighter/paramedic to continue patient care to the hospital. This review should catalog the ALS intervention performed that caused the need for paramedic transport. For example, if existing County policies require an IV to be started but no medication was administered, that could be a legacy approach before tiered-response was an option. SJCEMSA should request a copy of the data identifying the inappropriate use of BLS for a more substantial CQI review.

Finding: SJCEMSA policy requires a 100% audit of all 911 calls in which a BLS ambulance is dispatched. While SJCEMSA conducts audits based on information from the field, interviews with the AMR leadership team identified that the required audits are not being completed consistently due to a lack of CQI staff resources.

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Recommendation: To support an effective tiered-response program that all EMS providers trust, SJCEMSA should include tiered-response discussions within its CQI Council meeting agendas. While a 100% audit of all BLS responses to 911 calls by the ambulance provider is ideal, at a minimum, it should be mandatory for every referral to an ALS unit or that required the firefighter/paramedic to accompany the BLS unit. The audit should compare the MPDS category to the ALS interventions performed and adjust dispatch recommendations appropriately.

Field Management & Supervision

HCS consultants reviewed the provider agreements for all four ambulance providers in the County related to the management and supervision of field operations. The AMR agreement states in part, "…it shall provide the management personnel necessary to administer and oversee all aspects of emergency ambulance service. The Contractor shall provide at least two field supervisors 24 hours per day, working 12-hour shifts, and an additional field supervisor 12 hours per day during peak demand times."

Finding: Three of the four providers appear to be following the contractual requirements. Through interviews with AMR management and direct observation by HCS consultants, it was identified that AMR does not comply with this contractual requirement. As the provider agreement requires, AMR does not consistently staff two supervisors 24 hours per day and always provide a third supervisor during peak times. It was noted that, prior to the beginning of this year, there was a five-hour window at night that was staffed by only one supervisor.

Additionally, it appears that when there are two supervisors on duty, there are periods when both supervisors are located at the AMR deployment center, possibly completing administrative tasks. During a recent multi-casualty incident (MCI) with four victims in Zone X-23, both supervisors were at the AMR deployment center; neither responded to the incident, as AMR and SJCEMSA policy require.

Recommendation: AMR management should fulfill its contractual obligations by ensuring the required supervisors are in the field, not just at the AMR deployment center. SJCEMSA should monitor for compliance. Future contracts should specify a minimum percentage of field time in the supervisor job description.

Field Supervisor Certification/Licensure

Having EMS field supervisors who are paramedics brings a wealth of clinical knowledge, leadership skills, and operational experience to the scene of an emergency. This can improve patient care, employee career development, and organizational effectiveness.

Finding: AMR sometimes uses EMT shift leads as field supervisors to respond to 911 calls to meet its contractual requirements. The current contract does not specify the supervisor's level of certification.

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Recommendations: Field supervisors are required to supervise ALS personnel; therefore, it is recommended that all supervisors in the field should be paramedics. This requirement should be included in all providers' successive contracts.

6. EMS Data Integration and Performance Reporting Requirements

EMS data integration and performance reporting requirements encompass the collection, standardization, and analysis of EMS data to generate performance indicators and metrics. These requirements enable real-time monitoring, compliance with regulations, stakeholder engagement, and CQI to ensure optimal delivery of emergency medical services.

Timely access to performance data is crucial for effective decision-making and CQI. Real-time monitoring and reporting systems allow EMS agencies to track key performance indicators, identify trends, and take proactive steps to address issues promptly. This requires robust data analytics capabilities and user-friendly reporting interfaces that provide actionable insights to stakeholders.

Clinical Data

All ambulance providers use ImageTrend for ePCR. The software enables EMS agencies to capture and document patient care data in real-time. It offers user interfaces and customizable data entry forms that allow agencies to collect essential information related to compliance requirements. ImageTrend offers robust data management capabilities. It provides a centralized database where agencies can securely store and organize patient data. The software allows for easy data retrieval and analysis, enabling agencies to generate comprehensive reports and analytics on clinical metrics. These reports can help agencies identify clinical quality trends, track performance, and demonstrate adherence to regulatory requirements.

Finding: A review of the SJCEMSA website revealed that clinical data reporting by the providers has been delayed for a couple of months. The apparent cause is the transition from the MEDS PCR software to ImageTrend. When fully integrated, the ImageTrend software will assist SJCEMSA in gathering clinical data by providing a comprehensive and streamlined data collection, management, and reporting solution.

Recommendation: SJCEMSA should capitalize on the tools within ImageTrend to benefit clinical care to the community as it relates to streamlining data collection, real-time data access, and enhanced communication and collaboration. Systemic issues can be identified and addressed through ongoing education and training. Software is available to support CQI automation. FirstPass, owned by FirstWatch, is a popular solution. SJCEMSA should consider this option to reduce staff time.

Compliance Software

SJCEMSA uses FirstWatch software to gather response time data. The compliance software has several positive effects for EMS agencies. This online compliance utility (OCU) software for gathering response time data offers improved accuracy, real-time monitoring, performance analysis, benchmarking, compliance reporting, and performance transparency. These positive effects help EMS agencies enhance their response time performance, optimize operations, and provide better care to their communities. FirstWatch is the leader in this industry.[8]

Finding: OCU software has become a standard in the EMS industry. They offer significant automation to the compliance process, streamline exemption requests, and reduce the task load on the EMS agencies.

Recommendation: Continue to mandate OCU software to automate and simplify the EMS system compliance needs.

7. Ambulance and Dispatch Staffing and Schedules

Staffing models are a critical factor in the efficient operation of the provider. EMS providers have adopted several models nationwide, each reflecting their respective systems' unique needs and priorities.

AMR Finding: AMR currently employs 72 full-time and 29 part-time paramedics and 112 full-time and 37 part-time EMTs. AMR stated it "overstaffs" to accommodate sickness, injury, and vacation needs. The use of part-time EMTs and paramedics depends on individual availability; however, the current collective bargaining agreement (CBA) requires part-time employees to work at least 48 hours each month. Given the higher call volume in AMR's service area, they predominantly use a 12-hour shift pattern, working four days followed by three days off for one week and the inverse the following week.

Manteca Finding: MDA currently employs 16 full-time and four part-time paramedics, along with 12 full-time and six part-time EMTs, using an ambulance staffing schedule of 24-hour shifts (i.e., 2 on/3 off) and other shift variances. Three full-time supervisors evenly split the schedule, working 48 hours followed by 96 hours off-duty (i.e., 48/96). The latter matches how many fire departments currently schedule their staff.

Ripon Fire Finding: Ripon Fire currently uses a 48/96 shift schedule, and all personnel can work the ambulance, regardless of rank. They have three paramedics and three EMTs assigned regularly to the ambulance; although, with injuries and staffing shortages, they staff with other qualified personnel.

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[8] www.firstwatch.com

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VRECC Finding: AMR currently employs 53 dispatchers, eight supervisors, and three support staff and uses a 12-hour shift pattern of four shifts on and three shifts off for one week and the inverse the following week.

SFD EDC Finding: SFD employs 16 full-time dispatchers, including three dispatch supervisors, six call-takers, a CAD coordinator, a quality assurance analyst, a technology position dedicated to the center, and a center manager for 26 full-time staff. The center has three part-time staff, two dispatchers, and one office staff supporting QI, records requests, etc. The call-takers are scheduled an average of 40 hours per week (i.e., three [12-hour] shifts, followed by four shifts the following week), while the dispatchers work 24-hour shifts (i.e., 24 on/24 off/24 on/24 off/24 on followed by four days off- "Kelly" schedule). There are three shifts – A, B, and C. Given the 24-hour shifts, dispatchers are provided the following structure for sleep period: between 2330 and 0800, there are two dispatchers and one call-taker at consoles at a minimum, with the ability to 'buzz' dorm rooms for greater alarm fires, multiple fires, increased call volume, and other surges in dispatch demand. SFD EDC is conducting a staffing/efficiency study with mission-critical partners.

SFD EDC Recommendation: Given the growing understanding of 24-hour shift work on employee mistakes, lower performance, and increased injuries, SFD EDC may consider moving away from this shift type. The overnight hours could be rescheduled during the day to match the dispatchers' scheduled hours more closely to 911 call demand.

8. Integration of Bi-Directional Health Exchange

Bi-directional health exchange between prehospital providers and EDs enhances patient care, improves communication, promotes continuity of care, facilitates faster diagnosis and treatment, reduces medical errors, and optimizes resource allocation. Benefits of bi-directional health exchange between prehospital providers and emergency departments include:

1. Enhanced Patient Care: Bi-directional health exchange allows for the seamless transfer of patient information between prehospital providers and emergency departments. This enables receiving facilities to access critical patient data, such as medical history, allergies, medications, and vital signs, improving patient care and outcomes.

2. Improved Communication: Bi-directional health exchange promotes effective communication between prehospital providers and emergency departments. Real-time information sharing, such as the patient's condition, treatment provided in the field, and patient status changes during transport, enables better care coordination and reduces response times.

3. Continuity of Care: Integrating bi-directional health exchange ensures a smooth transition of care from prehospital providers to emergency departments. Receiving facilities can access the patient's prehospital records, facilitating a seamless handoff and continuity of care. This helps avoid duplicative tests, delays in treatment, and ensures accurate capturing of the patient's medical history.

4. Faster Diagnosis and Treatment: Bi-directional health exchange provides emergency departments with timely and comprehensive patient information. Access to prehospital data, such as ECGs, vital signs, and other diagnostic test results, enables faster and more accurate diagnosis. This facilitates prompt initiation of appropriate treatment, improving patient outcomes.

5. Reduced Medical Errors: By ensuring that accurate and up-to-date patient information is available to prehospital providers and emergency departments, bi-directional health exchange helps reduce medical errors. This minimizes the risk of medication errors, adverse drug interactions, and other mistakes due to incomplete or inaccurate information.

6. Efficient Resource Allocation: Bi-directional health exchange allows receiving facilities to anticipate and prepare for incoming patients by providing real-time information about the patient's condition and treatment provided in the field. This facilitates efficient resource allocation, ensuring that the necessary resources, such as staff, equipment, and specialized care, are available when needed.[9]

7. Provider education: By making patient disposition information available, providers can use this information for additional education and training of field staff.

Finding: The SJCEMSA website offers a patient feedback form whereby field personnel can request hospital feedback about patients' medical conditions. Through discussions with SJCEMSA leadership, it was shared that stakeholders can also use this form to support internal CQI programs and processes.

Recommendation: The County should consider a robust bi-directional health exchange between its EMS providers and hospitals. The successful integration of an exchange will require collaboration, standardization, financing, and ongoing evaluation to ensure effective communication and seamless transfer of patient information considering the following:

1. Standardize Data Exchange: Establish a standardized format and set of data elements that can be exchanged between prehospital providers and emergency departments. This ensures that the information shared is consistent and can be easily understood by both parties.

[9] www.healthit.gov

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2. Implement Health Information Exchange (HIE) Systems: Utilize HIE systems to facilitate the secure exchange of health information between prehospital providers and emergency departments. These systems should support bi-directional data flow, allowing both parties to send and receive patient information in real-time.

3. Ensure Data Security and Privacy: Implement appropriate security measures, such as encryption and access controls, to protect patient data during transmission and storage. Adhere to privacy regulations, such as HIPAA, to maintain patient confidentiality.

4. Develop Interoperability Standards: Collaborate with vendors and industry organizations to establish interoperability standards that enable seamless data exchange between different systems used by prehospital providers and emergency departments. This promotes compatibility and reduces the need for manual data entry or data conversion.

5. Train and Educate Users: Provide comprehensive training to prehospital providers and emergency department staff on using the bi-directional health exchange system. Ensure they understand the benefits, workflow integration, and best data entry and retrieval practices.

6. Establish Protocols and Workflows: Develop clear protocols and workflows for the bi-directional exchange of health information. Define the specific data elements that should be exchanged, the timing and frequency of data transmission, and the responsibilities of each party involved.[10]

7. Explore options for implementation financing or grants through the California Emergency Medical Services Authority or other impacted organizations.

9. Feasibility for Community Paramedic and Alternative Destination Programs

In 2014, the California Office of Statewide Health Planning and Development (OSHPD) approved an application from the California EMS Authority (EMSA) to establish a Health Workforce Pilot Project (HWPP #173) to evaluate multiple community paramedicine concepts. OSHPD continually renewed the HWPP Community Paramedicine Pilot Project, encompassing 20 projects in 14 communities across California. The seven different community paramedicine concepts include:

1. Post Discharge
2. Alternate Destination
3. Frequent 911 use
4. Hospice
5. Public Health Collaboration
6. Behavioral Health
7. Sobering Center

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[10] www.healthit.gov

Assembly Bill 1544 (Gipson) introduced the Community Paramedicine or Triage to Alternate Destination Act, which was signed by the Governor in September 2020, to authorize the implementation of community paramedicine or triage to alternate destination programs statewide at the discretion of each local EMS agency.

Community paramedicine and alternate destination programs have shown promising benefits in improving patient care and reducing healthcare costs. Community paramedicine programs involve expanding the role of paramedics beyond traditional emergency response to provide non-emergency care and preventive services in the community. This includes home visits, chronic disease management, medication management, and health education. By bringing healthcare services directly to patients' homes, these programs can improve access to care, reduce hospital readmissions, prevent unnecessary 911 calls, and enhance the community's overall health. It should be noted that a number of these programs currently lack funding mechanisms.

Research of current legislation revealed that Senate Bill 1180 has been introduced in the California Senate and is pending a hearing in its Health Committee. SB 1180, if passed, would require commercial insurance carriers as well as the state Medi-Cal program to include payment for community paramedicine and triage to alternate destinations within their reimbursement benefits.

On-Scene Treatment and Release

Within the EMS system, this refers to providing medical treatment to patients who have called 911 and <u>not</u> transporting them to a healthcare facility. This approach is typically used for patients with minor injuries or illnesses that do not require further treatment or hospitalization. The value of on-scene treatment and release programs can be evaluated based on several factors:

1. Patient Outcomes: Studies have shown it can effectively manage certain conditions without hospital transport. For example, in cases of sprains and minor lacerations, providing immediate care at the scene can lead to a satisfactory outcome for the patient without further medical intervention. However, it is essential to ensure appropriate follow-up care or referrals to ensure the completion of care occurs.

2. Cost Savings: On-scene treatment and release can reduce healthcare costs by avoiding unnecessary ambulance transport and ED visits. EMS providers can determine if a patient's condition can be adequately managed without immediate ED care by providing an on-site assessment. This can help optimize prehospital and hospital resources for high-acuity patients and reduce unnecessary healthcare expenditures.

3. System Efficiency: This program can improve system efficiency by reducing ambulance turnaround times and decreasing the burden on EDs. This can help improve overall system performance and shorten response times for critical cases.

Finding: The community may benefit from a formal on-scene treatment and release program. With the current APOT delays mentioned earlier, there is a substantial benefit to reducing ED transports; however, the implementation of this initiative is challenged by a lack of funding mechanisms.

Recommendation: Conduct a careful assessment of the efficacy of on-scene treatment and release and the capability of the current EMS providers to triage patients appropriately. A successful program requires clear protocols and guidelines to ensure appropriate care and patient safety are not compromised. Some providers have developed the ability for EMS crews to consult with physicians and mid-level providers while on scene using telemedicine. Ongoing evaluation and research are necessary to continuously assess this approach's effectiveness and identify areas for improvement.

911 Triage and Referral

When trained, 911 dispatchers assess the severity of a caller's condition over the phone, and if it does not require an EMS response by dispatch protocols, that is called triage and refer. After determining that there is no medical emergency, the dispatchers refer the caller to a medical provider to offer appropriate instructions or referrals. This provider can be an EMT, paramedic, nurse, or higher, following clearly defined protocols, located within the dispatch center, or connected virtually to the patient.

Finding: Similar to on-scene treatment and release, 911 triage and referral offers similar opportunities to 1) improve patient outcomes, 2) reduce healthcare costs, and 3) improve system efficiency.

Recommendation: Evaluate the local applicability and value of 911 triage and referral based on the following factors:

1. Timeliness of Response: The primary goal of 911 triage is to ensure timely and appropriate emergency response. Effective EMD triage protocols and well-trained dispatchers can help identify critical situations and prioritize responses accordingly. Conversely, the same dispatchers can identify a non-emergency call and transfer it to a healthcare provider for disposition.

2. Accuracy of Triage: The accuracy of dispatcher triage is crucial in determining the appropriate level of response required for a given situation. Dispatchers must gather relevant information from callers and make informed decisions about the urgency and resources needed. The efficacy of triage can be evaluated by assessing the accuracy of these decisions, such as monitoring how often a call is referred back to the dispatcher and whether a caller redials 911 within 24 hours for unresolved needs.

3. Patient Outcomes: The ultimate measure of efficacy is the impact on patient outcomes. Effective 911 triage and referral can help ensure patients receive timely and appropriate care.

4. System Efficiency: Effective triage and referral processes can help optimize the use of EMS resources and improve system efficiency. Accurately assessing the severity of emergencies and deferring non-emergency patients to a medical provider for advice and possible referral can avoid unnecessary ambulance transports and ED visits. This reduces costs, alleviates the strain on healthcare resources, and improves overall EMS system performance.

It is important to note that 911 triage and referral can have a positive or negative impact depending on how the program is designed. Continuous evaluation, training, and system improvements are necessary to ensure the quality of these processes and minimize any potential shortcomings. Additionally, public education and awareness campaigns can promote proper utilization of emergency services and reduce the occurrence of calling 911 for inappropriate situations.

Post-discharge Follow-up

One of the critical benefits of post-discharge follow-up programs is that they help ensure patient continuity of care. Through regular check-ins and monitoring, EMS providers can identify potential issues or complications early on and intervene before they escalate. This prevents unnecessary hospital readmissions and improves overall patient health.

These programs also play a crucial role in patient education and self-management. By providing patients with information and resources to understand their conditions better and manage their care, they can become more engaged in their healthcare, more resilient, and less likely to call 911 for ambulance transport and ED visit.

Furthermore, post-discharge follow-up programs can help address any interruptions in the healthcare system. By bridging the gap between hospital and home care, these programs provide a smooth transition for patients and ensure that they always receive the necessary support and services.

The efficacy of post-discharge follow-up programs can be attributed to their ability to provide ongoing home care, support patient education and self-management, and proactively address gaps in the healthcare system. By improving patient outcomes and reducing hospital readmissions, these programs contribute to overall healthcare delivery and patient satisfaction.

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Finding: Visiting patients immediately after discharge can improve patient outcomes and reduce hospital readmissions. These programs involve providing ongoing care and support to patients after they have been discharged from the hospital, as was demonstrated in the pilot projects in the cities of Alameda and San Diego.

Recommendation: Discussions should be held with the current EMS providers and general acute care hospitals to ascertain their willingness to participate in this program. With that support, the SJCEMSA can develop the protocols and policies to guide the post-discharge follow-up programs.

Behavioral Health Alternate Destination Programs

One of the main advantages of these programs is that they provide a more appropriate and specialized response and destination to individuals experiencing behavioral health crises when contacting 911. Instead of sending them to EDs where they may not receive the specific care they require, these programs connect callers with alternative destinations such as crisis stabilization units, mental health clinics, or mobile crisis teams. By diverting behavioral health calls away from EDs, these programs also help to alleviate overcrowding and reduce wait times for individuals with other urgent medical needs. This improves the efficiency of the EMS system and EDs by allocating resources appropriately.

In addition, these programs can reduce the stigma of seeking behavioral health services. By offering an alternative to EDs, individuals may feel more comfortable reaching out for help during a crisis, knowing they can connect with professionals who understand their needs.

Finding: Overall, community paramedicine and triage to alternate destination programs have demonstrated positive impacts on enhancing patient care, reducing healthcare costs, and improving system efficiency – all goals of the IHI Triple Aim.[11] These innovative approaches to EMS care delivery can potentially transform the healthcare landscape by providing more patient-centric and cost-effective care.

Recommendation: The County should explore the use of behavioral health triage to alternate destination programs to alleviate the current strain on local EDs and assist with the APOT challenges currently facing the EMS system. An obstacle to implementing these services is the lack of sufficient facilities within the County.

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[11] www.ihi.org/improvement-areas/triple-aim-population-health

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10. EMS System Financial Analysis

Payor Mix

The providers shared copies of their payor mix information. The table describes the countywide weighted-average payor mix rates. AMR and Manteca are experiencing similar patient payor types. Ripon Fire has a significantly higher percentage of private insurance than other providers. Escalon appears to have a large population over 65 based on the number of Medicare transports completed.

Payor Mix, 2022	
Payor	Percentage
Medicare	40.6%
Medi-Cal	33.5%
Insurance	11.3%
Private	9.8%
Facility/Other/Cash	4.9%
Total	100.0%

Note: Weighted average
Source: Ambulance providers

Cost Containment Strategies

Dispatch: A single dispatch center for all ambulance providers offers significant cost containment. This allows more resources to be focused on unit hours for improved response times.

Hospital Off-Load Time: The current challenges with off-loading patients present the most significant opportunity to control costs that do not benefit patient care. Off-load is defined as the amount of time it takes to transfer the patient, plus complete documentation and clean the gurney. If ambulances could turnover patient care within the County standard of 20 minutes set by EMS Policy #4985 and 20 minutes to prepare the ambulance for the next call (i.e., 40 minutes total), it would generate $948,948 in savings or the equivalent of 12 additional unit hours per day – just for AMR. This is based on the number of minutes beyond 40 for AMR units during 2023 at the 90th percentile standard. The data analyzed combines the time to turn over patient care with the time to complete documentation and clean the ambulance. The patient turnover policy standard is consistent with the state goal of 20 minutes within 90% of the time.[12] Creating solutions to address off-load delays and promptly return to service provides the ability to mitigate the response time challenges faced by all ambulance providers.

APOT Expense		
		Quantity
EMS Policy Turnover Time (minutes)		20
Return to Service Goal (minutes)		20
Total Hospital Time (minutes)		40
Time lost (Off-load>40 minutes) (hours)		4,273
AMR Cost/Unit Hour	$	222
Potential Annual Savings	$	948,948
Additional Unit Hours/Day		12

Source: ImageTrend, AMR data

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[12] Health & Safety Code 1797.120.5

Evaluation of Public-Private Partnerships

The alliance models in Contra Costa and Sonoma counties demonstrate the potential of leveraging relationships between public and private agencies. As the provider-of-record, public entities can collect higher Medi-Cal revenue than private providers. The latter does not have the expense of civil service retirement programs and can provide the SSM and deployment plan experience to optimize ambulance deployment. More resources can be brought forward to serve the community through these partnerships.

Ambulance Rates

The County does not limit the rates that may be charged for IFT, non-emergency ambulance, or standby services. The rates listed are current as of June 2023 and are subject to changes annually. There is a slight variance in the rates between the four providers.

Authorized Rates for Emergency Ambulance Service				
Provider	AMR	Manteca	Ripon Fire	Escalon
Service Area	Zone X	Zone D	Zone E	Zone F
ALS Emergency Base Rate	$3,586.32	$3,586.22	$3,586.32	$3,448.38
BLS Emergency Base Rate	$3,058.44	$3,058.44	$3,058.44	$2,940.81
Night Charge	$253.02	$253.02	$253.02	$243.29
Oxygen	$321.18	$321.18	$321.18	$308.83
Mileage (per loaded mile)	$76.10	$76.10	$76.10	$73.17
EKG	$101.45	$101.45	N/A	N/A

Financial Statements

The consulting team reviewed the financial statements provided by the four ambulance services. They demonstrated a wide range of revenue and expenses based on the size of their service areas. All appear to be financially stable currently.

AMR Finding: The unaudited 2023 fiscals demonstrate a favorable financial position. The revenue and cost per transport are within the range expected for an operation of its size.

AMR Recommendation: Review audited financials when they become available to confirm the findings of the preliminary documents.

Manteca Finding: The CPA noted no concerns based on the audit. The provider has a healthy margin between revenue and expenses in its Manteca/Lathrop operations.

Ripon Fire Finding: The audit includes both EMS and fire operations, which is challenging when assessing the ambulance service. Ambulance revenue in fiscal year 2022 was $533,000. Most providers estimate at least $1,000,000 to operate an ALS ambulance 24/7 annually. Therefore, the current ambulance program is not self-sustaining and requires a heavy subsidy from property tax revenue. The CPA noted that general expenses outpace revenue compared to the prior year. This could impact service delivery if additional funding is not identified.

Ripon Fire Recommendation: More revenue may be available than received based on the higher proportion of privately insured patients in its zone. The fire district may want to conduct a billing audit to ensure it is collecting the maximum revenue possible.

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Escalon Finding: The financial statements provided demonstrate a financially stable service. The expenses are consistent for a provider with one ambulance. Revenue per transport is higher than anticipated and more significant than the other providers in the County. Removing the donations and membership fees reduces it slightly, but it is still considerably higher than expected.

Recommendation: Monitor all ambulance providers annually for financial status and compare with prior years. This oversight of annual audits will proactively identify the potential for service interruption due to provider failure.

11. Medical Helicopter Utilization

Using medical helicopters in the 911 field responses can have several positive impacts. Helicopters can provide rapid transportation for critically ill or injured patients. They can quickly reach remote and inaccessible locations, bypassing traffic congestion and geographical obstacles. They also bring a higher level of care to the scene as most helicopters are staffed with a paramedic and a critical care registered nurse, with an expanded scope of practice beyond ALS. Transferring a patient to a helicopter immediately allows the ambulance to return to service, which can be vital for a rural environment.

However, the utilization of medical helicopters must also consider that they are subject to weather conditions and operational limitations. Adverse weather, such as heavy rain, fog, or high winds, can ground medical helicopters. Additionally, operational constraints, such as limited availability or restricted landing zones, may affect their ability to respond promptly in certain situations.

Finding: Medical helicopter service is available in the County for patients whose conditions meet helicopter transport criteria. Air Medical Holdings Group, which includes REACH, Cal-Ore, and CalSTAR, provides County helicopter and fixed-wing ambulance services. These aircraft resources are available for critically ill and injured patients throughout the County and surrounding counties. There is a base of operations at the Stockton Metropolitan Airport, and in 2023, the service responded to requests for both 911 and interfacility transports (IFT). Reviewing the cancellation rates, they were significantly higher than industry standards. Cancellation or non-response rates can be broken down into several categories:

- Weather restrictions
- Mechanical issues
- Ambulance arrives before the helicopter
- Changes in the condition causing the patient to be unstable for transport
- Loss of bed at receiving hospital

Recommendation: Current medical helicopter dispatch protocols should be reviewed due to the significant cancellation rate. The use of helicopters requires careful resource allocation. It is essential to balance the availability of air and ground ambulances to ensure optimal coverage and response capabilities.

Finding: SJCEMSA's Aircraft Utilization Policy #4448 has been revised to address concerns expressed during the stakeholder meetings and is out for public comment.

Recommendation: The helicopter dispatch protocols should be reviewed to reflect the best approach for patient care regardless of geography. That should be the driving factor if a patient can reach definitive care sooner.

12.Other Areas of Interest Warranting Discussion

Ambulance Patient Off-Load Time Delays

An effectively functioning EMS system and EDs are vital to all Californians. APOT delay is the time that transpires when transferring patient care from the ambulance crew to the ED staff. While not well studied, these delays negatively impact patient safety, patient and provider satisfaction, and ED throughput efficiency and effectiveness. When ambulance crews are delayed, it decreases their ability to return to the community and deliver lifesaving care.

Medical Helicopter Service, 2023			
Type	Requests	Transports	Cancellation
911	281	12	95.73%
IFT	503	356	29.22%

Source: EMS Agency

To assist hospitals in reducing the time it takes to accept a patient, the California Hospital Association (CHA) and EMSA jointly created the APOT Delay Collaborative to analyze and develop solutions to the problem of ambulance patient off-load delays. Recognizing the inherent complexities and the need to involve multiple stakeholders, CHA, regional hospital associations, and EMSA embarked on a multi-phased project to minimize delays, including developing a toolkit for hospitals to reduce APOT delays. The data analysis identified that the APOT delay issues within the County have increased over time.

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To gain a better understanding of this impact on the EMS system, HCS consultants visited the following EDs on different days of the week and times of the day:

St Joseph's Medical Center

Adventist Health - Lodi

- St. Joseph's Medical Center (STEMI Center)
- San Joaquin County General Hospital (Trauma Center)
- Dameron Adventist Hospital (STEMI Center)
- Adventist Health-Lodi
- Sutter Tracy Hospital
- Doctors Hospital, Manteca
- Kaiser Manteca

Finding: The chart indicates that most EDs cannot consistently off-load patients within the desired 20-minute goal. San Joaquin General and St. Joseph appear to be the most impacted, with Adventist Health-Lodi (AH-Lodi) experiencing similar challenges in the winter months.

APOT, 90th percentile
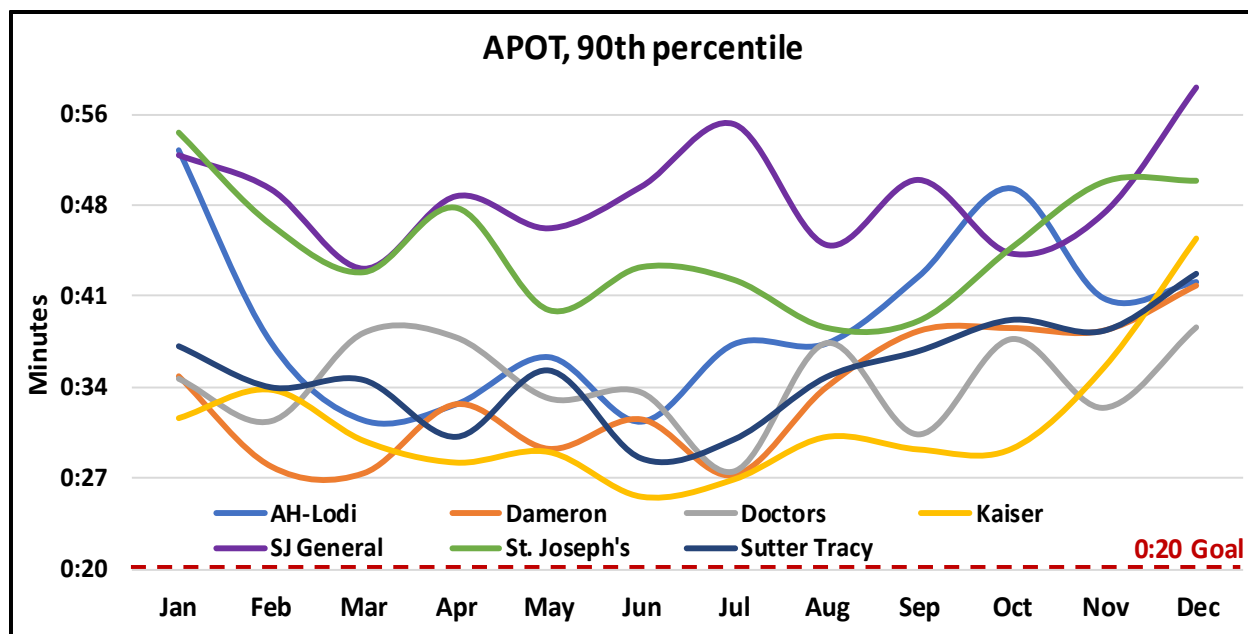
Ambulance Patient Off-load Times, 90th Percentile												
Hospital	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
AH-Lodi	0:53	0:38	0:31	0:33	0:36	0:31	0:37	0:38	0:43	0:50	0:41	0:42
Dameron	0:35	0:28	0:27	0:33	0:29	0:31	0:27	0:34	0:38	0:39	0:39	0:42
Doctors	0:35	0:31	0:38	0:38	0:33	0:34	0:27	0:38	0:30	0:38	0:32	0:39
Kaiser	0:32	0:34	0:30	0:28	0:29	0:25	0:27	0:30	0:29	0:29	0:36	0:46
SJ General	0:52	0:50	0:43	0:49	0:47	0:50	0:55	0:45	0:50	0:45	0:48	0:58
St. Joseph's	0:54	0:47	0:43	0:48	0:40	0:44	0:43	0:39	0:39	0:45	0:50	0:50
Sutter Tracy	0:37	0:34	0:35	0:30	0:35	0:28	0:30	0:35	0:37	0:39	0:39	0:43

Source: EMS Agency, 2023 data

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St. Joseph Finding: The medical center established an APOT Coordinator who gathers information from the ambulance crew and works with the ED charge nurse to find an appropriate bed within the ED. However, that does not constitute the transfer of care from the crew to ED staff, as they were held on the "wall" in 2023 from 39 to 54 minutes (90% of the time) before a bed became available based on County data (see chart below). Consultants on one of the site visits observed the hospital not accepting any more patients due to staffing issues and many patients waiting to be admitted, shifting patients to other hospitals facing similar APOT delays.

San Joaquin General Finding: The hospital APOT delays appear to be partially influenced by many prisoners and correctional officers arriving from the California Correctional Health Care Services (CCHCS) facility daily. Most CCHCS patients were observed to be either ambulatory or in wheelchairs, causing EMS crews to wait a considerable amount of time, in some cases up to three to four hours, before they could transfer care of their patients to hospital personnel.

Recommendation: All hospitals in the County should take full advantage of recommendations and strategies from the APOT toolkit published by CHA/EMSA. SJCEMSA should establish an APOT committee comprising representatives from all hospitals and transport agencies in the County.

Finding: HCS consultants observed at all hospitals a general lack of urgency by AMR ambulance crews to return to service once their patients had been transferred to the care of ED personnel. APOT delays have become such a foregone conclusion that AMR crews expect it and appear less motivated to become available, further affecting system response time compliance. The ImageTrend data available to SJCEMSA staff revealed that AMR crews take 44 minutes 90% of the time to return to service after patient care is transferred to ED staff. County staff indicated that the data may not be perfect, but a delay in returning to service could represent hundreds of unit hours deployed back into the system. When ambulance supervisors arrived to check on the crews' status, HCS consultants noticed the crews would go back into service immediately.

Recommendation: It is incumbent upon ambulance providers' leadership to monitor APOT times and take corrective action when crews have transferred their patients to ED staff but failed to advise the dispatch center that they are available for service. This will increase available ambulances, reduce response times, increase first responder satisfaction, and improve patient care. Automated systems that track the time the patient turnover occurred and either start a defined clock to be available or notify the supervisor when a threshold is exceeded should be explored.

Finding: In an attempt to alleviate the strain on the availability of ambulances for 911 responses, SJCEMSA adopted the Transfer of Care in ED Policy #4985 (see Attachment C), which allows ambulance crews to:

1) Take a patient to another hospital if "unnecessarily delayed" at the first hospital.
2) Place a patient in a bed, chair, or waiting area with no patient turnover and leave.

ED stakeholders expressed grave concerns with this policy as it causes disruption and can potentially place patients at risk should they leave without a proper assessment or be left at the facility without an adequate turnover of care. Most importantly, this policy appears to be in direct contrast to the federal Emergency Medical Treatment and Labor Act (EMTALA).[13]

Per this Act, the patient becomes the hospital's responsibility when the ambulance drives onto hospital property. The patient cannot leave without a proper medical screening exam. This would typically include checking vital signs and assessing the primary complaint. This is usually completed by an ED physician, physician's assistant, or nurse practitioner; however, the policies differ between hospitals. If the medical provider determines there is no emergency medical condition and documents that result, the patient can be transported to another hospital. It was unclear to the consulting team how extensive the practice of patients being transported to another hospital without a medical screening; interviews identified one instance where a patient left the initial receiving hospital before a medical provider assessment.

Recommendation: SJCEMSA should continue to consult with the County Counsel to analyze EMS Policy #4985 concerning EMTALA. Further evaluation is needed on the policy language allowing crews to leave a patient at the hospital whose care has not been formally transferred to ED staff. SJCEMSA should collaborate with the ED directors and hospital leadership to facilitate a better approach to the transfer of patient care.

Use of Non-911 ALS IFT and CCT Providers

Finding: The current contract with AMR requires that it provide ALS IFT and CCT services throughout Zones X-21 through X-26 and staff one CCT-RN unit 24 hours per day; AMR can utilize its 911 units to offer ALS IFT. This requirement does not apply to the two hospitals in Manteca, located in the MDA service zone, as they can utilize any IFT and CCT ambulance provider permitted within the County without restriction.

Recommendation: Allowing other non-911 EMS providers to manage non-emergency ALS and CCT services can have several positive effects. Hospitals benefit from additional options for ambulance transport. The 911 system benefits as 911 ambulances can be freed to focus on emergency calls and critical patient care. This allows 911 ambulance providers to allocate their limited resources more efficiently and prioritize emergencies requiring immediate medical intervention.

Non-911 providers often have more flexibility in terms of scheduling and availability. Depending on the hospital and patient's needs and preferences, they can accommodate non-emergency IFT requests at various times, including evenings and weekends. This flexibility can reduce waiting times for patients and healthcare facilities, ensuring timely transfers between facilities. IFT and CCT providers often work closely with healthcare facilities to coordinate and streamline the transfer process. This collaboration ensures smooth transitions and effective communications between the sending and receiving facilities. It can lead to better coordination

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[13] https://calhospital.org/wp-content/uploads/2019/11/emtala2018_epub_members.pdf

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of medical records, medications, and other vital information, enhancing patient safety and continuity of care.

Finding: There are ambulance providers currently permitted by SJCEMSA that state they are willing to consider providing ALS IFT and CCT services; they include:

- Active Transport Medical Services (BLS, CCT)
- Amwest Ambulance (ALS)
- Bay Medic Transportation (BLS, CCT)
- Citizens Medical Response (BLS)
- Protransport-1 (BLS, CCT)
- NorCal Ambulance (BLS, CCT)

Recommendation SJCEMSA should continue to explore expansion of the use of non-911 providers for ALS non-emergency IFT and CCT and should carefully evaluate and regulate to ensure patient safety, quality of care, and adherence to applicable regulations and standards. Close collaboration between EMS providers, healthcare facilities, and the EMS agency is crucial to maintaining a seamless and coordinated healthcare system.

Finding: In addition to the approved paramedic scope of practice, a CCT-P may perform advanced procedures and administer medications as part of the basic scope of practice for interfacility transports when a licensed and certified paramedic has completed a Critical Care Paramedic (CCP) Training Program as specified in Section 100155(b) of the California Code of Regulations, and completed competency testing, holds a current certification as a CCP from the International Bureau of Specialty Care (IBSC) and other requirements as determined by the medical director of the LEMSA.

Recommendation: The SJCEMSA should consider authorizing specialty-trained paramedics (i.e., CCT-P) to assist with transferring lower acuity patients, thereby removing some of the pressure for CCT-RN transports.

Public/Private ALS Field Provider Patient Care Coordination

Collaboration between fire departments and private ALS providers improves emergency coordination and communication. Both entities can align their practices and procedures through joint training, drills, and protocols, ensuring seamless integration during joint response efforts. This coordination helps streamline the response process, reduce delays, and enhance patient care.

Interactions between fire departments and private ALS providers bring complementary skills, resources, and expertise, resulting in a more robust and efficient emergency medical response system. Working together can provide higher patient care and ensure that EMS is delivered promptly and effectively.

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Finding: HCS consultants spent considerable time observing the interaction between the fire departments and the ambulance providers. While frustration was expressed about response times or the type of unit arriving in the AMR zones, first responders felt that there was a collaborative approach to the continuation of patient care on scene. The consultants' observations were consistent with the collaborative approach expressed by first responders.

The ALS fire department stakeholders expressed concerns and frustrations about SJCEMSA Policy #5001 for on-scene control for patient healthcare management. (see Attachment D).

Recommendation: SJCEMSA should review Policy #5001 with first responder stakeholders to clarify the difference between scene management and medical care management of patients. Updating this policy will set better expectations for field crews.

Finding: Currently, the fire departments use ESO for their ePCRs. It is incompatible with ImageTrend, which is used by all of the ambulance providers in the County.

Recommendation: Ideally, first responders and transport providers should utilize the same ePCR software. This allows for seamless sharing of information from first responders to transport crews, easier CQI, and a single record from dispatch to disposition. If this is not feasible, the two platforms should be linked to support inter-agency data sharing, EMS agency oversight, CQI reviews, KPI tracking, and other elements that support improved patient care.

Finding: ALS first responders were previously restocked for their disposable supplies used at the scene of an emergency by the respective ambulance transport provider per the requirements of their earlier provider agreements. This requirement was removed from AMR's current provider agreement, and the restocking of first responders, while not required, has been inconsistent depending on the AMR crew.

Recommendation: All transport providers should restock on a "one-for-one" basis, disposable medical supplies used by first responders, as the cost of these supplies should be considered part of the ALS ambulance providers' base rates. The restocking cannot include injectable medications due to Drug Enforcement Agency (DEA) requirements. Future contracts should incorporate restocking as a requirement.

EMS Agency Overview

SJCEMSA is responsible to "plan, implement, and evaluate" the EMS system under Division 2.5 of the California H&SC. The EMS Agency administers over 60 agreements, operating permits, and designations. A large part of fulfilling this role consists of collecting and evaluating data for system improvement.

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The County EMS system is coordinated and evaluated by the SJCEMSA. It comprises highly trained individuals working in different sectors from different organizations of prehospital healthcare and public health and safety. These organizations and personnel have a shared mission and a vital role in providing a collective continuum of care for people in need.

The continuum of care includes the first call to 911 and EMD-trained dispatchers who determine the type of emergency, the response of highly-qualified personnel following standardized prehospital medical treatment protocols approved by the SJCEMSA Medical Director and advised by mobile intensive care nurses (MICNs) and physician medical control at the base hospitals, potential transport to a designated receiving hospital ED or specialty care center; and followed by a CQI review of the entire process. SJCEMSA permits non-emergency ambulance services to transport patients to more appropriate acute or sub-acute settings, adding value to the EMS system.

Licensing and Certification Fees											
County	Monterey	Tulare	Solano	Santa Cruz	Kern	San Mateo	Stanislaus	Ventura	San Joaquin	Sonoma	San Francisco
Population	448,627	485,493	469,551	274,253	937,075	782,838	568,246	852,051	816,805	490,855	901,457
EMD cert				$75	$102				$70		
EMD recert				$75							
EMR							$34		$79		
EMT OOC				$200							
EMT initial			$50	$100	$102	$125	$131	$136	$149	$155	$183
EMT recert			$50		$102	$87	$93	$96	$54	$117	$135
EMT motor verif									$110		
AEMT							$159				
MICN initial			$75	$75	$102		$112		$242		
MICN reauth			$75		$102						
Medic accred			$75	$75	$102	$50	$112	$80	$650	$200	$40
Medic reaccred*			$75	$75				$0	$0	$0	
Medic Intern fee									$97		

Notes: * Fee in Ventura, San Joaquin, and Sonoma if accreditation expired

Source: Interviews with EMS Agencies

Finding: A review of the SJCEMSA's fee schedule identified that the rates are typically higher than those of other EMS agencies in California. The most notable difference is the rate for paramedic accreditation. Existing ambulance providers stated they create a barrier to entry for new paramedics, especially if they are looking for part-time work.

Recommendation: Considering the paramedic staffing shortages within the County and California, SJCEMSA should review its paramedic accreditation and re-accreditation fees to align them with surrounding counties, thereby relieving the financial burden for those who wish to come to work here.

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CONCLUSION

The San Joaquin County EMS System comprises highly trained individuals working in all aspects of EMS who have a shared mission and vital role of providing a collective continuum of care for people in need. SJCEMSA plays a critical role in coordinating the EMS system. The countywide use of EMD and MPDS provides excellent 911 caller support and resource management opportunities. Patient care standards are high and well documented through a standardized ePCR platform for ambulance providers.

The County EMS system faces challenges requiring initiative-taking measures and strategic planning. This report contains recommendations for the stakeholders to consider. They can mitigate the issues of limited resources, extended response times, APOT delays, and on-scene coordination challenges. Through innovative approaches and technological advancements, the EMS system can enhance its effectiveness, improve patient outcomes, and provide high-quality EMS to the County residents and visitors.

ATTACHMENTS

Attachment A: Deployment Plan Requirements

A. The ALS ambulance providers shall maintain system status management and deployment plans specific to meeting EMS performance requirements within San Joaquin County, continuously monitor the implementation of these plans, and secure necessary ambulance post locations at the Contractor's expense. The deployment plan shall:

1. Specify locations of ambulances and numbers of vehicles to be deployed during each hour of the day and day of the week based upon the number of vehicles available to respond to calls for various status levels.
2. Describe 24-hour system status management strategies.
3. Describe mechanisms to meet the demand for emergency ambulance response during peak periods or unexpected periods of unusually high call volume.
4. Provide maps that identify proposed ambulance stations or post locations within the response time compliance areas (subzones).
5. Specify the anticipated response limes to each response time compliance area at the 90th % fractile, including variations based upon System Status levels.
6. Describe the full-time and part-time work force necessary to fully staff ambulances identified in the deployment plans.
7. Describe any planned use of on-call crews.
8. Describe any mandatory overtime requirements.
9. Describe record keeping and statistical analyses to be used to identify and correct response time performance problems.
10. Describe any other strategies to enhance system performance and/or efficiency through improved deployment/redeployment practices.
    B. Contractor shall keep a current deployment plan, including maps, on file with the EMS Agency and have a plan to redeploy or add ambulance hours if response time performance standards are not met.
    C. A revised deployment plan shall be provided to the EMS Agency within 24 hours of implementation of any change made by the Contractor in ambulance stations or post locations.
    D. The EMS Agency shall be informed of meetings conducted by Providers staff to consider changes in the deployment plan and shall be permitted to send representatives to such meetings.
    E. Ambulance Providers shall agree to participate in a countywide integrated response plan approved by the County designed to ensure the response of the closest emergency ambulance regardless of provider or zone.

Attachment B: CARES Data

2022 CARES Data	San Joaquin County Survivability	California Survivability	National Survivability
Utstein	**40.6%**	28.6%	30.7%
Defined by CARES to include only patients that were witnessed by bystander and found in shockable rhythm.			
Utstein Bystander	**51.3%**	31.4%	34.3%
Defined by CARES to include only patients that were witnessed by bystander, found in shockable rhythm AND received some bystander intervention (CPR and/or AED).			
Bystander CPR rates	**43.3%**	41.0%	40.0%
Public AED use	**13.6%**	9.6%	11.3%
Overall Survival	7.1%	7.8%	9.3%
Inclusion criteria: All Out-of-hospital cardiac arrest patients where resuscitation is attempted by a 911 responder.			

2022 Total Percentages of Non-Traumatic Etiology Cases			
Initial Rhythm	San Joaquin County	California	National
Ventricular Fibrillation / Ventricular Tachycardia	12.5%	14.9%	17.0%
Percentage of VF/VT Patients Discharged alive	**35.5%**	25.3%	26.7%
Percentage of Discharged alive with CPC 1 or 2	84.2%	86.5%	88.1%
Asystole	**65.9%**	60.2%	52.6%
Percentage of Asystole Patients Discharged alive	1.4%	2.2%	2.3%
Percentage of Discharged alive with CPC 1 or 2	**75.0%**	60.8%	59.9%
Other "ECG" Rhythm	21.7%	25.0%	30.4%
Percentage of "Other" Patients Discharged alive	8.1%	11.1%	11.9%
Percentage of Discharged alive with CPC 1 or 2	**80.0%**	71.7%	77.9%

Attachment C: Transfer of Care in ED Policy #4985

PURPOSE:

The purpose of this policy is to establish a process for the transfer of patient care in the emergency department that provides patient safety while reducing ambulance patient off-load delays and the occurrence of ambulance clusters.

AUTHORITY:

Health and Safety Code, Division 2.5, Sections 1797.52, 1797.120, 1797.220, 1797.225, 1798, 1798.170.

BACKGROUND:

Receiving hospitals are obligated pursuant to the federal Emergency Medical Treatment and Active Labor Act (EMTALA) to promptly provide each patient arriving at the receiving hospital with an appropriate medical screening examination and necessary stabilizing treatment for emergency medical conditions and labor within the hospital's capability and capacity. The Centers for Medicare and Medicaid (CMMS) issued S&C- 06-21 stating that refusing EMS requests to transfer patient care may result in a violation of EMTALA and raises serious concerns for patient care and the provision of emergency services in a community.

DEFINITIONS:

A. "Ambulance Cluster" means five (5) or more ambulances simultaneously experiencing APOD at the same receiving hospital.
B. "Ambulance Patient Off-load Time (APOT)" means the time interval between the arrival of an ambulance patient at an emergency department and the time the patient is transferred to an emergency department gurney, bed, chair or other acceptable location and the emergency department assumes the responsibility for care of the patient.
C. "Ambulance Patient Off-load Time (APOT) Standard" means a twenty (20) minute time interval by which APOT shall be completed.
D. "Ambulance Patient Off-load Delay (APOD)" or "Non-Standard Patient Off-load Time" means the occurrence of an APOT that exceeds the APOT Standard of twenty (20) minutes.
E. "Emergency Department Medical Personnel" or "ED Medical Personnel" means a physician, mid-level practitioner, or registered nurse.
F. "EMS Personnel" means the paramedic, emergency medical technician, authorized registered nurse, or physician responsible for a patient's out of hospital patient care.

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G.   "Receiving Hospital" means a licensed acute care hospital with a comprehensive or basic emergency permit that is approved by the California Department of Public Health (CDPH) and authorized by the San Joaquin County EMS Agency (SJCEMSA) to participate in the EMS system.

H.   "Transfer of Patient Care" means the transition of patient care responsibility from EMS personnel to receiving hospital ED Medical Personnel and a verbal patient report if given.

POLICY:

It is the policy of SJCEMSA to require hospitals and prehospital personnel to transfer patient care promptly and effectively from prehospital personnel gurney to appropriate hospital personnel.

PROCEDURE:

I.   Receiving hospitals shall develop and implement policies and processes that facilitate the prompt and appropriate transfer of patient care from EMS personnel to ED medical personnel within the emergency department to minimize the occurrence of an APOD and ambulance clusters.

II.   Receiving hospitals shall at a minimum require ED medical personnel to:

A.   Provide EMS personnel with a safe area within the emergency department in direct sight of ED medical personnel where the EMS personnel may temporarily wait to transfer patient care.

B.   Promptly acknowledge the arrival of each patient arriving by ambulance.

C.   If transfer of care is not immediate, provide attending EMS personnel with an estimated time transfer of care will occur.

D.   Promptly but not later than 20 minutes of arrival accept the transfer of patient care from EMS personnel including the movement of the patient from the ambulance gurney to an emergency department bed, Emergency Department (ED) chair, or ED waiting room.

E.   Promptly accept a verbal patient report from attending EMS personnel.

F.   Not delay the transfer of care and the movement of patients off of ambulance gurneys.

III.   Receiving hospital shall during any occurrence of APOD:

A.   Provide attending EMS personnel with an estimated time ED medical personnel will accept the transfer of patient care.

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B. Inform EMS personnel, including supervisors, of the actions the receiving hospital is taking to resolve APOD.

C. Actively engage in APOD mitigation.

D. Activate the receiving hospital's surge plan anytime an ambulance cluster occurs. The surge plan shall remain activated until all APODs are resolved.

IV. EMS personnel responsibilities for transfer of patient care:

A. Work cooperatively with the ED medical personnel to promptly transfer patient care.

B. When appropriate for the patient's condition, walk-in ambulatory patients or use an emergency department wheelchair rather than the ambulance gurney. If ED medical personnel are not immediately available to accept the transfer of patient care of an ambulatory or wheelchair patient, then EMS personnel provide a verbal patient report to the ED triage nurse and place the patient in the ED waiting area. If ED medical personnel are unavailable to receive or refuse to accept the verbal patient report, then submit a copy of the electronic patient care record or submit a written interim patient care report to the ED unit clerk and return to service.

C. Provide a verbal patient report to ED medical personnel at time of transfer of care.

D. Accurately record the transfer of patient care time in the ambulance service provider's electronic patient care record.

E. If receiving hospital personnel deny or unnecessarily delay and emergency patient's entry into the emergency department then EMS personnel are directed to:

1. Transport the patient to the next closest receiving hospital or specialty care center (e.g. STEMI, stroke, trauma); and

2. Report the occurrence pursuant to SJCEMSA Policy No. 6101, Sentinel Event Reporting Requirements.

V. If APOD occurs EMS personnel may move their patient from the ambulance gurney to any available ED bed, ED hallway chair, or ED waiting area as appropriate for the patient's condition and current medical needs without waiting to obtain ED medical personnel direction.

VI. Responsibility for Patient Care:

A. Prior to the transfer of patient care EMS personnel have a duty to continue monitoring the patient and to provide medical treatment including advanced life support until responsibility is assumed by ED medical personnel or other medical staff of the receiving hospital.

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B.   While waiting to transfer patient care EMS personnel shall continue to actively assess the patient and document vital signs and treatment in the electronic patient care record.

Patient treatment on EMS gurney by ED medical personnel staff is prohibited with the exception of life saving procedures.

VII.   Emergency ambulance service providers may develop processes to expedite the return to service of ambulances that are experiencing APOD. These processes may include an employee of the emergency ambulance service provider assuming responsibility for patient care from EMS personnel experiencing APOD as follows:

A.   The ratio of care shall not exceed:

    1.   One paramedic to monitor and provide patient care to a maximum of five patients requiring advanced or basic life support.

    2.   One emergency medical technician (EMT) to monitor and provide patient care to a maximum of five patients requiring basic life support.

B.   The transporting EMS personnel shall document the assumption of patient care by the hallway paramedic or EMT in the electronic patient care record.

C.   The hallway paramedic or EMT shall while waiting to transfer patient care continue to actively assess the patients under their care and document vital signs and treatment in the electronic patient care record.

Attachment D: Authority for Medical Emergency Management Policy #5001

SAN JOAQUIN COUNTY
EMERGENCY MEDICAL SERVICES AGENCY

TITLE: **AUTHORITY FOR MEDICAL EMERGENCY MANAGEMENT**   EMS Policy No. **5001**

PURPOSE: The purpose of this policy is to define the authority for patient health care management in the San Joaquin County EMS system.

AUTHORITY: Division 2.5, California Health and Safety Code, Section 1797.220

POLICY:

I.   In order to ensure accountability and medical control for patient care management throughout the pre-hospital process the following shall apply:

A.   In the event that both transport and non-transport emergency medical services personnel are on the scene with the same qualifications, patient health care management will rest with the San Joaquin County emergency ambulance service transport provider. The first arriving paramedic shall initiate care and shall transfer care to the transport provider as soon as the "task at hand" is completed (i.e., starting IV, etc.). All pre-hospital personnel shall cooperate with one another to ensure rapid and efficient care and transport of all patients.

B.   During multi-casualty incidents (MCIs) the senior most qualified representative from the exclusive emergency ambulance service provider, which may include field supervisors or management personnel, shall determine who shall serve as the "Medical Group Supervisor" or if established the "Medical Branch Director."

C.   The list below defines the assignment of responsibility for patient care management in the San Joaquin EMS system based on resources available on scene from the lowest level to highest level with the emergency ambulance service transport provider paramedic having the highest level of responsibility for patient care management:

1.   Public Safety First Aid;
2.   First responder;
3.   Non-transport EMT-I;
4.   Transport EMT-I;
5.   Non-transport Paramedic;
6.   Transport Paramedic.

D.   Notwithstanding paragraphs A, B, and C above, the authority of the San Joaquin County Health Officer and Medical Health Operational Area Coordinator shall not be infringed.

Effective:	November 14, 2006	Page 1 of 1
Revised:		
Supersedes:	EMS Policy 530.03	

Approved: Signature on File _____   Signature on File _____
             Medical Director   EMS Administrator

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Attachment E: Acronyms

AB	Assembly Bill
ACE	Accredited Center of Excellence
AEMT	Advanced-EMT
AH	Adventist Health
ALS	Advanced Life Support
AMR	American Medical Response
APOT	Ambulance Patient Off-load Time
BLS	Basic Life Support
CAD	Computer-Aided Dispatch
CARES	Cardiac Arrest Registry to Enhance Survival
CBA	Collective Bargaining Agreement
CCHCS	California Correctional Health Care Services
CCP	Critical Care Paramedic
CCT	Critical Care Transports
CCT-P	Critical Care Transport-Paramedic
CHA	California Hospital Association
CPR	Cardiopulmonary Resuscitation
CQI	Continuous Quality Improvement
DEA	Drug Enforcement Agency
ECA	Escalon Community Ambulance
ED	Emergency Department
EMD	Emergency Medical Dispatch
EMS	Emergency Medical Services
EMSA	[California] EMS Authority
EMT	Emergency Medical Technician
EMTALA	Emergency Medical Treatment and Labor Act
EOA	Exclusive Operating Area
ePCR	Electronic Patient Care Report
FRALS	First Response ALS
HCS	Healthcare Strategists

HIE	Health Information Exchange
H&SC	Health and Safety Code
HWPP	Health Workforce Pilot Project
IAED	International Academy of Emergency Dispatch
IBSC	International Bureau of Specialty Care
IFT	Inter-Facility Transports
KPI	Key Performance Indicator
LEMSA	Local EMS Agency
MCI	Multi-Casualty Incident
MDA	Manteca District Ambulance
MICN	Mobile Intensive Care Nurse
MPDS	Medical Priority Dispatch System®
NAEMSP	National Association of EMS Physicians
NIMS	National Incident Command System
OCU	Online Compliance Utility
OSHPD	Office of Statewide Health Planning and Development
PCR	Patient Care Report
PSAP	Public Safety Answering Point
QI	Quality Improvement
RFP	Request for Proposal
RFPD	Ripon Consolidated Fire District
RLS	Red Lights and Siren
SFD EDC	Stockton Fire Department Emergency Dispatch Center
SJCEMSA	San Joaquin County EMS Agency
SSM	System Status Management
STEMI	ST-Elevated Myocardial Infarction
VRECC	Valley Regional Emergency Communications Center

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