Contra Costa Health Services

Emergency Medical Services
EMS Quality Improvement Program
(EQIP) Plan and Toolkit

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Contra Costa County EMS Quality Improvement Program
# EQIP Plan and Toolkit

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- Rapid Cycle Improvement within the EMS System
- QI/QA Models
- CQI Process Improvement and Problem Solving Sequence
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- Risk Evaluation
- Lean Six Sigma: A primer

This Quality Improvement (QI) Plan serves as both a guideline and toolkit for our EMS QI partners to fully participate in the Contra Costa County Emergency Medical Services Quality Improvement Program (EQIP). This document is designed to be nimble and is updated as needed by the EQIP committee membership. The EMS QI coordinator is responsible for keeping this document current and accessible to EQIP membership.

Contra Costa County Emergency Medical Services
EMS Quality Improvement Program (EQIP)

Mission Statement

To ensure that quality Emergency Medical Services are available for all people in Contra Costa County and that emergency medical care is consistent with best practices and evidence-based medicine.

Authority

On January 1, 2006 the California Emergency Services Authority (EMSA) implemented regulations related to quality improvement for EMS throughout the state. Contra Costa County EQIP satisfies the requirements of Title 22, Chapter 12, Section 4 of the California Code of Regulations.

In addition, EMSA document #166 “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 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 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
- Clinical Care and Patient Outcome
- Skills Maintenance/Competency
- Transportation/Facilities
- Public Education and Prevention
- Risk Management
Background: Understanding Quality Improvement for EMS Systems

Research is limited in the area of EMS quality improvement, and standards in this area are still emerging. Since there are many types of EMS structures it is accepted that QI plans and strategies must be individualized for each system.

Although the concepts of quality improvement and quality assurance (QA) have been present in “industry” for over 30 years, limited testing exists in the area of EMS. One of the challenges in using industry models of quality improvement in EMS, is that most of the existing research is based on the manufacturing of products rather than the delivery of services. Industry QI/QA methods are premised on the belief that defective products can be prevented by analyzing the process, rather than the result. Should the result or product be flawed then it can be used as an “opportunity” to improve the process. These defect events are actually “valued” because of the opportunity they present to make the “product” better!

In contrast EMS provides a service not a product. As a result the measurement of our processes, functions, services, flaws or defects is challenging. One strategy in viewing this is to think, “Rather than do nothing, and just respond to complaints, we will attempt to reduce the number of complaints received.” EMS system QI currently focuses on the actions of the providers rather than the outcome. While outcome data is important, it is impossible to “un-do” what has already been done. Therefore EMS QI must use that information to measure against the past and make improvements for the future.

Nationally the long-term goal is to produce a “seamless” system of data to evaluate the entire spectrum of EMS, from 911 activation to patient discharge. Data analysis to this degree will give us the opportunity to evaluate what “makes the difference” in the field. The work done in quality improvement is tied to this long-term goal.

The single most important element of QI plans is the ability to measure. Virtually every action that is performed has the potential to be measured. Any time 911 is called, a number of key indicators can be measured. With the advent of electronic patient care reports (PCRs) there is tremendous potential to study the system and identify patient care elements that can be improved, honed and tested.

Measuring Quality

Quality indicators are defined measurements that are part of a process. These indicators can then be used for analysis and comparison. National and statewide indicators have been developed, fine-tuned and tested to “standardize” how we look at care in the field. With the many differences in EMS systems throughout the country, these national and state indicators are utilized based on each unique EMS system. What is important for one EMS system may not be for another. Perhaps one agency responds to a greater number of motor vehicle accidents and wants to focus on the average time for extrication. While another has a high number of “frequent flyers” and wants to measure specific indicators in the hopes to develop strategies to decrease these events.

In addition, there are many opportunities to measure outcomes based on standards established in the EMS community. For example, the Utstein criteria for cardiac arrest incorporates outcome data. This outcome data is a simple process because the outcomes are positive or negative and a percentage of patients who are successfully resuscitated from cardiopulmonary arrest can be established. This percentage then becomes the standard which can be used as a benchmark with other EMS systems. These benchmarks can be used to notice any positive or negative changes in the system’s performance.

Another example would be EMS systems that send out customer satisfaction surveys. This process results in feedback from internal and external customers. This feedback can help identify strengths and weaknesses of the EMS system, resulting in changes based on evidence rather than hunches or “gut feelings.”

Training programs can benefit from an effective QI program in many ways. Procedure performance indicators can be designed and measured at regular intervals (ie: intubation). A QI program may choose to measure frequency of procedures and then base EMS training needs on the skills performed infrequently. EMS agencies may request patient diagnosis from the receiving hospital on a regular basis to determine how often the provider’s impression matches that of the hospital. This process can help identify areas needing additional training.

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Implementation of the QI Program

- A state of the art QI program requires commitment to a new approach to attain quality care.
- A QI program must be “facilitated” by leadership, it cannot be demanded.
- Stakeholders should comply with QI related state regulations and statues.
- The Local EMS Agency acts to facilitate, guide, educate while creating resources and infrastructure to assist stakeholders in fully participating in the CQI program.
- Each stakeholder must clearly understand QI procedures and that QI is a never-ending process.

Local Emergency Medical Services Continuous Quality Improvement (CQI)

The purpose of the Contra Costa County EMS Continuous Quality Improvement (CQI) Program is to monitor, review, evaluate, and improve the delivery of pre-hospital care services in Contra Costa County. The Quality Improvement Plan of the Contra Costa County EMS system is designed to create a consistent approach to facilitate attainment of the key EMS quality objectives based on input from the providers and customers of those services. These objectives include:

- Assuring that the level of patient care is consistent with policies and field treatment guidelines
- Evaluation and improvement of system-wide performance
- Assignment of responsibility for monitoring and evaluating activities
- Delineate scope of care
- Identification of important aspects of out-of-hospital care
- Collection, analysis and dissemination of data from dispatch to discharge
- Communication of relevant quality improvement information system-wide
- Promotion of appropriate utilization of EMS resources and services
- Cultivate standardization of the quality improvement processes

EMS Quality Improvement Partnership: QI Advisory Committee/Team Structure

The Contra Costa County EMS QI Committee/Team is a patient focused partnership consisting of designated stakeholders, EMS Medical Director, and members of the EMS staff assigned to clinical programs. EMS QI activities are coordinated under the EMS Medical Director and QI Coordinator. This committee is advisory to the EMS Medical Director.

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EMS QI Team Membership
Membership includes: EMS Medical Director; QI Coordinator; EMS Staff assigned to clinical programs and representatives of BLS provider and first responder programs, Fire Districts with ALS & BLS programs; Medical Dispatch Centers; Private ALS provider, Base Hospital & Trauma Center, Receiving Hospitals; and Air Ambulance providers.
Responsibilities of EMS CQI Committee

The EMS QI Committee performs the following functions in accordance with state guidelines as defined in the California Code of Regulations Title 22, Division 9, Chapter 12, Section 100400:

- Develop and implement a system-wide EMS QI program which will include indicators to address the following the State EQIP focus areas.
- Annual evaluation of the system-wide EMS QI Program for effectiveness and outcomes.
- Incorporation continuous input and feedback to and from EMS provider groups.
- Assure availability of training and in-service education for EMS personnel.
- Develop in cooperation with appropriate personnel/agencies a performance improvement action plan to address identified needs for improvement and provide technical assistance and medical oversight for system and clinical issues.
- Publish a summary of activity and plan implementation for periodic distribution.

CQI Process

CQI is a dynamic process that provides critical feedback and performance data on the EMS system based on defined indicators that reflect standards in the community, state and the nation. Traditional components of a CQI process include:

- Define a problem
- Measure data to validate and quantify the problem
- Analyze the data and symptoms of the problem to determine the root cause
- Develop and implement a plan of action through education or policy/process revision
- Measure and monitor the results providing feedback
- Continuous monitoring of control system to assure compliance
CQI incorporates Quality Assurance aspects but is unique in its approach to problem analysis and problem solving. These differences are defined in the CQI and QA: What's the difference addendum at the end of this plan.

The primary purpose of any CQI model should be to reduce barriers to good patient care, facilitate competency and recognize excellence. Examples of these models can be found in the addendum. CQI methodologies have different strengths. Provider agencies are encouraged to use methods that work for them and are appropriate to their resources. This will increase opportunities for success in building an integrated county-wide quality improvement program. A list of CQI models are contained in the toolkit addendum portion of this plan.

### EMS Quality Improvement (QI) Committee Procedures

- The EMS Medical Director will oversee the QI program.
- The EMS QI Coordinator will act to coordinate QI committee programs and activities.
- The EMS QI Committee shall meet regular intervals.
- All committee members shall sign a confidentiality agreement.
- The EMS agency shall maintain all records in a confidential manner during the review process, and shall destroy identifiable patient information directly following the review process.

### Data/System Review

Various databases currently exist which contain data relevant to Continuous Quality Improvement (CQI) in EMS. These databases include, Zoll (Fire ePCR), MEDS (AMR ePCR), and First Watch. Long term local EMS data warehouse implementation is being explored. Data systems are used to evaluate performance in the following ways:
- Prospectively identify areas of potential improvement
- Answer questions about the EMS System
- Monitor changes once improvement plans are implemented
- Provide accurate information enabling data driven decisions
- Monitor individual performance within the EMS system
- Support research that will improve our system and potentially broaden EMS knowledge through publication

Contra Costa County EMS Quality Improvement Program (EQIP) is made up of the following key components:

1. Core Patient Care Indicators
2. EMS Event Reporting (Patient Safety Reporting Program)
3. QI Agency Activity tracking

These key components in tandem with effective communication processes are mission-critical in establishing a truly integrated, effective, county-wide, QI program.

Improvements on performance and quality issues require a comprehensive understanding of what is happening in the field, effective identification of root causes, data focused analysis and non-punitive improvement interventions. This is coupled with strategies to establish realistic and appropriate priorities for improvement. Success is dependent on promoting collaborative quality partnerships with all stakeholders throughout the EMS system.

Core Indicator reports have been identified and are in various phases of development (See Table A). Data elements used to compile core indicator reports will be compliant with both CEMSIS and NEMSIS. As state reporting becomes integrated with local EMS data systems and relationships between prehospital and hospital data merge, the vision of sharing clinical and outcome information will be realized.

Such a data management system will need to be adequately supported by data and technology experts. Mechanisms for the timely data management including the rapid interpretation by CQI reviewers/evaluators are essential to the process. Resources will need to be planned and established for these systems to evolve and become further refined. The Local EMS Agency plays an important role in supporting stakeholders in their efforts to integrate electronic prehospital records into their EMS systems.
<table>
<thead>
<tr>
<th>Indicator Name</th>
<th>ZOLL Crystal Reports (CR)</th>
<th>MEDS Business Objects (BO)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utsteins Report</td>
<td>NS</td>
<td>IP</td>
<td>Data base built. Data entry started. No reports defined. CARES implementation being considered.</td>
</tr>
<tr>
<td>Cardiac Arrest</td>
<td>NS</td>
<td>IP</td>
<td>Reports defined. Map of report process required. CARES implementation being considered.</td>
</tr>
<tr>
<td>Pediatric Report</td>
<td>NS</td>
<td>IP</td>
<td>Reports defined. Map of report process required.</td>
</tr>
<tr>
<td>Documentation</td>
<td>IP</td>
<td>IP</td>
<td>Preliminary parameters defined. Reports being generated on related issues with final report elements in development.</td>
</tr>
<tr>
<td>Trauma and Trauma Triage Destination Report</td>
<td>C</td>
<td>C</td>
<td>*Uses trauma registry in tandem with BO. No CR component at present.</td>
</tr>
<tr>
<td>Patient Safety and EMS Event Reporting</td>
<td>C</td>
<td>C</td>
<td>Non-ePCR system data collection program.</td>
</tr>
<tr>
<td>Airway Management</td>
<td>NS</td>
<td>IP</td>
<td>Preliminary parameters defined.</td>
</tr>
<tr>
<td>Chest Pain/STEMI</td>
<td>NS</td>
<td>IP</td>
<td>Reports defined. Map of report process required.</td>
</tr>
<tr>
<td>Pain Evaluation and Treatment</td>
<td>NS</td>
<td>IP</td>
<td>Reports defined. Map of report process required.</td>
</tr>
<tr>
<td>Shortness of Breath Report</td>
<td>NS</td>
<td>IP</td>
<td>Preliminary parameters defined.</td>
</tr>
<tr>
<td>Destination Decision Report</td>
<td>NS</td>
<td>IP</td>
<td>Preliminary parameters defined.</td>
</tr>
<tr>
<td>AMA/Patient refusal Report</td>
<td>NS</td>
<td>NS</td>
<td>Preliminary parameters defined.</td>
</tr>
<tr>
<td>General Activity Report (dispatch related)</td>
<td>C</td>
<td>C</td>
<td>Non-ePCR system data collection program. Medical Priority Dispatch System (MPDS) used.</td>
</tr>
<tr>
<td>Customer Satisfaction</td>
<td>Some IP</td>
<td>C</td>
<td>Agency-based survey system Non ePCR system data collection program.</td>
</tr>
<tr>
<td>Infrequent Skills</td>
<td>NS</td>
<td>C</td>
<td>Improved report developed breaks out patient ages.</td>
</tr>
</tbody>
</table>
EMS EVENT REPORTING: A Patient Safety and Recognition Reporting Program

In January 2007 the QI Committee began working on a fundamental redesign of our patient safety reporting processes. The project was undertaken upon of review of each agency’s current processes and county EMS Agency practices in this area. Numerous opportunities for improvement were identified with input from stakeholders throughout the EMS system.

Reporting models from numerous states and California Local EMS Agencies were reviewed. A review of the literature was also undertaken and a best practice strategy for patient safety reporting system design was developed. This new patient safety and patient care recognition model was founded on the following key principles:

- Patient safety
- Provider and agency accountability
- Non-punitive performance improvement focus
- Realistic patient safety data management
- Promotes interagency respect
- Process to capture “great catches” AKA “near misses” within the EMS system
- Supports HR, HIPPA and agency privacy practices
- Formal system to capture and recognize excellence in the delivery of EMS services
- Ability to capture critical “characteristics” of patient safety for system-wide evaluation and analysis

The program allows each provider agency to use a consistent process to collect, review, categorize and track patient safety events. This information is collected by the appropriate agency QI coordinator conducting the review. Blinded aggregate reports of these events will then be sent to the Local EMS Agency QI coordinator for quarterly review. This information will then be incorporated into a countywide report.

The electronic QI review form was developed with input from all stakeholders. Using the electronic system, defined reports are easily generated and mechanisms put in place to assist the agencies to automate the reporting processes. The reports include:
<table>
<thead>
<tr>
<th>Name of Report</th>
<th>Description of Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMS Event Summary</td>
<td>Lists each event and all characteristics with summary and % for each</td>
</tr>
<tr>
<td>Time to Close Case</td>
<td>Identifies how long it took to investigate and closes cases and if case met criteria for Local EMS Agency notification</td>
</tr>
<tr>
<td>Clinical Characteristics</td>
<td>Lists each event, its clinical characteristics with summary and % for each</td>
</tr>
<tr>
<td>Exemplary Care</td>
<td>Lists date each exemplary care event and parties involved for recognition</td>
</tr>
<tr>
<td>Reporting Party Data</td>
<td>Lists total number of events and who reported</td>
</tr>
<tr>
<td>Great Catch</td>
<td>Lists each great catch and characteristics involved</td>
</tr>
<tr>
<td>Nature of Event Criteria</td>
<td>Lists nature of each event with summary and level of significance</td>
</tr>
<tr>
<td>Operational Characteristics</td>
<td>Lists each event and all characteristics with summary and % for each</td>
</tr>
</tbody>
</table>

Participation in the reporting system is voluntary and is not meant to duplicate work or other programs that the agency has that accomplish the same objective.
Quality Improvement (QI) Activities

QI activities are comprehensive in their scope and encompass many strategies. They utilize a number of approaches and models of problem solving and analysis. These activities, while distinct, are inter-related and address clinical and system issues from three perspectives:

- **Prospective:** Working proactively to mitigate issues before they occur.
- **Concurrent:** Assessing issues and addressing them as they happen.
- **Retrospective:** Examining the data we have collected to provide additional insight into the efficacy, effectiveness and efficiency of our EMS system.

QI activities may include but are not limited to

- **Provider Recognition**
  - QI programs should regularly recognize the efforts made by individuals and agencies, which promote high quality patient care.

- **Data Collection and Analysis**
  - The collection of data allows the QI team to identify frequency, trends, improvements, declines and other areas that are actionable.

- **Customer Satisfaction**
  - Surveying customers is similar to being graded on performance.

- **Patient Care Report (PCR) Reviews**
  - PCRs are a valuable source of information of the quality of patient care delivery.

- **Skill Maintenance**
  - QI analysis can identify skills or procedures are deficient or not performed on a frequent basis. These skills should receive performance review and testing.

- **Continuing Education (CE)**
  - CE covers regulatory and mandated training.

- **Establishing QI Peer Groups**
  - QI peer groups are designed to balance the judgment of any QI decision. A peer group of providers using their best judgment allows for better acceptance.
• **Protocol and Procedure Review**
  o Regular timely review of treatment protocols is imperative. Review is important to update medical procedures and apply new rules and regulations that may affect treatments.

• **Quality Improvement Meetings**
  o QI meetings are held to communicate the findings and plans of the various activities to other providers in the system. Meetings work towards improving the system of patient care.

• **Generating Activity Reports**
  o Activity reports are summaries of various measurable events that can be based on individual provider agencies or on the entire EMS system. These reports can be used to establish trends, consistencies and rates of proficiency. These reports can help to establish training needs or identify the need for system changes.

• **Internship Programs**
  o An internship program is a plan to orient a new provider to methods and standard operating procedures of a service programs. Experienced preceptors, training officers serve to facilitate and monitor this process.

• **Development of Standards**
  o Standards are generalized characteristics that should be met on all calls. Standards keep providers focused on basic principals of customer services.

• **Benchmarking**
  o Benchmarking is a comparison of a system’s performance statistics against the nationally established performance levels.

• **EMS Event Review Process**
  o Issues or concerns can come from a variety of sources and may be clinical, operational or both. EMS events are to be reviewed and the characteristics of the events measured and analyzed for improvement of the EMS system.

• **Equipment/Technology Evaluation**
  o The QI Committee plays an important role in creating processes to objectively evaluate and analyze new equipment and technology.

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**Confidentiality of Proceedings**

All proceedings, documents, and discussions of the Quality Improvement Committee are confidential pursuant to section 1157.7 of the Evidence Code of the State of California. (See form in addendum)

Data collected specific to personnel shall only be exchanged between the personnel and provider levels.
Training and Education

Training and Education is fundamental to the success of quality improvement and is addressed in collaboration with quality and training experts from all of our stakeholders throughout the EMS system. For this reason the Contra Costa EMS Quality Improvement Program is in strong partnership with the Contra Costa Fire EMS Training Consortium.

In February 2005, the Fire EMS Training Consortium, was developed by local EMS stakeholders. Participation includes all Fire BLS and ALS and ALS Transport responders and the contracted ALS transport service provider AMR; a total of 10 agencies. The values of the consortium are Quality, Teamwork and Innovation. The mission and goals of the consortium include:

- Standards-based training for all fire and ambulance personnel
- Integrate prehospital skills/CE training into a county-wide system
- Utilize patient simulator training countywide to achieve training objective
- Improve and integrate “partners” in ALS/BLS training
- Facilitate increased interagency training to promote cooperation and respect

The EMS Agency QI Committee works in strong partnership with the consortium to communicate and educate EMS providers throughout the system in the following ways:

- Identification, development and implementation of EMS best practices
- Skills and protocol focused indicator reports monitoring field practice and success
- Annual EMS updates on protocol changes and quality initiatives
- Support in the development of standardized curriculum and resources to support training activities
- Review of educational needs assessment
- Recommendations for training on clinical and patient care issues

The EMS Agency QI coordinator publishes an electronic bimonthly quality improvement newsletter directed at all stakeholders in the EMS system and acts as a liaison for training and quality issues between emergency departments and the field. Communication of quality practices is key and the QI committee works collaboratively to disseminate information, education and training to achieve outcomes.
**Interagency Quality Improvement Responsibilities**

Interagency quality improvement responsibilities are summarized below and are based on Title 22 California Code of Regulations Chapter 12 EMS System Quality Improvement.

**EMS Agency Responsibilities**

- Provide an EMS Medical Director to be responsible for overall EMS system medical oversight, and staff necessary to provide overall coordination of EMS system quality improvement activities.

- Cooperate with EMSA in carrying out the responsibilities of statewide EMS QI Program and participate in the EMSA Technical Advisory Group.

- Cooperate with EMSA in the development, approval, and implementation of state optional EMS system indicators.

- Provide for prospective system-wide direction through established county polices, procedures and guidelines.

- Provide for quality oversight of Local EMS Agency activities which include:
  - Designate EMS Base Hospital(s) to provide on-line consultation and trauma triage.
  - Provide for and coordinate retrospective evaluation of EMS system performance, both clinical and operational, and determine educational or other needs to improve system performance.
  - Credential EMT-I, Paramedic, and MICN providers. Coordinate credential review process as necessary.
  - Approve primary training programs for EMT-I, Paramedic and MICN, and continuing education for all levels of EMS personnel.
  - Establish procedure for periodic review of policies, procedures, and treatment guidelines. Establish procedures to assure that all EMS personnel and hospitals are notified of EMS system changes and updates.
  - Develop and distribute EMS System Plan/Updates, Hospital Resource Assessment and EMS System Annual Reports.
o Collect clinical and response data necessary to evaluate EMS system performance.

o Process EMS Notification Forms and other requests for incident review to assure evaluation and/or investigation.

o Provide contract compliance activities.

**Base Hospital Responsibilities**

- Designate an Emergency Department (ED) Physician as Base Hospital Medical Director.
- Designate a Base Hospital Liaison Nurse.
- Assure the presence of a currently certified Mobile Intensive Care Nurse (MICN) or Base Hospital physician in the ED at all times to provide radio consultation and trauma triage instructions to pre-hospital personnel.

- Assure MICNs and Base Hospital physicians are familiar with EMS policies, procedures and EMS treatment guidelines. Establish procedure for informing base hospital personnel of EMS changes and updates.

- Implement a Base Hospital QI Plan that includes mechanisms to:
  o Evaluate and improve (including education) performance of base hospital personnel, including the provision of feedback to involved personnel.
  o Assist ambulance and air ambulance transport providers and the EMS Agency in evaluating and improving EMS patient care in the field. Such assistance might include identification of and feedback on trends, areas for improvement, problem cases and cases with educational value.

- Develop and implement a quality improvement program consistent with State Regulations and local guidelines.

- Develop procedure for obtaining follow-up on base-directed calls.

- Provide the EMS Agency with statistics and information necessary for monitoring and evaluating the EMS system including base hospital activity data and base log.

- Participate in EMS Agency QI activities
Emergency Medical Dispatch Agency Responsibilities

- Provide dispatchers trained and certified as Emergency Medical Dispatchers.

- Assure EMS dispatchers follow Emergency Medical Dispatch (EMD) policies and procedures, and are familiar with pertinent EMS policies and procedures. Establish procedure for informing dispatchers of EMS system changes and updates.

- Assist the EMS Agency in evaluating and improving EMS services.
  - Such assistance might include identification of and feedback on trends, areas for improvement, problem cases and cases with educational value.

- Use EMD formal QI plan to evaluate and improve performance.
  - Improvement activities include education and the provision of feedback to involved personnel.

- Provide QI summary and protocol compliance reports to EMS Agency at defined intervals.

- Participate in EMS Agency QI activities.

First Responder Agency Responsibilities - Basic Services

- Provide first responder services with staff trained to provide first aid, CPR and defibrillation at a minimum.

- Assure agency’s personnel are familiar with pertinent EMS policies. Establish procedure for informing agency personnel of EMS system changes and updates.

- Participate with EMS Agency staff in performing quality improvement evaluation and training activities including those related to defibrillation.

- EMS staff provides oversight, monitoring, data collection and feedback for defibrillation program.

- Provider submits all pre-hospital patient data to EMS Agency following each contact where defibrillation is used.
- Monitor and evaluate response times to EMS requests. Identify areas for improvement and take steps to address and re-evaluate.

- Participate in EMS Agency QI activities.

**First Responder Agency Responsibilities - Enhanced Services**

- Provide first responder services with staff certified as EMTs at a minimum.

- Assure Agency’s EMS personnel are currently and appropriately credentialed at all times.
  - Paramedic licensure and accreditation; EMT certification.
  - ACLS, BTLS or PHTLS, and PEPP competency (paramedics).
  - Skills verification during accreditation period certification.

- Provide advanced life support services (if offered) with staff licensed and locally accredited as paramedics.

- Document patient care information for each patient contact on an EMS Agency approved patient care report, ideally electronically.

- Assure agency’s personnel are familiar with EMS policies, procedures and protocols. Establish procedure for informing agency personnel of EMS system changes and updates.

- Develop and implement a quality improvement program consistent with pertinent State Regulations and local guidelines.

- Provide (or arrange with the EMS Agency to provide) QI activities for EMT and paramedic staff. Provide an RN or MD to oversee quality improvement activities as part of the enhanced first responder QI program.

- QI activities to include:
  - Using patient care data for routine and problem-oriented internal evaluations.
  - Using the Quality Improvement Processes to address problems or issues (both clinical and operational) internally.

- Provide the Local EMS Agency with data necessary for monitoring and evaluating the EMS system including clinical data and response times for ALS and BLS first responders. Identify areas for improvement and takes steps to address and re-evaluate.
• Participate in EMS Agency QI activities.

Ground Ambulance Provider Agency Responsibilities

• Assure Agency’s EMS personnel are currently and appropriately credentialed at all times.
  o Paramedic licensure and accreditation; EMT certification.
  o ACLS, BTLS or PHTLS, and PEPP competency (paramedics).
  o Skills verification during accreditation period certification.

• Assure agency’s personnel are familiar with EMS policies, procedures and protocols. Establish procedure for informing agency personnel of EMS system changes and updates.

• Provide for a Medical Director to be responsible for the medical supervision of the Agency’s EMS personnel. Provide for an RN or MD to plan and oversee Agency QI activities.

• Develop and implement a quality improvement program consistent with pertinent State Regulations and local guidelines.

• Provide the EMS agency with data necessary for monitoring and evaluating the EMS system including clinical data and response time data for emergency (911) calls.

• QI activities to include:
  o Routine and problem oriented internal evaluations using patient care data.
  o Using the Quality Improvement Process address problems or issues (both clinical and operational) internally.

• Provide dispatch data and clinical data as identified in County contract.

• Document thoroughly and accurately patient care information for each patient contact on an EMS Agency approved electronic patient care report.

• Monitor and evaluate response times to EMS requests. Identify areas for improvement and takes steps to address and re-evaluate.
- Participate in EMS Agency QI activities.

**EMS Aircraft Provider Agency Responsibilities**

- Assign a liaison to interact with other EMS provider agencies, base hospital(s), and EMS Agency.
- Assure Agency’s EMS personnel and pilots are currently and appropriately credentialed at all times.
- Assure Agency’s personnel are fully oriented to EMS system prior to assigning to EMS response duties.
  - Orientation to include pertinent policies, protocols, hospital locations, map reading, documentation requirements, etc.
  - Establish procedure for informing agency personnel of EMS system changes and updates.
- Provide the EMS Agency with clinical and response time data necessary for monitoring and evaluating the EMS system, particularly for trauma patients as part of the EMS trauma audit process.
- Participate in EMS Agency Quality Improvement activities.

**Receiving Facilities**

- Assign a hospital liaison to interact with provider agencies, base hospital(s), and EMS Agency.
- Provide limited data necessary to evaluate EMS system performance. (Admitted/discharged from ED, lived/died; discharge diagnoses, and length of stay for trauma triaged and cardiac arrest patients.)
**EQIP Addendums**

- Contra Cost County EMS Organizational Chart
- Contra Costa County EMS Quality Improvement Program Policy
- Form: Acknowledgement of Quality Improvement Committee Confidentiality
- Quality Improvement Program: Annual Agency Self Assessment
- EMS Provider Template: EMS Quality Improvement Program Policy Template
- EMS QI Indicator Focus Areas
I. PURPOSE
To identify primary responsibilities of all participants in the (Agency Name) Quality Improvement Program (EQIP) and to ensure optimal quality of care for all patients who access the EMS system.

II. DEFINITION
(Agency Name) EMS Quality Improvement Program: An integrated, multidisciplinary program that focuses on system improvement. Methods of evaluation are composed of structure, process and outcome measurements.

III. REQUIREMENTS
A. (Agency Name) participates in the Contra Costa County EQIP at the level as agreed between the agency and Contra Costa EMS.

B. EQIP indicators will be compliant with the California Code of Regulations, Title XXII, Division 9, Chapter 12 and modeled after the State of California Emergency Medical Services Authority (EMSA) Publication: Emergency Medical Services System Quality Improvement Program Model Guidelines.

C. The oversight for the EQIP will be the responsibility of the (Agency name) EMS Medical Director and (Agency Name) EMS (director/coordinator/administrator) in cooperation with the Local EMS Agency Prehospital Quality Improvement Committee.

D. Appropriate QI indicators shall be reviewed at the agency level on a monthly basis and a report of findings shall be made to the Contra Costa EMS Agency at agreed upon intervals. Aggregate data for the EMS System will be maintained by the EMS Agency.

E. (Agency name) shall submit an annual report of quality improvement activities to the Contra Costa County EMS Agency.

F. The Contra Costa County EMS Agency shall provide an annual report of quality improvement activities to the California EMS Authority. This information may be incorporated as part of the Contra Costa County Emergency Medical Services Agency Annual Program Report.

G. All proceedings documents and discussions of the (Agency name) Quality Improvement Committee are confidential pursuant to section 1157.7 of the Evidence Code of the State of California.
   a. Agency representative of the Prehospital Quality Improvement Committee shall sign a confidentiality agreement
   b. Agency name shall maintain all records in a confidential manner consistent with current patient privacy laws (HIPPA).

Revised:
# Contra Costa Emergency Medical Services

## Quality Improvement Program

### Annual Agency Self Assessment

<table>
<thead>
<tr>
<th>Organization:</th>
<th>Survey date:</th>
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<tr>
<th>Evaluation Criteria</th>
<th>YES</th>
<th>Comments/Examples</th>
</tr>
</thead>
</table>

## 1. Quality Improvement Plan

1A | Written QI Plan up to date and reflects current QI processes and organizational chart.
1B | QI Plan reviewed and approved by EMS agency
1C | QI Plan addresses the 8 EMSA EQIP focus areas

## 2. Quality Improvement Activities and Participation

2A | QI Committee (meeting attendance)
   | Trauma Audit Committee
   | PreTAC Committee
   | Facilities Committee
   | Medical Advisory Committee
   | EMCC
2B | Participates in common data base systems (below)
   | Electronic PCR
   | EMS Event Reporting
   | QI Activity Tracking
2C | Policies and procedures support EQIP focus areas
2D | Participates in the development of EMS system performance standards and indicators
2E | Participates in the development of thresholds for evaluation of EMS system indicators
2F | Has mechanisms of collecting data
2G | Develops and recognizes improvement based on performance standards
2H | Takes actions to improve care when indicated
2I | Recognizes and rewards positive performance
2J | Assesses effectiveness of remedial actions
2K | Uses effective communication mechanisms to provide feedback to providers and QI participants (email, newsletters, staff meetings, training sessions)

## 3. Training and Education to support Quality Improvement

3A | Fire EMS Training Consortium participant
3B | Participates in QI committee training programs
3D | Utilizes standardized training modules supported by the EMS agency to conduct training
3E | Systems in place to evaluate training needs and training effectiveness

Prepared by: ____________________________ Date: ________________
ACKNOWLEDGEMENT OF QUALITY IMPROVEMENT COMMITTEE CONFIDENTIALITY

As a member of the Contra Costa County Quality Improvement Committee involved in the evaluation and improvement of the quality of care rendered to patients within the emergency medical services system, I recognize that confidentiality is vital to the free and candid discussion necessary to effectively conduct quality improvement activities and is required by Section 1157.7 of the Evidence Code of the State of California. Therefore, I shall respect and maintain the confidentiality of all discussions, deliberations, records and other information generated in connection with theses activities and make no disclosures of such information except to persons authorized to receive it.

It is expected that the confidentiality of all the EMS Quality Improvement information will be maintained by all committee members and members of its subcommittees.

I understand that all affected persons and agencies are entitled to undertake such action as is deemed appropriate to ensure that this confidentiality is maintained, including action necessitated by any breach or threatened breach thereof.

Name:______________________  Title/Agency:______________________

Signature:______________________________________ Date:___________
POLICIES AND PROCEDURES

POLICY #: 8
EFFECT DATE: 07/01/07
PAGE: 1 of 1

SUBJECT: EMS QUALITY IMPROVEMENT PROGRAM (EQIP)

APPROVED BY: Art Lathrop, EMS Director Joseph A. Barger, MD, EMS Medical Director

I. PURPOSE
To identify primary responsibilities of all participants in the Contra Costa County EMS Quality Improvement Program (EQIP) and to ensure optimal quality of care for all patients who access the EMS system.

II. DEFINITION
EMS Quality Improvement Program: An integrated, multidisciplinary program that focuses on system improvement. Methods of evaluation are composed of structure, process and outcome measurements.

III. REQUIREMENTS
A. EQIP includes all Contra Costa County prehospital care providers participating at the level as agreed between the agency and Contra Costa EMS.
B. EQIP indicators will be compliant with the California Code of Regulations, Title XXII, Division 9, Chapter 12 and modeled after the State of California Emergency Medical Services Authority (EMSA) Publication: Emergency Medical Services System Quality Improvement Program Model Guidelines.
C. The oversight for the EQIP will be the responsibility of the EMS Medical Director with advice from stakeholders participating on the Prehospital Quality Improvement Committee.
D. Appropriate QI indicators shall be reviewed at the agency level on a monthly basis and a report of findings shall be made to the Contra Costa EMS Agency at agreed upon intervals. Aggregate data for the EMS System will be maintained by the Contra Costa County EMS Agency.
E. Each Prehospital provider agency shall submit an annual report of quality improvement activities to the Contra Costa County EMS Agency.
F. The Contra Costa County EMS Agency shall provide an annual report of quality improvement activities to the California EMS Authority. This information may be incorporated as part of the Contra Costa County Emergency Medical Services Agency Annual Program Report.
G. All proceedings documents and discussions of the Prehospital Quality Improvement Committee are confidential pursuant to section 1157.7 of the Evidence Code of the State of California.
   a. Each member of the Prehospital Quality Improvement Committee shall sign a confidentiality agreement.
   b. Each agency shall maintain all records in a confidential manner consistent with current patient privacy laws (HIPPAA).

Revised:
EMS QI Indicator Focus Areas

The 2006 EMSA EQIP Guidelines identify eight QI focus areas for the California State Emergency Medical Services System. These guidelines apply to all Local EMS Agencies, EMS providers and Hospitals. They are to be used to evaluate the quality of emergency medical services we provide. These indicators fall under the following categories:

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

As part of this effort the State is working to build consensus around the California EMS Information System (CEMSIS) data elements. These elements will provide the tools needed for standardized objective measures of quality (indicator reports) for the EMS system. Eventually CEMSIS will pull data from each Local EMS Agency provided by EMS providers within the Local EMS Agency’s jurisdiction through Electronic Patient Care Record (ePCR) systems to evaluate the State EMS system. Stakeholders in the EMS system have the ability to meet these requirements in a number of different ways. Agencies with electronic data systems will be building data reports using indicators compliant with CEMSIS. This data will flow into local EMS Agency data warehouses and then into the State data system for analysis.
Access to the State data system will be available through protected internet link to all Local EMS Agencies and provider agencies contributing data. Standardized quality indicators are programmed into CEMSIS and will be populated with available data. All participants will have access to a report generator to allow for custom reports. The State is working with the Office of Statewide Health Planning and Development to link emergency department and hospital discharge data with prehospital care data to provide all participants access to patient outcomes.

EMSA and Local EMS Agencies recognize that resources play a role in EMS provider agencies and receiving hospitals ability to participate in this evaluation process. When sufficient resources are not available to allow full implementation of a data driven QI program, as described in the EQIP guidelines, agencies will be able to meet these QI indicator areas, by participating in activities, that achieve objectives consistent with the eight focus areas. This guideline is meant to be a resource to our agencies and hospitals to identify appropriate activities, data indicators, processes and systems that address the eight EQIP focus areas as part of their own individual EMS QI Plan.

It is important to understand that the eight EQIP focus areas are not limited to the evaluation of an agency’s quality improvement or training program, rather they address the full spectrum of services and the functions that support the EMS system. Examples of how this would look for agencies with large and small resources are described in the EMS Function Indicator Chart that follows.
Indicator codes correspond to details located in Appendix M of the EMSA Quality Improvement Sample Indicators by the California Vision Group on System Evaluation and Improvement. All EMS function indicator areas do not have to be simultaneously monitored. Function area indicators are chosen by each agency, and should be monitored at appropriate intervals. Each agency has the freedom to choose indicators appropriate to their agency size and resources. Selected indicators should be meaningful and address the need for improvement. All agencies are to regularly participate in the Contra Costa County EMS QI program as part of this process. The following are EXAMPLES of activities, processes, programs and indicators that can meet the eight EQIP focus areas. Policies alone are not evidence of compliance and processes such as site inspections, spot checks and tracking systems should be in place to demonstrate compliance. Documentation of these processes is strongly recommended. Internal policies and procedures supporting these eight EMS QI function areas should be identified in the agency QI Plan and reviewed and revised at appropriate intervals. Agencies can also demonstrate compliance by participating in quality activities where the local EMS agency is able to generate reports utilizing ePCR data warehouses.

<table>
<thead>
<tr>
<th>EMS FUNCTION INDICATOR AREA</th>
<th>PROVIDERS WITH FULL IMPLEMENTATION E-PCR</th>
<th>PROVIDERS WITH LIMITED IMPLEMENTATION PCR</th>
<th>PROVIDER WITH PAPER PCR</th>
<th>PROVIDERS WITH DISPATCH</th>
<th>BASE AND RECEIVING HOSPITALS</th>
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<tbody>
<tr>
<td>Personnel</td>
<td>WELLNESS WORKLOAD POLICIES AND PROTOCOLS ED1 Education and training indicator A, B (if provider has EMT-1 training school)</td>
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<td>WELLNESS WORKLOAD POLICIES AND PROTOCOLS BH1 Base Hospitals- Activity Indicator B-D</td>
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<tr>
<td>Equipment &amp; Supplies</td>
<td>Preventative Maintenance Plans Pharmaceutical inventory control ePCR system infrastructure support IT support policies and resources Mechanisms to deliver ePCR to facilities</td>
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<td>Preventative Maintenance Plans Communication coverage protocols IT support policies and resources Contingency plans</td>
<td>Inventory control policies ePCR system infrastructure support (ability to receive and incorporate ePCRs) into patient record</td>
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<td>INDICATOR</td>
<td>PROVIDERS WITH FULL IMPLEMENTATION E-PCR</td>
<td>PROVIDERS WITH LIMITED IMPLEMENTATION PCR</td>
<td>PROVIDER WITH PAPER PCR</td>
<td>PROVIDERS WITH DISPATCH</td>
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<td>Skills Maintenance &amp; Competency</td>
<td>Policies and monitoring mechanisms regarding: Scope of Practice Skills utilization evaluation Infrequent skills Review of success rates (Benchmarking) EMSA Core Indicator SK1: A-J Orientation policies and programs Competency standards and assessments Educational needs assessments/testing Provider improvement plan policies and procedures Performance reviews and HR supporting policies to address remediation</td>
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<tr>
<td>Transportation and Facilities</td>
<td>Response times, Wait times, Specialty care center destination policies and procedures EMSA Core Indicators: AC2:A-D if able to collaborate with PSAP. AC3: A-D, EMS Dispatch Center (if able to collaborate with PSAP. TR1:A-G,I-O Air Transport utilization indicators and/or ePCR data elements</td>
<td>Response times, Wait times, Specialty care center destination policies and procedures EMSA Core Indicators: AC2:A-D if able to collaborate with PSAP. AC3: A-D, EMS Dispatch Center (if able to collaborate with PSAP. RF1:A,B,C,E,. TR1:A-G,I-O Air Transport utilization indicators and/or ePCR data elements</td>
<td>Response times, Wait times, Specialty care center destination policies and procedures Paper sampling of EMSA Core Indicators: AC2:A-D if able to collaborate with PSAP. AC3: A-D, EMS Dispatch Center (if able to collaborate with PSAP. RF1:A,B,C,E,. TR1:A-G,I-O Air transport utilization case review</td>
<td>Response times, Wait times, Specialty care center destination policies and procedures Paper sampling of EMSA Core Indicators: AC2:A-D if able to collaborate with PSAP. AC3: A-D, EMS Dispatch Center (if able to collaborate with PSAP. RF1:A,B,C,E,. TR1:A-G,I-O Air transport dispatch protocols</td>
<td>EMSA Core Indicators: BH1: B,C,D RF1: A-E Trauma Centers TH1: A,B TR1: A-G,L-O Off load times Trauma destination review Base destination review Policies and procedures to support above Reddinet communication of trauma and CT diversion Air transport case review</td>
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<td>INDICATOR</td>
<td>PROVIDERS WITH FULL IMPLEMENTATION E-PCR</td>
<td>PROVIDERS WITH LIMITED IMPLEMENTATION PCR</td>
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<tr>
<td><strong>Documentation</strong></td>
<td>Policies and Procedures in place supporting electronic PCR completion for each patient contact</td>
<td>Policies and Procedures in place supporting PCR completion for each patient contact</td>
<td>Policies and Procedures in place supporting PCR completion for each patient contact</td>
<td>Policies and Procedures in place supporting 911 call documentation for each patient contact</td>
<td>Policies and Procedures in place supporting appropriate documentation completion for each patient contact</td>
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<td></td>
<td>Training, education and compliance monitoring of electronic PCR documentation</td>
<td>Training, education and compliance monitoring of PCR documentation</td>
<td>Training, education and compliance monitoring of PCR documentation</td>
<td>Training, education and compliance monitoring of 911 documentation</td>
<td>Training, education and compliance monitoring of Base contact documentation</td>
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<tr>
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<td>Quality review processes in place for AMA’s, Field pronouncements and PCR completion using ePCR data monitoring</td>
<td>Quality review processes in place for AMA’s, Field pronouncements and PCR completion using ePCR data</td>
<td>Quality review processes in place for AMA’s, Field pronouncements and PCR completion using ePCR data</td>
<td>Quality review processes in place for 911 call documentation and review</td>
<td>Quality review processes for Base contact documentation completion and wave file review</td>
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<td>Mechanisms in place to identify and track EMS patient documentation</td>
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<td>Mechanisms in place to identify and track EMS patient documentation</td>
<td>Mechanisms in place to identify and track EMS patient calls</td>
<td>Mechanisms in place to identify and track EMS patient documentation</td>
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</tbody>
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**Documentation of orientation and continuing education in compliance with state and local guidelines**

**Patient confidentiality policies and processes in place in compliance with HIPAA**
<table>
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<tr>
<th>INDICATOR</th>
<th>PROVIDERS WITH FULL IMPLEMENTATION E-PCR</th>
<th>PROVIDERS WITH LIMITED IMPLEMENTATION PCR</th>
<th>PROVIDER WITH PAPER PCR</th>
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<th>BASE AND RECEIVING HOSPITALS</th>
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<tr>
<td>Risk Management</td>
<td>Issue resolution process in place</td>
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<td>Post incident review process in place</td>
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<td>Compliant with 1798.200 Health and Safety Code reporting requirements</td>
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<td>Processes in place to assure CAL OSHA required training of providers</td>
<td>Processes in place to assure CAL OSHA required training of providers</td>
<td>Processes in place to assure CAL OSHA required training of providers</td>
<td>Processes in place to support CAL OSHA requirements for prehospital providers</td>
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<td>Internal policies and procedures OSHA compliant</td>
<td>Internal policies and procedures OSHA compliant</td>
<td>Internal policies and procedures OSHA compliant</td>
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<td>Remediation processes in place to support positive corrections</td>
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<td></td>
<td>Personnel and patient safety reporting system &amp; monitoring in place</td>
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</table>
EMS Toolkit Resources

- Toolkit Bibliography
- CQI and QA: What’s the difference
- The Plan Do Check Act Cycle (PDCA)
- Rapid Cycle Improvement within the EMS System
- QI/QA Models
- CQI Process Improvement and Problem Solving Sequence
- Planning a Change
- Five Steps of Risk Management
- Risk Evaluation
- Lean Six Sigma: A primer
This QI toolkit contains content and resources adapted from many sources. The information contained in this document is intended for education use. Distribution and use of the material shall not imply approval of any of the reference materials used in completing this document:


2. California Code of Regulations Title 22: Division 9: Pre-hospital Emergency Medical Services, Chapter 12. EMS System Quality Improvement


5. Nebraska Health and Human Services EMS, “Measuring Success Through Quality Improvement”

6. Institute of Medicine, “Crossing the Quality Chasm: A New Health System for the 21st Century” March 2001


9. New York City Dept. of Health and Mental Hygiene, “Quality IMPACT Basic CQI Course” 2007


12. Institute of Medicine, “EMS at the Crossroads” 2006


# CQI and QA: What’s the difference

<table>
<thead>
<tr>
<th>CQI: Continuous Quality Improvement</th>
<th>QA: Quality Assurance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus is on systems first and individual performers second. <em>Measures what your current processes are and creating systems to make things better.</em> Not focused on blame.</td>
<td>Focus is on human error and identifying and eliminating outliers (poor performers). <em>Making sure you (individual) are doing the right things in the right way.</em></td>
</tr>
<tr>
<td>Strives to ensure that policies, procedures and protocols <em>make sense</em> and meet the current and evolving needs of the <em>patient</em>.</td>
<td>Strives to ensure that individuals <em>are following</em> their policies, procedures and protocols.</td>
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<tr>
<td>Relies on <em>teamwork between different groups</em> in the system, as those closest to the problem usually have the best ideas about the solution.</td>
<td>Relies on <em>following the rules and policies</em> of the organization to meet the standards required by regulatory and accrediting bodies.</td>
</tr>
<tr>
<td>Involves both <em>prospective and retrospective</em> review. <em>It is aimed at measuring where you are and creating systems to make things better</em></td>
<td>Involves <em>retrospective policing</em> and may be punitive</td>
</tr>
<tr>
<td>Utilizes <em>system-wide goal setting</em> to address incremental improvement within processes.</td>
<td>Utilizes <em>individual goal setting</em> to address individual improvement</td>
</tr>
<tr>
<td>Monitors improvements in quality of care through <em>continuous</em> review.</td>
<td>Monitors compliance through <em>periodic</em> audits and inspections.</td>
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<tr>
<td><strong>Relies on leadership</strong> to improve quality. A top down commitment to quality has shown to produce best outcomes.</td>
<td>Activities can be carried on independent of strong leadership.</td>
</tr>
<tr>
<td>Requires effective communication throughout the organization at all levels. <em>Focus is on breaking down barriers to improve constantly.</em></td>
<td>Communications are <em>focused on individuals</em> involved.</td>
</tr>
<tr>
<td><strong>Utilizes tools, data analysis to demonstrate improvement by providing feedback to all parties.</strong> Uses <em>best practices</em> shown effective. “No need to re-event the wheel”. Incorporates evidence-based care.</td>
<td><em>QA is an activity that is part of QI</em> and needed to establish confidence that performance is at a high standard in advance.</td>
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<td>Relies primarily on <em>individual performance evaluation</em> and <em>personal improvement plans</em>.</td>
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</table>
Rapid Cycle Improvement Within the EMS System

Design a protocol
- define indicators
- set parameters of study

Collect data

Implement changes

Brainstorm changes

Analyze data

Report findings
RISK EVALUATION

In evaluating risk determine the likelihood that a harmful event may occur. When evaluating probability look at the number of times a specific event has occurred over a given period of time. With this information you can determine where the incident fits into one of the four categories above. What is important is to remember that usually the most severe incidents are the least common and that the fact that simply because an event has never occurred in an organization or region does not mean that the incident will never occur.

During risk evaluation the following questions should be answered?
- What is the risk?
- Has the risk occurred locally?
- How does this organization compare to the national occurrence of this event?
- What is the probability of different outcomes?
- What are the consequences should these outcomes occur

The next step is to prioritize or rank the areas that need to be addressed. Determine the potential outcome based upon 3 factors. Severity, probability and exposure.

Total Risk = (S)everity x (P)robability x (E)xposure
Lean Six Sigma (LSS): A Primer

**Sigma:** Greek word used in statistics to stand for the amount of variation seen in a process, set of data or anything you can measure

**Introduction**

The purpose of this primer is to give you an introduction to Lean Six Sigma. Six Sigma is one of the most widely used quality improvement methods available today. Lean Six Sigma is a streamline version of Six Sigma. Lean Six Sigma is an “improvement method” that uses data to identify and eliminate process problems. It is also an improvement “engine” because it’s ability to re-design roles, procedures inside an organization so that work generates results continuously.

Even if your organization does not use Lean Six Sigma to it’s full extent there is very little downside to getting involved. The kind of training and education offered through Lean Six Sigma enhances your effectiveness no matter what your roll. The upside potential of LSS is enormous. You can get rid of a lot of waste which will save you time and make your work more meaningful and develop decision making, problem solving and teamwork skills while making a difference to your organization. LSS has a proven track record of success in all types of organizations and adapts well to “service” focused systems such as EMS. The California EMS Authority is currently training their quality professionals in this model.

Six Sigma has problems in that it requires extensive education and has fallen into the trap of the number of “belts” trained within an organization as a measure of success. However it does not matter how many Six Sigma “green or black belts” you have in an organization if they cannot find and fix the long response times, treatment errors, customer dissatisfaction, time and financial waste. LSS uses a handful of tools that can solve about 90% of the problems and is focused on what works. LSS is focused on reducing delay and non-value-added activities. It uses essential Six Sigma tools for reducing defects and variations. The application of the 4-50 rule and a handful of tools make the difference. “Lean Six Sigma is a journey, not a destination.”

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1. [Source 1]
2. [Source 2]
“It takes all the elements, working together, to create real solutions. Any of the elements alone are not enough. You need to combine the creativity of people working on the process with data and with an understanding of customers and processes.”

Top 10 Ways You Know You Need Lean Six Sigma

1. Customers still complain about your services
2. Employees complain about roadblocks to serving patients
3. Blaming customers
4. Blaming employees
5. Customers become frequent flyers or use system inappropriately
6. Costs climb
7. Customers switch to your competitors
8. Productivity flat lines or falls
9. Margins thin
10. Growth Stagnates or shrinks

What is variation and why is it important?

Variation is one of the most common sources of problems in a process. There are lots of process improvement methods but most serve the two purposes. One of those is to eliminate variation in quality and speed. In every action there is variation. What is important is to look at the “way” something varies. These patterns in the variation can expose the cause of problems and point the way to solutions. Explore how each task is completed and how long that task takes. Is the task done in the same way all the time? Is there any easier way to do the task more quickly? What gets in the way of people being able to do the task the way it is supposed to be done?
Lean Six Sigma Pearls

- 4% of the methods and tools will give you over half of the benefit.
- LSS is a toolkit for helping you think “outside the box”
- Unnecessary complexity adds cost, time and enormous waste.
- Teamwork is essential. Work towards having an environment where people are encouraged to work together every day. People can discuss and resolve problems openly and don’t use issues against each other. There is a feeling that we are all in this together.
- Anything that does not meet the customer needs is a “defect”
- It is easy to make improvements in a bad process but very difficult to improve a process that is already working fairly well
- Is result oriented, project-focused approach to quality, productivity and profitability
- Defines customers broadly as both internal and external to the organization or system
- Internal processes can leak cash like a rusty bucket
- It is important to blame processes and not people
- Errors are not your fault or the fault of your people. It’s your systems and processes that are at fault; they let people make mistakes that could be prevented.
- Delays between the steps in your processes cost you time and money and dampen your productivity and profitability
- Watch your product or service, not your people: Time taken to fix defects, mistakes and errors that shouldn’t have happened in the first place consumes time and money that could be better spent serving customers.
- Watch your process, not your people. Control variation, the small and large differences from day to day month to month of your services. Even a small
reduction in delay, defects and variation in your process can give you a substantial improvement.

- In addition to variation as one of the most common sources of problems with a process work flows also are a major source. The hand-offs from one person or workstation to another. The physical path that the work follows in the field. One of the best ways to look at this aspect is to draw a map or flowchart of the process. The teams have to examine every step and ask “Is this step necessary? What value does it bring to the customer?”

- Implement a proven improvement system. Most processes are created by accident in an ad hoc way, problems with processes are fixed using common sense and trial and error over time. Eventually these methods do not solve the complex problems organizations and systems face and may stop working all together. A few key LSS tools used in the right sequence can provide immediate breakthrough improvements in speed, quality, productivity and profitability.

- Methods and tools are the easy part: changing the culture is hard.

- LSS will not fix everything about your organization or system. It does not fix customers, poor morale or poor leadership. It is a management system that can improve morale, leadership and services indirectly. It can help you understand and serve your customers better.

The Universal Improvement Method

Regardless of the acronym used for process improvement- TQM, PDCA, CQI, FOCUS, DMAIC etc.- the over-arching method is the same and is it’s acronym is FISH for FOCUS, IMPROVE, SUSTAIN AND HONOR. These are the central components of LSS. Organizations that achieve success over time know how to “FISH”. It allows for realistic improvement over time.

LSS Process

- **Focus** on key problem areas by counting and categorizing your delays, defects, misses, mistakes, errors and variation. Focus on one key problem, skill or area of your business life at a time. Identify one mission-critical problem to solve. It should be something you can affect directly. “Make the invisible visible” use data, charts, graphs to help define and measure the issues.

- **Improve** by eliminating delays, defects and variation. Improve significantly in that area. Get started, but start simply, inexpensively. Reduce delay. Most delay happens “between” activities. Count your misses, events, defects and plot them on a line graph. Categorize your misses and display using a pareto chart. Analyze the root causes of these processes or issues and how to prevent them using a fishbone diagram or countermeasures matrix.

- **Sustain** the improvement by monitoring key measures and responding if they become unstable. Sustain improvement through repetition and practice until it becomes an unconscious habit. Measure and monitor to ensure that you sustain the new, higher level of performance. Sustaining change and improvement is one of the most difficult things to do. It is easy to fall back into old patterns. Re-measuring processes at regular intervals helps keeps you informed on how well
you are doing over time. There are many different tools to help you look at data in different ways. Control charts will tell you when something abnormal happens to your process. Reports can be built to help alert you to potentially unstable conditions so you can take action.

- **Honor** your progress with simple rewards. Then review what you’ve learned and refocus on another area for improvement. Many times we make improvements and forget to honor the progress made. It is important to connect pleasure with improvement. Develop a system of rewards and recognition. Without rewards the quest for improvement can be lost. So periodically it is important to look back over the last week, month and year and ask
  - What worked? What have you learned?
  - What have you accomplished?
  - How have you grown?
  - What’s next?

### The 4-50 Rule

Pareto’s 80/20 rule states that 20% of what you do will produce over 80% of the results. The 4/50 rule is a refinement of this model that states the 4% or what you do will create over 50% of your results. This is where you should spend your time. You do not have to improve everything, just a few key things that really matter. Two tools that can help narrow your focus are:

- **Voice of the Customer Analysis** to understand the links between what customers want and what you do.

- **Balanced Scorecard** to establish key measures and targets for improvement in four key areas: financial, customer satisfaction, quality and growth.

### Skills for Effective Teams

- Set goals
- Assign accountability
- Handle conflict
- Pay attention to how decisions are made
- Make sure you have effective meetings
- Foster continuous learning
- Collaborate with other groups

### Base Decisions on Data and Facts

Data and facts are the foundation of LSS. Have a rule that people must support their opinions with facts. Facts and data save a lot of trouble and prevent a lot of wasted time and money. Learning to use data to support decisions is challenging. Common roadblocks include a lack of available data, little training in collecting and analyzing data
and historical pattern of using data only to punish or reward individuals, not make decisions about improvement. ¹

Once the decision to use data has been made the next issue is “what kind of data?” Most data falls into two categories:

- **Result measures**: reflect the outcome of a process or procedure
- **Process measures**: reflect what goes on to produce the result

The four typical types of data that teams find useful are¹

- Customer satisfaction (result measure)
- Financial outcomes (result measure)
- Speed/lead time (result or process measure)
- Quality/defects (result or process measure)

**Five laws of Lean Six Sigma¹**

- Customers are important
- Speed, quality and low cost are linked
- You need to eliminate variation, defects and focus on process flow if you want to deliver quality, speed and low cost
- Data is critical to decision-making
- People have to work together to make the kinds of improvements customers will notice

**DMAIC (Define-Measure-Analyze-Improve-Control)¹**

DMAIC (pronounced dub-MAY-ick) is the process improvement method used in Six Sigma and Lean Six Sigma for making improvements that last. It forces teams to confirm the nature and extent of problems. Identifies the true causes. Finds solutions that evidence shows are linked to the causes and establishes procedures for maintaining the solutions even after the project is done.

**Six Things Managers Must Do to Support Lean Six Sigma¹**

- Pick the right projects
- Pick the right people
- Follow the method
- Clearly define roles and responsibilities
- Communicate, communicate, communicate
- Support education and training
Sources:
