

**Assessment of the Status of
Quality Management
in the Alameda County EMS System**

draft



Prepared by:

N. Dale Fanning, Quality Management Coordinator
Alameda County Emergency Medical Services

October 2005

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Assessment of the Status of Quality Management of the Alameda County EMS System

Introduction

This assessment is based on interviews conducted in the spring of 2005 with the quality coordinators from each of the fire departments with which Alameda County holds either a First Responder Advanced Life Support (FRALS) or Advanced Life Support (ALS) Transport provider contract. In some cases, the EMS Coordinator (or EMS Division Chief) was also present. These unstructured visits lasted from one and a half to two and a half hours. Questions asked during these visits were qualitative and open-ended in order to encourage open communication about issues impacting the evolution of quality management within each department. Similar interviews followed with quality managers from:

- American Medical Response (AMR)
- Alameda County Medical Center (ALS Base Hospital)
- Dispatch centers (Oakland and Livermore Lab)
- Camp Parks Fire
- East Bay Regional Park

The purpose of these visits was to develop a general understanding of quality management activities within each organization, and to assess the current status of the system with respect to the *EMS System Quality Improvement Program Model Guidelines* (hereinafter referred to as the EMSA QI Guidelines) that were issued by the California EMS Authority in March 2004. These visits were also used as an opportunity to ask providers for feedback regarding the services provided by EMS office staff and to gather their suggestions for the reconvening of the Quality Council. Evaluation of proposed data sets and data collection systems is beyond the scope of this assessment.

Trauma system quality management is overseen by the EMS Medical Director in conjunction with the Trauma Audit Committee (TAC), utilizing a peer review process established in January 1987. Alameda County EMS has a Trauma Coordinator who reviews trauma system data and prepares cases for review by TAC. Trauma system quality management is not addressed in this assessment.

Historical Perspective

Prior to 1990, quality in EMS referred to Quality Assurance (QA) activities that were delegated by Local EMS Agencies (LEMSAs) to base hospitals. Base hospitals employed Mobile Intensive Care Nurses (MICNs) who were specially trained to give orders to paramedics over the radio.

A Base Liaison Nurse was responsible for overseeing the quality of the performance of MICNs and the paramedics who were assigned to that base. This oversight included reviewing patient records, periodic focused audits on specific types of calls (e.g. chest pain), and insuring that all

personnel were up to date on all required licenses and certificates. Base Liaisons also coordinated “Field Care Audits” which included a critique of recordings of selected calls, along with a continuing education presentation which ideally addressed areas in which improvement was needed, as identified by audit.

When individual deficiencies were detected, Base Liaison Nurses would counsel the paramedic (or MICN) and design an education plan, known as a *remediation*. Serious policy violations that caused actual or potential patient harm were referred to the local EMS agency for an Investigative Review Plan (IRP). These could be intimidating because there was a potential for the paramedic certificate to be revoked, but they usually resulting in a remediation plan, rather than action on the certificate.

This system worked fairly well when paramedics were assigned to a specific base. Physicians and nurses got to know the paramedics, took a personal interest in their training, and trusted their abilities. As ambulance services began to grow and evolve, a computer aided dispatch system known as *system status management* resulted in a redesign of ambulance deployment that was more efficient: crews spent more time actually running ambulance calls instead of waiting for them. This was more cost-effective for the company but, since ambulances were constantly being reassigned from one area of the county to another, it was no longer possible to assign paramedics to a specific base hospital. They could attend the required run reviews at any base hospital, and the “close knit family” relationships fell part.

Prior to the 1990’s, most of the fire departments provided basic life support first responder services. Berkeley, Albany, and Piedmont provided paramedic transport service, and Fremont provided paramedic first responder service. The City of Alameda provided basic life support transport service. During the 1990s, fire departments initiated paramedic programs and, in 2005, all departments with county contracts maintain 24/7 paramedic response. This increased the number of paramedics working in the system and, since first responder paramedics only accompany the patient to the hospital on the most critical calls, there was little opportunity for these paramedics to become acquainted with base hospital personnel.

The remainder of the county (including the City of Fremont) was designated as an exclusive operating area for paramedic ambulance transport. American Medical Response (then Regional Ambulance, which was one of the original companies that merged to form AMR) has held the contract since 1990.

The AMR leadership had an interest in addressing quality concerns internally because they were legally responsible for the actions of their employees. Base Liaison Nurses who tried to establish remedial plans for paramedics found that they really had no authority to enforce them, because, short of action on the EMT or paramedic certificate by the county, only the employer could enact suspension or other disciplinary action. Changes in EMS policies also allowed paramedics to do more on standing orders, so base contact became less frequent and usually required consult with a Medical Radio Operator (MRO) who was and ED physician familiar with EMS policies and procedures. While base hospitals continued internal quality assurance with their MICN staff, their role with respect to prehospital care providers became ambiguous as ambulance services became more autonomous and developed their own quality assurance programs.

Emergency Medical Dispatch (EMD) began in Alameda County in 1990, and with it came national standards for training, certification, management and quality assurance (QA). EMD QA was managed internally by dispatch centers, with oversight from the Alameda County EMS Medical Director and EMS staff.

Quality Improvement (QI) was first introduced to the EMS administrators in California in the early 1990s when the EMS Authority awarded a grant to San Mateo County EMS to develop quality in the EMS industry in the state. San Mateo EMS hired Carol Schepper, an organizational psychology consultant who had worked with W. Edwards Deming. Deming was instrumental in the development of Continuous Quality Improvement (CQI). Carol served as a coach for the state's EMS Quality Leadership Team, a high-level multidisciplinary oversight group. This group adopted Deming's *Plan-Do-Study-Act* model and formed Quality Action Teams composed of mid-level managers and frontline personnel to design implementation plans for QI in EMS education, local EMS agencies, and provider groups. Carol taught several different seminars including meeting facilitation and teambuilding in addition to QI training programs.

EMS agencies set out with much enthusiasm to form Quality Improvement teams, but became disheartened when they encountered two major barriers: (1) The process took longer than anyone had imagined. With funding cutbacks impacting many EMS systems, the cost-benefit ratio came into question. (2) Most EMS systems did very little data collection. EMS lagged behind the rest of health care in developing data management systems, and data analysis is a key step in all QI models.

The EMS Authority began to award grants for the development of integrated data collection systems. One such grant was for the development of a minimum data set with standardized indicators (measures) to be used statewide. Local EMS agencies were encouraged to send data to the state, but participation was optional. Some local EMS agencies complained of flaws and inconsistencies in the minimum data set, and the EMS Authority did not do much with the data they received.

Alameda County Task Force and EMS Council

In 1994, in response to a financial crisis, high-level representatives from EMS System participant and stakeholder groups formed an EMS Task Force to brainstorm ideas for redesigning the 911 medical response system. After their recommendations were presented to the Alameda County Board of Supervisors in *A Task Force Report on the Future of EMS*, an EMS Council was formed to determine whether or not the 44 recommendations in the report were medically appropriate, operationally feasible, and financially sound. The EMS Council convened subgroups of "subject matter experts" to evaluate and refine the recommendations and make periodic reports back to the Council.

The Data Collection/CQI subgroup recommended that the county develop a fully-automated data management system in which data would be entered at the point of service and downloaded into a central repository maintained by the EMS District. Dispatch reports and First Responder reports would be integrated with the transport Patient Care Report (PCR), and the resulting core data set collected for each patient contact would be integrated into a single case. Ideally, patient outcome data would be obtained from receiving hospitals, so that all phases of patient care would be reflected in the case report.

Once reliable data were obtained, ongoing improvements to the EMS system could be based on objective information. Alameda County EMS would analyze the data and publish regular reports based on identified system trends. System participants would benefit through access to data for specific audits and research studies.

The software for the central repository would have to be non-proprietary and flexible, so that the EMS agency could update report formats and data fields in response to continually evolving system trends. Fire departments in the county do not all use the same records management systems, and all are different from the system used by American Medical Response. The central repository would require interfaces so that data could be imported from a variety of different sources.

The EMS Council approved the recommendations for the data system and in 2002 the EMS agency held a competitive bid process for a vendor to build the data system. Lancet Technologies, Inc., the developers of the county's trauma registry, was awarded the bid. A Lancet project manager worked on-site at the EMS office for over a year but was unable to surmount the following obstacles:

- Providers had multiple data collection systems with multiple interface limitations.
- Few providers had personnel trained in Information Technology. It was difficult to establish a working relationship with temporary employees, light-duty firefighters, etc. who were assigned data entry tasks.
- Establishing a unique identifier to track patients from one provider to the next proved more difficult than anticipated.
- Provider clocks were not synchronized, resulting in errors in time measurements.

The project was eventually cancelled without a successful product.

EMSA Vision Project

EMSA engaged the State EMS Commission, Local EMS Agencies (LEMSAs), EMS providers and other EMS constituents in a collaborative five-year Vision Project from 1999 to 2003. A main focus of the project was standardization and improving efficiency of the state's EMS system. Over 140 individuals on six different committees worked to implement the 66 Vision Project objectives.

A second focus of the project was to implement the 90 recommendations made by the National Highway Traffic Safety Administration (NHTSA) following an assessment of California's EMS systems in 1999. One of the most important recommendations was the pursuit of statewide consistency, standardization, and coordination of EMS systems.

One of the six Vision Committees was called System Evaluation and Improvement. The primary mission of this committee was to design a comprehensive model for EMS system evaluation and improvement. The committee realized that it needed to build the quality system essentially from scratch and formed the following sub-goals:

- Evaluation of EMS regulatory agencies
- Standard definitions, indicators, and benchmarks
- Comprehensive data collection system
- Feedback/reporting of data
- Ensure data are utilized for continuous quality improvement (CQI)
- Establish CQI linkages
- System evaluation training for all levels of EMS personnel
- Immunity and discovery protection for QI
- Guidelines for EMS research
- Develop formal system structure

Based upon these goals, the committee developed the following documents:

- *State EMS Data Set*
- *State EMS Data Collection and Reporting Process Guidelines*
- *California EMS Information System (CEMSIS State Data System)*
- *EMS Quality Indicators* (developed in conjunction with a grant project led by the Mountain Valley EMS Agency)
- *State EMS Evaluation and Quality Improvement Guidelines*

The objective of the state data project is to create a statewide database of EMS-based patient information and then to link that data whenever possible to data from other systems (e.g. Computer Aided Dispatch, or CAD, data) to create a picture of the EMS care continuum and ultimately, a picture of the emergency response system as a whole.

LEMSAs are plagued by difficulty in obtaining outcome data from hospitals on EMS system patients. EMSA hopes to develop a central repository that would link data received from LEMSAs to hospital outcome data at the state level. As of 2004, the Office of Statewide Planning and Development (OSHDP) requires hospitals to collect and submit data, including emergency department patient outcome. Linkages are also planned with data systems at the California Highway Patrol and Department of Health Services.

State initiatives to promote legislation regarding QI protection from discoverability have met with significant challenges from trial lawyers, but this remains one of EMSA's goals for the future.

Guidance from State and Federal Agencies

Federal Guidance

NHTSA, a part of the U.S. Department of Transportation, is the lead federal agency for EMS system development. In 1997 NHTSA issued *A Leadership Guide to Quality Improvement for Emergency Medical Services (EMS) Systems*. This document applies the Malcolm Baldrige criteria (described below) to EMS systems and provides an overview of Quality Improvement tools and techniques. The NHTSA guide served as a resource for state EMS agencies to use in the development of their quality management directives and recommendations for LEMSAs.

State Guidance

The California Emergency Medical Services Authority (EMSA) issued the EMSA QI Guidelines in March 2004. These guidelines support and provide further detail regarding the EMS System Quality Improvement regulations set forth in Chapter 12 of Division 9 of Title 22 of the California Code of Regulations. These regulations prescribe how EMS systems meet the requirements identified in Division 2.5 of the California Health and Safety Code, established by the EMS Act of 1980 (SB125).

State guidelines call for each provider and base hospital to submit a quality plan, and for each EMS agency to submit a system-wide quality plan, but there is no mention of EMS agencies developing internal quality plans to look at their own processes. A state project to develop an assessment process for local EMS agencies has been on hold for some time. It seems appropriate for the EMS agency to serve as a role model for quality by using quality tools and techniques to improve the services they provide to the community (e.g. injury prevention) and to EMS system participants.

The EMSA QI Guidelines address the organizational structure for quality improvement at each level, as shown in the figure on the following page. The guidelines recommend that the LEMSA and each provider agency have an internal EMS QI team with members skilled in data analysis and QI program management. EMSA also encourages LEMSAs and each EMS provider to have a multidisciplinary "Technical Advisory Group" that includes a variety of system stakeholders, including frontline EMTs and Paramedics, and a representative from the public at large.

Baldrige National Quality Program

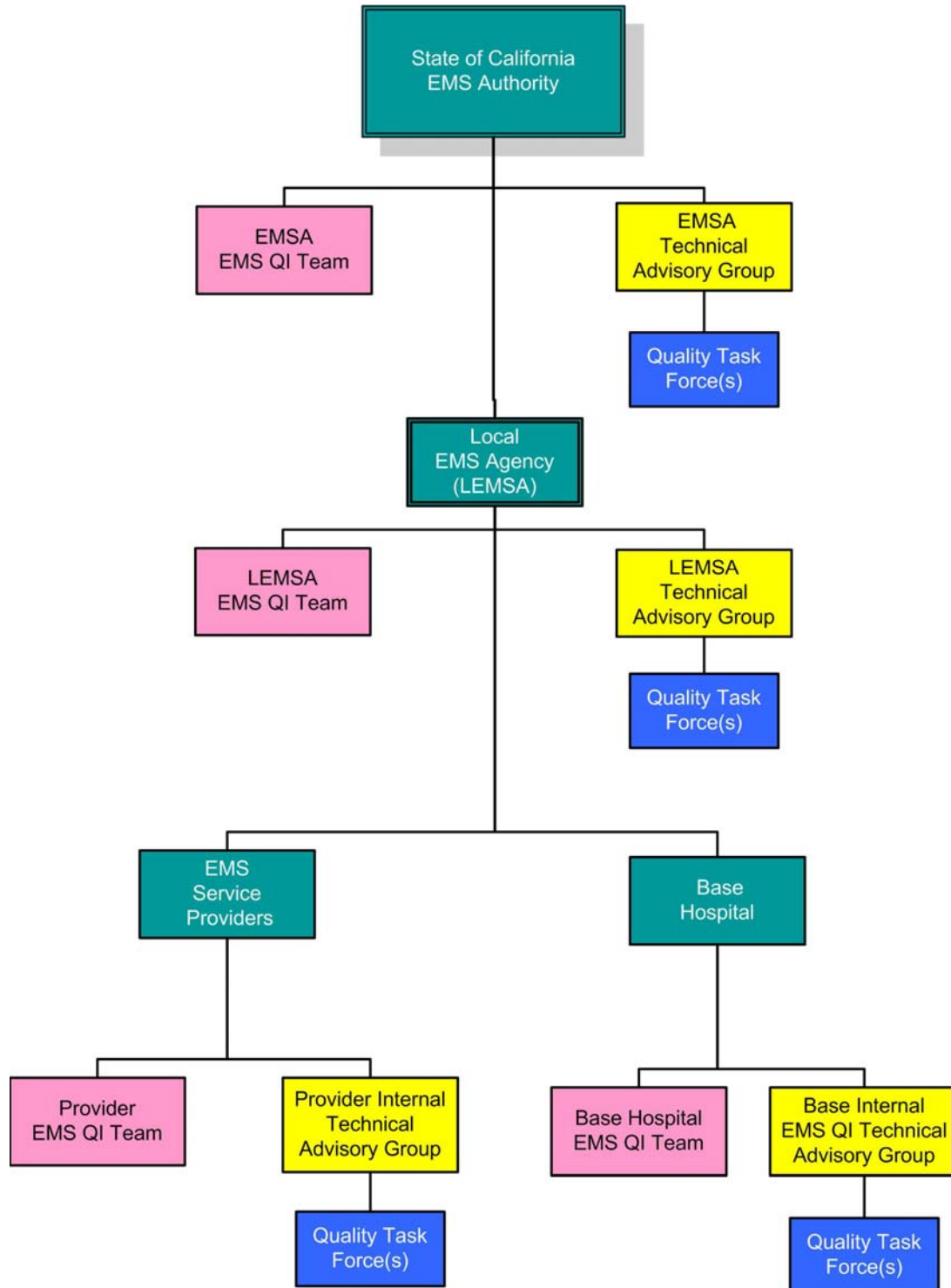
The first pages of both the NHTSA guidance described above and the EMSA QI Guidelines recommend that EMS system participants use the Baldrige Health Care Criteria for Performance Excellence to guide QI efforts and evaluate progress in the quality arena.

The Malcolm Baldrige National Quality Award was established by the federal Public Law 100-107 in 1987 as a public-private partnership. Malcolm Baldrige, who served as Secretary of Commerce from 1981 to 1987, was known for his managerial excellence and his long-term improvement in efficiency and effectiveness in government. The U. S. President presents the awards annually to organizations that are selected for performance excellence, based on the Baldrige Criteria.

The law establishing the award states: "Strategic planning for quality and quality improvement programs, though a commitment to excellence in manufacturing and services, are becoming more and more essential to the well-being of our Nation's economy and our ability to compete effectively in the global marketplace."

While EMS as an industry is a long way from winning a Baldrige award, we may still be able to benefit from using the Baldrige Criteria to guide us in our implementation of the EMSA QI Guidelines.

EMS Quality Management Structure EMSA EMS System Quality Improvement Guidelines



Six Sigma

The Alameda County EMS system is now closer than it has ever been to receiving standardized data from our providers. The goal of data collection has always been to make changes to the system based on statistical evidence, derived from data analysis. The Quality Council will need to know how to use the data effectively when it becomes available.

Just as the first page of the EMSA Guidelines mentions Baldrige, the first page of the Baldrige Criteria booklet mentions Six Sigma, and it is mentioned more often than other quality improvement models throughout the Baldrige document as an effective approach for performance improvement. Bonnie Sinz, the EMSA staff person for data and quality improvement, says that, while the State QI Guidelines do not recommend a specific model, "Six Sigma is the cream – If you're using that, you'll be in good shape."

Six Sigma incorporates the principles of other quality improvement models, but provides a more comprehensive approach that ensures that improvement projects are aligned with the strategic plan and supported by the senior leadership of the organization. Six Sigma also has clearly delineated steps and a broader range of statistical tools than other models.

Ten of the sixteen members of the Quality Council successfully completed a Six Sigma Yellow Belt course sponsored by Alameda County EMS in mid-September 2005. This course prepares students to be active members of Six Sigma project teams. Course evaluations indicate that the class was well-received. The company that provided the training is considering offering the next level of training (Green Belt) in the Bay Area within the next few months. The Green Belt course trains participants in the statistical tools necessary to become project team leader/facilitators.

Overview of Current EMS Provider Quality Activities

Today AMR and fire departments county-wide have provider-based quality management programs. The EMS agency plays a role in the oversight and coordination of these efforts. Ambulance transport and first responder contracts require monthly data submission, and a periodic update of the organizations' quality plans. The most recent updates of the plans for first response agencies were submitted April, 2005.

The organization of all of these plans was based on a content list (see next page) developed by an ad hoc subgroup of the EMS Section of the Alameda County Fire Chiefs Association, and approved by the county's EMS Medical Director.

Each municipal fire department addressed the topics in the content list, describing how they accomplish the various quality activities in the categories of prospective, concurrent and retrospective. Some departments went into detail; others were very brief, but all met the minimum requirements.

The plans reflect traditional quality assurance processes, some of which were once performed by base hospitals and others that are employer responsibilities. While some departments have full-time quality managers, in other departments the EMS Coordinators are responsible for quality assurance, in addition to their lead role in the management of the department's EMS

First Responder ALS Quality Plan Overview

1. MISSION STATEMENT
 - a. Promote optimal patient outcomes through ongoing collaborative Quality Improvement.
 - b. Add you agency specific mission statement and philosophy
2. QI PLAN COMPONENTS
 - a. PROSPECTIVE:
 1. Department Orientation
 2. EMS Articles
 3. EMS training (infrequently used skills, annual policy update, theme of the month)
 4. Maintenance of licenses and certifications.
 5. Public education (CPR, AED, etc.)
 6. Intranet
 7. Department EMS committees
 8. EMS Self-Assessment
 9. Preceptors, mentors and field training officers
 10. EMS equipment assessment
 11. Peer review
 12. Paramedic self assessment
 - b. CONCURRENT:
 1. Ride Along programs
 2. EMS evaluations
 3. Networking, local and state meetings and conferences
 4. Preceptors, mentors, field training officers
 5. Hospital input (Base contact and Receiving facility feedback)
 6. Inter-agency interaction
 7. Police agencies and AED providers
 8. Transport providers (air and ground)
 - c. RETROSPECTIVE
 1. Retrospective Activities
 2. County data requirements
 3. Cardiac Arrest
 4. Intubation
 5. Fractile response times
 6. Field studies
 7. CPAP
 8. 12 Lead
 9. Agency requirements
 10. Controlled substances
 11. Local, state compliance audits
 12. Customer feedback
 13. Unusual occurrences
 14. Care review (reporting format, feedback)
4. DEFINE THE PLAN EVALUATION PROCESS
5. REFERENCE LIST

operations. The person responsible for EMS quality may also be responsible for all EMS training. All are very busy, and many have little or no clerical support.

Current Base Hospital QA activities

Today the Highland Campus of the Alameda County Medical Center is the only remaining base hospital. All paramedic base contact calls are answered by MROs, who are attending physicians or senior residents. Highland Base offers a monthly continuing education lecture for all prehospital care personnel in conjunction with American Medical Response. While there are no longer MICNs in this county, the Base Liaison Nurse reviews and transcribes recordings of all calls, and submits quarterly reports to the EMS agency. If she has questions, she contacts the MROs directly and/or refers unusual calls to the Base Hospital Physician for follow-up.

Private ambulance provider

AMR holds the contract for the exclusive operating area established by Alameda County. This private ambulance service transports about 90% of the county's 911 medical patients. Paramedics submit data from each transport on a "bubble form" that is scanned into a computer at the end of each shift. A senior data systems analyst compiles the data, and the data system identifies errors for follow up by the Clinical Education Specialist (CES). The query system is flexible, so that the CES can stratify data and run reports "on just about anything I want." Paramedics receive a quarterly report of their performance, and the CES gets a master list.

She reviews PCRs for follow-up with individual paramedics. When remediation is needed, paramedics enter into a three-step Personal Improvement Plan (PIP). While the PIP is part of the employee's permanent file, it is different from the progressive disciplinary process that might lead to termination. The PIP is signed by the CES and the paramedic, and is forwarded to the AMR and county EMS Medical Directors for review.

Dispatch

Alameda County EMS provides funding for a single EMS Quality Assurance Manager (QA Manager) for Oakland Fire Department (OFD) Dispatch and the Alameda County Regional Emergency Communications Center (ACRECC) in Livermore. These two dispatch centers provide EMD for most of Alameda County, using a CAD system.

At the ACRECC, the QA Manager reviews dispatch events using written reports and digital voice logging systems to ensure compliance with standard operating procedures. He evaluates operator efficiency by analyzing time interval statistics and provides feedback on performance standards to the emergency dispatch supervisors, recommending solutions and coordinating the follow-up on problems and issues.

In Oakland, the QA Manager's role has been primarily to review, evaluate, and provide feedback on individual EMD calls, as described above. OFD is in the process of hiring three EMD-Qs, who are EMD Dispatchers with additional training in QA, including use of ProQA and other software programs designed specifically for EMD QA. Each EMD call evaluated is assigned a score based on a structured scoring system that analyzes various facets of the call.

Alameda County EMS Quality Management Structure

The internal EMS QI team at Alameda County EMS began meeting in July 2002. Its mission is to develop and implement an internal EMS office quality management plan to increase effectiveness by solving problems and improving processes within the EMS office.

Internal QI Team members:

- Quality Management Coordinator
- Information Systems Analyst
- Special Projects Coordinator
- Others to be determined

The Internal QI team will submit plans and project proposals to the EMS Director and EMS Medical Director for review and approval, and will also serve as a forum for internal discussions EMS system quality issues.

The Quality Council reconvened in July 2005. It will serve as the Technical Advisory Group for Alameda County EMS, as described in the EMS QI Guidelines. Membership of the Council includes:

- Fire EMS Quality Coordinators
- AMR Clinical Education Services Coordinator
- Base Hospital Liaison Nurse
- Dispatch Quality Consultant
- EMS Medical Director
- EMS Quality Management Coordinator
- Others to be determined

The purpose of the Quality Council will be described in the 2006 Alameda County EMS Administration Manual as follows:

- Serve as the LEMSA Technical Advisory Group for Alameda County
- Identify QI educational needs
- Charter (and/or serve as) Quality Task Force(s) to use quality tools and techniques to solve problems and improve processes related to system-wide issues
- Provide input for the EMS System Quality Improvement Plan
- Contribute to the development of a consistent approach to gathering and analyzing data
- Monitor and evaluate system data reports to identify opportunities for improvement and training needs

EMS Provider Quality Management Structure

Fire Departments

When asked about their internal “EMS QI Team,” most fire service quality coordinators described meeting with EMS Coordinator or EMS Division Chief to discuss quality management activities. A few just said, “I’m it.” Three departments described a second, larger group, with a cross-section of members ranging from frontline paramedics and EMTs to Assistant/Deputy Chiefs. These might be called “Technical Advisory Groups,” as described in the EMSA QI Guidelines, except that they do not have representation from customer groups or outside agencies. Only one department is currently conducting what EMSA calls a Quality Task Force, (the department calls it a Quality Action Team), and one other department is considering starting one in the near future.

AMR

The AMR Clinical Education Specialist (CES) reports to the regional CES Manager, who approves all plans for remediation, re-education, and course topics. The CES Manager and her assistant speak often with the Director and Assistant Director of Operations. They review issues on a biweekly basis to ensure clinical and operational issues are coordinated and tracked.

The Northwest Plains Region (Colorado, Montana, Washington, Oregon, and California) holds monthly Key Performance Indicator conference calls in which data submitted by CES personnel throughout the Region are presented to the group. CES personnel also present clinically based problems identified, including root causes, solutions, and statistics relevant to the analysis.

Dispatch

At the ACRECC, the QA Manager reports to the Emergency Dispatch Communication Manager. The QA Manager directs the quality review process and coordinates the meetings of the Medical Oversight Committee, and the Dispatch Review Committee. The Medical Oversight Committee members are the EMS Medical Director, the Dispatch Manager, the EMS Quality Assurance Manager, and one EMD-Q. The Medical Oversight Committee meets quarterly to review the medical appropriateness of all EMD policies and procedures. The EMS Medical Director reviews and approves EMD protocols. The Dispatch Review Committee includes the QI Manager, all of the EMD-Q’s, and one Dispatch Supervisor. The Dispatch Review Committee evaluates all reviews performed by the EMD-Q’s and makes recommendations to the Medical Oversight Committee.

Base Hospital

At Highland, the Base Liaison Nurse contacts the MROs directly with questions and concerns that result from her review of calls. She also works closely with the Base Hospital Physician, and reports any potentially serious problems to her for follow-up. The Base Hospital Physician conveys messages and updates regarding Base issues to the MROs at the weekly ED Physician Conference, as well as the semimonthly Attending Physician meetings.

Current status with respect to Baldrige Categories

The various quality improvement models mention that quality should not be a program or project assigned to a single person or department, but instead should be pervasive throughout the organization. The Baldrige Health Care Criteria for Performance Excellence are designed as a roadmap to help organizations build quality into all aspects of conducting business.

Baldrige criteria for performance excellence are new to EMS systems. There has never been an expectation that the business practices of EMS provider organizations are aligned with the Baldrige model. This assessment merely attempts to establish a baseline or starting place with respect to the criteria, since they are recommended by the State *EMS QI Program Model Guidelines*. Each of the categories listed below begins with a summary adapted from the 2005 *Health Care Criteria for Performance Excellence* and/or the interpretation found in the EMSA QI Guidelines. More information about specific criteria can be found in state and federal guidance documents.

Category 1: Leadership

Leadership addresses how the senior leaders guide and sustain the organization, setting organizational vision, values and performance expectations. Attention is given to how senior leaders communicate with staff, develop future leaders, and create an environment that encourages ethical behavior and high performance. The Category also includes the organization's governance system, its legal and ethical responsibilities to the public, how the organization supports its community, and how the organization contributes to the health of the community. Leadership includes efforts by senior leadership and management to lead by example to integrate quality improvement into the strategic planning process and throughout the entire organization and to promote quality values and QI techniques in work practices.

Most of the Fire Chiefs in the county are very supportive of EMS, recognizing that the large majority of their requests for service are medical aid calls. Many of the current Chiefs came up through the ranks after the importance of EMS to the fire service had been established, and some of them worked as paramedics. In this era of tight budgets, costs must be justified, but in general the leadership is willing to commit resources for training and equipment to improve EMS services.

Some of the departments have a full-time nurse acting as Quality Coordinator. Several of the smaller departments have contracted with a part-time nurse or paramedic and in some departments the EMS Coordinator, who is a paramedic, doubles as Quality Coordinator as well. They all seem to have "full plates" and some spoke of being overwhelmed with all they have to do to such an extent that they admit they are unable to perform all of the tasks described in their quality plans.

Category 2: Strategic Planning

Strategic Planning addresses strategic and action planning, deployment of plans, how plans are changed if circumstances require a change, and how accomplishments are measured and sustained. Strategic Planning includes alignment of quality goals with the overall strategic plan of the organization. Key components include: 1) developing long-term and short-term organizational objectives for structural, performance and outcome quality standards; 2)

identifying ways to achieve those objectives, and 3) measuring the effectiveness of the system in achieving quality standards.

While the Chiefs recognize EMS quality improvement activities as a requirement of their contracts with EMS, formalized QI activities are generally not extended to fire suppression, so they have not been incorporated into the strategic planning process for the Department, which is usually tied to budget allocations for the upcoming fiscal year.

It is important to note, however, that some major departmental goals in the past few years have been directly related to EMS, and so have resulted in changes in the work done by Quality Coordinators. Examples include First Responder ALS programs and 12-Lead EKG projects.

Performance at structure fires, HAZMAT incidents, etc. is evaluated by other means established by the fire service, such as “hot washes,” completion of required forms, and after action reports.

Best Practice: In one department the City Council creates broad goals and sends them to all city departments for more detailed planning. The EMS Division makes quarterly presentations at Executive Staff meetings that describe progress towards meeting Division goals, and must submit an annual report describing how the EMS Division met the five Departmental goals that are aligned with the City Council goals.

Category 3: Focus on Patients, Other Customers and Markets

Focus on Patients, Other Customers, and Markets addresses how the organization seeks to understand the voices of patients, other customers, and the marketplace, with a focus on meeting patients’ and other customers’ expectations and requirements. The Category stresses communication procedures for soliciting, receiving, reviewing, and responding to praise, complaints, and comments is an important part of performance excellence strategy. Networking and comparison among agencies or between systems is encouraged.

Several of the departments mentioned a strong focus on customer service, and three said that it is in their mission or values statements. All departments have a procedure in place for responding to and resolving customer complaints, but they are usually handled on a case-by-case basis and not trended. Some cities have suggestion boxes in city buildings and/or solicit e-mail suggestions on the city’s website. In some cities it is not uncommon for citizens to call the Fire Chief directly with suggestions or complaints. None of the fire departments conduct customer focus groups, but all do some form of community outreach, such as visiting schools or senior centers, or teaching CPR courses.

Best Practice: One fire department has been doing internal customer surveys for ten years. The surveys were once anonymous by work centers but now that individuals are identifiable, the results may be less candid. The same agency recently added external customer surveys by sending out surveys to customers who received any type of service (not just EMS). Survey results are personally reviewed by the Fire Chief and Deputy Chiefs.

AMR

Employee satisfaction surveys are conducted at least annually by the Regional office in Livermore. The results are aggregated and feedback to employees is presented for the entire company at the national level. Customer survey results go to Operations and are not shared with CES.

Category 4: Measurement, Analysis, and Knowledge Management

This category is the main point within the Criteria for all key information about effectively measuring, analyzing, and reviewing performance and managing organizational knowledge to drive improvement and organizational competitiveness, with specific attention to performance as a health care provider. It concerns managing and using the data needed for effective QI. Since quality improvement is based on management by fact, information and analyses are critical to QI success.

EMS providers submit quarterly data to the EMS office for response times, cardiac arrests, intubations, and Continuous Positive Airway Pressure (CPAP) cases. Much of this data has to be compiled by hand from PCRs and county forms. When the data is complete, the EMS Medical Director will analyze these data and provide feedback to provider agencies regarding their performance with respect to system-wide results.

Most of the fire departments are now using the computerized records management system developed by BioKey, and the remaining departments are considering changing to that system. Alameda County EMS and fire department representatives are working with the vendor to implement a version of the BioKey system that will be tailored to meet the data needs of the county. Implementation is planned to begin early in 2006. The EMS Agency will serve as a central repository for data from all EMS system providers and once the system is fully operational the EMS Medical Director, EMS Quality Management Coordinator, and the Quality Council will be able to monitor a wide variety of performance indicators and identify opportunities for system improvement.

Category 5: Staff Focus

Staff Focus addresses key human resource practices – those directed toward creating and maintaining a high-performance workplace and toward developing staff to enable them and the organization to adapt to change. This Category includes the work environment, support staff climate, and staff relationships. It involves working to develop the full potential of the EMS workforce. This effort is guided by the principle that the entire EMS workforce is motivated to achieve new levels of service and value.

In-house training programs for employees ensure that all requirements for re-licensure and maintaining county accreditation are met. Some of the smaller departments send their personnel to off-site training to meet these requirements. Discretionary topics for training sessions are usually selected based on trends found in PCR review, or problems that have been identified by field supervisors, and are scheduled up to a year in advance. Union negotiations determine many of the decisions made regarding the work environment. While a few departments approach paramedic remediation as a disciplinary process, most frame interventions in a positive light, as opportunities to improve performance. Among EMS

providers in Alameda County, quality managers appear to enjoy a positive working relationship with the prehospital care personnel.

Several system providers have employee recognition programs designed to boost morale. AMR, for example, recognizes an EMT and Paramedic of the Quarter who is elected by the crews. They award pink and blue stork pins for field deliveries and field save pins if the patient is admitted to ICU. The CES also plans to present “Kudos” snack bars with a note of commendation when she catches crews doing a good job.

Category 6: Process Management

Process Management concerns the creation and maintenance of high quality services. Within the context of quality improvement, process management refers to the improvement of work activities and work flow across functional or department boundaries. The category addresses:

- Design and introduction of EMS patient care services
- Anticipating future trends and designing processes for expanded EMS services
- Regular analysis of critical indicators of quality that leads to identification of opportunities for improvement (triggers for QI projects)
- Design and delivery of support services (Work processes that do not involve direct patient care)
- Design and delivery of community health services (e.g. CPR classes, injury prevention education)
- Supplier performance management (e.g. medical supplies, vehicles, services)
- Benchmarking: Comparing processes with other systems to identify best practices

Quality management in the Alameda County EMS system is focused on Quality Assurance. While providers take a positive approach with crews, the focus is on discovering errors made by individuals and providing retraining to improve individual performance. The lack of system-wide data has made it difficult for the EMS office to take the lead in shifting the focus to process improvement. The recent Six Sigma training provides a model for the Quality Council to use to identify key processes to monitor and to know understand when data related to those processes reveals a need for more intensive study.

Best Practice: The QI Manager for ACRECC has used Six Sigma methodology successfully to identify a flaw in the call-taking process and improve the process, resulting in a reduction in the time from receipt of the call to dispatch of the appropriate unit.

Category 7: Organizational Performance Results

Key drivers are those performance areas defined in the strategic plan as the most critical to the success of the system as it works to achieve its mission. The over-arching purpose of measuring results is to assess how well the system is doing in its key driver areas. Results show that the system is making a difference. There are three broad result areas:

- Input results (resource components): Leadership, workforce, suppliers, equipment, etc.
- Process results: Efficiency of design and delivery of work processes, productivity and operational performance
- Outcome results: Effectiveness of patient care, support services, and fulfillment of public responsibilities (e.g. disaster response and public health emergencies).

Traditionally, measures of EMS system performance have focused on response time. Response time requirements are specified in provide contracts, and serve as the basis for contract compliance measures. While provider contracts also require submission of Quality Improvement plans, the relationship between those plans and overall organizational performance has not been addressed. As discussed in Category 2, QI programs are generally not integrated with the overall organizational strategy.

Provider Feedback for Alameda County EMS

In the following sections, numbers in parentheses () indicate the total number of persons who made this (or a very similar) comment.

What's working well

- The Scenarios prepared by EMS a few years ago are excellent and are still being used, but have fallen into the hands of paramedics so they should be revised (4).
- Policy 2000 is very important. Without it, budget issues might create pressure on them to release a paramedic for 1:1 staffing sooner.
- They appreciate being able to get feedback from the county on autopsy reports (2).
- They appreciate the county sponsored orientation and consider it valuable.
- Certifications are handled smoothly.
- EMS staff respond quickly to e-mails and phone calls, and QI coordinators feel they have a good working relationship with staff (5). Staff mentioned specifically: Cindy, Dr. Pointer, John V., Bill.
- Having Cindy and Dr. Pointer at the EMS Section meetings is valuable as a resource and a place to bring collective issues.
- They have a good working relationship with Mike Turay (4).

Opportunities for Improvement

EMS office and staff

- They would like the EMS office to give them the benefit of the doubt if we think they have not submitted something (maybe we lost it). They would like adequate time to respond to our requests for them to send (or resend) data before the Chief is notified.
- Memos like the one regarding bringing in equipment perpetuate an "us vs. them" mentality between EMS and the fire service.

- They wish the EMS staff all got along with one another. That might reduce the “revolving door” at EMS that means providers have to get acquainted with new staff and wait for them to get up to steam (2).
- It’s frustrating to submit data to EMS and not know how (or if) the data is used. They would like to see system-wide reports based on the data they are submitting (5).
- Beware of false starts, like the Lancet data system and the EMS armband projects.
- The website and the policy manual are great, but the newsletter is a little “tired,” as though we’ve run out of innovative ideas and guest writers.
- EMS staff could be a little more sensitive to their time constraints (the example cited was a problem with an EMS employee no longer on staff).
- Each time a form is revised, they must go to each station to replace the old form, and provide training for personnel on the new form. There should be a transition period instead of expecting that new forms will be in place immediately. It would help them if we revised forms once annually so they can incorporate form updates into the annual policy training.
- When we give classes, we should keep in mind that their training schedules are set a year in advance and that it costs them overtime to send their personnel. Two half-days in a row is better than a full day away from the job. While it’s a challenge to find a good topic when there are both EMTs and paramedics in the group, it would be nice to have EMS offer something other than “merit badge” courses. While documentation classes are not exciting, liability issues regarding documentation are important.

Comments on unusual occurrences:

- Unusual Occurrence reports seem to be handled all right from the provider perspective.
- Much is handled internally and not sent to EMS.
- The most common interdepartmental issue is a delayed AMR response time or taking too long on-scene. This is usually handled at the scene and/or directly with AMR management, and not sent to EMS (2).
- Sending to EMS seems to be a formality, so it doesn’t interfere with their internal investigation process.
- There are no criteria for what should go to EMS.
- They seldom hear anything back from EMS on u.o.’s
- “I send information back to whoever asks me for it (usually Cindy, Dr. Pointer, or Kris), and I don’t send cc’s.”

Frequent Users:

- Continue to be an issue and needs to be addressed.
- Referrals to Social Services or the SIP Falls Program don't go far enough to resolve the problem (2).
- Cities would benefit from a list of resources for referral to county services.
- There aren't enough PHNs or social workers to handle it all. Conservatorship takes too long, but sometimes the threat of it is enough.

Receiving hospitals:

- There should be a forum for providers to establish relationships with the receiving hospitals, primarily so they will be willing to provide follow-up and outcome information on cases when paramedics want feedback. They need a conduit that is not too time-consuming and less dependent on "who you know."
- Base Field Care Audits used to be the forum for developing trust and addressing issues. Now, with no forum for communication, things fester until they become a crisis.
- Sending out a letter to hospitals to inform them about a new piece of equipment (e.g. Combitube) isn't enough. The word doesn't trickle down to the physicians and nurses. The hospital staff need actual training in the new equipment.

On-Scene Time:

- AMR medics sometimes spend too much time on-scene (staring I.V.'s etc.). It's usually tolerated unless it's a trauma. It's more of a problem with new hires.
- Consider more on-scene time for first responder paramedics to deliver patient care. Procedures done on-scene are more controlled than in the back of a moving ambulance. If we study the impact of longer scene times, we may find that patients benefit (with exceptions, like trauma, ST elevation).

Other:

- Providers should consider a collaborative approach to C.E. – taking turns offering classes.
- Standardizing equipment: the I.V. incompatibility problem has been solved, but if we buy different defibrillators, we're going to have an incompatibility problem with electrodes.
- Getting equipment back continues to be an issue.

Provider Suggestions regarding the Quality Council

- Process:
 - Avoid getting mired in process. Make some decisions in advance (e.g. leadership, meeting time, purpose) instead of spending too much time getting going (3).
 - Don't be nebulous: be clear about what the group is being tasked with and what they can expect to take away. Give us specific tasks.
 - Have regular (same each time) alternates if the primary member can't make the meeting (2).
 - We need a clear process for how we analyze an issue. We need to know how to select the right tool for the analysis.

- Purpose:
 - Work on system-wide issues: brainstorm and then vote to choose priorities.
 - Address questions on data collection and new forms (e.g. The Combitude form is confusing because "success is not clearly defined).
 - Share best practices between departments (e.g. peer review, mentoring)
 - Provide QI training: Bring us all up to the same level so we can all contribute (6).
 - Once we are getting data in, analyze it to identify statistical abnormalities. Then use ad hoc subgroups of the Quality Council to explore the cause.
 - We need to define the system we are improving. It should not be limited to patient care protocols – There are a lot of other aspects of the system that need improving.

- Other:
 - Looking forward its reinstatement. Start as soon as possible (no time will be good for all).
 - Liked what Ann was doing (Ann Yungert, PHCC/Quality Coordinator 2000) (2).
 - Limited time/funding for internal QI teams.
 - Be sensitive to providers' reluctance to have their performance data shared publicly. Each provider should receive their own data and compare it to the system as a whole.

Recommendations/Proposed Work Plan

- Reconvene the Quality Council (Done: July 2005)
- Work with the Quality Council to determine the extent to which Baldrige criteria can be incorporated into our quality management efforts. Baldrige criteria are complex and require a large commitment of time and resources from the top leadership of each provider organization. We should take from Baldrige what we find useful, but not let it weigh us down.
- Encourage providers to share best practices at Quality Council meetings.
- Provide Six Sigma Yellow Belt training for provider quality managers (Done: September 2005).
- Attend Green Belt training to become more skilled at facilitating Six Sigma projects. Encourage Quality Council members to enroll, if interested.
- Work with the Quality Council to charter improvement projects that target system-wide issues, using Six Sigma methodology. Submit project proposals to EMS Director and/or EMS Medical Director for sponsorship.
- Encourage (but not require) use of Six Sigma tools and techniques for tackling internal problems that providers really care about and want to improve.
- Develop an internal EMS agency quality plan to improve processes within the office.
- Use provider quality plans, EMS agency quality plan, this assessment, and other resource documents to develop a system-wide quality plan, in collaboration with the Quality Council.
- Design a template for future development of provider quality plans that incorporates a QI approach in addition to QA. Explore modification of QA activities to free up time for QI.
- Develop a time line for the above recommendations (The State EMS Authority has not yet established a time line for QI plan development, data submission requirements, or the implementation of other components of the EMS System QI Program Model Guidelines).

Resources

Alameda County EMS Agency (1998). *An Update Report by the EMS County to the Board of Supervisors on the Future of Emergency Medical Services in Alameda County*. Oakland, CA.

Baldrige National Quality Program (2005). *Health Care Criteria for Performance Excellence*. Gaithersburg, MD.

California Emergency Medical Services Authority (2003). *Vision Implementation Project Final Report*. Sacramento, CA.

California Emergency Medical Services Authority (2003). *State Emergency Medical Services Plan*. Sacramento, CA.

California Emergency Medical Services Authority (2004). *Emergency Medical Services System Quality Improvement Program Model Guidelines*. Sacramento, CA.

National Highway Traffic Safety Administration (1997). *A Leadership Guide to Quality Improvement for Emergency Medical Services (EMS) Systems*. Washington D.C.

Interviews with system provider quality managers:

Provider	Date	Contact(s)
Alameda Fire Department	06-07-05	Doug Clifton
Alameda County Fire Department	04-29-05	Al Kleveno, Deede Vultaggio, Rich Brown
Alameda County Medical Center	07-27-05	Valerie Louie
Albany, Emeryville & Piedmont Fire Depts.	05-24-05	Gail Porto
American Medical Response	07-22-05	Michelle Voos
Berkeley Fire Department	04-27-05	Ann-Margaret Moyer
Camp Parks Fire Department	06-30-05	Eric Martinez
East Bay Regional Parks	07-26-05	Dan McCormick, Mark Caplin, Dennis Rein, Andy White, Paul Cutino, Larry Moss
Hayward Fire Department	05-05-05	Bob Negri
Oakland Fire Department	05-26-05	Luis Diaz
Fremont Fire Department	04-14-05	Bob O'Brien, Pat Kramm
Dispatch Centers: LLNL & Oakland Fire	07-12-05	Mike Denton
Livermore-Pleasanton Fire Department	06-15-05	Sabina Imrie
Union City & Newark Fire Departments	06-07-05	Marlene Rivers

Acronym List

AED	Automated External Defibrillator
ALS	Advanced Life Support
AMR	American Medical Response
ACRECC	Alameda County Regional Emergency Communications Center (in Livermore)
CAD	Computer Aided Dispatch
CES	Clinical Education Specialist (at AMR)
CEMSIS	California EMS Information System
CPAP	Continuous Positive Airway Pressure
CRP	Cardiopulmonary Resuscitation
CQI	Continuous Quality Improvement
EMD	Emergency Medical Dispatch
EMS	Emergency Medical Services
EMSA	California Emergency Medical Services Authority
FRALS	First Responder Advanced Life Support
HAZMAT	Hazardous Materials
ICU	Intensive Care Unit
IRP	Investigative Review Panel
LEMSA	Local EMS Agency
MICN	Mobile Intensive Care Nurse
MRO	Medical Radio Operator (a physician)
NHTSA	National Traffic Safety Administration
OSHPD	Office of Statewide Planning and Development
PCR	Patient Care Report
PHCC	Prehospital Care Coordinator (at Alameda County EMS)
PIP	Personal Improvement Plan (at AMR)
QA	Quality Assurance
QI	Quality Improvement
TAC	Trauma Audit Committee