CHAPTER 1

EMS Systems: Roles, Responsibilities, and Professionalism

OBJECTIVES

Upon completion of this chapter, the paramedic student will be able to:

1. Outline key historical events that influenced the development of emergency medical services (EMS) systems.
2. Identify the key elements necessary for effective EMS systems operations.
4. Describe the benefits of continuing education.
5. Differentiate among the training and roles and responsibilities of the four nationally recognized levels of EMS licensure/certification: Emergency Medical Responder, Emergency Medical Technician, Advanced Emergency Medical Technician, and Paramedic.
6. List the benefits of membership in professional EMS organizations.
7. Differentiate among professionalism, professional licensure, certification, registration, and credentialing.
8. List characteristics of the professional paramedic.
9. Describe the paramedic’s role in patient care situations as defined by the U.S. Department of Transportation.
10. Describe the benefits of each component of off-line (indirect) and online (direct) medical direction.
11. Outline the role and components of an effective continuous quality improvement program.
12. Recognize EMS activities that pose a high risk for patients.
13. Describe actions paramedics may take to reduce the chance of errors related to patient care.

KEY TERMS

**advanced life support** The provision of care that paramedics or allied health professionals render, including advanced airway management, defibrillation, intravenous therapy, and medication administration.

**basic life support** Care provided by persons trained in first aid, cardiopulmonary resuscitation, and other non-invasive care.

**certification** A process by which authority is granted to a person to take part in an activity. This person has to meet certain qualifications.

**code of ethics** A set of guidelines that are designed to set out acceptable behaviors for members of a particular group, association, or profession.

**continuous quality improvement** A management approach to customer service and organizational performance that includes constant monitoring, evaluation, decisions, and actions.

**credentialing** A local process that allows a paramedic to practice in a specific EMS agency (or setting).

**emergency medical services** A national network of services coordinated to provide aid and medical assistance from primary response to definitive care; the network involves personnel trained in rescue, stabilization, transportation, and advanced management of traumatic and medical emergencies.

**extended scope of practice** The expansion of health care services provided by emergency medical services personnel in the prehospital setting.

**licensure** A process of regulating occupations through licenses granted by a government authority.

**managed care organizations** Networks that provide patient care services to their members, including health maintenance organizations and preferred provider organizations.

**medical oversight** The ultimate responsibility and authority for the medical actions of an EMS system; usually provided by one or more physicians.

**off-line (indirect) medical direction** The establishment and oversight of all medical components of an EMS system, including protocols, standing orders, educational programs, and the quality and delivery of online (direct) medical direction.

**online (direct) medical direction** The medical direction physician or designee who directly supervises prehospital
The role of the paramedic is different than that of the “ambulance driver” of the past. Today’s paramedics work in sophisticated emergency medical services (EMS) systems. They take part in an array of professional activities. These activities enhance the paramedic’s ability to provide quality service and state-of-the-art patient care in the field and in less traditional health care settings.

EMERGENCY MEDICAL SERVICES
SYSTEM DEVELOPMENT

Assigning a time and place to the birth of organized prehospital emergency care is difficult. To understand EMS system development, one must first consider certain events from ancient times to the present.

Before the Twentieth Century

The ancient Egyptians used herbs and drugs as medicine. They also splinted fractured bones, and they performed some surgeries. The Edwin Smith papyrus (circa the seventeenth century BC) depicted medical practice in Egypt. This system referred to the pulsation of the heart, palpation, and abnormal motor functions associated with brain injury. Other ancient texts show that surgery was practiced by the Babylonians of Mesopotamia, an ancient region of southwest Asia, as early as 1700 BC.¹

Organized prehospital emergency care has its roots in military history. Paintings of Roman battlefields suggest that some of the warriors cared for the injured. The first “ambulance” is thought to have been a covered cart used by one of Napoleon’s surgeons, Dominique-Jean Larrey. He moved injured soldiers to treatment areas during the Napoleonic wars in the 1800s.² The first civilian ambulance services were established in Cincinnati and New York City in the 1860s. In the United States Civil War, there was scandal when Walt Whitman and Matthew Brady reported that record all patient care activities and circumstances related to an emergency response.


did you know?
Clara Barton was an American nurse who served as a frontline volunteer during the American Civil War. She saw first-hand the value of the Red Cross during the Franco-Prussian War of 1870. These experiences encouraged her to establish a society in the United States. Under her leadership, the American Red Cross became the premier disaster relief organization in the world. Clara Barton was the founder and first president of the American Red Cross, which was established on May 21, 1881, in Washington, D.C.³

Twentieth Century

During World War I, medical care made rapid progress. Wounded soldiers needed urgent care for their injuries, which often were caused by machine guns and bombs. Thus

regulation The act of enrolling one’s name in a register, or book of record.
reciprocity The practice of granting an individual licensure or certification/regISTRATION based on licensure or certification/registration by another state, agency, or association.
standing orders Specific treatment protocols used by prehospital emergency care personnel in the absence of online (direct) medical direction.
treatment protocols Guidelines that define the scope of prehospital intervention practiced by emergency services personnel.
the military developed battlefield ambulance corps. During World War II, the military moved wounded soldiers by airplane. Then during the Korean conflict, the military evacuated soldiers with helicopters. During the Vietnam conflict, the military improved urgent care and rapid evacuation with well-trained corpsmen. These efforts became the basis of the prehospital care of the injured today.

From the early twentieth century through the mid-1960s, prehospital care in the United States was provided in several ways. Care mostly was delivered by urban, hospital-based systems. These systems later developed into municipal services. Care also was provided by funeral directors and volunteers who had little or no training in emergency care. Most patients received minimal stabilization at the scene. Then they were transported quickly to the nearest hospital.

Two landmarks in EMS development occurred in 1966:
1. The National Academy of Sciences–National Research Council Committee on Trauma and Shock published Accidental Death and Disability: The Neglected Disease of Modern Society (the “white paper”). This document lists recommendations to improve care for victims. Eleven of these recommendations are related directly to EMS (Box 1-1).
2. The U.S. Congress passed the Highway Safety Act of 1966. This act created the U.S. Department of Transportation. Congress also created the National Highway Traffic Safety Administration (NHTSA). The act provided legislative authority and funds to improve EMS and directed states to develop effective EMS programs. If the states did not develop effective EMS programs, they were subject to a loss of up to 10% of their federal highway construction funds. As a result of this act, states gave more than $142 million between 1968 and 1979 to develop EMS and early advanced life support (ALS) pilot programs.

Emergency medical services also emerged as a nationwide system because of death rate comparisons from World War I to Vietnam. Death rates for battlefield casualties were 8% in World War I. In World War II, they were 4.5%. In Korea, they decreased to 2.5%. Then in Vietnam, they were less than 2%. This decline was due to advances in field care for trauma patients (Box 1-2). These and other factors helped formulate the blueprint for improving prehospital emergency medical care in the United States. During 1972 and 1973, federal and private sources provided $31 million to fund EMS programs in 37 states and Puerto Rico.

In 1973, Congress passed the Emergency Medical Service Systems (EMSS) Act. This act paved the way for states to benefit from federal funds. The states could obtain the funds by forming regional EMS agencies. The act listed 15 vital parts of the EMS system (Box 1-3). Plus, the act required emergency care programs funded by the U.S. Department of Health and Human Services to plan and put into practice a regional approach for emergency response and immediate care for trauma patients. This act played a major role in creating regional EMS systems from 1974 to 1981.

**Critical Thinking**

How would you feel about moving to an area with this minimal level of emergency medical services?

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**Box 1-1 Eleven Recommendations for Emergency Medical Services Identified in the White Paper**

1. Extension of basic and advanced first aid training to greater numbers of the lay public.
2. Preparation of nationally acceptable texts, training aids, and courses of instruction for rescue squad personnel, police officers, firefighters, and ambulance attendants.
3. Implementation of recent traffic safety legislation to ensure completely adequate standards for ambulance design and construction, ambulance equipment and supplies, and the qualifications and supervision of ambulance personnel.
4. Adoption at the state level of general policies and regulations pertaining to ambulance services.
5. Adoption at district, county, and municipal levels of ways and means of providing ambulance services applicable to the conditions of the locality, control and surveillance of ambulance services, and coordination of ambulance services with health departments, hospitals, traffic authorities, and communication services.
6. Initiation of pilot programs to determine the efficacy of providing physician-staffed ambulances for care at the site of injury and during transportation.
7. Initiation of pilot programs to evaluate automotive and helicopter ambulance services in sparsely populated areas and in regions where many communities lack hospital facilities adequate to care for seriously injured persons.
8. Delineation of radio frequency channels and equipment suitable to provide voice communication between ambulances, emergency departments, and other health-related agencies at the community, regional, and national levels.
9. Initiation of pilot studies across the nation for evaluation of models of radio and telephone installations to ensure effectiveness of communication facilities.
10. Day-to-day use of voice communication facilities by the agencies serving emergency medical needs.
11. Active exploration of the feasibility of designating a single nationwide telephone number to summon an ambulance.


**Critical Thinking**

How does the “age” of the emergency medical services profession compare with the “age” of your parents’ or grandparents’ professions?
In 1981, funding for EMS development changed due to the Consolidated Omnibus Budget Reconciliation Act (COBRA). This act consolidated EMS funding into state preventive health services block grants. As a result, funding under the EMSS Act was eliminated. These block grants were paid to state health departments instead of regional EMS organizations. Because these grants could be spent on projects other than EMS, the grants fell victim to politics. Thus direct funding for EMS declined. Through cuts in funding and staff, the ability of NHTSA to support the U.S. Department of Health and Human Services effort diminished. As a result, each state had to develop and fund their EMS systems. Thus the great growth that EMS experienced in the 1960s and 1970s declined. NHTSA continues to assist EMS development. In 1988 NHTSA established “10 System Elements” (the Statewide EMS Technical Assistance Program) as a recommended standard for EMS systems (Box 1-4).
In 1996 NHTSA and the Health Resources and Services Administration (HRSA) published a consensus paper that was held in high regard. This document, the Emergency Medical Services Agenda for the Future, was referred to as the Agenda. The Agenda was federally funded and completed by the National Association of EMS Physicians and the National Association of State EMS Directors. These organizations designed the Agenda to be used by government and private organizations at the national, state, and local levels. The intent of the document was to build a common vision for the future of EMS. The Agenda also was meant to help guide planning, decision making, and policy regarding EMS.

The Agenda made 14 suggestions for EMS focused on principles of public health and safety systems (Figure 1-1), including the EMS education system (described later in this chapter). The 14 attributes for EMS identified by the Agenda are the following:

1. Integration of health services
2. EMS research
3. Legislation and regulation
4. System finance
5. Human resources
6. Medical direction
7. Education systems
8. Public education
9. Prevention
10. Public access
11. Communication systems
12. Clinical care
13. Information systems
14. Evaluation

Box 1-5 outlines other landmarks in EMS development.

Changes in federal health care reform affect the way health care, including emergency care, is provided. Managed care and extended scope of practice are most relevant to EMS. Managed care refers to patient care services that are provided to members by managed care organizations (e.g., health maintenance organizations [HMOs], preferred provider organizations [PPOs], and other provider networks). These plans now cover about 60% of the U.S. population. This reform affects EMS systems in the way that they provide patient care choices for their clients (e.g., emergency versus nonemergency response, resources, and personnel; transportation modes; and health care facility options).

Extended scope of practice came out of the cost-containment setting of managed care. As it relates to EMS, extended

![Figure 1-1: Emergency medical services: part of the health care system.](image-url)
scope of practice refers to expanding services of EMS personnel in the prehospital setting. Examples include providing health screenings, physical examinations, and immunizations. Expanded scope for paramedics will continue to evolve. EMS agencies and managed care programs will develop other useful patient services to enhance revenues, to further injury prevention programs, and to reflect changes in how medical care is delivered. Expanded scope also helps ensure that EMS remains a vital part of the health care system.8

### BOX 1-5 Other Landmarks in the Development of Emergency Medical Services

- **1973**: The American College of Surgeons develops the first training programs for ambulance attendants.
- **1974**: Dr. Peter Safar demonstrates the efficacy of mouth-to-mouth ventilation.
- **1975**: Mid 1950s: The American College of Surgeons develops the first training programs for ambulance attendants.

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>1969</td>
<td>The U.S. Department of Transportation and National Highway Traffic Safety Administration (NHTSA) develop the basic training course for emergency medical technicians (EMTs).</td>
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<tr>
<td>1969</td>
<td>The Committee on Ambulance Design develops Ambulance Design Criteria, a report to the U.S. Department of Transportation and the NHTSA to complement the National Academy of Sciences–National Research Council Medical Requirements for Ambulance Design and Equipment (1968). This document recommends ambulance design standards and emergency equipment. The NHTSA agrees to issue matching federal funds to states that purchase vehicles meeting these standards.</td>
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<tr>
<td>1970</td>
<td>The National Registry of Emergency Medical Technicians is organized to standardize education, examinations, and certification of EMTs on a national level.</td>
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<td>1972</td>
<td>President Nixon directs the U.S. Department of Health, Education, and Welfare to develop new ways to organize emergency medical services (EMS), which results in $8.5 million in contracts being awarded to develop a model EMS system.</td>
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<td>1972</td>
<td>The University of Cincinnati establishes the first residency program to train new physicians exclusively for the practice of emergency medicine.</td>
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<td>1973</td>
<td>The star of life is adopted as the official symbol for EMS. The six blue bars of the star of life represent the six system functions of EMS: detection, reporting, response, on-scene care, care in transit, and transfer to definitive care.</td>
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<tr>
<td>1973</td>
<td>President Gerald Ford proclaims the first National EMS Week.</td>
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<tr>
<td>1975</td>
<td>The National Association of Emergency Medical Technicians is founded.</td>
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<tr>
<td>1975</td>
<td>The American Medical Association accepts and approves the Paramedic role as an emergency health occupation.</td>
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<td>1977</td>
<td>More than 40 EMT training agencies throughout the United States develop and test the national training standards for the paramedic for 2 years.</td>
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<tr>
<td>1980</td>
<td>The U.S. Department of Health and Human Services releases the Position Paper on Trauma Center Designation, which describes trauma centers within EMS systems. The paper also categorizes facilities.</td>
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<tr>
<td>1984</td>
<td>The EMS for Children program, under the Public Health Act, provides funding for enhancing the EMS system to better serve pediatric patients.</td>
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<tr>
<td>1986</td>
<td>The 1979 Public Safety Officer’s Act (SB 1479) is amended to expand the $50,000 compensation to include survivors of rescue squads, ambulance crew members, and public safety department volunteers killed in the line of duty (amended in 1990).</td>
</tr>
<tr>
<td>1990</td>
<td>Government agencies include the National Institute of Health and Human Services, the Center for Medicare and Medicaid Services. The new Medicare fee structure caused major reductions in payment for some emergency medical services agencies but increased fees for others.</td>
</tr>
<tr>
<td>1991</td>
<td>The Institute of Medicine publishes Emergency Medical Services for Children, which points out deficiencies in the ability of the health care system to address the emergency medical needs of pediatric patients.</td>
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<tr>
<td>1995</td>
<td>Congress does not reauthorize funding for this act.</td>
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### NOTE

Medicare and Medicaid are the two insurance programs of the U.S. government. Together, these insurance programs cover about 25% of the U.S. population. These plans have rules that affect how patients qualify for emergency medical services transportation. The rules also decide the conditions under which reimbursement for transportation will occur. This reimbursement became standardized throughout the country in 2002.
CURRENT MEDICAL SERVICES SYSTEMS

The EMS system of today is a network of coordinated services that provides medical care to the community. The coordination is defined by the NHTSA Technical Assistance Program Standards. This coordination ensures that patients are treated quickly and properly and that resources are used efficiently. Together these factors reduce health care costs (Figure 1-2). They also improve patient outcome and reduce hospital stays.

State EMS systems usually are made up of local and regional agencies that manage the delivery of prehospital care. The local agencies are responsible for providing day-to-day EMS to the community. Local agencies also work with regional and state agencies to create protocols and help set standards and guidelines. Local agencies provide data collection services and coordinate mutual aid and disaster planning. Most state EMS agencies have advisory councils to help organize EMS programs and activities. These councils are made up of medical professionals, paraprofessionals, consumers, and public and private agencies with an interest in EMS. The state agency is responsible for licensing and/or certification. In addition, the state enforces state EMS regulations and develops public education programs. Moreover, the state agency acts as a liaison with national agencies. Some of these national agencies include NHTSA, the Federal Emergency Management Agency (FEMA), Homeland Security, and the Maternal Child Health Bureau of the Health Resources and Services Administration.

Emergency Medical Services System

![Diagram of Emergency Medical Services System]


DID YOU KNOW?

NEMSIS stands for the National Emergency Medical Services Information System. NEMSIS is the national repository that will be used to store EMS data from every state in the nation. Since the 1970s, the need for EMS information systems and databases has been well established, and many statewide data systems have been created. However, these EMS systems vary in their ability to collect patient and systems data and allow analysis at a local, state, and national level. For this reason, the NEMSIS project was developed to help states collect more standardized elements and eventually submit the data to a national EMS database. Such a database will be useful in:

- Developing nationwide EMS training curricula
- Evaluating patient and EMS system outcomes
- Facilitating research efforts
- Determining national fee schedules and reimbursement rates
- Addressing resources for disaster and domestic preparedness
- Providing valuable information on other issues or areas of need related to EMS care

Emergency Medical Services System Operations

The operations of an effective EMS system include citizen activation, dispatch, prehospital care, hospital care, and rehabilitation.

CITIZEN ACTIVATION

Emergency public safety services are highly visible in the community. However, the public is not always aware of the complex nature of these services. Citizens expect to have police and fire protection. They also expect to get a quick response with skilled personnel in a medical emergency. These expectations are due to years of available public safety service, public relations, press coverage, and national media. The public also expects such service because of public support in the form of taxes, donations, subscriptions for service, and user fees.

DID YOU KNOW?

In December 1971, the television show “Emergency!” made its debut to millions of viewers. The series starred Randolph Mantooth as paramedic John Gage and Kevin Tighe as his partner, paramedic Roy DeSoto. This popular TV series contributed to a change in public attitudes about fire service and prehospital emergency care. It was also during this time that many fire departments expanded their services to include EMS response.

Public involvement in EMS goes beyond funding. Citizens are often at the scene of an injury or illness. They play an important role in recognizing the need for emergency services. Citizens sometimes administer first aid, help secure the scene and gain access to the patient, and can be instrumental in managing a crisis. Educating the public is...
fundamental to the development of an effective EMS system. Paramedics help prepare the public to respond to a medical emergency. They also build support for EMS by helping to develop and present public health care education and prevention programs (see Chapter 3).

**CRITICAL THINKING**

How is the emergency medical services system funded in your community?

Once citizens recognize that an emergency exists and a call for help is made, the response is coordinated. Citizens usually contact communication centers and dispatching services by emergency phone numbers. The number 9-1-1 offers access to public safety services in most of the country. These services include fire service, law enforcement, and EMS. The availability of emergency access through 9-1-1 continues to expand across the country as areas adopt the system. In areas that do not have 9-1-1, citizens should have easy access to other emergency phone numbers. These numbers can be promoted through public awareness programs, phone stickers, and phone book covers. Other ways of engaging an emergency response include firebox pull stations, citizen band radios, voice over Internet protocol (VOIP), and cell phones. Chapter 5 covers 9-1-1 in more detail.

**PREHOSPITAL CARE**

Ill or injured patients may need prehospital intervention and stabilization. Interventions may involve basic life support (BLS) and ALS skills. Depending on the situation (e.g., entrapment, distance to the hospital, and availability of ALS), initial prehospital care may be limited. The care may consist of giving only comfort and reassurance. Care also may require spinal immobilization, airway protection, endotracheal intubation, intravenous therapy, medication administration, defibrillation, and external cardiac pacing.

**HOSPITAL CARE**

When the patient is brought to the emergency department, patient care resources expand. This care may include physicians, physician assistants, nurse practitioners, nurses, technicians, ancillary support staff (allied health counselors, social workers, and others), secretaries, and medical record staff. Diagnostic tests are often performed. These services may be provided by laboratory, radiology, and cardiopulmonary departments. Resources available beyond the emergency department include surgery, cardiac catheterization, intensive care, physical therapy, pharmacy, nutrition services, and many others.

**REHABILITATION**

After hospital delivery and definitive care, many patients receive some type of rehabilitation services. Rehabilitation often occurs before and after hospital discharge. The services may be in the form of education and physical and occupational therapy that help the patient to recover. Rehabilitation also can help the patient to maintain maximal independence. One example of such therapy is helping patients and families adjust to required changes in lifestyle after a myocardial infarction. Another example is retraining in activities of daily living (e.g., bathing and preparing meals). Job rehabilitation also allows patients to adapt to limb impairment or loss.

**EMS EDUCATION**

The national standard curriculum for paramedics was last revised in 1998. That same year, EMS leaders worked with NHTSA to revise a portion of the Agenda (the National Emergency Medical Services Education and Practice Blueprint [the Blueprint]). This revision revealed the future of EMS education. The text was titled the EMS Education Agenda for the Future: A Systems Approach (the Education Agenda). The Education Agenda named core content categories for each license level. The Education Agenda also stressed the integration of EMS within the overall health care system. Figure 1-3 is a diagram of a model that came from the revision. New to this revision was the definition of cognitive (knowledge), psychomotor (skills), and affective (attitude) objectives.

The NHTSA and HRSA also funded the National EMS Core Content, which was published in 2005. This document defined the entire domain of out-of-hospital practice. It also identified the universal body of knowledge and skills for EMS personnel. This project was led by the National Association of EMS Physicians and the American College of Emergency Physicians.

The National EMS Scope of Practice Model (Scope of Practice) was published in 2007. This consensus document defined the four levels of EMS personnel described in this chapter. It also defined the practices and minimum skills for each level. Each educational level assumes mastery of previous competencies for each license level. Each individual must demonstrate each skill within his or her scope of practice and for patients of all ages.

Development of the National EMS Education Standards (the Standards) was led by the National Association of EMS Educators (NAEMSE). The Standards replace NHTSA’s national standard curricula that had been the cornerstone of EMS education since the 1960s. The Standards define the competencies, clinical behaviors, and judgments that must be met by entry-level EMS personnel at each licensure level. The goal was to meet practice guidelines as defined by the National EMS Scope of Practice Model. Content and concepts defined by the National EMS Core Content were also integrated within the Standards. Box 1-6, EMS History, outlines the timeline of these publications and standards.

**NOTE**

Each EMS licensure level represents a significant difference in skills, risk, knowledge, level of supervision and autonomy, judgment, and clinical decision making.
## Paramedic: National Standards Curriculum

### Diagram of Educational Model

**Competencies**
- Mathematics, reading, and writing

**Pre- or Co-Requisite**
- EMT or EMT-Basic
- Human anatomy and physiology

**Preparatory**
- EMS systems/The roles and responsibilities of the paramedic
- The well-being of the paramedic
- Illness and injury prevention
- Medical/legal issues
- Ethics
- General principles of pathophysiology
- Pharmacology
- Medication administration
- Therapeutic communications
- Lifespan development

**Medical**
- Pulmonary
- Cardiology
- Neurology
- Endocrinology
- Allergies and anaphylaxis
- Gastroenterology
- Urology
- Toxicology
- Hematology
- Environmental conditions
- Infectious and communicable diseases
- Behavioral and psychiatric disorders
- Gynecology
- Obstetrics

**Airway Management and Ventilation**
- History taking
- Techniques of physical examination
- Patient assessment
- Clinical decision making
- Communications
- Documentation

**Trauma**
- Trauma systems/mode of injury
- Hemorrhage and shock
- Soft-tissue trauma
- Burns
- Head and facial trauma
- Spinal trauma
- Thoracic trauma
- Abdominal trauma
- Musculoskeletal trauma

**Patient Assessment**

**Special Considerations**
- Neonatology
- Pediatrics
- Geriatrics
- Abuse and assault
- Patients with special challenges
- Acute interventions for the home care patient

**Assessment-Based Management**

**Operations**
- Ambulance operations
- Medical incident command
- Rescue awareness and operations
- Hazardous materials incidents
- Crime scene awareness

**Lifelong Learning**
- Continuing education

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**Figure 1-3** Diagram of Department of Transportation education model. (U.S. Department of Health and Human Services, Health Resources and Services, Health Resources and Services Administration, Maternal and Child Health Bureau: *Emergency medical services agenda for the future*, Washington, DC, 1999, The Administration.)
**NOTE**
The Education Agenda recommends that EMS students graduate from a nationally accredited EMS educational program to be eligible for National EMS Certification (Figure 1-4). This is to ensure consistency and quality of EMS personnel. National certification is the element critical to extend reciprocity to EMS personnel educated in other states. In the future, EMS educational programs will likely require review by the Committee on Accreditation of Educational Programs for Emergency Medical Services Professions (CoAEMSP). The goal of this accreditation is to ensure quality of education and to ensure that appropriate educational infrastructures and resources are available for students in EMS programs. For more information, see The Commission’s website at www.caahep.org.


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**National EMS Core Content**

**National EMS Scope of Practice Model**

**National EMS Education Standards**

**National EMS Certification**

**National EMS Education Program Accreditation**

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**EMERGENCY MEDICAL SERVICES PERSONNEL LEVELS**

Various levels of personnel and medical direction come together to make an effective prehospital EMS system. The levels include dispatcher, Emergency Medical Responder (EMR), Emergency Medical Technician (EMT), Advanced Emergency Medical Technician (AEMT), and Paramedic. Each EMS level described here has satisfied training based on the National EMS Education Standards. They function as part of a comprehensive EMS response, under medical oversight. (The following descriptions of EMS practitioner levels are adapted from the National EMS Education Standards.)

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**Dispatcher**

A dispatcher is a telecommunicator. This person serves as the primary contact with the public. The dispatcher directs the proper agencies to the scene. These agencies may include ground and air ambulances, fire departments, law enforcement, utility services, and others. The term telecommunicator applies to call takers, dispatchers, radio operators, data terminal operators, or any combination of such functions in a public service answering point located in a fire, police, or EMS communications center (see Chapter 5). An effective EMS dispatch communications system includes the following functions:

- **Receive and process calls for EMS assistance.** The dispatcher receives and records calls for EMS assistance and selects an appropriate course of action for each call. To do this, the dispatcher must obtain as much information as possible about the emergency event. This information
includes name, call-back number, and address. The dispatcher may also have to deal with distraught callers.

- **Dispatch and coordinate EMS resources.** The dispatcher directs the proper emergency vehicles to the correct address. This person also coordinates the emergency vehicles while en route to the scene, to the medical facility, and back to the operations base (Figure 1-5).

- **Relay medical information.** The dispatch center can provide a telecommunications channel among appropriate medical facilities and EMS personnel; fire, police, and rescue workers; and private citizens. This can consist of phone, radio, or biomedical telemetry.

- **Coordinate with public safety agencies.** The dispatcher aids communications between public safety (fire, law enforcement, rescue) and the EMS system. This coordinates services such as traffic control, escort, fire suppression, and extrication. The dispatcher must know the location and status of all EMS vehicles and whether support services are available. In larger systems, computer-aided dispatching is used. This provides for one or more of the following abilities:
  - Automatic entry of 9-1-1
  - Automatic interface to vehicle location with or without map display
  - Automatic interface to mobile data terminal
  - Computer messaging among multiple radio operators, call takers, or both
  - Dispatch note taking, reminder aid, or both
  - Ability to monitor response times, response delays, and on-scene times
  - Display of call information
  - Emergency medical dispatch review
  - Manual or automatic updates of unit status
  - Manual entry of call information
  - Radio control and display of channel status
  - Standard operating procedure review
  - Telephone control and display of circuit status

Many EMS and public service agencies require specialized training for their dispatch personnel. The dispatcher then can give directions to the caller while the caller waits for EMS arrival. The training may include the US DOT training program for the emergency medical dispatcher, which is described further in Chapter 5.

### Critical Thinking

What type of dispatching is provided in your community? Are dispatchers trained to the level of emergency medical dispatcher?

**Emergency Medical Responder (EMR)**

The EMR (also known as First Responder) may be the first trained person in an EMS system to arrive on a scene. These responders may include personnel from fire departments and law enforcement agencies. They also may include designated commercial medical response teams, athletic trainers, and others. The primary focus of the EMR is to initiate immediate lifesaving care to critical patients who access the EMS system. This person has the basic knowledge and skills necessary to provide basic lifesaving interventions while awaiting additional EMS response. The EMR can also assist higher-level personnel at the scene and during transport. They perform basic interventions with minimal equipment. The EMR can do the following:

1. Recognize the seriousness of the patient’s condition or extent of injuries.
2. Assess requirements for emergency medical care.
3. Administer appropriate emergency medical care for life-threatening injuries relative to airway, breathing, and circulation.

**Emergency Medical Technician (EMT)**

The EMT (formerly known as EMT-Basic) is trained in all phases of basic life support. This training includes the use of automated external defibrillators and the administration of some emergency medications. The primary focus of the EMT is to provide basic emergency medical care and transportation for critical and emergent patients who access the EMS system. They perform interventions with the basic equipment typically found on an ambulance. They also assist paramedics in the care of patients during transport.

**Advanced Emergency Medical Technician (AEMT)**

The AEMT was formerly known as EMT-Intermediate. The degree of training and skills that the AEMT practices varies between states and EMS systems. Training can include ALS procedures such as percutaneous airway adjuncts, intravenous therapy, defibrillation, cardiac rhythm interpretation,
and administration of some emergency medications. The primary focus of the AEMT is to provide basic and limited advanced emergency medical care and transportation for critical and emergent patients who access the EMS system.

**Paramedic**

The **paramedic** (formerly known as EMT-Paramedic) is trained in all aspects of basic and advanced life support procedures that are relevant to prehospital emergency care. The paramedic has advanced training in patient assessment, clinical decision making, cardiac rhythm interpretation, defibrillation, drug therapy, and airway management (Box 1-7). The paramedic provides emergency care based on advanced assessment skills and the formulation of a field diagnosis. The paramedic’s specific roles and duties are discussed later in this chapter.

**BOX 1-7 Description of the Paramedic Profession**

The description of the paramedic profession provides the philosophy and rationale for the depth and breadth of coverage.

- Paramedics have fulfilled requirements prescribed by an accrediting agency to practice the art and science of out-of-hospital medicine under medical direction. Through performing assessments and providing medical care, their goal is to prevent and reduce mortality and morbidity caused by illness and injury. Paramedics primarily provide care to emergency patients in an out-of-hospital setting.
- Paramedics possess knowledge, skills, and attitudes consistent with the expectations of the public and the profession. Paramedics recognize that they are an essential component of the continuum of care and serve as linkages among health resources.
- Paramedics strive to maintain high-quality, reasonable-cost health care by delivering patients directly to appropriate facilities. As advocates for patients, paramedics seek to be proactive in affecting long-term health care by working with other provider agencies, networks, and organizations. The emerging roles and responsibilities of the paramedic include public education, health promotion, and participation in injury- and illness-prevention programs. As the scope of service continues to expand, the paramedic will function as a facilitator of access to care and as an initial treatment provider.
- Paramedics are responsible and accountable to medical direction, the public, and their peers. Paramedics recognize the importance of research and actively participate in the design, development, evaluation, and publication of research. Paramedics seek to take part in lifelong professional development, perform peer evaluation, and assume an active role in professional and community organizations.

**NATIONAL EMERGENCY MEDICAL SERVICES GROUP INVOLVEMENT**

Many groups and organizations help to set the standards of EMS (Box 1-8). These groups exist at the national, state, regional, and local levels. They take part in development, education, implementation, lobbying, and setting standards for EMS. Membership and participation in professional organizations help promote the professional status of the paramedic. These groups expose the paramedic to trends in emergency care, continuing education, and to resource experts. The organizations also provide for national representation. They have a unified voice in other health care organizations and issues of national matters. The EMS standard-setting groups have many roles. Their primary role, however, is to set standards with input from members of the profession and the community. By doing so, they help ensure that the public is protected from individuals and agencies that do not meet professional standards for licensure and/or certification.

One such organization is the National Registry of Emergency Medical Technicians (NREMT). The National Registry helps develop professional standards in the EMS industry. This organization verifies competencies for EMTs and paramedics by preparing and conducting certification examinations. The organization also simplifies the process of state-to-state mobility and reciprocity for its members.

**BOX 1-8 Sampling of National Emergency Medical Services Organizations and Associations**

- American Ambulance Association
- American College of Emergency Physicians
- American College of Surgeons
- Association of Air Medical Services
- Emergency Nurses’ Association
- National Association of EMS Educators
- National Association of EMS Physicians
- National Association of Emergency Medical Technicians
- International Association of Fire Chiefs
- International Association of Fire Fighters
- National Association of Search and Rescue
- National Association of State EMS Officials
- National Flight Nurses’ Association
- National Flight Paramedic Association
- National Registry of Emergency Medical Technicians

LICENSURE, CERTIFICATION, AND REGISTRATION

Paramedics are granted permission to practice their skills by three processes: licensure, certification, and registration. The exact wording of granting this permission varies by state.

Licensure
Licensure is a process of regulating occupations. In this process a license is granted by a government authority. The license allows a person to engage in a profession or activity that otherwise would be unlawful. Some states and local authorities require that paramedics have a license.

Certification
Certification grants authority to a person to take part in an activity. The person receives a document from a government or nongovernment entity showing that the person has met the requirements to practice an activity. Some states or local authorities require that paramedics be certified.

Registration
Registration is the act of enrolling one’s name in a register, or book of record. For example, paramedics can be licensed or certified in their state and can be registered with the National Registry of Emergency Medical Technicians.

Credentialing
Credentialing is a local process that allows a paramedic to practice in a specific EMS agency (or setting). Credentialing processes are typically guided by the local medical director (Figure 1-6).

PROFESSIONALISM

Training and performance standards have helped to define EMTs and paramedics as health care professionals. The term profession refers to a body of knowledge or expertise. The members of such a field are often self-regulated through licensing or certification that confirms competence. In addition, most professions adhere to standards. These standards include initial and continuing education requirements. Professionalism refers to the way in which a person follows the standards of a profession. These standards may include conduct and performance standards. These standards also usually include adhering to a code of ethics approved by the profession (see Chapter 7).

Health Care Professionals
Health care professionals conform to the standards of their profession. By providing quality patient care and striving for high standards, they instill pride in the profession and earn the respect of others. EMS professionals occupy positions of public trust and are highly visible role models. As

NOTE
Some persons believe that licensed professionals have greater status than those who are certified or registered. This belief is unfounded. A certification granted by a state and conferring a right to engage in a trade or profession is in fact a license.

**FIGURE 1-6** The relationship among education, certification, licensure, and credentialing.
such, the public has high expectations of EMTs and paramedics while they are both “on” and “off” duty. Therefore, professional conduct at all times and a commitment to excellence in daily activities complement the image of the EMS professional. Image and behavior are vital to establishing credibility and instilling confidence. The professional paramedic represents his or her employer; the EMS agency; the state, county, city, or district EMS office; and his or her peers.

**Attributes of the Professional Paramedic**

Many aspects of being professional can be applied to the role of the paramedic. Eleven of these attributes follow:

1. **Integrity.** Integrity means being honest in all actions. Integrity may be the most important behavior for EMS professionals. The public assumes EMS professionals have integrity. Actions that show integrity include being truthful, not stealing, and providing complete and correct documentation.

2. **Empathy.** Empathy is identifying with and understanding the feelings, situations, and motives of others. EMS professionals must always show empathy to patients, families, and other health care professionals. Behavior that demonstrates empathy includes showing caring, compassion, and respect for others; understanding the feelings of the patient and family; being calm and helpful to those in need; and being supportive and reassuring of others.

3. **Self-motivation.** Self-motivation is the internal drive for merit and self-direction. Self-motivation can mean taking the lead to finish tasks, to improve behavior, and to follow through without supervision. Some marks of self-motivation are showing enthusiasm for learning, being committed to continuous quality improvement or CQI (described later in this chapter), and accepting constructive feedback.

4. **Appearance and personal hygiene.** Paramedics are aware of how they present themselves as representatives of their profession. They must ensure that their clothing and uniforms are clean and in good repair. They must be aware of the importance of personal hygiene and good grooming.

5. **Self-confidence.** Paramedics must trust and rely on themselves, often in difficult situations. One key task is to assess personal and professional strengths and weaknesses. The ability to trust personal judgment shows self-confidence.

6. **Communications.** An important part of the paramedic’s job is communicating. Paramedics must be able to convey key information to others verbally and in writing. They must demonstrate communication skills by speaking clearly, writing legibly, and listening actively. Finally, paramedics must be able to adjust communication strategies to various situations.

7. **Time management.** Time management refers to organizing and prioritizing tasks to make the best use of time.

8. **Teamwork and diplomacy.** The paramedic must be able to work well with others to achieve common goals. As a member of the EMS team, the paramedic must place the success of the team above personal success. This is done by supporting and respecting other team members, being flexible and open to change, and communicating with co-workers to resolve problems. (See Chapter 5.)

9. **Respect.** Respect means having regard for others and showing consideration and appreciation. Paramedics are polite to others and avoid the use of derogatory or demeaning terms. They know that showing respect brings credit to themselves, their association, and their profession.

10. **Patient advocacy.** The paramedic must always act as the patient’s advocate, even when the patient disagrees with the care. Paramedics should not attempt to impose their personal beliefs on patients or allow personal biases (religious, ethical, political, social, legal) to impact patient care. The needs of the patient are always placed above self-interests. The paramedic also must protect the patient’s confidentiality.

11. **Careful delivery of service.** Paramedics deliver the highest quality of patient care. With this care comes attention to detail and proper prioritization of care. They also must evaluate their performance and attitude on every call. As part of the careful delivery of service, paramedics master and refresh their skills; perform full equipment checks; and ensure safe ambulance operations. Paramedics also follow policies, procedures, and protocols and comply with the orders of their supervisors.

**CRITICAL THINKING**

Which of these professional attributes represent your strengths? Which ones do you think you need to work on?

**ROLES AND RESPONSIBILITIES OF THE PARAMEDIC**

The paramedic may practice patient care at an emergency scene, from an emergency scene to the hospital, between health care facilities, or in other health care settings as permitted by state and local laws. The paramedic’s roles and duties can be divided into two groups: primary responsibilities and additional responsibilities (Box 1-9).

**Primary Responsibilities**

The paramedic must be prepared physically, mentally, and emotionally for the job. Preparation includes being committed to positive health practices (see Chapter 2). It also includes having the proper equipment and supplies
and maintaining adequate knowledge and skills of the profession. The paramedic must respond to the scene in a safe and timely manner. Scene assessment must consider personal safety; safety of the crew, patients, and bystanders; and the mechanism of injury or probable cause of illness.

The paramedic must quickly perform patient assessment to determine the injury or illness. Integrating assessment findings with knowledge of disease or injury helps the paramedic formulate a field impression. It also helps set priorities of care and transportation. Managing an emergency often entails following protocols and interacting with medical direction as needed. The care provided by the paramedic should minimize secondary injury. After stabilizing the patient in the field, the paramedic should provide for transport to an appropriate facility. Transportation may include a ground or air ambulance. The type of transport needed for optimal patient care is based on the patient’s condition, distance from the hospital, travel time, and other factors. Choosing the most appropriate facility requires knowledge of available resources, hospital designations, and categorization (Box 1-10). The hospital destination decision should be made jointly between the paramedic and the patient in cooperation with medical oversight. Knowledge of transfer agreements and local transport protocols is also helpful.

The paramedic is the patient’s advocate as responsibility for care shifts to the staff at the receiving facility. The staff must be briefed about the patient’s condition at the scene and during transport. The paramedic also needs to provide thorough and accurate documentation in the patient care report (PCR). The PCR should be completed in a timely manner so that the EMS crew can return to service. The crew should prepare the ambulance for return to service by replacing equipment and supplies (per agency protocol). The crew also should review the call openly. This can help to identify ways to improve the patient care services that were provided at the scene and during transport.

### Additional Responsibilities

Other duties of the paramedic include community involvement, support of primary care efforts, advocating citizen involvement in the EMS system, participation in leadership activities, and personal and professional development.

A paramedic can be involved in the community and can be a role model for the profession in many ways. The paramedic can advocate illness and injury prevention programs (see Chapter 3) and can participate as a leader in community activities. A few ways to improve the health of the community include teaching CPR, first aid, and injury prevention. These activities help to ensure proper use of EMS resources. They can also improve the integration of EMS with other health care and public safety agencies.

Communities and their health care organizations often enlist paramedics to support primary care efforts, and prevention and wellness programs. Paramedics can help to inform the public of the best use of prehospital and other non-EMS health care resources. Examples include alternatives to ambulance transportation, nonhospital emergency department clinical providers, and freestanding emergency clinics. These programs that teach when, where, and how to use EMS and emergency departments promote the best use of health care resources.
Encouraging citizens to be involved in EMS improves the system as a whole. Citizens can help to set the needs and parameters for EMS use in the community. They can offer an objective view into quality improvement and problem solving. In addition, having involved citizens creates informed, independent advocates for the EMS system.

Paramedics can take part in leadership activities in their communities in many ways. One example is conducting primary injury prevention initiatives (activities and risk surveys). Another example is assisting media campaigns to promote EMS issues and other health programs. (See Chapter 3.)

Finally, a paramedic has a responsibility for personal and professional development. There are many methods to accomplish this. Examples include continuing education, student mentoring, membership in professional organizations, and joining professional teams. Other methods include becoming involved in work-related issues that affect career growth, exploring alternative career paths in the EMS profession, conducting and supporting research initiatives, and being actively involved in legislative issues related to EMS.

**MEDICAL DIRECTION FOR EMERGENCY MEDICAL SERVICES**

The medical direction physician is the medical leader for the EMS system. The physician serves as a resource and as a patient advocate. This relationship between medical direction and the paramedic is critical to an effective EMS system. It allows for the delivery of advanced prehospital care. The ideal medical direction physician is properly educated as an EMS medical director. The physician also is motivated to provide the following: 13

- EMS system design and operations
- Education and training of EMS personnel
- Participation in personnel selection
- Participation in equipment selection
- Development of clinical protocols in cooperation with expert EMS personnel
- Participation in CQI and problem resolution
- Direct input into patient care
- Interface between EMS systems and other health care agencies
- Advocacy within the medical community
- Guidance as the “medical conscience” of the EMS system (advocating for quality patient care)

**Types of Medical Direction**

The two types of medical direction are **online (direct) medical direction** and **off-line (indirect) medical direction.** Both types ensure the quality of medical care in an EMS system. Most prehospital care is provided through standing orders and patient care protocols (varies by state). There are times, however, when a patient care issue falls outside the scope of standing orders or an unusual situation at the scene arises. When this occurs, the paramedic may need to contact online medical direction by radio or phone to convey the patient’s information and to receive orders through direct consultation with a physician or physician designee. The designee may be a registered nurse or physician assistant. The designee also may be a paramedic trained to give ALS orders in the medical direction system. Online medical direction allows for instant and specific care, telemetry, and CQI while paramedics are on the scene. As a rule, online medical direction supersedes off-line medical direction. 14

An advisory group often is the voice behind the off-line direction, but it also can be provided by one or more medical directors. A director must have full medical direction authority. He or she also must have knowledge of how the EMS system operates. This type of direction can be prosp ective or retrospective. Prospective off-line direction covers the authority to set treatment protocols and standing orders (Box 1-11). Such knowledge includes training for care and triage in the prehospital arena, as well as the choice of equipment, supplies, and personnel. Retrospective off-line direction includes any actions that take place after the EMS call. An example is reviewing a patient care report and providing CQI.

**On-Scene Physicians**

Some of the first ambulance personnel were physicians. Yet, rarely is a medical direction physician on the scene providing direct field supervision of EMS personnel. At times, however, a physician (physician intervenor) may witness the injury or illness. Perhaps the patient’s private physician is on the scene when EMS arrives. When this occurs, positive
interaction between the on-scene physician and the EMS crew is essential.

**NOTE**

An on-scene physician may not be familiar with functions of emergency medical services or medical oversight responsibilities. The lines of authority and responsibility for these physicians vary from state to state. Each EMS agency should have a policy that defines interaction with physicians on the scene.

If a nonmedical direction physician or the patient’s physician is on the scene, EMS personnel must follow protocols. If no protocols are in place, the paramedic should immediately contact online medical direction. The policies of many EMS agencies require that the physician on scene can assume responsibility for patient care and provide medical direction. Together the physicians can make choices about the patient’s care. With permission of medical direction, a physician on the scene may take control of the patient’s care. If a physician on the scene tries to direct care in opposition to medical direction, EMS personnel should have law enforcement intervene. This will ensure that the scene is safe and the EMS care goes uninterrupted.

**IMPROVING SYSTEM QUALITY**

A major goal of any EMS system is to evaluate and improve care continually. One way to meet this goal is through a modified form of quality assurance. This form of quality assurance is known as *continuous quality improvement* (CQI), which is the ongoing study and improvement of a process, system, or organization (Box 1-12).

**BOX 1-12 Quality Assurance and Continuous Quality Improvement**

Quality assurance (QA) is a system of quality management that by tradition was linked with spotting deviations from a standard (e.g., protocols). Quality assurance also altered these deviations through some type of punitive action. Continuous quality improvement (CQI) is a modified form of QA. Continuous quality improvement focuses on the system and not the individual, thus removing much of the punitive aspect associated with a QA program. Continuous quality improvement is less rigid than QA. In addition, CQI considers many factors that often apply to EMS. Continuous quality improvement includes the entire medical direction system and involves all health providers in the problem-solving process.

The EMS worker should use input from CQI activities to adapt treatment protocols and educational activities when needed. The goal of CQI is to find and fix problems in a positive manner. Continuous quality improvement also is aimed at improving the overall system. CQI activities include a review of the following:

- Outcome measures of prehospital care (e.g., scene times, procedure completion rates, and mortality reviews)
- Care while treatment is ongoing (concurrent reviews)
- Written EMS patient care paperwork (retrospective reviews)
- Random or selected radio communication tapes
- New procedures, equipment, or therapies

A CQI program identifies and attempts to improve problems in certain areas. Key areas that are monitored in most EMS systems include:

- Medical direction
- Financing
- Training
- Communications
- Prehospital management and transportation
- Interfacility transportation
- Receiving facilities
- Specialty care units
- Dispatch
- Public information and education
- Audit and quality assurance
- Disaster planning and mutual aid

Continuous quality improvement is a process that involves all caregivers in the problem-solving aspect (Figure 1-7). Continuous quality improvement stresses the value of enabling frontline personnel to perform their jobs well. With this group approach, all parties can be involved in elaborating on the cause of the problem. They can work together to develop remedies and can design a course of action to correct the problem. Then they can enforce the plan and reexamine the issue to see whether the problem has been resolved.

**CRITICAL THINKING**

The number of needle-stick injuries in your agency has increased. How might the continuous quality improvement process affect this situation?
Key actions or categories for EMS leaders to improve quality within their organization are as follows:

1. **Leadership** involves efforts by senior leadership and management. These persons lead by example to integrate CQI into the strategic planning process and throughout the entire organization. Such integration promotes quality values and CQI techniques in work practices.

2. **Information and analysis** deal with managing and using the data needed for effective CQI. Continuous quality improvement is based on management by fact. Thus information and analyses are critical to CQI success.

3. **Strategic quality planning** has three main parts. The first is developing long- and short-term goals for structural, performance, and outcome quality standards. The second is finding ways to achieve those. The third is measuring the effectiveness of the system in meeting quality standards.

4. **Human resource development and management** refers to developing the full potential of the EMS workforce. This effort is guided by the principle that the entire EMS workforce is motivated to achieve new levels of service and value.

5. **Emergency medical services process management** concerns the creation and maintenance of high-quality services. Within the context of CQI, process management refers to the improvement of work activities. Process management also refers to improving work flow across functional or departmental boundaries.

6. **Emergency medical systems results** entail assessment of the quality results achieved and examining the success of the organization in achieving CQI.

7. **Satisfaction of patients and other stakeholders** involves ensuring ongoing satisfaction. Those internal and external to the EMS system must be satisfied with the services provided.

Benefits gained by applying these seven guidelines and recommendations are many. They include improvements in service and patient care delivery, economic efficiency, and profitability. They also help improve patient and community satisfaction and loyalty, and healthful outcomes.

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**SHOW ME THE EVIDENCE**

The 2007 U.S. Metropolitan Municipalities’ EMS Medical Directors’ Consortium describes an evidence-based model to measure quality within suburban and urban EMS systems. They include specific key interventions and numbers-needed-to-treat that should be measured in the areas of ST-elevation myocardial infarction (STEMI), pulmonary edema, asthma, seizure, trauma, and cardiac arrest. The interventions to be evaluated in CQI are those that have been demonstrated by research to have a positive impact on patient outcome. For example, in a patient with trauma, prehospital records should be evaluated for scene time <10 minutes and transport to a trauma center.


**PATIENT SAFETY**

Patient safety is one of the most urgent health care challenges. In 1996, the Institute of Medicine (IOM) launched an ongoing effort to assess and improve the nation’s quality of care. The report brief of this initiative is titled To Err is Human: Building a Safer Health System. This study found that:

- Health care in the United States is not as safe as it should be—and can be.
- At least 44,000 people, and perhaps as many as 98,000 people, die in hospitals each year as a result of medical errors that could have been prevented.
- Preventable medical errors in hospitals exceed attributable deaths to such feared causes as motor-vehicle wrecks, breast cancer, and AIDS.
- High error rates with serious consequences are most likely to occur in intensive care units, operating rooms, and emergency departments.
- Most errors are caused by faulty systems, processes, and conditions (Box 1-13).

**High-Risk Activities**

There are many activities that can lead to medical errors in EMS. Some of the more high-risk activities include:
BOX 1-13 Types of Errors

**Diagnostic**
- Error or delay in diagnosis
- Failure to employ indicated tests
- Use of outmoded tests or therapy
- Failure to act on results of monitoring or testing

**Treatment**
- Error in the performance of an operation, procedure, or test
- Error in administering the treatment
- Error in the dose or method of using a drug
- Avoidable delay in treatment or in responding to an abnormal test
- Inappropriate (not indicated) care

**Preventive**
- Failure to provide prophylactic treatment
- Inadequate monitoring or follow-up of treatment

**Other**
- Failure of communication
- Equipment failure
- Other system failure


- Ambulance crashes
- Dropping patients
- Hand-offs
- Communication issues
- Medication issues
- Poor sterile technique
- Airway issues
- Spinal immobilization

**I PASS the BATON**

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**FIGURE 1-8** Transferring patient care safely.

**DID YOU KNOW?**

Hand-offs involve the transfer of rights, duties, and obligations from one person or team to another. Hand-offs should include the continuity and safety of the patient’s care. For hand-offs to be effective, a solid foundation in communications is necessary. Face-to-face communications through a standardized process is the best way to transfer patient care. This should include an opportunity to talk and respond to questions. The hand-off includes current information about the patient, such as care, treatment, condition, and recent or anticipated changes in the patient’s condition. A memory aid that can be used to provide structure in handoffs is I Pass the Baton (Figure 1-8).17

Most errors can be avoided by maintaining skill proficiency; by following established rules and protocols; by maintaining team communications; and by ensuring an adequate knowledge base in patient care procedures and related EMS duties. Patient safety issues will be discussed throughout this text.

**SHOW ME THE EVIDENCE**

Researchers in the UK surveyed four emergency departments and one ambulance service to investigate the hand-over process from ambulance personnel to the ED staff. They found a lack of active listening skills in the ED staff led to frustration of the EMS crews. They report that ambulance staff should be prepared to repeat their report, especially for seriously ill or injured patients. Reports for critically ill patients should be delivered in two phases; with essential information reported at the time of handoff and more detailed information conveyed after initial care of the patient in the ED has begun. They recommend more ED education on this process.

Preventing Medical Errors

Patient safety solutions have been developed by the World Health Organization (WHO), in collaboration with the Joint Commission, and The Joint Commission International. This group defined patient safety solutions as: “Any system design or intervention that has demonstrated the ability to prevent or mitigate patient harm stemming from the processes of health care.” In 2007, the International Steering Committee approved nine solutions for patient safety (Box 1-14).

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<th>BOX 1-14 Nine Patient Safety Solutions</th>
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<tr>
<td>1. Look-Alike, Sound-Alike Medication Names: Confusing drug names is one of the most common causes of medication errors and is a worldwide concern. With tens of thousands of drugs currently on the market, the potential for error created by confusing brand or generic drug names and packaging is significant.</td>
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<td>2. Patient Identification: The widespread and continuing failures to correctly identify patients often leads to medication, transfusion, and testing errors; wrong person procedures; and the discharge of infants to the wrong families.</td>
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<td>3. Communication During Patient Hand-Over: Gaps in hand-over (or hand-off) communication between patient care units, and between and among care teams, can cause serious breakdowns in the continuity of care, inappropriate treatment, and potential harm for the patient.</td>
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<td>4. Performance of Correct Procedure at Correct Body Site: Considered totally preventable, cases of wrong procedure or wrong site surgery are largely the result of miscommunication and unavailable, or incorrect, information. A major contributing factor to these types of errors is the lack of a standardized preoperative process.</td>
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<td>5. Control of Concentrated Electrolyte Solutions: Although all drugs, biologics, vaccines, and contrast media have a defined risk profile, concentrated electrolyte solutions that are used for injection are especially dangerous.</td>
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<td>6. Assuring Medication Accuracy at Transitions in Care: Medication errors occur most commonly at transitions. Medication reconciliation is a process designed to prevent medication errors at patient transition points.</td>
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<td>7. Avoiding Catheter and Tubing Misconnections: The design of tubing, catheters, and syringes currently in use is such that it is possible to inadvertently cause patient harm through connecting the wrong syringes and tubing and then delivering medication or fluids through an unintended wrong route.</td>
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<td>8. Single Use of Injection Devices: One of the biggest global concerns is the spread of human immunodeficiency virus (HIV), the hepatitis B virus (HBV), and the hepatitis C virus (HCV) because of the reuse of injection needles.</td>
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<td>9. Improved Hand Hygiene to Prevent Health Care-Associated Infection (HAI): It is estimated that at any point in time more than 1.4 million people worldwide are suffering from infections acquired in hospitals. Effective hand hygiene is the primary preventive measure for avoiding this problem.</td>
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Methods to Help Prevent Medical Errors in EMS

Methods to avoid medical errors in EMS can be grouped into environmental methods and individual methods.

Environmental methods that can help prevent medical errors include having clear and established protocols for procedures; ensuring that there is sufficient lighting for patient assessment and patient care procedures; and performing patient care duties with minimal interruptions. Organizing and packaging drugs (e.g., separating adult and pediatric drugs) to avoid confusing the medications is another example of an environmental method to reduce medical errors. Another example of a safety method to reduce medical error is securing equipment in the patient compartment of the ambulance. Another is safely securing adult and pediatric patients during transport.

DID YOU KNOW?

Medication Error Survey: Paramedic Self-Reported Medication Errors

**BACKGROUND:** Continuing quality improvement (CQI) reviews reflect that medication administration errors occur in the prehospital setting. These include errors involving dose, medication, route, concentration, and treatment.

**METHODS:** A survey was given to paramedics in San Diego County. The survey tool was established on the basis of previous literature reviews and questions developed with previous CQI data.

**RESULTS:** A total of 352 surveys were returned, with the paramedics reporting a mean of 8.5 years of field experience. They work an average of 11.0 shifts/month with an average of 25.4 hours and 6.7 calls shift. Thirty-two (9.1%) responding paramedics reported committing a medication error in the last 12 months. Types of errors included dose-related errors (63%), protocol errors (33%), wrong route errors (21%), and wrong medication errors (4%). Issues identified as contributing to the errors include failure to triple check, infrequent use of the medication, dosage calculation error, and incorrect dosage given. Fatigue, training, and equipment setup of the drug box were not listed as contributing factors. The majority of these errors were self-reported to the CQI representative (79.1%), with 8.3% being reported by the base hospital radio nurse, 8.3% found upon chart review, and 4.2% noted by paramedic during call but never reported.

**CONCLUSIONS:** Nine percent of paramedics responding to an anonymous survey report medication errors in the last 12 months, with 4% of these errors never having been reported in the CQI process. Additional safeguards must continue to be implemented to decrease the incidence of medication errors.


**Individual methods** include personal activities to improve patient safety. These include:

- **Reflection in action:** Think during an event (during action) when things do not go as planned. Reflection in action allows us to reshape what we are working on while
we are working on it. It helps us as we complete a task. Reflection in action promotes critical thinking and bridges the gap between “knowing and doing.”

- Question assumptions: Apply critical thinking to continuously look for good ideas and new solutions. This will help to set priorities and to problem solve.
- Reflection bias ("hindsight" bias): Avoid the tendency to judge an event, because a bad outcome is known from a previous experience you had. ("I knew that was going to happen.") Reflection bias is the inclination to see events that have occurred in the past as more predictable than they really were. Review the events after the fact and you might foresee the outcome as more preventable. Replace hindsight with insight.
- Use decision aids: Use evidence-based decision aids and guidelines (e.g., algorithms, pocket guides) to simplify decision making and improve patient safety. Decision aids can also facilitate patients’ participation in decisions about their care, when appropriate.
- Ask for help: You are functioning as part of a team. Don’t be hesitant to ask your crew members or medical direction for help or advice, if the need arises. If you are unsure about a decision, drug dose, or procedure, remember that patient safety comes first.

**SUMMARY**

- The roots of prehospital emergency care may date back to the military.
- In the early twentieth century through the mid-1960s, prehospital care in the United States was provided in a few ways. Care was provided mostly by urban hospital-based systems. These systems later developed into municipal services. Care also was provided by funeral directors and volunteers who were not trained in these services.
- The operations of an effective EMS system include citizen activation, dispatch, prehospital care, hospital care, and rehabilitation.
- Each level of EMS personnel have their own distinct roles and duties. These roles include telecommunicators (dispatchers), emergency medical responders, EMTs, advanced EMTs, and paramedics. These levels combine to make an effective prehospital EMS system.
- Many professional groups and organizations help to set the standards of EMS. These groups exist at the national, state, regional, and local levels. The groups take part in development, education, and implementation. Being active in such a group helps to promote the status of the paramedic.
- Continuing education is crucial. It provides a way for all health care personnel to maintain basic technical and professional skills.
- Professionalism refers to the way in which a person conducts himself or herself. Professionalism also refers to how one follows the standards of conduct and performance established by the profession.
- The roles and duties of the paramedic can be divided into two categories: primary and additional duties.
- The two types of medical direction are online (direct) and off-line (indirect). Both are equally important. They help to ensure that the components of quality medical care are in place in an EMS system.
- A CQI program identifies and attempts to resolve problems in areas such as medical direction, financing, training, communication, prehospital management and transportation, interfacility transfer, receiving facilities, specialty care units, dispatch, public information and education, audit and quality assurance, disaster planning, and mutual aid.
- Patient safety should be a high priority during every call. Errors that may cause injury or illness often involve handoffs, communication issues, medication issues, airway issues, lifting or moving patients, ambulance crashes, and immobilization.

**REFERENCES**


SUGGESTED READINGS