

# Advanced Leadership Issues in Emergency Medical Services

ALIEMS-Student Manual

*2nd Edition, 4th Printing-October 2013*



**FEMA**

**FEMA/USFA/NFA**  
**ALIEMS-SM**  
**October 2013**  
**2nd Edition, 4th Printing**

***Advanced Leadership Issues in Emergency  
Medical Services***



**FEMA**

# Advanced Leadership Issues in Emergency Medical Services

ALIEMS-Student Manual

*2nd Edition, 4th Printing-October 2013*



**FEMA**

**This Student Manual may contain material that is copyright protected. USFA has been granted a license to use this material only for NFA-sponsored course deliveries as part of the course materials, and it shall not be duplicated without consent of the copyright holder. States wishing to use these materials as part of state-sponsorship and/or third parties wishing to use these materials must obtain permission to use the copyright material(s) from the copyright holder prior to teaching the course.**

This page intentionally left blank.

**U.S. DEPARTMENT OF HOMELAND SECURITY**

**UNITED STATES FIRE ADMINISTRATION**

**NATIONAL FIRE ACADEMY**

**FOREWORD**

The U.S. Fire Administration (USFA), an important component of the Department of Homeland Security (DHS), serves the leadership of this Nation as the DHS's fire protection and emergency response expert. The USFA is located at the National Emergency Training Center (NETC) in Emmitsburg, Maryland, and includes the National Fire Academy (NFA), National Fire Data Center (NFDC), and the National Fire Programs (NFP). The USFA also provides oversight and management of the Noble Training Center in Anniston, Alabama. The mission of the USFA is to save lives and reduce economic losses due to fire and related emergencies through training, research, data collection and analysis, public education, and coordination with other Federal agencies and fire protection and emergency service personnel.

The USFA's National Fire Academy offers a diverse course delivery system, combining resident courses, off-campus deliveries in cooperation with State training organizations, weekend instruction, and online courses. The USFA maintains a blended learning approach to its course selections and course development. Resident courses are delivered at both the Emmitsburg campus and the Noble facility. Off-campus courses are delivered in cooperation with State and local fire training organizations to ensure this Nation's firefighters are prepared for the hazards they face.

*Advanced Leadership Issues in Emergency Medical Services (ALIEMS)* is one of several NFA courses that address specific management training needs identified in the development of Public Law 93-498. ALIEMS is designed to provide an awareness and training in advanced leadership issues affecting the delivery of EMS for those individuals involved in senior-level management of EMS programs for both fire service and other allied public service agencies.

This page intentionally left blank.

**TABLE OF CONTENTS**

<b><u>TITLE</u></b>	<b><u>PAGE</u></b>
Foreword.....	iii
Table of Contents.....	v
Course Schedule.....	vii
How to Use This Manual.....	ix
Course Goal and Course Introduction.....	xi
Firefighter Code of Ethics.....	xv
Grading Methodology.....	xvii
A Student Guide to End-of course Evaluations.....	xix
MODULE 1: LEADERSHIP.....	SM 1-1
MODULE 2: COSTING OUT EMERGENCY MEDICAL SERVICES.....	SM 2-1
MODULE 3: INFORMATION MANAGEMENT.....	SM 3-1
MODULE 4: QUALITY IMPROVEMENT.....	SM 4-1
MODULE 5: HUMAN RESOURCES RISK MANAGEMENT.....	SM 5-1
MODULE 6: MANAGING POLITICAL ASPECTS.....	SM 6-1
MODULE 7: MEDICAL OVERSIGHT IN EMERGENCY MEDICAL SERVICES.....	SM 7-1
MODULE 8: CHANGES IN HEALTH CARE DELIVERY.....	SM 8-1
APPENDIX A: GLOSSARY.....	SM A-1
APPENDIX B: REPRINTED ARTICLES.....	SM B-1
APPENDIX C: TOOLS FOR MANAGING ISSUES/CHANGES.....	SM C-1

This page intentionally left blank.

**Course Schedule--Week One**

<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>
<p>Welcome/Introductions/ Course Overview Ex I (Course Intro) MODULE 1: LEADERSHIP</p> <p><b>Lunch</b></p> <p>MODULE 1: LEADERSHIP (cont'd) Ex II (Leadership Functions) Ex IV (Vision Formulation) Review Reading Assignments</p>	<p>Reinforcing Activity #1 I.F.A.D.E.R.S.H.I.P</p> <p><b>Lunch</b></p> <p>MODULE 2: COSTING OUT EMS MODULE 3: INFORMATION MANAGEMENT Ex V (Info Mgmt) Assign Ex VI (Proposal)</p>	<p>Reinforcing Activity #2 MODULE 4: QUALITY IMPROVEMENT Ex V Feedback Ex VII (QI)</p> <p><b>Lunch</b></p> <p>Ex VII (cont'd) CURRENT ISSUES</p>	<p>MODULE 5: HUMAN RESOURCES AND RISK MANAGEMENT Ex VIII (Risk Mgmt)</p> <p><b>Lunch</b></p> <p>Reinforcing Activity #3 MODULE 6: MANAGING POLITICAL ASPECTS Ex IX (Role Play) Prep for Applied Midterm</p>	<p>Ex IX (cont'd) Applied Midterm Exam</p> <p><b>Lunch</b></p> <p>Written Midterm Exam Ex VI Group Work</p>
<p><b>Reading Assignment</b></p> <p>"Leadership: Fact or Fiction." Brame "EMS Agenda for the Future: Where Are We...Where We Want to Be." Delbridge, et al. "Managing Information for the Fire Department." Moriarty</p> <p>Module 1--SM 1-1--SM 1-10 Module 2--SM 2-1--SM 2-18 Module 3--SM 3-1--SM 3-10 <b>Homework: Exercise III</b></p>	<p><b>Reading Assignment</b></p> <p>NHTSA QI Manual 1-5; 13- 48</p> <p>Module 4--SM 4-1</p>	<p><b>Reading Assignment</b></p> <p>"Politics and Change." Selbst "Risk Management Practices in the Fire Service." USFA. P. 21-58.</p> <p>Module 5--SM 5-1--SM 5-14 Module 6--SM 6-1--SM 6-6 <b>Homework: RA #3</b></p>	<p><b>Reading Assignment</b></p> <p>"Whose License Is It Anyway." Page "Medical support for the fire service: current priorities and roles of physicians." Bogucki</p>	<p><b>Reading Assignment</b></p> <p>Module 7--SM 7-1--SM 7-10 <b>Homework: Bring personal mission statement to class on Monday</b></p>

**Course Schedule--Week Two**

<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>
Reinforcing Activity #4 MODULE 7: MEDICAL OVERSIGHT IN EMERGENCY MEDICAL SERVICES CURRENT ISSUES  <i>Lunch</i>  Ex X (Role Play)	CURRENT ISSUES Prep for Applied Final Ex VI (Proposal) Group Work  <i>Lunch</i>  Ex VI (Proposal) Group Work  <i>Reading Assignment</i> "More Expanded Scope: Operational EMS." Bogucki "Coming Soon to an Ambulance Near You." Stribling "EMS Systems and Managed Care Integration." Koenig, et al. "High Tech Triage." Garza "Brave New Managed World." Neely & Krakeel  Module 8--SM 8-1--SM 8-12	Reinforcing Activity #5 MODULE 8: CHANGES IN HEALTH CARE DELIVERY Ex XI (Managed Care)  <i>Lunch</i>  Ex XI (Managed Care) CURRENT ISSUES	Applied Final Exam   <i>Lunch</i>  Written Final Exam Feedback on Final Exam Reinforcing Activity #6-- Review Student Expectations	NFA Graduation

## HOW TO USE THIS MANUAL

This Student Manual (SM) is yours to keep. You are encouraged to take notes in it, underline key text, and generally use it in any way that enhances your learning.

We believe you will find the teaching approach used in the ALIEMS course to be very innovative. The course presupposes your knowledge of the technical and clinical aspects of EMS. Therefore, the course will concentrate on your application of technical information and the skills and knowledge taught in the course modules. In addition to being able to apply knowledge, you will be required to demonstrate skills based on your acquired knowledge. Because of the proactive nature of the course, there is very little classroom time allocated for lectures and conventional learning activities in relation to the simulations and exercises. Your instructors will review topical material briefly for each learning module. During those sessions, you are encouraged to maximize your personal development opportunities through active participation in class discussions. In addition, you are encouraged to take notes that will facilitate your recall of the material and use of your SM after you return to your job.

You will be expected to complete reading assignments from the SM text and the required reading articles in Appendix B. You will be accountable for the applicable reading assignments at the beginning of each class day. At the end of each module, a list of suggested readings appears, if applicable. Suggested reading material may be found at the NFA Learning Resource Center (LRC). You should take advantage of the LRC by using the various EMS texts, journals, and other reference material to expand your knowledge of EMS. The SM text material and material covered by reading assignments will be the EMS basis for the in-class exercises and simulations. Each of the exercises and simulations will place you into real-world scenarios requiring you to apply your EMS knowledge and demonstrate such skills as leadership, analysis, decisionmaking, problem-solving, and interpersonal communications. All of the geographic locations and personalities you will encounter during the simulations are fictional. Any similarity to actual locations or personalities is purely coincidental, and should not be considered relevant to the simulations. Following each exercise or simulation, your performance will be assessed and feedback will be provided.

This page intentionally left blank.

## COURSE GOAL AND COURSE INTRODUCTION

### Course Goal

To provide knowledge and practice, in the context of current issues, that facilitates the improvement of the Emergency Medical Services (EMS) systems mid- to upper-level managers' abilities to carry out leadership functions. In addition, to provide a forum for students to exchange ideas and individual viewpoints regarding current and future issues relating to leading EMS.

### Course Introduction

In October 1992, a Curriculum Advisory Committee (CAC) was convened at the National Fire Academy (NFA) to conduct an indepth review of EMS training with the objective of projecting training requirements into the 21st century. The CAC, comprised of EMS content experts from around the country, identified six EMS content areas for future course development. One of the areas, *Advanced EMS Management*, was considered to have sufficient priority to warrant development of a new NFA course for middle- to upper-level EMS managers. Development of the ALIEMS course commenced in late 1993 and continued through 1994 to meet that priority. ALIEMS was first piloted in November 1994, and went on line as a resident NFA course in April 1995. Concurrent with the early stages of development of the ALIEMS course, as a result of a similar CAC recommendation, the *Management of Emergency Medical Services* (MEMS) course taught at NFA was revised to provide the latest in leadership and management training for first-line EMS managers.

The goal of the ALIEMS course is to provide you with an inventory of advanced leadership and management skills that can be taken back to the work environment and demonstrated on the job. ALIEMS uses an innovative teaching method that requires you to demonstrate effective management skills rather than just indicating, through rote testing, a knowledge of leadership and management skills. Teaching leadership/management skills is not effective unless there is ample opportunity for you to practice the appropriate behaviors in a job-relevant context followed by feedback on your ability to demonstrate the appropriate behaviors effectively. Only if you actively practice these skills will you leave the course with improved management skills. The course content was developed from recommendations provided in the report of the 1992 CAC, an extensive review and extrapolation of material and issues from current EMS literature, input from EMS subject matter experts (SME's), and design guidance from the EMS Chair and educational specialists at the NFA. ALIEMS was revised in the Spring of 1999 to meet the changing needs and issues of EMS, and was piloted in August 1999.

ALIEMS is comprised of eight modules of instruction that, taken together, progress through EMS activities that might confront a mid- to upper-level EMS manager in a hypothetical city or community. Day One of the course provides for coverage of NFA

administrative material, student/instructor introductions, a discussion of basic leadership concepts, and an introduction to the exercise scenario that will unfold during the course. The course will provide you with realistic simulations that you can relate back to your job. The remainder of the 2-week course expands upon topics such as basic leadership and management issues, quality improvement, human resources, dealing with political aspects, the physician's role in EMS, changes in health care delivery and current management issues in EMS. **Most of the requisite technical data (knowledge) is presented through outside reading assignments.** You are accountable for the technical knowledge through demonstration and practice as the learning experience progresses.

The scope of ALIEMS is, by design, very broad and affords you ample opportunity to explore many EMS areas and issues. You are encouraged to expand the scope of any discussion to include specific problem areas or issues that you have encountered. Instructors have a responsibility to keep the course on track, but also have the leeway to meet the needs of individual classes. However, coverage of an unplanned topic may require after-hours discussion to complete.

As a resident program course at NFA, ALIEMS puts you into a unique campus environment that enhances the learning experience. Although you and your fellow students are from an EMS background and face many of the same types of problems, you will discover quickly there are many different approaches and solutions to those same problems. The resident environment encourages student sharing of issues, ideas, problems, and solutions both in and out of the classroom. Research indicates that students often benefit as much from professional out-of-class learning opportunities as they do from the course itself. Classroom activities are designed to promote maximum student interaction, group participation, and shared study. At the same time, the requirement for independent research affords you with an opportunity to leave your own mark on the class. What you take home from the ALIEMS course is directly related to your willingness to participate and learn from the experience.

We have covered to some extent the scope of the ALIEMS course. However, it is important to point out the areas that ALIEMS does not cover. ALIEMS does not deal with any clinical problems, protocols, or specific patient care procedures. Neither does ALIEMS cover startup procedures for a new EMS service, or EMS personnel training requirements or qualification. The course also avoids putting you, the senior EMS manager, on the street. Throughout the course, you will be placed "in the middle," with pressure being applied from first-line EMS managers and EMS street providers for advice, counsel, and support, and from those who have charged you with the responsibility of managing your EMS system. As a senior EMS manager, you are accountable for system operation and management. In addition, you will experience additional pressure from outside the organization.

Finally, ALIEMS stresses the application of effective leadership and management principles by a senior EMS manager in the unique environment of out-of-hospital emergency medical services. However, while dealing with the unique challenges of

providing responsive emergency medical services, EMS managers also must view their system as an operational business entity. This theme is addressed in many of the courses taught at the NFA in an effort to break down older, more traditional concepts. These more rigid concepts keep many fire departments from moving forward in a competitive business sense with other governmental agencies. In areas such as personnel management, financial management, quality improvement, and executive development, fire service agencies face problems similar to other businesses. Therefore, it is imperative that fire service and EMS managers use current, effective business practices when managing their service agencies. Although you are given the special problems and emergency situations of "the street," your management role places you in the position of running a business for your community. Community leaders and the general public expect you to be an effective manager and they hold you accountable for your performance. The staff and faculty at NFA trust that your participation in the ALIEMS course will be rewarding and beneficial to you personally and, after you leave NFA, will benefit the agency and community you represent.

This page intentionally left blank.

# FIREFIGHTER CODE OF ETHICS

## Background

The Fire Service is a noble calling, one which is founded on mutual respect and trust between firefighters and the citizens they serve. To ensure the continuing integrity of the Fire Service, the highest standards of ethical conduct must be maintained at all times.

Developed in response to the publication of the Fire Service Reputation Management White Paper, the purpose of this National Firefighter Code of Ethics is to establish criteria that encourages fire service personnel to promote a culture of ethical integrity and high standards of professionalism in our field. The broad scope of this recommended Code of Ethics is intended to mitigate and negate situations that may result in embarrassment and waning of public support for what has historically been a highly respected profession.

Ethics comes from the Greek word ethos, meaning character. Character is not necessarily defined by how a person behaves when conditions are optimal and life is good. It is easy to take the high road when the path is paved and obstacles are few or non-existent. Character is also defined by decisions made under pressure, when no one is looking, when the road contains land mines, and the way is obscured. As members of the Fire Service, we share a responsibility to project an ethical character of professionalism, integrity, compassion, loyalty and honesty in all that we do, all of the time.

We need to accept this ethics challenge and be truly willing to maintain a culture that is consistent with the expectations outlined in this document. By doing so, we can create a legacy that validates and sustains the distinguished Fire Service institution, and at the same time ensure that we leave the Fire Service in better condition than when we arrived.



## FIREFIGHTER CODE OF ETHICS

I understand that I have the responsibility to conduct myself in a manner that reflects proper ethical behavior and integrity. In so doing, I will help foster a continuing positive public perception of the fire service. Therefore, I pledge the following...

- Always conduct myself, on and off duty, in a manner that reflects positively on myself, my department and the fire service in general.
- Accept responsibility for my actions and for the consequences of my actions.
- Support the concept of fairness and the value of diverse thoughts and opinions.
- Avoid situations that would adversely affect the credibility or public perception of the fire service profession.
- Be truthful and honest at all times and report instances of cheating or other dishonest acts that compromise the integrity of the fire service.
- Conduct my personal affairs in a manner that does not improperly influence the performance of my duties, or bring discredit to my organization.
- Be respectful and conscious of each member's safety and welfare.
- Recognize that I serve in a position of public trust that requires stewardship in the honest and efficient use of publicly owned resources, including uniforms, facilities, vehicles and equipment and that these are protected from misuse and theft.
- Exercise professionalism, competence, respect and loyalty in the performance of my duties and use information, confidential or otherwise, gained by virtue of my position, only to benefit those I am entrusted to serve.
- Avoid financial investments, outside employment, outside business interests or activities that conflict with or are enhanced by my official position or have the potential to create the perception of impropriety.
- Never propose or accept personal rewards, special privileges, benefits, advancement, honors or gifts that may create a conflict of interest, or the appearance thereof.
- Never engage in activities involving alcohol or other substance use or abuse that can impair my mental state or the performance of my duties and compromise safety.
- Never discriminate on the basis of race, religion, color, creed, age, marital status, national origin, ancestry, gender, sexual preference, medical condition or handicap.
- Never harass, intimidate or threaten fellow members of the service or the public and stop or report the actions of other firefighters who engage in such behaviors.
- Responsibly use social networking, electronic communications, or other media technology opportunities in a manner that does not discredit, dishonor or embarrass my organization, the fire service and the public. I also understand that failure to resolve or report inappropriate use of this media equates to condoning this behavior.

Developed by the National Society of Executive Fire Officers

## Grading Methodology

### Evening Assignments

All evening assignments are individual assignments. Each evening assignment should be turned in first thing in the morning of the following day and placed in the "assignment box." The instructors will read and comment on students' work during the next day's class session. Instructors will remind students that they should upload their work onto the classroom shared drive. At the end of the course, students should download all of the other students' completed projects.

Each evaluated assignment receives a score. The criteria used to determine these scores are:

- |    |  |
|----|--|
| 10 | On time. Assignment questions/tasks addressed with appropriate thoroughness and depth.             |
| 8  | On time. Assignment questions/tasks addressed with moderate depth and thoroughness,                |
| 6  | Late. Or assignment questions/tasks addressed with appropriate or moderate depth and thoroughness. |
| 3  | Late. And/Or assignment questions/tasks addressed with minimal depth or thoroughness.              |
| 1  | Late and incomplete.   |
| 0  | Assignment not turned in.  |

Consideration will be made in the following areas:

1. Did the student comprehensively answer the assigned questions?
2. Did the student comprehensively address all issues associated with his/her response?
3. As a professional, is the student writing at a collegiate level using appropriate grammar, punctuation, and spelling?

As you evaluate projects throughout the course, your emphasis should be on ensuring that your comments are positive, diagnostic, and corrective.

- By "positive" is meant that you should use care in your wording selection. Some communication theorists believe that any message should both start and end with some type of positive comment.
- By "diagnostic" is meant that you clearly indicate (again, in a positive and constructive manner) where and how the assignment fell short.
- By "corrective" is meant that you specifically describe what the student must do with the assignment to bring it up to a "passing level."

Note: Use the included Grading Roster for official record keeping of students' scores. Turn the Grading Roster and Student Final Project grading pages in to the Training Specialist at the conclusion of the course.

## A Student Guide to End-of-course Evaluations

**Say What You Mean ...**

### Ten Things You Can Do to Improve the National Fire Academy

The National Fire Academy takes its course evaluations very seriously. Your comments and suggestions enable us to improve your learning experience.

Unfortunately, we often get end-of-course comments like these that are vague and, therefore, not actionable. We know you are trying to keep your answers short, but the more specific you can be, the better we can respond.



Actual quotes from student evaluations:	Examples of specific, actionable comments that would help us improve the course:
1 "Update the materials."	<ul style="list-style-type: none"> <li>The (ABC) fire video is out-of-date because of the dangerous tactics it demonstrates. The available (XYZ) video shows current practices.</li> <li>The student manual references building codes that are 12 years old.</li> </ul>
2 "We want an advanced class in (fill in the blank)."	<ul style="list-style-type: none"> <li>We would like a class that enables us to calculate energy transfer rates resulting from exposure fires.</li> <li>We would like a class that provides one-on-one workplace harassment counseling practice exercises.</li> </ul>
3 "More activities."	<ul style="list-style-type: none"> <li>An activity where students can physically measure the area of sprinkler coverage would improve understanding of the concept.</li> <li>Not all students were able to fill all ICS positions in the exercises. Add more exercises so all students can participate.</li> </ul>
4 "A longer course."	<ul style="list-style-type: none"> <li>The class should be increased by one hour per day to enable all students to participate in exercises.</li> <li>The class should be increased by two days so that all group presentations can be peer evaluated and have written abstracts.</li> </ul>
5 "Readable plans."	<ul style="list-style-type: none"> <li>The plans should be enlarged to 11 by 17 and provided with an accurate scale.</li> <li>My plan set was blurry, which caused the dotted lines to be interpreted as solid lines.</li> </ul>
6 "Better student guide organization," "manual did not coincide with slides."	<ul style="list-style-type: none"> <li>The slide sequence in Unit 4 did not align with the content in the student manual from slides 4-16 through 4-21.</li> <li>The instructor added slides in Unit 4 that were not in my student manual.</li> </ul>
7 "Dry in spots."	<ul style="list-style-type: none"> <li>The instructor/activity should have used student group activities rather than lecture to explain Maslow's Hierarchy.</li> <li>Create a pre-course reading on symbiotic personal relationships rather than trying to lecture on them in class.</li> </ul>
8 "More visual aids."	<ul style="list-style-type: none"> <li>The text description of V-patterns did not provide three-dimensional views. More photographs or drawings would help me imagine the pattern.</li> <li>There was a video clip on NBC News (date) that summarized the topic very well.</li> </ul>
9 "Re-evaluate pre-course assignments."	<ul style="list-style-type: none"> <li>The pre-course assignments were not discussed or referenced in class. Either connect them to the course content or delete them.</li> <li>The pre-course assignments on ICS could be reduced to a one-page job aid rather than a 25-page reading.</li> </ul>
10 "A better understanding of NIMS."	<ul style="list-style-type: none"> <li>The instructor did not explain the connection between NIMS and ICS.</li> <li>The student manual needs an illustrated guide to NIMS.</li> </ul>

This page intentionally left blank.

# MODULE 1: LEADERSHIP

## **Objectives:**

Given a written evaluation, In-Basket, or group activity, the students will be able to:

1. Identify the 10 modern leadership functions and provide examples of behavioral changes that leaders must make to carry out those functions.
  2. Identify and describe the behaviors characteristic of effective leaders.
  3. Develop an organization vision statement and a personal mission statement.
  4. Describe the strategies useful to gain commitment from employees to the leader's vision.
  5. Apply teamwork principles to develop a consensus vision statement for the class.
  6. Compare and contrast the consensus vision statement of the class with the Emergency Medical Services (EMS) Agenda for the Future.
  7. Explain the value of having an organizational vision and mission statement.
  8. Apply teamwork principles to develop consensus agreement.
  9. Create a plan to deal with a specific issue or specified change, using a model and a tool presented in the class.
-

This page intentionally left blank.

## LEADERSHIP FUNCTIONS

Specific functions that are becoming more common in the roles of modern organizational leaders include

- **Visioning:** Developing a statement that commits the organization and its services and products to total customer satisfaction and the highest possible standards of quality, productivity, and continuous improvement.
- **Leading through commitment:** Moving away from directing and controlling to building work environments that encourage people to try to do their very best always.
- **Satisfying the customer:** Maintaining continuous contact with internal and external customers and responding to their needs to build total satisfaction.
- **Coaching:** Controlling less and helping more. Working personally with individuals and teams in resolving performance-related problems, teaching new knowledge or skills, supporting performance, and adjusting performance.
- **Developing human resources:** Demonstrating the commitment, the knowledge, and the skills to develop the potential and careers of coworkers.
- **Leading teams:** Helping teams form, organize, and develop their full potential. Facilitating team meetings and helping teams create their own identities.
- **Managing work processes:** Understanding the end-to-end operations of work processes for which one is responsible. Demonstrating the knowledge and skills required to measure and improve these processes.
- **Managing change:** Anticipating and understanding the sources and processes of change; helping one's organization use change as an opportunity to improve performance.
- **Managing projects:** Demonstrating the competencies required to plan and manage special projects to meet specific administrative, production, and improvement needs of the organization.
- **Measuring performance:** Understanding the key elements in developing a performance measurement plan, identifying the opportunities for measuring organizational performance, and applying this understanding to one's organization.

## **THE IMPORTANCE OF LEADING WITH VISION**

Leaders who lead without a vision of what their organizations are to become doom their organizations to function according to mere tradition. Without a vision of the organization's future, leaders are reduced to keeping things the way they always have been; they are guided by the saying, "If it ain't broke, don't fix it." As a result, these organizations, and the personnel who work for them, cannot prosper and grow.

True leaders do things differently. They live by the saying, "If it ain't broke, you're not looking in the right place." Realizing that there is always room for improvement, they believe that no one has ever done anything so well that it cannot be done better. For true leaders, a vision is not a dream; it is a reality that does not yet exist. The vision is tangible to these leaders; their confidence in, and dedication to, the vision is so strong they can devote long hours over many years to bring it into being. In this way, a vision acts as an internal force, compelling a leader to action. It gives a leader purpose, and the power of the vision and the leader's devotion to it work to inspire others.

## **VISION--A DEFINITION**

What is vision? Vision is difficult to define because it functions at many levels. A simplistic definition of vision is the overarching direction for the future of an organization or program. Leaders with vision are able to take the present as it is and formulate a future that grows out of it and improves upon it. A vision is a target toward which a leader aims his/her resources and energy. The constant presence of the vision keeps a leader on track despite obstacles such as practical difficulties, fear of failure, negative attitudes of superiors, peers, or employees, or problems in the industry. Most important, when shared by employees, a vision can keep an entire organization moving forward in the face of adverse circumstances. Moving toward the same goal, employees work together rather than as disconnected individuals who just happen to work for the same company.

When employees understand a leader's vision, they understand what the organization is trying to accomplish and what it stands for. The vision serves as a unifying force, giving direction to each employee's actions because his/her individual efforts can be checked against it. Each employee can see what the future holds as a rational extension of the present.

In essence, the role of the leader is to give employees a sense of purpose and direction--a meaningful reason behind the work they do. Through their visions of the future, true leaders can lift employees out of the monotony of the daily work world and put them into a new world full of opportunity and challenge. This is why leaders are so critical to the success of an organization. They have the ability to see through all the confusion in the workplace and focus on what matters. A vision helps leaders and employees keep the frustrations of the workplace in perspective, enabling them to live with uncertainty in the short term because they can visualize success in the long term.

## **COMMUNICATING THE VISION**

Leaders must communicate their vision to others for it to become a shared vision. To accomplish this, leaders must first act in a manner consistent with the vision in everything they do. They must set a personal example; they must not send mixed signals by saying one thing and doing another.

Next, leaders must stress the importance of the vision so that people will take an interest in it. If employees believe the vision is important and worthwhile, many of them will want to be involved with it, even if they do not understand the details. Delivering a single, clear, and credible message is important in helping people to understand and buy into organizational goals and objectives. To communicate clearly and reinforce the vision, it is necessary to send frequent and simple messages that focus on the core values and beliefs that support the vision.

Symbols and rituals are effective ways to simplify rich and complex messages. Through symbolization, large amounts of complex information such as formal and informal organizational rules and values, situational information, emotional content, and other apparently unrelated data can be integrated succinctly and represented. For example, executives do not have to express their gratitude toward a retiring partner explicitly if they organize a reception, invite his or her friends, and offer a gift. The whole package symbolizes their recognition of the partner's contribution. Through the use of symbols and rituals, leaders can express their vision for the organization in a manner which is easily understood and remembered.

## **GAINING COMMITMENT**

After a vision has been explained simply and directly, people must decide whether they want to be a part of it. If they don't, they cannot be forced to support the vision over a long period of time without considerable cost to the organization. The day has nearly passed when autocratic leaders can succeed over the long term; the cost of using this approach is too high in terms of the inferior output resulting from poor quality effort, lost employee loyalty and support, and money. Moreover, forcing people to do things they do not want to do requires a great deal of energy over the long term--more energy than most people can afford to expend.

Most people are not motivated by being pushed. They are motivated by the desire to satisfy their own basic human needs: achievement, belonging, recognition, self-esteem, control over their lives, and the sense of having lived up to their ideals. Leaders must connect with these human needs and let people become excited about a vision. To be successful, leaders must respond to the ideas that rise out of the organization. Leaders must involve people in deciding how to achieve the vision, allow them to improve it, and recognize and reward them for their contributions.

Although a vision may be the work of one person, the more people who feel that they personally helped shape the vision, the more people who will be loyal to the vision. Having helped preside over its birth, employee midwives become proud parents who champion the vision. The leader's vision becomes their vision. Simply put, involvement creates ownership.

Even when the original vision is created solely by the leader, a shared vision can still result. But the leader must allow others to influence the implementation of the vision. When others can influence key decisions, they benefit from the resulting feelings of achievement and accomplishment. They feel responsible for the vision's realization. Personal feelings of success then become intertwined with the vision's success, and once this happens, a shared destiny exists. Loyalty to the vision, loyalty to the organization, and loyalty to oneself become fused. Leaders may come and go, but the commitment to the vision remains. Loyalty to the organization grows, because it is the vehicle by which the vision is attained and personal feelings of accomplishment are achieved. As the Chinese sage, Lao-Tse, wrote 25 centuries ago, "A leader is best, when people barely know he exists. When his work is done, his aim fulfilled, people say, 'We did this ourselves.'"

Following is the vision statement from the EMS Agenda for the Future. Review it in context of what you have just read.

## **EMS AGENDA FOR THE FUTURE**

### **Making It A Reality**

A vision for EMS in the next millennium:

*Emergency medical services (EMS) of the future will be community-based health management that is fully integrated with the overall health care system. It will have the ability to identify and modify illness and injury risks, provide acute illness and injury care and follow-up, and contribute to treatment of chronic conditions and community health monitoring. This new entity will be developed from redistribution of existing health care resources, and will be integrated with other health care providers and public health and public safety agencies. It will improve community health and result in more appropriate use of acute health care resources. EMS will remain the public's emergency medical safety net.*

*U.S. Department of Transportation, National Highway Traffic Safety Administration, DOT HS 808 441  
August 1996 NTS-41*

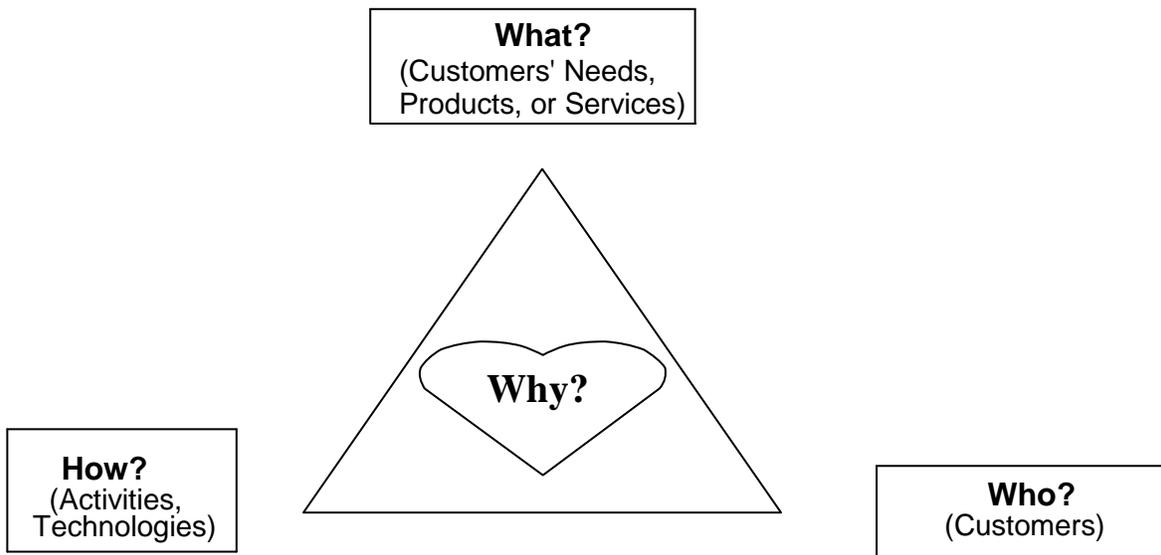
## Organizational Mission

The mission of an organization identifies the purpose of the organization. It should include the specific tasks that allow the organization to accomplish the vision. One of the most important and, often one of the most difficult aspects of the strategic planning process, is the development of a mission statement that briefly and clearly states the reasons for an organization's existence. The mission statement should include the organization's purpose(s)/function(s), its primary customer base, and the primary methods it will use to fulfill the purpose. The mission statement provides the context for formulating the strategies by which the organization will operate. It determines how resources will be allocated by the organization and what the general pattern of growth and direction will be for the future. The primary purpose for having a mission statement is to bring clarity of focus to members of the organization. It should provide members with an understanding of how what they do is tied into the organization's purpose.

## FORMULATING THE MISSION STATEMENT

The mission statement must complement the organizational values. The mission statement should address four basic elements (see Figure 1):

- What services does the organization offer?
- Who are the recipients of the services?
- How does the organization deliver the services?
- Why does the organization exist?



**Figure 1**  
**Four Basic Elements of the Organizational Mission**

## **What**

"What" involves defining the needs that the organization is attempting to fill. An organization must expand the definition past just services it provides and focus on the customers' needs.

Successful organizations try to identify services that meet the needs of the public and include these considerations. Achieving consensus on how broadly or narrowly to answer the "what" question can be a major issue in formulating the mission statement.

## **Who**

"Who" identifies the customers the organization is attempting to serve. No organization, regardless of size, is large enough to meet the needs of all possible customers.

An EMS organization can identify its customers in many ways: by geography, age, ethnicity, etc. An organization can identify its customers by single or multiple factors, for example, geographic density of calls and collection rate by payer mix. Clarity about its customers enables the organization to be more sensitive to their needs and to focus its resources.

## **How**

"How" defines the organization's methods for achieving its goals. For example, what level of service (Basic Life Support (BLS), Advanced Life Support (ALS), first response, transport) will be used in meeting the needs of its customers. This may involve a distribution strategy, such as providing injury prevention programs.

## **Why**

"Why" an organization provides the services that it does frequently is important to define for both profit-oriented and not-for-profit organizations. Many organizations feel the need to include some simple statement regarding "why" as part of their mission statements. It appears in the center of the diagram in Figure 1 on SM p. 1-7.

## **DRIVING FORCES**

Identifying and prioritizing the forces that drive the organization are important in developing the mission statement. Based on experience, an organization approaches strategic questions with these forces in mind. These forces help to determine and integrate the strategic choices of the managers. These forces may include

- services offered;
- customers served;

- technology used;
- method of delivering services; and
- financial stability.

This list of forces is not intended to be complete. The forces for each organization should be determined by a strategic planning team. Once they are determined, they should be prioritized in order of their perceived importance. Most major strategic decisions that organizations make involve the allocation of resources according to a set of priorities. If there are inadequate resources, the ranking of the forces that have been identified can determine how resources will be allocated or which direction the organization will pursue.

## **ORGANIZATIONAL ATTRIBUTES**

Developing the mission statement also should include identifying those attributes the organization has that set it apart from its competitors. What services do they alone offer? Distinct attributes may involve specialty services, alternative transport, or injury prevention programs.

Once the basic elements are addressed and the organization's driving forces and distinctive attributes are identified, they can be integrated into the organization's mission statement. The mission statement should be brief and identify the organization's basic service clearly. A well-written mission statement helps the organization develop its course of action and provides a guide for making routine day-to-day decisions. Once the mission statement is written, it is critical that all members of the organization know and understand it.

## **MISSION FORMULATION IN ORGANIZATIONAL SEGMENTS**

Once an overall mission statement has been developed for an organization, mission statements that are more specific and concrete should be developed for various divisions of the EMS organization such as training or the Public Information, Education, and Relations (PIER) office. Division mission statements should be more focused and more limited than that of the total organization, but they must be derived from the organizational mission statement.

## **DEALING WITH ISSUES AND CHANGE**

It has been said that Christopher Columbus defined bureaucracy while discovering America, i.e., he didn't know where he was going, he wasn't sure how he was going to get there, and he didn't recognize it once he arrived. Unfortunately, the same often can be said for fire service organizations--especially when they are called upon to face the ever-changing issues and the demand for change common to all modern organizations.

Functions of leaders include dealing with issues and managing changes. Dealing with issues and managing changes both involve a systematic process that has four stages: analysis, planning, implementation, and evaluation.

**Analysis** involves analyzing the existing situation and assessing the changes that need to be made. In this stage, an overall needs assessment is performed.

**Planning** involves using the information gathered during analysis to formulate a plan designed to address the issue or bring about the desired change. The goal of planning is to translate the requirements identified in the analysis stage into detailed, strategically sound plans. The planning phase generally involves developing a vision of the solution or end result, and defining goals, objectives, methods, and strategies to achieve the desired results.

**Implementation** involves executing the strategies identified in the planning stage. It is in this stage that unanticipated difficulties are most likely to occur.

**Evaluation** involves continuously and systematically monitoring the implemented plan to ensure that it is working as anticipated. Whether an approach is working can be determined by evaluating the effects of the implementation against the goals and objectives set out in the plan. Evaluation may take a variety of forms depending on the implementation approach. It is important that the evaluation tools selected allow for early detection of problems. If problems with the plan are detected or if the plan is not working as anticipated, the approach must be adjusted or the plan must be revised.

Several tools are available to facilitate the entire process necessary in dealing with an issue or managing change. These tools include the Project Planning Process and the Change Management Model. In addition, there are tools to facilitate various parts of the process, such as the "SWOT analysis" (strengths, weaknesses, opportunities, threats) and strategic planning. These tools are explained in detail in various National Fire Academy (NFA) courses, and are provided in an overview form below.

### **The Project Planning Process**

The Project Planning Process is designed to manage the development and implementation of specific processes/issues within the organization. An example would be determining a plan to update EMS providers on new protocols. This process is used in NFA's current *Management of EMS* (MEMS) course.

### **The Change Management Model**

The Change Management Model is designed to facilitate a smooth and effective modification or addition of new processes or operations. The Change Management Model uses separate teams for analysis and implementation, and could be used to manage

the relocation of EMS units within a system or increase the number of ALS units in a department effectively. The Change Management Model is used in NFA's current *Strategic Management of Change* course.

### **Strengths, Weaknesses, Opportunities, Threats Analysis**

The strengths, weaknesses, opportunities, and threats (SWOT) Analysis is one tool that can be used to address some of the aspects necessary for a thorough analysis. It is used to identify the strengths, weaknesses, opportunities, and threats to an organization with respect to a current issue. SWOT Analysis is used in the NFA's *Executive Leadership* course.

### **Strategic Planning**

The Strategic Planning Process incorporates the SWOT tool for analysis and provides guidance for the planning stage. The Strategic Planning Process could be used to determine a vehicle replacement schedule over a 20-year period. Strategic Planning is used in the NFA's *Executive Planning* course.

Appendix C of this manual contains graphic and/or abbreviated descriptions of each of the tools discussed in this section. You should refer to any or all of these tools to assist you in completing exercises during this course.

This page intentionally left blank.

## BIBLIOGRAPHY

- Connor, P.E., & Lake, L.K. (1994). *Managing organizational change*. (2nd ed.). Westport, CT: Praeger Publishers.
- Covey, S. (1989). *The seven habits of highly effective people*. New York: Fireside (Simon and Schuster).
- \_\_\_\_\_. (1999). Mission builder. [www.franklincovey.com/customer/missionform.html](http://www.franklincovey.com/customer/missionform.html).
- Delbridge, R., et al. (1998). EMS agenda for the future: Where we are...where we want to be. *Prehospital Emergency Care*, 2 (1), 1-12.
- Kinlaw, D. (1998). *Handbook of leadership training activities* (Activity 2). New York: McGraw Hill.
- Nolan, T., Goodstein, L. & Pfeiffer, J.W. (1992). *Applied strategic planning: The consultant's kit* (Chapter 8). San Diego: Pfeiffer & Co.
- Pitre, E., & Sims, H. P., Jr. (1987, Autumn). The thinking organization: How patterns of thought determine organizational culture. *National Productivity Review*, pp. 340-347.
- Snyder, N. H., & Graves, M. (1994). Leadership and vision. *Business Horizons*, 37 (1), 1-7.
- Stump, R. W. (1994). Change requires more than just having a vision. *HR Focus*, 71 (1), 34.
- Werther, W. B., Jr. (1988). Loyalty at work. *Business Horizons*, 31 (2), 28-35.
- Wright, J. (1994). Vision and positive image. (77 ed.) *New Bureaucrat*, 23, 55-56.

## SUGGESTED READINGS

- Coggan, R. (1993). Time to change our attitudes about change. *Fire Chief*, 37 (8), 94-97.
- Dean, S. (1994). The mystery of the missing managers. *JEMS*, 19 (11), 83-87.
- Frost, B. (1993). Managing organizational change. *Fire Chief*, 37 (8), 123-128.
- Heckerson, E. (1998, October). 21 steps to the 21st century. *Firehouse*, pp. 45-50.

This page intentionally left blank.

## MODULE 2: COSTING OUT EMERGENCY MEDICAL SERVICES

### **Objectives:**

Given a written evaluation, In-Basket, or group activity, the students will be able to:

1. Discuss the various considerations for calculating the cost of EMS service.
  2. Differentiate between functional and direct services.
  3. Describe the primary parts of an effective EMS operating budget.
  4. Compare and contrast the concepts of unit hour use, U:UH ratio, and total system cost per unit and per response.
  5. Identify and discuss advantages and disadvantages of funding source alternatives.
  6. Apply costing-out strategies to a variety of EMS system aspects.
  7. Describe a proactive approach to income generation given future health care needs.
-

This page intentionally left blank.

## **DETERMINING THE COST OF AN EMERGENCY MEDICAL SERVICES SYSTEM**

Several factors must be considered in determining the cost of operating an Emergency Medical Services (EMS) system. First and foremost, determine the types of services provided by the organization. Direct services are the services provided directly to the public. Look past the obvious patient care and include any public education programs, preventive programs, special events, etc. Functional services are the services provided to the department internally and can include yearly physicals, EAP, training, uniform allowances, office support, etc. Identify all of the services provided by the organization as the basis for beginning to identify areas of cost determination.

### **Cost of Goods and Services**

#### **1. Workload indicators.**

Determining the costs of goods and services should start with a review of workload indicators. These indicators include

- population served;
- total responses;
- rescue/EMS calls;
- first response calls;
- transports;
- training contact hours;
- special events for the public;
- standbys for fire support;
- operational EMS calls (i.e., haz mat, special rescue, etc.);
- response times (including return time and total time); and
- responses by unit.

Looking at workload indicators in past years allows the organization to determine where the program is now and to forecast needs for the future.

#### **2. Capital investments.**

Capital investments include determining the cost of replacing vehicles, high-dollar medical equipment (such as defibrillators), building new stations, upgrading engines to ALS capabilities, computers, etc. Although it may not be required for some governmental organizations, developing a depreciation schedule allows cost comparisons with private companies and a scheduled replacement program.

### 3. Operational and maintenance expenses.

Operational and maintenance expenses should be divided into fixed and variable. Fixed expenses are those service costs that remain the same regardless of level of activity. Fixed expenses include rent, salaries, depreciation, preventive vehicle maintenance, and training. A lesser fixed expense may be cost of relicensure for employees. Variable expenses change with activity and include unscheduled vehicle maintenance, station repair and maintenance, non-capital medical supplies, linens, gasoline, office supplies, accounting and legal expenses, etc.

- **Training costs**--Calculating the costs of training involves determining the total number of hours required for all aspects of the job for all personnel. This includes required fire, EMS, hazardous materials, and OSHA mandates as well as inservice training for new equipment/procedures. In addition to the direct costs in terms of training staff and manpower, all support services must be considered. Support services include secretarial staff to prepare any needed paperwork or handouts and recordkeeping.
- **Facility costs**--Using a depreciation schedule, the yearly (and even hourly cost) of a facility can be calculated. For example, if a new station costs \$750,000 and has a life expectancy of 30 years, the depreciation (cost) of that station per year is \$62,500 or approximately \$5,200 per month. To this base cost must be added the additional costs of operating supplies, maintenance and repairs, utilities, and insurance. By calculating the cost of each station, the fixed yearly or monthly facility expense can be determined.
- **Capital equipment costs**--The same approach can be taken for capital equipment costs. For example, if an ambulance costs \$100,000 and has a life expectancy of 5 years, the depreciation (cost) of that ambulance per year is \$20,000 or \$1,666.67 per month. Adding the cost of the required medical equipment, vehicle maintenance, insurance, and fuel and oil will allow the calculation of the total annual cost of the ambulance. However, since vehicle maintenance, fuel, and oil are variable expenses, these costs should be calculated for low-, medium- and high-volume units and the amount averaged.
- **Personnel costs**--Determining personnel costs requires that each rank's base salary and benefits are calculated. For each rank, the base salary plus FICA, retirement, life and health insurance, Workers' Compensation, disability, clothing allowance, and any applicable specialty pay should be calculated. For example, if a captain paramedic earns \$41,000 per year base pay (for a 56-hour work week, including Fair Labor Standards Act (FLSA) overtime), that would be an hourly rate of \$13.74. To that, add the following costs:

- Federal Insurance Contributions Act (FICA)--\$1.04/hour
- Retirement--\$3.74/hour
- Life and Health--\$0.99/hour
- Disability--\$0.07/hour
- Workers' Compensation--\$0.70/hour
- Clothing allowance--\$0.54/hour

This brings the total personnel cost for one captain paramedic to \$20.82 per hour.

These are provided as examples of considerations when costing out specific aspects of EMS. Once the monthly/yearly costs have been determined, the numbers can be applied to all personnel, stations, and equipment, and the overall costs can be allocated by station, unit, or number of runs.

## **COST CONCEPTS**

### **Unit Hour Use**

Two fundamental financial management concepts used by today's private EMS leaders are total system "cost per unit hour" and "unit hour use ratio" (U:UH ratio). Although almost impossible to replicate in a fire-based system, it is important for fire-based systems to understand the concept. The concepts of total system cost per unit hour and unit hour use ratio furnish the essential missing link between the operating budget and the cost per patient served in a strictly EMS system. The EMS provider is not a producer of runs or transports. Rather, the EMS provider simply provides unit hours of coverage (e.g., each unit hour being one hour of a fully equipped and staffed EMS unit available for dispatch or assigned to call). The EMS leader may control the provision of more or fewer unit hours and providing unit hours of coverage of greater or lesser clinical capability at higher or lower cost per unit hour provided. However, runs and transports are generated by forces beyond the provider's control (e.g., frequency and timing of accidents and illness).

The EMS leader also can control the cost and quality of unit hours provided and the deployment of those unit hours both around the clock and around the community. By carefully controlling the cost, quality, and quantity of unit hours provided, and by scheduling and geographically deploying those unit hours to match predictable fluctuations in frequency and location of demand as closely as possible, the effective EMS leader is able to maximize response time reliability at any given (or affordable) volume of unit hour provision.

**1. Cost per unit hour.**

The concept of total cost per unit hour is a measure of the total costs of providing coverage during a given accounting period divided by the total number of unit hours of coverage provided during that same accounting period. This measurement can be used to identify whether unit hour costs are excessive given the quality of care being delivered, in comparison to other, similar EMS delivery systems. If the unit hour cost is excessive, the source of inefficiency must be determined and corrective action taken. Excessive costs per unit hour can result from top-heavy administration, runaway wages, poor economies of scale, overtime pay resulting from poorly planned shift change procedures, and many other causes (e.g., the limitless symptoms of bad management).

**Cost per unit hour** =  $\frac{\text{total costs of providing coverage during given accounting period}}{\text{total \# of unit hours of coverage provided during accounting period}}$

An example that uses very simplified numbers for calculating cost per unit hour follows. A service has five ambulances covering a 24-hour period. Each ambulance is staffed with two paramedics each earning \$15.00/hour (including benefits). There is one supervisor who earns \$20.00/hour on duty for the 24 hours. It costs \$35.00/hr to operate each ambulance (includes maintenance, fuel, equipment, etc.).

- Unit hours--24 hours x 5 units = 120 unit hours

- Costs--1. Paramedic salary--24 hours x \$15.00 x 10 = \$3,600

2. Supervisor salary--24 hours x \$20.00 = \$480

3. Vehicle operating cost--24 hours x \$35.00 x 5 = \$4,200

4. Total costs for 24 hours = \$8,280

- Cost per unit hour--\$8,280/120 = \$69.00

Vehicle operating costs can be figured in a variety of ways. One common way is to create an inventory list of all equipment carried on the ambulance, including the vehicle itself. This inventory list should contain the cost of each item as well as its anticipated life span. Simple division will provide the cost per year of each piece of equipment and the vehicle itself; this can be further equated to an estimated cost per hour. Maintenance costs are figured similarly, using mileage and maintenance records to determine the average cost per year (and hence per hour). Disposable supplies that otherwise would be billed to a patient typically are not included in these costs.

**2. Unit Hour Use.**

Even more important to service efficiency than unit hour costs is the effectiveness with which the unit hours are used (e.g., U:UH ratio). In recent years within the EMS industry, the U:UH ratio has become the most widely accepted indicator of effective

scheduling, redeployment, and dispatching practices. The U:UH ratio is calculated by dividing the total number of patients served during any accounting period by the total number of unit hours of coverage provided during that same accounting period. The higher the U:UH ratio, the lower the cost per patient served.

$$\text{U:UH ratio} = \frac{\text{total \# of patients served during accounting period}}{\text{total \# of unit hours of coverage provided during accounting period}}$$

Assuming that runs, on average, are completed in 40 minutes, theoretically 1.5 patients could be served per unit per hour (i.e., one patient served each 0.666 unit hour of coverage). Thus, the maximum theoretical U:UH ratio is 1.5. Realistically, however, an emergency provider cannot service a continuous queue of calls and still provide quality medical care. When services take action to increase their U:UH ratio, they must be aware that by increasing the number of patients served per unit hour of coverage, they risk increasing the likelihood of member burnout and poor quality of care. However, by providing excess service (e.g., providing nonproductive unit hours of coverage) EMS organizations lower the U:UH ratio and thus increase the cost per patient served. In addition, a low U:UH ratio could lead to member rustout.

### **Factors Affecting the U:UH Ratio**

It is difficult to determine the best U:UH ratio as many factors influence the maximum U:UH ratio that can be achieved in a given setting. The most important include geographic density of demand for service, size and shape of service area, road systems and traffic flow, level of expertise in system status management, and, above all, level of response time reliability required by statute, ordinance, or contract. Where multiple providers compete to serve the same geographic area, the effect is to reduce each provider's "density of demand," even in areas with high population densities. Thus, from both the economic and operational perspectives, urban multiple-provider systems closely resemble sparsely populated rural areas.

The most common causes of wasted unit hours include staffing and scheduling practices that fail to account for demand-pattern fluctuations, poor geographic deployment practices, faulty dispatching procedure, and failure to take advantage of new electronic technologies for locating patients and managing response.

### **Economies of Scale in Out-of-Hospital Care**

It is generally agreed that the minimum population base necessary to support a reasonably efficient EMS system is somewhere around 200,000 people; however, it is more where multiple providers share the same market or where emergency versus non-emergency production is separated functionally. If the population served is lower than

200,000, either clinical and response time reliability must suffer, or substantial levels of subsidy will be required to offset the inefficiency induced by poor economies of scale.

Poor economies of scale have both financial and operational impacts. Financially, low-volume unit hour provision means that fixed costs, overhead costs, and support service costs must be distributed over fewer unit hours, thus forcing unit hour costs upward to excessive levels. The only alternative to these excessive unit hour costs is to reduce fixed costs, overhead costs, and support service costs by such measures as reducing levels of supervision, employing less capable management personnel, reducing worker compensation, and reducing the quality of such support functions as vehicle maintenance, inservice training, and communications infrastructure (e.g., cutbacks that inevitably must compromise the quality of patient care). Operationally, impact of poor economies of scale appears as a reduction in the maximum of U:UH ratio that can be maintained safely at any given level of response time reliability, given that, call volumes decrease, demand pattern fluctuations (both geographic and time of day) become increasingly unpredictable.

At the other end of the economy-of-scale spectrum, maximum potential efficiency appears to be achieved when a single firm serves a population of 1,200,000 exclusively. (In economic terms, the "average cost curve" continues to decline until the population served exclusively by a single company reaches about 1,200,000). Some of the most successful EMS companies achieve considerable economies of scale by operating services in multiple, noncontiguous communities whose combined populations allow a level of efficiency that could not otherwise be obtained.

## **OVERVIEW OF EMERGENCY MEDICAL SERVICES BUDGETING**

The financial future of any emergency medical or patient-transport organization is established through budgeting. A budget can be defined as a planning and control system--a financial action plan that the organization intends to follow for a specified period of time. The EMS budget accomplishes four main objectives: it provides a written expression of the service's objectives, policies, and plans; is a basis for evaluating financial performance in accordance with the plan; is a useful tool (but only a tool) for cost control; and creates financial awareness throughout the organization.

Budgeting requires that the service determine the financial feasibility of programs before including them in the organizational plan. This ensures that the new programs are realistic and attainable, and that the organization has the financial resources to maintain them.

There are several types and styles of budgets. Local governments or corporate headquarters for private companies usually dictate the specific format that must be used by an agency. The following, one example of an effective budget, consists of five parts:

goals and objectives, justification, operating budget, capital-needs report, and cash-flow forecast.

1. **Goals and objectives**--The budget goals and objectives are a written expression of what the organization wants to accomplish in a specified period of time. They must be accepted by everyone involved, and they must be S-M-A-R-T, i.e.,
  - **Specific**--The goals must be concise and to the point. Generalities and ambiguities will cause confusion and misinterpretation.
  - **Measurable**--Compliance must be determinable. If the actual results are vague, goals and objectives will not help.
  - **Attainable**--The goals must be within organizational reach, or their inclusion in the plan will cause frustration and lethargy toward other goals.
  - **Realistic**--Here, too, the goals and objectives must be a realistic part of the overall service's mission and must be appropriate for the organization.
  - **Tangible**--The accomplishment of a specific goal or objective must be demonstrable. It must be something that the people in the organization can see or know.
  
2. **Justification**--Budget justification demonstrates how numbers are calculated. The justification section of the budget correlates the numbers to the ideas, and it contains the supporting documents and data that show how the figures were computed. This validates financial decisions and projections.
  
3. **Operating budget**--The operating budget contains various figures and computations that enable the organization to track its future performance. The three parts of an effective operating budget are the statistics review based on workload indicator, expense budget based on operational and maintenance expenses, and revenue forecast.

The revenue forecast budget is prepared in essentially the same manner as the expense budget, but with fewer categories or accounts. Revenue is defined as the service's income from any source. There are two types of revenue for an ambulance service if it has no subsidiary businesses. There's a combined revenue derived from patient treatment and transport operations, which is commonly referred to as patient revenue. The other revenue, that from any other source, is called nonoperating revenue. Nonoperating revenue includes subsidies, tax receipts, interest from savings and investments, training revenue, fund-raising income, donations, membership fees, bequests, and so on. By combining patient revenue with nonoperating revenue and projected increases, it is possible to determine how much money the service will have for operations.

4. **Capital-needs report**--The capital-needs report is a listing of the major equipment purchases for the entire budget year. These items normally are not purchased each year, but are one-time or infrequent purchases that have a life expectancy measured in years and are depreciated over their lifetime. They often are financed rather than paid for outright.
  
5. **Cash-flow forecast**--The cash-flow forecast is the most difficult area to determine. It is also one of the most important areas, as it helps to determine whether there will be enough money at the right time to pay for certain goals and objectives. Although many government service agencies are not responsible for cash-flow forecasting, they should be encouraged to take this responsibility, since the ability to forecast cash flow improves the EMS leader's credibility when dealing with municipal budget officers. Thus, cash flow is the EMS leader's concern, even if it is not a primary responsibility.

## **OVERVIEW OF SYSTEM STRUCTURES AND FINANCIAL STRATEGIES**

There are a variety of different types of out-of-hospital care systems, plus numerous variations. These system types differ widely in the extent to which service delivery is provided by government agencies versus private firms, and in the extent to which the costs of delivery are paid with local tax dollars versus earned income from other sources.

- **Public Versus Privatized Delivery**

In some systems, out-of-hospital care service delivery is entirely government operated. In many systems, delivery is partly socialized (e.g., government-operated "rescue" service with emergency and nonemergency transport provided by private providers). Alternatively, some communities are served by fully "privatized" out-of-hospital care systems.

- **Public Versus Privatized Financing**

Failure to distinguish socialized *delivery* from socialized *financing* of delivery costs is a common mistake. For example, the Medicare program often has been referred to as an example of "socialized medicine." It is not. Rather, Medicare is an example of socialized insurance. (The Veterans' Administration hospital system is an example of socialized medicine). Out-of-hospital care systems have existed in which delivery is financed entirely from fee-for-service revenues and "subscription sales." Thus, the combination of fully public EMS delivery and fully privatized financing, though extremely rare, is possible. Theoretically, the reverse combination (i.e., fully privatized delivery with fully socialized financing) could exist, but most likely does not. There is no magic mixture of public versus privatized EMS delivery that can guarantee results. It is also true that there is no reliable correlation between financing method and results in the streets.

## REQUIREMENT FOR DIVERSITY IN FUNDING SOURCES

As the entire U.S. economy becomes more constrained, the public demands increased quality and productivity, and managed care organizations continue to expand, EMS advocates must consider a wide array of fundraising approaches, as well as emphasize more efficient organizations, production methods, and system structures. Diversification of funding is important in that, typically, no single source of revenue is adequate to meet the needs of an EMS agency. The best way to insulate an EMS agency from a catastrophic reduction or loss in funding is to take full advantage of as many revenue sources as possible. The following is a description of potential EMS funding methods with advantages and disadvantages of each source listed.

### 1. Major local government funding mechanisms.

- **Taxes**--Taxes can include general property taxes, local income taxes, general sales taxes used to fund most local services, transient taxes, and other taxes specifically earmarked for fire and EMS services.

Advantage--Offers a traditional source of revenue whose acquisition is broadly distributed across community residents (cost of service is spread over a large number of people), with the possibility of "earmarking" a portion of the revenue solely for EMS.

Disadvantage--Requires voter authorization or legislative approval to start and continue after a specified period, and can be used only up to a specified limit.

- **Borrowing**--In addition to the familiar bonds used for purchasing capital equipment, borrowing may include "certificates of participation" (COP's). COP's operate much like home mortgages and are used to purchase equipment and facilities when the local jurisdiction is not allowed to use more convenient debt instruments.

Advantage--Financially efficient way to spread the cost of capital equipment over a long period of time. Usually does not require voter approval. Oftentimes is tax-exempt, which attracts a large investor base.

Disadvantage--May involve complex legal and administrative requirements, and requires broad public support.

- **Leasing**--Leasing provides an alternative way to avoid a large capital outlay, and may offer a right-to-purchase at the end of the leasing arrangement.

Advantage--May require minimal or no initial capital outlay. Offers flexible payment terms spread over many years. May offer tax-exempt interest rate.

Disadvantage--Frequently not available since equipment is custom-ordered. Total cost is substantially higher than buying equipment outright.

- **Benefit assessment charges**--These charges are administered somewhat like property taxes. They factor in not only size and type of property, but also "benefits" from being close to fire stations, having special services available, etc.

Advantage--Provides a way to get around property tax limitations and also can improve the equity of charges for fire and EMS services.

Disadvantage--May be cumbersome to undertake and difficult to accomplish due to legal restrictions. May depend largely on cooperation of local government's finance and tax collection departments.

- **Fees**--Fees include medical care and ambulance transport, and small revenue producers such as fees for permits for new construction, special events, and operating hazardous functions. Also included can be fees for inspections and violations of codes, and fees for special services for which charges were not made in the past (e.g., rescuing a boater or hiker).

Advantage--Can be presented to the public as a means to improve equity to all taxpayers by not using everyone's taxes to subsidize those who use services the most. Also, when politicians cut budgets, departments that generate revenue (e.g., fee-for-service) often are spared the axe.

Disadvantage--Public may routinely expect services to be provided, and attempts to bill and collect fees for service may be a financial nightmare for organizations without prior experience and/or adequate legal advice or expertise.

- **Contracts**--Contracts may be used to provide fire protection and EMS in neighboring jurisdictions, to provide selected services for parts of jurisdictions, or to provide special services such as training, hazardous materials responses, and heavy rescue under an annual contract or with a fee per usage or per student.

Advantage--Can provide benefits in the form of increased levels of service through economies of scale, and by having more equipment and personnel available to serve either's needs.

Disadvantage--May be difficult to execute due to State regulations and previous mutual-aid agreements.

- **Cost sharing**--Cost sharing involves multiple departments joining together to pay for new facilities or services to reduce the burden of each, especially where the facilities or services are not used frequently.

Advantage--Perceived favorably by the public because of intergovernment cooperation. Allows production of a program or joint use of equipment or facilities that otherwise would not be possible.

Disadvantage--Control of resources must be shared as well as the costs.

- **Subscriptions**--Subscriptions are a form of insurance in which a household pays a fixed fee per year, and then does not have to pay anything additional for EMS or transport uses during the year. A variation is to have the subscription prevent any out-of-pocket expenditures beyond the subscription fee, but the local agency is free to charge the subscriber for fees that can be recovered from medical insurance or homeowners' insurance.

Advantage--Traditionally successful in rural areas and growing in popularity in suburban areas. Used by public, private, and volunteer agencies.

Disadvantage--Legal restrictions may limit operating functions of the program. May be difficult to market and requires significant planning and resources to implement and maintain.

- **Impact development fees**--In some instances, new developments can be required to pay for the impact they have on capital purchases such as new fire stations and their full complement of equipment.

Advantage--Private sector pays for the majority of the additional resources required thus allowing first-time purchases of equipment.

Disadvantage--EMS department is encumbered to staff and operate new stations indefinitely.

- **Consolidation**--The consolidation of several departments or parts of operations into a single entity may provide an efficient and cost-effective means of providing emergency medical services. Savings usually are brought about through elimination of duplicate functions such as management and training.

Advantage--Financially efficient for both the provider and citizens who may pay less per capita for consolidated services, or may get higher levels of service for the same cost.

Disadvantage--Major obstacle to consolidation is often the power struggle that occurs between organizations involved. Not all consolidations work and, in some instances, "smaller" may be more cost efficient.

## 2. Federal and State Programs.

- **Driving-related fees and fines**--Vehicle registration and traffic citations may have fees included to help pay for emergency medical services, which often are needed to assist victims of traffic accidents.

Advantage--Provides a stable funding source to support the State's EMS network. Revenue can be used to train fire and paramedical personnel, and to acquire fire and rescue equipment for local fire, rescue, and ambulance companies in State jurisdictions.

Disadvantage--Imposition of additional fees and fines may cause public resentment.

- **Special State grant programs**--These programs involve competitive grants for crime, health, or fire programs for specific public safety purposes such as improving the quality of emergency medical services.

Advantage--May be applied directly to the purchase of such EMS equipment as ambulances and automatic defibrillators, as well as training programs for first responders, EMT's, and paramedics.

Disadvantage--Unreliable source of revenue on a year-to-year basis. Application paperwork can be excessive and often requires technical expertise in proposal writing.

- **General State revenues**--Many States allocate part of their taxes to support fire and EMS services.

Advantage--May provide good source of revenue for rural or volunteer agencies which otherwise have limited means of funding.

Disadvantage--Varies largely from state to state and monies available typically must be used for specific EMS purposes which may or may not be consistent with specific EMS agency requirements.

- **State-provided services**--Services provided by the State include those that can be used in lieu of local services and funds, such as paramedic training.

Advantage--May offer state-of-the-art services that normally would not be available at the local level.

Disadvantage--Varies largely from state to state and services provided may not match specific EMS agency requirements.

- **Federal grant programs**--These programs include a variety of special purpose programs across Federal agencies which, while not specifically earmarked for EMS, can be used for EMS-related purposes.

Advantage--Can be applied directly to purchase of EMS equipment such as ambulances and automatic defibrillators, and for training programs for first responders, EMT's, and paramedics.

Disadvantage--Application paperwork can be excessive and often requires technical expertise in proposal writing. Securing funds continues to be highly competitive.

### **3. Private Sector Sources**

- **Direct Solicitation**--Direct solicitation includes door-to-door solicitation, telephone solicitation, or direct-mail solicitation. It commonly is used in volunteer departments to obtain charitable contributions.

Advantage--Can be highly successful when linked to a particular program or equipment purchase.

Disadvantage--May require considerable time commitment by service members. Success is contingent largely on economic conditions of the community.

- **Fundraising events**--Fundraising events may include bake sales, barbecues, carnivals, dinners, picnics, casino nights, sporting events, etc. They often are used in volunteer departments.

Advantage--Variety of options available which usually can be implemented at any time of the year, especially to offset "dry periods" of revenue collection.

Disadvantage--Success is related to economic conditions. Year-round funding projects (e.g., bingo) may consume so much time that volunteers burn out.

- **Corporate donations**--Corporate donations involve grants and services solicited from local and national corporations. These sources may be involved in safety (e.g., insurance companies) or simply may be interested in good public relations and in doing community service (e.g., fast food restaurants).

Advantage--Helps promote strong sense of community spirit and cooperation.

Disadvantage--Requires strong public relations, marketing, and technical proposal-writing skills. Success may be contingent largely on economic conditions in the community.

- **Private foundations**--Local community foundations may offer funds to be used for providing special public safety services, as well as specific contributions to EMS-related services.

Advantage--Can be an excellent source for starting new programs or for buying equipment that could not be funded from routine sources.

Disadvantage--May require significant public relations efforts as well as technical proposal-writing skills. Competition for available funds is usually fierce.

- **Capitated contracts**--EMS ambulance services may be subcontracted through large, prepaid health care programs (e.g., HMO's) as a portion of their total health care services packages.

Advantage--Revenue is known and guaranteed up front.

Disadvantage--If costs exceed guaranteed revenue, there is no method for recovering those costs.

## **PREPAID SERVICES**

The most powerful and far-reaching trend in the U.S. health care industry today is the conversion from fee-for-service financing to various forms of prepaid health care programs. The focus of managed health care organizations shifts the traditional "treatment" philosophy to a "preventive health and maintenance" philosophy.

Subcontracting EMS services can vary across different prepaid health care programs, and may range from basic nonemergency and emergency transport service (horizontal and/or vertical), to out-of-hospital care plus a full range of primary health care services. Other than the evolutionary growth experienced by systems, the most dramatic increase in market share can be created by developing contracts with large users and buyers of ambulance services. Contractual relationships that create exclusive- or preferred-provider relationship between an ambulance service and health care control organizations can increase dramatically the service's patient volume, for instance.

A key consequence of managed care organizations involves a change in the traditional philosophy of EMS finance. Historically it has been financially beneficial for EMS organizations to perform as many transports as justifiable and possible, as a means to maximize collections. The opposite is true with a capitated contract. Serving as subcontractors to managed care organizations, EMS departments receive flat annual rates for specific services provided to the community. Over-response or unnecessary transport of patients to emergency departments when complaints could be managed at an alternative transport site or treated in the field become the critical factors in determining whether an EMS organization turns a profit or exceeds its budget.

Private companies already are competing for out-of-hospital care and basic primary care services with managed care organizations. Public EMS agencies must evaluate their place in this new market in order to increase funding alternatives. They also must employ a variety of cost-reduction strategies. Consideration should be given to alternatives such as regional consolidation to improve economies of scale. Organizations that embrace a "business-as-usual" philosophy undoubtedly will cease to remain viable. This challenge of remaining financially viable requires an open mind to change and expanding the traditional philosophy of "prehospital emergency care" to "out-of-hospital" care. It is hoped that the EMS leaders of today possess the vision and leadership to respond to the challenge effectively.

This page intentionally left blank.

## BIBLIOGRAPHY

- Fitch, J. J., , et al. (1993). *EMS management: Beyond the street*. (2nd ed.). Carlsbad, CA: JEMS Communications.
- United States Fire Administration. (1994). *A Guide to Funding Alternatives for Fire and Emergency Medical Service Departments*. Emmitsburg, MD: Federal Emergency Management Agency, United States Fire Administration.

## SUGGESTED READINGS

- Davis, E., & Swor, R. A. (1993). Funding strategies for quality assurance programs. In R. A. Swor, S. J. Rottman, R. G. Pirrallo, & E. Davis (Eds.), *Quality management in prehospital care*. St. Louis: Mosby Lifeline, 110-117.
- Haber, S. (1994). *Funding options: How to inspire others to pay for your projects*. Paper presented at the 1994 EMS Expo, Session 4F.
- Krakeel, J. (1998, November.). Cost confusion abounds in fire-based EMS. *Fire Chief*, p. 22.
- Lazar, R., Jensen, A. & Goebel. R. (1995). *Fire service EMS costing strategies workshop manual*. Portland, OR: Lazar, Jensen, Goebel Prehospital System Consulting, 25-39.
- Swan, T. H. (1991). The paper chase. *Emergency*, 23(6), 44-50.

This page intentionally left blank.

# MODULE 3: INFORMATION MANAGEMENT

## Objectives

Given a written evaluation, In-Basket, or group activity, the students will be able to:

1. Describe the types of data required by an Emergency Medical Services (EMS) system to justify services and ensure a quality service delivery.
  2. Identify the basic and essential data elements set forth by the National Highway Traffic Safety Administration (NHTSA) in the Uniform EMS Data Element Dictionary.
  3. Discuss the importance of collecting objective data.
  4. List the various uses of EMS data.
  5. Identify obstacles in the collection of objective, accurate, and useful data in the EMS industry.
  6. Discuss the goal of EMS data collection.
  7. Identify and describe appropriate types of EMS reporting technology needed to move toward automation.
  8. Identify the potential organizational impacts that changing information management systems could have.
  9. Identify means of funding for a change in information management systems.
-

This page intentionally left blank.

## OVERVIEW OF THE USE OF INFORMATION IN EMERGENCY MEDICAL SERVICES (EMS)

EMS is an industry drowning in information. The raw material for information is data. When data are collected and arranged properly, they create new information, which leads to the production of new and valuable knowledge.

Yet, with the exception of physicians, most EMS leaders, managers, and providers are not in the "information" age. Most system design changes result from opinion. We design system changes based not on what has been proved, but on what we **believe** has been proved. Furthermore, we often are incapable of interfacing information gathered in one EMS system in a meaningful manner with information gathered in other EMS systems. This handicaps our ability to quantify--and therefore justify--our reason for existence in the world of health care. It doesn't have to be this way.

The function and essence of information is revealed in the word itself: **information**. Information is the fundamental ingredient for creating structure. In terms of EMS systems, this structure can be seen in the physical form of dispatch centers, fire stations, ambulances, fire trucks, and medical equipment. This structure also is visible in receiving facilities, medical treatment protocols, and training programs. These are all **formed** and created by the information that has been collected and analyzed.

Information is broken down into building blocks known as **data**. It should be obvious that the data an organization chooses to collect have a profound impact on what information actually is produced as the result of analysis. The data we choose to collect, the methods we choose to analyze those data, and the information that results from that analysis have a profound impact on our EMS system's knowledge, design, and operation. Information is an EMS organization's primary means of survival.

How many of these comments have you heard in your own organization (or have made yourself)?

1. Twelve lead EKG's done in the field would really improve our EMS system and patient care.
2. Giving a fluid challenge to a trauma patient with a blood pressure less than 80 systolic improves their chances of survival.
3. We save lots of people in our community from dying of cardiac arrest.
4. EMS makes a difference in patient outcomes.
5. Our EMS delivery process is providing quality patient care and is more cost-effective than a private EMS agency providing the same service.

The challenge is not to attack or defend any of the above statements. The challenge is to prove or disprove the statements based on sound and accepted scientific methodology. As stated, these comments are **hypotheses**--what we believe to be true. To prove any of them requires specific data that will provide objective information that either validates or disproves the statement.

## **TYPES OF DATA REQUIRED BY AN EMERGENCY MEDICAL SERVICES (EMS) SYSTEM**

Every EMS system collects data. The issue is whether those data are relevant or just a collection of numbers and facts. To justify services and ensure quality, programs must collect and analyze appropriate data. Not only should data collected be useful to the program collecting it, but they should be useful to EMS on a national level.

### **Definition of data elements**

The first step in re-engineering EMS information management in a way that will produce meaningful knowledge, regardless of which EMS system generates the knowledge, is to agree upon an industry standard for defining data elements. Until August of 1993, no uniform EMS data element dictionary existed that would allow EMS systems and agencies to collect data capable of "communicating across boundaries." In other words, one system's definition of the time a unit is responding might be from the time that the unit actually received the call. Another system might define the same data element as the time personnel verified by radio that they are responding. A third system might define this datum element as the time the vehicle actually moves.

Recognizing this problem, a consensus panel formed under the guidance of the National Highway Traffic Safety Administration (NHTSA) created a Uniform EMS data element dictionary as part of the Uniform Pre-Hospital Emergency Medical (EMS) Data Conference Final Report. This document defines each data element, prioritizes and recommends which data elements each EMS system should collect and analyze, and provides the rationale.

The dictionary includes 80 essential EMS data elements; these allow EMS systems to communicate equally and in an unbiased fashion with respect to data.

Using the example above, "time unit responding" is given a priority of "essential" and a definition of "time that the response unit begins physical motion." It also is justified and discussed in a separate category. If EMS information is to be standardized at a National instead of at a local level, it is critical that each EMS department and system adopt this National standard. Using the National standard allows EMS research to be performed using a National sample of EMS systems. By using a National sample, research results can be generalized to most EMS systems instead of being confined to the one that supplied the data.

## Types of Data

The EMS Systems Act of 1993 made recommendations for standardized data collection that was thought to be essential. The basic data elements are included in Figure 1.

<b>Basic Data Elements</b>	
Patient Demographic Data	EMS Vehicle information(level of care)
EMS response and transport intervals	Incident location
Patient complaint	Patient condition
Mechanism of injury	Therapy administered
Treatment outcome	Receiving medical facility

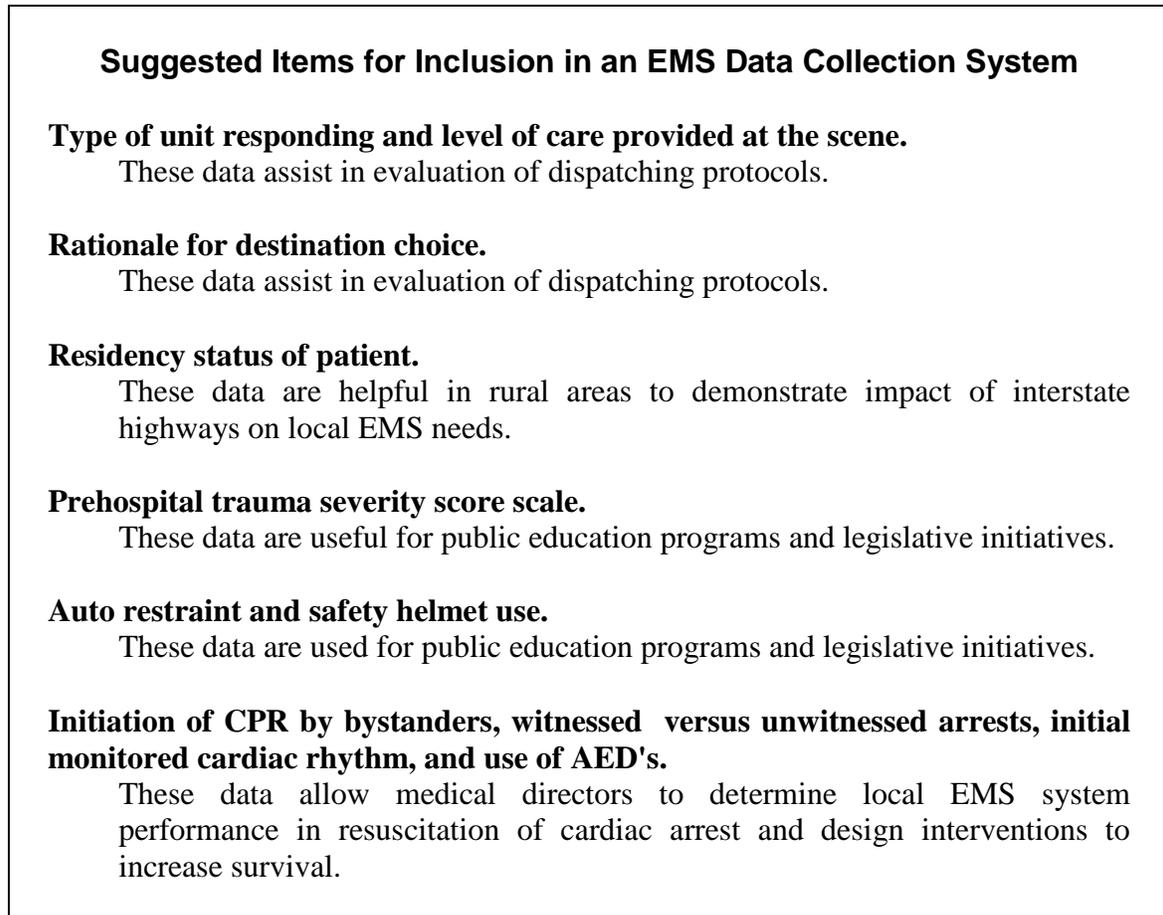
**Figure 1**  
**Basic Data Elements**

In addition to the basic data elements, other essential items for data collection were identified. These are shown in Figure 2.

<b>Essential Items for Inclusion in Data Collection System</b>	
Emergency Unit Identifier	Patient Gender
Crew Identification	Vital signs
Date of Incident	Glasgow Coma Score
Time dispatched	Illness/Injury site
Time arrived on scene	Mechanism(s) of injury
Time departed scene	Injury
Incident location	Basic Life Support procedures list
Reason for dispatch	Advanced Life Support procedures list
Dispatch and transport code	Medications administered
Receiving facility	Patient outcome
Patient name	Patient age

**Figure 2**  
**Essential Items**

Each EMS system is unique in structure and demographics. Once basic data elements for system operation have been collected and evaluated, specialized items for individual EMS systems can be added. Figure 3 is an example of specialized items of data that may be included.



**Figure 3  
Specialized Data Items**

## **USES OF EMS DATA AND INFORMATION**

The goal of data collection and analysis is to create useful information that leads to new knowledge that will improve EMS service delivery. However, information gathered through data collection is not limited to use in national research. Several uses of EMS data for within-system "research" are listed below.

- Provide a comprehensive medical record of the prehospital event.
- Provide a legal instrument in court.

- Determine training requirements for personnel.
- Allow for cost-recovery (reimbursement) of EMS services.
- Provide a method of determining human and nonhuman resource needs.
- Improve customer-related decisionmaking and planning.
- Measure contract performance between various providers and external vendors.
- Provide a competitive advantage against other EMS organizations incapable of justifying the quality of their EMS service delivery.
- Provide a means to measure progress toward the organizational vision.

Additional uses can be found in Figure 3 (above).

### **SOURCES OF EMERGENCY MEDICAL SERVICES (EMS) DATA**

EMS system information can be collected and analyzed from several different sources. The most common sources include

- **Data collected from Patient Care Reports (PCR's).**

The PCR documents the patient encounter and allows measurement of key performance elements.

- **Stakeholder data.**

These are data gathered from identified external customers who may require special services. For example, if a dialysis center opens up in the community, specialized training for EMS providers on how to provide care to dialysis patients may be appropriate.

- **Service perception data.**

This information measures how well the EMS system currently is meeting the needs of its customers. This involves collection of information related to service delivery (as opposed to clinical care). For example, were the EMS providers efficient and helpful? Was the EMS response timely? Data of these types may be collected using customer survey forms or similar devices.

- **Process data.**

Process data is important from a quality improvement perspective. This information is useful for identifying vehicle replacement time-frames, fuel consumption, provider training, personnel hours worked, billing processes, etc. These data also are useful in benchmarking performance between EMS providers and systems.

## **BARRIERS TO THE COLLECTION OF EMERGENCY MEDICAL SERVICES (EMS) DATA**

Historically, major obstacles have prevented the collection of objective, accurate, and useful data. The EMS profession is beginning to eliminate some of these barriers; however, some common barriers to EMS data collection remain a major concern.

### **Prehospital Environment**

The prehospital environment is not the optimal place to observe and record events objectively. EMS providers often must recall observations for documentation while simultaneously involved with patient care in an environment that may be dangerous and stressful. Experienced EMS providers all have experienced the "time-warp" that occurs when providing care to an acutely injured patient. Questions regarding actual field time are met with: "It seemed like we were only on scene for 10 minutes!" The environmental stress of providing EMS raises a question as to the validity of the observations of some EMS providers.

### **Uniform Data Elements**

The lack of uniform data elements for describing an entire EMS event has handicapped benchmarking and research capabilities. With the adoption of NHTSA's 80-data element dictionary, comparative reports (such as differences in resource consumption, cardiac arrest survival (Utstein criteria) and prehospital time comparisons) between different providers in geographically diverse EMS systems could occur.

### **Data Retrieval**

The inability to retrieve data and information from information systems when required creates a huge barrier. For example, your community's local newspaper is preparing an article on drowning and has requested information from your fire department on response, scene, and transport times, locations, and patient ages for all water-related incidents during the past 5 years. How long would it take your agency to find those data? Could you even find them? Careful thought should be put into how data will be stored to allow for easy retrieval of important and commonly sought information.

### **Documentation**

Incomplete or illegible documentation on run reports is one of the simpler causes of data loss. However, if data from run reports are not recoverable, the barrier to data collection is severe. How much time is wasted in tracking down an EMS provider to complete or interpret a run report?

## System Barriers

Some EMS systems appear to be designed to make collecting and analyzing data more difficult.

- Using report forms with multiple layers of copies that require pressing hard enough to ensure that the last copy is legible, oftentimes results in the last copy being impossible to read.
- An EMS system may unwittingly cause a barrier to data collection through the QA process. When confronted often enough regarding questioned treatments, EMS providers learn how to "document to stay out of trouble." The result is an inaccurate record. To confound the problem, any research done using that record provides results that are based on flawed data!
- Barriers may be a result of cost and economics. Communities have limited resources for providing fire protection and EMS services. It is a constant juggling act to match available resources with demand for services. Because of this dynamic situation, EMS providers may feel pressured to return to service as quickly as possible in order to respond to the next call for service. Because of this, proper documentation of previous calls for service may be affected negatively.

## Communication

One of the central functions of administration and management in the past has been to control information: to keep it contained in order to protect the department. This control was (and still is) necessary in certain circumstances. However, it often is applied to all information and to all but upper-level personnel. This makes it appear that administration operates on the idea that the last thing its personnel need is information running loose in the organization!

EMS providers need a thorough understanding of all operational definitions, the applications and importance of data, and how those data should be collected. It is just as critical that they understand how the data collection and analysis are linked to the department's vision statement. The process of information sharing is so critical that it should be **one of the most important tasks of the leader**.

## USEFUL TECHNOLOGY

**Optically Scanned Reports**--These forms are filled out in the field by EMS providers. They then are forwarded to an administrative office where they are fed into an optical scanner that reads the marks on the page. Current optical scanners can read forms completed in pen or pencil, thus making the technology more acceptable to the EMS provider.

**Manual Entry Methodology**--Administrative personnel review the patient care report (PCR) and then select which data elements are entered into the computer database. This allows for better quality control of the data entered and more detailed descriptions of physiologic status, injury, illness, and mechanisms of injury. The flexibility of this technology results from use of coding systems based on ICD-9 classifications of illnesses and injuries used by the Centers for Disease Control and Prevention (CDC). Because the data points are not preselected as in the optically scanned format and all choices are not listed on the PCR, more data can be assembled on a single page. Furthermore, quality is enhanced because of the identification of mistakes or incomplete entries on the PCR, which then can be returned to the providers for correction and completion.

**Paperless Reports**--This type of data collection technology relies on hand-held, pen-computers integrated into a specially designed software program. The EMS provider, using the pen--which is actually a point-and-click device similar to a mouse--navigates through electronic documents by selecting options from easy-to-follow, drop-down menus. Using this technology, the EMS provider records the entire range of patient and call scene data. Data also can be entered by typing or by handwriting directly on the hand-held computer screen with the stylus. Once in the computer, the data may be faxed via wireless phone directly from the ambulance to the hospital emergency department. These data also can be transferred to a central database via modem, cable, or infrared transmission. The central database transmits this information to other computer systems, such as the billing system, the quality improvement department, or State and Federal agencies as required.

It appears that paperless technology is the wave of the future. Both cost-effective and research-friendly, several agencies and departments across the country have had a positive experience with this technology. As with all technology, it will improve and become less expensive to implement as time goes on.

## BIBLIOGRAPHY

- Altieri, M., et al. (1997). *A leadership guide to quality improvement for emergency medical services (EMS) systems*. Washington, DC: National Highway Traffic Safety Administration. 19-25.
- Criss, E., Valenzuela, T. (1994). Data collection. In A.E.Kuehl (Ed.) *Prehospital Systems and Medical Oversight*. (2nd ed.). National Association of EMS Physicians; St. Louis: Mosby-Lifeline, 153-157.
- Department of Transportation. (1994). Uniform pre-hospital emergency medical services (EMS) data conference final report. Washington, DC: National Highway Traffic Safety Administration.
- Jennings, C. (1998). Going paperless. *Journal of emergency medical services*, 23 (12), S-1 - S-6.
- National Highway Traffic Safety Administration. (1996). *EMS agenda for the future: information systems*. Washington, DC: Health Resources and Services Administration Maternal and Child Health Bureau, 55-56.
- Polsky, S. (1989). Medical record keeping. In W. Roush (Ed.) *Principles of EMS Systems*. (2nd ed.). Dallas: American College of Emergency Physicians, 143-164.

## SUGGESTED READINGS

- Austin, C. & Boxerman, S. (1998). System design, evaluation, and selection. *Information Systems for Health Services Administration*. (5th ed.). Chicago: Health Administration Press, 215-232.
- Austin, C. & Wager, K. (1996). Health information systems. *Handbook of Health Care Management*. Malden, MA: Blackwell Publishers, 227-253.
- Olson, L., Peters, S. & Stewart, J. (1998). Security and confidentiality in an electronic medical record. *Journal of Healthcare Information Management Systems Society*, 12 (2), 27-37.
- Wheatley, M. (1994). The creative energy of the universe--information. In *Leadership and the new science*. San Francisco: Berrett-Koehler, 101-119.

This page intentionally left blank.

# MODULE 4: QUALITY IMPROVEMENT

## Objectives

Given a written evaluation, In-Basket, or group activity, the students will be able to:

1. Describe each of the Baldrige Categories of Quality Improvement (QI) applied to Emergency Medical Services (EMS).
  2. Identify at least three ways that leaders can demonstrate continuous commitment to QI goals.
  3. Identify the external and internal customers of an EMS service organization.
  4. Identify and describe the steps involved in planning a QI program.
  5. Describe the requirements for data collected in a QI program.
  6. Define benchmarking.
  7. Identify sources/types of data to determine input, process and outcome results.
  8. Identify the key drivers (key component services) for an EMS system.
  9. Using the key drivers identified, develop the following:
    - a. Objectives/Performance indicators.
    - b. Compliance required in each indicator.
    - c. Evaluation methods used to assess compliance.
-

This page intentionally left blank.

# MODULE 5: HUMAN RESOURCES AND RISK MANAGEMENT

## Objectives:

Given a written evaluation, In-Basket, or group activity, the students will be able to:

1. Describe the importance of effective human resources plans and policies for achieving system goals.
  2. Discuss organizational socialization and the results of ineffective socialization.
  3. Discuss human resources plans and policies to achieve system goals and mission including
    - a. Recruitment.
    - b. Retention.
    - c. Affirmative action/Equal opportunity.
    - d. Selection.
    - e. Volunteers.
  4. Discuss the use of teams for increasing organizational effectiveness.
  5. Describe the goal and the steps involved in instituting a risk management program.
  6. Identify the primary method of detecting increased risk to a system.
  7. Identify risks (current and potential) involved with Emergency Medical Services (EMS) system programs.
  8. Discuss the liability issues related to organizational risks.
  9. Identify documentation necessary to support/defend the risk management program.
  10. Use the risk management process to analyze and develop a plan for managing an EMS risk management issue.
-

This page intentionally left blank.

## HUMAN RESOURCES

### Organizational Socialization

The process by which new employees are transformed from outsiders to participating and effective members of an organization is called organizational socialization. Research has shown that this process can be very stressful for newcomers. Although confronted with positive opportunities when entering a new organization, newcomers are also in a tension-producing transition, facing loneliness and social isolation as they seek to establish an identity within the new environment. In addition, performance anxiety often interferes with efforts toward accomplishing new tasks. An appreciation of what newcomers face is essential for designing effective human resource programs.

The socialization experience can be divided into three major stages: anticipatory socialization, encounter, and change and acquisition. Each stage is discussed below.

#### 1. Anticipatory Socialization.

Anticipatory socialization involves all learning which occurs before a newcomer joins the organization. It is during this stage that expectations are developed. With the knowledge newcomers obtain during the interview and selection process, they fantasize about what they will do and what is achievable in the new job. In this stage, two factors appear to influence the success of the socialization experience: 1) realistic assessment of the organization--the degree to which newcomers have a complete and accurate view of organizational goals, climate, and philosophy; and 2) realistic assessment of the job--the degree to which newcomers have a complete and accurate view of new job responsibilities.

Realistic assessment of the job should influence the perceived demands newcomers face positively. Newcomers who enter the job with a realistic picture should have an easier time discovering what is and is not expected of them in terms of task and role. A realistic job picture also can provide a preview of task and role demands so that newcomers can design effective preliminary coping strategies, thus enabling them to respond to new demands with a greater sense of efficacy.

Realistic assessment of the organization also can be expected to influence the demands faced by newcomers. Realism about the organization can convey such elements of the culture as norms, values, activities, and aims. Through this process of cultural appreciation, newcomers can begin to construct a scheme for interpreting their organizational experiences. In addition, employees with realistic pictures of the organization are more likely to be aware of interpersonal demands when they accept the job.

## **2. Encounter**

Encounter, the second stage of socialization, begins on the first day of work, and is believed to continue for the first 6 to 9 months on the job. During this stage, expectations meet the reality of organizational demands, and "reality shock" may occur. At this time, newcomers see what the organization is like and attempt to become participating members of it. Encounter is characterized by the basic activities that engage new employees.

The first of these activities is learning the tasks of the new job. New skills are learned, new procedures are adopted, and often new equipment must be mastered. Even when new employees arrive with considerable training, they must learn how to perform in a new setting. Adjusting to the demands of the task can be difficult for newcomers, especially if there is a substantial mismatch between the newcomer's pre-employment job perceptions and the actual reality of the job. Perceived constraints on task performance can also lead to frustration. For example, when equipment, supplies, services, and job-related information is withheld or becomes difficult to access, newcomers can become frustrated and dissatisfied.

A second activity in the encounter phase is attempting to clarify roles in the organization. Organizational members are introduced, and their expectations are communicated. These expectations are often conflicting and ambiguous. In addition, conflicts between a newcomer's personal life and work life can emerge.

Establishing new relationships is the third activity in the encounter stage. As strangers to organizational members, new employees establish relationships not only in performing their jobs, but also in the organization's informal social network. This process can be stressful as newcomers seek acceptance by peers, adjust to unfamiliar supervisory styles, and struggle to understand "office politics."

## **3. Change and Acquisition**

Individuals faced with the demands of task-, role-, and relationship-clarification activities strive toward some resolution during the third stage of socialization: change and acquisition. This resolution process is known as coping. Folkman and Lazarus (1980) define coping as "cognitive and behavioral efforts to master, reduce, or tolerate demands."

Research has shown that control plays an important role in coping with demands. It appears that individuals cope by increasing, creating, or maintaining perceptions of personal control. Karasek (1979) found that increased job demands are less likely to be perceived as stressful when they are accompanied by increased decision latitude. In this way, perception of control is maintained.

Social support is another factor that is important in coping with demands. Feldman and Brett (1983) found that newcomers perceive assistance from others within the organization to be a beneficial coping strategy. Supervisors and peers are key socializing agents and should be selected carefully because of their contribution to newcomer adjustment.

This final stage, change and acquisition, completes the transition as the newcomer "learns the ropes" or becomes proficient in the performance of task, role, and interpersonal requirements. By mastering demands, the newcomer can facilitate a healthy adjustment to the organization; however, lack of mastery can produce organizational distress, leading to negative outcomes for both the individual and the organization.

### **Organizational Implications of Socialization**

Distress, as a result of poor adjustment, may have profound implications for newcomers, and the individual costs of distress affect the organization directly. Such direct costs to the organization include absenteeism and poor performance. Indirect costs such as dissatisfaction, poor quality working relationships, and faulty decisionmaking, although more difficult to quantify, also are destructive to the organization.

Socialization failures leave newcomers with feelings of alienation and discomfort, which may affect their performance negatively and cause them to leave the organization eventually. While the positive outcome of socialization is individual and organizational health, the mismanagement of stressful transitions can result in excessive or unanticipated turnover.

The socialization of newcomers to organizations is a continual process occurring as part of organizational entry. It is, by nature, related to other facets of entry such as recruitment, selection, and training. Recruiting highly qualified individuals and seeking the best job candidates from this targeted group can make the transition process less stressful for both the organization and the individual. During recruitment and selection efforts, it is important to keep in mind the issue of person-environment fit, because a good "fit" has beneficial consequences. The fit between person and environment concerns two fundamental matches in personnel selection: 1) between the skills and abilities of the individual and the demands of the job, and 2) between the needs and values of the individual and the rewards provided by the organization. In addition to effective recruitment and selection processes, an effective training and development program also can serve to facilitate the adjustment of the newcomer by equipping the individual to better deal with task and role demands.

## Developing Effective Recruitment, Selection, and Training Programs

Providing new employees with a realistic assessment of the organization and job requirements through the use of effective recruitment and selection techniques enables them to adjust their expectations regarding employment accurately. The following examples are methods to provide the new employee with an accurate picture of the organization and job requirements.

- Exercises that simulate important aspects of the job such as those typically performed in assessment centers.
- Informative and explorative interviews which
  - Provide comprehensive, factual, and detailed information about the job/organization in an unbiased manner.
  - Explore extensively the applicant's job values, educational/career goals, desired working conditions, aptitudes, interests and motivations.
  - Determine the fit between the needs and values of the individual and the organization's reward system.
- Written tests that measure knowledge essential for effective job performance.
- Job-relevant medical screening procedures such as strength and flexibility tests, lower back x-rays, and laboratory tests to determine applicants at risk for occupational injuries. It should be remembered that any medical screening can be conducted only after a provisional offer of employment according to the Americans with Disabilities Act (ADA) regulations.

Once on the job, preceptor and mentor programs are invaluable in the socialization of the new employee. Preceptor programs provide training in job tasks while mentor programs provide "political" training. The "political" training is crucial for the new employee to "fit" into the organization. This training involves

- understanding the organization's culture, values, and norms;
- identifying the role, influence, and importance of all organizational members;
- dealing appropriately with organizational members who have different personal agendas;
- interpreting correctly seemingly ambiguous and often conflicting messages; and
- working around various organizational constraints on task performance.

The first and most important step in developing effective recruitment, selection and training programs is to conduct a job analysis to determine the important aspects of the target job. The job analysis consists of

- defining the job in terms of observable member behaviors;
- determining what job tasks cluster together in terms of similar behaviors or common requirements; and

- determining how the important job behaviors can be observed and measured.

There are several methods of conducting a job analysis. For information to be accurate, more than one method always should be performed. These methods include

- Observing incumbents performing the job.
- Conducting one-on-one interviews with incumbents and their supervisors to determine
  - What daily tasks/activities/responsibilities are involved in the job.
  - How much time is spent performing each task.
  - How critical each task is to effective job performance.
  - How difficult it is to train members to perform the critical tasks.
  - Frequently encountered problems in the job.
- Develop and administer a questionnaire to a wide sample of incumbents based on the results of the interviews. Incumbents should rate the following regarding each activity of the job:
  - frequency;
  - importance;
  - time spent; and
  - difficulty.
- Collect critical incident data from incumbents and their supervisors. In groups of four to five, incumbents and their supervisors describe actual, specific examples of very effective and very ineffective performance from existing or previous job incumbents. These incident descriptions should include
  - What led up to the incident and the setting in which it occurred.
  - Exactly what the member did that was effective/ineffective.
  - Perceived consequences of the critical behavior.
  - Whether such consequences were actually within the control of the member.

Once information has been collected using these methods, it then should be categorized under appropriate skill dimensions and developed into checklists of observable job behaviors.

The job analysis serves several functions. It

- Provides clarification of the expectations of performance for both managers and members.
- Identifies specific duties and responsibilities involved in the job.
- Allows new members to be advised of duties/responsibilities before they start the job.

- Identifies for managers exactly what behaviors to observe and document regarding each member's performance.
- Eliminates rating errors.
- Provides the basis for managing performance problems and feedback objectively.
- Provides the basis for preparing for promotional examinations.
- Is required by law to ensure that personnel decisions are made solely on the basis of job performance.

The final step in the job analysis process is validation of the results. This validation should be done by experts doing the job to ensure it reflects the job functions and responsibilities accurately.

## **ORGANIZATIONAL TEAMS**

With increasing economic, regulatory, and reform pressures, as well as continued personnel recruitment and retention problems, EMS leaders need to give serious consideration to the use of teams as a management alternative. EMS teams can inject new ideas and enthusiasm throughout the organization and provide added motivation for improved performance. Member teams also can help EMS organizations recruit and retain qualified and highly motivated personnel, increase job satisfaction, improve customer service, and build long-term commitment to organizational goals and objectives.

### **The Importance of Teamwork**

Teams are effective at getting things accomplished because of their combined expertise. No one person has all the answers, but when the knowledge and skills of several people are brought together, the results can be powerful. Improved decision-making, faster problem-solving, and greater productivity are a few of the potential outcomes. In addition, workplace teams are effective because increased member involvement leads to improved job satisfaction. When members develop a sense of ownership with respect to their decisions, they become committed to carrying them out.

Because effective team performance in the field is a vital component of out-of-hospital care, it would seem that developing organizational problem-solving and decisionmaking teams within EMS would be a natural extension of the job. Unfortunately, however, EMS crews seldom are consulted about organizational issues. Yet in a wide range of business arenas, teams routinely handle day-to-day operational issues such as solving customer-service problems, identifying equipment purchasing options, researching technological advances, recommending changes in payroll, and determining better methods of providing service.

## The Best Use of Teams

Teams are most appropriate for improving organizational performance when:

- organizational goals are unclear;
- productivity is low;
- service problems remain unresolved;
- customers express dissatisfaction;
- organizational systems or procedures are ineffective;
- poor internal relationships and conflicts exist; and
- the organization is undergoing change.

Teams may not be appropriate or effective when the organization's management environment does not accept and support the team concept, when data are limited or not easily accessible, or when an emergency situation that requires immediate action exists.

## Management's Responsibilities to the Team

Teams need a solid commitment from management. Management must provide a climate in which teams can carry out their objectives without interference. Management also must demonstrate trust and respect in the team's abilities and skills; recognize and reward the team for its contributions, and provide the team with the resources necessary to get the job done. These resources include a place to meet, funds to support the team's work, equipment and supplies, access to data and information, and time to do the job.

## Getting a Team Started

- **Determine the need**--What is the team to do?
- **Gather the team**--Who would be a good team member? Which personnel command the respect of their peers? Should the team be interdisciplinary, or should it consist only of supervisors? Of EMT's? For optimal effectiveness, teams should have no fewer than 5 and no more than 12 individuals.
- **Decide how the team will be facilitated**--Who will lead the group? As the team develops, the leadership role should rotate among members regardless of organizational level.
- **Hold an initial meeting**--Explain the purpose of the team and the goals to be accomplished. Teams usually meet once a week for up to two hours on company time. Teams may become a permanent part of the management system, or, if formed for a specific purpose, they may exist only until a project's conclusion.

## RISK MANAGEMENT

### Definition

Risk management in health care is about preventing disability, loss of life, and/or irreparable business damage as a result of the provision of patient care; it is not just about preventing monetary loss. Risk management involves direct "hands-on" patient care as well as various indirect aspects of patient care, including the development of effective training programs and the selection of qualified personnel. However, regardless of its specific focus, the overall goal of risk management is to reduce the frequency and severity of preventable, adverse events that create losses.

### Risk Management Process

Every risk management program should be viewed as a process consisting of the following components:

- The **identification** of potential risks so that uncertainties can be controlled.
- The **measurement** of risks to determine the probability of potential losses.
- The **development** of strategies to lessen risks.
- The **implementation** of these strategies.
- The **monitoring** of risk management strategies/activities to ensure their effectiveness.

These components are covered in detail in your readings in the United States Fire Administration (USFA) publication *Risk Management Practices in the Fire Service*.

### Identifying Risks

Because very few accepted standards in out-of-hospital care have been validated through research, the risk manager must proactively seek out and analyze data and reports that suggest methods for aiding the detection and reduction of unsafe activities. Areas of EMS operations that should be considered in a risk management program are listed below:

Vehicle accidents	Employee attrition
Vehicle breakdowns	Continuing education
Driving skills	Dispatching procedures
Personnel physical fitness	Protocols testing
Station inspections	Protocol deviations
Building safety	Response times
Skills retention	Nontransport times

Hazardous materials exposures	Vehicle downtimes
Stress management	Mutual aid interactions
Debriefing effectiveness	Controlled substance losses
Documentation	Job-related injuries
Hiring selection criteria	Probationary supervision

Some aspects of out-of-hospital care involve more risks than others. One area of increased risk for many EMS organizations is the no-transport call. The legal issue regarding the paramedic's duty to obtain the patient's "informed refusal" has not been addressed in appellate court decisions. Therefore, risk management on these types of calls might concentrate first on improving the providers' physical assessment skills and, secondarily, dealing with the legal complexities of consent issues.

Endotracheal intubations are another frequent source of liability. In these cases, the issue again is assessment because of apparent failure to confirm the position of the tube. Because the result of improper tube placement is often death or severe brain damage, claims based on this medical error can be very detrimental. The paramedic's argument that "I thought it was in" does not provide an adequate defense. A possible plan to manage this risk might include 1) researching the "success rate" of intubations by identifying "success" criteria, 2) providing re-education and skills labs or practice on a more frequent basis, and 3) by having supervisors respond on all cardiac arrests both to observe techniques and provide assistance. Consideration also should be given to various technological methods which could be used to monitor the effectiveness of performance.

While examining the clinical areas that pose the greatest risk, it also is important to monitor underlying causes of deviations from protocols and patient complaints that have not materialized into "high-risk" areas. In addition, risk management activities should examine characteristics or factors within an EMS organization that may hinder or enhance risk management efforts. For example, asking the following questions may reveal valuable information:

- Are new member orientation and preceptorship programs providing inexperienced EMT's with sufficient information and training?
- Are the organization's selection techniques identifying the most qualified personnel for employment effectively?
- Do members from a particular training institution consistently lack skills?
- Are continuing education programs consistently well attended?

In addition to studying factors within the organization, risk management activities also should monitor extraorganizational risks created by the system within which the agency functions. Sample questions for evaluating risks in this arena include

- What scene situations are most dangerous for EMS providers?
- What response types can benefit from more staffing on the scene to reduce time or risk to the EMS crew--for example, a paramedic supervisor to assist on scene rather than an Emergency Medical Technician (EMT)-staffed fire department pumper?

Of course, numerous additional questions for consideration could be listed. The EMS risk manager must determine what questions should be asked and then obtain answers to those questions. For risk management activities to be successful, they must include questions, answers, planning efforts, and the introduction and monitoring of programs to manage risks.

### **Methods of Managing Risks**

There are several methods of managing risk that every EMS organization should consider.

**Avoidance**--One method of managing risk is to avoid it. Policies such as refusing to allow relatives to ride in ambulances during patient transport or refusing to allow EMS providers to perform medical procedures without express authorization by the medical director are examples of this risk management technique.

**Reduction**--Another method of risk management is to reduce the degree or severity of risk. Patient treatment protocols, clinical skills testing, routine physical fitness training, and scheduled vehicle maintenance are examples of risk management activities that help reduce the risk of loss but do not eliminate risks completely. A strong Quality Improvement (QI) program that monitors key component areas and performance indicators is the primary way to detect increased risk to the system. These data then can be used to identify ways to reduce that risk.

**Acceptance**--A third method of risk management is to accept it. This method is common in EMS operations, often reflected in the day-to-day running of calls, such as driving with the use of red lights and sirens (RLS), entering an apartment complex without police cover, or carrying a patient on a stretcher down a stairwell. These activities entail some amount of known risk to the EMT.

**Insurance**--A fourth method of risk management is insurance. Insurance transfers your risk to someone else. However, because of the uncertainty of juries and the lack of legal precedents in the EMS field, the insurance industry may be hesitant to insure some EMS activities. Nevertheless, most EMS operations must have insurance, at least motor vehicle liability insurance, as a prerequisite to providing patient care.

EMS managers must decide which of these risk management methods is the most feasible, affordable, and effective for their individual situations. Unfortunately, risk management often is dictated by the limited resources of the EMS organization. Expensive insurance may cause organizations to either underinsure their equipment or delay replacement. If wages are below standards, only poorly qualified personnel may be hired. Organizations may save money by scaling back on the number of units on the street, but this may create other problems regarding the quality of care rendered. Clearly, the balancing and weighing of risks must be reviewed constantly.

### **Documentation**

Without a "paper trail" to document the efforts of the risk manager, it can be very difficult, if not impossible, to identify and solve risk management problems. Documentation serves multiple purposes. It can validate testimony, assist in testimony by refreshing recall of an event, enable retrospective review without unnecessary duplication of collection efforts, and suggest efforts to reduce risk. Although paperwork does not necessarily demonstrate that an act was taken, it can be convincing evidence. For example, vehicle maintenance logs and canceled checks do not prove a vehicle was repaired, but these documents can effectively persuade a jury.

Documentation that identifies a problem also must indicate what action was taken to correct the problem and that the task was completed successfully. Recording that a member must attend a continuing education class is effective only if the documentation also shows that the member was aware of the situation and that the assignment was fulfilled. Organizations with well-defined recordkeeping policies will be better prepared to identify and implement effective interventions for reducing risks.

### **Conclusion**

For risk management efforts to be successful, they require support from personnel at all levels of the organization. Problem identification often requires considerable fact-finding and information-gathering activities. Risk managers will need to be seen as trustworthy in order for personnel to be forthcoming about risk management issues. Blindly imposing restrictions and recordkeeping requirements will only frustrate members and likely will defeat the very purposes of risk management. To be successful, it is important that organizational members understand and feel that they are valuable contributors to the risk management process, as opposed to feeling the process is being forced upon them.

This page intentionally left blank.

## BIBLIOGRAPHY

- Feldman, D. C., and Brett, J. M. (1983). Coping with a new job: A comparative study of new hires and job changers. *Academy of Management Journal*, 26, 258-272.
- Fitch, J. J., et al. (1993). *EMS management: Beyond the street*. (2nd ed.). Carlsbad, CA: JEMS Communications.
- Nelson, D. L. (1987). Organizational socialization: A stress perspective. *Journal of Occupational Behavior*, 8, 311-324.
- Shanaberger, C. J. (1992). Risk management. In S. S. Polsky (Ed.), *Continuous quality improvement in EMS*. Dallas: American College of Emergency Physicians.

## SUGGESTED READINGS

- Hallas, G. (1992). Hiring top-notch employees: Guidelines for unmasking the best applicant. *JEMS*, 17 (2), 54-56.
- Harrawood, D., Shepler, R. and Gunderson, M. (1995). Risky business: Why EMS needs risk management. *JEMS*, 20 (7); 30.
- Scott, T. (1993). Pick the right person using the assessment center process. *JEMS*, 18 (9), 59-64.
- Tritt, P. L. (1994). Human resources and manpower. In W. R. Roush (Ed.), *Principles of EMS systems*. (2nd ed.). Dallas: American College of Emergency Physicians.

This page intentionally left blank.

# MODULE 6: MANAGING POLITICAL ASPECTS

## **Objectives:**

Given a written evaluation, In-Basket or group activity, the students will be able to:

1. Identify and describe typical political actions/behaviors.
  2. Describe factors that confound basic political relationships in an organization.
  3. Discuss details leaders must consider when planning approaches to interaction with outside political entities.
  4. Identify the steps involved in the lobbying process.
  5. Demonstrate the ability to influence a political issue successfully.
-

This page intentionally left blank.

## MANAGING POLITICAL ENTITIES

By its very nature, Emergency Medical Services (EMS) is involved with numerous agencies and organizations, each having its own ideals and opinions regarding the focus and direction of EMS. Because each agency has its own interests, it is important that EMS leaders understand the respective viewpoints, areas of authority, and ideals and agendas of these various organizations in order to function effectively within the EMS system.

Networking is making and maintaining useful contacts. Lobbying is essentially just persuading or influencing a specific person or group to your way of thinking. Both are mandatory in today's business world, and have become so in EMS. You may want support for your plan or proposal, or you may want to change laws to improve your ability to serve, etc. Whatever your purpose, you are trying to influence someone and, as people differ, so must your approach.

### State Emergency Medical Services Office

Each State EMS office is responsible for the direction of EMS at the State level with requirements filtering down to the local level. Most State authority is supported by State legislation which enables the EMS office to carry out its responsibilities, establishes limits of authority, and provides some appropriations from State funds. The State EMS office may be a separate authority or it may be housed within another State agency, such as the State health department or highway/transportation department. Functions of the State EMS office include

- regulation of provision of ambulance or medical transportation services;
- establishment of training standards for EMS personnel;
- coordination of EMS communication systems;
- data collection; and
- system evaluation.

It is important to understand the political authority and agenda of the State EMS office in order to participate successfully in EMS at the local level. Because most State EMS offices are within the State's public health system, authority and legislative initiatives also should take a public health or "preventive" approach.

When attempting to influence the legislative process, it is essential to obtain the support of the State EMS office, its parent organization, and the highest level executive officer of that organization. It also is important to understand the EMS laws and associated regulations that have an impact on particular areas of the EMS profession. To increase their effectiveness when dealing with the State EMS office, EMS leaders should know the answers to the following questions:

- What does the State EMS office do?
- How are its activities authorized?
- Who is involved with implementation?
- What other EMS statutes or regulations exist?

## **OTHER EMERGENCY-MEDICAL-SERVICES-RELATED ENTITIES**

In addition to understanding the State's lead EMS agency, it also is important to be aware of other influential EMS organizations. Lead agencies in every State exchange information and services with many other EMS organizations, agencies, and support groups. One entity--and an integral part of the EMS system structure--is the State-level advisory board or council. Although considered to be advisory in nature, this board or council typically is strong politically, and its recommendations to the State EMS lead agency can have a significant impact on the direction of the EMS program. Again, effective preparation for influencing this agency involves researching the answers to important questions:

- When and where does the council meet?
- Who are the members?
- Where do they live?
- What EMS areas do they represent?
- How often are they appointed and by whom?

Other organizations that can effect change in the EMS arena are State affiliates of various EMS organizations, the State board of nursing, and the State medical society. Also, in addition to the State lead agency, there are several related State agencies to consider in EMS initiatives. Each State governor's office has an office of highway safety, which has a parent agency at the Federal level, the National Highway Traffic Safety Administration of the Department of Transportation (NHTSA/DOT). This Federal office provides limited funding for EMS initiatives. Since the State office of highway safety represents the governor's office, it becomes a valuable link in the network chain, not only for financial purposes but also for its political support. Spinoff programs administered by this office include passenger restraints, motorcycle safety, alcohol and drug use, and impaired driver programs, all of which are related to improving emergency medical care. New program initiatives, legislation, and other activities should involve these offices from the beginning.

## **STEPS IN LOBBYING PUBLIC OFFICIALS/DECISIONMAKERS**

### **Planning:**

- Research the process.
- Determine the decisionmakers and individuals/groups with influence.
- Study the decisionmakers and their stands/points of view.

- Gather facts, figures, numbers to support position.
- Anticipate concerns/arguments.

**Begin before you need their help:**

- Attend functions.
- Get to know them personally.

**Approach:**

- Make them want to do it!
- Present in decisionmaker's terms and best interests.
- Approach the decisionmaker strategically and bring support.
- Keep careful records.
- Persevere.

**Follow up:**

- Thank everyone.
- Keep in touch--NURTURE YOUR NETWORK.

**STEPS IN LOBBYING TO PASS LEGISLATION**

**Obtain the acceptance/support of EMS and related agencies, officials and organizations:**

- Note the need to lobby individuals.
- Don't overlook hospitals, physicians, and other professional groups.
- Get acquainted with House and Senate staffers on medical committees.
- Contact city or county lobbyists.

**Agree on draft legislation:**

- Determine who will be affected, negatively or otherwise.
- Decide who will serve as sponsor.

**Prepare to justify the bill or program:**

- Research and obtain the data.
- Break down information for effect
- Determine if lawmakers have information and realize need.
- Establish how lawmakers' areas would benefit.
- Determine tangible results lawmakers would receive for a positive vote.
- Submit written summaries of justification to legislators.

**Research the process:**

- Determine committees likely to be involved.
- Establish personal contact with chairs of committees before legislation is introduced.

**Request sponsorship from appropriate committees.**

**Introduce bill.**

**Obtain copy of schedule to determine hearings, meetings, and actions:**

- Telephone the sponsor or chair in advance and notify him/her of your intent to attend.
- Ask if additional representation is desired/appropriate.

**While the bill is in committee:**

- Have supporters call, write or visit.

**While waiting for vote of entire body:**

- Maintain contact to emphasize commitment and interest, and to monitor schedule.
- Supply information to additional persons requiring--keep it simple, to the point, and believable.

**Following success, share the news and the credit:**

- Thank everyone involved.
- Publicize the event.

Lobbying is a critical element of jobs at this level. It is **not** a luxury--something that can wait until we have the time. Although most people associate the need to network and lobby with private enterprise, in these days of shrinking public budgets we must learn from our private counterparts, i.e., we must fight for our share of the financial pie and for the recognition we are due.

If we take a truly proactive approach to risk management, medical control, customer service, and other programs, we should find ourselves wanting to change the laws and regulations which influence our service. States which have the most worthwhile and appropriate regulations have organizations with a strong lobbying network in place.

## BIBLIOGRAPHY

- Arnold, J. E. (1992). Fire chiefs, city managers: Working together. *Fire Chief*, 36 (1), 48-50.
- Cottet, J. (1992). Explaining why you need to buy. *Fire Chief*, 36 (9), 42-43.
- Fitch, J. J., et al. (1993).. *EMS management: Beyond the street*. (2nd ed.). Carlsbad, CA: JEMS Communications, 364-368.
- Selbst, P. (1998). The C.J. Shanaberger lecture: politics and change. *Prehospital Emergency Care*, 2 (4), 317-325.
- Spruill, W. N., Jr. (1994). EMS: Working with--and within--the "system." In W. R. Roush (Ed.), *Principles of EMS systems*. (2nd ed.). Dallas: American College of Emergency Physicians.
- Stravino, A. P. (1994). The hostile takeover of transport territory. *Fire Chief*, 38 (5), 70-77.
- Wolfberg, D. M. (1991). Pulling your weight in EMS politics. *JEMS*, 16 (3), 59-65.

## SUGGESTED READING

- Cady, G. (1995). Cooperation: An alternative to consolidation. *Prehospital Care Administration: Issues, Readings, Cases*. St. Louis: Mosby, 2 (7), 301-311.
- Cottet, J. (1992). Explaining why you need to buy. *Fire Chief*, 36 (9), 42-43.
- Fitch, J. (1995). Creating interagency partnerships; When collaboration overcomes competition. *Prehospital Care Administration: Issues, Readings, Cases*. St. Louis: Mosby, 619-623.
- Gardner, and Taigman, M. (1996, March). Conflict Management. *JEMS*, pp. 91-94.
- Kendrick, S.B., Jr., and Ozimek, D. (1992). Is talk cheap? Communication skills for the EMS professional. *JEMS*, 17 (2), 49-53.
- Stravino, A. P. (1994). The hostile takeover of transport territory. *Fire Chief*, 38 (5), 70-77.

This page intentionally left blank.

# MODULE 7: MEDICAL OVERSIGHT IN EMERGENCY MEDICAL SERVICES

## **Objectives:**

Given a written evaluation, In-Basket, or group activity, the students will be able to:

1. Determine the duties and responsibilities of the medical director according to system requirements.
  2. Identify ways to develop a strong relationship with the medical director.
  3. Describe the importance of communication in developing an effective working relationship with the medical director.
  4. Discuss the two types of medical direction: online (or concurrent) and offline (prospective).
  5. Discuss the merits and drawbacks to reliance on online medical direction versus protocols and standing orders.
  6. Demonstrate effective methods of communication and conflict resolution with a medical director.
-

This page intentionally left blank.

## RELATIONS WITH THE MEDICAL DIRECTOR

Medical directors and Emergency Medical Services (EMS) leaders work together effectively most of the time. To some extent this is surprising since they have a number of things working against them. Both are accustomed to being in control, and definitely are not accustomed to having their decisions and directions questioned. Furthermore, the lines of authority between them often become blurred.

There are ways both to avoid and make the most of differences when they arise. Although it may sound trite, communication and mutual respect are the keys to building and maintaining a useful working relationship with a medical director.

Developing a solid working relationship with the medical director begins with taking time to learn about one another's responsibilities, lines of authority, and to develop common goals, objectives, and action plans. Preplanning and outlining responsibilities clearly is critical, but accept that there will always be gray areas. These gray areas often center on personnel and the use of resources. Discuss these situations as they arise; negotiate and compromise as necessary.

EMS leaders and medical directors must develop not only common goals, but agree on objectives and action plans as well. For example, this does not mean simply agreeing to provide good customer service, but on exactly what that means and how to achieve that goal **within system and situational constraints**. In the past, there was a trend toward medical directors who simply "signed off" on the necessary paperwork so that the system could exist legally. This is a risky practice indeed; further, clearly it is not in the best interests of patient care. The current trend is toward medical directors who monitor and control all aspects of medical practice, including policy decisions. The EMS leader bears the responsibility to ensure that the medical director is involved significantly in all medical aspects of the system. Ideally, this is addressed during the recruitment and selection process, but sometimes this requires influencing an existing situation and relationship. In extreme cases, leaders may need to alter the existing agreement/contract in order to ensure they are providing adequate levels of care, using their resources effectively, and avoiding legal liabilities.

Medical directors should be involved in all aspects of out-of-hospital medical care. They bear the ultimate responsibility for medical oversight, and must approve (and often develop) all guidelines before they are instituted. Medical directors, in conjunction with the employer, share the authority over providers as they deliver care. The employer and medical director must work together to develop methods of monitoring the quality of medical care delivered (Table 7-1). Field participation by the medical director is an invaluable tool in medical oversight. Medical directors should be involved deeply in quality control, risk management, customer service, and education programs. They should be partners with the EMS leader, with complementary and even overlapping functions and responsibilities. Ideally, medical directors are active leaders and advocates for the EMS system and its patients.

**Table 7-1  
The Medical Director's Area of Authority**

<b>AREA OF AUTHORITY</b>	<b>MEDICAL DIRECTOR</b>	<b>CHIEF</b>
Medical Standards	Has Overall Authority	Makes Recommendations
EMS Operations	Makes Recommendations	Has Overall Authority

**OFFLINE MEDICAL DIRECTION**

The essence of offline medical direction is that, ultimately, there is a single, identifiable physician who should oversee the overall quality of care in an EMS system. While many physicians from different disciplines might be involved in the development of protocols, policies, and procedures for the system, there still must be a single physician for each agency who is responsible for the quality of the care that is delivered by that agency. It is imperative that the agency head and medical director work together to achieve the goal of consistent quality patient care.

Because of this scope of responsibility, it is essential that the medical director have authority commensurate with it. This does not necessarily imply administrative authority over nonmedical system components. However, the medical director must have authority in medical matters, including the authority to recommend the participation and suspension of out-of-hospital providers and resource hospitals. Other specific responsibilities of the medical director include establishing and implementing

- protocols for treatment, triage, communications, and transport as well as standing orders;
- standards for participation by communication resource hospitals and physicians;
- medical standards for the categorization and designation of emergency receiving facilities;
- medical standards for ongoing system review and quality assurance;
- standards for training and continuing education of all levels of Emergency Medical Technician (EMT)'s; and
- standards for participation by training programs for all levels of EMT's.

**1. Protocols**

The medical director must establish a set of protocols that define the overall system design. These protocols must address and identify the scope and involvement of out-of-hospital providers, the role of online medical direction, and the mechanism for quality assurance.

- **Treatment protocols**--Treatment protocols are guidelines that define the scope of out-of-hospital intervention that will be practiced by providers. They are a means of establishing uniform quality of care for the system. The treatment protocols must be integrated into primary training, continuing education, and refresher training programs for out-of-hospital providers. Additionally, they form the basis for ongoing monitoring of the system and for quality assurance. Therefore, treatment protocols are the first protocols that new or refining systems should develop. Because they define the scope of health-care delivery within an EMS system, they are the responsibility of the offline medical director and, ideally, are developed with input from medical advisory committees.

Because of the dynamic nature of the practice of medicine, treatment protocols must be reviewed on an annual or biannual basis and revised accordingly to reflect the current "state of the art" in emergency medical practice. Whenever major changes are made in treatment protocols, there needs to be appropriate inservice or continuing education training regarding the changes. No changes in protocols should be instituted until providers have been re-educated and uniform implementation of the changes can be expected.

- **Standing orders**--Many EMS systems use standing orders in situations that range from life-threatening conditions only to functioning totally under standing orders. Standing orders are quite specific and define those out-of-hospital interventions that are authorized by an EMS system without online, real time medical direction. Because standing orders authorize nonphysicians to perform invasive procedures in the absence of direct orders, they must be developed and signed by the offline medical director. Standing orders should be standardized throughout the system to ensure uniformity and prevent confusion.
- **Communication protocols**--Communication protocols define the method and timing of communications with online medical direction. They are related closely to standing orders in that they might define those situations where online voice communication is not necessary. As this is a medical decision, it must be established by the medical director, ideally in consultation with a medical advisory committee.

Another important aspect of the communication protocol is the designation of a specific online medical direction source for each identified field unit. The designation will determine whether the same resource will be used for all communications regardless of the patient's destination, or if direct contact is to be made with the receiving hospital. When the designated online medical direction resource is not the facility that will receive the patient, there may be concern if the physicians at the

receiving facility wish to have input into field treatment of patients they subsequently will be responsible for. This is an issue that must be addressed and resolved by the offline medical director in the best interests of patient care. For purposes of system standardization and quality control, the primary online medical direction authority should remain the same for a specific unit.

- **Triage protocols**--Triage protocols define the sorting of patients at multiple-casualty incidents according to the seriousness of injuries.
- **Destination protocols**--These protocols define the appropriate receiving facility for a patient with any given medical condition. For example, protocols may call for transport of trauma patients to designated trauma centers. In addition to trauma patients, the EMS system may be dealing with patients in a managed care organization who require transport to one of its facilities. Often this involves bypassing closer, nondesignated facilities. Thus, these protocols tend to be the most controversial, attracting the most attention in the course of their development. Determining the appropriate receiving facility clearly involves medical decisions and must be established through offline medical direction. Again, this is accomplished ideally through an advisory committee of physicians from various specialties and managed care organization physicians, if applicable. Hospital representatives also should be included in the development of these protocols.
- **Transport protocols**--Transport protocols define the proper mode of transport for particular cases. Not only are they based on the nature of the medical emergency and the patient's condition, but on transport times to facilities also. More specifically, they address the use of air versus ground transport in given situations. Transport protocols also address the level of expertise or certification of a transport provider.
- **Special protocols**--Protocols should be developed to address special circumstances that might be encountered within the EMS system. These would include the following: when a run is cancelled or the patient cannot be found, when the patient refuses treatment, when the patient obviously is dead, when the patient has "do-not-resuscitate" (DNR) orders or a living will, when cardiopulmonary resuscitation (CPR) should be terminated, whether to transport a patient against his/her will, and when a physician is on the scene.

## 2. Interrelations

The EMS system is unique in that it seeks to deliver quality emergency medical care via a team approach. As such, it includes a wide range of players during both the design and

implementation phase. In the implementation phase, it requires interactions between basic- and advanced-level EMT's, emergency and intensive care unit nurses, emergency physicians and other medical specialists, online medical directors, and the offline medical director.

Because the offline medical director is responsible for EMS system design as well as its daily implementation, he/she must have expertise and be comfortable in dealing with each of these subgroups. The offline medical director will need to form advisory committees consisting of representatives from various interested groups. In addition, he/she will need to sit as an advisor on other committees that do not address medical care directly but have an impact on the system in such a way that the input of the offline medical director is important.

### **3. Selection**

Depending on the nature of the given system, there will be various individuals or groups of individuals who are charged by law or tradition with the selection of the medical director. This authority should be familiar with the qualifications for medical directors as specified by American College of Emergency Physicians (ACEP) and the position paper of the National Association of EMS Physicians (NAEMSP). In addition, the selection committee should seek the advice, if not the consent, of key medical leaders within the community. The medical director should have the support of local emergency physicians, local and State medical societies, and hospital associations and their representatives.

## **ONLINE MEDICAL DIRECTION**

The underlying goal of online medical direction is real time (via radio or telephone) direction of out-of-hospital providers in the delivery of emergency medical care. Online medical direction differs from offline medical direction, which refers to administrative and protocol oversight exercised by a medical director or committee of physicians and EMS providers. Quality online medical direction requires the presence of online physicians who are involved in the design and implementation of the system, participate routinely in online direction of care, are well acquainted with EMS personnel, and are involved in EMS medical audits and quality assurance programs.

### **1. Online System Design**

EMS systems vary in configuration as well as in the amount of control given to physicians at the State or local level. In most States, legislation defines the duties and responsibilities of physicians involved in the system, with most specifying a regional design with a hierarchy of medical oversight. The design of the local medical oversight system is dependent on the regional design as well as on the responsibilities assigned to practicing physicians in that area. Often, the agency responsible for providing the EMS

personnel has considerable influence over local medical oversight system design. In addition, local political considerations often dictate certain aspects of the online system. Regardless of its actual configuration, however, every EMS system should have a medical director (offline medical direction) whose responsibilities include overseeing the system, monitoring its performance, and ensuring quality patient care. This physician should be a member of the online team that provides ongoing direction of patient care and EMS team performance.

Online medical direction involves physician direction of out-of-hospital providers in the delivery of emergency medical care. Hospital-based direction provided by radio or telephone communication from a hospital-based physician (or registered nurse under the supervision of the physician) who usually is located in an emergency department (ED), is the most common model in EMS systems.

Such direction implies the ability to monitor effectively the performance of the field team, ensuring quality medical care and prompt patient transport. An essential element in the design of any system is the online physician's ability to alert the hospital team of the patient's impending arrival and to suggest appropriate preparations.

## **2. Quality Assurance**

Essential to the design of online medical direction is the provision of ongoing review of the system. Quality assurance programs can be designed around onscene observation by physicians or supervisors, review of tapes and written records, prospective and retrospective studies of patient outcomes, and computer-aided review for educational planning. The most effective and accurate picture of the quality of care provided by EMS teams is obtained from onscene observation. The great disadvantage of such a system rests in its inefficiency and expense. A valuable variation on this theme is the review of the call at the receiving ED with the physician and nurse in charge of the patient. Retrospective reviews carry with them the disadvantage of being ineffective in promptly correcting a patient-care problem. They do serve a useful educational purpose, but confrontational meetings, in which field teams become defensive about what may be interpreted as an attempt to discredit their efforts, must be avoided.

## **PROS AND CONS OF CONFIGURATION DESIGN**

**Standing order system**--In this arrangement, EMS field teams apply prescribed protocols according to the presenting signs and symptoms of the patient. Physician consultation is **not** required, and a report is given to the hospital team on arrival.

**Protocol system**--Field teams are provided with a set of patient protocols designed as guidelines to patient care in a field setting. In such a system, orders are either presumed or direct. With presumed orders, the protocol may be initiated, but the physician is contacted at a point designated in the protocol. With direct orders, patient-care protocols

may be applied only after direct orders from the physician. (Some allowance usually is made for extenuating circumstances, such as a technical breakdown or interference in communications.)

The pros and cons of such configurations relate to several elements inherent in each local system. When providers are given more responsibility, there is a greater need for specific and detailed protocols. In addition, there is a greater need for online physicians to become well-acquainted with providers through daily involvement in the system and frequent exposure to EMS personnel through training and online supervision of care. The advantage of "presumed orders" is more expeditious patient management; however, presumed order protocols must be subject to a strict quality assurance program. A "direct order" system can be cumbersome and inefficient, and without the benefit of the same level of audit and quality assurance as other designs, it cannot, of itself, guarantee good quality. Regardless of how a system is specifically designed, out-of-hospital management must be based on written protocols developed by clinicians involved in the system on a daily basis. These guidelines should set the standard of care, not only for providers, but also for online physicians.

### **INTERACTION WITH EMERGENCY MEDICAL SERVICES EDUCATIONAL PROGRAMS**

All advanced-level (and in most States, basic-level) EMS educational programs must have a medical director. The EMS system medical director should have a strong working relationship with the medical director and faculty of any outside EMS educational program involved with providing training for providers in the system. Since most educational programs follow U.S. Department of Transportation (DOT) curricula, it is important that the medical director work with the educational program to develop ways to include local system protocols. It is also critical that the medical director be aware of, and involved in, any problems or remediation plans for system providers who are students. For further information on responsibilities of medical directors of EMS educational programs, see Storer, et al. (1998).

This page intentionally left blank.

## BIBLIOGRAPHY

- Bogucki, M. (1997). Medical support for the fire service: current priorities and roles of physicians. *Prehospital Emergency Care*, 1 (2), 107-113.
- Bourn, S. (1994). Mother, may I...? *JEMS*, 19 (1), 43-45.
- Brame, K., and Davis, P. (1992). Fire service medical control: Who do those doctors think they are? *Fire Chief*, 36 (3), 53-55.
- Fitch, J. J., et al. (1993). *EMS management: Beyond the street*. (2nd ed.). Carlsbad, CA: JEMS Communications.
- Krentz, M. J. (1989). Offline medical control. In W. R. Roush (Ed.), *Principles of EMS systems: A comprehensive text for physicians*. Dallas: American College of Emergency Physicians.
- Kuehl, A.E. (Ed.). (1997). *EMS systems and medical oversight*. (2nd ed.). St. Louis: Mosby-Lifeline.
- Polsky, S., et al. (1993). Guidelines for medical direction of prehospital EMS. *Annals of Emergency Medicine*, 22, 742-744.

## SUGGESTED READINGS

- Alonso-Serra, H., Blanton, D., and O'Connor, R. (1998). Physician medical direction in EMS. *Prehospital Emergency Care*, 2 (2), 153-157.
- Polsky, S., et al. (1993). Guidelines for medical direction of prehospital EMS. *Annals of Emergency Medicine*, 22, 742-744.
- Storer, D.L., et al. (1998). Physician medical direction of EMS education programs. *Prehospital Emergency Care*, 3 (1), 158-159.

This page intentionally left blank.

# MODULE 8: CHANGES IN HEALTH CARE DELIVERY

## Objectives:

Given a written evaluation, In-Basket, or group activity, the students will be able to:

1. Compare "prehospital" and "out-of-hospital" services.
  2. Define common terms associated with managed care (health maintenance organization (HMO); preferred provider organization (PPO); gatekeeper; capitation, etc.).
  3. Discuss various new trends in health care delivery, including
    - a. Change in emphasis.
    - b. HMO/PPO versus private insurance.
    - c. Cost containment issues.
  4. Identify and describe the effects of managed care on cost recovery systems, including
    - a. Fee for service.
    - b. Contracts.
    - c. Capitation.
  5. Discuss the effects of managed care on current and future services provided by Emergency Medical Services (EMS).
  6. Describe the considerations involved in determining an EMS organization's roles in a managed care system.
  7. Analyze and develop strategies for developing support to expand services to partner with managed care.
-

This page intentionally left blank.

## CHANGES IN HEALTH CARE DELIVERY

The role, and even the definition, of Emergency Medical Services (EMS) is changing. Since its inception in the early 1970's, the philosophy of modern EMS has been to provide prehospital **emergency** medical care to patients with life-threatening conditions. Yet, even the novice needs to do only a cursory review to realize that the majority of prehospital medical care is not rendered to patients with life-threatening emergencies. In addition, research regarding the impact of advanced level EMS on life-threatening problems has failed to demonstrate any significant effect on mortality--with the exception of early defibrillation. However, with advances in technology in the last few years, we have seen the procedure of prehospital defibrillation move from solely within the paramedic scope of practice to basic level EMT's, police officers and even airline attendants.

A review of current literature also shows a shift in terminology from "prehospital" care to "out-of-hospital" care. At first, one might think that this has no significance. Prehospital and out-of-hospital care all appear to mean the same thing. But implied in this terminology shift is that the services of existing EMS organizations should (and in many cases already do) involve more than management of medical problems that will be treated at a hospital. Out-of-hospital care includes a variety of patient care needs such as preventive health programs (e.g., immunizations, health screenings) and home health care for patients with tubes, shunts, etc. These are certainly not new needs in health care, so why are they now being discussed in the context of EMS? The major catalyst for these discussions is managed health care.

### Managed Care

Although the Clinton administration's push for a national health insurance initiative in the early 1990's failed, it set in motion drastic changes in the existing health care industry aimed at reducing and controlling costs. These changes have led to the proliferation of the **Managed Care Organization (MCO)**. Before an EMS organization can address any form of interface with managed care, leaders and managers must understand the terms commonly associated with this type of health care delivery.

**Managed care** is an umbrella term for an organized system of health care that seeks to control the selection and use of health services of a specific patient group. This health care is coordinated through a specific network of primary care physicians (known as "**care coordinators**"). Patients belonging to the organization may not access specialists without first seeing their primary physician and getting his/her approval/referral. Without approval from the primary physician, the managed care organization usually will not pay for the services of a specialist. Depending on the literature you are reading, care coordinators also may be referred to as "**gatekeepers**."

**Capitation** is a negotiated rate. The health care provider is paid a fixed amount for each enrollee in the organization. It is important to realize that patients enrolled in a managed

care organization pay vastly reduced fees to see their "primary physician." This serves as an incentive to encourage physician visits for such things as preventive care (but makes it almost impossible to choose any options not approved by the primary physician). For physicians, the incentive encourages minimal tests, referrals, and hospitalizations.

### **Types of Managed Care**

There are numerous types of managed care.

- **Individual Practice Association (IPA)**--Physicians are prepaid a capitation rate by the organization on a monthly basis for service to members. The physician receives the same rate whether members see the doctor that month or not.
- **Group Health Maintenance Organization (HMO)**--An HMO contracts with a group of physicians to provide health care to enrollees. Physicians continue to practice in their own offices, but distribute income from the HMO among the group.
- **Network HMO**--An HMO contracts with several physician groups, but physicians may continue to provide care to non-HMO patients.
- **Staff HMO**--The physicians are employees of the HMO.
- **Preferred Provider Organization (PPO)**--Enrollees in this type of managed care can seek treatment from an approved network of physicians/providers who agree to abide by a set reimbursement structure; or they may see other physicians. If they see physicians who are not part of the network, the benefits from the organization are reduced.
- **Point of Service (POS)**--This is a combination of an HMO and PPO. The enrollee chooses which plan to seek treatment from at the time the service is needed.

These types of care may be categorized into three options:

**Option 1--Traditional HMO**--In this type of care, the primary provider makes all referrals. Specialists are also within a network. This is the most economical type of managed care.

**Option 2--Point of Service**--In this type of care, the primary physician must make specialist referrals, but the patient may seek in- or out-of-network services. If the patient chooses out-of-network services, there is a higher deductible and co-pay.

**Option 3-PPO**--In this type of care, the patient may see any specialist within the network without a referral from the primary physician. This is the most expensive of the three types of managed care.

In 1996, about 60 percent of Americans were enrolled in some sort of managed care health plan. This is an increase of approximately 35 percent from 1992. At least 38 states were mainstreaming Medicaid-eligible persons into managed care. With the fiscal problems of Medicare, this population is not far behind. Of all the types available, the most common types of plans chosen were the HMO and PPO.

### **Financial Issues Related to Managed Care**

There are several financial issues related to managed care. EMS leaders must be cognizant of, and (if they are not already dealing with them) prepare, their organizations for operating within the reimbursement structure of managed care organizations. The first step is to understand the terminology related to managed care and the reimbursement structures.

- **Provider**--Those who provide the care and services.
- **Payer**--Those who pay for the services. This may be either the customer or another source, such as the employer.
- **Customer**--The person receiving care.
- **Fee for Service**--With this type of reimbursement system, the patient (or private insurance carrier) reimburses the provider for the services rendered. This requires the provider to submit an itemized bill for services and supplies used. Regardless of what the provider charges, most insurance carriers have a cap on the amount they will reimburse for various services and supplies. However, total reimbursement is based on what is done and what is used for each individual patient.
- **Capitation**--With this type of reimbursement, the provider and managed care organization negotiate a rate (fixed amount) that the health care provider will be paid for each enrollee in the organization. The provider is paid this rate regardless of whether the enrollee uses the services or not.
- **Contract (discounted services)**--This type of reimbursement usually involves the commitment of the provider to dedicate personnel and transport capabilities to the managed care organization for a specific number of hours per day for which the managed care organization pays an hourly rate plus an additional fee for transport. Reimbursement arrangements between EMS services and managed care are either capitation or contract agreements.

Although seeming fairly straightforward in application, there are hidden issues that must be considered with EMS/managed care financial agreements. The most obvious is that if an agreement is reached between an EMS provider and a managed care organization, that agreement will include the stipulation that all of the managed care organization patients

will be transported to their facilities. If patients are not transported to the organization's facilities, the patient is faced with a claims denial for the initial transport and an additional fee for transfer to the organization's facility.

A second issue involves transfer calls. If an EMS service enters into an agreement with a managed care organization to provide ambulance services, there is a high likelihood that the managed care organization will require coverage for ambulance transfers as well as emergency responses. This means the EMS service leaders must analyze those effects on response times, unit location, personnel needs, etc., **before** negotiating the rate.

Other issues may involve the addition of alternative transport. Will the contract include transport of MCO patients who do not require Advanced Life Support (ALS) services, but rather a wheelchair van? Will the agreed-upon fee allow for supporting entirely ALS services, or would a tiered response be more cost effective?

Even if a capitation/contract agreement is implemented, EMS leaders must remember that many HMO's require their members to call their organization before receiving permission for treatment. Thus, it is the HMO that decides if an ambulance is dispatched, not 911.

The effects of managed care organizations' attempts to move patients away from the 911/emergency department pathway to health care are seen in a study conducted by Blue Cross of Idaho which revealed an 18 percent drop in emergency department visits for members of the Healthwise managed care organization. Although not addressed, one might assume this decrease in emergency department visits was accompanied by some decrease in the demand for EMS. What effect will this trend have on revenue generation/cost recovery for EMS organizations?

Other financial issues that must be considered include the need for additional equipment and training. Besides the obvious concern of additional units and personnel, leaders must determine if specialized equipment will be needed for transfer calls. Will the current employees need additional training to manage specialized equipment or monitor pharmacological agents that are not in their current protocols that may be used on transfer patients? As this module continues, you will notice that other financial concerns will surface.

### **Scope of Services**

Discussion of expanded services is all around us. At any EMS gathering there is discussion of what EMS services will entail in the next decade. EMS is facing changes related to acute-care triage of patients, integration with primary care, increased participation in public health and prevention activities, and limiting transportation to real emergencies. Although no one knows for sure exactly what services will emerge in response to these areas, we can be fairly well assured that the scope of services EMS has traditionally provided is going to change!

Since the inception of EMS in the early 1970's, its service leaders and managers have planned their organization's direction based on the concept of managing the demand for services. With the ever-increasing numbers of managed care organizations, that concept is shifting from managing demand for services to managing access to services. Calling the managed care organization before calling 911 to determine the need for an ambulance already has been addressed.

The financial reimbursement structure of managed care organizations encourages a "more-for-less" approach to providing medical services. With a fee-for-service reimbursement system, the more service you provide, the more money you receive. With capitation/contracts, health care providers (including EMS services) are paid a predetermined fee. Any costs incurred over that fee are lost revenue. Any money not spent in providing care is profit. Thus, providers are rewarded for delivering less care. Will this lead to a change in treatment protocols to diminish the amount of ALS intervention in order to cut costs and increase profit? Our ethical side would like to believe it will not. Our business side would have to say the potential exists. At the very least, it would seem that protocols would be reviewed for unnecessary interventions.

Several factors will both affect and drive the changes in scope of services. These factors may have varying significance from one service program to another, but they all must be considered as EMS leaders review their current system and set the vision and direction for their organization's future.

### Community Expectations

Today, most citizens still expect to call 911 and immediately get medical advice from trained dispatchers while paramedics in an ambulance rush to their aid. This is also the mission and expectation of most EMS service programs. As more and more individuals enroll in managed care organizations, this expectation will be somewhat altered. Citizens still will expect that when someone calls 911, paramedics in an ambulance will rush to their aid **if** their HMO has determined they need an ambulance! For some patients this already has become a harsh reality based on claims that were denied after a true diagnosis was determined.

On the other hand, if you talk to any of your street providers or look at the data retrieved from patient encounter forms, you are acutely aware that the majority of responses are not true emergencies. Yet, in the traditional EMS structure, your only option for cost recovery is to transport these patients to the emergency department. This means you are spending a great deal of money to maintain ALS units to transport nonemergency, basic level care patients to emergency departments for primary health care in addition to the occasional true emergency.

Managed care organizations' push to have their patients avoid calling 911 first can create a significant negative fiscal impact on an EMS system, whether it is private or public. Fire-based EMS systems, in particular, currently rely on 911 calls as the sole basis for revenue generation. Having enrollees call an in-house line first lowers the number of 911

calls, thus decreasing revenue by changing the payer mix and increasing the number of uninsured and indigent patients using the system. As managed care continues to increase participation by households, this fiscal impact will force EMS systems either to seek alternative sources of revenue such as capitated contracts for nonemergency transport, or get out of the business.

Will community expectations expand? What will be expected in terms of health prevention and maintenance? Will there be set days (or even the "drop-in" approach) at fire stations for routine checks for blood pressure monitoring/health screening? Will your EMS service form a partnership with State/county health programs to provide immunizations at the fire stations or use ambulances to transport teams to underprivileged areas of the city? In some parts of the country, this is not a question that needs to be answered--it is already a reality.

### Expanded Scope of Practice

What exactly is expanded scope of practice? Depending on the conversation, it may be anything from immunization programs and health care screenings, to transporting to alternate facilities, or treat-and-release protocols. The views of what expanded scope of practice could mean to EMS vary considerably among physicians, nurses and paramedics themselves.

### Prevention Programs

Interfacing with community health prevention programs to provide immunizations is already a reality for EMS systems in many areas of the country. Other prevention programs include health screening or injury prevention education programs. For example, many EMS service programs already are involved in some aspects of injury prevention such as car seat safety programs.

It is only a slight stretch to envision EMS personnel conducting home assessments to identify potential risk (and solutions) for injury. After all, fire suppression personnel have been active for years in installing smoke detectors in private homes in an effort to reduce the risk of injury and property loss from fire.

### Transport to Alternate Facilities

Transporting to alternate facilities involves the ability to do a more indepth assessment at the scene. The assessment currently used by paramedics is straightforward and aimed at identifying life- or limb-threatening emergencies. To justify transport to an alternate facility, such as a clinic, would require a more comprehensive examination than the current standard field assessment. Decisions to transport to alternate facilities also might involve contacting the managed care organization to discuss patient condition and reach

consensus on transport destination. Regardless of the approach, more onscene time will be required. This can directly affect number of needed units and personnel. Transporting to alternate facilities also may involve the dispatch center. Pathway management may divert these patients before the paramedics are even dispatched.

The U.S. Department of Transportation (DOT) EMT-Paramedic curriculum completed in 1998 significantly expands paramedic training compared to the 1985 version. This expanded curriculum provides the base for expanded scope of practice. It also affects the cost of training. The hour investment has increased significantly from the 1985 curriculum, resulting in financial ramifications for EMS service programs that pay for the cost of training their personnel. In addition to the direct educational cost, service programs often pay the employee/student overtime and, in many cases, incur a secondary cost of callback personnel to cover while the student is in class or at a clinical session.

Before deciding what aspects of expanded scope of practice your organization may embrace, it is critical to determine what your community needs and what resources the EMS organization has (or can develop) that can be integrated into the existing community health care network.

### **Determining the Place of Emergency Medical Services in the Health Care System**

Private providers and, in some instances, fire services, already have begun the transition to survive in the managed care environment. Fire departments that provide EMS today will have to be involved to some degree with a managed care organization if they want to stay in EMS. This will require EMS leaders to assess the needs of the managed care organization, the needs of the community, and the ability of their department to meet those needs.

#### Needs of the Managed Care Organization

The only way to learn about the needs of the managed care organization(s) is to meet with those organizations. The National Highway Traffic Safety Administration (NHTSA) has established a national-level roundtable to bring managed care organizations and EMS representatives together to discuss the major issues involved in the interface. This is a starting point for local departments to review the general issues and concerns. However, local departments also must meet with the local managed care organization(s). By keeping an open mind and honest dialogue, both groups can identify each other's needs and, to a great extent, the needs of the community.

Although managed care is a challenge to EMS, we still must be objective in our approach to determining solutions that will be mutually beneficial.

Managed care organizations also must be educated on the value of EMS. EMS can offer payers and providers many value-added services that tie into expanded scope.

### Needs of the Community

Other sources of information regarding community need include the State/county health department and medicaid office. Local departments must communicate with other health agencies to identify the needs of the community. After all, the community is the customer of all of the organizations involved.

EMS must work with managed care organizations and other health agencies to establish standards of care based on customers' needs as well as medical standards, and ensure that the underlying philosophy is that the customers' needs are more important than cost containment. If a contract or capitated agreement is being developed, input about, and review of, field treatment protocols should be sought from the MCO physicians. Therefore, it is critical to fire/EMS departments that the medical director is involved in all of these meetings.

### Department's Ability to Meet Customer Needs

The department must have a solid understanding of where its current EMS system is, and a vision of where it wants EMS to go. Once that has been determined, the assessment of what is needed to get there can begin. This assessment involves all of the areas discussed throughout this course, as well as the previous sections of this module.

In addition to system vision, the department must consider its internal customers (employees). There is some evidence that EMS personnel are resistant to the changes that managed care could place on their current scope of practice. Departments must educate and inform employees of potential changes and the impact of those changes **before** unilateral implementation by a general order. Employees must be allowed to voice opinions and be part of the process of change if "buy-in" is to occur.

EMS leaders must take managed care seriously and be willing to change the way EMS is practiced currently. EMS systems no longer can afford to view themselves as isolated entities. The role of EMS is expanding to one of a primary provider of out-of-hospital care, not just prehospital care. EMS is one part of the overall health care system and that system is being managed by an outside entity!

EMS leaders also must take an active role in representing the needs of their customers. This involves becoming more cost-conscious, customer-service oriented, and focused on the end result of the best quality care for the patient at the most reasonable cost. This requires strong commitment and hard work. Making the transition from the traditional to the new role will not be easy. Leaders must provide the vision and open communication with all entities involved (including their employees) to redefine the role of EMS and guide the changing and expanding scope of services within their organizations.

## BIBLIOGRAPHY

- Besemer, C. (1996, December). Managed care impacts EMS. *Emergency*, pp. 30-33.
- Bogucki, M. S. (1998). More expanded scope: Operational EMS. *Prehospital Emergency Care*, 2 (4), 330-333.
- Dickinson, E. & Verdile, V. (1996). Managed care organizations: A link in the chain of survival? *Annals of Emergency Medicine*, 28 (6), 719-721.
- Dukes, P. (1996). EMS: Mnemonic for what/emergency/extended/expanded? medical? managed? services? [online]. Available: <http://lama.kcc.hawaii.edu/ems/managedcare.htm>.
- Froomkin, D. (1998, October). Backlash builds over managed care [online]. Available: [www.washingtonpost.com/wp-srv/politics/special/healthcare/healthcare.htm](http://www.washingtonpost.com/wp-srv/politics/special/healthcare/healthcare.htm).
- Koenig, K., Salvucci, A., Zachariah, B. & O'Connor, R. (1998). EMS systems and managed care integration. *Prehospital Emergency Care*, 2 (1), 67-69.
- Ludwig, G. (1998, May). Managed care! What does that mean? *EMS Update* [online]. Available: [www.baygraphics.net/update8.html](http://www.baygraphics.net/update8.html).
- \_\_\_\_\_. (1999, February). Is managed care in your future? [online]. Available: [www.emergency.com/iafcfeb3.htm](http://www.emergency.com/iafcfeb3.htm).
- Neely, K. & Krakeel, J. (1997, May). Brave new managed world. *Fire Chief*, pp. 31-35.
- Rasmussen, K. (1998, April). A primer on the types and terminology of managed care [online]. Available: <http://healthcare.tqun.com/library/wekly/aa041798.htm>.
- Sachs, G. M. (1996, July). Can fire service EMS survive in a managed-care environment? *Fire Engineering*, pp. 68-70.
- U.S. Dept. of Health and Human Services. (1999, December). EMS managed care bulletin [online]. Available: [www.nhtsa.dot.gov/people/injury/ems/bulletin/ems99.pdf](http://www.nhtsa.dot.gov/people/injury/ems/bulletin/ems99.pdf).
- Zavadsky, M. (1997, May/June). Perspectives on expanded scope of practice. *Ambulance Industry Journal*, pp. 20-21.
- \_\_\_\_\_. (1997, August). Perspectives on expanded scope of practice, Part II. *Ambulance Industry Journal*, pp. 20-21.

**SUGGESTED READINGS**

- Besemer, C. (1996, December). Managed care impacts EMS. *Emergency*, pp. 30-33.
- \_\_\_\_\_. (1996, January). Is paramedic scope expanding? *Emergency*, pp. 30-33.
- Dickinson, E. and Verdile, V. (1996). Managed care organizations: A link in the chain of survival? *Annals of Emergency Medicine*, 28 (6), 719-721.
- Garza, M. (1994, April). Treatment without transport. *JEMS*, pp. 75-77.
- Hsiao, A. and Hedges, J. (1993). Role of the emergency medical services system in regionwide health monitoring and referral. *Annals of Emergency Medicine*, 22 (11), 53-59.
- Lipowitz, S. (1995, April). Taking the 'E' out of EMS. *Fire Chief*, pp. 37-44.
- Sachs, G. M. (1996, July). Can fire service EMS survive in a managed-care environment? *Fire Engineering*, pp. 68-70.
- U.S. Dept. of Health and Human Services. (1999, December). EMS managed care bulletin [online]. Available:  
[www.nhtsa.dot.gov/people/injury/ems/bulletin/ems99.pdf](http://www.nhtsa.dot.gov/people/injury/ems/bulletin/ems99.pdf).

# **APPENDIX A: GLOSSARY**

This page intentionally left blank.

**GLOSSARY**

<b>ACEP</b>	American College of Emergency Physicians.
<b>ACLS</b>	Advanced Cardiac Life Support.
<b>ADA</b>	Americans with Disabilities Act.
<b>AIDS</b>	Acquired Immune Deficiency Syndrome.
<b>ALS</b>	Advanced Life Support.
<b>BLS</b>	Basic Life Support.
<b>CAD</b>	Computer-Aided Dispatch.
<b>Capitation</b>	Flat fee for services paid by managed care organization.
<b>CBD</b>	Criteria-Based Dispatch--level of care required determines level of response.
<b>CDC</b>	Centers for Disease Control and Prevention.
<b>Communication protocols</b>	Define the method and timing of online medical control, as well as the source of control for specific units.
<b>COP</b>	Certificate of Participation.
<b>Destination protocols</b>	Designate the appropriate receiving facility for patients with a given medical condition.
<b>Dispatch protocols</b>	Standards for dispatching response.
<b>DNR</b>	Do Not Resuscitate.
<b>ED</b>	Emergency Department.
<b>EMS</b>	Emergency Medical Services.
<b>EMT</b>	Emergency Medical Technician.
<b>EMT-P</b>	Emergency Medical Technician--Paramedic.
<b>Fee for service</b>	User pays for cost of service.
<b>FEMA</b>	Federal Emergency Management Agency.

<b>First responder</b>	First on scene--level of response and training may vary.
<b>HBV</b>	Hepatitis B Virus.
<b>HIV</b>	Human Immunodeficiency Virus.
<b>HMO</b>	Health Maintenance Organization.
<b>ICS</b>	Incident Command System.
<b>IEMS</b>	Integrated Emergency Management System.
<b>IIMS</b>	Integrated Information Management System.
<b>Medical Director</b>	Physician charged with directing and overseeing all aspects of medical care for EMS system; also known as physician program director.
<b>MCO</b>	Managed Care Organization.
<b>MIS</b>	Management (or Manager of) Information Systems (or Services).
<b>Mutual aid agreement</b>	Support agreement between neighboring systems.
<b>NAEMSP</b>	National Association of Emergency Medical Services Physicians.
<b>NFA</b>	National Fire Academy.
<b>NFPA</b>	National Fire Protection Association.
<b>NHTSA</b>	National Highway Traffic Safety Administration.
<b>Off-line medical control</b>	The establishment and monitoring of all medical aspects of a system, including protocols, education, and online medical control.
<b>OLMC</b>	Online Medical Control.
<b>Online medical control</b>	Real-time direction of out-of-hospital medical care via radio or telephone.
<b>OSHA</b>	Occupational Safety and Health Administration (Federal).

<b>PBQA</b>	Provider-Based (or Peer-Based) Quality Assurance.
<b>PCR</b>	Patient Care Record (or Report).
<b>Physician extender</b>	EMT-P.
<b>PIER</b>	Public Information, Education, and Relations.
<b>PIO</b>	Public Information Officer.
<b>PLS</b>	Peak Load Scheduling--allocates resources by demand for services.
<b>PPO</b>	Preferred Provider Organization.
<b>Protocols</b>	Guidelines, policies, and procedures.
<b>Provider</b>	EMS member; one who provides out-of-hospital emergency medical services.
<b>QI</b>	Quality Improvement.
<b>QM</b>	Quality Management.
<b>RAMO</b>	Risk Assessment and Modification Organization.
<b>RLS</b>	Red Lights and Siren.
<b>Special protocols</b>	Guidelines which address special circumstances in out-of-hospital care, such as patient refusal of treatment, DNR, physicians in the field, etc.
<b>SSM</b>	System Status Management; management of resources before/between calls.
<b>Standing orders</b>	Specific guidelines which authorize out-of-hospital interventions without online (real-time) medical control.
<b>Third/Separate service</b>	Unique independent EMS organization funded and operated by local government using government employees; <b>not</b> administered by fire/police departments.
<b>Tiered response</b>	Level of response (ALS/BLS) varies based upon patient need.
<b>Transport protocols</b>	Define the proper mode of transport and level of expertise required for transport of particular classes of patients.

<b>Treatment protocols</b>	Define the scope of out-of-hospital medical intervention.
<b>Triage protocols</b>	Sorting of patients at multiple-casualty incidents according to the seriousness of injuries.
<b>USFA</b>	United States Fire Administration.
<b>U:UH ratio</b>	Unit hour use ratio.

# **APPENDIX B: REPRINTED ARTICLES**

This page intentionally left blank.

# Leadership: Fact or fiction?

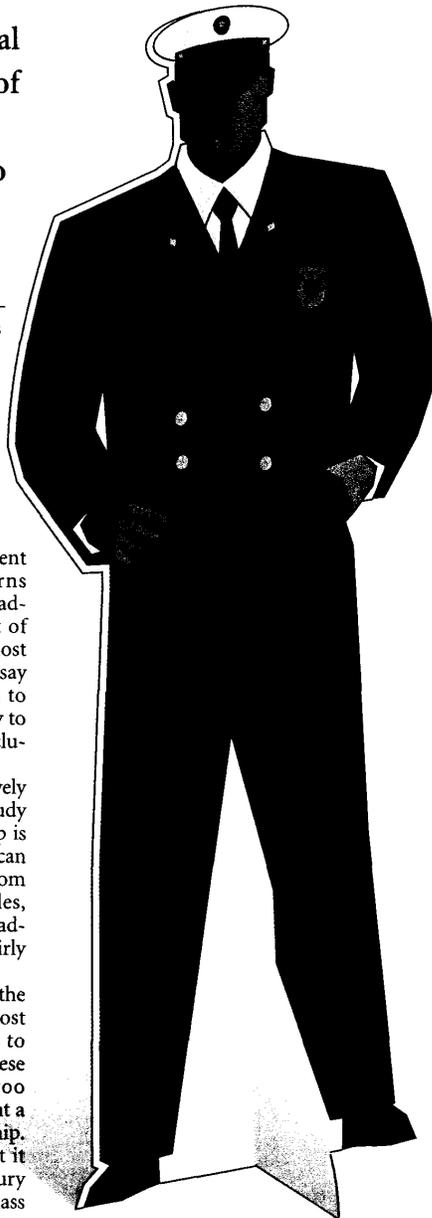
The future of the fire service hinges on effective, entrepreneurial leadership. How many of these seven keys to successful leadership do you hold?

**L**eadership: Is it real or just a figment of the imagination? Is leadership merely marketing hype, or is there substance to the increasing popularity of leadership writings and teachings? Is leadership really just management wearing a different guise, or is it something altogether different from traditional management concepts? Leadership: What is it, really?

These and other questions represent the many ideas and concerns addressed in the growing field of leadership study. The interesting part of these questions is that if you ask most people if leadership is real, they'll say yes. However, when you ask them to define leadership, their answers vary to the point of being vague and inconclusive.

The study of leadership is a relatively new discipline. Compared to the study of medicine, for example, leadership is but a babe in the woods. While one can certainly derive leadership lessons from the classic works of Plato, Sophocles, and Machiavelli efforts to quantify leadership in modern society are still fairly new.

In his 1991 book "Leadership for the Twenty-First Century," Joseph C. Rost notes Bass' and Stodgill's efforts to develop a leadership handbook. These scholars compiled more than 4,700 leadership studies, yet did not present a single unified definition of leadership. In his own studies, Rost noted that it wasn't until the turn of the 19th century that any effort was made in world-class



*By Kevin Brame, Chief Training Officer  
Orange County (Calif.) Fire Authority*

dictionaries to define the term leadership. Up to that point, leadership remained a vague notion behind the more definable terms of lead, leader and leading.

## **Proof of leadership**

Over the years and through observations and readings, I've concluded that leadership is in fact real, even though definitions can be drastically different. "In the eye of the beholder" is probably a more appropriate approach to trying to define what leadership is or is not. Still, there are some common threads that can help tie together thinking about leadership.

First, from a purely academic view, most of the empirical studies of leadership conclude that it involves so many variables that it's nearly impossible to capture a single unified meaning.

In his writings, James MacGregor Burns noted that although leadership is one of the most observed and studied fields, it remains one of the least understood. He also argued that for all we know about leaders, we know far too little about leadership: We've failed to grasp the essence of leadership in modern society.

So the first common thread is that leadership definitions by their very nature will be vague to one person or industry and precise to another. This concept then allows for the exploration of leadership from unique personal or organizational perspectives.

The second common thread is

founded on the first. If you accept the notion that leadership means different things to different people or organizations, then you recognize that leadership won't be defined in the empirical terms of a scientific approach, but rather in the abstract concept of an art. While efforts to define leadership in concise quantifiable terms are appropriate, the vast array of popular literature that tries to link leadership to personal thought and development is also valuable and substantive.

In his thoughtful writing "Leadership is an Art," Max DePree tries to define leadership in personal terms that are easily understood from an internal perspective and that point to the abstractness of art. He writes, "Leadership is an art, something to be learned over time, not simply by reading books. Leadership is more tribal than scientific, more a weaving of relationships than an amassing of information, and in that sense I do not know how to pin it down in every detail."

In comparing leadership to art, one can find things appealing in the most graphic of paintings or in the subtlest of watercolors. But in both cases, the appealing part is often found only through quiet reflection and introspection. As observers of art we know what we like. Although they're not always quantifiable, our likes and dislikes are still real.

**7 keys to effective leadership**

By now you're probably wondering how this applies the fire service. The answer lies in examining where our industry is headed and who's in the lead. The fire service, like any organization in our society, is looking for leadership. Burns puts this thought into a larger context by saying, "One of the universal cravings of our time is a hunger for compelling and creative leadership."

Arguably the best method for examining the leadership desires of our industry is to look at leadership from a personal perspective. In a 1982 address to the Western Academy of Management, Thomas E. Cronin presented a framework for such a process. His seven key ingredients for effective leadership may serve as useful tools to help you develop your personal concepts of where the fire service is headed and who's in the lead.

**1) Leaders know who they are and where they're going.** In an industry designed around a paramilitary structure, it's often difficult for people to differentiate position power from true leadership. Although wearing five

bugles in and of itself doesn't constitute leadership, many think it does. This is the point when the old saying "Actions speak louder than words" is appropriate. Simply put, leadership is action, not position, rank, title, age, experience or any other limiting device.

To be decisive and action-oriented means that the leader must have a clear understanding of self and a sense of direction. An understanding of self is often the most difficult to achieve and maintain. To gain a comprehensive self-understanding, one must often look to others for observation and feedback.



In the National Fire Academy's Executive Fire Officer Program, a 360° evaluation process is used to provide critical feedback to students. The process incorporates self-ratings, as well as ratings from peers, subordinates and supervisors.

When the results are returned to the student, it's interesting to note changes in their facial expressions and demeanor. In many cases, the feedback is the first opportunity students have had to get real information about how others see them.

It's easy in rank-conscious organizations for position to overshadow true leadership. Chief officers must constantly remind themselves that rank has no place in the promulgation of leadership. If rank becomes a consequence of good leadership, then so be it. But all in all, development of leadership must start from within the person and not the badge.

If you have a solid understanding of self, then determining a sense of direction is easier. Take a moment and consider how many individuals you know

who've been promoted through the ranks only to get to the top and have no clue of where to go from there. For many, their only direction is toward the retirement office. At the same time, our industry awaits compelling and creative leadership.

So do you know who you are and where you're headed? Besides a paycheck, what's your drive for coming to the fire station each day? Do you have a need for leadership that's being left unanswered? Are you willing to step out and provide that leadership? Before you say yes or no, stop and take a look inside. Organizational leadership must begin with personal leadership.

**2) A leader selects important problems and mobilizes followers to overcome them.** In traditional management training programs, significant effort is placed in defining and implementing various models of problem-solving. These are valuable efforts necessary for the conduct of efficient and effective best business practices.

However, what's often overlooked is how the problems are first identified. Then, once a plan is established, how do you effectively make the issue a passion to everyone? That's the point when leadership steps in and management becomes a tool of effective leadership.

The difficulty fire service leaders face in establishing priorities is that our industry breeds reactionaries. For the most part, our culture allows resources to lie in wait for a crisis to happen, although fire prevention and education is one area where we've been proactive. Overall, the fire service has been successful in reducing the number of fires and related deaths and injuries. The problem for fire service leadership is how to sustain those efforts. I don't know a fire department in this country that doesn't have growing pockets of apathy toward prevention efforts.

Apathy among followers is a terminal illness of effective leadership, and we as an industry have a problem. Take a moment and consider your department's efforts and success in Fire Prevention Week activities. Granted, success in this case is subjective, but one need only look two weeks later in October to see how our promotion compares to the enthusiasm and energy surrounding law enforcement's Drug Awareness Week.

Did you ever stop to think about the fact that we've significantly lost momentum in what used to be our shining month? I look around at all the grade schools in my community and

note that during Fire Prevention Week, we're generally lucky to get a one-liner in the PTA newsletter.

When faced with such a loss of enthusiasm, how does a leader sustain success and stay motivated, while helping others to do the same? Cronin suggests that the leader select important problems. Reading between the lines, leaders must stop worrying about the things they can't control and start working on those they can effectively influence. It means choosing battle lines on a map not because they're on the map, but rather because they're the right lines to choose.

A classic example of choosing the right problem for the right reason is found in the ongoing issue of EMS. Recently I presented this leadership topic at the IAFC Fire-Rescue Med conference. As expected, the public-versus-private banter was all around.

In quizzing a few of the attendees, I asked, "Why are you pursuing the public transport model?" Inevitably, the responses included the idea of generating revenue. Sadly in some cases, it was the first comment made.

The leadership issue derived from these responses: Are we doing it for the right reasons? Is battling for transportation rights our highest priority? How does this fit into where we're going as an industry? How do we sustain our enthusiasm for this effort over the long run?

Again, to be successful in leading this cause, we must have self-honesty. As leadership philosophers and students have said, managers do things the right way, but leaders do the right things.

**3) Leaders have to provide the risk-taking and entrepreneurial imagination.** Once the priority problems have been identified, the solutions usually aren't easy to come by. Effective solutions to complex problems, such as community fire protection, often require trial and error. Effective solutions also require imagination and the ability to think out of the box, and that often means taking risks.

Risk-taking is an important part of being an effective leader. Imaginative thinking requires the leader to step out of the office and perceive things that could be rather than things that are. This isn't easy for many, particularly in an military-structured industry with a lot of rank consciousness.

To be an entrepreneurial leader requires thinking that benchmarking is for someone else to do, because you're the benchmark. To be the benchmark and be willing to take risks means that

## Leadership reading list

"C.Y.A. — Change Your Attitude," Tom Bay, 1997, Bay & Macpherson, Newport Beach, Calif.

"Address to the Western Academy of Management," Thomas E. Cronin, published in "To Lead or Not To Lead," 1995, Phi Theta Kappa, Jackson, Miss.

"Leadership is an Art," Max DePree, 1989, Dell Publishing, New York.

"Leadership for the Twenty-First Century," Joseph C. Rost, 1991, Praeger Publishers, Westport, Conn.

you comprehend the seriousness of Cronin's first key ingredient. Leaders must have confidence in themselves and their organizations, which begins with knowing that they're doing the right things.

The imager and risk-taker is often the subject of ridicule and the infamous firehouse commentary. But the effective leader recognizes this and will use it to his advantage.

I recently heard some typical firehouse rhetoric about a chief in a metropolitan area who recognized two sig-

nificant problems. The first was that some fire station conditions were deteriorating, and the second was that there was no money available to address the issue.

This chief stepped outside the box and established a coin collection program, placing "Friends of the Fire Department" collection jars at various retail stores in the community. For many volunteer agencies this may not sound risky, but in a metropolitan career department the idea was classified by many as absurd.

While the final results of the coin collection program won't be known for some time, the mere fact that the chief was willing to try something different says that the leadership in him won over the conservatism and status-quo proponents. To sustain an imaginative approach to issues faced, leaders such as this chief must be willing not only to be proponents of "why not," but must also nurture the same philosophy among their followers.

Failure to use imagination and out-of-the-box thinking can often lead to tragedy. A classic point of this lesson comes from the history documented in "From the Earth to the Moon," a recent HBO miniseries about the U.S. effort to put a man on the moon.

Following the tragic fire on the launch pad that killed three astronauts, a Senate hearing was conducted to look at the cause. When asked specifically what caused the tragedy, a respondent simply attributed it to "a lack of imagination."

Further questioning provided the detail that even with all the planners, scientists, technicians and astronauts, no one considered that there would be a fire on earth, so contingency plans only related to fires in space.

Whether true or not, the point of the matter is that imagination and entrepreneurial spirit can lead to seeing things outside the box. A leader's role is to be the one opening the doors to the outside and asking everyone to join him or her in the fresh air.

**4) Leaders need a sense of humor and a sense of proportion.** Laughter is the best medicine. Leadership is a serious business, but not one that requires the leader to be without laughter.

Often in the fire service, we're accused of being cold or callous because of what some perceive as gallows humor. The reality is that we often look for the humorous points in life so we can survive the serious times. It also indicates that leaders are human and with that goes the possibility of snafus. I for one don't want to be led by someone who can't take a step back and laugh at him or herself.

Effective leaders use the human side of leadership to gain support and respect for their role by not trying to hide behind a mask of seriousness. Contrary to some beliefs, no one goes through life without at least one or two screw-ups. The effective leader capitalizes on those events by learning from them and demonstrating that even those in the lead can have a bad day. Humor provides the leader the opportunity to express humanity, vitality and resilience.

Humor provides another opportunity that's truly critical to effective leadership: a sense of proportion. Through a sense of self, the true leader has an understanding of his or her worth to the industry, the community and family.

All too often, people in supposed leadership positions fail to remember where they came from. Many also forget that someone was in the seat before them and someone will be in their chair when they leave. The chief who fails to recognize these limits may at some point have the opportunity to find a position in the unemployment line.

A classic analogy to make my point was brought to my attention by Tom

Bay, a speaker and co-author of the book "C.Y.A. — Change Your Attitude." He describes the image of a hand being placed inside a bucket of water. The analogy is that your hand represents you, and the water represents your organization. As you're inserted in your organization, the water is displaced around you so that your hand can be accommodated and then the organization fills in all around you.



**In an industry designed around a paramilitary structure, it's often difficult for people to differentiate position power from leadership.**



Now imagine removing your hand. What happens? The water quickly fills the void where your hand used to be, and after a short time the ripples disappear and the surface is smooth.

In this scenario, true leaders with a sense of proportion recognize that once they're removed from the picture, life goes on. Yes, folks, none of us is irreplaceable. The failure of many chief officers is to think that they're indispensable. The same is true for organizations whose leaders fail to keep their organizations in proper perspective. The fact that fire departments around the country are consolidating more and more frequently, that EMS is now traded on the stock market and that private fire protection services are becoming more prevalent should be cause for our industry to step back and reflect.

**5) Leaders have to be skilled negotiators and mediators, but leaders must also be able to stir things up and encourage healthy and desired conflict.** To some, Cronin's point here may seem contradictory, but it's really a leadership survival skill. Earlier I noted that effective leadership requires imagination. Imagination is often not found until someone is forced or challenged to think creatively.

Conflict, when managed correctly, often provides the leader with that opportunity. I've never met a fire service member who didn't like a good rescue or fireground challenge. After all, we're a can-do industry. The task of today's fire service leadership is to go beyond fire-

ground scenarios and take that eagerness to the boardroom.

This past year, there has been controversy at the National Fire Academy, resulting in the program chairs taking a rather dramatic step in producing a position paper that was critical in some regards to where the academy is and where it's headed. Regardless of your opinion of the chairs' position, it's important to see the issue as an opportunity for leadership to come through controversy.

Controversy is often viewed as detrimental, yet effective leaders recognize conflict as opportunity. If a leader doesn't have someone challenging his or her position, then a status quo environment will persist. In such a situation, the potential for failure may exceed the leader's ability to overcome groupthink, and a catastrophic failure may occur.

The Challenger space shuttle disaster is a classic example of controversy gone astray with the inability of those in hierarchical positions to effectively accept controversy as being for the good of the order. The results were tragic.

The ability to be an effective negotiator, mediator and conflict manager takes a significant effort on the part of the leader, and it often means taking controversial stands. It's during conflict that the phrase "It's lonely at the top" comes to mind. But again, leadership requires weighing all the facts, seeking out opposite opinions and views, and doing the right thing.

Here's a simple example. I recently submitted "Leadership: Fact or Fiction?" as the title for a conference presentation. The response I received from a conference planner was that some might find it insulting or offensive. I questioned this thinking from the perspective that if it's insulting or offensive, that's all the more reason to put it in the conference, because to challenge another's thinking can result in beneficial growth for all.

**6) The leader has to have brains and breadth.** A significant challenge in our industry is to continue to evolve beyond the "fire is hot and water is wet" approach to education. Without sounding condescending, tomorrow's true fire service leaders must become educated beyond the traditional bounds.

Younger members of our industry often ask me about degree programs. Instead of offering validation, I challenge them to clarify why they want this particular degree and what good it will do in their future. The response is usually a blank stare, because they're not thinking past tomorrow.

While I encourage anyone to com-

plete a degree program, I'll do my best to lean people away from limiting degrees that don't incorporate a broad spectrum of interdisciplinary studies.

Recently, in reviewing several fire service career development programs, I noted that they centered on the traditional fire-and-water components. One program designed to lead to a chief officer certification never accounted for group dynamics, public speaking, written communication skills or critical thinking.

A while ago, I made a proposal to conduct career development programs at a regional fire training association. Their response was that no one will attend because it doesn't focus on big fire, big water. I wondered if this is how the dinosaurs ended up the way they did.

Challenging the status quo requires leadership with views beyond traditional lines. The goal of an effective leader should be to look beyond the obvious. Remember to look laterally for assistance in maintaining a course of growth and to glance backward to help measure progress.

Consider the ancient Polynesians as they set out for distant islands. Equipped with minimal provisions and only outrigger canoes, they pushed off

from one shore toward lands unknown.

In a tradition-bound organization this would never have happened. In an organization where only lip service is given to leadership, the outrigger would have been on a short tether. But in an organization that promulgates leaders with a broad spectrum of education and experience and equips them with provisions for the long haul, the just rewards are new lands to explore and enjoy.

**7) Effective leaders must have integrity.** This ingredient is last because without it all the others don't matter. Leadership integrity represents the leader's ability and desire to consider the perspective of those being led. In other words, people will follow those who see them as human beings rather than simply a means to accomplishing the goal.

Like character, Cronin writes, integrity is more easily maintained than recovered. Once a follower questions a leader's integrity, the ability to be successful becomes questionable. There are a number of chief officers throughout our industry who fail to recognize that a gold badge doesn't come with integrity and leadership. Those characteristics are won and lost based on your actions.

DePree solidifies Cronin's thought on leadership integrity: "The first responsibility of leadership is to define reality. The last is to say thank you. In between the two, the leader must become a servant and a debtor. Leadership is much more an art, a belief, a condition of the heart rather than a set of things to do. The visible signs of leadership are expressed ultimately, in its practice."

The effective fire service leader will consider Cronin's key ingredients as an acceptable and realistic point from which to start overcoming individual and industry challenges. In terms of our future industry, the status quo is no longer acceptable. Our effort as today's leaders should be to develop our legacies through development and service to those we'll leave behind. Remember that leadership is measured by your actions, not your position. 

---

Kevin Brame is chief training officer for the Orange County (Calif.) Fire Authority. A member of the fire service for 22 years, he was a certified paramedic for eight years and was formerly EMS program manager for Orange County. Brame is a graduate of the National Fire Academy's Executive Fire Officer Program and has an associate's degree in mobile intensive care, a bachelor's degree in vocational education and a master's degree in organizational leadership.

---

This page intentionally left blank.

# SPECIAL CONTRIBUTION

## EMS AGENDA FOR THE FUTURE: WHERE WE ARE . . . WHERE WE WANT TO BE

EMS Agenda for the Future Steering Committee: Theodore R. Delbridge, MD, MPH, Bob Bailey, John L. Chew, Jr., MS, Alasdair K. T. Conn, MD, Jack J. Krakeel, MBA, Dan Manz, David R. Miller, Patricia J. O'Malley, MD, Susan D. Ryan, Daniel W. Spaite, MD, Ronald D. Stewart, OC, MD, DSc, Robert E. Suter, DO, MHA, E. Marie Wilson, RN, MPA

### ABSTRACT

During the past 30 years, emergency medical services (EMS) in the United States have experienced explosive growth. The American health care system is now transforming, providing an opportune time to examine what we have learned over the past three decades in order to create a vision for the future of EMS. Over the course of several months, a multidisciplinary steering committee collaborated with hundreds of EMS-interested individuals, organizations, and agencies to develop the EMS Agenda for the Future. Fourteen EMS attributes were identified as requiring continued development in order to realize the vision established within the Agenda. They are integration of health

services, EMS research, legislation and regulation, system finance, human resources, medical direction, education systems, public education, prevention, public access, communication systems, clinical care, information systems, and evaluation. Discussion of these attributes provides important guidance for achieving a vision for the future of EMS that emphasizes its critical role in American health care. **Key words:** emergency medical services; EMS Agenda for the Future; community health.

PREHOSPITAL EMERGENCY CARE  
1998;2:1-12

The 1966 paper, "Accidental Death and Disability: The Neglected Disease

of Modern Society," provided 29 recommendations to improve the American emergency health care system.<sup>1</sup> Eleven related directly to out-of-hospital emergency medical services (EMS). Subsequent federal initiatives, in the forms of the Highway Safety Act of 1966 and the Emergency Medical Services Systems Act of 1973, and other public and private support spawned rapidly evolving EMS systems across the country. EMS expanded in the belief that better response would improve patient outcomes. Yet, initial EMS growth began with a lack of knowledge of the most efficient processes for delivering optimal resources to the spectrum of situations addressed by today's EMS systems.

Because the health care system is undergoing transformation, this is an opportune time to examine what has been learned during the past three decades in order to create a vision for the future of EMS. In June 1995, the National Highway Traffic Safety Administration (NHTSA), in partnership with the Health Resources and Services Administration (HRSA), Maternal and Child Health Bureau (MCHB), realized the need for agencies, organizations, and individuals involved in EMS to evaluate their roles and chart a course for the future. They commissioned the de-

Received July 18, 1997, from the Department of Emergency Medicine, University of Pittsburgh, Pittsburgh, Pennsylvania (TRD); North Carolina Office of Emergency Medical Services, Raleigh, North Carolina (BB); EMSSTAR Group, Annapolis, Maryland (JLC); Emergency Services (AKTC) and Pediatric Emergency Services (PJO), Massachusetts General Hospital, Boston, Massachusetts; Fayette County Fire and Emergency Services, Fayetteville, Georgia (JJK); Vermont Emergency Medical Services Division, Burlington, Vermont (DM); HealthSpan Transportation Services and Allina Health System, St. Paul, Minnesota (DRM); Emergency Medical Services for Children, Massachusetts Department of Public Health, Boston, Massachusetts (PJO); National Highway Traffic Safety Administration, Washington, DC (SDR); Arizona Emergency Medicine Research Center, University of Arizona, Tucson, Arizona (DWS); Ministry of Health, Halifax, Nova Scotia, Canada (RDS); Department of Emergency Services, Providence Hospital and Medical Centers, Southfield, Michigan (RES); and Connecticut Office of Emergency Medical Services, Hartford, Connecticut (EMW). Revision received August 18, 1997; accepted for publication August 20, 1997.

Supported by a grant from the National Highway Traffic Safety Administration (DT4N22-G-05188).

This document is being published simultaneously in *Prehospital Emergency Care* and the *Annals of Emergency Medicine*.

Address correspondence to: Theodore R. Delbridge, MD, MPH, Department of Emergency Medicine, University of Pittsburgh, 230 McKee Place, Suite 400, Pittsburgh, PA 15213. e-mail: <delbridg+@pitt.edu>. Reprints are not available.

TABLE 1. Summary of Recommendations: How to Get "Where We Want to Be"

<p><b>Integration of Health Services</b></p> <ul style="list-style-type: none"> <li>■ Expand the role of EMS in public health</li> <li>■ Involve EMS in community health monitoring activities</li> <li>■ Integrate EMS with other health care providers and provider networks</li> <li>■ Incorporate EMS within health care networks' structure to deliver quality care</li> <li>■ Be cognizant of the special needs of the entire population</li> <li>■ Incorporate health systems within EMS that address the special needs of all segments of the population</li> </ul> <p><b>EMS Research</b></p> <ul style="list-style-type: none"> <li>■ Allocate federal and state funds for a major EMS systems research thrust</li> <li>■ Develop information systems that provide linkage between various public safety services and other health care providers</li> <li>■ Develop academic institutional commitments to EMS-related research</li> <li>■ Interpret informed consent rules to allow for clinical and environmental circumstances inherent in conducting credible EMS research</li> <li>■ Develop involvement and/or support of EMS research by all those responsible for EMS structure, processes, and/or outcomes</li> <li>■ Designate EMS as a physician subspecialty, and a subspecialty for other health professions</li> <li>■ Include research related objectives in the education processes of EMS providers and managers</li> <li>■ Enhance the quality of published EMS research</li> <li>■ Develop collaborative relationships between EMS systems, medical schools, other academic institutions, and private foundations</li> </ul> <p><b>Legislation and Regulation</b></p> <ul style="list-style-type: none"> <li>■ Authorize and sufficiently fund a lead federal EMS agency</li> <li>■ Pass and periodically review EMS enabling legislation in all states that supports innovation and integration, and establishes and sufficiently funds an EMS lead agency</li> <li>■ Enhance the abilities of state EMS lead agencies to provide technical assistance</li> <li>■ Establish and fund the position of State EMS Medical Director in each state</li> <li>■ Authorize state and local EMS lead agencies to act on the public's behalf in cases of threats to the availability of quality EMS to the entire population</li> <li>■ Implement laws that provide protection from liability for EMS field and medical direction personnel when dealing with unusual situations</li> </ul> <p><b>System Finance</b></p> <ul style="list-style-type: none"> <li>■ Collaborate with other health care providers and insurers to enhance patient care efficiency</li> <li>■ Develop proactive financial relationships between EMS, other health care providers, and health care insurers/provider organizations</li> <li>■ Compensate EMS on the basis of a preparedness-based model, reducing volume-related incentives and realizing the cost of an emergency safety net</li> <li>■ Provide immediate access to EMS for emergency medical conditions</li> <li>■ Address EMS relevant issues within governmental health care finance policy</li> <li>■ Commit local, state, and federal attention and funds to continued EMS infrastructure development</li> </ul>	<p><b>Human Resources</b></p> <ul style="list-style-type: none"> <li>■ Ensure that alterations in expectations of EMS personnel to provide health care services are preceded by adequate preparation</li> <li>■ Adopt the principles of the <i>National EMS Education and Practice Blueprint</i></li> <li>■ Develop a system for reciprocity of EMS provider credentials</li> <li>■ Develop collaborative relationships between EMS systems and academic institutions</li> <li>■ Conduct EMS occupational health research</li> <li>■ Provide a system for critical incident stress management</li> </ul> <p><b>Medical Direction</b></p> <ul style="list-style-type: none"> <li>■ Formalize relationships between all EMS systems and medical directors</li> <li>■ Appropriate sufficient resources for EMS medical direction</li> <li>■ Require appropriate credentials for all those who provide on-line medical direction</li> <li>■ Develop EMS as a physician and nurse subspecialty certification</li> <li>■ Appoint state EMS medical directors</li> </ul> <p><b>Education Systems</b></p> <ul style="list-style-type: none"> <li>■ Ensure adequacy of EMS education programs</li> <li>■ Update education core content objectives frequently enough so that they reflect patient EMS health care needs</li> <li>■ Incorporate research, quality improvement, and management learning objectives in higher level EMS education</li> <li>■ Commission the development of national core contents to replace EMS program curricula</li> <li>■ Conduct EMS education with medical direction</li> <li>■ Seek accreditation for EMS education programs</li> <li>■ Establish innovative and collaborative relationships between EMS education programs and academic institutions</li> <li>■ Recognize EMS education as an academic achievement</li> <li>■ Develop bridging and transition programs</li> <li>■ Include EMS-related objectives in all health professions' education</li> </ul> <p><b>Public Education</b></p> <ul style="list-style-type: none"> <li>■ Acknowledge public education as a critical activity for EMS</li> <li>■ Collaborate with other community resources and agencies to determine public education needs</li> <li>■ Engage in continuous public education programs</li> <li>■ Educate the public as consumers</li> <li>■ Explore new techniques and technologies for implementing public education</li> <li>■ Evaluate public education initiatives</li> </ul> <p><b>Prevention</b></p> <ul style="list-style-type: none"> <li>■ Collaborate with community agencies and health care providers with expertise and interest in illness and injury prevention</li> <li>■ Support the Safe Communities concept</li> <li>■ Advocate for legislation that potentially results in injury and illness prevention</li> <li>■ Develop and maintain a prevention-oriented atmosphere within EMS systems</li> <li>■ Include the principles of prevention and its role in improving community health as part of EMS education core contents</li> <li>■ Improve the ability of EMS to document injury and illness circumstances</li> </ul>
---	---

continued

TABLE 1 (continued).

<p><b>Public Access</b></p> <ul style="list-style-type: none"> <li>■ Implement 9-1-1 nationwide</li> <li>■ Provide emergency telephone service for those who cannot otherwise afford routine telephone services</li> <li>■ Ensure that all calls to a PSAP, regardless of their origins, are automatically accompanied by unique location-identifying information</li> <li>■ Develop uniform cellular 9-1-1 service that reliably routes calls to the appropriate PSAP</li> <li>■ Evaluate and employ technologies that attenuate potential barriers to EMS access</li> <li>■ Enhance the ability of EMS systems to triage calls, and provide resource allocation that is tailored to patients' needs</li> </ul> <p><b>Communications Systems</b></p> <ul style="list-style-type: none"> <li>■ Assess the effectiveness of various personnel and resource attributes for EMS dispatching</li> <li>■ Receive all calls for EMS using personnel with the requisite combination of education, experience, and resources to optimally query the caller, make determination of the most appropriate resources to be mobilized, and implement an effective course of action</li> <li>■ Promulgate and update standards for EMS dispatching</li> <li>■ Develop cooperative ventures between communications centers and health providers to integrate communications processes and enable rapid patient-related information exchange</li> <li>■ Determine the benefits of real-time patient data transfer</li> <li>■ Appropriate federal, state, and regional funds to further develop and update geographically integrated and functionally-based EMS communications networks</li> <li>■ Facilitate exploration of potential uses of advancing communications technology by EMS</li> <li>■ Collaborate with private interests to effect shared purchasing of communication technology</li> </ul>	<p><b>Clinical Care</b></p> <ul style="list-style-type: none"> <li>■ Commit to a common definition of what constitutes baseline community EMS care</li> <li>■ Subject EMS clinical care to ongoing evaluation to determine its impact on patient outcomes</li> <li>■ Employ new care techniques and technology only after shown to be effective</li> <li>■ Conduct task analyses to determine appropriate staff configurations during secondary patient transfers</li> <li>■ Eliminate patient transport as a criterion for compensating EMS systems</li> <li>■ Establish proactive relationships between EMS and other health care providers</li> </ul> <p><b>Information Systems</b></p> <ul style="list-style-type: none"> <li>■ Adopt uniform data elements and definitions and incorporate them into information systems</li> <li>■ Develop mechanisms to generate and transmit data that are valid, reliable, and accurate</li> <li>■ Develop information systems that are able to describe an entire EMS event</li> <li>■ Develop integrated information systems with other health care providers, public safety agencies, and community resources</li> <li>■ Provide feedback to those who generate data</li> </ul> <p><b>Evaluation</b></p> <ul style="list-style-type: none"> <li>■ Develop valid models for EMS evaluations</li> <li>■ Evaluate EMS effects for multiple medical conditions</li> <li>■ Determine EMS effects for multiple outcome categories</li> <li>■ Determine EMS cost-effectiveness</li> <li>■ Incorporate consumer input in evaluation processes</li> </ul>
---	--

velopment of the EMS Agenda for the Future to help meet that need.

The purpose of creating the EMS Agenda for the Future was to determine the most important directions for future EMS development, incorporating input from a broad group of EMS stakeholders. This would provide guiding principles for the continued evolution of EMS, focusing on out-of-hospital aspects of the system.

**PROCESS**

The process used to develop the EMS Agenda for the Future was a modification of the National Institutes of Health (NIH) Technology Assessment and Practice Guidelines Forum.<sup>2</sup> A multidisciplinary steering committee prepared initial drafts of the document. The com-

mittee distributed its second draft to 500 EMS-interested organizations and individuals for peer review. Of these, 178 (28%) furnished comments. The steering committee analyzed these comments and revised the document accordingly.

The EMS Agenda for the Future Blue Ribbon Conference convened in McLean, Virginia, on December 1-3, 1995. One hundred thirty-three individuals participated. Each participant attended several of 32 breakout sessions to comment on critical aspects of the future of EMS and critique the steering committee's updated draft. Later, the steering committee sent its subsequent revision to conference participants for their final comments. The steering committee met again in March 1996, at which time final comments

were reviewed and appropriately incorporated. The following discussion summarizes the conclusions and recommendations of the EMS Agenda for the Future.

**EMS: VISION FOR THE FUTURE**

The health system of today, with its emphasis on advanced technology and costly acute interventions to achieve societal health, is transforming to focus on the early identification and modification of risk factors before illness or injury strikes. EMS will mirror and, in some cases, may lead this transition.

The EMS of the future will be community-based health management that is fully integrated with the overall health care system. It will have the ability to identify and mod-

ify illness and injury risks, provide acute illness and injury care and follow-up, and contribute to treatment of chronic conditions and community health monitoring. EMS will be integrated with other health care providers and public health and public safety agencies. It will improve community health and result in more appropriate use of acute health care resources. EMS will remain the public's emergency medical safety net.

The vision for the future emphasizes a continued critical role for EMS in caring for the health of Americans. Fourteen EMS attributes, described below, require ongoing attention and development if such a vision is to be realized. Specific recommendations with regard to each attribute are summarized in Table 1.

### Integration of Health Services

*Where we are:* Contemporary EMS systems were created to meet the immediate needs of the acutely ill and injured. EMS, in general, meets these objectives in relative isolation from other health care and community resources. EMS systems are disconnected from other community resources and do not routinely ensure appropriate follow-up by other health care providers or agencies. They are unable to integrate their care with sources for patients' continuing health care. Thus, potential positive effects of EMS, in terms of improved health for individual patients and the community, remain unrealized.

Researchers have published reports regarding public health surveillance and referral to social service agencies by EMS personnel.<sup>3-5</sup> Others have described a model for incorporating EMS and health monitoring referral systems.<sup>6</sup> Some EMS systems are determining the benefits of collaboration and routine communication with patients' primary health care providers.

*Where we want to be:* EMS is an integral component of the health

care system, and it shares attributes with the other elements that collectively represent the continuum of health care (Fig. 1). EMS provides care that is integrated with other health care providers and community health resources, ensuring that EMS treatment is part of a complete health care program. Liaisons with other community resources enable EMS to be proactive in affecting people's long-term health, relaying information regarding potentially unhealthy situations to agencies with a vested interest in maintaining the health of their clients. With medical direction, EMS facilitates access for its patients to appropriate sources for continued medical care, supporting efforts to implement cost-effective community health care while ensuring that the special needs of specific patients are addressed.

### EMS Research

*Where we are:* EMS has evolved rapidly over the past 30 years despite slow progress in developing EMS-related research. The "chain of survival" concept provides the best evidence of meaningful systems research.<sup>7,8</sup> Most published EMS research focuses on a single intervention or health problem and rarely addresses the inherent complexities of EMS systems.<sup>9</sup> In many cases our poor understanding of systems research has led to the development of wrong assumptions with regard to EMS care.<sup>9,10</sup>

Currently there are major impediments to the development of high-quality EMS research. They include: inadequate funding, lack of integrated information systems that provide for meaningful linkage with patient outcomes, paucity of academic research institutions with long-term commitments to EMS systems research, overly restrictive informed consent interpretations, and lack of education and appreciation by EMS personnel regarding the importance of EMS research.

*Where we want to be:* A national EMS research agenda provides

guidance so that a sufficient volume of quality research is undertaken to determine the effectiveness of EMS system design and specific interventions. EMS evolves with a scientific basis. Adequate investigations of EMS interventions and system designs occur before they are advocated as standards. As much as possible, EMS research employs systems analysis models, using multidisciplinary approaches to answer complex questions. Federal agencies responsible for funding health care research are committed to EMS-related studies. Additionally, integrated information systems facilitate data collection to determine EMS effectiveness. EMS personnel of all levels appreciate the role of research in terms of creating a scientific basis for EMS care.

### Legislation and Regulation

*Where we are:* All states have legislation that provides a statutory basis for EMS activities and programs. However, during 35 state evaluations by NHTSA technical assessment teams, only 40% of states reported having comprehensive enabling legislation for development of a statewide EMS system.<sup>11</sup> Only 20% of states had an identified lead agency that provided central coordination of EMS system activities.<sup>11</sup> In some cases, local governments have passed ordinances to delineate EMS standards for their communities. Authorities responsible for implementing regulations are, in general, extensively involved in personnel licensing, training program certification, EMS vehicle licensing, and record keeping.

*Where we want to be:* A federal lead EMS agency is sufficiently funded to provide coordination among federal programs and agencies affecting EMS, serve as an information clearinghouse, and facilitate nationwide EMS development. All states have a single EMS lead agency responsible for developing and overseeing a statewide EMS system. It

ensures that EMS of acceptable quality is available to the entire population and provides technical assistance to local EMS systems. Furthermore, state legislation provides a template that allows local medical directors to determine the specific parameters of practice for their EMS systems, helping them meet the health care needs of their communities.

### System Finance

*Where we are:* Providing the nation with EMS is a multibillion-dollar effort each year. In Hawaii, where the entire EMS system is state-funded, the cost is approximately \$27 per capita per year.<sup>12</sup> Extrapolating that cost to the entire U.S. population yields an estimate of \$6.75 billion per year for EMS. This does not include the costs of human efforts, including those by volunteers.

Emergency medical services systems are funded by a combination of public and/or private funds. Those EMS systems relying on third-party payers for significant revenue must, in general, provide patient transportation in order to be reimbursed for their services. The primary determinants of EMS cost relate to system preparedness. On the other hand, the primary determinant of payment for services is patient transport. Thus, the driving forces of cost and payment are not aligned.

Some health care insurers or providers may stipulate to their subscriber patients that authorization must precede utilization of EMS. Refusal to pay EMS for services provided may be based on lack of preauthorization or retrospective determination that the patient condition did not represent an emergency.

*Where we want to be:* As a component of the health care delivery system, EMS is consistently funded by mechanisms that fund other aspects of the system. These mechanisms recognize the value of treatment that is provided without transport. Payment for EMS is pre-

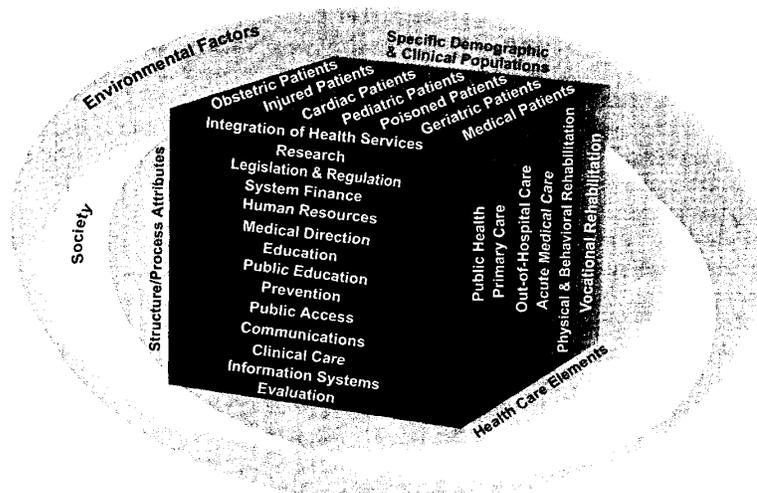


FIGURE 1. EMS: part of the health care system, sharing attributes with the other health care system elements.

paredness-based, accounting for the cost of maintaining a state of suitable readiness. It considers such factors as service area size and complexity, utilization, and predetermined quality standards. Finances are linked to value, as determined by community consumers, and cost and payment drivers are aligned. The maintenance of EMS system preparedness and continued development of its infrastructure are also facilitated by local, state, and federal governments.

### Human Resources

*Where we are:* Across the country, more than 40 different levels of emergency medical technician (EMT) certification exist. However, the National EMS Education and Practice Blueprint has established standard knowledge and practice expectations for four levels of EMS providers: First Responder, EMT-Basic, EMT-Intermediate, and EMT-Paramedic.<sup>13</sup> Many other health care workers also collaborate to affect the patient care provided by EMS. They include physicians, nurses, nurse practitioners, physician assistants, respiratory therapists, and others. Volunteers serve more than 25% of the nation's population, but the number of EMS volunteer organizations is decreasing.<sup>14,15</sup>

Perennial issues for EMS workers include unique occupational risks, limited mobility, and inadequate compensation. Emergency personnel are at least twice as likely as the general population to suffer from post-traumatic stress disorders.<sup>16,17</sup> Exposure to blood-borne pathogens may be another significant risk. Between 6 and 19 per 1,000 advanced life support (ALS) EMS responses involve a contaminated needlestick to EMS personnel.<sup>18,19</sup> The average hepatitis B virus seroprevalence among EMS workers has been reported to be 14%, 3 to 5 times higher than that of the general population.<sup>20</sup> EMS workers frequently confront dangerous situations, and assault, lifting, falling, and motor vehicle crashes contribute to injuries.<sup>21-24</sup>

*Where we want to be:* People attracted to EMS service reflect the cultural diversity of our communities. The value of supporting the well-being of the workforce is widely recognized, and there is improved understanding of the occupational issues unique to EMS workers. All EMS workers receive available immunizations against worrisome communicable diseases, appropriate protective equipment, and pertinent education.

Reciprocity agreements between

states eliminate unnecessary barriers to mobility for credentialed EMS professionals. Career ladders exist to facilitate transitions for EMS workers to parallel fields. EMS personnel are recognized as members of the health care delivery team. Optimal preparation helps ensure that they deliver quality care that meets an acceptable community standard.

### Medical Direction

*Where we are:* Administrative and medical direction management components, working in concert, are theoretically required to ensure quality state-of-the-art EMS. In most states, medical direction of EMS systems that provide advanced care is mandated by law. The form of such direction varies dramatically from close supervision to infrequent consultation. A growing number of basic-level EMS systems are also being required to establish a formal relationship with a medical director, and the Emergency Medical Technician: Basic (EMT-B), National Standard Curriculum emphasizes the role of medical direction during EMT-B education and practice.<sup>11,25</sup>

Emergency medical services medical directors come from several specialties. However, most on-line medical direction, contemporaneous medical supervision of EMS personnel caring for patients in the field, is provided by emergency physicians.<sup>11</sup> A model curriculum for EMS education within emergency medicine residency programs has been published.<sup>26</sup> Although on-line medical direction may be important for selected patients, its systematic application for all EMS patients remains controversial.<sup>27-33</sup> Medical direction activities in addition to contemporaneous oversight of in-field personnel are also critical for ensuring optimal EMS. The medical director's role is to provide medical leadership for EMS, involving the participation of medical direction staffs, oversight agencies and boards, community physicians, administrative staffs, and others. Ultimately, this collaborative effort is responsi-

ble for ensuring the appropriateness and quality of EMS care.

*Where we want to be:* All EMS providers and activities have the benefit of effective medical direction. Each state has a qualified EMS medical director responsible for overseeing the state's EMS system. EMS medical directors, in consultation with other health professionals, are responsible for determining EMS systems' practice parameters to ensure that the needs of individual patients and communities are being met.

Medical direction is provided by qualified physicians and staffs with special competency in EMS. The resources available to medical directors are commensurate with responsibilities and the size and complexity of the population served. EMS medical directors are in a position to positively influence systems and the care they deliver through their knowledge of the complexity of EMS, optimal care for the spectrum of EMS patients, issues related to population-based care, occupational health concerns of EMS personnel, and principles of clinical research.

### Education Systems

*Where we are:* Curricula developed on behalf of the U.S. Department of Transportation (DOT) provide the bases for education of First Responders, EMT-Basics, EMT-Intermediates, and EMT-Paramedics. Settings for EMS education include hospitals, community colleges, universities, technical centers, private institutions, and fire departments.<sup>34</sup> Increasing numbers of colleges offer bachelor's degrees in EMS.<sup>35</sup> Most reports of EMS education issues discuss the requirements to develop specific skill proficiency.<sup>36-44</sup> However, meaningful analyses linking the suitability of EMS education to the spectrum of services provided have not been published.

*Where we want to be:* EMS education employs sound principles and facilitates lifelong learning for EMS professionals. It provides the tools

necessary for EMS providers to serve identified health care needs of the population. Thus, educational objectives are congruent with the services provided. Education programs are based on nationally standardized core contents for providers of various levels. Core content standardization facilitates recognition by credentialing agencies, while providing program infrastructure and opportunity for local customization. Higher-level EMS education programs are affiliated with academic institutions. Colleges and universities recognize EMS education as achievement worthy of academic credit. Interdisciplinary and bridging programs provide avenues for EMS professionals to enhance their credentials or transition to other health care roles.

### Public Education

*Where we are:* EMS has not yet developed its full potential to educate the lay public. Most of what the public knows about EMS is derived from television programs intended for entertainment and not for education. Isolated examples of EMS public education initiatives exist. In some areas Emergency Medical Services for Children (EMS-C) funds have facilitated development of programs related to childhood illness and injury.<sup>45</sup> The Make the Right Call campaign and other efforts have focused on timely access and appropriate utilization of EMS.<sup>46,47</sup> Additionally, some EMS systems participate in disseminating cardiopulmonary resuscitation (CPR) and bystander care education. However, planned and evaluated EMS public education initiatives remain sporadic. In general, EMS is not optimally engaged in providing education that improves community health through prevention, early identification, and treatment.

*Where we want to be:* Public education is acknowledged as an essential ongoing activity of EMS. EMS contributes to improving community health by disseminating valuable information regarding prevention of illnesses and injuries,

appropriate access and utilization of EMS and other health care services, and bystander care. EMS public education programs address the needs of all members of the community, including school-age children, senior citizens, and those with special needs. The public's knowledge of EMS-related issues, including funding, level of care provided, and system expectations and standards, is enhanced. Furthermore, purchasers of health care services are well informed about EMS issues, including evaluating and ensuring optimal EMS.

### Prevention

*Where we are:* The health care system is evolving from an emphasis on providing highly technologic, curative care to improving health through prevention and wellness. In this era, injury prevention has taken on a new dimension for both improving the nation's health and truly controlling health care costs.<sup>48</sup> Addition of injury prevention modules to the National EMS Education and Practice Blueprint has been strongly advocated.<sup>49</sup>

Emergency medical services are not commonly linked to the public's prevention consciousness. However, the potential role of EMS in prevention has been recognized.<sup>49,50</sup> In some regions EMS personnel currently are taught principles of injury prevention.<sup>51</sup> EMS-initiated prevention programs have been successful in reducing drowning in Pinellas County, Florida, and in Tucson, Arizona, and in reducing falls from height in New York.<sup>45,52,53</sup> The Safe Communities and Safe America concepts involve systematic approaches to address all injuries, and emphasize the need for integration of public and private partners and efforts, including acute care.<sup>54,55</sup>

*Where we want to be:* EMS providers receive education regarding prevention principles. EMS systems and providers are actively engaged in injury and illness prevention programs. These are

based on local needs, addressing identified injury and illness problems. EMS systems also maintain prevention-oriented atmospheres that emphasize safety and well-being for their own workers. They enhance their ability to document the circumstances contributing to illness and injuries. Such information is shared with other community resources to help attenuate injury and illness risk factors.

### Public Access

*Where we are:* For nearly 30 years, 9-1-1 has been the designated national emergency telephone number. Currently, approximately 25% of the U.S. geography is covered by 9-1-1, making it available to 78% of the population.<sup>56,57</sup> Seventy-nine percent of the largest U.S. cities use 9-1-1E, which automatically provides emergency call-takers with callers' telephone numbers and locations.<sup>58</sup> When 9-1-1 is the emergency telephone number, 85% of the public knows it, compared with 36–47% when the emergency telephone number is seven digits.<sup>59</sup> Cellular telephones provide one alternative for accessing emergency help. However, in many areas cellular telephone users cannot be assured of reaching the appropriate public safety answering point (PSAP) for their locations. The most important piece of information provided during an emergency call is the location of the person(s) requiring help. Yet, adequate address systems are lacking in many areas.

Financial barriers also affect access to appropriate emergency care via 9-1-1. These include inability to pay for telephone services, requirements of health care networks for their patients to obtain authorization prior to using 9-1-1, requirements to access emergency care through an alternative telephone number, and others.

Many EMS systems prioritize calls to appropriately delay response to less acute situations. This theoretically enhances the system response to critical emer-

gencies. However, EMS is generally unsophisticated in terms of its ability to ensure that the eventual response is commensurate with the services that are actually needed.

*Where we want to be:* Implementation of 9-1-1 is nationwide. From any telephone in the United States, a caller can dial 9-1-1 or push an emergency icon in order to contact the appropriate PSAP. In cases where routine telephone services are not provided because of an inability to pay for them, limited service that enables 9-1-1 access is made available. Every call for emergency services is automatically accompanied by location-identifying information, including an address or other geographic data. Cellular telephones and other personal communication systems provide a reliable means of accessing EMS via 9-1-1. Position-identifying technology ensures that all emergency calls are routed to the appropriate PSAP.

No financial, legal, social, or age-related barriers to accessing appropriate care via 9-1-1 exist for those who perceive an emergency. Systems for accessing EMS and other emergency services also employ communications technology that reduces barriers imposed by geography, caller age, specific disabilities, and language spoken. EMS access results in allocation of system resources that best fulfill the need. Calls are triaged so that the EMS response, given the available options, is the most appropriate (Fig. 2).

### Communication Systems

*Where we are:* Effective communication networks provide access to the EMS system, dispatch of EMS and other public safety agencies, coordination among EMS and other public safety agencies, access to medical direction, communications to and between emergency health care facilities, communication be-

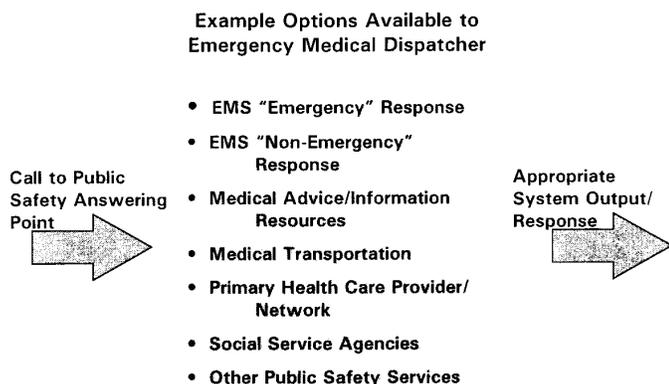


FIGURE 2. Public access to an appropriate EMS response.

tween EMS and other health care providers, and outlets for disseminating information to the public. Emergency medical dispatchers (EMDs) have been advocated as essential personnel at all EMS dispatching centers, and a national standard curriculum is available.<sup>60-64</sup> EMDs are able to efficiently query callers and provide dispatch life support via pre-arrival instructions.<sup>65,66</sup> Such instructions are thought to be a cost-effective mechanism for improving survival from out-of-hospital cardiac arrest.<sup>67</sup>

From a communications perspective, EMS personnel are, for the most part, isolated from the rest of the health care delivery system. They rarely have access to medical history information that might improve decision making. Limitations of communication systems may even hinder the ability to obtain on-line medical direction. The spectrum of communications equipment currently in use is broad and includes antiquated radios, cellular telephones, and mobile data terminals. Only 14 states have a comprehensive EMS communications plan in place.<sup>11</sup>

*Where we want to be:* Each call for emergency medical care is received by personnel with the requisite combination of education, experience, and resources necessary to enable them to determine the most effective course of action. All callers to EMS

receive appropriate medically-directed dispatch life support. EMS communication networks incorporate other health care providers and community services. These networks allow EMS workers to receive and share data with others who have important information about their patients and clients. Additionally, EMS communication systems ensure reliable availability of on-line medical direction and enable transmission of relevant real-time patient data. Networks are geographically integrated and based on functional need to enable reliable communications among EMS, fire, law enforcement, and other public safety agencies. Issues related to disaster preparedness are addressed, and each state maintains an up-to-date communications plan.

### Clinical Care

*Where we are:* The clinical care delivered by EMS has evolved significantly over the past 30 years. To some extent it has capitalized on the availability of new pharmacologic agents and technology, developed the means to deliver lifesaving care faster, and begun to systematically address the particular needs of specific groups of patients. However, EMS systems vary dramatically with regard to the sophistication of care they provide. There is no standard baseline of

care that is provided by all systems, and the scopes of EMS care differ among states and often between localities. The interventions EMTs can perform, the equipment available to them, and the medications they carry vary greatly.<sup>68,69</sup> In some areas, EMS clinical care variations may be the result of adapting to meet the health care needs of communities. A project at Red River, New Mexico, is an example of such adaptation in a rural community.<sup>70</sup> However, the effectiveness of EMS care has been established for few clinical problems.

Regardless of its sophistication, EMS care is usually intended to get patients to a hospital. Transportation of patients to nonemergency facilities or between facilities may be accomplished by EMS providers or ambulance services operating outside the EMS system.

*Where we want to be:* EMS provides a defined baseline of care and services in all communities. Expansion of services occurs in response to identified community health care needs. Out-of-hospital EMS care is optimal for patients' circumstances, so that it positively influences outcomes. The effects of EMS are properly and continually evaluated. Technologic and pharmaceutical advances are evaluated in terms of their appropriateness and effectiveness prior to their widespread deployment in EMS systems.

Patient transport activities are integrated with the overall health care system. EMS is capable of facilitating access to hospital emergency departments and other health care resources designated by medical direction. Staffing patterns for interfacility or secondary transports match the potential care required for specific types of patients. The responsibility and authority for medical direction during these transports are clear.

### Information Systems

*Where we are:* Several initiatives have focused on the need for development of improved techniques for

collecting EMS-related data. The Trauma Care Systems and Planning Act of 1990 emphasized the need for collection of data for the evaluation of emergency care for serious injuries.<sup>71</sup> The 1993 Institute of Medicine Report, "Emergency Medical Services for Children," recommended that states collect and analyze uniform EMS data needed for planning, evaluation, and research of EMS for children.<sup>72</sup> During the 1993 Uniform Pre-Hospital Emergency Medical Services Data Conference, conferees discussed potential data elements and determined them to be essential or desirable.<sup>73,74</sup>

The data required to completely describe an EMS event exist in disparate locations. These include EMS agencies, hospital records, public safety agencies, and vital statistics offices. In most cases, meaningful linkages between such sites are nonexistent. The lack of organized information systems that provide valid, reliable, and accurate data is a significant barrier to conducting EMS system evaluation, including outcomes analysis.<sup>10,75</sup> Lack of information systems that are integrated with EMS and other health care providers and community resources limits the ability to share useful data. Research efforts are also hindered. For example, integrated information systems may serve as multisource databases, which have been advocated as useful tools for conducting EMS cardiac arrest research.<sup>76</sup>

*Where we want to be:* EMS shares integrated information systems with other health care providers, public safety agencies, and community resources. They provide mechanisms for EMS to transmit and receive useful information. The data necessary to describe entire EMS events are available within information systems that link multiple-source databases. These information systems incorporate uniform data elements, facilitating continuous EMS evaluation, even across multiple EMS systems, and supporting EMS-related research.

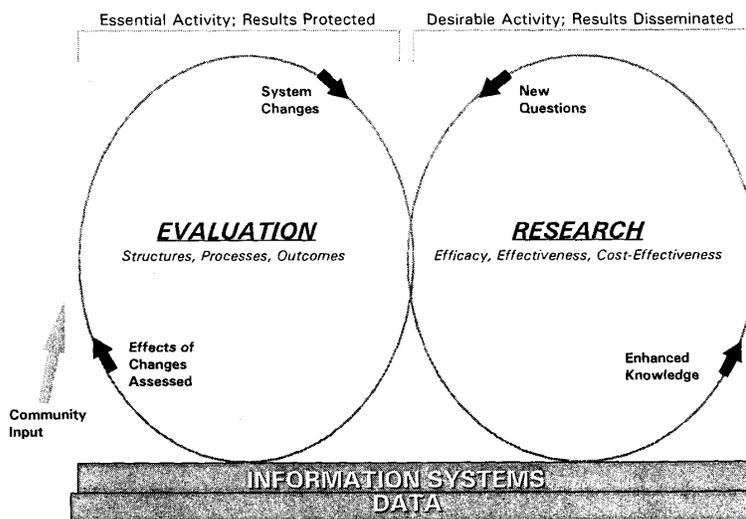


FIGURE 3. EMS evaluation and research: supported by information systems.

## Evaluation

*Where we are:* Evaluation is the process of assessing the quality and effects of EMS, so that strategies for continuous improvement can be designed and implemented. EMS systems are evaluated using structural (input), process, and outcome measures. Because long-term patient outcomes may be insensitive to variation in EMS care, intermediate outcomes that have a closer temporal relationship to EMS care often are utilized.<sup>77</sup> Cardiac arrest and trauma are widely used as "tracer" conditions to determine the overall effects of EMS systems.<sup>78-80</sup> For other conditions, there is a paucity of literature evaluating the effects of EMS. Estimates of EMS costs for saving the life of a cardiac arrest victim are similar to those for other lifesaving treatments.<sup>81,82</sup> However, such estimates are locality-specific and do not necessarily apply to all EMS systems. Models for determining EMS effectiveness and cost-effectiveness are lacking.

System evaluation and EMS research both rely on information systems as sources of data (Fig. 3). Research is a desirable but optional activity for every EMS system.

Evaluation, on the other hand, is essential, and seeks to determine the effects of applying new knowledge through structural and process changes.

*Where we want to be:* Continuous comprehensive evaluation of EMS assesses all aspects of the system. Evaluation is integral to quality improvement processes that measure, maintain, and improve the effectiveness and efficiency of EMS. Evaluation involves many clinical conditions. Although mortality remains an important outcome to evaluate, others are tracked as well. These include disease, disability, discomfort, dissatisfaction, and destitution.<sup>83</sup> Public satisfaction and consumer input are a focus of EMS evaluation efforts. The cost-effectiveness of EMS is also evaluated. This includes the cost-effectiveness of system preparedness and relates to various injury and illness conditions.

## IMPLICATIONS FOR THE FUTURE

The EMS Agenda for the Future project sought and received input from a large group of individuals and organizations with interests in EMS. Despite the group's heterogeneity,

common themes pervaded the process. Although the project was not specifically intended to develop consensus, it was promising that a great degree of agreement existed on fundamental issues. This facilitated identification of areas appropriate for future EMS development.

Our collective EMS experiences over the last 30 years provide a foundation on which to create the future. As we look forward, it is clear that EMS must be integrated with other services intended to maintain and improve community health and ensure its safety. The special needs of members of our diverse society must be recognized and addressed. We must also focus on aspects of EMS that improve its science, strengthen its infrastructure, and broaden its involvement in enhancing the health of our communities. Additionally, the value of EMS as the public's emergency medical safety net cannot be neglected. Most importantly, the ability to achieve the vision for the future of EMS will depend on the development of new partnerships within the health care system and commitments to improve the emergency health care system.

The EMS Agenda for the Future represents an effort to look toward the future from a specific point in time. American society and the health care system are dynamic. Thus, frequent evaluation of where we are and where we want to be is essential to ensure that EMS fulfills its critical role in optimally caring for the health of Americans.

The authors gratefully acknowledge the support and guidance of Dr. Ricardo Martinez and Dr. Jean Athey, the direction of Ms. Kathleen Stage-Kern, the administrative skills of Ms. Gina Baker, and the assistance of all those who participated during the process of creating the EMS Agenda for the Future.

## References

1. National Academy of Sciences, National Research Council. *Accidental Death and Disability: The Neglected Disease of Modern Society*. Washington, DC: National Academy Press, 1966.
2. Perry S, Wilkinson SL. The technology assessment practice guidelines forum: a modified group judgement method. *Int J Technol Assess Health Care*. 1992;8:289-300.
3. Gerson LW, Hoover R, McCoy S, Palmisano B. Linking the elderly to community services. *J Emerg Med Serv*. 1991;16(6):45-8.
4. Gerson LW, Schelble DT, Wilson JE. Using paramedics to identify at-risk elderly. *Ann Emerg Med*. 1992;21:688-91.
5. Krumperman KM. Filling the gap: EMS social service referrals. *J Emerg Med Serv*. 1993;18(2):25-9.
6. Hsiao AK, Hedges JR. Role of the emergency medical services system in region wide health monitoring and referral. *Ann Emerg Med*. 1993;22:1696-702.
7. Cummins RO, Ornato JP, Thies WH, Pepe PE. Improving survival from sudden cardiac arrest: the chain of survival concept. A statement for health professionals from the Advanced Cardiac Life Support Subcommittee and the Emergency Cardiac Care Committee, American Heart Association. *Circulation* 1991;83:1832-47.
8. Newman MM. Chain of survival takes hold. *J Emerg Med Serv*. 1989;14(8):11-3.
9. Spaitte DW, Criss EA, Valenzuela TD, Guisto J. Emergency medical service systems research: problems of the past, challenges of the future. *Ann Emerg Med*. 1995;26:146-52.
10. Spaitte DW, Valenzuela TD, Meislin HW. Barriers to EMS system evaluation—problems associated with field data collection. *Prehosp Disaster Med*. 1993;8(1, suppl):S35-S40.
11. Snyder JA, Baren JM, Ryan SD, et al. Emergency medical service system development: results of the state-wide emergency medical service technical assessment program. *Ann Emerg Med*. 1995;25:768-75.
12. Maiava D. Director, Hawaii Emergency Medical Services, personal communication, 1996.
13. National Emergency Medical Services Education and Practice Blueprint. Columbus, OH: National Registry of Emergency Medical Technicians, 1993.
14. McNally VP. A history of the volunteers. *Fire House*. 1986;11:49-53.
15. Fitch JJ. Volunteers. In: Kuehl AE (ed). *Prehospital Systems and Medical Oversight*, ed 2. St. Louis, MO: Mosby-Year Book, 1994, pp 316-20.
16. Mitchell JT. Critical incident stress management. In: Kuehl AE (ed). *Prehospital Systems and Medical Oversight*, ed 2. St. Louis, MO: Mosby-Year Book, 1994, pp 339-44.
17. Mitchell J, Bray G. *Emergency Services Stress: Guidelines for Preserving the Health and Careers of Emergency Personnel*. Englewood Cliffs, NJ: Brady Publishing-Prentice Hall, 1990.
18. Hockreiter MC, Barton LL. Epidemiology of needlestick injury in emergency medical service personnel. *J Emerg Med*. 1988;6:9-12.
19. Reed E, Daya MR, Jui J, et al. Occupational infectious disease exposures in EMS personnel. *J Emerg Med*. 1993;11:9-16.
20. Menegazzi JJ. A meta-analysis of hepatitis B serologic marking prevalence in EMS personnel. *Prehosp Disaster Med*. 1991;6:299-302.
21. Garza M (ed). *Paramedics report many on-duty assaults*. *EMS Insider*. 1993;20(9):7.
22. Gershon RRM, Vlahov D, Kelen G, Conrad B, Murphy C. Review of accidents/injuries among emergency medical services workers in Baltimore, Maryland. *Prehosp Disaster Med*. 1995;10:14-8.
23. Hogya PT, Ellis L. Evaluation of the profile of personnel in a busy urban EMS system. *Am J Emerg Med*. 1990;8:308-11.
24. Schwartz RJ, Benson L, Jacobs LM. The prevalence of occupational injuries in EMTs in New England. *Prehosp Disaster Med*. 1993;8:45-50.
25. *Emergency Medical Technician: Basic, National Standard Curriculum*. Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration, 1994.
26. Swor RA, Chisholm C, Krohmer J. Model curriculum in emergency medical services for emergency medicine residencies. *Ann Emerg Med*. 1989;18:418-21.
27. Erder MH, Davidson SJ, Chaney RA. On-line medical command in theory and practice. *Ann Emerg Med*. 1989;18:261-88.
28. Gratton MC, Bethkey RA, Watson WA, et al. Effect of standing orders on paramedic scene time for trauma patients. *Ann Emerg Med*. 1991;20:52-5.
29. Hunt RC, Bass RR, Graham RG, et al. Standing orders vs. voice control. *J Emerg Med Serv*. 1982;7:26-31.
30. Pointer JE, Osur MA. Effect of standing orders on field times. *Ann Emerg Med*. 1989;18:1119-21.
31. Hoffman JR, Luo J, Schriger DL, et al. Does paramedic base hospital contact result in beneficial deviations from standard prehospital protocols? *West J Med*. 1989;153:283-7.
32. Thompson SJ, Schriber JA. A survey of prehospital care paramedic/physician communication from Multnomah County (Portland), Oregon. *J Emerg Med*. 1984;1:421-8.
33. Wuerz RC, Swope GE, Holliman CJ, Vazquez-de Miguell G. On-line medical direction: a prospective study. *Prehosp Disaster Med*. 1995;10:174-7.
34. *The Future of EMS Education: A National Perspective*. Washington, DC: Joint Review—Committee on Educa-

- tional Programs for the EMT Paramedic, 1994.
35. Polk DA, Langford SJ. EMS degree programs. *J Emerg Med Serv.* 1992;17(8):69-75.
  36. Anderson TE, Arthur K, Kleinman M, et al. Intraosseous infusion: success of a standardized regional training program for prehospital advanced life support providers. *Ann Emerg Med.* 1994;23:52-5.
  37. Cayten CG, Starocck R, Walker K, et al. Impact of prehospital cardiac algorithms on ventricular fibrillation survival rates. *Ann Emerg Med.* 1981;10:432-6.
  38. Fuchs S, LaCovey D, Paris P. A prehospital model of intraosseous infusion. *Ann Emerg Med.* 1991;20:371-4.
  39. Landis SS, Benson NH, Whitley TW. A comparison of four methods of testing emergency medical technician triage skills. *Am J Emerg Med.* 1989;7:1-4.
  40. Losek JD, Szewczuga D, Glaeser PW. Improved prehospital pediatric ALS care after an EMT-Paramedic clinical training course. *Am J Emerg Med.* 1994;12:429-32.
  41. Powell JP. Training for EMT/Paramedics in perinatal care and transport. *Tenn Med.* 1982;75:133-4.
  42. Trooskin SZ, Rubinowicz S, Eldridge C, et al. Teaching endotracheal intubation with animals and cadavers. *Prehosp Disaster Med.* 1992;7:179-84.
  43. Walters G, D'Auria D, Glucksman E. Automatic external defibrillators: implications for training qualified ambulance staff. *Ann Emerg Med.* 1992;21:692-7.
  44. Werman HA, Keseg DR, Glimcher M. Retention of basic life support skills. *Prehosp Disaster Med.* 1990;5:137-44.
  45. Feely HB, Athey JL. Emergency Medical Services for Children: Ten Year Report. Arlington, VA: National Center for Education in Maternal and Child Health, 1995.
  46. Ho MT, Eisenberg MS, Litwin PE, et al. Delay between onset of chest pain and seeking medical care: the effect of public education. *Ann Emerg Med.* 1989;18:727-31.
  47. Moses HW, Engelking N, Taylor GJ, et al. Effect of a two year public education campaign on reducing response time of patients with symptoms of acute myocardial infarction. *Am J Cardiol.* 1991;68:249-51.
  48. Martinez R. Injury prevention: a new perspective. *JAMA.* 1994;19:1541-2.
  49. Garrison HG, Foltin G, Becker L, et al. The role of emergency medical services in primary injury prevention. *Prehosp Emerg Care.* 1997;1:156-62.
  50. MacLean CB. The future role of emergency medical services systems in prevention. *Ann Emerg Med.* 1993;22:1743-6.
  51. Sklar D, Sapien R, Olson L, Monahan C. EMTs and Injury Prevention, Advocates for Children. Albuquerque, NM: New Mexico EMS-C Project, 1995.
  52. Harrawood D, Gunderson MR, Fravel S, Cartwright K, Ryan JL. Drowning prevention, a case study in EMS epidemiology. *J Emerg Med Serv.* 1995;19(6):34-41.
  53. Ogden JR, Criss EA, Spaite DW, Valenzuela TD. The impact of an EMS-initiated, community-based drowning prevention coalition on submersion deaths in a southwestern metropolitan area [abstract]. *Acad Emerg Med.* 1994;1(2):A101.
  54. *Safe Communities: An Approach to Reduce Traffic Injuries*, Discussion Paper. Washington, DC: National Highway Traffic Safety Administration, 1995.
  55. Rosenberg M. Program briefing to Dr. David Satcher, Director, Centers for Disease Control and Prevention. Atlanta, GA: CDC, 1996.
  56. Lumpe D. Calling 911: who will answer? *Emerg Med News.* 1993;4:10-3.
  57. National Heart Attack Alert Program Coordinating Committee Access to Care Subcommittee. 9-1-1: rapid identification and treatment of acute myocardial infarction. *Am J Emerg Med.* 1995;13:188-95.
  58. Cady G, Scott T. EMS in the United States: 1995 survey of providers in the 200 most populous cities. *J Emerg Med Serv.* 1995;20(1):76-82.
  59. Eisenberg M, Hallstrom A, Becker L. Community awareness of emergency phone numbers. *Am J Public Health.* 1981;71:1058-60.
  60. ASTM Committee F-30 on Emergency Medical Services. *ASTM Standards on Emergency Medical Services*. Philadelphia: American Society for Testing and Materials, 1994.
  61. Clawson JF. Emergency medical dispatch. In: Kuehl AE (ed). *Prehospital Systems and Medical Oversight*, ed 2. St. Louis, MO: Mosby-Year Book, 1994, pp 125-52.
  62. Clawson JF. Emergency medical dispatch. In: Roush WR (ed). *Principles of EMS Systems*. Dallas, TX: American College of Emergency Physicians, 1994, 263-89.
  63. *Emergency Medical Dispatch National Standard Curriculum, Instructor's Guide*. Washington, DC: National Highway Traffic Safety Administration, 1996.
  64. National Association of EMS Physicians. *Emergency medical dispatching*. *Prehosp Disaster Med.* 1989;4:163-6.
  65. Stratton SJ. Triage by emergency medical dispatchers. *Prehosp Disaster Med.* 1992;7:263-8.
  66. Clark JJ, Culley L, Eisenberg M, Henwood DK. Accuracy of determining cardiac arrest by emergency medical dispatchers. *Ann Emerg Med.* 1994;23:1022-6.
  67. Valenzuela T, Spaite D, Clark D, et al. Estimated cost-effectiveness of dispatcher CPR instruction via telephone to bystanders during out-of-hospital ventricular fibrillation. *Prehosp Disaster Med.* 1992;7:229-34.
  68. Delbridge TR, Verdile VP, Platt TE. Variability of state-approved emergency medical services drug formularies [abstract]. *Prehosp Disaster Med.* 1994;9(3, suppl 2):S55.
  69. Garrison HG, Benson NH, Whitley TW, Bailey BW. Paramedic skills and medications: practice options utilized by local advanced life support medical directors. *Prehosp Disaster Med.* 1991;6:29-33.
  70. Senate Joint Memorial #44: Expanded-EMS Study. Albuquerque, NM: New Mexico Department of Health, Emergency Medical Services Bureau, 1995.
  71. *Trauma Care Systems Training and Development Act of 1990*: Public Law 101-590. Washington, DC, 1990.
  72. Durch JS, Lohr KN (eds). *Emergency Medical Services for Children*. Washington, DC: National Academy Press, 1993.
  73. *Uniform Pre-hospital Emergency Medical Services (EMS) Data Conference: Final Report*. Washington, DC: National Highway Traffic Safety Administration, 1994.
  74. Spaite D, Benoit R, Brown W, et al. Uniform prehospital data elements and definitions: a report from the Uniform Prehospital Emergency Medical Services Data Conference. *Ann Emerg Med.* 1995;25:525-34.
  75. *EMS Outcomes Evaluation: Key Issues and Future Directions*. Proceedings from the NHTSA Workshop on Methodologies for Measuring Morbidity Outcomes in EMS. Washington, DC: National Highway Traffic Safety Administration, April 11-12, 1994.
  76. Hedges JR. Beyond Utstein: implementation of a multi-source uniform database for prehospital cardiac arrest research. *Ann Emerg Med.* 1993;22:41-6.
  77. Cayten CG. Evaluation. In: Kuehl AE (ed). *Prehospital Systems and Medical Oversight*, ed 2. St. Louis, MO: Mosby-Year Book, 1994, 158-67.
  78. Eisenberg MS, Horwood BT, Cummins RO. Cardiac arrest and resuscitation: a tale of 29 cities. *Ann Emerg Med.* 1990;19:179-86.
  79. American College of Surgeons Committee on Trauma. Quality assessment and assurance in trauma care. *Bull Am Coll Surgeons.* 1986;71:4-23.
  80. Shackford SR, Mackersie RC, Hoyt DB,

- et al. Impact of a trauma system on outcome of severely injured patients. *Arch Surg.* 1987;122:523-7.
81. Urban N, Bergner L, Eisenberg MS. The costs of the suburban paramedic program in reducing deaths due to cardiac arrest. *Med Care.* 1981;19:379-92.
82. Valenzuela TD, Criss EA, Spaite D, et al. Cost effectiveness analysis of paramedic emergency medical services in the treatment of prehospital cardiopulmonary arrest. *Ann Emerg Med.* 1990;19: 1407-11.
83. Fletcher RH, Fletcher SW, Wagner EH. *Clinical Epidemiology—The Essentials.* Baltimore: Williams & Wilkins, 1988.

# MANAGING INFORMATION FOR THE FIRE DEPARTMENT

BY MICHAEL MORIARTY

- The secretary was going crazy! It had happened again. One of the training officers got tired of working with a file over the Localtalk network and copied it to his machine. He continued to work on it there. Now, there were two files, which didn't match—one on the server and one on the officer's machine. This happened all the time, and the secretary was stuck with manually updating the files.

- The dispatcher was stymied. A battalion chief who "knows computers" was put in charge of designing and implementing

.....

■ **MICHAEL MORIARTY** has been employed in the fire services in Hawaii for more than 12 years. For the past 10 years, he has worked as a firefighter/EMT for the Hawaii County Fire Department. He has a master's degree in computer-based learning, specialty information systems, from Nova-Southeastern University and is a candidate for a master's degree in business administration from the University of Phoenix, online. He will be an adjunct instructor for the Executive Planning course at the National Fire Academy.

the department computer system. The BC knew dBASE™, so he had used a dBASE™ database for incident reports. The problem was that dBASE™ locked out everyone else whenever someone was editing a file. With 50 runs per day, the dispatcher could seldom get into the incidents database to see if there had been previous runs to the address to which he had just sent the ambulance.

- Suddenly the new IBM clones were brought in to the dispatching unit. None of the dispatchers was given any training. Worse was the fact that all of the information the dispatchers needed to function was in the old Macintoshes. The DOS/Windows™ enthusiast the department had put in charge of designing the computer system had made no plans to move the information to the new machines. In a panic, the dispatchers called a computer-literate firefighter at a far-flung station and asked him to translate the files so they could operate.

Does any of this sound familiar? Unfortunately, scenes like these are commonplace around fire departments today. Lack of proper planning has put powerful technology on the desktop and then cruelly denied users the ability to use it in the most effective

manner. Do you want to learn the basics of how to plan and implement an information system? Read on.

## OVERVIEW

The modern microcomputer has become cheap enough to be present in a great many fire departments. Along with the promise presented by this technology comes the problem of planning to use it properly. Unfortunately, there is a worldwide shortage of planning expertise; and the fire service, already fighting cutbacks, has been among the least likely to have the resources available to take maximum advantage of this new technology. The result is that this powerful new weapon on many a desk is being radically underutilized. Lack of planning has blunted the beneficial effects of computers on actual operations.

To realize the benefits of computer technology, data (a conglomeration of facts) must be processed into *information* (a useful form of data). Information, of course, means different things to different people in different situations with different needs. The common tendency is to put the cart before the horse and commit to a given favorite com-

puter platform without assessing the holistic informational needs of the organization. Contrary to common tendencies, the central focus should be on the *information*, not a given computer platform (IBM vs. Mac vs. UNIX®, etc.).

The function of a comprehensive *information system* is to deliver the proper information to the proper people in usable form at the proper time.

The classic article "Cash Drain, No Gain" (*Computerworld*, Nov. 25, 1991) reveals that 50 percent of the durable tools purchased by American companies are computer technology-related. At the same time, productivity gains are falling. A strong case is made for the position that the decline in American productivity gains is related to the companies' refusal to retool the workplace to take full advantage of computer technology. Businesses install hardware and then keep working in the same old way; they fail to use the technology to accomplish what it can. They use high-technology equipment as an exotic typewriter. To use computer information system technology most effectively, your department has to be willing to examine itself and reengineer work processes.

But be aware that "reengineering" can be a wolf in sheep's clothing. Too many times, the term is used to justify actions originating from an agenda other than sound information management. According to *Computerworld* (June 13, 1994), various studies indicate that between 50 and 85 percent of the businesses that have reengineered are unsatisfied with the results. It points out that "downsizing" may be the motivation for "reengineering" and that the two are not necessarily the same thing. The tendency is to invest in technology as a replacement for personnel but then to pull the resources before the technology is implemented. In an era of budget cuts, watch out for predatory attempts to cut back on personnel or other resources without a methodical bedrock plan for implementing the changes.

Before initiating the purchase process for any information technology, it is wise to have the systems analyst, or whoever is going to be in charge, in place first. If you are going to use people from within your fire department, do not choose those responsible for the information system on the basis of rank. Rank has absolutely nothing to do with competence in system analysis and design. Choosing on the basis of rank is a sure way to shoot your system in the foot right from the start.

Too often, decisions of major importance are made before the people who are going

to run the system are on board. This means they are not there to affect the crafting of the system. Outside consultants may or may not approach the project with competence and the appropriate ethics. Sometimes hardware sales drive the consultant. In such a situation, you will end up with a slipshod end product of considerably less use than one that has been well constructed. It is always wise to have those who have to live with the product construct it; they have a vested interest in creating a truly viable end result.

As an example, I encountered a project wherein the police and fire departments of a jurisdiction were directed by their city council to cooperate in constructing an information system. A consultant had been hired to see them through the process. The consultant analyzed the needs of the two departments and then sent out a request for proposal (RFP). The project was so far along that the systems analyst was hired two weeks before the formal evaluation of five vendor proposals. The proposals were to be evaluated by a committee of 14 people, all using standardized evaluation forms. Points were to be awarded and totaled; the winner would be awarded the \$3 million contract. This selection process is an attempt to be objective and is aimed at eliminating litigation from the unsuccessful vendors.

This all sounds fine until one gets into the details. Doom hung heavily on the horizon as members of the evaluation committee began asking the consultant questions such as, "But where am I going to put this on my desk?" Although the fire stations had to deal with 72 reports, the RFP requested that only two be put on the computer system, the Ambulance Report Form (ARF) and the Incident Report Form. No provision was made for ambulance personnel to input the ARFs at the hospital, which meant the paramedics would have to fill out a dry form and then enter the computerized version at the station and that lawyers involved in a lawsuit might be provided with two versions of the ARF over which to argue. In addition, work for the paramedics would be doubled, and the fire department would be exposed to a liability risk.

Although the RFP had listed CAMEO™ compatibility as one of the fire department's needs, it was entirely missing from the evaluation sheet. Nowhere in the RFP or proposals was adequate training mentioned. One vendor listed three days of training support in its proposal. The fire department was supposed to pay \$400,000 for this system.

As it turned out, the consultant had spo-

ken with one person in the fire department and had never visited a station. When confronted, the consultant blamed the fire department for not telling him what it needed. Apparently, it had never occurred to him that, if this fire department knew how to design an information system, it wouldn't have hired him. Finding out what the fire department needed was his job. This was basically a hardware sale. Luckily, the fire department had not committed to the project and was able to bail out. Further involvement could have led to a financial loss, protracted litigation, or both. Be forewarned: Get your people in place before going too far, and be sure to provide them with enough resources so they are not fighting "brush-fires" instead of building your system.

### INFORMATION SYSTEM COMPONENTS

There are two major parts to an information system. The first deals with the structured information a department needs to have technology "chew" on in a very predictable and repetitive fashion. Payroll, incident reports, personnel actions, etc. fit into this category. This kind of information typically is digested by the traditional management information system (MIS). The second part of the effort to build an information system has to do with what happens, what is available, and what can be done on the desktop.

### PART I

#### Classic Information System Design

It is useless to begin planning an information system without first having a *strategic plan* for the development of the organization. After all, if the system is designed to deliver the proper information to the proper people in the proper form at the proper time, we have to know who they are, where they are, and what they need. This would be impossible without first knowing what the structure of the organization will be and where each unit within it is headed. Growth needs to be planned for, not encountered. To be utilized at maximum effectiveness, an *information system* must be created by a management that is aware of where the organization is going.

#### Organizational Information Requirements Analysis

The Organizational Information Requirements Analysis (OIRA) is the first step in the design of an information system. Each organizational unit of the department should have its information needs assessed. This assessment can include a look at the paperwork, survey forms, interviews, and actual

observation of operations. An increasing level of understanding of the needs of a given organization or unit can be gained as more of these tools are used to look at a given situation. Use as many as you can. You can't know your organization too well.

#### Design

"The hardest single part of building a software system is deciding precisely what to build. No other part of the conceptual work is as difficult as establishing the detailed technical requirements, including all the interfaces to people, to machines and to other software systems. No other part of the work so cripples the resulting system if done wrong. No other part is more difficult to rectify later," stressed F. Brooks in *IEEE Computer* (April 1987).

From the OIRA, the design flows. This is the point at which specifications are worked out and different options compared. The comparison should include performance; maintenance; and costs, both long range and immediate. This is the time when hardware and software platforms are considered and software is evaluated.

At this point, financial considerations force many departments into buying canned software. Many of these packages are excellent tools for performing specific functions. The problem is that they are a very partial solution to a comprehensive problem. The software companies that produce the packages cannot anticipate the particular needs of all possible customers. If you buy the product and then modify it to suit your needs, it is only reasonable that the company that sold the product to you will refuse to guarantee it. After all, it can't tell what you might do to it.

Another choice is to pay the company to do the programming. This is costly and can result in anything from an excellent product to a horror show. Know with whom you are dealing and what their capabilities are. Check with customers to find out if they like the support they get. Make sure the contract is clear as to what each party's responsibilities are, and make sure you have all that you require clearly spelled out in the contract.

The absolute worst-case scenario is to have your people looking at an incident report on the screen of a computer and then checking information on that screen against information in another computer file or on a piece of paper to see if they match. The idea is to automate this stuff, eliminating disparate data files so that everyone is using the same information and avoiding "busy work."

To design an integrated information sys-

tem, it first is necessary for the analyst to "normalize" the data with which you work. This process involves methodically examining each piece of data your organization uses. It is a step-by-step process for replacing convoluted associations between data with associations in a two-dimensional tabular form.

- Each entry in a table represents one data item; there are no repeating groups.
- Entries are column-homogeneous—that is, in any column, all items are of the same kind.
- Each column is assigned a distinct name.
- All rows are distinct; duplicate rows are not allowed.
- Both rows and columns can be viewed in any sequence at any time without affecting the information content or the semantics of any function using the table.

The basic thrust here is that any data item should originate only in one place; all the other dependent files should get that piece of data from this one source. By forcing your department to structure data this way, loose items, data replications, and disparate data files can be eliminated. It may be that many forms use the same piece of data but it is called by different names; standardization of naming conventions, therefore, is part of this phase.

After each data piece is identified, it is thoroughly described in a "data dictionary." This tool provides a reference you can use to learn what, where, who, and why about any data you may later need to understand. After all of the data is "normalized," dependent relationships in the data can be considered in the actual programming.

New technologies are constantly evolving. For example, relational technology, described above, is being challenged by "object oriented programming" (OOP). Rather than relying on code, "objects" are created and can be used and reused as needed. OOP provides the advantage of quick development times, but it can be a real chore to maintain databases created with some of these tools. Do not be too eager to be on the "bleeding edge" of technology. Look for tools that work and for which you can find satisfied references.

In many instances, major cost factors are not considered during the early stages of system design. Among such costs are the following:

- *The physical environment.* Thoroughly examining the physical environment (offices and stations) that will house the new technology is a wise preemptive move; it will give you a better handle on a realistic

budget. Appropriate desks, wrist rests, chairs, and glare screens are factors that, if ignored, can result in repetitive injury claims by workers.

- *Training and support costs.* This area represents the single largest budget item in an information system. Do not be fooled by comparing the costs of the hardware/software only. You perpetually will need to train and support your personnel. Have a good look at ease-of-use issues for your end users. Getting a 10-percent break on the hardware and then paying twice as much for training and support later is not a good deal. Carefully assess the training and support costs that are likely to pile up later. Write these costs into the budget.

- *Compatibility.* Lack of hardware standards may cause problems with compatibility later. Getting the needed disk storage space and RAM on machines may not be adequately considered if software requirements are not thoroughly understood and related to hardware purchases. When negotiating dealer maintenance agreements, be as hard-nosed as possible and push for all you can get. You'll need the help later. What appears to be a deal on price from a smaller manufacturer actually may cost you more when you fail to get the support you would have gotten from a "more expensive" vendor. Software costs could be 70 percent upgrade- and installation-related. This is worth remembering as you estimate software costs for your system. Try to think methodically about your entire work environment.

#### **Software Creation, Software Tools, Coding**

The first thing to remember here is that your department needs to be ready for the long haul. The last thing you need is to be dependent on one person and have that person be unavailable. One old-timer in information systems calls this "the motorcycle syndrome." He told me that whenever he takes over a project, he asks all the young hotshot programmers if they ride motorcycles. If they do, he assigns other workers to find out what they are doing on the project (as a backup). He told me that he had seen projects fail when a young programmer, responsible for an important module, was injured in a motorcycle crash. The concept is applicable to more than software and motorcycles.

Another common pitfall is the programmer who is building job security by not documenting what makes up the system. This strategy, which is more common than desirable—and also intolerable—means you must be dependent on this programmer.

*Insist* that every line of code and every piece of data be defined and documented. Everything about your system needs to be recorded. Analysts unfamiliar with the system should be able to read the documentation and understand what they are dealing with. This is the industry "standard of care," and those who will not live up to it—especially if they are acting in their own best interest—are a danger to the organization. If employees refuse to document their activities adequately, fire them and be ready to start over. Be ruthless on this issue; your organization's welfare depends on it.

#### **A CUSTOMIZED SYSTEM**

If you decide to create a customized system, be aware that this is a complex process. One of the major business problems a manager faces is how long a given task will take. Among the methods of estimating software development time are the standard formula developed by IBM; Historical Records, which depends on having records of similar projects; the "seat of the pants" method; and the "ask the programmers and multiply by 2" method. None of these methods historically has proved to be very exact.

Beware of "creeping elegance." Whenever you do something, it is inevitable that new ideas for doing it better will occur to you after you have finished. This is natural; but in the setting of software development, it is a dangerous invitation to cost overruns and extended development times. Programmers will run you around endlessly with this if you let them. Be absolutely intransigent on the issue of meeting the specifications. Ask yourself, "Is this feature in the specifications?" If it isn't, tell the programmer to forget it. If the module or feature runs to specifications, forget improving it for now and move on to finishing the project.

The creative effort is in the design specifications. Programmers are needed to render that design faithfully, not to be "creative" during the programming stage. This highlights how very important your initial specifications are. If you mess up on them, the project is torpedoed from the beginning.

With the computer technology changing as quickly as it is and with the large costs involved in creating an information system, it is wise to maximize the options open to your department. It would be horrible to have spent the money to create a fine customized information system and then find that the hardware manufacturer on which you are dependent is going out of business. Even long-time players in the computer industry are not immune to real problems.

**PORTABLE SOFTWARE TOOLS**

One way of hedging your bets is to use "portable" software tools such as portable operating systems and portable applications.

**Portable operating systems**

Portable operating systems can run on multiple hardware platforms. The UNIX® operating system immediately comes to mind. Portability is present with UNIX®, but be aware that it is not as simple as it seems at first. Two major UNIX® implementations are in use around the UNIX® world, and then various proprietary flavors of each of them. Getting software from one system to work on another can be a trick; quite often device drivers present a problem. Another example of a portable operating system is Windows NT®, which runs on a large number of hardware platforms.

Operating systems are going to become more and more portable. UNIX® and Macintosh® computers have been able to run DOS® and Windows® for some years now. Many implementations of UNIX® run on Intel® boxes (Sun®, Solaris®, Next Step®, SCO®, etc.).

The next phase of operating system evolution involves a software architecture called the "micro kernal." Micro kernals are tiny software kernals capable of invoking multiple operating system "personalities." An example would be "Chorus," a popular French micro kernal that takes up all of 45K in disk space. Don't be fooled by size. Micro kernal technology is the basis for Windows NT as well as the new operating system Apple® and IBM® are developing together. We shall soon see a wave of micro kernal-based operating systems capable of running software from multiple operating systems.

**PORTABLE APPLICATIONS**

Portable applications run under multiple operating systems. The advantage here is similar to that achieved with portable operating systems: You can move your expensive system and not have to recreate it. Some examples of portable database software are Oracle™, Double Helix™, dBASE™, and Omnis 7™. There are others, and one may be well-suited for you. Taking a close look at all portable software before committing to any product can protect your investment and give you leverage in your dealings with hardware vendors. If your hardware vendor is not performing the way you want, no problem; you can buy hardware from someone else next time because your system is portable.

**IMPLEMENTATION**

There are a number of ways to convert to the new system:

- *the direct method*—the new system is put in place and run,
- *the parallel method*—the old and new systems run side by side, and
- *the phased method*—parts of the system are brought online in a predetermined order.

Many fire departments may find themselves using phased conversion because it allows for smaller capital outlay in tight fiscal times. It is also possible to run a pilot program.

**IMPORTANT CONSIDERATIONS**

The important things to consider are the following:

- You have a plan as to what will happen, what is needed, and why.
- You evaluate the effectiveness of the system you put in place. Ask your organization, "Is this thing doing what it is supposed to?"

Information systems are constantly evolving as needs change and technical opportunities arise. Do not take a view from the top and think everything is okay. Design your evaluation process so that it involves all levels of your organization and gives you a representative picture of what is really going on. Make sure you take advantage of opportunities and eliminate problems in a systematic fashion.

**PART 2  
Distributed Computing**

While the predictable and indisputable needs of the organization can be addressed by a traditional management information system, sitting on the desktop now lies a well of technical and creative possibilities. This technology, combined with the synergy of many creative minds in your organization, can become a major resource for your department. However, you have to consciously decide to make this happen. The name *Traditional Management Information Systems* (MIS) even suggests that only management has meaningful information needs. Why waste the system on management only? Why not give the front line troops the opportunity to maximize the technology present on their desktops? This is a powerful potential weapon for all levels of the organization.

The vast wellspring of ideas present in your personnel can be used to drop your training and support costs by enabling personnel to communicate with and support each other. Advanced users can coach less computer-able personnel, reducing depen-

**SOURCES OF  
SYSTEMS ANALYSIS  
TRAINING**

- *The National Fire Academy.* Offers a relatively new course in information system planning designed to aid fire department managers in planning information systems.

- *UC Berkeley.* Offers a correspondence course called "Systems Analysis and Design" (X422). Connection also is offered through direct dial over telephone lines or the Internet. Contact: Center for Media and Independent Learning, University of California Extension, Fulton Street, Berkeley, CA 94720; (510) 642-4124; Internet: cmil.violet.berkeley.edu

- *NOVA University.* Regionally accredited, NOVA Southeastern is the largest private university in Florida and offers master's and doctorate degrees with a specialty in information systems. The course work is done mostly remotely over the satellite systems. Contact: NOVA Southeastern University, Center for Computer Based Learning, College Avenue, Fort Lauderdale, FL.

- *The International School of Information Management.* Offers master's degrees in information resources management. Accredited by the California Department of Education, ISIM delivers master's degree online via the Connect Inc. Network, the same network that carries ICHIEFS. Contact: The International School of Information Management, Box 1999, Santa Barbara, CA 93116-1999, Phone: (805) 685-1500, Fax: 805/685-9685, e-mail: Connect Inc.-ISIMADMIN, 3406188, CompuServe - 73320,1462

- *University of Phoenix Online.* Offers bachelor's and master's degrees in business administration via computer telecommunications. An information management course, "Information Management in Business" (CIS 564), is available. Online classes are delivered by direct dialing, through CompuServe or, shortly, via the Internet. Contact: University of Phoenix Online, California Street, Suite 505, San Francisco, CA 94111, (415) 956-2121, (800) 388-5463; fax: (415) 956-6339. ■

—MICHAEL MORIARTY

dence on a central help desk, thereby dropping costs. Software tools developed by personnel within various stations or divisions—say a spreadsheet on water available at different hose pressures run through differing lengths of hose—can be exchanged and used by others.

To do this, an electronic bulletin board system (BBS) can be used. A variety of BBSs are available. Some are cheap or free; some are not so cheap. It is wise to have the structured part of your system well analyzed before beginning to think about which product to buy. For instance, there are questions regarding whether the bulletin board can be run over a Local Area Network (LAN) and the network protocols under which they will operate. Questions such as these highlight the wisdom of knowing where you are headed with the general system before looking at BBS products.

The BBS might serve also as an electronic mail enabler. It is vital that whatever electronic mail system you choose be able to send computer files, not just a text-based message. This ability will enable users to share software tools they have constructed. After all, it is the people at the front lines who know what they need most. You will be amazed at what they come up with.

Whatever mail system you choose, it is wise to consider the technical specifications closely. For instance, if someone decides to send a cute holiday greeting to all the fire personnel (via a mailing list), does this make a copy for everyone—taking up masses of disk space—or is the replication done for everyone off one record? This can be critical. You can crash the system and quickly run out of disk space with the former setup. Another nice feature is the ability to “unsend” mail. Not very many systems have it.

Some bulletin board systems allow multiple computer types to use them easily. A number of BBS systems allow Windows®, Macintosh®, and text-based terminal emulators to use them. Windows®- and Macintosh®-based systems can use full-fledged graphical user interfaces (GUI)—icons and point and press, for example. A secondary benefit is that it is possible for personnel to log in from their home computers regardless of the platform the department has adopted as its standard. On the other hand, the GUI software also can be used as an added layer of security, to lock out unwanted visitors.

Another factor worth consideration is the ease with which a query may be made of the database used by the department. If queries must be constructed in arcane computer language, you can bet there will be a minimum

of queries. This means your people will not be looking at the data from a myriad of different angles, trying to make “information” out of it. Isn't that what you are paying for? Simple query tools are required.

Some software tools allow nearly English language queries that then transparently search multiple databases (without your having to know exactly where to look) and arrive back with the answer. Look into using these tools; they will allow your people to creatively address their problems with a minimum of technical hurdles. The vast majority of your people are far less interested in mastering the intricacies of computers than in getting the information they need to assist them in their work.

Constructing information systems is no easy job. It requires a methodical approach. If you give the question a 15-minute design, you will get about 15 minutes of productive use out of your system. By paying close attention to the structured information needs of your department, as well as making room for the less definable creative possibilities residing in your personnel, you will be on the way to maximizing your investment in technology. If management remains oblivious to the information needs of front-line personnel or, because of some draconian fear, decides to consciously limit the ability to creatively utilize information and communicate with each other, the technology sitting on the desktop will continue to do just that. ■

*The author may be reached through e-mail as follows: ICHIEFS-MSQUARED, Compuserve-72240.3160@compuserve.com, Nova University-moriarty@alpha.acast.nova.edu, Interlink Hawaii-msquared@llhawaii.net*

#### References

- Brooks, F. “No Silver Bullet: Essence and Accidents of Software Engineering,” *IEEE Computer*, April 1987, 10-19.
- Martin, James. *Computer Data-Base Organization*, 2nd ed. (Prentice-Hall Inc., Englewood Cliffs, NJ, 1977).
- Martin, James. *Information Engineering, Book II, Planning and Analysis* (Prentice-Hall, Inc., Englewood Cliffs, NJ, 1990).
- Martin, James. *Information Engineering, Book III, Design and Construction* (Prentice-Hall Inc., Englewood Cliffs, NJ, 1990).
- Parker, Charles S. *Management Information Systems: Strategy and Action*. (McGraw-Hill Inc., New York, NY, 1989).
- Rowe, Mason, Dickle and Snyder. *Strategic Management: A Methodological Approach*, 3rd ed. (Addison-Wesley Publishing Company Inc., 1990).
- Senn, James A. *Analysis and Design of Information Systems* (McGraw-Hill Inc., New York, NY, 1984).
- Wetherbe, James C. *Systems Analysis and Design*, 3rd ed. (West Publishing Company, St Paul, 1988).

# SPECIAL CONTRIBUTION

## THE C. J. SHANABERGER LECTURE: POLITICS AND CHANGE

Paul L. Selbst, PhD

In Texas City, Texas, there's been a reorganization of EMS. A falloff in fires has led to the cross-training of firefighters and the consolidation of fire and ambulance services in the interests of local economy and efficiency.<sup>1</sup> In Chicago, a different change is taking place. Workers at the Michael Reese Hospital went on strike to protest its sale. This public charity hospital had already been sold by the city to the for-profit Columbia/HCA Corporation and is now to be spun off again. Workers are concerned that it won't remain a hospital, and Jesse Jackson has turned this into a civil rights issue.<sup>2</sup> Managed care is causing a revolution.

These and other changes are like a typhoon swirling around us in the health care field. Change is a constant in our money- and technology-hungry postindustrial society. We Americans don't wallow in tradition; our cultural values change. We institutionalize it in concepts like "change agents" and "strategic

planning," and the proverb "A rolling stone gathers no moss." There's likely to be very little long-term stability in most work settings that you as emergency physicians will experience. Look at the entire academic establishment whose careers are based on teaching us how to make change; who write about it, who consult with corporations, and who speak at annual meetings of professional associations like this one. We celebrate change. But what about politics? It is also a piece of our lives.

Politics is part of human interaction. It is normal and found in families, on the job, in neighborhood associations, and even in professional organizations. Think of sibling rivalry, and remember some of the titles of the '70s: "The Politics of Sex" or "The Politics of Marriage." Politics goes together with change like gravy goes with mashed potatoes, yet we don't celebrate it equally or talk much about it at the work level in discussing change, which gets all of the attention. In essence our pundits seem either to be unaware of the importance of politics, or to downgrade it. We are taught that change is rational, and grows out of the Western tradition of the scientific method; that change is a problem to be solved by smart people and some technique; that resistance is not really rational and can be managed. The fact is we are taught a lot of rubbish. Then when we practice what we are

taught and change fails or fizzles, we cynically say "The more things change, the more they remain the same," and get disillusioned about trying. In my lecture I try to show the living connections between these constants of change and politics. I offer some models to help in understanding them and in assessing our fitness for dealing with them.

First, let me establish the idea of political economy as it applies to organizational life. Although our interest is at the level of the health care delivery system, the interlacing themes of politics and change are common to all social experience. They are as applicable to government bureaus as they are to schools, business corporations, and ambulance services. So, although I may speak generically, in examining political dynamics associated with change, these all have direct implications for EMS. I hope that they are recognizable.

We can begin with EMS. The authors of a history of EMS make it clear that politics has played an active role in its development. They describe fragmentation in EMS services that arose from the lobbying of a specialty subgroup and say "Obviously issues went beyond clinical to political and financial."<sup>3</sup> They further say that "After more than 25 years of rapid growth, change, and progress, medical directors' key issues of concern as EMS enters the mid-1990s are sys-

Received February 2, 1998, from the Master in Health Services Administration Program, St. Joseph's College, Standish, Maine. Accepted for publication February 9, 1998.

Presented at the National Association of EMS Physicians annual meeting, Ft. Lauderdale, Florida, January 1998.

Address correspondence and reprint requests to: Paul L. Selbst, PhD, 10 Stoneridge Drive, Standish, ME 04084-5251. e-mail: <pselbst@sjcme.edu>.

tem design, management, economics, and effectiveness."<sup>3</sup> I submit that system design, management, and economics are not separable from politics. Those dynamics must be understood by EMS directors, and incorporated in their day-to-day actions, to achieve that ultimate goal of effectiveness.

### THE EXISTENCE OF A POLITICAL ECONOMY

There are some seemingly intractable problems in national life that most Americans agree need to be corrected. For example, a new way to pay for political campaigns, the undesirability of negative political advertising, the need for consistent education of American children in basic reading, writing, and math, and the destructiveness of drugs among urban young people. Similarly, in the health care field, surveys show that most Americans are in consensus about the shame of 44 million uninsured citizens, the need to care for the very young and the very old, the desirability of further lowering infant mortality, the urgency of getting costs within control, and the need to correct fragmented services that create barriers to coherent care. Is there any doubt that, as a society, we agree that these objectives are all worthwhile? Then why do they seem impossible to achieve? There is growing pessimism that our society will reach them in the foreseeable future.

Each one of these social issues has to be dealt with by policy decisions. So, despite a lot of agreement by ordinary people, there is not enough agreement by the President, Congress, governors, and legislators that leads to corrective action, especially action that is substantive and not mostly symbolic. Each social problem carries profound economic implications, and so there arise equally profound political effects. So long as someone has to pay—someone gains, and someone else loses. So policy solutions may be stifled, distorted, in-

complete, or postponed until overwhelming crisis forces a change.

This is the nature of political economy. Political and economic forces are interlocked. There are interest groups that support changes and interest groups that oppose them. James Madison, in the *Federalist Papers*, called this "the violence of faction." He said, "The public good is disregarded in the conflicts of rival parties," and that "Measures are too often decided, not according to the rules of justice and the rights of the minor party, but by the superior force of an interested and overbearing majority."<sup>4</sup> Now in today's society the minor parties are the young, the old, the poor, and the marginalized. It is mainly a contest between those who have and those who do not. As the economics change so do the politics, and the result is not necessarily fair.

But my lecture is not about national politics and policies, or lamentable social problems. That was only to set the stage by describing some features of political economy as they affect social change at a larger social level. We can find comparable conditions in health care organizations at the operational level. A colleague of mine who was a hospital administrator had a notable experience. Most of the younger surgeons in the hospital, one by one, came to see this administrator and bitterly complain about the clinical incompetence of the surgeon who was the department chair. After enough complaints, he got the medical executive committee to hold a hearing. All of the complaining surgeons showed up and, in apparent tribal behavior, rallied and testified in support of the department head. Now that's a powerful lesson in the potency of a political faction.

We work in organizations, and contribute time, energy, loyalty, and ideas, in exchange for income, status, and satisfaction. These are all precious resources to us. As economists tell us, the creation, allocation, and uses of scarce re-

sources constitute the basic economic problems. These economics, in our organizations, shape our daily lives. And, as there are different groups trying to satisfy their competing preferences, many of the self-protective tactics of the actors at our organizational level resemble those at the community or national political level.

This situation is true of any complex organization even at its most stable. Although an organization may be in a placid environment, there are still issues of reorganization, personnel changes, budget allocations, and the purchase of major equipment that pit departments and individuals against one another. Take the example of a nursing director who peacefully retired after 18 years in a large urban hospital. Her successor was an outsider whose appointment made all of the senior nursing administrators insecure and nervous. So they began to politick: feeding her information to score points, or withholding information to create dependency; looking for physician support to get staff and equipment for their units; discrediting the claims of rival units; and so on. And all of this politicking when the hospital was stable, under calm conditions.

How much more are the political currents stimulated when the outside environment is turbulent, making change, and radical change, and immediate change, essential priorities? This is the health care field today, where innovation is necessary to keep up with competing providers in the same marketplace, and pressures from government and employers keep cutting revenue streams. There is much that roils the water as resources keep getting scarcer, driven by DRGs, managed care, the continuing march of technology, and our aging population. The results are diversification, downsizing, corporate restructuring, sales of medical practices, mergers, provider-sponsored organizations, integrated systems, and so on.

Every member of a health care organization has a stake in the outcomes of these changes. We are all stakeholders.

But there is more. Organizational change and politics are not simple cause-and-effect reactions; there are other social forces that contribute at the same time to political motivations of people in organizations. Let's look at these.

### CONFOUNDING FACTORS

There are some confounding factors that add to the basic political relationships in organizations. First, consider volunteerism. We see some conflicts in attitudes. Americans have had a tendency to distrust government, on one hand, and to strongly favor individual rights as guaranteed by government, on the other. So the focus on freedom of action leads us to want personal choice rather than to be told what to do; whether on the job, rooting for the unpopular underdog, or picking our own physician. Because we reject government intrusion and the associated taxes, we are willing to assume responsibilities. So we are a nation of volunteers, taking on burdens that are responsibilities of government in other countries, such as fire departments, ambulance services, and hospice programs. I was astounded one day, when I was discussing nonprofit organizations in a graduate management class. An American student, who had been working in Saudi Arabia for the past 15 years, asked this question: "What is a nonprofit organization?" This made me reflect on the specialness of American values. Because of these values America is a nation of philanthropists. We have built a nonprofit establishment that is unique in the world.

But this is under pressure. Because of fierce opposition to increases in taxes, some human services in the public sector have been eroding over the last few years. As benefits and safety nets get cut, po-

litical officials appeal to churches and voluntary organizations to pick up the slack. This has been a strategy of Presidents Bush and Clinton. But there is a limit. My mail is now flooded with urgent requests for donations by worthy charitable organizations. There is a real danger of compassion fatigue. If the voluntary sector doesn't get the money to do the job, and government relinquishes responsibility, masses of Americans will be in greater need. Pressures on those service organizations that we work in, despite inadequate resources, will be tremendous, and so will the instability of our organizations.

A second trend in this country is the corporatization of nearly every organization, from grocery stores to drug stores, auto dealers, pawn shops, and all manner of health care services. For example, hospitals merge and create large, vertically integrated systems. This works for reasons of market power, efficiency, or profitability. Even governments are outsourcing public services to large corporations in the belief, right or wrong, that they can be operated more cheaply and better. That's why Chicago sold Michael Reese to Columbia/HCA. Largeness is in, and it begets complexity. It is consolidation, the opposite of the pluralism that we Americans prefer. This leads to fewer choices. The farther away workers get from centralized decision centers that affect them, the more political they must become, to preserve their security and roles.

A third trend is the growing willingness to challenge authority. The counterculture kids of the '60s and '70s have grown up and gone to work. They have demystified leadership authority, with the help of the news media that is happy to expose inadequacies of national rulers and CEOs alike. Witness the no confidence vote in their president by the faculty of the University of Maine, and the latest dark revelations about President John Kennedy. Workers now seem less

submissive and tolerant of poor management. But perhaps Eric Hofer was right in seeing this challenge arising from disillusionment with poor leadership, including failed change, and the hope that conditions can still be better.<sup>5</sup> Where hope exists, and the leadership emphasizes values and mission, we find greater solidarity and more willingness to follow our leaders.

A fourth trend is that of professionalization. More and more occupations, especially in health care, are seeking the work fulfillment and respect that professionals command. Look at nurses and prehospital providers. They want advances in education, higher income, work autonomy, self-governance, and policy influence that resemble the medical model of professionalism. The medical arrogance also rubs off; they are getting more uppity to deal with.

The total of these continuing developments means that both inner and external environments of health care organizations will remain turbulent, with factions competing for their particular advantages. Organizational change is a constant, and political behavior is a predictable outcome.

### THE MANAGEMENT APPROACH

There is an explosion of management literature today and change is very often discussed since it is a prime priority in this turbulent age, in which government and economic forces are transforming the health care system. But prescriptions for change are written to the viewpoint of the producer of change: the manager who sets it into motion. The very definition of a manager today that of a "change agent." There is seldom a strategic discussion addressed to, or about, the people affected by change, who are also responsible for carrying it through. These are the soldiers of the organization: physicians, nurses, allied

professionals, housekeepers, and clerks. The assumption seems to be that they are malleable materials; human resources that can be utilized, even manipulated, for efficient production. Consider the words of a popular textbook in health services management:

When desired outputs are not achieved, or when new outputs are sought, managers must change something. . . . Inputs can be changed; managers can employ new people with specific education or experience . . . more or different training for current employees . . . introduction of technology. Managers can also change the organizational structure, the relationships among people who work in the health service organization, and the conditions under which they work. . . . Philosophies about how internal and external stakeholders are treated can be changed. Approaches to and methods of motivating, leading, and communicating can be changed if circumstances require this.<sup>6</sup>

This is a quintessential technocratic statement. The emphasis here is on engineering; the design of the organization according to management specifications, with the weight on management rationality and formal decision making. It's the kind of indoctrination that many MBA graduates get. But it deals with only one side of the totality, and the easier one to understand. It's the yin, but the informal side of decision making is the yang, which is less emphasized.

Of course change is imperative. This is the responsibility of management, and managers cannot truly give up control and accountability. Health services organizations must adapt to an uncertain and threatening environment. They must be successful in the markets of today. They must be solvent and demonstrate their worthiness to their constituents, for continued financial and political support. This is as true of emergency medical services as it is of hospitals and home health agen-

cies. And, since organizational effectiveness depends on management vision and competency, what's wrong with strong leadership?

Nothing is wrong so long as the practitioner of leadership also recognizes the reality of followership. People, other than managers, are more than an organizational problem that good management techniques can overcome. Although this statement may seem simply like common sense that is grounded in experience, it doesn't appear much in the contemporary prescriptions that managers are given to improve their organizations. quality circles, total quality management (TQM), participative management, reengineering, and work redesign are top-down efforts to improve productivity, that allow workers to participate within carefully controlled boundaries. As the industrial psychologist Frederick Herzberg pointed out 30 years ago, many managers believed that the best way to motivate workers was a kick in the behind.<sup>7</sup> This has changed somewhat, but even in more consciousness-raising courses like human resources management, the emphasis is still on the word "management."

We see, though, that the genius of human resources is that they are not passive materials. Of course this is no revelation; we deal and cope with brilliant, annoying, or unpredictable people every day, in and out of organizations. And we ourselves are on both sides of the fence, as producers of change and as consumers of other people's change, so we know how we react. Yet little academic attention has been paid to followers, particularly those in mid-level management, who are major instruments in the change conversion process. But what about the literature and seminars on change, springing up like mushrooms, that emphasize shared governance, TQM, and the learning organization? These are mainly lessons in "how to do it."

Their emphasis, in bringing mid-level managers and rank and file staff into decision making, is in matters of cost and quality. When handled poorly, this kind of participation is simply symbolic; it is image management that doesn't impress stakeholders. When done well, it can be substantive and make important operational contributions. The trouble is that it does not get at the strategic dimension of the organization; at doing the right things, and not just doing things right. That is where the more profound decisions are made: for diversification, merger, reorganization, new product development, and downsizing. And these have the greatest effects on the people who work in and with the organization. They would like a piece of that decision making as well: for security, for fairness, for identity, for freedom, for creativity, or for the contribution of ideas. Who knows what gives people satisfaction? Different stakeholders have different motivations that cannot be reduced to a simple average and handled the same way for everyone.

But that is not usually uppermost in the minds of CEOs. Let's revisit the language of the writers quoted above, on how to create an organizational climate for creativity and innovation; that is, for deliberate and desirable change. They say to hire creative people is best. If not, then second best is to create a climate that lets people experiment, keeps rules to a minimum, doesn't press for specifics too soon, encourages diversity of opinion, and tolerates foolish ideas.<sup>6</sup> This seems like good advice, but it's also pretty utopian. It assumes a more democratic style of leadership than most of us have experienced. Does it apply to EMS organizations that some insiders have referred to as autocratic?<sup>8</sup> It also assumes that the leaders themselves are united in their commitment to this kind of climate, which may not be true. It assumes, again, that you can ma-

nipulate motivation from the top down. It assumes that members will be uniformly motivated; that is, that everyone will behave the same way, in a simple cause-and-effect equation. We do know that not everybody will be happy. Somebody will feel threatened. Some managers will give this only lukewarm support. There will be differences of opinion. And some people will want to be left alone and not have to participate.

And what about change that is not successful? Many efforts to change organizations either fail or gain only limited success. We have all seen them begun with big fanfares and then poop out.<sup>9</sup> Several of these experiences can produce skepticism, if not downright cynicism and resistance, among those affected. All of these situations are the media for culturing the internal exercise of politics.

### ORGANIZATIONAL POLITICS

Given the fact that there are always individuals and groups with differing purposes, differing values, and differing preferences, as well as contests in which someone benefits and someone loses, power struggles are common. Political behavior should be expected and understood as normal in organizational life; change is not needed to trigger it. But here is where common understanding among managers peters out. Let me offer an example of a naive rationality that failed to recognize human behavior. Dr. X was appointed CEO of a health care institution. He got into a quarrel with the vice president of the board, who then undermined his position. He unilaterally changed the monthly newsletter to make it more professional and cut out the president's folksy column, which that dignitary did not appreciate. He reorganized and made a lot of middle managers anxious. All of this was done with the best of intentions and some success. For the first time in years that organization went into

the black. But it did not matter. Dr. X had dug his grave. Within the year he was terminated, despite change that looked successful from the outside. He had expected more rational goal and task orientation than stakeholders were willing to give.

Organizational members often resist changes that seem rational to goal-oriented managers, for a variety of good reasons: threats to security, to social relationships, to status, and to influence; fear of uncertainty; fear of inadequacy in a new role; and inconvenience. Even when managers are taught about this behavior, however, the solutions that are recommended may not be commensurate with the situation. Here are some suggestions from the management book cited earlier: More communication, more education, more counseling, and even coercion.<sup>6</sup> This is all manipulative, all top-down, all aimed at breaking resistance, and mainly missing the point.

To recapitulate for a moment, as organizational beings, ourselves, we need to accept some realities. All organizations are made up of people. People behave in ways that advance their self-interest. This requires political behavior. And change exacerbates political behavior that is already present. Let's now look at the nature of that behavior.

The first question is: is this a matter of power relationships, as politics is often described? Not necessarily. Power is one goal and is profoundly important. I will never forget the time that I interviewed for the CEO job at a New England hospital. As I approached the nondescript old building, I saw a bright new glass and steel wing. I asked my escort what it was and she replied, "Oh, that's Dr. Leroy's wing." Before I set foot in that hospital I knew that the jig was up. I would never be able to equal the power of a physician who could raise that kind of money. He would rule that roost until he retired. But

power, isn't everything. Politics is more variable. Some people may seek power, but others may want to avoid it and be left alone. Some may be looking for status rather than power. But isn't power needed in order to gain status or have the strength to be left alone? Not necessarily. Some people may use dirty tricks to protect their interests rather than the exercise of power. Perhaps they discredit people in power and so neutralize them. Or they may have special knowledge that makes them valuable.

As members of a social order, we continually engage in political activity, even when we are not aware of it. We try to advance ourselves. We try to avoid uncertainty, disruption, and other dysfunctions from the control of someone else's discretion. Generally we try to achieve more personal independence, gain influence on higher authority, and control the factors that are important to our well-being.

Politics comes naturally to us. Even as children we learn competitive ways of maneuvering for personal advantage, in school, with siblings, and through games. As adults we maneuver as well. Here are typical political actions: seeking strength by uniting with others in cliques, and by bringing cliques together in coalitions through trading favors if necessary. As individuals we learn to ally ourselves with important people, to compete for resources and recognition, and to engage in impression management, by controlling information favorable or unfavorable to ourselves, avoiding involvements that reflect unfavorably, taking credit for good outcomes, and passing the blame for undesirable outcomes. We learn the value of symbolism, in the clothes we wear, the way we speak, the people we associate with, our visible access to decision makers, and the inside knowledge that we imply we have. Similarly, we look for allies to oppose those who op-

pose us. You may recall that expression "the enemy of my enemy is my friend." In the group we try to limit its dependence on other groups and to enlarge the domain over which the group has discretion, as well as freedom of action. We seek to protect group norms. When conflicts arise we may try to smooth them out by negotiated agreement and compromise, by gaining the support of higher authority, by discrediting the opposition, or by intimidation.

Beyond the individual, we are also affected by the culture of our work organizations. Take the case of a hospital strike in New York City. Two world-famous medical centers of equal sizes, scopes, and statures had completely different behaviors. At Mount Sinai Hospital, angry strikers tried to bar professionals who crossed the lines. They physically assaulted supervisors and replacement workers, and damaged cars and delivery trucks. About a mile away, at the New York Hospital, calm and cooperation prevailed. Same union; different cultures.

Mergers are especially problematic when they marry incompatible cultures. Last year, again in New York, a planned merger that had been approved by the boards of the Presbyterian and New York University Hospitals fell through. The two medical staffs could not reconcile their cultural differences.

As we look to the future we see American life becoming more organized in larger corporate, merged, and bureaucratized structures, with cultures clashing, and individuals becoming smaller cogs in their wheels. We can expect more overt political behavior of the sort that I have described. But largeness and impersonality are not the only stimuli. Even in small and more personal organizations, political behavior is there and aggravated by crisis, which is especially endemic to stressed-out health care organizations. Add continuing change to these already-smoldering destabi-

lizing conditions, and it is no wonder that politics is a pervasive component of organizational life, for professionals and non-professionals alike. In short, politics is. Its practice may be beneficial if change is misguided and it may be dysfunctional in slowing or modifying needed change. We can't judge it; we do need to understand it.

But what if all that I am describing is something you have not observed in your work environment, nor have you felt the need to knowingly engage in that kind of behavior? I'll accept that. Sometimes political behavior seems to be in remission, especially in a successful and stable organization, with particularly competent leadership. But these days both executive tenure and organizational stability are short-lived. Watch for the signs, and I am confident that you will eventually find them.

### INCREMENTALISM AND CHARISMA

So far I have described planned or reactive change that we normally encounter in organizational life. But there are two other kinds of change that are very interesting and a little more exotic: incremental change and charismatic change. Let's look first at incrementalism. The kinds of organizational change that I have described, such as merger or reorganization, are fairly radical and their effects are visible. They are carried out over fairly short periods of time, weeks or months. They represent acute shocks to the organizational system, to which politics is one kind of immune response. But how do stakeholders react to chronic change; that is, small incremental changes over a long period of time?

The strategic aim of management, in making gradual changes slowly, may be an ultimate manipulation, to avoid rocking the boat and stimulating opposition. This is a time-honored management approach that is extolled in the cur-

rent TQM philosophy. The "parable of the frog" is a popular example. In this lesson we learn that a frog, if thrown into a pot of boiling water, will jump out. But if it is put into cold water that is then gradually heated, it will grow sluggish and remain in the pot until the water boils and its goose is cooked, if you pardon a tortured metaphor. The purpose of the parable is to convince managers that slow change is less of a disruptive shock to the system than rapid change, and less likely to cause destabilization and failure. This is logical. Incremental change is a valid technique and I introduce it to students who are learning management. But this approach also has the potential to be used for wicked purposes, so another reason for awareness is for defense.

Consider the bank teller who embezzles thousands of dollars in small amounts over a decade. Or the story of a hospital that acquired an independent nonprofit nursing home over a period of seven years. Little by little it contracted to manage departments that few people notice or care much about: the laundry, housekeeping, purchasing, the pharmacy, and the business office, all on the basis of economy and efficiency. By the time that key stakeholders were aware that the hospital was dominating the home, it was too late. It needed only a small step to take it over completely. The most dramatic description of incrementalism was that of Dietrich Bonhoeffer, the great theologian who was executed by the Nazis in 1945. He pointed out that they removed the people considered to be the dregs of an orderly society: the criminals, the homosexuals, the Gypsies, the Communists, the labor organizers, and then the Jews. "Ordinary" people stood back and applauded. And Bonhoeffer added, by the time we realized what was occurring, they came for us. In incrementalism, then, you work from the margins until you reach the center.

In its worst manifestation, incrementalism may be likened to a degenerative disease. It is less likely to provoke opposition because when the effects are visible it may be too far advanced. But there are other reasons as well, stemming from the slowness of the process. Management can also dominate the politics. The management may be able to stack its supporters in key positions, or remove or coopt internal political opponents, as in the case of Bonhoeffer, to maintain its freedom of action. So the question of politics depends on where you sit; in management, as a change producer, aiming for maximum control, or as a stakeholder, a change consumer, who wants to protect yourself but may be weakened in your ability to do so. Whether for good or ill, incrementalism is a potent approach to change.

Now let's look at charismatic change. This is an interesting and somewhat opposite view of organizational change, in which everyone in the organization, including the management, wants mainly to preserve rather than to innovate. This begins with a social, ideological, or religious movement, that has been established by a forceful and visionary leader. In religion this would include Buddha, Jesus, and Mohammed, but also Catherine McAuley of the Sisters of Mercy and Mother Teresa of the Missionaries of Charity. In the political sphere we have parties, such as the Communists of Lenin and the Democrats of Jefferson, but also followers looking for an institution, such as the deGaullists in France, the Peronistas in Argentina, and the Reaganites in this country. In the social sphere there are the profession of nursing, started by Florence Nightingale, and the Catholic Worker Movement of Dorothy Day.

The people in these kinds of movements are committed to and motivated by the utopian ideals in each founder's vision. Once the movement is born, and after the

passing of its founder, the disciples want to preserve the vision for all time. The renowned sociologist, Max Weber, called this effort "the routinization of charisma."<sup>10</sup> In the health field we see the expression of this idea in those who follow the doctrines of Sigmund Freud vs those who follow Carl Jung. These are, in the truest definition of the term, paradigms. They inform the world views, values, and problem-solving methods of those who adhere to them.

Charisma involves exceptional visions of exceptional personalities. But once dissociated from those personalities, how do those visions get institutionalized? This occurs through a complex process of change that involves codification and indoctrination. The major aim is conservative; to preserve the vision and, in channeling change, to preserve the movement that was initially given life.

The routinization process legitimizes how successors to the founder, and successive leaders, are chosen. Norms for followers and their training are established. Regularized official functions are fulfilled by elders who hold bureaucratic offices. Original teachings, a creed, myths, and an official history are written down, sanctified, and declared through frequent ritual. Followers join a fellowship and are made to feel privileged as members. Innovators and dissenters are made to be heretics and isolated or removed.<sup>10</sup> In Judaism, keeping the laws alive was called "building a fence around the Torah." So change is controlled but it is not entirely absent. The movement continues to evolve because people have their own ideas and because society keeps changing. For example, the Buddhism of Siddhartha and the Communism of Lenin are not identical to those of the founders, although most early doctrines are still recognizable. Internal politics here are at the level of the leadership, rather than the followers, as they jockey for succes-

sion and for influence over doctrine. Think of the Vatican.

The relevance of the routinization of charisma is becoming sharper for contemporary public service and human welfare organizations. Their missions are in danger of being distorted or abandoned in the face of crushing economic and competitive pressures. In response, there is a new literature focusing on value-centered leadership, also called "visionary leadership." Some of the methods I've described may be useful in the repertoire of managers who are trying to reconcile innovative change while preserving fundamental values.

### POLITICAL-ECONOMIC MODELS

At this point I would like to take a number of the key ideas that I have discussed and integrate them in political-economic models, which will also include some ethical considerations.

In the first model change is considered desirable by the leadership of an organization. There are two perspectives of the actors involved: that of the leadership, the change producers, and that of the stakeholders, the change consumers. There are also two directions of movement: toward innovation and toward conservation. This model highlights differences. Change creates different political methods and ethical objectives, depending on the different actors, and their different economic aims that are interested in different kinds of resources (Table 1).

In this model the stakeholders who participate in innovative change may be in a defensive political mode as they seek to keep what they have, and their ethical concerns are those of fairness and equity. But the leaders who innovate are able to create freedom of action for themselves, and ensure continuing freedom for the stakeholders, by developing a coalition of stake-

TABLE 1. Desirable Change

	Innovation	Conservation
Producer (leader)	Economics: get resources	Economics: get followers; keep values
	Political method: negotiated coalition	Political method: vision indoctrination
	Ethics: autonomy	Ethics: nonmaleficence
Consumer (stakeholder)	Economics: preserve benefits	Economics: gain personal identity
	Political method: alliances	Political method: submission
	Ethics: justice	Ethics: beneficence

holders who support their objectives. On the conservation side, leaders seek followers because, without them, there is no movement and the vision is frustrated. The method is vision indoctrination. The operative ethical principle is that of nonmaleficence, not doing harm, because of the power that the leaders command.

It is interesting to contrast the innovation of the change agent, which we see up close most of the time, with the conservation approach of a charismatic movement. For innovative change the absence of routines permits the decentralization of power, which opens avenues of freedom throughout the organization. Conversely, routines are essential in centralizing and conserving charismatic ideals.

To round out our discussion of change, we last consider another kind of change that is usually seen as undesirable by both the leadership and the stakeholders. That is the change brought about by crisis in the organization, which threatens its functions, its objectives, its viability, and its survival. It typically has corrosive effects on management discretion, stakeholder morale, and organizational stability.

I identify three common kinds of crisis that demonstrate effects of a political economy:

1. Problematic leadership—either when a leader is incompetent or neglectful, and damages the organization, or when no succes-

sor to a leader is designated, leading to power struggles.

2. Structural dissonance—When the organization is structurally changed, in response to powerful outside market or political pressures, in ways that are either too much or too little. That is, overformalization (too many rules, too much hierarchy, too much centralized decision making) or underformalization (too few rules and too much anarchy).
3. Withdrawal of resources—This is the one we are most familiar with. It pertains to loss of money, allegiance of critical stakeholders, or organizational reputation and status (Table 2).

From a political standpoint, coping responses to changes brought by crisis take different forms. They may be welcome to those who leverage the crisis as an opportunity to get help that was previously

denied, by leaking details to the news media, by creating conflict that escalates the crisis and thereby gaining power, by using the situation to purge unwanted personnel, or by breaking up coalitions whose policy influence is too powerful. So while crisis is seen as negative for most of the organization, it can be seen as a positive opportunity for these actors. But more usually crisis often stimulates a lot of political dysfunction as it magnifies all of the insecurities that were already there and promotes self-protective behavior. In addition to the usual political effects, crisis stimulates accusations of blame and struggles for priorities as different actors have different theories about how to restore organizational health.

Like the previous model of desirable change this demonstrates that, as crises vary, so do economic objectives, political methods, and ethical emphases.

### CONCLUSION

There is no single best way to understand or to deal with the political economy of change; it depends on the circumstances. I have offered observations on the internal politics of various kinds of change, such as innovation, incrementalism, conservation of charismatic vision and values, and crisis. I have offered some models of desirable and undesirable change that show the relationships among organizational economics, politics, and ethics.

TABLE 2. Undesirable Change

Coping Responses		
	Leadership	Economics: policies and decisions Political methods: alliance and resource control Ethics: autonomy and nonmaleficence
Crisis	Structure	Economics: authority and efficiency Political method: negotiated coalition Ethics: autonomy
	Resources	Economics: labor and materials Political method: negotiated coalition Ethics: justice and beneficence

Service in emergency medicine is an admirable calling. It is one of which everyone, provider, patient, or public, approves and in which everyone immediately recognizes civic virtue. The saving of lives and the relief of suffering of vulnerable fellow human beings offer great satisfaction despite professional stresses. But even in this much-applauded setting we must separate the clinical part of it from its organization and management.

So the implication of my message is that, even as clinicians, you need to apply organizational skills if you want to be professionally effective and personally secure. Because change affects all of us, we may function as political actors without always being aware that we are doing so, or we may not participate when we ought to. And when we do act deliberately we want to be sure that we do it successfully.

So one bedrock skill to master is the cultivation of awareness of political currents, tied to active observation. What is going on: with the leadership, the direction of the organization, and the other stakeholders? What is the status of morale, of information reliability, of developing alliances, of scapegoating, of symbolic vs substantive actions, and why?

A second key skill is willingness to compromise. We may be inclined to stand on principle when we ought to be concerned about where we are principally standing. In a charged political situation, stubbornness may be foolishness. But defining roles, trading benefits, and reaching accommodation are not necessarily talents that we innately possess. Learning how to negotiate is not a waste of time. Check the business section of a bookstore. You will see a growing number of books on negotiating. It is a popular management subject.

Strategic thinking is another skill. Sizing up and building on strengths, in order to exploit opportunities, are prerequisites for long-term success, whether in our organizations or in our personal careers. This is a skill that warrants a seminar or even a course if we are not there already.

Find ways to be indispensable to the organization. As Machiavelli pointed out, those who need you will be faithful to you. Those who don't will be careful because of your power.<sup>11</sup> This is a great resource in times of adversity.

Then there's that old chestnut, communication. But it is not mainly the art of expressing yourself, but rather the art of listening that is so vital. We can all valuably work on that.

Now beyond these personal skills that center on more effective political participation in change processes, there is a central strategic question. Rather than being swept along by changes triggered by other actors, how can emergency physicians join as agents of change? Your basic concerns with care and its quality are certainly needed in the chambers where decisions are made, as change producers try to balance the imperatives of market pressures, money, and mission.

In working to preserve the values of mission, look at the methods of conservation that I described in the routinization of charisma. See, too, how crisis can be leveraged to strengthen your own role. Take care that physicians in the dominant coalition that influences policy decisions are strong, are politically skillful, and represent your patient-centered goals and values.

But be also aware of the danger of advocacy; that your effort to educate and support can make you myopic. First you become a champion, then a partisan, and ulti-

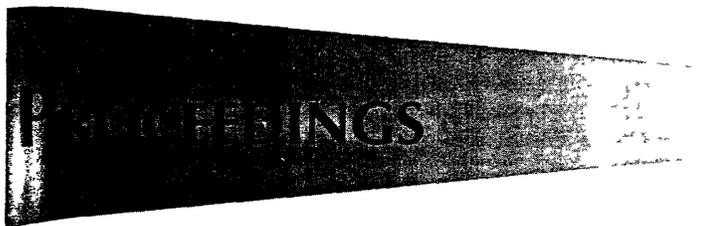
mately a factionalist, making necessary compromises difficult. Attach yourself to counselors who are clearheaded and sensitive to the political situations you encounter. Ask their advice about when to stand and when to give. Then take counsel with yourself, but at least you will have heard other opinions.

Finally, in returning to Machiavelli, we see that he was also right about the ubiquity of change. He said, "One change always leaves the way prepared for the introduction of another."<sup>11</sup> So the political economy is never-ending. May you take that journey with mastery and with confidence, and may you enjoy it!

## References

1. Eubanks NT. A proposal for fire and emergency medical services consolidation in Texas City. Unpublished masters paper, Saint Joseph's College, Standish, Maine, 1997.
2. Asplund J. Employee's fate at issue in Columbia's hospital deal. *AHA News*. 22 Dec 1997, p 5.
3. Mustalish A, Post C. History. In: Kuehl AE (ed). *Prehospital Systems & Medical Oversight*. St. Louis: Mosby, 1994.
4. Beard C. *The enduring federalist*. New York: Frederick Ungar, 1948.
5. Hofer E. *Before the sabbath*. New York: Harper & Row, 1997.
6. Rakich J, Longest B, Darr K. *Managing health services organizations*. Baltimore: Health Professions Press, 1992.
7. Herzberg F. One more time: how do you motivate employees? In: Leavitt H, Pondy L (eds). *Readings in Managerial Psychology*. Chicago: University of Chicago Press, 1997, pp 26-42.
8. Palmer R. Letter to the editor. *Prehosp Disaster Med*. 1996; 11:313-4.
9. Palmer M. The misdirected attempt at organizational change. *The "why."* *Healthcare Rev North N Engl*. 1997 ;10:8.
10. Weber M. The nature of charismatic authority and its routinization. In: Weber M. *On Charisma and Institution Building*. Chicago: University of Chicago Press, 1968.
11. Machiavelli N. *The Prince and the Discourses*. New York: The Modern Library, 1940.

This page intentionally left blank.



## MEDICAL SUPPORT FOR THE FIRE SERVICE: CURRENT PRIORITIES AND ROLES OF PHYSICIANS

M. S. Bogucki, MD, PhD

*Proceedings of the Symposium with Recommendations to the U.S. Fire Administration,  
November 9–11, 1995, Emmitsburg, Maryland*

### SYMPOSIUM PARTICIPANTS

Richard Duffy (IAFF)  
Occupation Safety and Health  
Assistant  
International Association of Fire  
Fighters  
Washington, DC

David Barillo, MD  
Senior Staff  
U.S. Army Burn Center  
San Antonio, TX

Robert M. Bass, MD (NAEMSP)  
Executive Director  
Maryland Institute for EMS Systems  
Baltimore, MD

Sandy Bogucki, MD, PhD (Chair)  
Visiting Scholar  
USFA/National Fire Academy  
Assistant Professor  
Section of Emergency Medicine  
Yale University School of Medicine  
Fire Surgeon, Branford Fire  
Department  
Branford, CT

Captain Richard K. Brooks, III  
Emergency Medical Services

Received July 26, 1996, from M. S. Bogucki, MD, PhD, USFA Visiting Scholar and Section of Emergency Medicine, Department of Surgery, Yale University School of Medicine, New Haven, Connecticut. Accepted for publication October 10, 1996.

Address correspondence and reprint requests to M. S. Bogucki, MD, PhD, Section of Emergency Medicine, Department of Surgery, Yale University School of Medicine, 464 Congress Avenue, New Haven, CT 06519–1315. e-mail: <mary.bogucki@yale.edu>.

Baltimore County Fire  
Department  
Towson, MD  
Jeff Dyar, NREMT-P (NFA)  
EMS Program Chair  
National Fire Academy  
Emmitsburg, MD

Steve Ennis (NVFC)  
Second Vice Chairman  
National Volunteer Fire Council  
Fredericksburg, VA

Alexander Furr (USFA)  
Chief  
Fire Program Coordination Data  
Analysis Branch  
U.S. Fire Administration  
Emmitsburg, MD

John V. Gallagher, MD  
EMS Medical Director  
Phoenix Fire Department  
Phoenix, AZ

Richard Gerkin, MD NFPA 1582)  
Medical Director  
Phoenix Fire Department Health  
Center  
Phoenix, AZ

Jonathan Jui, MD  
Associate Professor  
Department of Emergency  
Medicine  
Oregon Health Science University  
Medical Director  
U.S. Forest Service Region X Fire  
Service  
Portland Fire Department  
Multnomah County EMS  
Portland, OR

Captain Murrey E. Loflin  
Safety Officer  
Virginia Beach Fire Department  
Virginia Beach, VA

Assistant Chief Michael T. Love  
Department of Fire & Rescue  
Services  
Montgomery County  
Rockville, MD

Melissa A. McDiarmid, MD, MPH  
(OSHA)  
Director  
Office of Occupational Medicine  
Occupational Safety and Health  
Administration  
U.S. Department of Labor  
Washington, DC

Randy Marriott, MD, EMT-P  
EMS Physician Advisor  
Premier Health Care Services  
Dayton, OH

Chief Dennis J. Merrifield (IAFC)  
Bayshore Fire Protection & Rescue  
Service District  
Fort Meyers, FL

Daniel J. O'Brien, MD  
Associate Professor  
Department of Emergency Medicine  
University of Louisville School of  
Medicine  
Medical Director Louisville/Jefferson  
County EMS Fire Surgeon  
Louisville Division of Fire  
Louisville, KY

Chief Edward P. Plaugher  
Arlington County Fire Department  
Arlington, VA

## BACKGROUND

Little has been written about the role(s) physicians have played in the fire service throughout history. Traditionally, only large, municipal departments were able to employ the services of a physician; most of those who did were looking for ways to reduce absenteeism, gold-bricking, and overtime. Despite the obvious hazards of the job with its attendant morbidity and mortality, few of the early "fire surgeons" could be considered advocates for fire service personnel.

The early 1970s saw the confluence of a number of developments that would markedly change the face of medical support for the fire service. Landmark legislation directed attention to safety in the workplace, and OSHA became part of every fire chief's lexicon. A variety of agencies began compiling and distributing statistical data relating to the health and safety of firefighters. The medical subspecialty of occupational medicine was evolving, and its practitioners were defining the epidemiology of hazardous occupations, including the fire service, as well as caring for their victims. Through its Redmond Foundation, the International Association of Fire Fighters (IAFF) played a leadership role in this process from its inception. More recently, the National Fire Protection Association (NFPA) has bolstered the initiatives by producing its standard: "Medical Requirements for Fire Fighters" (NFPA 1582).

Concomitantly with occupational medicine, modern EMS was being established, with new capabilities for rapid response, trauma care, and emergency cardiac care. Medical direction of this entity would eventually be the province of the fledgling specialty of emergency medicine, but early on, EMS answered to consortiums of trauma surgeons, orthopedists, and cardiologists. The fire service participated as providers of EMS in many jurisdictions. Fire departments

were already geographically positioned and trained for rapid-response capability, and many had sponsored the rescue squads that were the forerunners of the new systems. From the very first of the IAFF's Redmond Symposia, it was recognized that one of the benefits of including EMS among fire department functions was that it also provided some level of medical support to its own members on the fire ground.

The parallel development of the fields of EMS and occupational medicine, as they relate to the fire service, appears to have resulted in considerable progress in the areas of firefighter health maintenance and safety. It is clear, however, that the occupation is still too dangerous, and that there are remarkable gaps in the medical support available to most fire departments. It is interesting to note that as the disciplines of EMS medical direction and occupational oversight of fire service personnel matured, neither has been truly integrated into fire service administration and operations as the old fire surgeons had. EMS medical directors' attention was primarily directed toward the patients contacted by firefighters rather than the firefighters themselves, and most occupational medical providers had little or no emergency operational experience. This meant that, nationwide, there were very few physicians who actually responded to major incidents, very few physicians who understood fire service operations well enough to contribute to the development of departmental procedures aimed at reducing risk to personnel, and vanishingly few physicians who could serve as advocates for the fire service during negotiations with local municipalities, legislatures, or regulatory agencies.

Unfortunately, these conditions have coincided with a period of unprecedented expansion of fire service functions, most carrying risks at least as great as those previously encountered on the fire ground. It

can now be said that the primary mission of the modern fire service lies in the mitigation of all hazards, rather than centering on fire suppression and prevention. Thus, many specialized operations that could potentially benefit from medical expertise have been incorporated into the fire service. Among others, these include urban search and rescue, hazardous materials incident management, all forms of technical rescue, and many geospecific functions such as wildland fire fighting and marine, ice, and cold water rescue.

The extent of the current inadequacy of medical support for the fire service, as well as some possible approaches to correction, can be appreciated from the results of a survey of fire chiefs attending the 1995 national convention of the International Association of Fire Chiefs (IAFC). When asked to evaluate the on-scene medical support available to their personnel at high-hazard field operations, only 14% of the fire chiefs described it as "adequate," while 39% felt it was inadequate, and 46% had no opinion or did not answer the question. Even more interesting, however, were the predictors of the chiefs' satisfaction with their departmental medical support. Here, the chiefs were asked to express their level of satisfaction with ten individual elements of medical support, spanning a spectrum of EMS medical direction, occupational medicine, and operational assistance. Good predictors of the chiefs' satisfaction with medical support included the presence of a physician "with sufficient understanding of emergency operations to participate in 'SOP' [standard operating procedure] development" and the presence of a physician who is considered an officer in the department. It is important to point out that these fire surgeons and fire officers sometimes were the occupational health providers, sometimes were the EMS medical directors, and sometimes appeared just to be friends of

the department who happened to have MDs after their names. The key determinant seemed to be the relationship between the physician and the department rather than the specialty of the physician.

The establishment of such salutary relationships between physicians and fire departments is made difficult by a number of factors. Many of the nation's 34,000 fire departments are in relatively remote locations that are, themselves, medically underserved. Even when there is not a shortage of physicians in a community, there still may be no specialty-trained or qualified individuals available to oversee the occupational health or EMS functions of the department. Most departments operate under fiscal constraints, which, they feel, preclude obtaining the costly services of appropriate physicians. Departments that are able to contract for occupational health services or to obtain EMS medical direction on either a contract or a voluntary basis do not automatically have adequate medical support.

Physicians who are willing to assist in departmental operations beyond their own expertise have no readily accessible resources from which to learn medical oversight of other fire service functions. In fact, much of the medical science on which such resources might be based does not even exist in the literature. The experience of physicians who have had prior fire service training and those who have been involved with fire service operations during their professional careers have written very little to guide those without such a background.

The symposium on Medical Support for the Fire Service brought together representatives of many of the organizations affected by the current deficiencies. Physicians with experience in medical direction of fire service-based EMS and physicians with experience in occupational medical issues of the fire service comprised the majority of

participants. Fire service leaders, including chiefs of departments, health and safety officers, and EMS officers completed the roster. This group was tasked with generating position statements and recommendations aimed at improving medical support available to fire service personnel. Specifically, ways in which the USFA could augment the ability of departments to recruit physicians and the impact that involved physicians can have, both locally and throughout the fire service, were discussed.

### POSITION STATEMENTS

**1. The following fire service programs and functions were identified as areas that require a physician, or should, optimally, have some form of physician medical support:**

- Occupational Health and Safety Committee (as described in NFPA 1500)
- Physical requirements and personnel fitness programs
- Wellness programs—includes nutritional/dietary issues, smoking cessation, etc.
- Medical requirements—includes initial assessment of new hires, periodic evaluation, and return to duty determination (as described in NFPA 1582)
- Personnel injury and illness policies
- Infection control programs—includes vaccinations, risk reduction, post-exposure follow-up, etc.
- Drug-free workplace and employee assistance programs
- Worker's compensation issues, especially interfacing with managed care organizations
- Planning and emergency response for hazardous materials incidents
- Emergency care and long-term surveillance of personnel follow-

ing exposure to hazardous materials

- Urban search and rescue—planning and operations
- All types of technical rescue—planning and operations
- Critical incident stress management programs
- EMS medical direction—includes the list of 13 responsibilities defined by the American College of Emergency Physicians (ACEP); see Appendix
- Investigation of line-of-duty deaths and serious injuries
- Rehab and medical monitoring of personnel at incident scenes
- Departmental and community-wide "public health" surveillance—ways of detecting phenomena (or clusters of events) that may pose risk to fire service/EMS personnel
- Quality management of all the activities listed above
- Data collection and research to improve performance of all activities listed above—includes ergonomic considerations for injury reduction, and adaptation of equipment to "smaller, lighter, older, etc." personnel
- Recognition of future needs based on expansion or evolution of fire service functions

### Discussion

This list was presented by Chief Dennis Merrifield, representing the IAFC, and amended and refined by the group. From a medical standpoint, these activities can be grouped into those which fall into the discipline of occupational medicine, those which are identified with emergency medicine through its association with out-of-hospital medical care, and those which form a separate category referred to as "fire medical operations." It is important to note (as it was a theme of the symposium) that the use of the word "fire" in this context is a matter of convenience, and should not

be taken literally. That is, the operations are those of the "fire service," but in most jurisdictions the fire service is the emergency response agency charged with the mitigation of all hazards. Thus, "fire medical operations" include all of the relevant activities and functions performed by the fire service, not specifically those relating to fire suppression.

The fire service leadership present recognized some additional priorities for medical support that do not fall under program categories, but require a broader response from the medical community. These included adapting some conventional practices of occupational medicine, rehabilitation/sports medicine, and other medical providers to the specific needs of fire service personnel. For example, a broader understanding of the physiologic demands of fire suppression needs to be incorporated into medical management strategies. Furthermore, a dearth of definitive studies relating to risk of cardiac, pulmonary, reproductive, and oncologic disease in fire service personnel persists despite decades of attempts at such research.

**2. The combined medical needs of the fire service, as described above, are optimally met by multiple physicians whose specialty training and experience prepare them for their specific roles within the fire service.**

### Discussion

It would be very rare to find a single physician whose medical expertise encompasses all of the areas described by the list of fire service activities requiring medical support. Even if there were a cadre of individuals possessing such qualifications, it would not necessarily be desirable to have a single physician attempt to fulfill all of these roles. One important reason for this is the possibility of conflicts occurring when the physician switches roles.

The group strongly endorsed the "Phoenix F. D. model" of medical

support, with its full-time, in-house EMS medical directors and (separate) fire department health center for occupational medicine. The level of expertise available in both of these areas to departmental personnel represents a model that fire departments should emulate where possible. To those who would raise the issue of cost, the symposium participants had two responses. First, there are many creative ways of achieving such a system through volunteerism and/or collaboration with academic and other institutions, and fire departments should be aggressive in pursuing them. Second, many departments need to rearrange their priorities with respect to financial considerations. Personnel must be considered the most valuable asset and the primary investment of any department. In career departments, salaries generally represent the bulk of the yearly budget. In both career and volunteer services, the training, experience, and skills of each responder form the very foundation of the department, and defy placement of a dollar value. As such, "preventive maintenance" of this investment should be accorded a very high priority in the budget process, just as preventive maintenance of expensive apparatus is. Furthermore, risk and liability are reduced by close medical supervision of EMS and rescue operations.

**3. The fire service and medical communities should formalize their mutual commitments to the enhancement of medical support for fire service personnel through the designation and training of fire medical officers (FMOs). An FMO is a physician who is an integral part of the emergency response capability of a fire service and actively participates in its leadership.**

### FMO Qualifications

- Knowledge of fire service-based, out-of-hospital emergency care and occupational medicine by

formal training and/or experience

- Sufficient expertise in hazard mitigation by training and/or experience to allow the FMO to operate safely in emergency environments (consistent with departmental standards)
- Provide medical leadership to the fire service (incorporates direct or indirect supervision of all activities identified in position statement 1)
- Provide liaison between fire and medical communities (includes medical examiner, other consultants)
- Provide medical/technical information (e.g., assist with writing specifications for specialty physician contractors, SOPs)
- Serve as health and safety advocate for fire service personnel
- Provide medical support at incident scenes, as requested by administration
- Represent the department before local government and other groups, as requested by administration

### Discussion

This position attempts to address the gap that is left in medical support for the fire service even when both EMS medical direction and qualified occupational medicine providers are available to a department. Acknowledging that many departments do not have even these basic services available, however, it is also anticipated that FMOs will be instrumental in obtaining expert providers of them for their departments. In other words, the FMO's primary responsibility to his or her department is to serve as a health and safety advocate for its personnel by transforming that department into a more sophisticated consumer of locally available medical services. In the present economic environment, many departments and municipalities contract with "low-bid"

HMOs or outpatient medical centers for occupational medical services. Unfortunately, it is a common practice to advertise occupational/industrial health capability without appropriate training or certification of the medical providers. A department's FMO, being familiar with the physical demands of the job as well as the resources of the local medical community, would augment a chief's ability to obtain the best possible occupational medical support through formal recommendations and by assisting in writing the contract specifications for medical providers. Furthermore, the FMO would continue to contribute by serving as a liaison between contract providers, subspecialty consultants, and the department's administration, which may be uncomfortable converting the medical information provided into equitable decision and policy. If the FMO is appropriately trained and certified in occupational medicine, then he or she might serve as a primary provider of that service, while assisting in the acquisition of the best locally available EMS medical direction through a similar contract process.

The FMO concept centers around the needs of local departments for local physician involvement, and readily adapts to the size, configuration, geography, and financial resources of the department. Where practitioners of all medical specialties and subspecialties are available, the FMO is charged with obtaining the best possible providers for his or her department. In isolated, rural areas, where fire services comprise small, volunteer companies, an FMO may be asked to provide all aspects of medical support for a department where no other medical resources are accessible. In either case, expertise in emergency operations and the various components of medical support will enhance a physician's contribution to the safety and effectiveness of fire service personnel.

For reasons that will become clear later, it is likely that EMS med-

ical directors will eventually constitute a majority of FMOs. It is important to reiterate, however, that the position depends more on interest in, knowledge of, and commitment to the fire service than on a physician's specialty. It is also clear that only a small minority of the nation's 34,000 fire departments will be able to employ and financially compensate an FMO unless the FMO also provides EMS medical direction or occupational medical care.

It was the opinion of the conferees that the effectiveness of the FMO in fulfilling the roles described would be strongly enhanced by stature in the department's administration. There was no attempt to designate a rank range for FMOs as there was agreement that there was too much variability among departments for such a recommendation to be meaningful. The group emphasized the importance of the FMO participating in the departmental leadership at the policy-making level. Without this level of involvement, there is a danger that the FMO and the other members of a department's administration will not fully understand the constraints under which each is forced to operate. Moreover, cultural change within an organization, e.g., reordering priorities to emphasize personnel health and safety, is most effectively promoted by individuals who have been fully assimilated into the culture. Finally, a paradigmatic shift from the traditional hierarchical organization of departments to a matrix-type concept of organization was advocated because it would better accommodate the complex reporting relationships inherent to physicians working within fire departments.

**4. The USFA should actively participate in the effort to improve medical support for all aspects of fire service operations. Its leadership confirms the integration of EMS and management of a broad**

**spectrum of hazardous emergencies into the essential mission of the fire service. The USFA, with its national perspective and constituency, would be the most effective representative of the fire service in the formation of partnerships and alliances with the professional medical organizations.**

The following specific recommendations are offered to the USFA to begin implementation of this initiative:

- Compile and publish a Sourcebook for Physicians in Fire Departments
- Establish a modular sequence of courses with USFA's National Fire Academy (NFA) leading to a national FMO designation
- Establish an "electronic clearinghouse" for medical literature relevant to fire service operations
- Adapt the National Fire Incident Reporting System (NFIRS) database to generate more usable EMS, and health and safety information

### Discussion

Publication of a "Sourcebook for Physicians in Fire Departments" was seen as an urgent, immediate need both for physicians currently working with the fire service and for departments' ability to recruit support from local medical communities. Steve Ennis, representing the National Volunteer Fire Council (NVFC), emphasized the value of such a product to his constituents, and the importance of including all aspects of medical support in the text. This would facilitate the recruitment of physicians without prior expertise in either EMS medical direction or occupational medicine to assist in fire service operations in areas where there is a shortage of physicians trained in the relevant specialties.

The group suggested this sourcebook be organized in a multi-author format with editor(s) to ensure con-

sistency of style. It should consist of chapters covering key content areas written in synopsis style, and emphasizing the best available references for further reading. Individual chapters would be devoted to medical and emergency operational topics, and would, ultimately, cover most of the activities described in the first position statement. Combined with appropriate indoctrination by local departments, this sourcebook should serve as the basis for the entry of interested physicians into medical support of local fire service operations.

The proposed FMO program for the USFA/NFA bears some superficial similarity to the Executive Fire Officer (EFO) program, but has some important distinguishing characteristics. The FMO program would consist of curricular modules encompassing similar content areas to the chapters in the Sourcebook. These modules must be either 1) designed to be completed in one- or two-day sessions, which can be tacked on to national or regional professional meetings; or 2) designed for delivery in a "distance learning" format, e.g., by teleconference or on-line interactive sessions. Furthermore, it is suggested that the modules be both developed and delivered in collaboration with agencies with established content expertise. For example, the EMS medical direction module might be developed and delivered by the USFA/NFA in collaboration with the National Association of EMS Physicians (NAEMSP) and the National Highway Traffic Safety Administration (NHTSA); the occupational health and safety module with the Redmond Foundation of the IAFF, OSHA, and/or the NFPA; the operational considerations at emergency incidents with the IAFC, etc.

The various modules should be designed as stand-alone courses, each addressing the essential topics specific to medical support of all types of emergency operations. In this way, they can be made avail-

able to the largest possible audiences. That is, access to the courses would not be limited to those willing to commit to the entire FMO sequence.

The group's emphasis on research and development in the areas of medical support for the fire service was evidenced by the inclusion of a research requirement prior to completion of the FMO sequence. This research would be designed and performed in the local setting, with supervision by either USFA/NFA through the program's leadership, or a local academic medical center. The USFA/NFA would define the commitment of the local fire department to the FMO through the use of general prerequisites for entry into the FMO program. In other words, it would be the local department's responsibility to ensure that an FMO candidate had met state requirements for emergency scene personal safety, including such benchmarks as hazardous materials (hazmat) first responder-operational.

A further word should be added here about the medical direction sections of both the FMO sequence and the Sourcebook. The increased numbers of departments performing EMS functions, and the new requirements for physician medical direction of all prehospital providers, including BLS and first responders, should be viewed as a vital opportunity for the fire service. In the communities that do not have qualified emergency medicine physicians already experienced in EMS medical direction, the fire service should consider providing the necessary training to physicians willing to provide these services. By taking on this responsibility, the fire service also gains the opportunity to influence the content of such training. On a national level, the same influence should be exerted by the fire service on medical direction curricula even for specialty trained emergency physicians. In this way, physicians can be prepared to oversee the

broader scope of fire service-based EMS activities such as medical monitoring at hazmat incidents, participation in technical and/or protracted search and rescue operations, and supervising rehab and medical surveillance on the fire ground. As has been seen in so many recent incidents, there is a tremendous need for physicians to understand the full spectrum of emergency operations performed by local fire services, and to be present so that new risks that may not have been previously encountered can be anticipated and/or mitigated on scene. In addition, the IAFF points out that the FMO model would facilitate resolution of its objections to some of the wording in ACEP's medical direction policy statement (Appendix). This is because the FMO is a participant in (rather than a dictator to) departmental administration regarding communications standards, dispatch protocols, mutual aid, multiple casualty incidents, hazmat response, etc.

The establishment of an "electronic clearinghouse" for medical literature that impacts medical support for the fire service helps to build a scientific foundation for the practice of physicians in the fire service. The clearinghouse is envisioned as an on-line resource headquartered in the Learning Resource Center (LRC) at the USFA/NFA. Initiation of this service would entail a grant or contract to a graduate student in either a fire science program or an information systems program, or perhaps, a medical resident or fellow. The process would probably begin with scans of NIOSHTIC, MEDLINE, and other databases, and simply identify titles and abstracts of articles in the medical literature that relate to medical support of emergency responders. It is hoped that this concept would eventually grow, probably through collaboration with additional agencies having shared interests, to become a fully annotated listing of titles, content, and quality of the literature. The devel-

opment of this resource is considered essential to the realization of the full potential of large-scale physician involvement in the fire service, but it involves a considerable outlay of funds, and would require planning and implementation over future budget cycles.

Finally, the participants in this symposium unanimously urged the USFA to seize the opportunity presented by the current NFIRS revision process, and include data collection regarding the nature and outcomes of fire service EMS functions. Depending on the jurisdiction, EMS typically comprises 65-80% of a fire department's call volume, yet no useful data whatsoever are presently collected on this aspect of fire service operations. It is simply intuitive that departments need feedback on their impact in this arena, just as much as in the fire suppression arena. For example, it would be incredibly useful for departments to be able to cite both local and national success rates using automated defibrillators when requesting more of them during budget hearings. This not only is true of equipment evaluation, of course, but also would serve to identify targets for community and national prevention programs

such as the highly successful one to decrease life and property loss due to fires. Furthermore, such data would delineate the true breadth of fire service activities both locally and nationally, facilitating recognition of training, equipment, and staffing priorities.

Once again, however, the participants encouraged the USFA to recognize the opportunity to take its rightful place as the lead agency for the largest and most diverse EMS delivery system in the country. Here, the group was referring to the overwhelming need for the types of data just described throughout the EMS industry. Progress in out-of-hospital care is being hindered by the universal inability to collect large volumes of EMS data across geographic, jurisdictional, and system boundaries. The USFA has the resources already in place to respond to this need, and could do so virtually without any unplanned expenditure. The group agreed upon a one-page, check box-style data form for EMS encounters. A sample has been formatted by Dr. Bass, the NAEMSP representative, and Dr. Bogucki with data points that also conform to NHTSA's national data set. The data content advocated by the symposium partici-

pants has been incorporated by the USFA data group, and will be reflected in the NFIRS iteration currently scheduled for implementation in 1998. Since the symposium, several groups of EMS providers and leaders, including EMS management class participants at the USFA/NFA, have been informally polled regarding predicted levels of compliance with such a form. Like the symposium attendees, all groups have unanimously agreed that the benefits accrued by participation and compliance with this initiative would serve as adequate incentives to ensure widespread cooperation.

The participants in the symposium thank the USFA for their interest in this important topic, and for their sponsorship of the project. They offer their services to these agencies as further writers and developers of the concept, and look forward to the inevitable improvements in all phases of fire service operations that will result from these initiatives. All agency representatives agree to brief their respective organizations on the outcome of these meetings, and will encourage further collaboration that could lead to realization of these proposals.

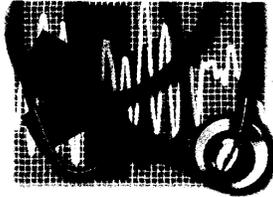
APPENDIX

*Responsibilities of EMS Medical Direction, Reprinted from the ACEP Policy Statement: Medical Direction of Prehospital Emergency Medical Services, Approved by the ACEP Board of Directors, October 1992*

To optimize medical direction of all prehospital emergency medical services, physicians functioning as medical directors should, at a minimum:

1. Serve as patient advocates in the EMS system.
2. Set and ensure compliance with patient care standards, including communications standards and dispatch and medical protocols.
3. Develop and implement protocols and standing orders under which the prehospital care provider functions.
4. Develop and implement the process for the provision of concurrent medical direction.
5. Ensure the appropriateness of initial qualifications of prehospital personnel involved in patient care and dispatch.
6. Ensure the qualifications of prehospital personnel involved in patient care and dispatch are maintained on an ongoing basis through education, testing, and credentialing.
7. Develop and implement an effective quality improvement program for continuous system and patient care improvement.
8. Promote EMS research.
9. Maintain liaison with the medical community, including, but not limited to, hospital, emergency departments, physicians, prehospital providers, and nurses.
10. Interact with regional, state, and local EMS authorities to ensure that standards, needs, and requirements are met and resource utilization is optimized.
11. Arrange for coordination of activities such as mutual aid, disaster planning and management, and hazardous materials response.
12. Promulgate public education and information on the prevention of emergencies.
13. Maintain knowledge levels appropriate for an EMS medical director through continued education.

This page intentionally left blank.



## STREET LAW

## Whose License Is It Anyway?

By James O. Page, Esq.



IN THE LATE 1960S, WHILE MOST OF TODAY'S EMS medical directors attended grammar school, a new category of health care worker was devised. Somebody called them "paramedics"—and the name stuck. At the time, they did things in the field that even nurses weren't permitted to do in hospitals.

Largely due to the popularity of the TV series "Emergency!," public demand for paramedics outpaced the normal processes of legislative approval. In fact, a study conducted in 1975 showed that paramedics were functioning in 25 states before any authorizing laws or regulations were adopted.<sup>1</sup>

#### The myth: These paramedics practice under my license

Most early paramedic programs were created at the behest of physicians who believed in taking advanced life support (ALS) procedures to ill and injured people (rather than waiting for the patients to arrive at a hospital). When confronted by the absence of authorizing laws or regulations—and the long process required for getting such laws passed—many pioneering physicians had an easy answer: "These paramedics practice under my license."

Thus began an American myth that has survived at least two generations of EMS medical directors. In 1999, a medical doctor who says, "paramedics operate under my license," quite frankly, is out of touch. Some try to justify this opinion with the belief that the vague and oft-abused concept of medical control extends to ultimate control of a paramedic's license or certificate.

Except in two states, medical doctors never could delegate the duties and responsibilities of their license to other people. In Connecticut prior to September 1975, it was presumed that an exemption in the Medical Practice Act for physician assistants also applied to prehospital paramedic personnel. New Hampshire had a similar exemption. To the extent that these laws linked paramedics to the supervision and control of specific physicians, it might be said they were practicing under the doctors' license.

A license grants conditional authority to a named individual. The authority is limited to those powers and privileges specifically named in a law (such as the Medical Practice Act). Except for laws authorizing physicians and surgeons to sponsor and be responsible for physician assistants and nurse practitioners, no law empowers them to allow anyone else to "operate under my license."

#### Governing regulations

Over the years, every state has developed a regulatory mechanism for ALS field providers. Although there are dozens of official

titles—from Advanced EMT and EMT-Advanced to Mobile EMT and Mobile Intensive Care Technician—the term *paramedic* remains the label that most people recognize.

Most states regulate paramedics through certification or licensure. Some states treat licensure as though it were certification, and vice versa. Regardless, the authority to function as a paramedic constitutes a personal relationship between the state and the licensed (or certified) individual. When it appears a paramedic may threaten public health and safety, an EMS medical director has the right and responsibility to take appropriate action. The medical director could refuse to allow the paramedic to operate under the authorizing protocols that bear their signature. If that refusal costs the paramedic their job (a property right), they are entitled to due process.

More commonly, the medical director will seek an investigation and request disciplinary action from the authorizing agency (the state health department in most places). While the local EMS medical director may serve as a complainant and a witness in hearings or other due process proceedings, an unbiased third party (usually an arbitrator, hearing officer or administrative law judge) must make the ultimate decision.

If paramedics worked under a physician's license, the state would not issue a certificate or license. The paramedic's right to practice would be subject to the physician's permission. The physician could sever the relationship at will, without affording the paramedic due process. Many licensed paramedics have been unpleasantly surprised by the burdens that come with licensure. Because it's a personal relationship between them and the state, if action is taken to suspend or revoke that license, a long and expensive process will ensue. Usually, it's the same process that physicians go through (and pay for) when their licenses are in jeopardy.

During the 30 years since America's first paramedics took their knowledge, skills and tools to the street, they have been treated much like kids in the middle of a custody dispute. One of the most extreme arguments is that they operate under their medical director's license. At the other extreme are those who claim paramedics should be able to function as free agents. The best interests of patient care lie somewhere between the extremes. And virtually all state laws take that middle road. ■

*Jim Page is the founder of JEMS. He has been a member of the California Bar since 1971 and has written and lectured extensively on legal issues related to EMS.*

#### References

1. National Study of Paramedic Law and Policy (1975-76). Lakes Area Emergency Medical Services. (Jems library reference No. 000479.)

Disclaimer: This column is not a substitute for individualized legal advice in the confines of an attorney-client relationship. If you need advice about a specific legal situation, consult an attorney.

This page intentionally left blank.

EMS 2000 Part I

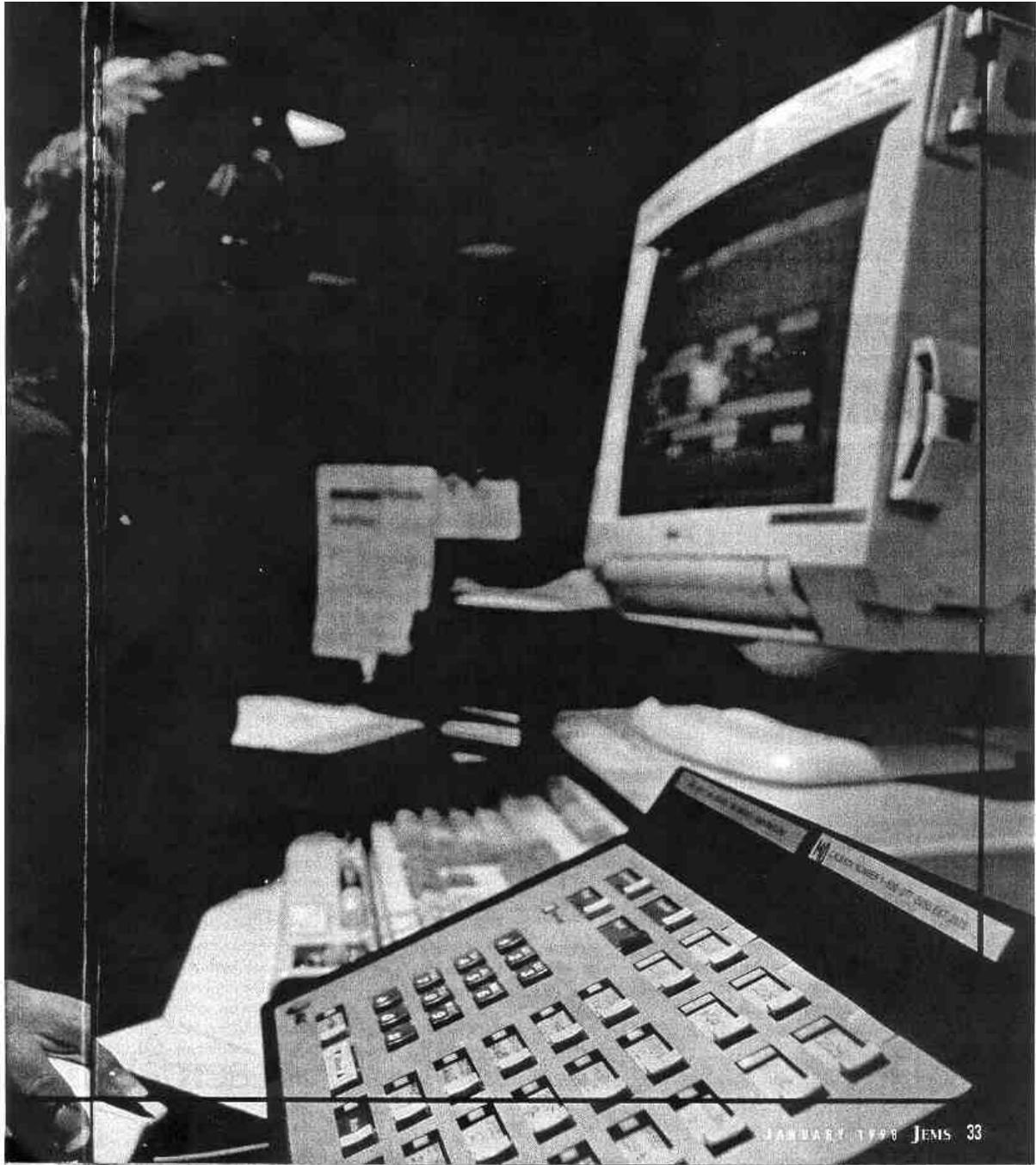
HIGH-TECH

TRIAGE

BY MARION ANGELL GARZA  
PHOTOGRAPHY BY SARI MAKKI

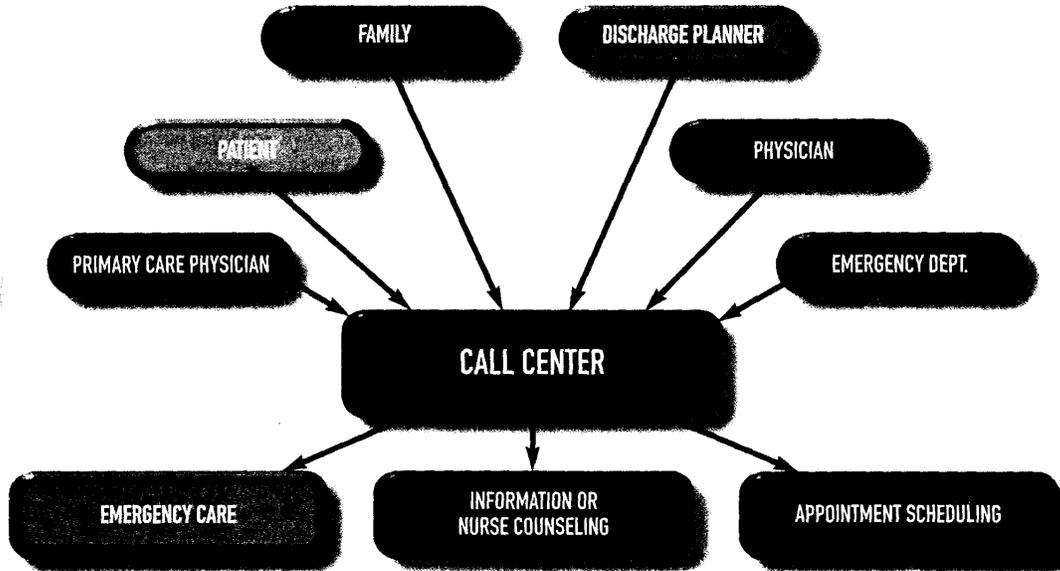
**Pathway management services  
promise patients the right health care,  
at the right time, at the right place,  
from the right provider—at the right price.  
Do they deliver?**

EMS MUST TRANSFORM TO SURVIVE. MANAGED CARE IS RESHAPING THE HEALTH CARE landscape. The federal government is cutting ambulance service reimbursement from multiple directions. The majority of fire service activity has shifted from fire suppression to medical assistance—due to the success of fire-prevention programs, and many departments now compete for patient-transport contracts. Recognizing that such change represents opportunity as well as danger, far-sighted ambulance company executives and fire chiefs are laying the groundwork to parlay their strengths—sophisticated communica-



# AM Pathways Triage Process

EMS IN THE 21ST CENTURY

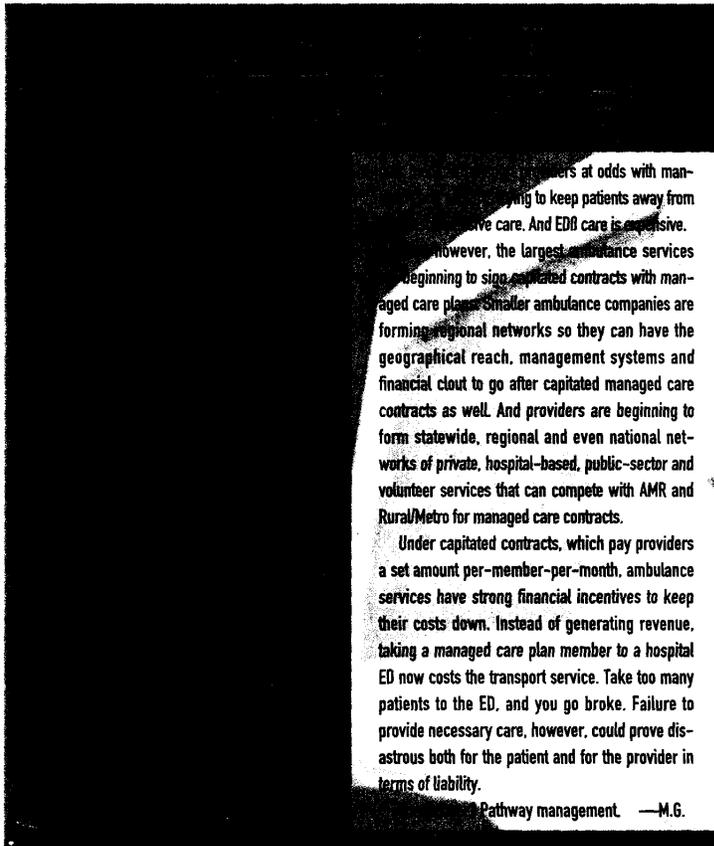


Source: American Medical Response AM Pathways

tion, information and deployment systems, fleets of medically equipped vehicles and well-trained emergency personnel—into expanded roles that will allow them to survive and thrive.

Although it's not yet clear just how this will shake out—or exactly what impact it will have on medics—EMS providers are developing a wide spectrum of new services to sell to managed care organizations, health plans, physician groups and anyone else who wants to pay for them. These “pathway management” services (also called “demand management,” “access management,” “access coordination,” “episodic care management” and “unscheduled care management”) are being marketed with the promise of ensuring that patients get the right health care, at the right time, at the right place, from the right provider—and at the right price.

Pathway management includes such call-center services as triage, nurse advice, appointment scheduling and emergency and nonemergency ambulance dispatch. When fully developed, it will encompass a full range of medical transport services—from taxis to helicopters. On-scene triage is a crucial part of the plan. And in some places paramedics and/or nurses, physician assistants and even physicians will treat patients on scene or make scheduled



...ers at odds with man-  
 ...ing to keep patients away from  
 ...ve care. And ED care is expensive.  
 ...however, the largest ambulance services  
 ...beginning to sign capitated contracts with man-  
 ...aged care plans. Smaller ambulance companies are  
 ...forming regional networks so they can have the  
 ...geographical reach, management systems and  
 ...financial clout to go after capitated managed care  
 ...contracts as well. And providers are beginning to  
 ...form statewide, regional and even national net-  
 ...works of private, hospital-based, public-sector and  
 ...volunteer services that can compete with AMR and  
 ...Rural/Metro for managed care contracts.

Under capitated contracts, which pay providers a set amount per-member-per-month, ambulance services have strong financial incentives to keep their costs down. Instead of generating revenue, taking a managed care plan member to a hospital ED now costs the transport service. Take too many patients to the ED, and you go broke. Failure to provide necessary care, however, could prove disastrous both for the patient and for the provider in terms of liability.

Pathway management. —M.G.

EMS IN THE 21ST CENTURY

house calls. Ultimately, some ambulance company executives even plan to expand pathway management into the emergency department (ED) and into a whole new realm of "disease management" services.

"We are integrating EMS into the health care system in a way people never envisioned a few years ago," says Don Jones, JD, MPH, a former vice president of Laidlaw's MedTrans and of Health-Cap, a large physician practice management company.

"We're talking about leveraging our position at the front end of the system to save billions downstream," says EMS consultant and systems expert Jack Stout, who is developing a national network that can compete for pathway management contracts. "The demand for all this exists, but the provider side has not been ready."

Until now.

American Medical Response has created a division called American Medical (AM) Pathways to develop new programs and to negotiate contracts with managed care organizations. Rural/Metro is involved in multiple demonstration projects around the country related to "managing unscheduled, episodic care." Both AMR and Rural/Metro are engaged in research projects to determine if and how expanded services can cut health care costs while safeguarding—and hopefully improving—patient care and outcomes.

**Oregon to Ohio**

Although private ambulance companies take the lead, fire departments are beginning to get involved in pathway management as well. In the Portland, Ore., area, for example, paramedic first responders from two fire depart-



"THE NURSE MIGHT HAVE YOU ON THE LINE FOR 20 TO 30 MINUTES GIVING YOU INFORMATION. MANY PEOPLE HAVE CONCERNS THAT DON'T TAKE HOURS SITTING IN AN ED TO ADDRESS."

—BETTY TILL,  
EMCARE

"THE SERVICE COMBINES THE STRENGTHS OF EMS, WHICH IS QUICK AND DIRECT, AND THE MORE NURTURING APPROACH OF NURSE ADVICE AND COUNSELING."

—GLEN LELAND, AMR



ments are participating with AMR and Oregon Health Sciences University in a pathways-related study designed to see how well ALS first responders and medical dispatchers agree on patient conditions and on required treatment. "We're having the field crews do what they normally do on scene, then when they come back they open the dispatch file and compare what the dispatchers asked and what they saw on scene to see if there's a match," explains Marley Drake, EMS program manager for the Portland Fire Department.

In California, several county EMS agencies have restructured to provide pathway management services, using both public and private EMS providers for on-scene triage and perhaps treatment. In Alameda County (across the bay from San Francisco), a pathway-management plan devised by a working group including representatives from local fire departments, AMR (the local ALS provider), hospitals, emergency physicians and managed care groups, is becoming a reality. Alameda County EMS and AMR convinced Rep. Pete Stark to introduce legislation in Congress (passed as part of the Balanced Budget Act of 1998) that will allow three counties (one of them probably Alameda County) to receive Medicare reimbursement even if patients are not transported. The county EMS agency will be paid a lump sum in advance, then will broker the funds to providers who triage, treat and/or transport patients to EDs or elsewhere. To accomplish this, Alameda County will use a new Emergency Triage (ET) and dispatch system, designed to access patients by phone and on scene, as well as get emergency callers the proper care and/or transport. The ET program will be integrated with a new Non-Emergent Triage (NET) system designed to link nonemergency callers with the proper services. EMS providers nationwide have begun forming networks that allow them to pool their resources and go after managed care contracts and device pathway management programs. So far, most of these networks have been confined to the private sector. But that may be changing.

In Southwest Ohio, for example, 29 fire departments (including volunteer services) have formed the Miami Valley Fire/EMS Alliance. In November, the Alliance began providing on-scene triage and emergency transport for CareNow of Greater Dayton, a new pathway management service organization created by a hospital association and a physician group, Premier Health Care. "We have watched AMR (Pathways) closely, and their model is very close to our model," says emergency physician Jim Augustine, MD, FACEP, president and chairman of the board of CareNow. He says that CareNow ultimately will "direct all unscheduled care activities in the Dayton area," including pathway management telephone services, transportation, urgent care, ED and home care services.

EMS consultant Tom Scott, MA, predicts that all EMS systems eventually will be forced to get into pathway management at some level, even if it's just providing advanced triage in the 9-1-1 center and/or linking with a nurse advice service. "We're becoming a care-coordination center for someone who is having an acute medical event of some sort," says Scott.

### Manage the Emergency Call

Pathway management starts with "capturing" telephone calls that come in to 9-1-1 and other emergency numbers, as well as calls that come in via managed care plans' toll-free and seven-digit numbers and medical advice lines. Some pathway management services also handle private physicians' after-hours calls and telephone calls to EDs from patients seeking advice.



Millions of Americans now have access to medical advice ("nurse advice") phone services, mostly through their health plans. The largest such service, Access Health Inc., holds contracts to provide telephone consultation on health care issues to some 20

"THE ONLY OPTION NOW IS TO TAKE THEM TO THE HOSPITAL OR LEAVE THEM AT THE SCENE."

—TOM SCOTT, EMS CONSULTANT

EMS IN THE 21ST CENTURY

million plan members. The huge Access Health switchboard in Colorado is staffed by nearly 100 nurses at a time, who answer calls from all over the United States.

Rural/Metro has established a strategic partnership with the second-largest medical advice company, National Health Enhancement Systems (NHES).

"We bought almost 10 percent of their company and have a seat on the NHES board of directors," says Dave Lindberg, Rural/Metro's national director of managed care. "Our alliance with them is to develop new products together." The first joint Rural/Metro-NHES product will likely appear in San Diego, where a Rural/Metro-fire department partnership took over the city's emergency ambulance service on July 1, 1997. "We've concentrated on getting the system up and running, but are now starting to look at what to do with managed care," says Lindberg. "The city said the new contractor must develop ways to reduce unnecessary utilization, and we fully intend to use NHES for nurse advice and triage in conjunction with that." Lindberg acknowledges that Rural/Metro is involved with a number of demonstration projects around the country to develop EMS solutions for managed care. But he says the company cannot talk about them until mid-1998 because of "nondisclosure agreements with strategic partners" and the need to safeguard "proprietary information."

"WE KNOW WHO NEEDS TO BE IN AN ER, AND WE CAN KEEP PATIENTS OUT OF THE ER WHO DON'T NEED TO BE THERE."

—BRAD SCHWARTZ,  
MEDAMERICA ONCALL



AMR, on the other hand, is quite willing to talk about AM Pathways. AMR has opened three Pathways call-taking centers so far—in Denver, Miami and New Haven, Conn.—and plans to launch four more. "We started taking calls from the members of several health plans in May," says Glenn Leland, AMR vice president for strategic development, who describes pathway management as "a health care access and navigation tool." The first seven contracts give some 900,000 people access to AM Pathways, he says.

"We are capable of doing the same things we've done with 9-1-1 calls, so we can get an ambulance if you need it," says Betty Till, EmCare vice president of corporate communications and former AM Pathways vice president for quality, education and communications. "But we can also determine if you don't need an ambulance, then do a more detailed secondary triage and get you to a more appropriate level of care." The most appropriate care might mean scheduling the patient to be seen later by a primary care physician, referring the patient to a clinic (then calling to make sure the patient was seen) or linking the patient with

*EMS IN THE 21ST CENTURY*

AM Pathways' nurse advice component. "The nurse might have you on the line for 20 to 30 minutes giving you information," says Till. "Many people have concerns that don't take hours sitting in an ED to address."

The way it now works, managed care plan members dial a seven-digit or toll-free number to reach AM Pathways. "There have been some discussions with communities about using Pathways as an adjunct to their 9-1-1 systems, so if a nonemergency call comes in to 9-1-1 they can get triaged appropriately," says Leland.

Callers to an AM Pathways center first reach a paramedic or EMT who has been trained as an emergency medical dispatcher (EMD). These EMDs use Medical Priority Dispatch System-Omega protocols (currently, only used by AM Pathways and by the city of Montreal) to perform primary triage. "If we determine the call is an emergency, we provide prearrival instructions," says Leland. If the EMD decides the call is not an emergency, secondary triage is provided by a registered nurse, physician assistant or nurse practitioner. According to Leland, the service "combines the strengths of EMS, which are quick and direct, and the more nurturing approach of nurse advice and counseling."

However, AM Pathways does not have the only EMS-related call center. In Maine, MedComm Medical Access Point went online last summer. "When it is fully realized, it will be a fully integrated nurse-advice, ambulance-dispatch and medical-control center," says MedComm chief executive officer Kevin McGinnis—formerly Maine's state EMS director. MedComm is going after managed care contracts, and already provides such services as after-hours telephone coverage for physician practices (even scheduling appointments) and physician referrals and post-discharge follow-up for institutions. Eventually, MedComm will offer EMD services or EMD training to small 9-1-1 public safety answering points (PSAPs) and will even provide 9-1-1 dispatch for smaller ambulance services. "We will be able to send the correct ambulance, or if one is not needed, send the call to our nurse," says McGinnis.

"Our Medical Access Point is the only one that on a statewide basis can link the caller to



“WE FEEL IT’S VERY IMPORTANT THAT WE FRONT-END THE SYSTEM WITH A LIVE VOICE AND WITH SOMEONE WHO IS ABLE TO DETECT AN EMERGENCY, AND THAT THE CALLER CAN BE AUTOMATICALLY CONNECTED TO THE APPROPRIATE AMBULANCE SERVICE.”

—KEVIN MCGINNIS, MEDCOMM

the appropriate ambulance service,” he adds. “We feel it’s important that we front-end the system with a live voice and with someone who is able to detect an emergency, and that the caller can be automatically connected to the appropriate ambulance service. If you tell someone to hang up and dial 9-1-1, they may fall through the cracks and die.”

According to Stout, only about 12 percent of calls to 9-1-1 and other emergency numbers are for true emergencies. “We know when these life-threatening calls come in, and they will get an emergency response, as they do today, and go to the ED,” he says. “But it should also be pointed out that about 12 percent of the non-9-1-1 calls are also life-threatening. If the same people answer both emergency and nonemergency calls, they can be run through the same algorithm to see which calls are actually life-threatening.”

### The Docs

Brad Schwartz, MD, FACEP, is co-founder and medical director of MedAmerica OnCall, which bills itself as “a full-service demand management system for emergent and urgent care.” The Southern California-based service (a subsidiary of MedAmerica, a large physician-practice management company) provides phone triage, phone advice, patient repatriation, disease management services, workers’ compensation reporting and patient-care authorization services to clients nationwide. It also handles calls to EDs for medical advice. “The American College of Emergency Physicians has a policy that ED staff should not give advice over the telephone,” says Schwartz. “We try to fill that need.”

“No one knows triage better than emergency physicians,” insists Schwartz, who is also the medical director for AMR’s San Diego County operations. “We know who needs to be in an ER, and we can keep patients out of the ER who don’t need to be there,” he says.

Emergency physician Augustine says, “We have worked through the issue of trying to keep people out of the ED. But there’s a less publicized but serious problem of people fearing to go to the ED—for chest pain, stroke, ectopic pregnancy, pains in their head—because they fear it won’t be paid for.”

While such telephone triage services can fill many gaps, pathway management services will only reach their full potential once they can capture and triage 9-1-1 calls for medical assistance. “If you can’t control the calls at the 9-1-1 center, you have to spend a lot of time convincing people to call another number,” says Scott. The public sector now controls most 9-1-1 centers, but private-sector pathway managers may start competing for contracts to operate PSAPs. In fact, Rural/Metro recently began operating a 9-1-1 PSAP in Pennsylvania. Most likely, however, you’ll see public-private partnerships developing to handle 9-1-1 calls.

Jones expects the public sector to continue answering 9-1-1 calls, since many callers want police or fire department services. But he also envisions regional secondary PSAPs for all medical calls. “I think some examples will appear around the country where more services are provided to the 9-1-1 caller,” says Jones. “They will work and people will start copying them.”

### New Roles for Medics?

While much disagreement abounds regarding what part paramedics and EMTs will play in this new expanded EMS, experts agree that medics will have an important role in triaging patients. Pathway management will give paramedics and EMTs more options for patients who don’t need to go to the hospital. “The only option now is to take them to the hospital or leave them at the scene,” says Scott. In the future, field providers will be able to call the patient’s primary care physician, have the call center provide the patient with medical advice or schedule an appointment. Ideally, medics will treat patients on scene or transport them somewhere other than to an ED.

If primary and secondary triage at the call center fail to conclusively rule out a potentially serious condition, an EMS assessment team can be sent to the scene. “If a paramedic gets to the scene, the medic would be able to assess the patient and see if the patient needs to go to the hospital,” says McGinnis. “If not, they would be able to immediately link with a triage nurse who would work with the patient to find the best source of care.”

“The medics will be given the information already gathered, and told what other information is needed to determine when and where the patient should be treated and the mode of transport needed,” says McGinnis. To gather information that can help determine the most appropriate care for the patient, field personnel might take a blood pressure, put on a 12-lead ECG, take a throat culture or draw blood.

Stout stresses that in such situations, paramedics are not diagnosing the patient. “They are just gathering facts and information and feeding it into an algorithm,” he says. And such a role, he insists, requires no new laws or enabling legislation. “People call 9-1-1 to find out if they need to have called,” says Stout. “What they get now is a very expensive ride to a very expensive place to get that answer. And very often the answer is ‘no.’”

### Beyond the Call Center, Beyond the Street

“Pathway management saves money downstream by increasing the quality—and cost—of call-taking upstream,” says Stout. “If we don’t participate in the payment for downstream services, we can’t afford to do it.”

To meet that challenge, some ambulance companies and provider networks are positioning themselves to manage the entire spectrum of “episodic” health care. Besides triaging phone calls and providing advice, appointment scheduling, on-scene care and the most appropriate transport, the mobile health care provider of the future wants to handle the patient’s care in an urgent care center, emergency department or at home. But more on that—and on what these new services might mean for EMS field providers—in “EMS 2000 Part II” in the February issue of *JEMS*. ■

*Marion Angell Garza is editor of the EMS Insider, the management newsletter published by Jems Communications.*



## EMS SYSTEMS AND MANAGED CARE INTEGRATION

Kristi L. Koenig, MD, Angelo A. Salvucci, MD, Brian S. Zachariah, MD,  
Robert E. O'Connor, MD, MPH

Managed care organizations (MCOs) and EMS systems share the common goal of providing health care that is appropriate and timely. Despite this common thread, each has distinct priorities and incentives. Cooperation between EMS and MCO systems is required to preserve the emergency health care safety net.

Dr. Koenig is consultant, Accident & Emergency Department, St. George's Hospital, University of London, London, UK, director of prehospital & disaster medicine, Highland General Hospital, and associate professor of medicine, University of California at San Francisco, San Francisco, California. Dr. Salvucci is medical director, Emergency Medical Services Agencies, Santa Barbara and Ventura Counties, California, and clinical instructor in emergency medicine, Los Angeles County/USC Medical Center, Los Angeles, California. Dr. Zachariah is assistant professor, Division of Emergency Medicine, and medical director, Emergency Medical Services, University of Texas Southwestern Medical Center, Dallas, Texas. Dr. O'Connor is chair, NAEMSP Standards and Clinical Practice Committee, medical director, State of Delaware EMS, and research director and associate clinical professor, Department of Emergency Medicine, Medical Center of Delaware, Newark, Delaware.

Approved by the NAEMSP Board of Directors July 12, 1997. Received July 15, 1997; accepted for publication July 16, 1997.

Address correspondence and reprint requests to: Kristi L. Koenig, MD, Director of Prehospital and Disaster Medicine, Department of Emergency Medicine, Alameda County Medical Center, Highland General Hospital, 1411 East 31st Street, Oakland, CA 94602. e-mail: <kristik@hghed.com>.

Managed care organizations operate under the evolving paradigm of health care financing: capitation.<sup>1</sup> In this manner, a set fee is paid prospectively to providers; any expense incurred in excess of the plan's capitated rate represents a loss to the provider. The provider is given an incentive to provide cost-effective medical care to the health plan's members. This is largely accomplished by emphasizing preventive health maintenance and attempting to accurately match resources to medical need.

On the other hand, EMS systems were established to provide rapid episodic emergency health care access, regardless of the patient's location or financial status. EMS system design emphasizes preparedness, which is extremely difficult to quantify. This paper is intended to guide those involved with EMS systems and MCOs to make sound decisions that preserve access, quality, and integrity in emergency health care.

### POSITION

The National Association of EMS Physicians (NAEMSP) believes in the following principles:

1. The highest priority of EMS systems is to provide immediate medical care and transportation to persons with a perceived medical emergency.

2. Current EMS practice is based on the best available information. Any EMS service changes must be evidence-based to the greatest possible extent. Quality improvement and validation studies are necessary to ensure the safety of nontraditional triage, response, and destination algorithms.

3. The integrity of current 911 systems must be maintained and system fragmentation discouraged. The public should be encouraged to utilize 911 systems whenever a perceived medical emergency exists, as determined by a prudent layperson.

4. Calls received by EMS that involve nonemergency health care advice may be directed to appropriate alternative resources. These resources may involve an MCO or other health service resource.

5. Mandatory preapproval for accessing EMS via 911, and retrospective denial of payment based on the final diagnosis, is medically unsound, and therefore unacceptable.

6. A collaborative effort between MCOs, physicians, and EMS systems is essential to educate the public on the appropriate use of 911. Such a collaborative approach should provide a

- cost-effective, medically appropriate service that will meet the patient's and community's emergency health care needs.
7. Coordination between EMS systems and MCOs should be accomplished with the participation of the entire community, including physicians, out-of-hospital care personnel, out-of-hospital provider agencies, local EMS agencies, hospitals, educational institutions, public health agencies, patients, consumers, and MCOs.
  8. EMS systems must continue to have independent and qualified medical oversight of all medical and operational policies and procedures, including triage, dispatch, patient care, and destination protocols.<sup>2</sup>
  9. EMS systems must provide prompt quality patient care and, when medically indicated, rapid transport to the closest appropriate facility. While the patient's MCO affiliation is one of several valid factors that helps to determine the appropriate destination, the emergency health care needs of the patient are paramount.
  10. Complying with the needs of an MCO need not result in differing standards of care within the community, based on insurance status. A single standard of care within the community is imperative.
  11. A clearly designated physician must have oversight authority and responsibility for each interfacility transfer. EMS systems should establish interfacility transfer protocols that define the responsible agency or agencies. All transfers must be made in accordance with patient care needs, preestablished medical standards, and local, state, and federal laws.
  12. Strategies to develop funding mechanisms for EMS systems should acknowledge that MCO subscribers represent only a fraction of the lives covered by EMS. Innovative funding approaches should facilitate alignment of the incentives of MCOs, other third-party payers, and EMS systems.
  13. Managed care may create changes in the workplace for EMS. Employers must take necessary steps to meet the operational, educational, and fiscal duties that are attendant to such change.

### DISCUSSION

Out-of-hospital resource management has become an important issue because of the influence of MCOs and the increasing focus on the global cost of medical care.<sup>3</sup> There is little question that dispatching a fully-equipped paramedic-staffed ambulance to every 911 call, with subsequent obligatory ambulance transportation to the nearest emergency department, is not always justified.

Provided that patient care is not compromised, resource management and cost containment in EMS are laudable goals. Increased efficiency may reduce the overall cost of emergency health care delivery. Examples of programs to reduce emergency health care costs might include: transport of patients to urgent care centers or physicians' offices, on-scene treat and refer protocols, and interfacility transfers to hospitals affiliated with the patient's health care network.<sup>4</sup>

Managed care plans should not develop alternate access numbers for patients with emergencies.<sup>4-6</sup> System fragmentation would undermine medical quality and operational efficiency. It has been a long struggle to implement 911 systems through much of the country; such systems have improved access and outcome. Statutory changes may be

necessary in order to protect access to emergency health care.

The assertion that patients should call their physicians prior to or rather than 911 assumes that the EMS system no longer has a role in determining whether or not the patient has an emergency necessitating the dispatch of an ambulance. It is incumbent on the dispatch service to develop a system of caller questioning to ensure that appropriate resources are sent. However, even a prudent layperson cannot reliably determine whether or not to call 911.<sup>7</sup> Whenever possible, EMS dispatch centers should establish links with health care network referral and advice lines in order to facilitate appropriate disposition of nonemergency calls.

The current funding structure tends to reimburse emergency care on a fee-for-service basis only for patients who are transported. This encourages limited service-delivery options and treatments that may have no medically proven benefit, and provides no motivation for the development of a less costly but medically appropriate resource.<sup>8</sup> Funding mechanisms that align the incentives of EMS systems, MCOs, and traditional insurers should be developed. EMS providers are a valuable resource. Changes in their role need to be explored with a focus on training, education, and adaptation.

Finally, EMS systems research is crucial. Current models deliver excessive responses with minimum triggers and have multiple built-in redundancies. Evaluation of patient outcome and its relationship to cost needs emphasis. Response configurations need to be validated against need.<sup>9</sup> Research findings will serve the interests of patients, EMS systems, and MCOs.

### SUMMARY

Emergency medical services systems and MCOs must cooperate and educate each other in order to effect delivery of reliable, high-

quality emergency health care to the entire community. Shared goals are rapid access, medically appropriate care, and operational efficiency. An integrated approach is necessary in order to maintain the integrity of EMS systems. EMS systems serve as a safety net for patients with perceived emergencies. Changes in form and function should be guided by outcome studies that ensure the continued delivery of quality emergency health care services.

## References

1. Karpel M. *Managed Care in Emergency Medicine, Understanding the New Economics and Opportunities*, 1st ed. Dallas: American College of Emergency Physicians, 1995, p 77.
2. Blanton D, Alonzo-Serra HM. Medical director job description. *Prehosp Emerg Care*. 1998, in press.
3. Davidson SJ, Sturgill TD. Carpe diem—appointed care [commentary] *Acad Emerg Med*. 1996;3:655-6.
4. Koenig KL. Unscheduled access to health care: reengineering the 911 system [commentary] *Acad Emerg Med*. 1996; 3:989-91.
5. Billittier AJ IV, Moscati R, Janicke D, Lerner EB, Seymour J, Olsson D. A multi-site survey of factors contributing to medically unnecessary ambulance transports. *Acad Emerg Med*. 1996; 3:1046-52.
6. Brown E, Sindelar J. The emergent problem of ambulance misuse. *Ann Emerg Med*. 1993;22:646-50.
7. Dickinson E, Verdile VP. Managed care organizations: a link in the chain of survival. *Ann Emerg Med*. 1996;28:719-21.
8. Jones D. Health care trends forecast. *EMS Insider*. 1995; June:6-7.
9. Koenig KL. Quo vadis: "scoop and run," "stay and treat," or "treat and street"? [commentary]. *Acad Emerg Med*. 1995;2:147-9.

This page intentionally left blank.

# Brave new managed world

Increasingly, health care in the United States means *managed* health care. Can fire department EMS thrive in this new environment?

By Keith Neely  
Asst. Professor of  
Emergency Medicine  
Oregon Health Sciences  
University  
Portland, Ore.

and  
Jack J. Krakeel, Director  
Fayette County (Ga.) Fire  
& Emergency Services



a flat monthly fee based on the age and assessed taxable valuation of their covered properties.

If the FCFD can provide services within this fixed amount, they happily find themselves with a budget surplus. If their costs exceed their monthly allotment, they have to find some other way to make up the difference. Now the FCFD is operating just like a hospital or doctor's office in a managed-care environment.

In this environment, a consolidation of fire agencies may occur to achieve greater cost efficiencies, or agencies may find other creative ways to provide proper fire services at a lower cost. Not all departments will respond the

same way, however.

A few departments may stubbornly continue to contract with the dwindling number of fee-for-service plans. Others may argue that cities and counties have a stake in fire protection and seek tax subsidies. And some, recognizing the potential gains in this new arrangement, find ways to work with Franklin Assurance and others to provide services differently or offer new cost-saving services, thus thriving in this new world.

## A familiar evolution

If this has a familiar ring, it's because this is exactly how health insurance and health care have evolved from a fee-for-service to a managed-care environment. It also suggests how EMS is evolving in managed-care environments.

However, much isn't yet clear about the evolving relationship between fire service EMS and managed care. It's a natural and probably inevitable fit, but fire chiefs interested in exploring this relationship must do their homework before calling up a potential insurance partner. This article will suggest a series of steps in the evolution of a fire department-based EMS program

Included in the fire memorabilia collection at the St. Louis Fire Department headquarters is one of the largest collections of fire marks in the world. These unique fire insurance plaques allow one to reflect on the early development of this country's fire service.

First introduced to North America by the father of the fire service, Benjamin Franklin, fire marks were the visible emblem of an assurance company. These plaques adorned the front door of a dwelling to serve as an easily recognizable identification of an insured property, assuring that a private fire company associated with the assurance company would commit the necessary resources to minimize damage.

Individual assurance company policy holders shared both the profit and losses of the assurance company. This kind of residential dwelling coverage and the protection that it afforded owes its origin to Franklin's founding of the "Philadelphia Contributorship for the Insurance of Houses from Loss by Fires" in 1752.

## What if...

What a twist of fate it would have been had Ben placed the burden of paying for fire protection on employ-

ers who provided it as an employee benefit rather than leaving it to the individual. What if this were the origin of the way we do things?

Employer groups in, say, Fair City, U.S.A., would contract with Franklin Fire Assurance Co., and others like it, to provide fire insurance for their employees. The assurance companies would contract with Fair City Fire Department to provide fire protection. Rather than being entirely tax supported, the FCFD would either bill a dwelling owner directly for firefighting services or bill Franklin Assurance on the owner's behalf.

In this fictional financial scenario the FCFD operates just like a hospital or doctor's office in a fee-for-service environment. And just like Blue Cross, Franklin Assurance would simply pay for each firefighting service.

As time goes by, prices go up and up. Let's say that along about 1975, employers began complaining about the high cost of providing employees' fire insurance. Soon they insist that Franklin and other assurance companies lower their costs. In response, Franklin tells the FCFD that instead of reimbursing them for every fire, they will pay

operating in the new world of managed care.

**Step 1: Develop agreements with neighboring departments.**

Managed-care organizations look for ways to control costs. When contracting for services, they're interested in agreements that cover large numbers of their members and a range of logically related services. A single contract is more efficient for a health plan to administer, and a single large organization or strategic coalition of organizations can provide a range of coordinated services less expensively than many separate organizations.

In the three-county Portland, Ore., metro area, for example, the Kaiser health plan covers about 300,000 people. There are more than 15 fire departments in this same geographic area. To interest a managed-care organization of this size in an innovative approach to caring for its members, a fire department-based program would have to devise a plan that covers much of the medical market area and has a single point for contracting.

In the same Portland metropolitan area, four contiguous fire departments cover more than 800,000 citizens. These agencies are working with the Oregon Health Sciences University Department of Emergency Medicine to develop an appropriate range of new services and then broker these services to insurance companies.

These four departments have committed to a regional partnership. One of its goals is to develop innovative community health services that emphasize out-of-hospital non-emergency health care and prevention. Among the products being explored is an arrangement that would make ALS engines available to nurse telephone-advice services.

Under that arrangement, the engine may be sent to certain callers to the telephone service who would otherwise be referred by the nurse to an ER or urgent care center. This is attractive to health plans because it offers a unique and valuable service to a large number of members over a wide geographic area, and a way to reduce the use of highly

expensive ERS or urgent care centers.

**Step 2: Establish alliances with a transporting partner.**

The best way to help control acute health-care costs is to match EMS resources to patient needs more accurately. This implies a different working relationship with an ALS transport provider, if the fire department itself does not provide this service. Only a minority of callers to 911 actually need an ALS first responder and ALS ambulance. Many callers with non-emergency conditions may require only an ALS engine to conduct an assessment, and then make further non-urgent care or transportation determinations. The Portland scenario suggests this approach.

Or there may be other interesting arrangements. If pending plans are approved, the San Diego Fire Department will commit itself to a minimum response time limit, allowing the private ambulance service an extended response time. Also, the ambulance contractor will be allowed by the city to operate with one

## Informed Care: A public safety response to managed care

By Chief Jeff Bowman  
Anaheim (Calif.) Fire Department

The containment of rising health-care costs is a national problem of overwhelming importance. Health-care cost increases far outstrip the rate of both individual earnings increases and cost-of-living indices, and every time the premiums for medical insurance go up, government, corporate and small business leaders must decide whether to reduce plan benefits or cut workers.

Even when the economy is doing great and it's time to expand production, business has to weigh the cost of not only current premiums, but the reserves that will be needed to fund future obligations. Each time unions begin contract negotiations, they have to weigh the cost of benefits such as medical coverage for their families against the need for higher incomes. No one is served by high and steadily rising medical costs.

Among the suggested causes of runaway medical costs are several factors that are hard to prove and even harder to fix. There is, however, one area where there's universal agreement. We know for certain that using hospital emergency rooms for primary medical care is the least efficient and most expensive way to treat the sick and injured. However, as more companies do away

with medical insurance programs, a growing segment of the population is turning to this physician-of-last-resort for primary care.

Many large health maintenance organizations and multi-specialty medical groups have determined through extensive utilization reviews that they're losing large amounts of revenue because of the overuse of emergency departments. They have begun implementation of utilization management through patient education and control. They're willing to accept the risk of guessing, over the phone, what's best for the patient. Occasionally the result is devastating for the patient and the health plan.

The one system that isn't within the scope of HMO control is the vast network of emergency responders. The 911 system is ingrained in the national psyche and has shown itself to be both efficient and effective. Citizens insist that the 911 "rescue" system be maintained. Health-care providers want, just as adamantly, for the 911 system to be more responsive to their efforts at patient control.

To that end, the Anaheim (Calif.) Fire Department brought together a who's who of Orange County health care to discuss the need to create a seamless countywide system to address this dilemma. Represented were fire labor and management, hospital administrators, HMO executives, medical group executives, ambulance providers, county health-care officials, and independent consultants, one of whom was Jim Page.

We named the process "Informed Care," since our contention is that proper information from the onset to the conclusion of out-of-hospital emergencies is essential to both providers and payers. While we know prehospital medical services need some "minor surgery," we believe a good prognosis exists for a long-term recovery, and that amputation of any parts is unnecessary.

Informed Care proposes to partner the fire-based EMS system with local medical providers and ambulance companies to build an information exchange network that

paramedic, not two. The fire department, which will respond ALS units to all calls, will supply the other paramedic.

What's in these arrangements for the fire service? Cost savings to health plans and private ambulance partners generated by the fire department can be shared with the fire department. The private sector can purchase resources from the fire department. While the final San Diego system redesign is still a work in progress, the department expects to be compensated for its contribution to the EMS system.

### Step 3: Develop new community standards.

For any fire department to do things differently for callers to 911 and yet avoid liability, the community in which it operates has to incorporate these practices into their community standards. The fire service cannot implement these changes on its own.

Portland is creating decision rules for paramedics that would allow various levels of treatment, transportation modes and destinations for patients with different medical

conditions. These new patient-care protocols will internalize the new, lower-cost options while allowing paramedics to continue basing their decisions on clinical factors, not financial considerations.

Based on patient presentation, a paramedic picks a care option, which may happen to cost the patient and insurance plan less. This creates value that can be shared by the parties creating that value. The fire service has to work closely with the community to create such standards.

Managed-care plans can and should be involved in this. The Kaiser system in Portland is partially funding the necessary research to develop the above-mentioned care and transportation options. Kaiser and other health plans were heavily involved in developing the recent San Diego ambulance service request for proposal, a document that delineates the county's ambulance service needs to prospective providers. They also served on the selection committee.

Managed-care organizations have to be brought to the table. They

need to understand the unique characteristics and needs of EMS and the fire service. The fire service also needs to understand the unique characteristics and needs of health plans. This can only happen by getting to know each other in a context that strives to establish mutually beneficial partnerships.

### Step 4: Establish patient-care databases.

Fire departments interested in working in a managed-care environment must work with the community to create an EMS database containing all data from dispatch to patient outcome, however outcome is defined. Initial research is required to create the above-mentioned clinical decision rules. Good research has to be done to understand the financial implications of these arrangements.

Clinical database management is an area of great vulnerability for fire departments. Most do not have experience with either clinical data or outcome measures. While fire departments don't necessarily have to create this capability, it's critical

would provide local firefighter/paramedics with patient information, which would help them direct the patient to a facility preferred by the patient's provider. In return, the medical providers would agree to let the paramedic (who has no financial interest in the outcome) make decisions based solely on what's best for the patient.

By bringing all three groups together, the fire-based paramedic system would remain in overall charge of public safety, the patient's needs are best served, the medical group is protected from errors, the medical provider maintains control over the majority of their patients suffering unexpected illnesses or injuries, the appropriate level of transportation would be used, and the consorted facility becomes the primary receiving center.

The net result could show a significant savings to the system as a whole. Money spent on expensive transportation techniques, on emergency departments that have no specific knowledge of the patient, and on the subsequent transfer of the patient to the correct facility could be reduced significantly.

The American College of Emergency Physicians estimates that as many as 70% of those patients arriving by ambulance are, in fact, ambulatory and do not receive definitive treatment in the emergency department. Telephone education/triage systems being employed are currently estimated to save between \$5 and \$10 per patient per month in a normal medical practice, depending on patient demographics.

By using these same partners, Informed Care proposes to develop and/or house a telephone medical information/education/triage system for the smaller medical groups attached directly to the 911 dispatch system. The same connectivity would be made available to the larger HMO networks that already have such systems in place. Being connected to the dispatch system allows triage nurses who, in the course of their patient interview, find that the patient is in fact in need of immediate care to alert and effect a paramedic dispatch while never losing contact with the patient. This use of infor-

mation technology is at the heart of Informed Care.

We believe we could show net savings of \$3 per patient per month in Anaheim alone. This would mean about \$6 million per year for a city of 175,000 insured lives. Once this amount is proven, we could expand the principle throughout the county of 1.5 million insured lives with commensurate savings. And it isn't hard to extrapolate these numbers throughout the country. Every year, hundreds of millions of health-care dollars could be used for business expansion, jobs for those now underemployed, and additional tax revenues for federal, state and local governments.

While the initial meetings were well-attended and productive, the effort's momentum slowed quickly due to the resistance of special-interest groups that stand to lose business. Unfortunately, the greater good for the system hasn't been realized on a countywide basis, at least not yet. We at the Anaheim Fire Department continue to refine our beliefs and have chosen to develop a more localized pilot version to prove that we can make it work.

The Orange County Emergency Medical Services Agency has created a subcommittee called the Managed Care Task Force to evaluate the need for such change in our current EMS delivery system. We hope to run parallel efforts to see if our separate groups draw similar conclusions, and have established an AFD staff member as liaison to both committees.

We aren't certain of the eventual outcome of either project. Nevertheless we remain committed to the belief that not tackling the problems only puts us further behind in the effort to maintain an excellent health-care environment for our citizens that more closely aligns with the financial expectations of health-care payers.

Jeff Bowman has been chief of the Anaheim (Calif.) Fire Department for 11 years. He is a past president of the California Fire Chiefs Association and is chairman of the Board of Anaheim Medical Center. Bowman has a bachelor's in organizational behavior from the University of San Francisco.

to support efforts by regional EMS authorities or other bodies to create effective database management. One way to do so is to provide data generated by EMS runs to the database using computerized patient-care report forms.

Systems redesigned without much research or critical examination are at great risk. If a fire department, using bad decision guidelines, mistakenly does not send ALS resources to a child who turns out to be in severe respiratory distress just to save money, it would look just as money-grubbing as the health insurance plans we all love to hate.

This is not an unrealistic concern. We will see capitated EMS care in the very near future. Instead of being paid for transporting patients, EMS providers will receive a flat pre-paid monthly "allowance." Once the allowance is spent, it's gone. If the EMS allowance exceeds expenses, it's a surplus. If the EMS service spends more than its allotment, well, you know the rest of that story.

Under capitation, an EMS agency is motivated to use expensive resources only when clearly necessary. This leads to shaving the use of costly resources, but it could move systems closer to inadvertently not responding when they should.

Great care has to be taken to prevent such an occurrence.

In many parts of the country, a new day is at hand for fire service EMS. Regional fire service inter-agency agreements, partnerships with private ambulance services, participation in developing new community standards, and helping to conduct research and develop databases may all be new to your department, but they're probably in your future.

Take heart. A few communities are already out there on the ragged leading edge. They will have much to teach us all. PJ

---

Keith Neely, MPA, EMT-P, is an assistant professor of emergency medicine at Oregon Health Sciences University, Portland, Ore. He has been a firefighter and paramedic in the Portland area and Denver. He is currently pursuing a doctorate in public administration and policy.

Jack J. Krakeel is the director of the Fayette County (Ga.) Department of Fire and Emergency Services. In addition to serving as chairman of the IAFC's EMS Section, he is a member of the executive committee of the National Fire Services Accreditation Program and the IAFC representative and a member of the board of directors for the Commission on Accreditation of Ambulance Service. Krakeel has a bachelor's in management and a master's in business administration.

# Coming soon to an ambulance near you

Thanks to increasingly small but sophisticated technologies, the ambulance of the future will be much more like the ER of today.

**T**he time: the first years of the 21st century. The place: on scene with a trauma victim. The first responders go to work to stabilize the victim and prepare him for transport.

The ambient noise level is high, making it hard to hear what's going on inside the victim's chest. A handheld device assists the responders, acting as a kind of supersensitive ear, listening to the sounds coming from the victim's lungs, and the sound of blood flow, to help determine if there's any blockage or other damage.

An IV is needed, but a good vein is hard to find. The EMT dons a pair of goggles looking something like those used for night vision or "seeing" through smoke. In fact, this device does use thermal imaging to allow the responder to "see" the victim's subdermal veins. Intubation is also necessary, and the responders have a device that monitors each breath the victim takes. If the intubation goes awry, they'll know instantly.

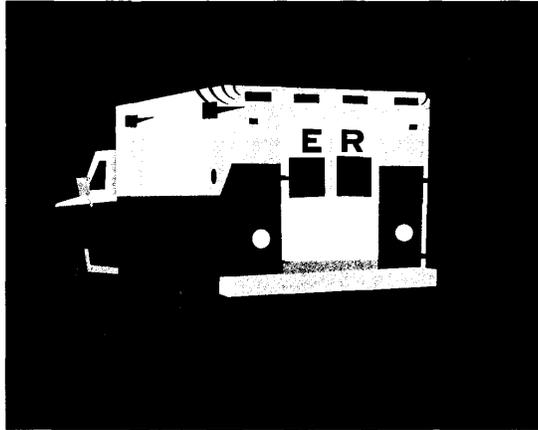
En route to the ER, the EMT draws a drop of blood from the victim and puts it into a small machine that performs a chemical analysis of the blood, a process that would have been possible only in a hospital laboratory just a few years earlier. The data gathered from this analysis is relayed by a cellular communications link to the ER, where physicians can be apprised of the information before the patient even arrives.

The above scenario describes EMS technologies that are either emerging on the market today or will be soon. In the near future, new and remarkably small devices will become available to responders. These devices won't be a substitute for responders' skill or experience, but they should help them do their jobs

better, as any good tools should.

## A simple jump?

The spread of technologies into the realm of emergency responder care isn't a simple jump from the lab to the cab. Technological improvement begins with basic research, some by private industry but much sponsored by the government. Often the research doesn't explicitly seek a medical application initially, but for



promising technologies the financial incentives to develop medical applications are strong.

ER technologies that become portable enough can become ambulance technologies. In the last year or two, a flurry of devices has become practical for the responder, not only because they can be taken aboard an ambulance easily, but also because they can be taken out of the ambulance and to the victim.

■ **Pocket-sized ECGs.** One developed by Technology Transfer Inc., Lafayette, Ind., weighs a little more than a pound and uses no wires, patches or jellies, but can display a

patient's ECG data on an LCD when touching the victim's chest. It also can be connected to a modem, and the data can be relayed to a physician or emergency room.

■ **Extremely small pulse oximeters.** These devices use skin-penetrating infrared beams to measure pulse and blood oxygen levels almost instantly. Pulse can be difficult to find in many situations, and O<sub>2</sub> levels are especially useful to know in cases of severe breathing difficulties. The smallest pulse oximeter fits over a finger, and some defibrillators now entering the market include these devices as part of the package.

■ **Miniature blood analyzers.** iSTAT Corp. in Princeton, N.J., now markets a blood analyzer that needs only a single drop of blood and a few minutes' time to measure the contents of the sample. On-the-spot blood analysis can uncover signs of various serious conditions, such as kidney failure, insulin shock or anemia, and can do it much faster than conventional methods at a hospital.

■ **Capnographers.** Capnography measures the amount of CO<sub>2</sub> emerging from a patient's airway. In the field of anesthesiology, keeping track of this bit of data has proved to be vital in ensuring that the patient is receiving the oxygen he or she needs.

In an EMS setting, passing a tube into a patient to provide oxygen — intubation — can be a tricky business, since there's always the possibility that the tube might be inadvertently placed in the esophagus instead of the trachea, or that it might slip out if the victim throws up or the ambulance hits a patch of bad road. Reportedly this problem has led to a number of victims' deaths.

There are ways to detect the mis-

By Dees Stribling  
Managing Editor

placement of tubes without capnography, such as the careful ear of a trained responder, but in the noisy, jarring atmosphere of an ambulance that might be impossible. Capnography, by measuring CO<sub>2</sub> from the exhalation, can alert the EMT that something is wrong with intubation.

Capnographs can also provide clues about what's going on in a patient's chest, such as the "integrity of the airway, proper functioning of the respiratory delivery system, ventilator function, cardiopulmonary function, subtleties of rebreathing and other fine points in the respiratory cycle," explains physician Louis M. Guzzi, an assistant professor of anesthesia at Florida Hospital in Orlando, who also works to develop non-invasive diagnostic techniques for the Army.

"These points are especially true in the field, transport environment or emergency department where auscultation [listening to the body for the purpose of diagnosis] may be limited or hindered by extraneous noise or conditions. Given that a failed airway accounts for between 10 and 20% of all morbidity and mortality in trauma, the advantage appears obvious."

This technology is already on the EMS market, but as yet isn't widely used. Nellcor Puritan Bennett, a Pleasanton, Calif., manufacturer of medical equipment, produces a device called the Easy Cap, which weighs less than an ounce. It can be easily fitted on standard airway connectors and works almost instantly, turning from purple to yellow in the presence of CO<sub>2</sub>, which is an easy thing to watch for.

Novametrics, Wallingford, Conn., produces a line of capnographers that generate a waveform, which is a graphic representation on an LED screen that tells EMTs how much CO<sub>2</sub> is coming from the victim on a breath-by-breath basis. One thing this information will tell responders is whether there's a partial airway obstruction, since such an occurrence would partially obstruct CO<sub>2</sub> going out as well as O<sub>2</sub> going in.

**Under development**

Capnographs may be new and still working their way into EMS, but

what about hand-held devices that you can't hold in your hand yet because they're still under development? A number of exciting technologies are now emerging, many from military labs or labs doing work for the military.

The military's interest is clear, since a new generation of hand-held medical devices would presumably decrease mortality rates in combat situations. But sometimes the original research is far removed from any patient-care application. Take, for instance, **acoustic analysis**, which for years has been of special interest to the Navy, which both wants its submarines to be as quiet as possible, and to be able to hear

an array embedded, say, in a stretcher, to listen to body sounds from a multitude of positions.

The device is completely non-intrusive. Sound waves travel from the body to a membrane in the device. The motions of the membrane affect a series of lasers inside the device, and microchips are able to interpret the perturbations in the laser light as corresponding sound signals from, in this case, the lungs. Further in the future, more sophisticated listening devices might be able to detect other problems, such as subdermal damage or a blocked blood vessel.

**Thermal imaging** is another promising avenue of military research that's likely to lead to EMS applications. Firefighters are already familiar with the idea, since it's the underpinning of infrared thermal imagers that enable the human eye to "see" through smoke. More advanced applications of this technology might be used in the near future to help responders see into the human body.

"Thermal resolution, the ability to detect small differences in temperature, has improved significantly over the past several years," notes Michael Grenn, a scientist at Ft. Belvoir, Va., who works for the U.S. Army Night Vision and Electronic Sensors Directorate. "Medical studies using more advanced infrared equipment have just begun, and the potential is enormous. It's well known that imaging temperature differences can provide valuable information about a patient's condition."

Someday a responder might use "helmet-mounted configurations," that is, goggles, to look not only for a proper site for an IV, but also to check for any part of the body that's suffering a reduced blood flow, because such areas tend to be cooler than other parts of the body. Or the configuration might more closely resemble a large magnifying glass that a responder holds to check whether efforts to stop a victim's bleeding have resulted in a reduced blood flow to tissues elsewhere.

"Infrared light at shorter wavelengths can penetrate human tissue hundreds of millimeters in depth, potentially enabling quick and non-



*This depiction of the Army's Life Support for Trauma and Transport system shows two of the units (an artist's rendering added by computer to the photo) ready to move combat casualties by helicopter. On the left, a medic monitors the casualties' conditions with a handheld device. In the near future, this technology will probably be available for civilian use.*

other submarines in the vastness of the oceans.

As a consequence, much research has been done on interpreting sounds. The practical upshot of this is that responders may soon be able to interpret more accurately sounds that the human body makes. Healthy bodies produce a certain range of sounds, and trauma or disease have their own signature sounds as well.

"We're working with Walter Reed and the University of Utah now on a project to develop a laser fiber-optic device that will be able to 'read' good or bad sounds coming out of the lungs, and we hope, the cardiovascular system," says Glenn Allgood, a senior researcher at Oak Ridge National Laboratories. "We're going to start clinical trials this year."

At the moment, the device is roughly the size of a human fist, but Allgood says he expects it to shrink further, perhaps as small as a dime. Devices that small could be used as

invasive determination of blood chemistry, internal blood flow and tissue viability," adds Grenn.

Responders might also soon be able to make use of telecommunication devices in a way never before possible. The **Medic-Cam**, developed by the Army Research Laboratory, Adelphi, Md., is more than just a way for a paramedic or EMT to call up an emergency physician and ask for advice. It's a way to allow the doctor to look directly at the scene.

The heart of the Medic-Cam is a high-resolution color camera mounted on a visor, plus a tiny monitor that allows the person wearing the visor to see what the far-off physician sees. The video images and conversation between the responder in the field and the doctor are transmitted via satellite.

"The Medic-Cam has many potential applications beyond the battlefield," notes Electronics Now magazine. "As the cost goes down, which is likely as most of the components are simply modified commercial items, it could find its way into the typical civilian vehicle."

#### **The coming LSTAT**

A further piece of military hardware designed for battlefield use with potential EMS applications — though

not a hand-held device — is the Life Support for Trauma and Transport system, known as the LSTAT.

"It's nothing less than a portable emergency room," says Dr. Bill Wiesmann, who until his retirement this month was head of Combat Casualty Care at the U.S. Army Medical Research Materiel Command and a co-developer of the LSTAT. "It's based on a NATO-standard stretcher, encloses the patient fully, and includes a wide range of life support, patient monitoring and diagnostic equipment. Altogether, it comes in at under 100 pounds, though there are plans to design a 'mini-LSTAT' which would weigh about 15 pounds. In either case, the LSTAT is designed to be fully portable by vehicle or aircraft."

The LSTAT has been under development since 1994. The initial prototype was developed by scientists at Walter Reed Army Medical Center. In 1996, the USAMRMC joined forces with Northrop Grumman's Advanced Technology and Design Center to design a second series of prototypes, which have been submitted to the Food and Drug Administration for approval and which will be field-tested by the Army later this year.

The LSTAT features a remarkable array of equipment, including a

defibrillator, skin sensors based on aerospace technology to monitor vital signs and sensors integrated within the IV catheter, and a microventilator using a suction unit to keep the victim's airway clear. An on-board oxygen generator supplies the ventilation system's O<sub>2</sub> by using a high-voltage osmotic membrane that can capture the gas from the atmosphere, thus obviating the need for oxygen bottles. This too is based on aerospace technology.

Displays on the side of the LSTAT allow medics to monitor the victim's status, or a hand-held monitor could provide the same information to a medic at a distance from the LSTAT. The remote system could also be used to control the LSTAT.

The LSTAT will be in the field for military use in the next few years. But will it ever have any application in EMS? At first, certainly, it will be extremely expensive, and will require a good deal of training to make it usable, so it isn't likely to be in the back of every ambulance any time soon, if ever.

"But there will be agencies that should look into this technology," says Wiesmann. "In some cases, just as on the battlefield, the LSTAT could be the decisive factor in patient survival." PB

This page intentionally left blank.

## EDITORIALS

MORE EXPANDED SCOPE:  
OPERATIONAL EMS

In this issue of *Prehospital Emergency Care*, White et al.<sup>1</sup> describe the use of an ingestible, encapsulated sensor to continuously monitor core temperatures in rescue divers. The commercially available system amplifies and transmits signals from the ingested sensor to a wearable recording device. The authors employed this technology to quantify some of the physiologic consequences of working in extremely hot or cold temperatures for emergency responders wearing protective ensembles and using respirators. This group previously reported using the same system to assess changes in core temperatures among firefighter/paramedics wearing level-A personal protective equipment (PPE) during hazardous materials (hazmat) training evolutions.<sup>2</sup>

Although not done in the two studies completed by these authors, they point out that it is presently possible to transmit signals from their sensors via radiotelemetry to laptop computers or other display terminals. Substitution of these components for the portable recording devices used in their studies would allow monitoring of emergency responders' core temperatures in real time, and would facilitate use of these data in decision making regarding personnel allocation and on-scene tactics. This capability adds tremendous significance to the demonstrated feasibility of using such technology in the emergency operational environment. It also justifies well-designed follow-up studies to establish a reliable, scientific basis and to define their intrinsic

limitations with respect to deployment in this challenging arena.

Studies in which responders' physiologic parameters are monitored during emergency operations have proliferated since investigators at Grumman Aerospace first brought 'space-age' biosensor technology to the fire ground, under contract with the Fire Department of the City of New York in 1974.<sup>3</sup> Experiments involving monitoring of personnel in various types of PPE under conditions of environmental thermal stress have also been conducted with fighter pilots,<sup>4,5</sup> soldiers,<sup>6,7</sup> and firefighters.<sup>8-11</sup>

There are some essential differences between monitoring healthy emergency responders working under austere or hostile conditions and monitoring sick or injured patients in controlled, clinical settings. These have been recently discussed in detail.<sup>12</sup> The use of sensors for continuous vital sign and cardiac monitoring of patients is typically facilitated by easy access to biological signals, very restricted levels of activity, confinement to a limited geographic area, and the presence of highly sophisticated personnel to interpret monitor output. The combination of relatively tightly controlled environmental conditions and the patients' physical inactivity generally allows the monitored parameters to be interpreted within fairly narrow limits of "normal."

Contrast these considerations with the case of rescue divers, hazmat technicians, combat soldiers, or firefighters. Whereas it may be desirable to monitor the same physio-

logic parameters in order to ascertain the condition of these individuals during emergency operations, several obstacles must be overcome before meaningful data can be obtained. First, the sensors must be positioned such that accurate signals are reliably transduced and transmitted. Sensor location and function must be able to withstand personnel motion, sweating, or incidental trauma. Their presence cannot be allowed to compromise the integrity of materials or seals within the protective ensemble, and their application should not affect emergency response times. Personnel cannot be encumbered by added weight or tethered by external wiring because these could threaten their operational capability and safety. Telemetry of data must typically occur over greater distances and through more substantial structural barriers than would normally be encountered on an inpatient unit.

Interpretation of the data must take into consideration the environmental extremes confronting the emergency responder as well as the extraordinary levels of exertion, intermittent catechol surges, and impairment of the normal mechanisms for heat dissipation that is associated with wearing PPE. Finally, much of the interpretation must be customized to the individuals involved, since physiologic responses to heat, cold, fear, excitement, and exertion are highly variable. Therefore, a significant proportion of the interpretation must take place at the software level since it would be

difficult to compare real-time data with baselines for all individual responders in a useful time frame, and since the field monitoring personnel are likely to be EMS providers with limited medical sophistication.

As technologic advances bring more capacity for monitoring both the environment and the personnel during emergency operations, decisions will have to be made regarding when, where, and in what format to distribute the massive amount of information being gathered. Clearly, video screens, similar to those in an ICU, continuously displaying the vital signs of 50 firefighters working at a structure fire would be of very limited value to an incident commander (IC). On the other hand, continuous displays indicating teams that are still working and teams that have had to evacuate due to "alarm" conditions of their members might be tremendously useful in a command post. Alternative iterations of the same data, but conditioned and displayed differently, could be used in other sectors, e.g., rehab, operations, or staging.

One of the most important distinctions between patient and responder monitoring arises from the focus and objectives of the monitoring. Where physiologic monitoring is incidental to provision of medical care for an ill or injured patient, the focus is entirely on detecting abnormal values within that patient so that they can be considered in the context of the disease process, and treated expeditiously. Monitoring of healthy workers under physiologically stressful conditions will generally be associated with a broader focus and objectives. In other words, it takes place in the context of a larger mission. While the most immediate justification for personnel monitoring may be health surveillance and prevention of adverse outcomes for the workers, the monitoring function will likely also be used to assist completion of the operational objectives.

This means that the data output from physiologic and environmen-

tal sensor arrays worn by the workers can provide an IC with intelligence regarding interior conditions and latent hazards, as well as levels of thermal stress and sustained exertion among crews or individuals on scene. This can certainly assist the IC in decisions regarding the need for additional resources and tactical options. Similar data transmitted to battlefield commanders might have comparable operational implications, and could also prevent high-risk rescue attempts involving nonviable casualties. In both milieus, the technology infrastructure for physiologic monitoring will support deployment of additional sensors for environmental hazards as well as transmitters that both identify and locate personnel in the chaos.<sup>12,13</sup> The cumulative data stream will, it is hoped, decrease the morbidity associated with hazardous occupations. It will almost certainly improve personnel safety, efficiency, and overall success of the operations, themselves.

It is significant that the authors<sup>1,2</sup> chose to publish their findings in the EMS literature, and to the physician oversight community. Real-time, on-site medical monitoring of healthy workers in hazardous environments is a rapidly evolving discipline. Its development is being hastened by both emergent technology and a generally decreased tolerance for occupational morbidity. The new discipline draws principles and experience from occupational, military, wilderness, sports, aerospace, and emergency medicine, but it has not yet been recognized and defined as a discrete area of expertise, and it has not been established as a component of one of the medical specialties.

There are a number of reasons why it makes sense for emergency medicine (EM), in general, and EMS, in particular, to take ownership of this discipline. First is the close relationship that already exists between many of the user, or beneficiary, communities and EMS, including medical oversight. Examples of

these communities include fire, urban search and rescue (USAR), all forms of technical rescue, hazmat, and law enforcement services. There is some precedent for EM involvement in assessing and mitigating occupational risks incurred by members of these services during emergency operations in the field.<sup>14,15</sup> Further, safe and effective accomplishment of technical rescue, hazard abatement, and situation resolution is a mission shared by both field and hospital-based emergency personnel. Some of the implications of this mission orientation have already been discussed.

A second reason why EM should consider the leadership role in development of this discipline is that most on-site monitoring will probably be performed by EMS personnel. Some of the first steps in this direction have already been taken by the fire service through federal practice recommendations<sup>16</sup> and its principal standards making process.<sup>17</sup> NFA 1500, *Fire Department Occupational Safety and Health Program*, currently includes the following provisions:

The fire department shall develop standard operating procedures that outline a systematic approach for the rehabilitation of members operating at incidents. Provisions addressed in these procedures shall include medical evaluation and treatment, food and fluid replenishment, crew rotation, and relief from extreme climatic conditions . . .

Such on-scene rehabilitation shall include at least basic life support care . . .<sup>17</sup>

The appendix to the same chapter of NFA 1500 is even more specific regarding the expectations of EMS personnel providing medical support to firefighters during an incident:

Medical evaluation and treatment in the on-scene rehabilitation area should be conducted according to EMS protocols developed by the fire department in consultation with the

fire department physician and the EMS medical director. If ALS personnel are available, this level of EMS care is preferred.<sup>17</sup>

Both the NFPA and the federal Occupational Safety and Health Administration (OSHA) require transport-capable EMS to be present before emergency responders wearing PPE enter environments that are considered to be immediately dangerous to life and health.<sup>18</sup> The practice of EMS personnel performing pre- and post-suit medical evaluations has become widespread, though the components of these evaluations and acceptable parameters vary widely. It is important to emphasize that EMS providers are already providing medical support beyond simple "standby" functions both on the fire ground and at hazmat incidents. This means that they do not wait for symptoms of illness or injury to occur, but are actively monitoring the emergency response personnel and making decisions regarding who can safely continue their hazardous duties, and who requires additional rehabilitation.<sup>16</sup> The lack of credible science on which to base these practices together with their attendant liability should greatly concern physicians responsible for EMS supervision. The introduction of additional technology generating more data points of uncertain significance should be closely observed by EMS physicians so that these data points are not used as the basis of indefensible decisions.

Specially trained EMS providers also currently provide medical support under hostile and sometimes austere conditions in other tactical environments. These include Special Weapons and Tactics (SWAT) team operations<sup>19</sup> and the battlefield.<sup>20,21</sup> It can be argued that the growing experience of EMS with this function will increase both the facility of providers with relevant monitoring procedures and civic expectations of EMS systems. It is certainly obvious that EMS providers already serve these functions in

many jurisdictions, and that medical directors need to be aware of the need for appropriate protocols and supervision.

Two additional arguments for inclusion of this nascent discipline in the scope of EM physicians' and EMS practice deserve brief mention here. This is where the greatest clinical experience and expertise with portable instrumentation in uncontrolled environments currently resides. Furthermore, the broad potential applications, beyond providing medical support for other emergency responders, represent a very significant opportunity to rationally expand the scope of EMS.

As was discussed above, medical monitoring of healthy workers under hazardous conditions implies a dual focus: first on the physiologic status of the personnel, and second on completion of the mission that has placed them in harm's way. This type of medical support, with all of its collective applications, could be termed "operational EMS." A working definition can be derived using principles from Adm. Zimble's essay on military medicine.<sup>22</sup> Operational EMS comprises a body of knowledge, specially trained providers, dedicated protocols, and applied technology organized into a medical support system for personnel working in hazardous, austere, and/or tactical environments. Its emphasis is on prevention of occupational morbidity and maintenance of optimal operational capability.

As with any new medical or paramedical specialty, operational EMS will build on and overlap with more traditional aspects of EMS. Some equipment currently used to monitor patients in the out-of-hospital setting will be adapted for use in the operational environment. Monitored personnel will occasionally, inevitably become patients, and providers will rely on their training and protocols for civilian trauma, combat casualty care, hazmat toxicology, or other relevant specialties while mobilizing toward

definitive medical or surgical care. Providers who can render service across this entire continuum will be enormous assets to their respective agencies or jurisdictions.

At this early stage in its ascendancy, operational EMS is vulnerable to many forces that could impede or arrest its continued development. It is important to bear in mind the current difficulty proving efficacy of EMS systems. Each new application of medical monitoring technology must be proven to make a difference in well-designed, scientific trials. Outcomes in operational EMS, however, may not solely depend on clinical end points. Metrics allowing comparison of missions in terms of performance may also need to be incorporated into field evaluation of new technologies. The point is that simple demonstration of technical capability cannot be allowed to define the parameters and practice of the medical discipline.

New technologies should be introduced to the operational environment only in response to well-defined needs or problems. Failure to adhere to this tenet may result in absurd expenditure of scarce resources while worsening clinical and mission outcomes.<sup>23</sup> The technologies must also be demonstrated to be safe, effective, and reliably robust under conditions of use. Finally, if they don't 1) provide research data that can be generalized and used to alter procedures, 2) demonstrate decreased morbidity and/or improved medical outcomes when they are used, or 3) demonstrate improved mission outcomes without adversely affecting personnel health and safety, then they should not persist in operational EMS practice.

It should be pointed out that services or jurisdictions contemplating introduction of medical monitoring technologies to personnel engaged in hazardous duty will need to be cognizant of confidentiality issues. Paradigms will have to be developed to delineate whether data gen

erated and archived from biosensors during emergency operations are part of a department's operational record or part of the workers' medical records. This will be important if occupational consequences could be imposed as a result of information or incidental findings discovered during monitoring. Even more important to an implementing service is the establishment of backup safety procedures. Since there are currently no reliable data to support the use of physiologic monitoring in operational decision making, documentation of apparently normal parameters should never be used to require an individual to continue a task if he or she expresses a need to stop due to fatigue or other incapacitation. Voice communications technology and protocols should be enhanced to supplement biotelemetry systems, not replaced by them.

Operational EMS encompasses battlefield monitoring, medical support for fire, technical rescue, and hazmat response services, and tactical EMS as well as a variety of other industrial and recreational applications. Current literature and conference agendas suggest that a massive technology infusion is about to revolutionize operations in these environments. Undoubtedly, this will be a very exciting and potentially satisfying arena for both research and practice well into the next century. It is hoped that EMS physicians will recognize operational EMS as an opportunity to open a particularly meaningful practice track for their service providers. This can occur only through their leadership of multidisciplinary initiatives toward scientific design and rigorous testing of the emerging technologies. The success of operational EMS will

also require its physician leaders to expeditiously translate study results into protocols and to supervise the implementation of the technologies and interventions essential to the evolving discipline.

M. S. BOGUCKI, MD, PhD  
*Section of Emergency  
 Medicine  
 Department of Surgery  
 Yale University School of  
 Medicine  
 New Haven, Connecticut*

Disclosure: Dr. Bogucki has ownership interest in a company that is developing advanced technology for civilian emergency response applications.

## References

- White LJ, Jackson F, McMullen MJ, Lystad J, Jones JS, Hubers RH. Continuous core temperature monitoring of search and rescue divers during extreme conditions. *Prehosp Emergency Care*. 1998;2:280-4.
- Menze R, McMullen MJ, White LJ, et al. Core temperature monitoring of firefighters during hazardous materials training sessions. *Prehosp and Disaster Med*. 1996; 11:108-11.
- Abeles FJ. A Firefighter's Integrated Life Protection System. Phase I: Design and Performance Requirements. FDNY Contract No. 219454. Bethpage, NY: Grumman Aerospace Corporation, 1974.
- Nunnely SA, French J, Vanderbeek RD, Stranges SF. Thermal study of anti-G ensembles aboard F-16 aircraft in hot weather. *Aviat Space Environ Med*. 1995; 66:309-12.
- Cotter JD, Taylor NAS. Physiological assessment of the RNSAF constant wear immersion suit: laboratory and field trials. *Aviat Space Environ Med*. 1995;66: 528-36.
- Reneau P. Relating heat strain in the chemical defense ensemble to the ambient environment. *Milit Med*. 1996;161: 210-13.
- McLellan TM. Heat strain while wearing the current Canadian or a new hot-weather French NBC protective clothing ensemble. *Aviat Space Environ Med*. 1996;67:1057-62.
- Duncan HW, Gardner GW, Barnard RJ. Physiological responses of men working in fire fighting equipment in the heat. 1979; *Ergonomics*. 22:521-7.
- Smolander J, Louhevaara V, Tuomi T, Korhonen O, Jaakkola J. Cardiorespiratory and thermal effects of wearing gas protective clothing. *Int Arch Occup Environ Health*. 1984;54:261-70.
- Skoldstrom B. Physiological responses of fire fighters to workload and thermal stress. 1987; *Ergonomics*. 30:1589-97.
- Bennett BL, Hagan RD, Banta G, Williams F. Physiological responses during ship-board firefighting. *Aviat Space Environ Med*. 1995;66:225-31.
- Wiesmann WP, Pranger, LA, Bogucki MS. Real time physiological monitoring with distributed networks of sensors and object oriented programming techniques. In: Lieberman RA, Vo-Dinh T. *Biomedical Sensing and Imaging Technologies*. Proc SPIE. 1998;3258:130-41.
- Zajchuk R, Sullivan GR. Battlefield trauma care: focus on advanced technology. *Milit Med*. 1995;160:1-6.
- Pepe P. Accelerated hearing loss in urban emergency medical services firefighters. *Ann Emerg Med*. 1995;14: 438-42.
- NAEMSP and NASEMSD. Use of warning lights and siren in emergency medical vehicle response and patient transport. *Prehosp Disaster Med*. 1994;9: 133-6.
- U.S. Fire Administration. *Emergency Incident Rehabilitation*. Washington, DC: FEMA, 1992, FA-114.
- National Fire Protection Association. *Fire Department Occupational Safety and Health Program*. Quincy, MA: NFPA, 1997, p19-20, 39-40.
- 29 CFR 1910.120. (Code of Federal Regulations.)
- Heiskell LE, Carmona RH. Tactical emergency medical services: an emerging subspecialty of emergency medicine. *Ann Emerg Med*. 1994;23:778-85.
- Lorenzo RA. Improving combat casualty care and field medicine: focus on the military medic. *Milit Med*. 1997;162: 268-72.
- Butler FK, Hagmann J, Butler G. Tactical combat casualty care in special operations. *Milit Med*. 1996;161(suppl 1): 3-16.
- Zimble J. Military medicine: an operational definition. *Milit Med*. 1996;161: 183-8.
- Cloonan CC. Good lord, deliver us. *Milit Med*. 1995;160:545-6.

# APPENDIX C: TOOLS FOR MANAGING ISSUES/CHANGES

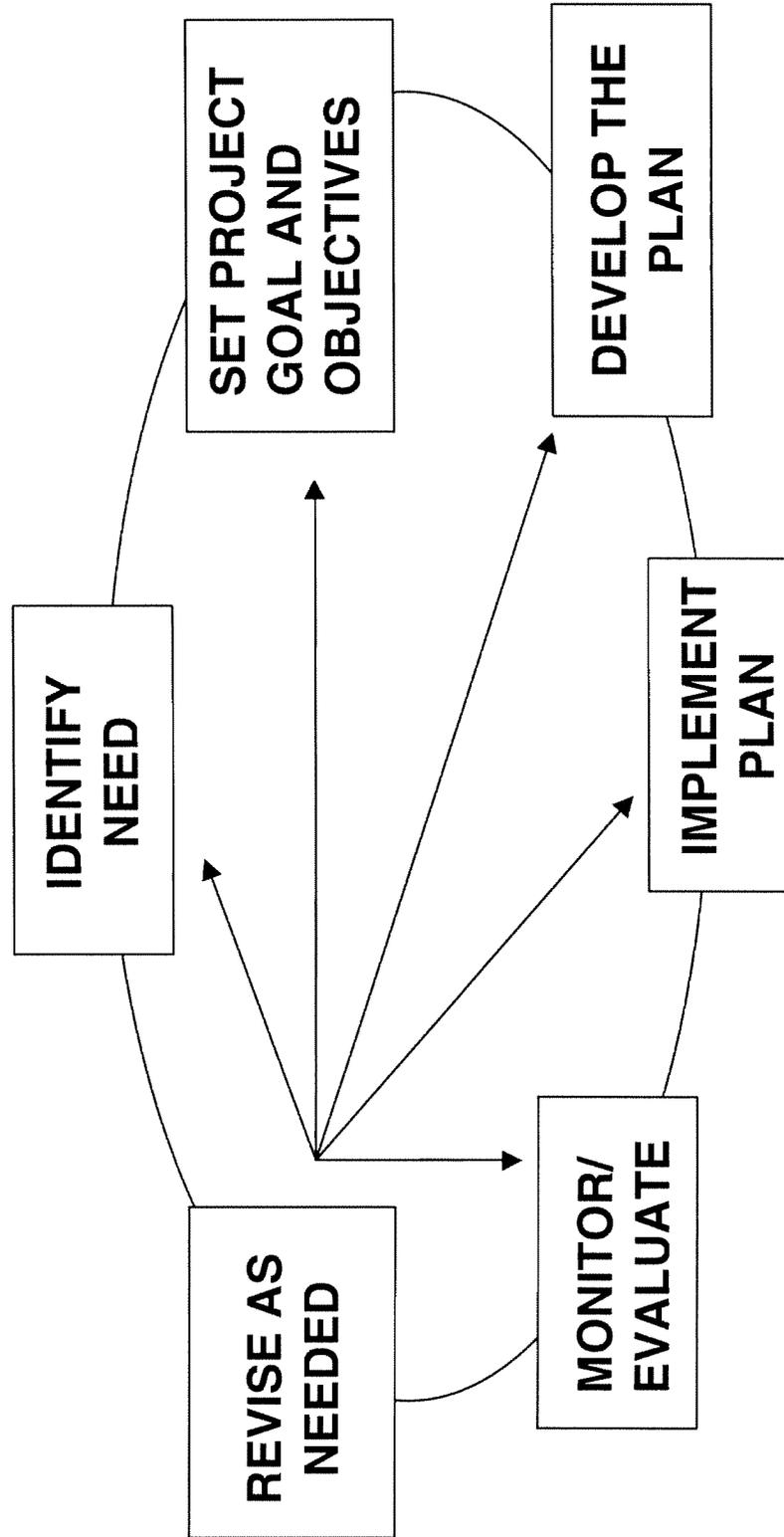
This page intentionally left blank.

## STRATEGIC PLANNING OUTLINE

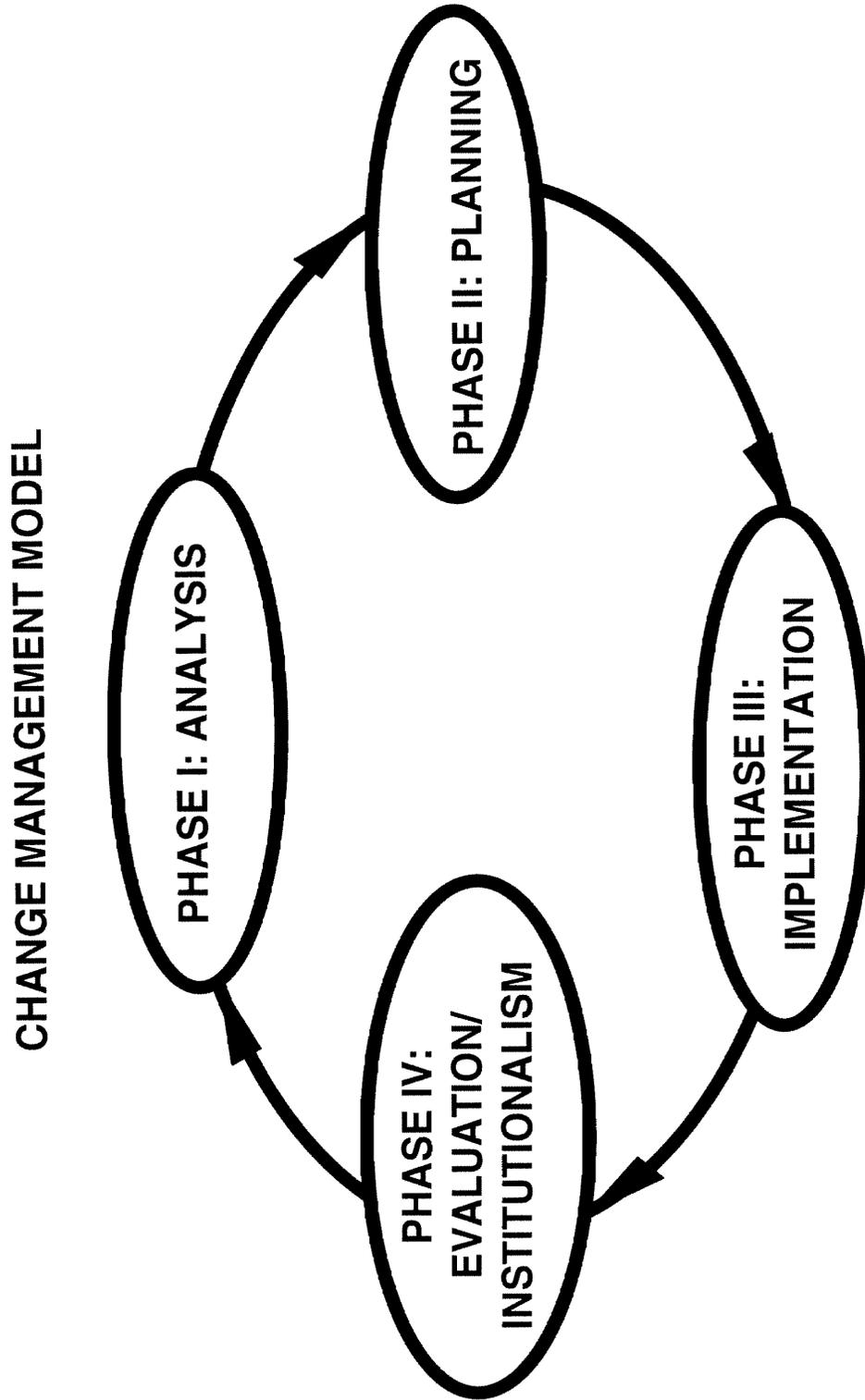
1. Identify a vision, mission, and values statement.
2. SWOT.
  - a. Strengths.
  - b. Weaknesses.
  - c. Opportunities.
  - d. Threats.
3. Resources.
  - a. Current resources.
  - b. Resources lacking.
4. Goals.
  - a. Short Term.
  - b. Long Term.
5. Strategies for Reaching the Goals.

PROJECT MANAGEMENT PROCESS

PROJECT MANAGEMENT PROCESS



CHANGE MANAGEMENT MODEL



This page intentionally left blank.