



Yolo County Emergency Medical Services Quality Improvement Plan

Contents

- Introduction 3
- Mission Statement 4
- Structure and Organizational Description 5
 - Yolo County Emergency Medical Services 5
 - Objectives 6
 - EMS QI Members 7
- EMS Organization Chart 8
 - Authority 9
 - Annual Update 9
- Interagency QI Responsibilities 10
 - EMS Agency Responsibilities 10
 - Base Hospital Responsibilities 10
 - Emergency Medical Dispatch (EMD) Responsibilities 11
 - Prehospital ALS Transporting and Non-Transporting Provider Agencies 11
 - BLS Transporting and Non-Transporting Provider Agencies 12
 - EMS Aircraft Provider Agencies 12
 - Paramedic Receiving and Designated Specialty Facilities 12
- Committees 13
 - CQI Committee 13
 - Physicians Advisory Committee (PAC) 14
 - Emergency Medical Care Committee (EMCC) 14
- CQI Process, Data Collection, and Reporting 16
 - CQI Process and Action to Improve 16
 - Data Collection 17
- Evaluation of System Indicators 18
 - Personnel 18
 - Equipment and Supplies 18
 - Documentation 19
 - Clinical Care and Patient Outcome 19
- Training and Education 21
 - Exercises and Drills 21
 - Trial Studies 21

Skills Maintenance and Competency	22
Public Education and Prevention	22
Risk Mitigation	23
Systems of Care	24
Trauma.....	24
Stroke.....	25
STEMI	25
Cardiac Arrest	26
Work in Progress-Goals	27
Appendix A	28
State Core Measures Reporting	28
Appendix B	30
Yolo County Local Indicators	30
Appendix C	31
Chart Samples from QI Reports.....	31

Introduction

The Emergency Medical Services (EMS) System relies on many different components of healthcare to coordinate and continuously work together to provide the highest quality of prehospital medical care to the community. The Yolo County EMS Agency (YEMSA) vision is to create a collaborative approach among all partners and the community to enhance the EMS delivery model to improve patient outcomes. Improving outcomes and affecting the quality of care for the community depends on a comprehensive and structured approach to seeking and recognizing those opportunities to enhance the system.

The purpose of the Yolo County EMS Quality Improvement Plan (EQIP) is to improve the quality and effectiveness of EMS through standardization, coordination and the evaluation of patient care and system design strategies. This is an inclusive multidisciplinary process intended to identify system wide opportunities for improvement. The focus is to create a consistent and collaborative approach toward improving patient care through continuous measurements of key performance indicators and the evaluation of whole system measures*. The continuous evaluation of defined measurements leads to the opportunity to strengthen or correct processes, provide needed training and education, monitor system design strategies, and recognize excellence and performance improvements.

*Martin LA, Nelson EC, Lloyd RC, Nolan TW. *Whole System Measures*. IHI Innovation Series white paper. Cambridge, Massachusetts: Institute for Healthcare Improvement; 2007. (Available on www.IHI.org)

Mission Statement

The Mission of Yolo County EMS is to evolve a cost effective, collaborative, and outcome-based EMS Delivery System that produces clinically superior and culturally competent care. We strive to work effectively with our Public Safety and Public Health partners to solve problems, make decisions, and achieve common goals.

Structure and Organizational Description

Yolo County Emergency Medical Services

YEMSA provides an EMS delivery system for a county of 1,024 square miles serving a population of approximately 219,116 residents; 87% of the population live in Davis, Woodland, West Sacramento, and Winters, and the remaining 13% live in unincorporated areas of the county. The delivery system consists of Advanced Life Support (ALS) and Basic Life Support (BLS) First Responders; ALS, BLS, and Critical Care Transport (CCT) ambulances; Air Ambulance aircraft; and dispatch agencies with trained dispatchers. Yolo County partners with prehospital receiving centers and designated specialty centers (STEMI, Stroke, and Trauma) in Yolo, Sacramento and Solano Counties. Online medical direction is provided by the Yolo County Base Hospital or the appropriate receiving specialty center.

Yolo County is serviced by two (2) Public Safety Answering Points (PSAPs): Yolo Emergency Communications Agency (YECA) and the City of Davis Police Department. These communication centers are responsible for answering 911 calls. YECA uses a priority dispatching system and provides arrival instructions according to Emergency Medical Dispatch (EMD) protocols.

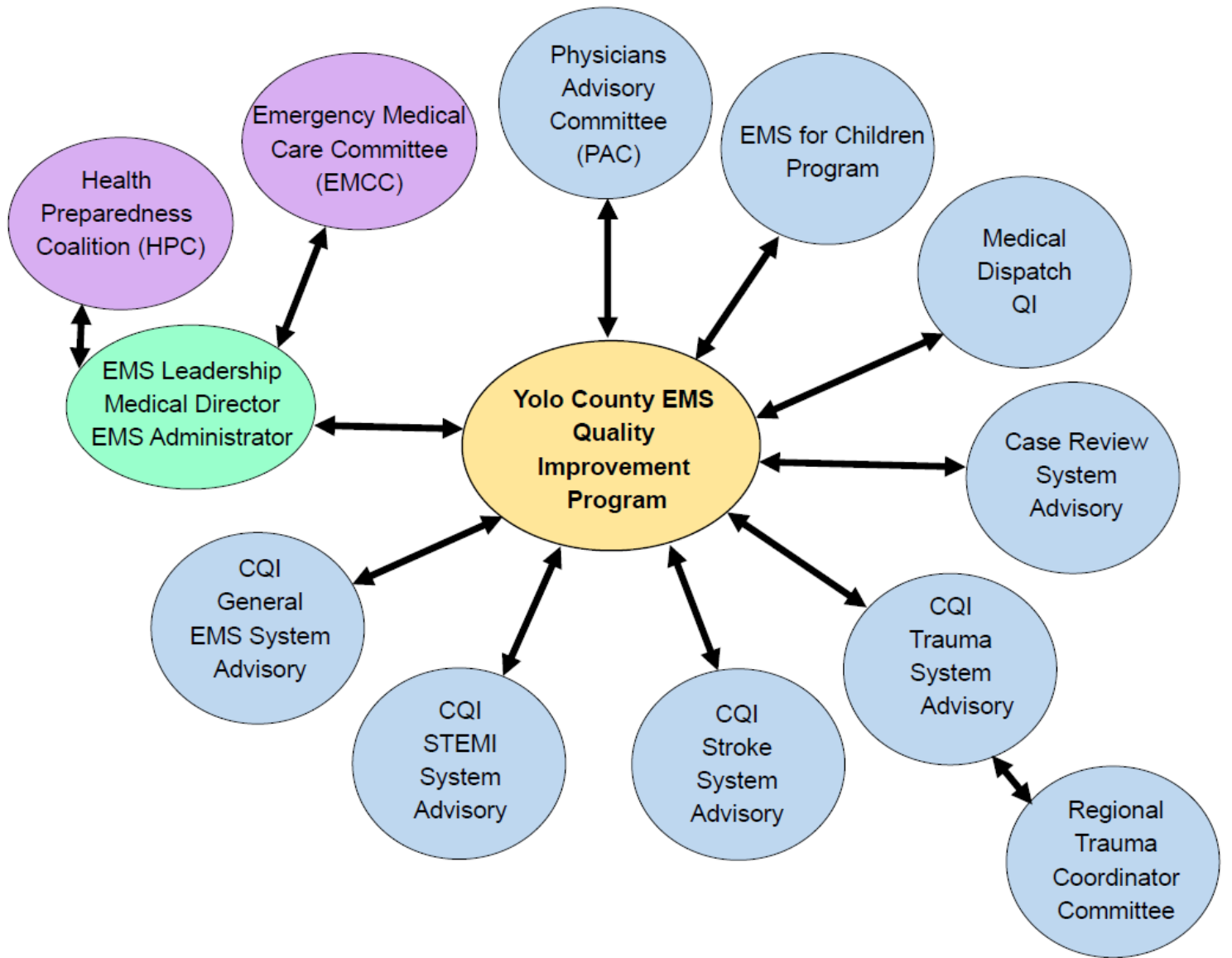
The county has one (1) exclusive operational area (EOA) for Emergency Ambulance Services and Advanced Life Support and Critical Care interfacility transport. The EOA was awarded to American Medical Response (AMR) in 2014 for a five (5) year contract with an additional five (5) year extension. Yolo County has one (1) non-transporting ALS Agency, Yocha DeHe Fire Department. All other First Responders are non-transporting BLS providers.

Objectives

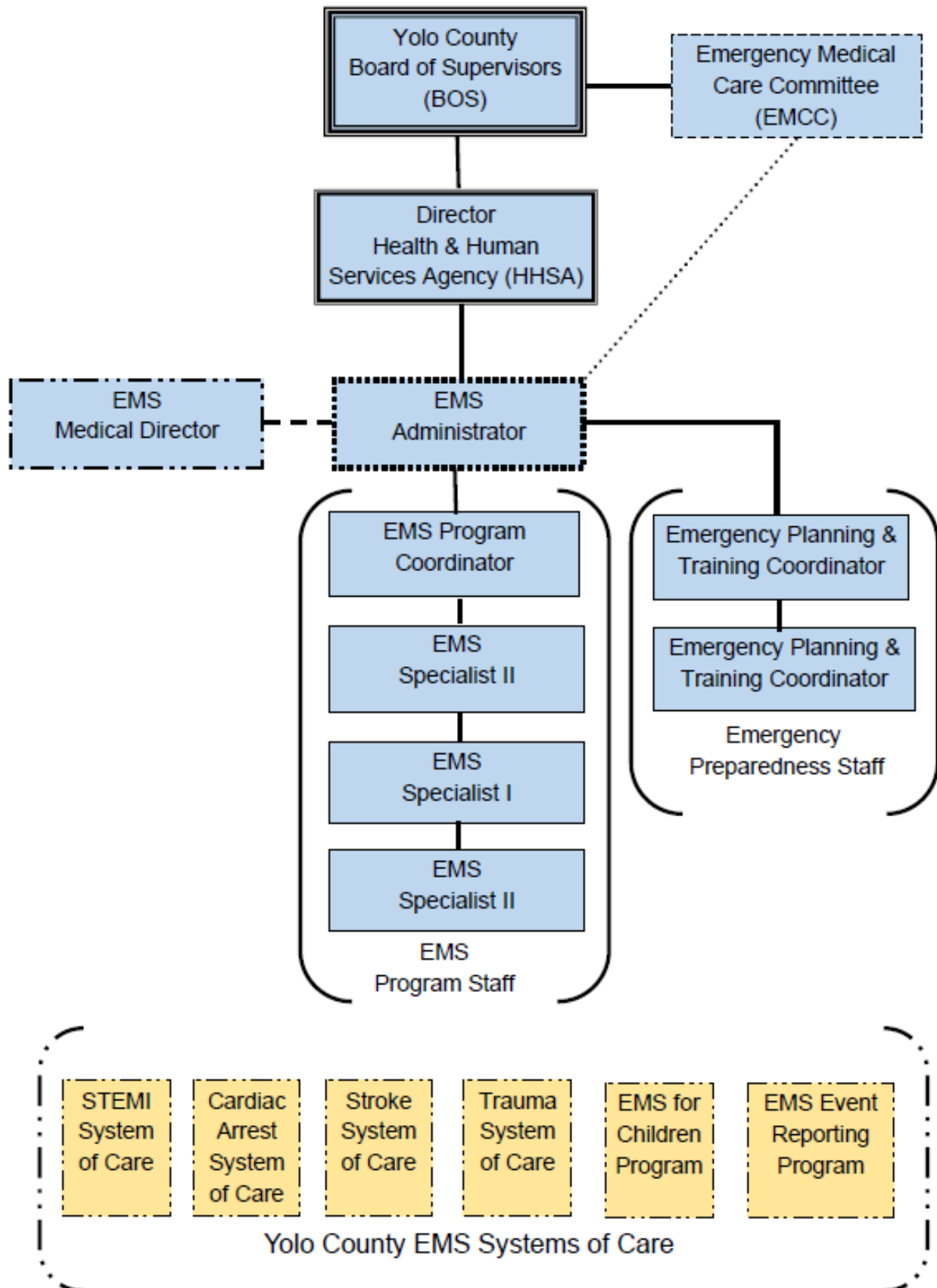
The Yolo County EQIP is designed to create a consistent approach to EMS quality objectives based on input from the providers and the customers of those services. These objectives include:

- Ensure the level of patient care is consistent with protocols and EMS policies;
- Evaluate and seek continual improvements in system-wide performance;
- Identify relevant and best practice components of prehospital care;
- Collect, analyze, and share data from dispatch to discharge;
- Communicate and support quality improvement information;
- Promote the appropriate utilization of EMS resources and services; and
- Foster multilevel provider involvement in identifying and developing system improvements.

EMS QI Members



EMS Organization Chart



Authority

On January 1, 2006, the California Emergency Medical Services Authority (EMSA) implemented regulations related to quality improvement for EMS throughout the state. Yolo County EQIP meets the requirement of [Title 22, Chapter 12, Section \(§\) 4 of the California Code of Regulations](#).

In addition, EMSA document #164 Emergency Medical Services System Quality Improvement Program Model Guidelines provided additional information on the expectations for development and implementation of a Quality Improvement Program for the delivery of EMS for local EMS Agencies (LEMSAs) and EMS Service Providers. Fundamental to this process is the understanding that the program will develop over time and allows for individual variances based on available resources.

This document defines eight (8) areas of focus for QI activities as it relates to the entirety of the EMS system and not just in the areas of patient care and training. These are:

- Personnel
- Equipment and Supplies
- Documentation
- Critical Care and Patient Outcome
- Skills Maintenance/Competency
- Transportation/Facilities
- Public Education and Prevention
- Risk Management

Annual Update

The YEMSA Medical Director works in collaboration with the Physician Advisory Committee (PAC) and Emergency Medical Care Committee (EMCC) members to evaluate and address any system-wide clinical issues and the initiatives to correct them. YEMSA will ensure that the CQI Plan is aligned with current strategic goals set forth by all stakeholders.

EMS partners shall conduct an annual review of their provider CQI Plan and submit the plan to YEMSA. YEMSA will provide the California Emergency Medical Services Authority (EMSA) with an annual update for approval.

Interagency QI Responsibilities

EMS Agency Responsibilities

- Provide prospective system-wide direction through established county policies and protocols
- Establish a procedure and timelines for periodic review of policies and protocols
- Establish procedures to inform all EMS personnel and hospitals of EMS system changes and updates
- Coordinate and provide a retrospective review of the EMS system performance through the collection of clinical and operational data from system participants
- Approve and review training programs for Emergency Medical Technicians (EMTs) and continuing education (CE) programs for all levels of EMS personnel
- Provide certification for EMTs in the Yolo County EMS system
- Accredite Paramedics in the Yolo County EMS system
- Review, investigate and take appropriate action for submitted EMS notification forms (Occurrence/Incident Reporting Form, and Unusual Occurrence Report Form)
- Approve clinical performance improvement plans for identified deficiencies in prehospital personnel

Base Hospital Responsibilities

- Develop and implement a Base Hospital QI Plan consistent with guidelines outlined in the Yolo County EQIP
- Provide an annual update of the QI plan from the date of approval and annually thereafter. Include in the update a summary of how the Base Hospital QI Plan addressed the program indicators
- Provide YEMSA with statistics and information as needed for monitoring and evaluating the EMS system
- Base Hospital physicians (MDs) provide on-line medical control for EMS personnel in concurrence with protocols established by YEMSA for prehospital care

- Participate on YEMSA committees, including but not limited to:
 - Continuous Quality Improvement (CQI) Committee
 - PAC

Emergency Medical Dispatch (EMD) Responsibilities

- Provide dispatchers trained and certified in EMD
- Establish criteria for evaluating EMD dispatchers in order to provide feedback and education for improvement
- Develop processes for improvement identified by YEMSA through the QI of EMD calls
- Collaborate with YEMSA in evaluating and improving EMS services; assistance may include identifying and providing feedback on trends, areas of improvement, or specific cases with educational value

Prehospital ALS Transporting and Non-Transporting Provider Agencies

- Participate in accreditation, (Paramedics) orientation, and training requirements for all prehospital care providers. Design and participate in educational programs based on improvement initiatives
- Establish a procedure for informing field personnel of system changes or updates
- Develop and implement a QI Plan consistent with guidelines outlined in the Yolo County EQIP
- Participate in appropriate EMS committees. This would include but is not limited to:
 - EMCC
 - CQI Committee
- Establish a system to maintain current records for all prehospital care providers. These should include:
 - Paramedic licensure and accreditation;
 - ALS, Pediatric Advanced Life Support (PALS), International Trauma Life Support/Prehospital Trauma Life Support (ITLS/PHTLS) (Paramedic) and Cardiopulmonary Resuscitation (CPR) (Paramedic/EMT)
 - Skills competency verification

- Share the results of internal CQI activities with YEMSA and assist in identifying needed clinical indicators
- Review internal CQI efforts regularly for effectiveness in identifying and resolving provider related clinical or relevant operational issues
- Provide, in conjunction with YEMSA, on-going or specifically identified training, reports of clinical indicators, and individual performance improvement plans

BLS Transporting and Non-Transporting Provider Agencies

- Establish a system to maintain current records for all prehospital care providers
- Establish a procedure for informing field personnel of system changes or updates
- Review internal CQI efforts regularly for effectiveness in identifying and resolving provider related clinical or relevant operational issues
- Share the results of internal CQI activities with YEMSA and assist in identifying needed clinical indicators
- Provide, in conjunction with YEMSA, on-going or specifically identified training, reports of clinical indicators, and individual performance improvement plans

EMS Aircraft Provider Agencies

- Ensure EMS personnel are appropriately credentialed at all times
- Ensure personnel are oriented to Yolo County hospital locations, documentation requirements, policies and protocols
- Provide YEMSA with clinical data necessary for monitoring and evaluating the EMS system

Paramedic Receiving and Designated Specialty Facilities

- Upon request, provide admission, diagnosis, treatment and discharge information of patients transported to the facility by ambulance

- Assign a nurse liaison to interact with provider agencies, YEMSA, the Base Hospital, and the CQI committee
- Participate in relevant educational or training opportunities

Committees

CQI Committee

The purpose of the committee is to identify and monitor trends, review clinical indicators, and in conjunction with YEMSA and the Medical Director, develop a system wide approach to quality improvement.

The information discussed within the CQI Committee is considered confidential. Everyone in attendance signs an agreement that no specific case or identifying information regarding patient care will be disclosed or discussed outside of committee meetings, except to follow up with necessary information or as a resolution for system design change.

The CQI Committee is open to the public and convenes quarterly with a focus for each meeting on a different area of care; specifically, **STEMI, Stroke, Trauma and General CQI**. The Yolo County EMS system has an emergency response volume averaging 18,500 calls each year, so based on the need to collect enough data for statistical significance, each specialty (STEMI, Stroke and Trauma) is reviewed yearly with one (1) quarter dedicated to other QI collected data. The committee consistently includes:

- YEMSA: Medical Director, Administrator, Program Coordinator, and staff
- Base Hospital representative(s)
- Receiving Hospital and Specialty Hospital representative(s)
- Ambulance and First Responder representative(s)
- Field personnel from Ambulance Providers and First Responders

More specific membership for these committees is addressed in **Systems of Care**.

Physicians Advisory Committee (PAC)

This committee is not open to the public. It is comprised of the YEMSA Medical Director, Emergency Department (ED) physicians (MDs), and any Provider Agency Medical Directors. PAC provides support through discussion and recommendations to YEMSA on clinical issues relating to prehospital care and protocols prior to any new implementations or changes.

Emergency Medical Care Committee (EMCC)

The EMCC acts as an advisory body to the Yolo County Board of Supervisors (BOS), YEMSA, and the Yolo County Health and Human Services Director on all matters relating to Emergency Medical Services.

The EMCC shall have the following duties and responsibilities as specified in the California Health and Safety Code, Division 2.5, Chapter 4, §§ 1797.274 and 1797.276:

At least annually, review the operations of the following:

1. Ambulance services operating within the county
2. Emergency medical care offered within the county, including programs for training large numbers of people in CPR and lifesaving first aid techniques
3. First aid practices within the county

Report, at least annually, to the EMSA, the Yolo County Health Officer, and YEMSA, its observations and recommendations relative to its review of the ambulance services, emergency medical care, first aid practices, and programs for training people in CPR and lifesaving techniques, and public participation in such programs in Yolo County. The EMCC shall submit its observations and recommendations to the BOS and shall act in an advisory capacity to the BOS, to the Yolo County Health Officer, and to YEMSA, on all matters relating to emergency medical services as directed by the BOS.

The EMCC is made up of twelve (12) regular voting members appointed by the BOS. The BOS may appoint alternate members for each regular member, who may serve in the absence of the regular member for whom (s)he was appointed. No person may represent more than one (1) entity or interest. The Committee consists of the following members appointed by the Yolo County BOS:

Category A: one (1) from each hospital serving as a "Base Hospital" for Advanced Life Support (ALS) ambulances in or for Yolo County

Category B: one (1) representative from each incorporated city and one (1) representative of the unincorporated area

Category C: one (1) physician (MD) representative who is involved with emergency medical services in Yolo County

Category D: one (1) representative nominated by police agencies

Category E: one (1) representative of rural fire departments/districts nominated by the Yolo County Fire Chiefs' Association

Category F: one (1) representative nominated by the University of California at Davis campus

Category G: one (1) representative nominated by the Yocha Dehe Wintun Nation

The EMCC may establish ad-hoc groups to advise YEMSA and EMS stakeholders on matters of interest. Membership on these focus groups may be open to members of the community who have an interest or special knowledge and will have full voting privileges on the focus group on which they serve. A member of the EMCC shall be a liaison to the focus group. Focus groups will be terminated upon completion of their goals.

CQI Process, Data Collection, and Reporting

CQI Process and Action to Improve

Quality Improvement begins with an awareness of what is actually occurring in the prehospital setting. This can come in the form of a single event that brings to light an opportunity for analysis of a wider problem and through methodical statistical measurements and process analysis of defined indicators. YEMSA utilizes multiple ways to collect and review relevant data, and based on identified aims, institutes the Plan-Do-Study-Act (PDSA) cycle model to test the change and determine if the change is an improvement. By collecting and monitoring defined indicators that reflect state and national standards in EMS, and within our own county, we can measure our performance, identify areas for improvement, and create an action plan to implement, monitor and study the effects of the changes.

Plan

Identify the objective

Ask questions and make predictions

Address how the objective will be met

Establish how data will be collected

Do

Carry out and test the change

Collect the data

Study

Evaluate the data

Compare the data to the predictions

Summarize what was learned

Act

Make any needed changes to the process, the tools, or the environment

Plan the next cycle or fully implement

Data Collection

In addition to participating in Emergency Medical Services Authority Core Measures Project, [\(Appendix A\)](#) YEMSA has developed local indicators [\(Appendix B\)](#) to measure and monitor goals and evaluate current systems. Local indicators, along with relevant State Core Measures, are reviewed quarterly at each CQI meeting. Core measures are submitted to the EMSA each year. The California State EMS data set (CEMSIS) and the National EMS Information System (NEMSIS) are incorporated into the data collection for Yolo County. Samples of charts and graphs used for reporting are provided in [Appendix C](#).

Evaluation of System Indicators

Personnel

YEMSA has established policies for Emergency Medical Responder (EMR) and EMT certifications, and Paramedic licensure and accreditations. EMRs are required to meet training, skills competency, and certification requirements every two (2) years. EMT processes and standards for certification, recertification and investigations align with state requirements. In order to obtain accreditation in Yolo County, Paramedics must meet standards outlined in policy, including attending a YEMSA orientation and the completion of a Five (5) Call Evaluation. Five (5) patient care reports are submitted for review and approval by YEMSA.

In collaboration with our transporting ALS provider, standards and requirements have been developed for Field Training Officers (FTOs)/Paramedic Evaluators. The requirements for the position include a knowledge assessment test, training, and outlined responsibilities to maintain FTO/Paramedic Evaluator status.

Provider Agencies communicate with YEMSA regarding licensure or certification expiration dates, personnel contact information, license status, and employment status as needed, or no later than annually for all licensed or certified personnel.

Prehospital performance issues are primarily handled at the employer level; however, if an incident involves a potential risk to public health, could be identified as a safety risk, or if the incident involves the potential harm to a patient, it must be reported to YEMSA immediately, but no later than twenty-four (24) hours.

Equipment and Supplies

YEMSA has developed minimum inventory and supply requirements which are identified in policy for:

- CCT/ALS/BLS Ambulance
- ALS/BLS Non-transport
- ALS /BLS Standby
- ALS/BLS Fireline
- ALS/BLS Rescue Task Force

All BLS Ambulance Providers are required to submit an Ambulance Permit Application and sign a yearly contract to provide BLS interfacility transport services in Yolo County. Ambulances are required to meet YEMSA inspection requirements for minimum equipment and supplies for a BLS ambulance, and each ambulance is permitted for the length of the service contract. Random inspections are performed to ensure compliance.

AMR, as the contracted EOA provider for Emergency Response and all ALS and CCT interfacility transports, must complete ambulance inspections and receive a yearly permit for each transporting unit by meeting the minimum equipment and supply requirements outlined for ALS and CCT transport services. Random inspections are performed to ensure compliance

When medication shortages arise, YEMSA has established a policy to provide immediate administrative orders or direction to mitigate acute supply shortages.

Documentation

YEMSA currently has two (2) electronic Patient Care Reporting (ePCR) software vendors that are being used by ALS EMS providers. Our goal is to have consistency and relevancy in how data is captured. This is an evolving process with recognizable challenges; by standardizing data collection methods and recognizing opportunities to educate personnel on ways to document accurately, we can better understand of the EMS system and identify areas of for improvement.

It is a requirement that all ALS and BLS providers be on a NEMSIS compliant system to facilitate consistency and accuracy of our data. We continue to support our providers to accomplish this requirement.

Clinical Care and Patient Outcome

Yolo County EMS treatment protocols are used for off-line medical direction by our prehospital providers. YEMSA has a policy that establishes guidelines and practices for protocol review. Protocols are evaluated on a continual basis and YEMSA receives feedback from all stakeholders within the system. Suggestions and/or draft protocols are accepted from YEMSA Committees, system participants, or interested parties.

YEMSA distributes draft protocols for public comments for a thirty (30) day period. After thirty (30) days, suggestions for corrections or changes are made and presented at PAC for final review and approval.

Protocols are updated bi-annually with adequate time allowed for training and distribution. Updates to existing or new protocols are implemented on January 1st and/or July 1st of each year.

Training and Education

YEMSA has a layered education and training system for all personnel. Personnel who are new into Yolo County for certification or accreditation receive the following:

- EMS Orientation
- Introduction to Policies and Protocols
- Optional & Local Scope Training

To maintain certification and accreditation in Yolo County, the following certifications are required based on service level:

- Basic Cardiac Life Support (CPR)
- Advanced Cardiac Life Support (ACLS)
- International Trauma Life Support/Prehospital Life Support (ITLS/PHTLS)

All EMS personnel have the opportunity to attend quarterly CQI meetings and bi-monthly case reviews offered in person and online. Other relevant trainings are offered online as needed. Paramedics are required to attend two (2) Yolo County CQI meetings or case reviews within the twenty-four (24) months prior to reaccreditation.

Exercises and Drills

YEMSA works in collaboration with the fire, law, dispatch, ambulance, and hospital providers to provide functional exercises that test our response and recovery plans. One of our top priorities is to sustain yearly function exercises that incorporate all providers. These exercises are used to analyze our system and to identify gaps. Future exercise objectives are based on the After Action Review (AAR) gaps discovered from the previous exercise. The Plan-Do-Study-Act cycle model is incorporated to continuously review and update plans when needed to meet the system needs.

Trial Studies

YEMSA analyzes system performance data and outcome data on an on-going basis. Based on the analysis, system needs may be identified to improve system performance

or patient outcome. The scope of the system need will direct YEMSA on the next steps; steps could include either a draft proposal to the PAC or the creation of an advisory committee to look at what options would address the system need. Stakeholders at PAC or the ad-hoc committee may conclude the best option to address the system need is to consider a trial project or a local optional scope proposal.

YEMSA values the coordination, communication, and the fostering of relationships with other counties to provide the services needed for optimal outcomes. Through our important relationships with bordering EMS Agencies and out-of-county hospitals, YEMSA has the support in place to complete the successful implementation of trial studies within our system.

Skills Maintenance and Competency

All personnel are required to maintain skills competency and verification which is conducted by the provider on a yearly basis. Additional skill maintenance and competency is required for infrequent skills, optional scope, local scope, and any trail studies as outlined in the YEMSA policies.

Public Education and Prevention

Public education and outreach is an important component in Yolo County. One of the largest outreach programs that has continued is the Hands Only CPR Outreach. All prehospital provider agencies are actively involved in providing Hands Only CPR education, utilizing a standardized approach at events throughout the county.

YEMSA worked in partnership with all local fire agencies and PSAPs to deliver the PulsePoint application to all of Yolo County to assist in public awareness of Cardiac Arrest events and bystander Hands Only CPR. Our goal is to meet or exceed ten percent (10%) of the entire county population being Hands Only CPR trained.

Injury Prevention is another major area of public education pursued in Yolo County. We work with agencies throughout Yolo County, which include child passenger safety; elderly fall prevention; mental health; and drug and alcohol prevention and intervention outreach. Local fire departments, law enforcement agencies, and EMS also coordinate the “Every 15 Minutes” program each year near high school graduation time to spread education about drunk driving for our local teens during this high-risk time of year.

In addition, YEMSA collaborates with public health, hospitals, emergency preparedness, first responders, and other health care systems within our county to identify health equity issues, emergent illness/injury, at-risk populations, and system impacts. It is important that YEMSA continues to explore opportunities to partner with other county agencies, and to stay involved in directly meeting preventive health, primary care, and other needs in the community in order to strengthen the clinical base and health system.

Risk Mitigation

An important component to ensuring a safe operating system is to identify vulnerabilities within the system and work collaboratively to address them. Creating an environment for reporting events, including near misses or close calls, is essential to reducing risk and creating a constructive response to errors and events. YEMSA would like to build upon the current model with the goal to transition our culture into embracing trauma informed practices. This will require a multi-layered approach, first by creating a culture that allows all participates to feel safe to bring up issues or concerns and second, by creating a reporting and follow up system that fosters the foundation of trauma informed practices. We can impact and improve outcomes through recognizing human behaviors and shifting our focus to a transparent collaborative approach to our health care delivery system.

Currently YEMSA utilizes an *Occurrence/Incident Reporting Form* which may be completed by any individual involved in an occurrence or incident when a problem or concern is recognized. An *Unusual Occurrence Reporting form* is used for events that have impact or potential impact on patient care and/or practice that is felt to be outside the norm of acceptable patient care.

Systems of Care

Trauma

The Yolo County Trauma System is a component of the EMS system designed to facilitate rapid identification, management, and transportation of critical trauma patients to a trauma center for treatment and intervention.

The closest Level I and Level II adult trauma centers are located in the adjacent counties of Sacramento and Solano. YEMSA facilitates the development, evaluation, and oversight of the Yolo County trauma system through contractual agreements with The University of California, Davis Medical Center (UCDMC), Sacramento (Level 1) and Kaiser Foundation Hospital (KFH), Vacaville (Level II). The closest pediatric trauma center is located in Sacramento County at UCDMC. YEMSA has interagency agreements with Sacramento and Solano County EMS to use their designated hospitals.

Yolo County Trauma Triage Criteria is used to identify critical trauma patients to be transported by a ground or air ambulance to the out-of-county trauma centers based on the most appropriate available resource to reduce transport times.

The trauma centers participate in YEMSA CQI. Data is provided quarterly to YEMSA by the trauma centers for patients transported from Yolo County, which includes patient information, diagnosis, treatments, and outcome that can be matched with data provided by ALS transport provider. The data is compiled and presented annually at the CQI meeting for Trauma

The yearly data is used to determine if appropriate care has been provided based on protocols, core measures, local indicators, and select trauma cases that align with the **Yolo County EMS Trauma Plan**. The committee is composed of:

- YEMSA Medical Director & Administrator
- EMS Provider Medical Directors
- Emergency Department/Trauma Medical Directors
- Emergency Department Trauma Managers or Nurse Liaisons
- EMS Providers (Paramedics and EMTs)
- CQI personnel from field providers (fire department and transport provider)
- CQI Staff from Air Ambulance (Helicopter) providers
- Trauma Center Staff (representing system Trauma Centers)
 - Trauma Program Medical Directors

- Trauma Program Nurse Managers
 - Public

YEMSA participates in the out-of-county trauma hospitals and LEMSA QI Program and case reviews as needed. We are also part of the Regional IV Trauma Coordinating Committee to address regional issues and concerns, and to improve the outcome of all trauma patients.

Stroke

The Yolo County stroke system is designed with the goal is to reduce stroke death and related disabilities for patients experiencing a stroke. Rapid identification of stroke symptoms by EMS providers, combined with early notification of a “Stroke Alert,” and direct transport to the closest Primary Stroke Certified (PSC) receiving center, optimize patient outcome.

YEMSA designates PCS receiving centers via contractual agreement with hospitals that meet or exceed PSC guidelines. Currently YEMSA has designated two (2) in county hospitals and five (5) out-of-county hospitals as Primary Stroke Receiving centers. Currently YEMSA is evaluating a layered stroke triage system which would incorporate the designation to Comprehensive Stroke Certified (CSC) receiving centers for Yolo County patients.

YEMSA has developed performance measures based on the American Heart Stroke Guidelines and Mission Life Line standards. Stroke data is provided to YEMSA by the ALS ambulance provider and submitted quarterly to participating hospitals for follow up based on determined quality indicators. This data is compiled and presented for review at the Stroke CQI meeting each year.

STEMI

The best chance of survival from a STEMI is through a collaborative approach; it begins with early recognition, rapid transport and early notification of a STEMI to a STEMI Receiving Center (SRC). Yolo County Paramedics use a field assessment of a 12-Lead ECG and, with recognition of a STEMI, notify the receiving center of a “STEMI Alert.” The early notification provides hospitals the opportunity to prepare for cardiac intervention and treat the patients directly on arrival.

Yolo County does not have any SRC receiving centers within the county. All SRCs are located out of county. Currently YEMSA has designated out-of-county SRCs through contractual agreements. YEMSA has three (3) SRC designated receiving centers in Sacramento and one (1) in Solano County.

STEMI data is outlined based on defined performance indicators for STEMI and submitted by the ambulance provider. This data is then submitted quarterly to participating hospitals for follow up on STEMI identified transports. YEMSA performance measures are aligned with State Core measures and American Heart Association (AHA) standards.

Performance measures include, but are not limited to, aspirin administration in patients with ST elevation, scene time for suspected acute coronary patients, and direct transport to a SRC.

The committee is composed of:

- YEMSA Medical Director & Administrator
- EMS Provider Medical Directors
- STEMI Coordinators, Managers, or Nurse Liaisons
- EMS Providers (Paramedics and EMTs)
- CQI personnel from field providers (fire department and transport provider)
- Public

Cardiac Arrest

Yolo County participates in the Cardiac Arrest Registry to Enhance Survival (CARES) program. Cardiac Arrest data is collected and reported to provide a platform to measure Yolo County outcome data against the rest of the nation and make changes to enhance delivery of care. This project is still in development as we continue to work with our designated STEMI centers that receive Yolo County ROSC patients to participate in CARES and, thereby collect complete outcome data for submission. Other components of cardiac arrest management and efforts to support positive outcomes for Yolo County include:

- Community outreach to promote and train on Hands Only CPR,
- Pulse Point to notify a citizen who can help with CPR or an Automated External Defibrillator (AED) for a nearby cardiac arrest
- Pre-Arrival instructions (PAIs) by trained dispatchers to assist in providing bystander CPR to the victim

- CODE-STAT reports provided to personnel from data collected during a cardiac arrest for individual performance review.

Work in Progress-Goals

1. We are evaluating new regulations for Stroke and STEMI to incorporate into Yolo County EMS
2. We are collecting data to evaluate integrating Comprehensive Stroke Certified centers into the system.
3. A strategic plan is in development with AMR to validate data and improve input from personnel through training
4. We are supporting and facilitating all providers to be on NEMSIS compliant system to improve and validate data collection
5. We are working with out of county hospitals to encourage participation in CARES

Appendix A

State Core Measures Reporting

CCR Title 22, Div 9, Chap 12	Set name	Set ID	Performance Measure name	Year to begin measure
D. Clinical Care and Patient Outcome	Trauma	TRA-1	Scene time for severely injured trauma patients	2013
		TRA-2	Direct transport to trauma center for severely injured trauma patients meeting criteria	2013
	Acute Coronary Syndrome	ACS-1	Aspirin administration for chest pain/discomfort	2013
		ACS-2	12-Lead EKG performance	2013
		ACS-3	Scene time for suspected heart attack patients	2013
		ACS-4	Advance hospital notification for suspected acute coronary syndrome	2014
		ACS-5	Direct transport to PCI center for suspected acute coronary syndrome (ACS) patients meeting criteria	2013
	Cardiac Arrest	CAR-1	AED application prior to EMS Arrival	2014
		CAR-2	Out-of-hospital cardiac arrests return of spontaneous circulation	2013
		CAR-3	Out-of-hospital cardiac arrests survival to emergency department discharge	2013
		CAR-4	Out-of-hospital cardiac arrests survival to hospital discharge	2013
	Stroke	STR-1	Identification of suspected stroke in the field	2014
		STR-2	Glucose testing for suspected stroke patients	2013
		STR-3	Scene time for suspected stroke patients	2013
		STR-4	Advance hospital notification for suspected stroke	2014
		STR-5	Direct transport to stroke center for suspected stroke patients meeting criteria	2013
	Respiratory	RES-1	Continuous Positive Airway Pressure (CPAP) given for patients with respiratory distress	2014
		RES-2	Beta2 agonist administration	2013

D. Clinical Care and Patient Outcome	Pediatric	PED-1	Pediatric asthma patients receiving bronchodilators	2013
		PED-2	Transport to pediatric trauma center	2014
	Pain Intervention	PAI-1	Pain intervention	2013
		PAI-2	Results of pain intervention	2014
E. Skills Maintenance and Competency	Performance of Skills	SKL-1	Endotracheal intubation success rate	2013
		SKL-2	End-Tidal CO ₂ performed on any successful endotracheal intubation	2013
F. Transportation and Facilities	Response and Transport	RST-1	Ambulance response time by ambulance zone (Emergency)	2013
		RST-2	Ambulance response time by ambulance zone (Non-Emergency)	2013
		RST-3	Transport of patients to hospital	2013
G. Public Education	Cardiopulmonary Resuscitation	PUB-1	Out-of-hospital cardiac arrests receiving bystander (non-EMS Personnel/Responder) CPR	2014

Appendix B

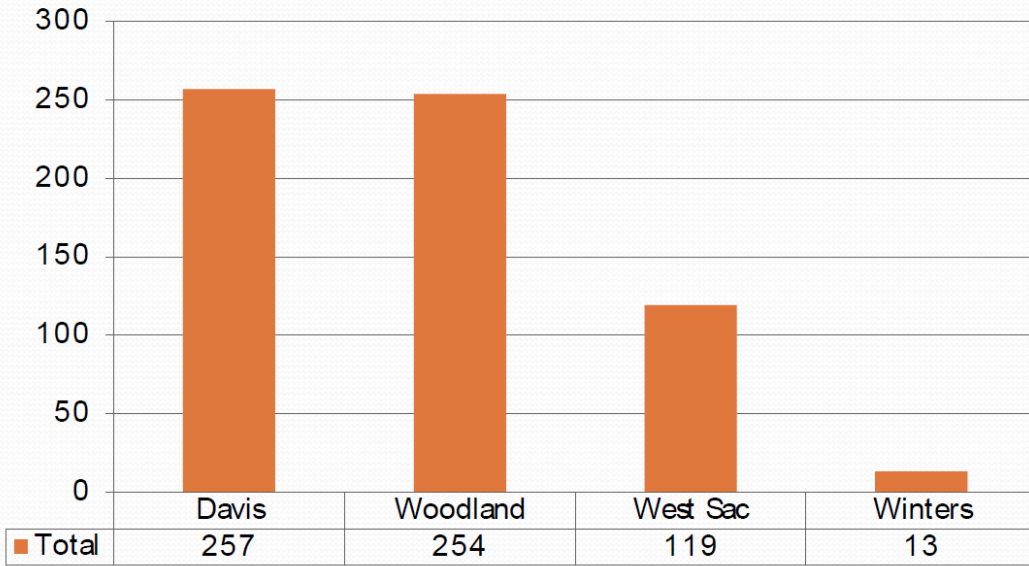
Yolo County Local Indicators

Set name	Performance Measure name	Year to begin measure
Trauma	Trauma Triage Documentation	2018
	Termination of Resuscitation (TOR)	2016
Stroke	Documented Last Known Well Time	2017
	Door to CT Time	2013
	Door to TIA activation	2018
	Number of Stroke Alerts	2018
Epinephrine Administration for Anaphylaxis	EPI given to patients with S/S of anaphylaxis	2018
Narcan Administration for ALOC	Narcan administration for ALOC	2018
STEMI	Mean time 12-Lead- pt. contact to 12-Lead	2017
	Volume of STEMI activations	2014
	Transport time to SRC	2014
	12-Lead Transmission to SRC	2015
	Door to Balloon	2015
	Transfers out of county to SRC	2015
Pediatric	Overall Disposition (Transports, AMA, RAS etc.)	2018
	BRUE impression, disposition	2018
Skill	Hemorrhage control (Tourniquet, Israeli bandage, Quick Clot)	2016

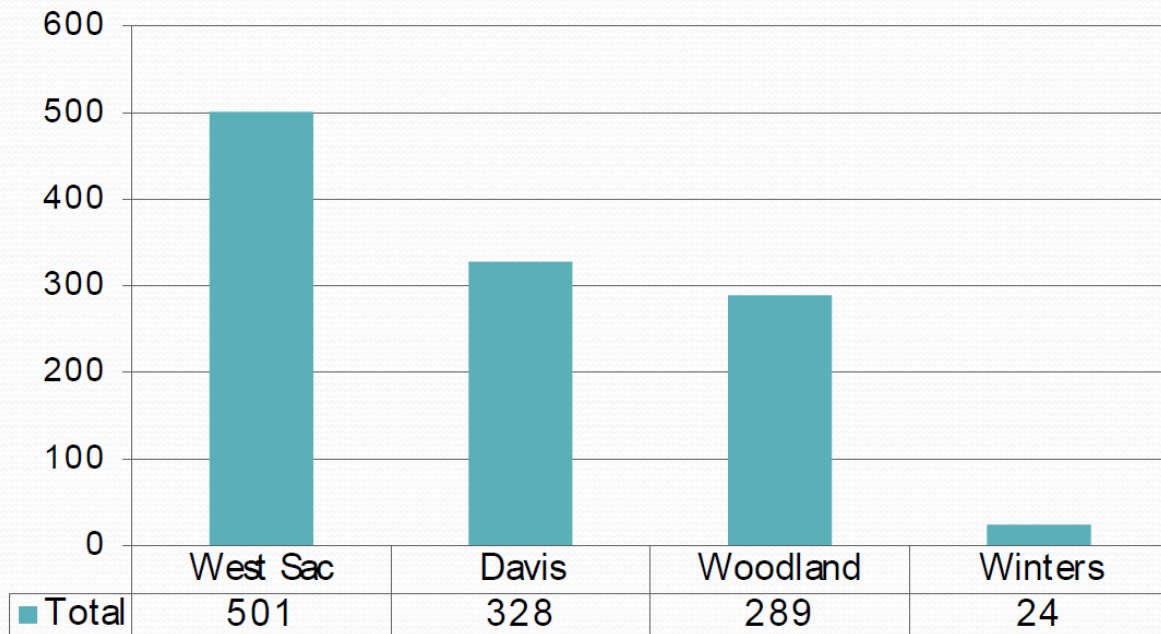
Appendix C

Chart Samples from QI Reports

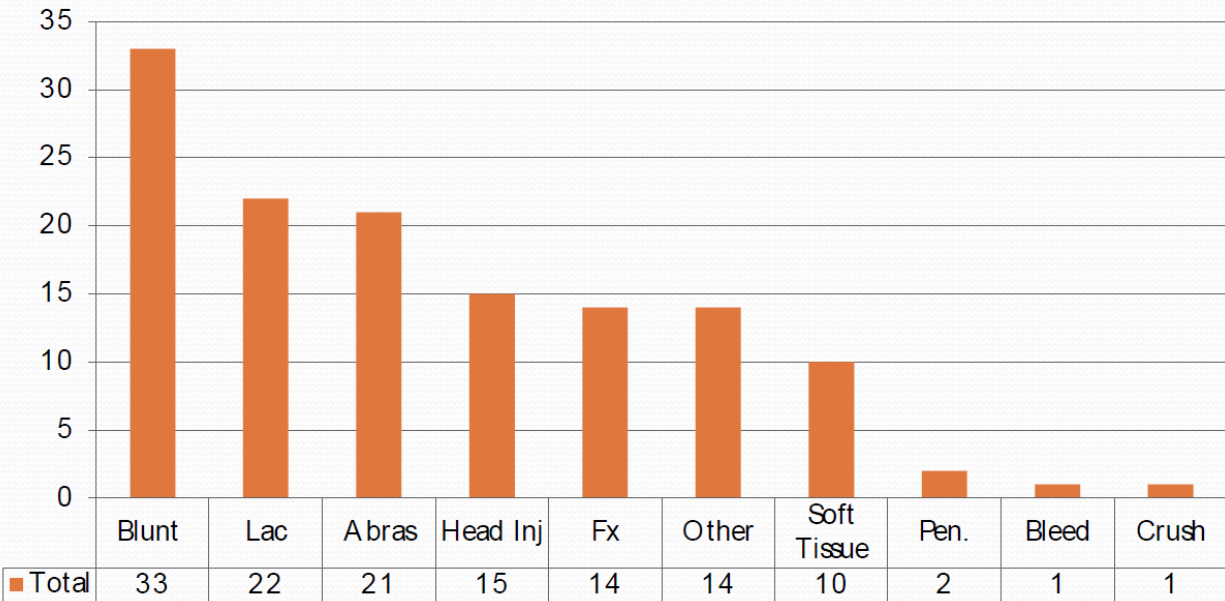
Falls over 60 by City



Behavioral Health by City

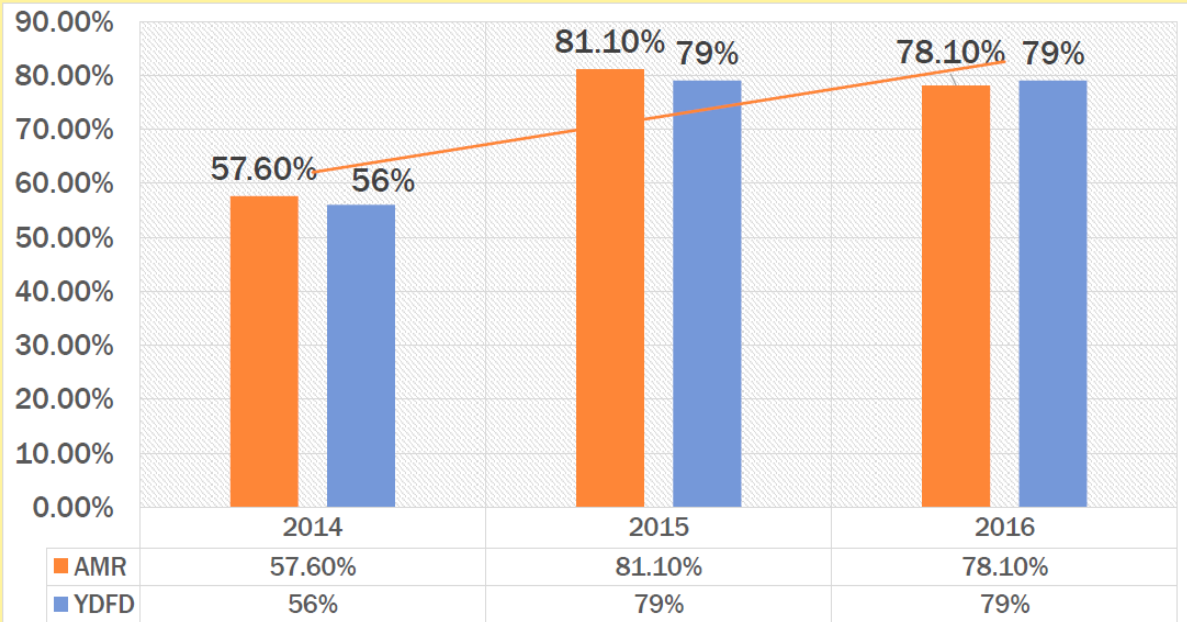


Pediatric Trauma Breakdown

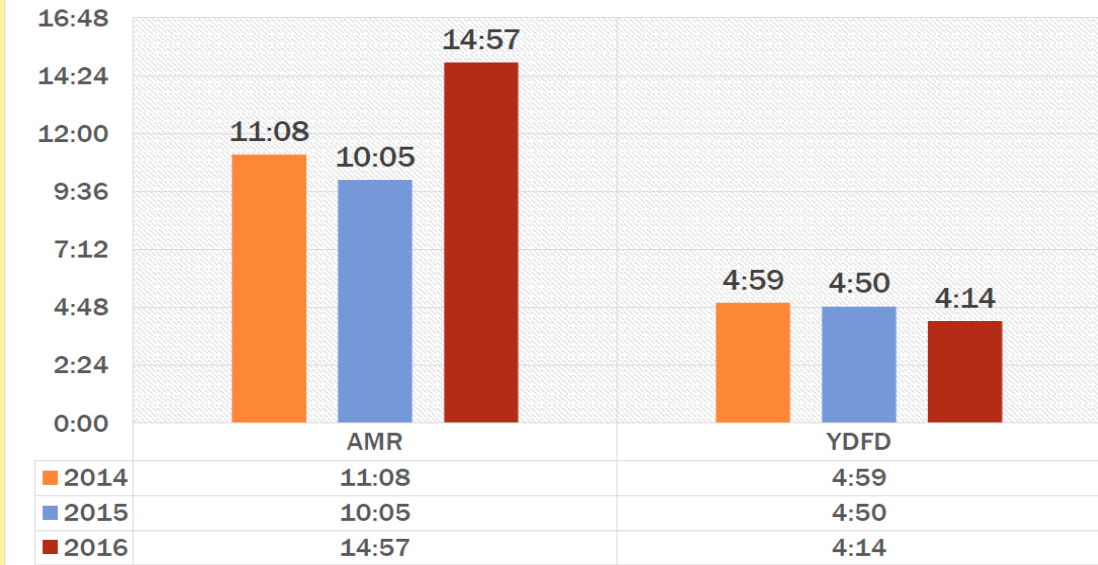


Acute Coronary Syndrome (ACS -1)

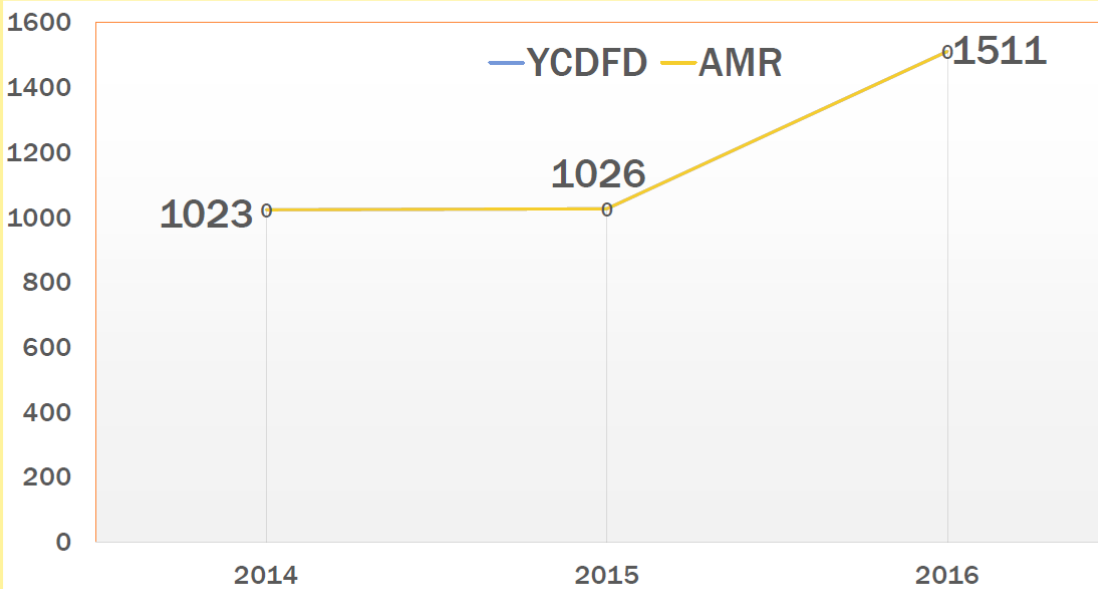
Patients 35 years and older with suspected cardiac chest pain who receive ASA by EMS personnel



PATIENT - 12 LEAD EKG



12 - LEAD EKG (CARDIAC)



31 Outcomes / 59 STEMI Activations

