

Emergency Medical Services Quality Improvement Program (EQIP)



Santa Clara County Emergency Medical
Services System

2014

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I. Purpose

The purpose of the EMS Quality Improvement Plan (EQIP) is to provide structure and guidance for the quality improvement (QI) coordinators of EMS providers within Santa Clara County. The EQIP describes the layout, requirements, and responsibilities of quality improvement programs at county and private provider levels. The EQIP also provides a detailed description of the administrative and committee structure of the Santa Clara County EMS Agency's QI network.

A. Organization Mission, Vision and Values

1. Mission Statement

"The mission of the Santa Clara EMS System is to evolve a cost-effective, collaborative, and outcome-based EMS delivery system that produces clinically superior and culturally competent care, while achieving high levels of patient satisfaction from the people of Santa Clara County."

2. Vision Statement

"We envision a comprehensive, accessible, and sustainable EMS delivery system, realized through collaboration, which provides clinically superior, efficient, and innovative care."

3. Values

The Santa Clara County EMS Agency values:

Dignity and Respect: We treat people with dignity and respect.

Progressive Innovation: We are dedicated to the continuous improvement of our processes and systems, based on science, data, and best practices.

Professionalism and Objectivity: We treat all individuals and organizations professionally, fairly, and without prejudice.

Leadership: We lead through collaboration and facilitation to ensure accountability, the provision of quality patient care, while ensuring fiscal and operational stability.

Participation: We value the contributions of the public, other agencies, and organizations in the development, implementation, and evaluation of the Santa Clara County EMS System.

4. EMS System Motto

"Innovative EMS in the World's Capital of Innovation"

II. Structure and Organizational Description

1. Description of the Quality Improvement Unit at the EMS Agency
 1. The Santa Clara County EMS Agency is a division of the Public Health Department. The EMS director is the head of the agency that is responsible for all components and aspects of the EMS system through the director of public health and the county chief executive officer. The EMS director reports to the Santa Clara County Board of Supervisors.
 2. The EQIP defines the following components of the EMS Quality Improvement Program:
 - a) Provides oversight for all EQIP activities.
 - b) Develops, aggregates, and evaluates data for all EQIP indicators in compliance with Title XXII, Division 9 Chapter 12, and the State of California Emergency Medical Services Authority (EMSA) Publication # 164, Emergency Medical Services System Quality Improvement Program Model Guidelines.
 - c) The EMS medical director provides oversight for all EQIP with advice from the Prehospital Care System Quality Improvement Committee (PCSQIC).
 - d) All prehospital provider agencies shall review and submit QI Indicators on a monthly basis to the Santa Clara County EMS Agency. All data from the EQIP indicators will be maintained by the Santa Clara County EMS Agency.
 - e) Each prehospital provider agency submits an annual report of quality improvement activities to the Santa Clara County EMS Agency, in accordance with the EQIP guidelines detailed in Appendix A.
 - f) The Santa Clara County EMS Agency updates goals and provides an annual report of all quality improvement activities to the State EMS Authority.
 3. The EMS medical director oversees all medical and clinical components of the EMS system. This includes policy and protocol development, all equipment approval, emergency medical dispatch, base station standing order protocols and continuous quality improvement. The EMS medical director is assisted by the quality improvement unit and support staff, which consists of:
 - a) The Clinical Section Manager: This position is responsible for clinical specialty care programs, specialty care systems, clinical quality improvement activities and services, including data collection, committee support, and ongoing evaluation of service delivery.
 - b) The EMS Specialist/Quality Improvement Coordinator: This position is responsible for the development and implementation of the local EMS Agency (LEMSA) quality improvement (QI) plan, oversight of prehospital QI process, outcome, and education. It also serves as clinical liaison to all prehospital providers and the base station.
 - c) The EMS Specialist/Strategic Initiative Support Coordinator:

- d) The EMS Epidemiologist: This position collects and analyzes data pertaining to QI and composes data reports as mandated by the LEMSA.

2. EMS Agency Organizational Chart

The EMS Agency organizational chart depicts the complete reporting structure of the Santa Clara County EMS Agency and the latest version can be found at the Santa Clara County EMS website.

3. Committees that Influence and Direct Quality Improvement

The following committees play a crucial role in the development and refinement of clinical care and clinical practice within the EMS system. Data is presented (as is outlined in this plan) within the QI committees to inform the prehospital providers and stakeholders on the quality performance of each respective medical specialty service. The QI committees are as follows:

1. Prehospital Care System Quality Improvement Committee (PCSQIC):

This committee reviews and studies all aspects of EMS prehospital care, identifies trends through the use of quality indicators, and provides system insight to providers. Membership of the committee consists of representation from all prehospital provider agencies in the county. This committee receives information from all of the other QI committees in order to inform prehospital providers.

2. The Medical Control Advisory Committee (MCAC):

This committee advises the EMS medical director on the development and improvement of prehospital medical policies and protocols. Membership of the committee consists of:

- a) The base hospital medical director;
- b) A physician representative from every hospital emergency department in the county;
- c) The medical director or his/her representative from each prehospital provider agency in the county;
- d) The EMS coordinators of each prehospital provider agency; and
- e) The EMS specialist/quality improvement coordinator.



Figure 1 - Quality Committees Reporting Structure

3. EMS Air Resource Utilization Quality Improvement Committee (EARUQIC):

This committee reviews the operational aspects of EMS air resources use within the Santa Clara County EMS system. Clinical issues are routed to appropriate committees. This is an open meeting and membership is not required for participation.

4. Trauma Care System Quality Improvement Committee (TCSQIC):

This committee includes members from the TEC as well as multidisciplinary members of trauma centers, emergency care providers, and medical specialties such as neurosurgery and orthopedics. The TCSQIC is the medical care review committee, as well as, an advisory group for trauma system issues.

5. Stroke Care System Quality Improvement Committee (SCSQIC):

This committee is a multidisciplinary committee composed of stroke medical directors, primary stroke center coordinators, EMS medical director, and other system stakeholders, as required. Major responsibilities include monitoring stroke system performance and recommendations for system improvement.

6. Cardiac Care System Quality Improvement Committee (CCSQIC):

This is a multidisciplinary committee comprised of STEMI center medical directors, STEMI center program managers, EMS medical director, the base hospital physician liaison, the base hospital nurse coordinator, representatives of medical control

advisory committee, and other system stakeholders, as needed. The major responsibilities of this committee include monitoring the STEMI system performance, as well as, recommendations for system improvement.

7. EMS Command and Control Quality Improvement Committee (ECCQIC):

This committee addresses the operational aspects of EMS response and mitigation including incident review, planning for events, WMD/disaster medical services, and provider agency operational reports. This committee is open to Santa Clara County EMS system providers only.

III. Statement of EMS QI Program Goals and Objectives

1. What is Quality?

Many authorities have offered their definition of quality. They have defined quality as:

“...satisfaction of Customers”—Edward Deming

“...fitness for intended use” —Joseph Juran

“...conformance to requirements” —Phillip Crosby

However, quality is not the entire story. As Joseph Juran points out, value is what most of us really want. Value can be defined as the level of quality *divided by* the cost of providing a given level of performance.¹

$$Value = \frac{Quality}{Cost}$$

But this still brings us back to the question, “What is quality in Emergency Medical Services?” For the sake of this discussion, quality is defined as, “Providing the right care at the right time for a patient in the prehospital environment.” To accomplish this, we need to understand two things:

1. What is the correct, most appropriate care?
2. When is the correct time?

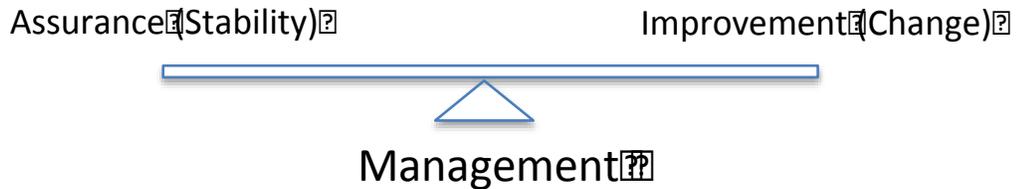
Various approaches have been used in an attempt to accomplish these two items. It is important to understand these three approaches. Quality is:

Quality Assurance – is the attempt to maintain a given level of quality or performance.

Quality Improvement – is the attempt to improve the level of quality or performance.

Quality Management (or simply management as depicted below) – is the balance of the first two approaches.

¹ Juran Quality Handbook.



It is important to note, we are not just talking about clinical quality or performance but instead are talking about everything that an organization does to provide care and service to the citizens they serve.

2. Santa Clara County's Approach to Quality

The clinical QI program for the Santa Clara County EMS system employs a process that begins with prehospital provider agencies and moves up through the LEMSA and ends with the state Emergency Medical Services Authority (EMSA). The Local EMS Agency (LEMSA), in conjunction with the prehospital provider agencies, develops and implements QI programs that are required based on frequency of monitoring identified by the LEMSA. In addition, each prehospital provider agency and facility will submit an annual report of QI activities to the LEMSA. The LEMSA incorporates the provider agency's QI activity reports into its annual report of QI activities, which is sent to the California EMSA.

Through a combination of performance indicators and clinical care/system demographics reports submitted to the various committees, the Santa Clara County EMS Agency monitors the clinical and operational effectiveness of the major initiatives of patient care in Santa Clara County, which are prehospital care, trauma, stroke, STEMI, and EMS for children. The data derived from the clinical indicators/reports at the individual provider agencies, is the basis for performance improvement within the EMS system. These reports are provided to various subcommittees and the Santa Clara County Board of Supervisors.

The LEMSA has the duty and regulatory authority to explore issues, perform root cause analyses, and implement corrective actions designed to correct any problem(s) identified. Clinical issues may be brought to the attention of the LEMSA from providers (individual), provider agencies, physicians, nurses and others (public). This applies to all EMS service providers in the county (fire departments, 911 transport agencies, and interfacility transport providers). **Concerns, unusual occurrences, and complaints regarding EMS activity and/or practices should be reported to the EMS Agency as a system variance report.** See Policy 108: System Variance Reporting in the Santa Clara County Emergency Medical Services Prehospital Care Manual for the system variance reporting process.

Additionally, there may be issues that require development of standards used to target performance in Santa Clara County. The LEMSA will develop, with the advice from the system stakeholders, the indicators to be used. All provider agencies will measure performance against established benchmarks and standards of care.

Specific quality goals are outlined annually in the Annual Update Document.

Our plan is to ensure that the communities of Santa Clara County receive state-of-the-art quality prehospital care. The following highlights the overall approach to assuring the patients receive the highest level of care possible.

IV. Measuring Performance

When measuring performance three types of indicators should be evaluated. These include:

A. Rule indicators

Rule indicators are standards or protocols where a variance does not cause an adverse patient outcome. In reference to Policy 108: System Variance Reporting, rule indicators would generally be classified as a Level B Variance, in which a variance was documented but no negative patient outcome occurred directly because of it.

B. Key performance indicators (KPIs)

Key performance indicators are rates that represent processes crucial to the EMS system performance. Of particular interest is the delineation between special cause and common cause variation.

1. Special Cause Variation

Special cause variation arises when there is a given assignable cause for the observed data that is not thought to be inherent to the process being measured.

2. Common Cause Variation

Common cause variation assumes that the observed variation is inherent to the process being measured. This delineation between the two is crucial as actions required of these two types of data differ. Within each key result area (KRA) we use statistical process control charts to monitor and focus on improving performance of a number of KPIs. As outlined in the model below, one of three actions could result from the monitoring of KPIs.

C. EMS System Variance Indicators

EMS system variance indicators are situations in which a variation in treatment or practice results in an adverse outcome, complaint, or a conflict.

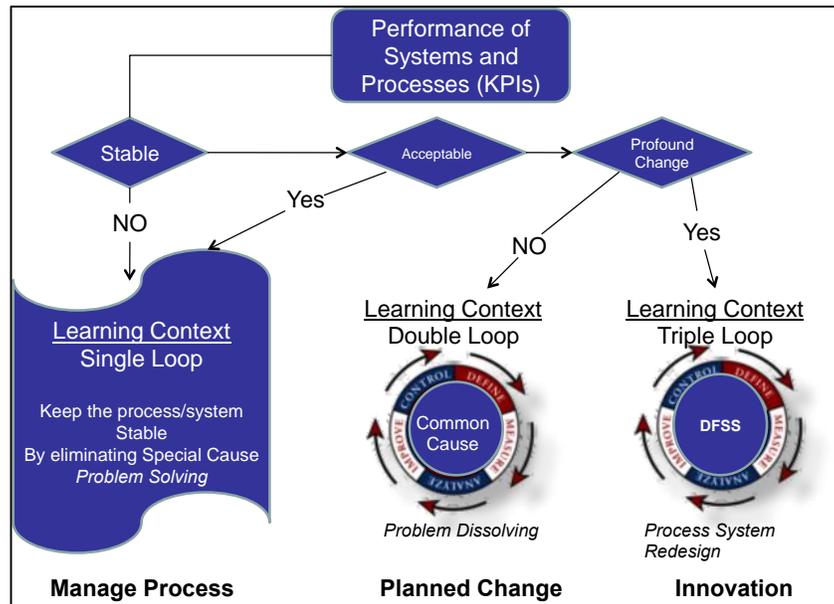
D. Management of Systems and Processes

1. If it is determined that performance is not meeting required or desired expectations but no special cause is identified, then, based on prioritization of projects, a quality improvement project may be initiated. In the course of the project, common cause variation will be evaluated and the process will be redesigned in such a manner that it is capable of producing the desired level of performance.

2. On occasion, it may be determined that an entirely new process is required to meet the needs of patients and/or customers. In this scenario, a design of

experiment project will be initiated with the goal of designing a new process that will meet or exceed the level of performance expected by patients and/or customers.

3. The following figure outlines the decision-making algorithm in the management of systems and processes.



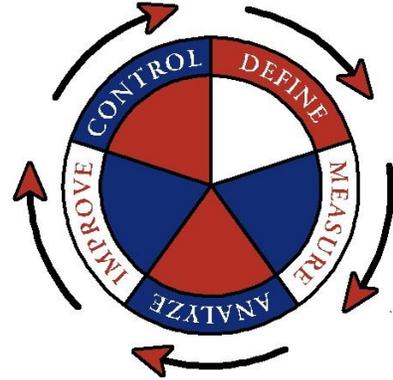
4. LEAN – Six Sigma

- a) Lean-Six Sigma is a project-oriented process improvement methodology that is aimed at creating processes that perform to specification levels with high degree of accuracy. A process that is performing at the Six Sigma quality level only results in 3.4 defects or errors per million opportunities. While it may be overly optimistic to expect that a process such as endotracheal intubation can perform at a level where only 3.4 intubation attempts are unsuccessful out of the next million attempts, the goal is to utilize the tools of Six Sigma to create processes that are as robust and error proof as possible. The Six Sigma methodologies, composed of five phases each, bear the acronyms DMAIC.

DMAIC is used for projects aimed at improving an existing process.

V. The DMAIC Project Methodology:

A. **Define:** The process starts by clearly understanding the problem or issue at hand. Next, the Six Sigma team strives to understand the voice of the customer. A clear understanding of customer expectations provides a platform for determining elements that are critical to quality. Then critical to quality goals can be established that will exceed customer expectations. By establishing goals that are customer centric, the organization stands to gain the most return on investment from the efforts of its Six Sigma team.

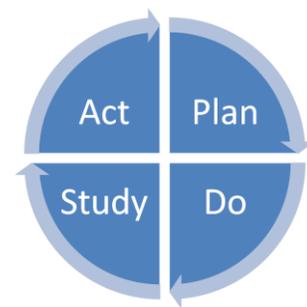


B. **Measure:** The measure phase of a Six Sigma project involves assessing current performance of critical to quality metrics and the establishment of a clear and understandable baseline. Often the process of assessing current process performance involves an evaluation of the accuracy and precision of currently available data. This upfront attention to measure accuracy and precision eliminates problems that can result at later stages of the Six Sigma process related to misinterpretation or inaccuracy of data.

C. **Analyze:** Once the Six Sigma team has established a clear and understandable baseline that is accurate and appropriately precise for the project at hand, the Six Sigma team is ready to consider changes that can be made to the variables that are most responsible for producing outputs. In this stage, effort is given to identifying cause and effect relationships with the goal of identifying the factors/variables that are most influential in producing the desired output.

D. **Improve:** During the improve phase, the PDSA (Plan, Do, Study, Act) model can be used to implement and evaluate improvements.

1. **Plan** - Understanding of the process gleaned from the analyze phase is used to make planned changes to the process.
2. **Do** – Such changes should be implemented as a pilot test or designed experiment.
3. **Study** - As a means of assessing the efficacy of changes made to the process, post-change performance is assessed and compared to baseline performance. This can be done with pre and post comparison of control charts or more advanced statistical methods.
4. **Act** – Finally, adjustments are made as necessary and then changes are implemented system-wide.



The PDSA cycle continues to be repeated until the desired actions are achieved.

E. **Control:** Once improvements have been made to a given process, control mechanisms are put in place to insure sustainability of desired results. Tools such as

statistical process control charts are used to detect the future state of any deviations from target and to allow for rapid correction before they result in adverse or undesired outcomes.

VI. Responsibilities of Key Stakeholders



- A. The path to excellence is a model for building an EMS system that minimizes occurrences of clinical variance and need for disciplinary actions by focusing on hiring the best employees and developing an open system of performance measurement and evaluation, provider feedback, system participation, and standardized processes.

The following outlines the activities required of various participants at each stage of the Path to Excellence.

1. The EMS Agency is responsible for development, implementation, and monitoring of the overall comprehensive quality improvement plan (EQIP – EMS Path to Excellence).
2. The comprehensive plan EQIP – EMS Path to Excellence is comprised of seven steps. Listed below are the stakeholder responsibilities of each step.
3. In addition to the comprehensive EQIP, each provider agency is required to have its own quality improvement plan.
4. Each year the EQIP will review quality improvement efforts and will update all stakeholders on quality improvement efforts.

B. EMS Agency

1. Step 1 - Hire the Best Employees

- a) Ensure the EMS Agency provides all individuals involved in quality improvement with the requisite quality improvement education and training needed to perform their respective roles.
- b) Certify/authorize prehospital personnel.
- c) Communicate educational and training needs to the appropriate training venues.
- d) Approve prehospital education and training programs.
- e) Evaluate the impact of education/training activities on EMS performance.
- f) Support provider agencies in the implementation of quality plans.

2. Step 2 - Set and Communicate Standards of Performance

- a) Develop a comprehensive EQIP.
- b) Educate stakeholders on their respective role in the EQIP.
- c) Provide education and training on quality improvement to stakeholders.
- d) Ensure the EMS Agency adheres to all local, state and federal regulations.
- e) Coordinate quality improvement committees.

3. Step 3 - Measure Performance

- a) Aggregate key performance indicator data on a monthly basis.
- b) Develop and present statistical process control charts of system performance for all three types of performance indicators.
 - Rule indicators
 - Key Performance Indicators
 - EMS Systems Variance

4. Step 4 - Provide Periodic Feedback

- a) Provide statistical process control chart feedback to each provider agency monthly.
- b) Provide updates on system performance for the various quality committee meetings.
- c) Provide continuous updates to the medical director.
- d) Support the medical director in reviewing annual performance and in creating periodic and annual updates.

5. Step 5 - Manage Systems and Processes

- a) Investigate special cause variation.
- b) Charter and facilitate quality improvement project teams aimed at improving key system processes.
- c) Support provider agencies in the implementation of improvement efforts.
- d) Provide real-time system support for:

- Multi-casualty situations.
- Periods of excessive hospital diversion.
- Periods of prolonged hospital wall time.

6. Step 6 - Manage Poor Individual-Level Performance

- a) Approve individual improvement/development plans for poor performers.
- EMS provider agencies will work in conjunction with the EMS medical director to execute performance improvement plans.

7. Step 7 - Take Individual-Level Corrective Actions

- a) As a last resort and in situations involving gross negligence, the EMS medical director will assist EMS provider agencies with corrective actions and referrals to EMSA, as deemed appropriate.

- C. Communications/Dispatch
1. Step 1 - Hire the Best Employees
 - a) Provide new employee orientation that sets the standard for performance.
 - b) Provide continuing education/training that integrated the knowledge glean from all performance improvement activities.
 - c) Maintain current certifications
 2. Step 2 - Set and Communicate Standards of Performance
 - a) Participate in quality improvement committees as appointed.
 - b) Insure that all policies, procedures and protocols comply with local, state and federal regulation and standards.
 - c) Make changes to internal performance standards as needed to support system performance.
 3. Step 3 - Measure Performance
 - a) Develop system performance indicators based on:
 - High-risk
 - High-volume
 - Agency requirements and improvement efforts
 - In-house improvement effortsDevelop individual performance indicators based on
 - Tape reviews
 - EMD QI Software
 - National Standards
 4. Step 4 - Provide Periodic Feedback
 - a) Provide system performance feedback to all dispatch personnel.
 - b) Provide individual performance feedback to all dispatch personnel.
 - c) Communicate system changes to all dispatch personnel.
 - d) Provide performance indicator data to EMS Agency on a monthly basis.
 5. Step 5 - Manage Systems and Processes
 - a) Participate in quality improvement projects.
 - b) Participate in incident reviews.
 6. Step 6 - Manage Poor Individual-Level Performance
 - a) Develop individual performance improvement/development plans for individuals with performance found to be statistically different than system performance.

7. Step 7 - Take Individual-Level Corrective Actions
 - a) As a last step take individual corrective action as outlined in Policy #106.

D. EMS Provider Agencies

1. Step 1 - Hire the Best Employees

- a) Provide new employee orientation that sets the standard for quality performance.
- b) Provide continuing education/training that integrates the knowledge gleaned from all performance improvement activities.
- c) Maintain current status on all certifications required by Santa Clara County. These requirements can be found on the EMS Agency's website under the EMT Certification and Paramedic Accreditation tab.
- d) Designate an individual as the primary quality improvement contact.

2. Step 2 - Set and Communicate Standards of Performance

- a) Participate in quality improvement committees as appointed.
- b) Insure that all policies, procedures, and protocols comply with local, state and federal regulation and standards.
- c) Make changes to internal performance standards as needed to support the EMS system's performance.

3. Step 3 - Measure Performance

- a) Develop system performance indicators based on:
 - High-risk
 - High-volume
 - Agency requirements and improvement efforts
 - In-house improvement efforts
- b) Develop individual performance indicators based on:
 - Patient charting
 - Patient care
 - High-risk
 - High-volume
- c) Evaluate system and individual performance through:
 - Review of PCRs
 - Ride-alongs
 - Routine testing
- d) Review variances/unusual events in care that are detected through:
 - PCR Review
 - Employee concerns
 - Management concerns
 - Public concerns

4. Step 4 - Provide Periodic Feedback

- a) Provide feedback to hospitals and base hospital as needed to facilitate patient outcome follow-up.
- b) Provide system performance feedback to all provider agency personnel.
- c) Provide individual performance feedback to all provider agency personnel.
- d) Communicate system changes to all provider agency personnel.

- e) Provide performance indicator data to EMS Agency on a monthly basis.
 - f) Supervisors and QI personnel should provide real-time feedback to agency personnel on performance.
 - g) Provide training education to EMS providers and the community
 - h) Address deficiencies in policy and protocol identified through the CQI process.
5. Step 5 - Manage Systems and Processes
- a) Participate in quality improvement projects.
 - b) Participate in incident reviews.
 - c) Participate in the quality review process.
6. Step 6 - Manage Poor Individual-Level Performance
- a) Develop individual performance improvement/development plans for individuals.
7. Step 7 - Take Individual-Level Corrective Actions
- a) As a last step take individual corrective action as outlined in Policy #106.

E. Receiving Facilities

1. Step 1 - Hire the Best Employees
 - a) Provide new employee orientation to medical facility.
 - b) Provide recommendations on the orientation of new employees.
 - c) Provide recommendations on continuing education/training objectives that integrate the knowledge gleaned from all performance improvement activities.
2. Step 2 - Set and Communicate Standards of Performance
 - a) Participate in quality improvement committees as appointed.
 - b) Insure that all policies, procedures, and protocols comply with local, state and federal regulation and standards.
 - c) Make changes to internal performance standards as needed to support system performance.
3. Step 3 - Measure Performance
 - a) Track patient outcomes.
4. Step 4 - Provide Periodic Feedback
 - a) Provide feedback to base hospital and provider agencies as needed to facilitate patient outcome follow-up.
 - b) Provide performance feedback to quality committees as necessary.
 - c) Report unusual event/variance to the appropriate provider agency and EMS Agency.
5. Step 5 - Manage Systems and Processes
 - a) Participate in quality improvement projects.
 - b) Participate in incident reviews.
6. Step 6 - Manage Poor Individual-Level Performance
 - a) Support provider agencies as needed with individual improvement/development plans.
7. Step 7 - Take Individual-Level Corrective Actions
 - a) Support provider agencies as necessary.

F. Base Hospitals

1. Step 1 - Hire the Best Employees

- a) Provide orientation to new base hospital physicians setting the standard for performance.
- b) Provide continuing education/training that integrates the knowledge gleaned from all performance improvement activities.
- c) Offer supervised clinical rotations for paramedics.
- d) Participate in the continuing education/training of prehospital personnel.
- e) Designate an individual as the primary quality improvement contact.
- f) Develop requirements for base hospital physician authorization and training.

2. Step 2 - Set and Communicate Standards of Performance

- a) Participate in quality improvement committees as appointed.
- b) Insure that all policies, procedures, and protocols comply with local, state and federal regulation and standards.
- c) Make changes to base hospital performance standards as needed to support system performance.

3. Step 3 - Measure Performance

- a) Develop system performance indicators based on:
 - High-risk
 - High-volume
 - Agency requirements and improvement efforts
 - In-house improvement efforts
- b) Develop individual performance indicators based on:
 - High-risk
 - High-volume
 - Agency requirements and improvement efforts
 - In-house improvement efforts
- c) Evaluate system and individual performance through:
 - Written record
 - Recorded communications
- d) Assist in the review of unusual events/variances in care that are detected through:
 - Complaints
 - Reviews
 - Adverse outcomes
 - Etc.

4. Step 4 - Provide Periodic Feedback

- a) Provide feedback to provider agencies and hospital as needed to facilitate patient outcome follow-up.
- b) Provide system performance feedback to all base hospital personnel.

- c) Provide individual performance feedback to all base hospital physicians personnel.
 - d) Communicate system changes to all base hospital personnel.
 - e) Provide performance indicator data to EMS Agency on a monthly basis.
5. Step 5 - Manage Systems and Processes
- a) Participate in quality improvement projects.
 - b) Participate in incident reviews.
6. Step 6 - Manage Poor Individual-Level Performance
- a) Develop individual performance improvement/development plans for individuals with performance found to be statistically different than system performance.
7. Step 7 - Take Individual-Level Corrective Actions
- a) As a last step take individual corrective action.

VII. System-Wide Key Performance Indicators

Santa Clara County's performance indicators are measures based on scientific evidence about processes and treatments thought to produce the best results for a condition or illness.

Quality improvement is a continuous process that requires continual monitoring and activity to maintain a given level of quality and to continuously strive to improve performance in all areas. Being a dynamic and continuous process, there is the need to occasionally update quality goals annually. Respectively, there is the need to evaluate performance indicators and core measures. Changes to the performance indicators will be made annually as part of the Annual Update process. On an annual basis the QI program will:

1. Determine if new performance indicators need to be added.
2. Determine if any performance indicators need to be retired or adjusted.*
3. Publish a list of revised indicators in the Annual Update Document.

* Performance indicator definitions should only be changed when absolutely necessary as the changes to definitions of core measure detracts from the ability to compare current performance to historical performance.

A. Performance Indicator Selection

Performance indicators are created to continually monitor key processes within the Santa Clara EMS System. Each year the Prehospital Care System Quality Improvement Committee (PCSQIC) reviews the performance indicators that are being collected and determines whether or not new performance indicators need to be collected and evaluated. The need for new performance indicators could arise from one of two perspectives.

1. An improvement project may lead to the discovery of a new leading performance indicator. Leading performance indicators are those that if performed correctly lead to desired outcomes. An example of a leading indicator is the time from onset of cardiac arrest until an initial shock is delivered. Evidence supports the notion that the shorter this time interval the higher probability of a desirable patient outcome.
2. A second situation is the situation in which a new outcome is determined to be important to the overall service and care provided to the citizens of Santa Clara County.

B. Clinical Indicator Reporting

The quality improvement unit of each prehospital provider agency will collect and aggregate the data needed to evaluate each of the performance indicators based on the care that its personnel renders to patients. Using ImageTrend canned reports or an Excel spreadsheet; each provider agency will submit the required information for the clinical indicator currently in use to the EMS Agency, monthly. The clinical indicator information is due to Santa Clara County EMS Agency by the 15th business day after the end of the month.

C. Agency Review of Performance Indicators

The EMS Agency epidemiologist will review and validate the data and place in the appropriate statistical process control chart. Special cause variation and/or processes that are not meeting performance standards will be discussed at the bimonthly meetings of the Prehospital Care System Quality Improvement Committee. The EMS Agency will also provide copies of the statistical process control charts created from each provider's data back to the given provider agency. In addition to the required performance indicators, the quality improvement unit of each local EMS provider is encouraged to develop their own performance indicators to evaluate unique aspects of their individual organization.

D. Evaluation of Performance Indicators

The Specialty Programs Nurse and/or the EMS QI Specialist will review each statistical process control chart. Out-of-control process and/or processes that are not meeting performance standards will be discussed at the bimonthly meetings of the Prehospital Care System Quality Improvement Committee. Each prehospital provider should investigate out-of-control data points and should provide their findings at the bimonthly meeting.

The following sections discuss how performance indicators should be evaluated, presented, and acted upon.

E. Presentation of Performance Indicators

Performance indicators are monitored over time with the purpose of monitoring process performance to allow for the early identification of changes to important processes and to provide a standardized way of visualizing improvements. Section VIII provides a brief example of the general concept and features of a control chart. Specifics on choosing the most appropriate type of control chart for a given type of data and for more detail on interpreting control charts can be found in the accompanying document, "Santa Clara County Emergency Medical Service's Guideline to Using Performance Data for Improvement."

VIII. Introduction Statistical Process Control Charts

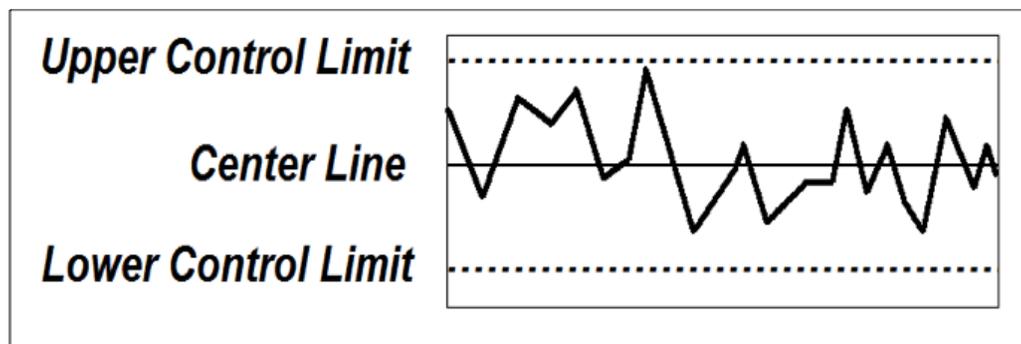
The statistical process control chart or "process behavior chart" is used to monitor processes over time. The theoretical basis is that work happens over time in the context of a process. Process data collected on such processes should produce a predictable range of data. This range is used to determine natural process boundaries. If data falls outside of these statistically derived boundaries then there is a high probability that there has been a change in a process. This phenomenon is known as "out-of-control." When a data point falls off these boundaries or control limits, the process is said to be out-of-control and the process that results in the data point should be investigated. If the process is not out of control and is not meeting given standards than all data from the process should be evaluated in aggregate to determine sources of common cause variation.

It is important to remember that out-of-control and "out of standard" are two entirely different phenomena. The approach on how to intervene in these two distinct situations is very different. When a process is in a state of control and is not producing outputs at a

desirable level, a process often referred to as common cause variation, then improvement efforts should be targeted at improving or redesigning the entire process, such that it produces desired outcomes. Alternatively, if a process is just out-of-control or is experiencing what is referred to as special cause variation, then it is appropriate to investigate the out-of-control points and to institute appropriate changes to prevent such special causes in the future.

There are three important components of a control or process behavior chart. These include the centerline, the upper control limit, and the lower control limit. The centerline represents the central tendency of the range of process data. Often, this is the average level of performance of a process. The second component is the upper control limit. The upper control limit represents the upper boundary of data that is considered to be within the range of a given process performance. Points that fall beyond this upper control limit or boundary have a high probability of coming from an alternative process. Simply meaning that there is a high probability that the series of steps that were carried out were altered in some manner. This could have resulted from any number of reasons from an employee doing the process incorrectly or from an adverse environment influencing the process's output. The final component is the lower control limit (LCL) or boundary and operates exactly like the upper control limits. Points falling below this level have a high probability of being produced by an altered process.

The following is an example of a control chart. Statistical process control charts (process behavior charts) are the most sophisticated way to monitor process indicators over time. While there are different types of control charts to accommodate different forms of data, all control charts have the same three essential components outlined above.



A detailed description of how to choose the correct data, the correct chart, and specifics of other ways to detect out-of-control points can be found in the accompanying, Santa Clara County Emergency Medical Service's Guideline to Using Performance Data for Improvement.

A. Using Performance Improvement Data

Process owners are responsible for continuously monitoring processes with control charts and for presenting a review of them to the appropriate oversight committee. Out-of-control points should be evaluated by the process owner and appropriate actions such as be instituted to prevent such deviations from the process in the future. If a process is found to be in "control" but is not meeting a particular standard, then the process owner should present such findings to the Prehospital Care System

Quality Improvement Committee (PCSQIC), who should also consider charting a quality improvement project to facilitate improvement of the process.

IX. Policy Review Process

A. Introduction

The policy review process is an advisory process to the EMS Agency and the EMS medical director for the formulation of medical protocols and operational policies. Policy suggestions and/or draft policies are accepted from committees, system participants, individuals, and/or interested parties.

Policies will be evaluated on an annual basis with adequate time allowed for training and distribution. Specific recommendations for additions, deletions, and/or revisions should be forwarded to the EMS Agency.

B. Policy Process

1. Written Public Comment

The EMS office will distribute draft policies to the appropriate system participants and/or interested parties for written comments.

Policies under consideration that affect the EMS system as a whole will be sent out for review by all systems participants. A policy under consideration that applies to a limited group will only be sent to those who would be directly affected.

The time frame allowed for the return of comments will be 60 days. Comments may be mailed or faxed to the EMS office, but must be received no later than 4:00 p.m. on the deadline date.

All comments will be reviewed by the EMS medical director. All suggestions will be taken into consideration.

2. Public Testimony

Public comments will be heard at the next most appropriate Emergency Medical Oversight Committee (EMOC) meeting (usually in August).

A final draft of the policy will be distributed prior to the meeting.

Time will be allotted at the meeting for public testimony and discussion. All recommendations will be taken into consideration during the finalization of the policy.

3. Annual Policy Review Process Timeline:

Policy Review Process	Timeline
Deadline for policy ideas	
Written public comment draft released	
Written comments due back to EMS	
Public testimony	
Finalized policies released	
Update training	
Effective date of new policies	

C. New Product Evaluation Process

1. Introduction

The new product evaluation process is an advisory process to the EMS Agency and the EMS medical director for the introduction of new products in a manner that supports the overall mission and vision of the EMS system. New product suggestions are accepted from committees, system participants, individuals, and/or interested parties on the new product suggestion form found in Appendix B.

2. New Product Evaluation

All new products should be evaluated based on the criteria found in the new product evaluation form. The new product evaluation form can be found in Appendix C.

D. Training and Education

1. Paramedic and EMT Training Programs

Paramedic and EMT training programs are approved and monitored in accordance with the California Code of Regulations, **Title 22**. Training programs receive EMS education initiatives associated with treatment protocol updates and quality improvement activities.

2. Continuing Education (CE) Title 22. Division 9. Chapter 11

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 partners throughout the EMS system. CE training program objectives are designed to:

- a) Meet state licensure/certification requirements and/or county accreditation requirements.
- b) Be developed with educational content to address Santa Clara County specific needs.
- c) Provide standards-based training for all fire and ambulance personnel.
- d) Integrate prehospital skills/CE training into a countywide system.

- e) Utilize patient simulator training countywide to achieve training objectives.
 - f) Improve and integrate “partners” in ALS/BLS training.
 - g) Facilitate increased interagency training to promote cooperation and respect.
- E. The EMS QI Council Education Committee will work in strong partnership with CE training programs to communicate and educate EMS providers throughout the system in the following ways:
- 1. Identification, development, and implementation of EMS best practices.
 - 2. Skills and protocol focused indicator reports monitoring field practice and success.
 - 3. Annual EMS updates on protocol changes and quality initiatives.
 - 4. Support in the development of standardized curriculum and resources to support training activities.
 - 5. Review of educational needs assessment.
 - 6. Recommendations for training on clinical and patient care issues.

F. Annual Update

The medical director will oversee an annual evaluation of the QI program annually. This evaluation will be presented to the EMS QI Council. The EMS Council will determine what changes are needed to better align with the strategic direction and to address macro system changes. An annual update will be created to inform, educate and train all individuals involved in QI activities. At a minimum this will include the following:

- 1. Update on new performance indicators.
- 2. Review key improvements from the previous year.
- 3. Review current important data and any special cause variations trends.
- 4. A review of any policy revisions.
- 5. A description of any changes in continuing education and skills training requirements.
- 6. A description of priorities for the coming year.

The annual update document is a written account of the progress of an organization’s activities as stated in the EMS QI Program. The plan will summarize previous year’s changes and progress. The annual update will include the indicators monitored, key findings/priority issues identified, improvement action plan/plans for further action, and state whether goals were met. If goals were not met, what follow-up actions are needed, if any. The update shall include, but not be limited to, a summary of how EQIP addressed the program indicators. The EQI Program shall be reviewed by the LEMSA or the EMSA at least every five (5) years.

Appendix A: EMS Key Performance Indicators

We envision a comprehensive, accessible, and sustainable EMS delivery system, realized through collaboration, which provides clinically superior, efficient, and innovative care.



Appendix B: New Product Suggestion Form

Santa Clara County Emergency Medical Services Agency
New Product Suggestion Form

Equipment to Evaluate:	Date:
Submitted by:	
Describe the equipment:	
Describe perceived benefit/outcomes from the equipment:	
Describe any concerns with integration of the equipment:	
Describe cost of integrating into the overall system:	
Describe potential cost saving from integration of the equipment:	
Additional Comments:	

Appendix C: New Product Evaluation Form

Santa Clara County Emergency Medical Services Agency
New Product Evaluation Form

Product Evaluated:	Date:
Evaluated by:	
	PCR#:
Describe your use of the product:	
Describe any problems associated with using the product:	
What was the outcome of the product use?	
Describe what you liked about the product:	
Describe what you didn't like about the product:	
How many times have you used this product? _____	
Do you think this product would improve patient care or make your job easier? <input type="checkbox"/> yes <input type="checkbox"/> no...why?	
Crew members (print names) 1.	2.
Department:	Unit#:
Additional Comments:	