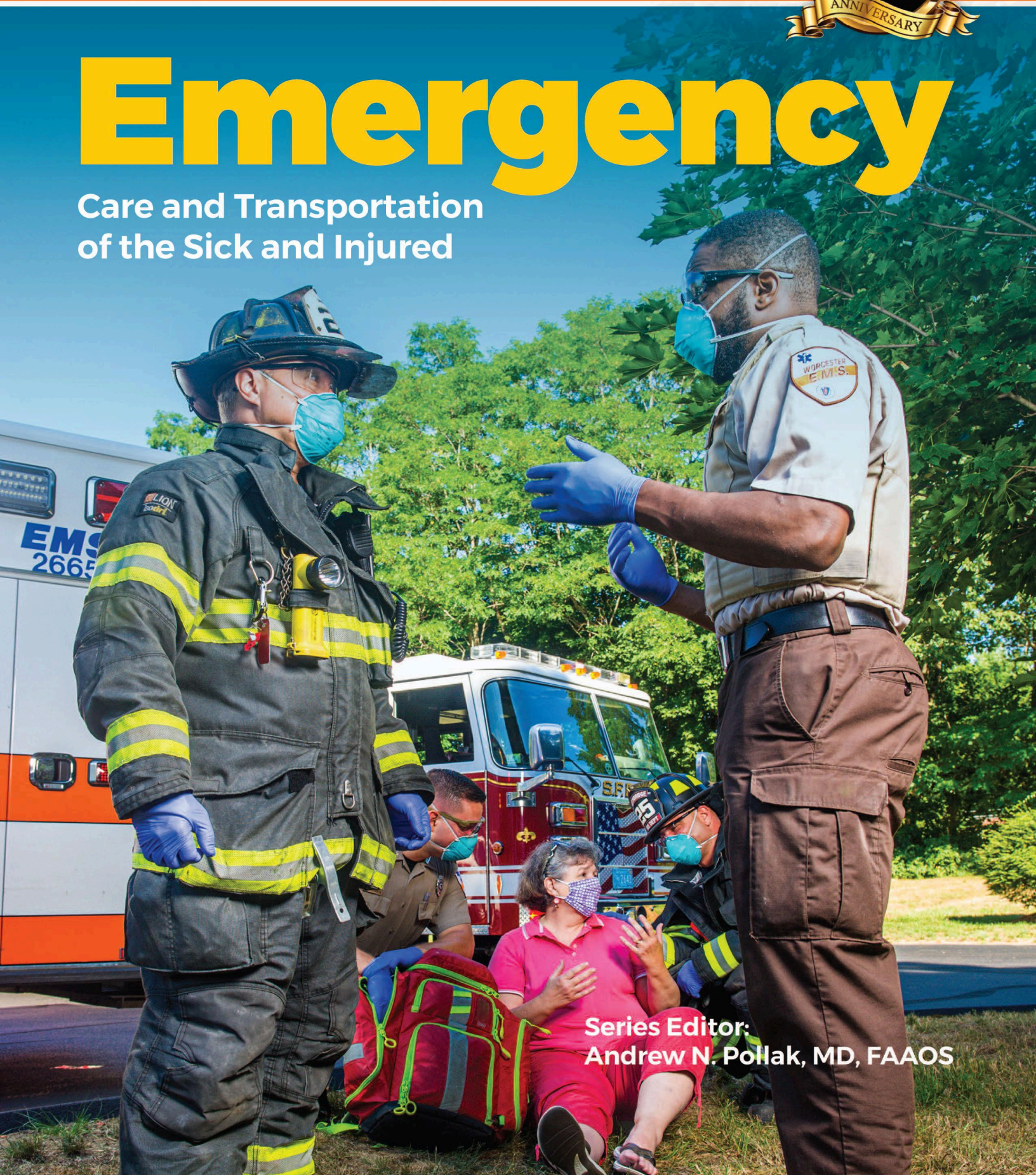
AAOS
American Academy of Orthopaedic Surgeons

TWELFTH EDITION

50th ANNIVERSARY

Emergency

Care and Transportation of the Sick and Injured



Series Editor:
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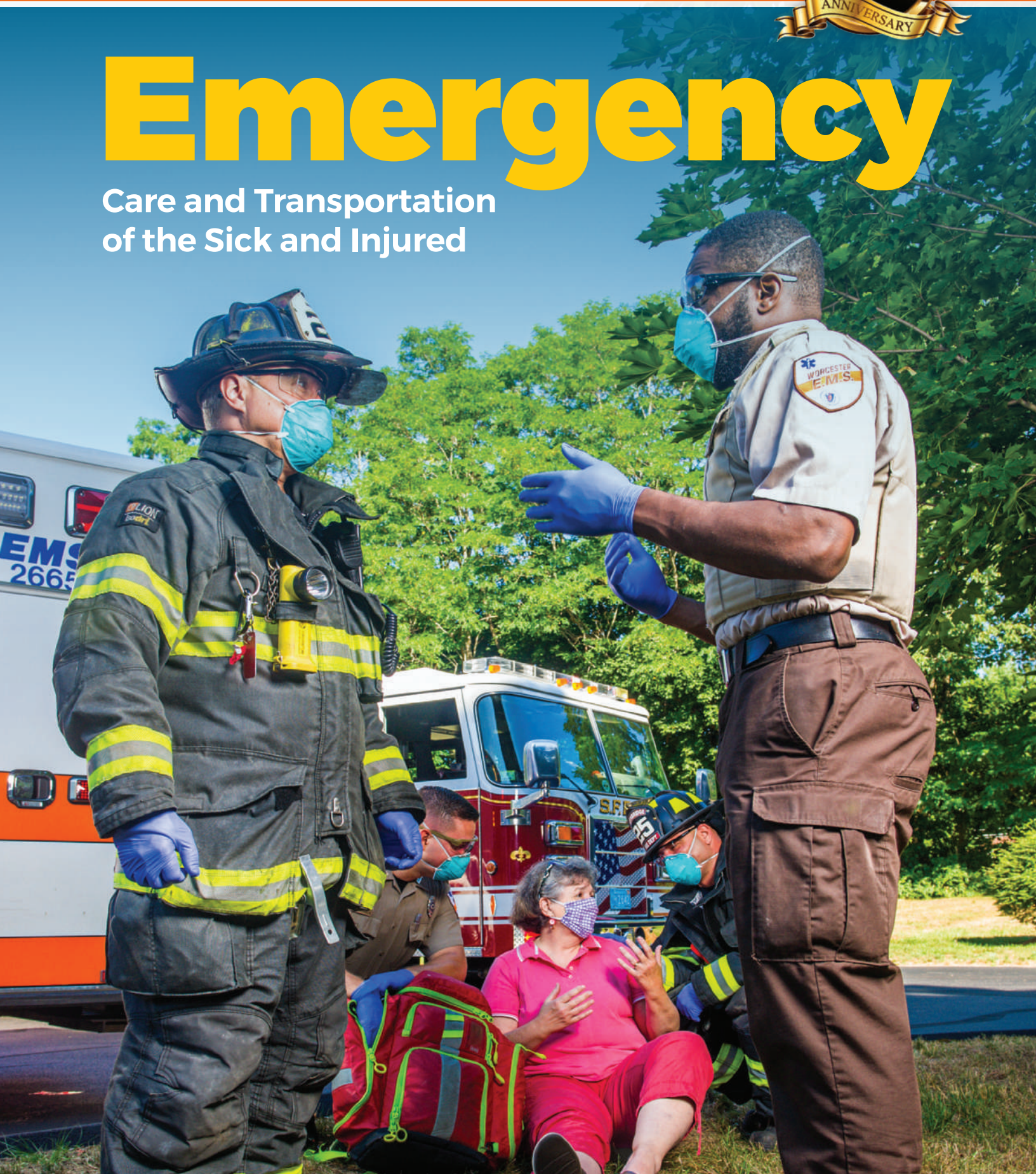


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TWELFTH EDITION

Emergency

Care and Transportation of the Sick and Injured

AAOS
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Celebrating 50 Years of EMS Education and Innovation

In 1971, the American Academy of Orthopaedic Surgeons (AAOS) published the first edition of ***Emergency Care and Transportation of the Sick and Injured***, with its now-familiar orange cover, and laid the foundation of EMS training. Today, the AAOS's commitment and dedication to excellence has transformed how EMS education is delivered throughout the world and helped to develop and train countless world-class EMS providers.

In 1997, the AAOS partnered with Jones & Bartlett Publishers (now Jones & Bartlett Learning) to release ***Emergency Care and Transportation of the Sick and Injured, Revised Sixth Edition***. Since the publication of that edition, the AAOS and Jones & Bartlett Learning have worked together to transform all levels of EMS training, from emergency medical responder to paramedic. This partnership has resulted in market-leading resources that go beyond initial training into assessment, continuing education, and professional resources to support EMS providers through every step of their education and career.

Today, the AAOS suite of EMS educational resources, from first aid and CPR to critical care transport, are the gold standard in training programs, offering exceptional content and instructional resources that meet the diverse needs of today's educators and students.

Jones & Bartlett Learning is proud and honored to congratulate our esteemed partner, the American Academy of Orthopaedic Surgeons, on the 50th anniversary of their first publication of the "Orange Book."

To explore other AAOS publications, programs, and products on orthopaedic trauma and other practice areas, please visit **www.aaos.org/Education**.

Brief Contents

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Skill Drills

Preface

Although we were often painfully reminded during the course of the COVID-19 pandemic of the importance of personal protective equipment (PPE) in our profession, readers may notice some variability throughout this textbook with regard to the types of PPE worn by providers and others as they care for patients. There are several explanations for this.

Prior to 2020, the level of PPE commonly worn by all providers during patient encounters typically included gloves. Eye protection was added during situations when the risk of a splash was high or when there was significant risk of aerosolization of material that could potentially come in contact with the eyes. For example, eye protection was typically worn while caring for patients who were bleeding significantly, when performing airway-related procedures, and during maternity calls. It was added on calls when there was a perceived high risk of being splashed with a potentially contaminated body fluid. In the post–COVID-19 era, however, use of eye protection has become more common.

In addition, masks are now standard equipment for all interpersonal encounters, let alone patient encounters. At various times throughout the pandemic, masks have been required in public places such as grocery stores. Social distancing guidelines mandate the use of masks in public. Simple face masks or cloth masks are considered mandatory both to decrease the risk of infection for the person wearing the mask and to decrease the risk associated with viral shedding that is a known consequence of infection, even in asymptomatic hosts. In other words, people with no symptoms can still be infected with the virus and shed the virus, and thus they are capable of transmitting it to others. To make it safer for people to be around those individuals, asking everyone to wear a mask in public can make the environment safer.

Furthermore, when caring for COVID-19 patients or those who have overt symptoms such as fever or cough, a higher level of protection is recommended, such as an N95 mask or even a powered air-purifying respirator (PAPR) system. There is some variability in that recommendation, with many agencies using N95 masks for all patient encounters given the increased level of protection they afford and the degree to which asymptomatic individuals who could transmit the disease to others are pervasive in the population.

As of the time of the development of this text, however, the pandemic situation was actively evolving. We have tried throughout the text to make the language follow best available knowledge and practice as of the time that the text was developed. However, the science in this area is evolving rapidly, as is clinical practice. It is likely that some or even much of what is included in this textbook with regard to PPE recommendations may be partially or completely outdated by the time it is published. We will attempt to make supplemental material available that reflects the most up-to-date knowledge.

Revising the illustrations and images throughout the book is much more difficult. Organizing photo shoots has been dramatically hindered by necessary social distancing restrictions. For this reason, in order to get the best information to students as soon as possible, we made efforts to edit certain images associated with perceived high-risk procedures, such as aerosol-generating procedures. Furthermore, we added N95 masks and appropriate eye protection to all new images that were created for this textbook. However, we were not able to update all of the photos to reflect new practice guidelines. It is certainly our hope that by the time the next edition is published, our knowledge of best practices with regard to PPE will be more settled,

and there will be greater consistency in the appearance of PPE in images throughout the text.

Until then, however, please accept our apologies for any inconsistencies in the use of PPE in the images and skill drills throughout this book. It is absolutely our intention to teach students the best practices with regard to PPE so that their risk of becoming infected and transmitting infection to their patients and others is minimized to the greatest degree possible.

Andrew N. Pollak, MD, FAAOS
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Acknowledgments

The American Academy of Orthopaedic Surgeons would like to acknowledge the editors and authors of previous editions of *Emergency Care and Transportation of the Sick and Injured*, as well as the reviewers of the new 12th edition.

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SECTION

1

Preparatory

Chapter 1

EMS Systems

NATIONAL EMS EDUCATION STANDARD COMPETENCIES

Preparatory

Applies fundamental knowledge of the emergency medical services (EMS) system, safety/well-being of the emergency medical technician (EMT), medical/legal, and ethical issues to the provision of emergency care.

Emergency Medical Services (EMS) Systems

- EMS systems (pp 12–21)
- History of EMS (pp 7–9)
- Roles/responsibilities/professionalism of EMS personnel (pp 21–23)
- Quality improvement (p 16)
- Patient safety (pp 17–18)

Research

- Impact of research on EMS care (pp 20–21)
- Data collection (pp 20–21)
- Evidence-based decision making (pp 20–21)

Public Health

Uses simple knowledge of the principles of illness and injury prevention in emergency care.

KNOWLEDGE OBJECTIVES

1. Define emergency medical services (EMS) systems. (p 3)
2. Name the four levels of EMT training and licensure. (pp 4–7)
3. Describe EMT licensure criteria; include how the Americans With Disabilities Act (ADA) applies to employment as an EMT. (p 7)
4. Discuss the historical background of the development of the EMS system. (pp 7–9)
5. Describe the levels of EMT training in terms of sets of knowledge, skills, and attitudes needed for each of the following: EMR, EMT, AEMT, and paramedic. (pp 9–11)
6. Recognize the presence of other first responders at a scene with EMS training, some knowledge of first aid, or merely good intentions, and their need for direction. (pp 10–11)
7. Explain the guiding principles of EMS Agenda 2050. (p 12)
8. Describe how medical direction in an EMS system works and the EMT's role in the process. (p 14)
9. Define mobile integrated health care and community paramedicine. (p 15)
10. Explain the purpose of the EMS continuous quality improvement (CQI) process. (p 16)
11. Characterize the EMT's role in disease and injury prevention and public education in the community. (pp 19–20)
12. Describe the roles and responsibilities of the EMT. (pp 21–23)

13. Describe the attributes an EMT is expected to possess. (pp 22–23)

14. Explain the impact of the Health Insurance Portability and Accountability Act (HIPAA) on patient privacy. (p 23)

SKILLS OBJECTIVES

There are no skills objectives for this chapter.

Introduction

You are about to enter an exciting field. As an emergency medical technician (EMT), you will be a critical part of the **emergency medical services (EMS)** system. EMS is a team of health care professionals who are responsible for and provide emergency care and transportation to the sick and injured (**FIGURE 1-1**). While not every call for care will involve a life-threatening emergency, the compassion, professionalism, and skill you bring will have a tremendous positive impact on each patient you encounter.

This course is the initial step in acquiring the critical knowledge, skills, and abilities (KSAs) you will use to help with emergency and nonemergency prehospital medical problems (**FIGURE 1-2**). The **National EMS Scope of Practice Model** describes the four levels of EMS practice. The National EMS Education Standards outline the knowledge and competencies that should be taught to students in each of these four levels of EMS practice. This education incorporates all the KSAs needed to become a competent, entry-level EMT. Education must continue long past the end of this course as you refine your KSAs, learn the details of working in a particular part of the health care system, and grow and adapt to keep up with the health care industry overall. For any role in emergency services and health care, education must continue throughout your career.

The next step is **certification**. This process verifies that a provider meets the minimum required KSA competencies for safe and effective emergency operations and patient care. Such exams often use a variety of testing instruments such as multiple-choice questions, skills stations, and simulated emergency calls. They are typically conducted or regulated by a state or military agency or by the National Registry of EMTs (NREMT). The NREMT is a nongovernmental, not-for-profit organization whose mission is to provide a valid, uniform process to assess the KSAs for competent EMS practice. Almost all states require NREMT certification for candidates to be eligible for a license to practice.

Although not all states use the NREMT testing process, EMS certification exams may be informed

FIGURE 1-1 As an EMT, you are part of a larger team that responds to a variety of calls and provides a wide range of prehospital emergency care.

FIGURE 1-2 In the classroom, you will learn both didactic and practical skills to prepare you for various types of calls.

by the NREMT's EMS Practice Analysis. Approximately every 5 years, the NREMT surveys EMS providers of all levels from across the United States to understand the current real-world practice of out-of-hospital emergency care and to help create a blueprint for valid certification exams. In 2019 the Practice Analysis also pulled data from the National EMS Information System (NEMSIS) to get a real picture of the types of calls and interventions EMS personnel in the United States encounter in actual practice. In effect, the Practice Analysis attempts to answer the question, "What is most important for EMS providers to know and be able to do to deliver safe and effective care?" From this information, the current Practice Analysis determines the certification test plan for each level of EMS provider. The test plan lays out an approximate percentage of questions on each topic that students will encounter on NREMT certification exams.

After successfully completing the certification process, the provider is typically eligible for **licensure**, the legal authority to practice in his or her state. Although some states still refer to this phase as certification, for the purposes of this textbook, the term *licensure* will be used.

Obtaining licensure in a state does not grant an EMT an unrestricted right to practice. The next phase of becoming a health care provider is **credentialing**. Credentialing is the verification process of a health care provider's qualifications. Credentialing may be a local or regional process, and it is typically directed and overseen by a physician medical director. In some cases, EMTs may be specifically credentialed to perform either fewer or additional techniques in their area or to work in certain types of care systems.

In most states, people who work in emergency medical care are categorized into four licensure levels, each with a different scope of practice and each requiring different types of education and training. The licensure levels are **emergency medical responder (EMR)**, **emergency medical technician (EMT)**, **advanced EMT (AEMT)**, and **paramedic**. An EMR has basic emergency care and operations training, and is focused on managing the emergency scene and initiating immediate life-saving care before the ambulance arrives. EMRs may also perform roles under the direction of providers with more advanced training.

An EMT has additional depth and breadth of training in basic emergency care and transportation of sick and injured patients. Although not always the first to arrive, EMTs most commonly focus on initial stabilization of the scene and fundamental emergency care. EMTs are the primary link between the emergency scene and the health care system.

An AEMT has additional preparation beyond the EMT level that includes training and education in specific aspects of **advanced life support (ALS)**, such as **intravenous (IV) therapy**, advanced airway management, and the administration of certain emergency medications. The AEMT's primary focus is on more advanced assessment techniques and selected emergency interventions known to improve patient outcomes.

Paramedics have the greatest breadth and depth of education and training among emergency care providers. Their preparation focuses on ALS assessment; diagnostic and treatment tools and techniques, such as interpretation of heart rhythms; advanced airway management; and emergency pharmacology. Paramedics function as part of a collaborative response, working under medical direction with EMS providers of other levels to help extend the reach of the health care system.

The standards for prehospital emergency care and the people who provide it are governed by the

YOU are the Provider

You are working as a new EMT and are on duty with an EMT driver and a paramedic partner. You are in the process of checking the ambulance when you are dispatched to a report of a 48-year-old woman with back pain. You and your crew proceed to the scene, approximately 6 miles away.

1. How do your roles and responsibilities as an EMT compare to those of other EMS provider certification/licensure levels?
2. How do the National Scope of Practice Model and the National EMS Education Standards affect your ability to assess and treat a patient?

laws of each state and are typically regulated by an office of EMS operating under the state's department of health. Although the specific training and licensure requirements vary from state to state, almost every state's requirements follow or exceed the guidelines recommended in the current National Highway Traffic Safety Administration (NHTSA) EMS Education Standards.

In 2020, the National Registry of Emergency Medical Technicians launched the National EMS-ID number system. An EMS-ID is a 12-digit identification number issued at no charge to all EMS professionals, from EMR to paramedic, and to students entering the profession. The number is automatically generated by the National Registry when a person creates an account. For EMS providers with an existing account, an EMS-ID is retroactively created. Unlike the number issued by the National Registry (NR Number) when an individual becomes certified, EMS-IDs do not change as the person's certification level changes. Thus, the various certification numbers a person may obtain in his or her career are all tied back to the single EMS-ID.

This textbook covers the practices and skills identified in the NHTSA National EMS Education Standards. It also covers the information needed for EMTs to perform the skills outlined in the NHTSA 2019 National EMS Scope of Practice Model.

To supplement the required core content, this text includes additional information to help you understand and apply the knowledge and skills included in the EMT course. The goal is to apply the KSAs identified in this text to work in the field as an effective emergency responder and caregiver. To achieve this goal, it is essential that you complete the assigned reading before each class. Simply attending class will not adequately prepare you to demonstrate the KSAs needed to complete each part of the course. Each class builds your ability to apply previous information. It is vital that you complete the readings and assignments to help you understand subsequent lessons and, ultimately, to be able to apply those lessons in real-world emergency situations. This approach is pivotal to your success in this course.

In class, your instructor will review the key parts of the reading assignment and clarify and expand on them. He or she will answer any questions you have and clarify any points you or others do not yet understand how to apply. Unless you carefully read the assignment and take notes before coming to class, you will not fully understand or benefit from the classroom presentations and discussions. Creating your own tools, such as flashcards, study questions, scenarios, and outlines, will help you retain important information. It will also help you take better notes during class (**TABLE 1-1**).

TABLE 1-1 Study Tips

- Determine the time of day when you can most effectively study.
- Make, and stick to, a study schedule that will allow you to master the information in small, digestible chunks.
- Find a place that is free from distractions and interruptions.
- Do not remain on call for work, family, or other obligations during study time.
- Turn off your devices so you are not taken out of the study zone by unnecessary alerts.
- Find a study group or partner. Work to help each other, and keep each other accountable.
- Before you begin, specify your study objectives. If necessary, write down specific questions you have about the material.
- Before reading an entire section, give it a quick overview to understand what you will be studying and how it will be presented.
- Study the most challenging information first, while you still have the most mental energy and drive.
- Group topics into manageable chunks to study.
- Think about each key learning point in terms of how you would explain it clearly to someone who was not in the class.
- Focus on learning and applying the information, not on exam grades.
- Consider making simple flowcharts or diagrams to better understand disease processes, assessment and care priorities, and decision making.
- Take advantage of additional learning tools, such as quizzes, simulations, or case studies, that allow you to test your knowledge and identify gaps in your learning.

In addition to textbook readings, EMT programs typically include a variety of learning activities, including the following:

1. Case presentations
2. Question-and-answer sessions
3. Small-group debates and discussions
4. Purposeful practice of practical (hands-on) skills with feedback

5. Putting-it-all-together patient care scenarios and simulations
6. Clinical experience to observe and participate in real EMS and in-hospital patient care

Using a variety of learning activities in class and in study sessions does not just make sessions more interesting; these strategies advance your knowledge from the most fundamental levels of learning, such as memorizing and understanding information, to applying this information. Further, this course breaks the information into chunks so you can evaluate and apply the right KSAs on actual EMS calls.

EMT Training: Focus and Requirements

Some of the subjects discussed in this textbook include:

- **Scene size-up.** Scene size-up involves getting an overview of the situation at hand and an awareness of the presence and level of safety threats. During scene size-up, you must gain a big-picture perspective of the call, determine whether it is safe to proceed, determine whether additional resources are needed, and identify the initial approach to mitigate the emergency.
- **Patient assessment.** Patient assessment is the foundation of any EMS call. Using your understanding of anatomy, physiology, and the pathophysiology of diseases, you will perform effective assessment techniques to determine what is wrong with your patient and identify life threats.
- **Treatment.** As an EMT, you will identify the need for and prioritize patient care. In some cases, you may work to improve patient oxygenation and ventilation. In others, you will control bleeding or assist patients during childbirth. In addition to hands-on skills, you will learn how to treat patients who are in emotional crisis, and how to calm patients to relieve some of their anxiety.
- **Transport.** Most patients need to be transported to a facility. This could mean a hospital, clinic, or other medical care facility. You will learn how to transport patients with a wide variety of illnesses and injuries.
- **EMS as a career.** Most of you are taking this course because you want to help people. To ensure all EMS providers have a long, healthy career, it is important for you to learn how to take care of yourself. Job stressors and successful ways to cope with them will be discussed.

Words of Wisdom

The Star of Life

The National Highway Traffic Safety Administration (NHTSA) recognized the need for a symbol that would represent EMS as a critical public service and created the *Star of Life*. NHTSA holds priority rights to the use of this registered certification mark.

Adapted from the personal Medical Identification Symbol of the American Medical Association, each bar on the Star of Life represents an EMS function:

1. Detection
2. Reporting
3. Response
4. On-scene care
5. Care in transit
6. Transfer to definitive care

The serpent and staff in the symbol portray the staff of Asclepius, an ancient Greek physician deified as the god of medicine. Overall, the staff represents medicine and healing, with the skin-shedding serpent being indicative of renewal.

The Star of Life has become synonymous with emergency medical care around the globe. This symbol can be seen as a means of identification on ambulances, emergency medical equipment, patches or apparel worn by EMS providers, and materials such as books, pamphlets, manuals, reports, and publications that either have a direct application to EMS or were generated by an EMS organization. It also appears on road maps and highway signs indicating the location of or access to qualified emergency medical care.

Adapted from US National Highway Traffic Safety Administration. http://www.ems.gov.

Licensure Requirements

To be recognized and function as an EMT, you must meet certain requirements. The specific requirements differ from state to state. Ask your instructor or your state EMS official about the requirements in

your state. Generally, the criteria to be licensed and employed as an EMT include the following:

- High school diploma or equivalent
- Proof of immunization against certain communicable diseases
- Successful completion of a background check and drug screening
- Valid driver's license
- Successful completion of a recognized health care provider basic life support (BLS)/cardiopulmonary resuscitation (CPR) course
- Successful completion of a state-approved EMT course
- Successful completion of a state-recognized written certification examination (usually NREMT)
- Successful completion of a state-recognized practical certification examination
- Compliance with other state, local, and employer provisions

The **Americans With Disabilities Act (ADA)** of 1990 protects people who have a disability from being denied access to programs and services that are provided by state or local governments and prohibits employers from failing to provide full and equal employment to the disabled. In addition, Title I of the ADA protects EMTs with disabilities seeking gainful employment under many circumstances. Employers with a certain number of employees are required to adjust processes so that a candidate with a disability can be considered for the position, and when possible, modify the work environment or how the job is normally performed. This allows EMTs who can perform the functional job skills with reasonable accommodations the opportunity to pursue a career in EMS.

One of the primary responsibilities of each state is to ensure the safety of its residents. As such, states have requirements prohibiting people with certain legal infractions from becoming EMS providers. The specific legal exclusions, either misdemeanors and/or felonies, are created on a state-by-state basis. Contact your state EMS office for more information.

Special Populations

EMS systems must be capable of handling many different types of patients and situations. These can include obstetric, pediatric, and geriatric emergencies. Assessment techniques, treatment procedures, and other aspects of EMS care vary between children, adults, and older people.

Overview of the EMS System

History of EMS

As an EMT, you will join a long tradition of people who provide emergency medical care to their fellow human beings. With the early use of motor vehicles in warfare, volunteer ambulances were organized and personnel went overseas to provide care for the wounded in World War I. During World War II, the military trained special corpsmen to provide care in the field and bring the casualties to aid stations staffed by nurses and physicians. In the Korean War, this evolved into the field medic and rapid helicopter evacuation to nearby Mobile Army Surgical Hospital units, where immediate surgical interventions could be performed. Many advances in the immediate care of trauma patients resulted from the casualty experiences in the Korean and Vietnam Wars.

Unfortunately, emergency care of the injured and ill at home had not progressed to a similar level. As recently as the 1960s and early 1970s, emergency ambulance service and care varied widely across the United States. In some places, it was provided by well-trained advanced first aid personnel who had well-equipped, modern ambulances. In a few urban areas, it was provided by hospital-based ambulance services that were staffed with interns and early forms of prehospital care providers. In many areas, the only emergency care and ambulance service was provided by the local funeral home using a hearse that could be converted to carry a cot and serve as an ambulance. In other places, the police or fire department used a station wagon that carried a cot and a first aid kit. In most cases, these vehicles were staffed with a driver and an attendant who had some basic first aid training. In the few areas where a commercial ambulance was available to transport the ill, it was usually similarly staffed and served primarily as a means to transport the patient to the hospital.

Many communities did not have formal provisions for prehospital emergency care or transportation. Injured people were given basic first aid by police or fire personnel at the scene and were transported to the hospital in a police or fire officer's car. Customarily, patients with an acute illness were transported to the hospital by a relative or neighbor and were met by their family physician or

an on-call hospital physician, who assessed them and then summoned any specialists and operating room staff who were needed. Except in large urban centers, most hospitals did not have the emergency department (ED) staff available today.

EMS as we know it today had its origins in 1966 with the publication of *Accidental Death and Disability: The Neglected Disease of Modern Society*. This report, prepared jointly by the Committees on Trauma and Shock of the National Academy of Sciences/National Research Council, revealed to the public and Congress the serious inadequacy of prehospital emergency care and transportation in many areas. As a result, Congress mandated that two federal agencies address these issues. Seeing early EMS as essentially an emergency transportation service, the National Highway Traffic Safety Administration (NHTSA), under the US Department of Transportation (DOT), was directed to enact the Highway Safety Act of 1966, and the Department of Health, Education, and Welfare (now known as the Department of Health and Human Services [DHHS]) was directed to enact the Emergency Medical Services Development Act of 1973, creating funding sources and programs to develop improved systems of prehospital emergency care. This history is why EMS is administrated at the federal level through the DOT and not the DHHS.

In the early 1970s, the DOT developed and published the first curriculum to serve as the guideline for EMT training. To support the EMT course, the American Academy of Orthopaedic Surgeons prepared and published the first EMT textbook—*Emergency Care and Transportation of the Sick and Injured*—in 1971, often called the Orange Book for its original trademark orange cover. Through the 1970s, following the recommended guidelines, each state developed the necessary legislation, and the EMS system expanded throughout the United States. During the same period, emergency medicine became a recognized medical specialty, and the fully staffed EDs that we know today became the accepted standard of care.

In the late 1970s, the DOT developed a recommended National Standard Curriculum for the education and training of paramedics and identified a part of the course to serve for EMTs.

During the 1980s, many areas enhanced the EMT National Standard Curriculum by adding EMTs with advanced levels of training who could provide key components of ALS care and advanced life-saving procedures. The availability of paramedics and ALS-level care on calls that require or benefit from advanced care has grown steadily in recent years. In addition, with the evolution in training and technology, the EMT and AEMT can now perform a number of important advanced skills in the field that were formerly reserved for only the paramedic.

This growth and sophistication of the EMS system did not come without its drawbacks. As each state sought to create a system that would meet the needs of its citizens, the definitions of EMS providers began to vary from state to state. For example,

YOU are the Provider

You arrive at the scene, ensure it is safe to enter, and make contact with the patient, a 48-year-old woman. She is sitting on her couch, is in obvious distress, and states her pain has been intermittent for about a month. She tells you and your crew that it is uncomfortable for her to walk. You assess the patient as your partner prepares to take her vital signs.

Recording Time: 0 Minutes	
Appearance	Grimacing; obvious pain
Level of consciousness	Conscious and alert
Airway	Open; clear of secretions or foreign bodies
Breathing	Adequate rate and depth
Circulation	Radial pulse, normal rate and rhythm; skin is pink, warm, and dry

3. Does this patient need any treatment at the scene that can be provided by an EMT?

EMTs were allowed to administer medications in some states, while in other states they were not.

In the 1990s, NHTSA began an examination of EMS from a national perspective. With the counsel of EMS providers, physicians, fire chiefs, nurses, state administrators, educators, and other interested professionals, NHTSA created the EMS Agenda for the Future. This important document established a plan to standardize the levels of EMS education and EMS providers in an effort to ensure a more seamless delivery of EMS care across the country. In 2019, NHTSA revised this document and published EMS Agenda 2050.

The skills you learn and the scope of practice EMTs now enjoy are part of this national movement toward an EMS system that meets the needs of an ever-changing health care industry through a safe and efficient method.

Levels of Training

At the federal level, NHTSA brings in experts from around the country to create the National EMS Scope of Practice Model. This document provides overarching guidelines for the minimum skills each level of EMS provider should be able to accomplish. **TABLE 1-2** shows some of the guidelines from that model.

Because licensure is a state function, laws are enacted at the state level to regulate how EMS providers will operate, and they are then executed by the state-level EMS administrative offices that control licensure. Finally, the local medical director

TABLE 1-2 Examples From the Interpretive Guidelines: National EMS Scope of Practice Model

Note:
- An EMT can provide all of the skills listed in the EMR level.
- An AEMT can provide all of the skills listed in the EMR and EMT levels.
- A paramedic can provide all of the skills listed in the EMR, EMT, and AEMT levels.

Examples of Airway/Ventilation/Oxygenation Skills			
EMR	**EMT**	**AEMT**	**Paramedic**
Oral airway	Nasal airway	Supraglottic airway	Endotracheal intubation
Bag-mask device	CPAP	Tracheobronchial suctioning	Cricothyrotomy
Upper airway suctioning	Pulse oximetry	$ETCO_2$ monitoring	Airway obstruction removal by direct laryngoscopy
Nasal cannula	Oxygen humidifiers		High-flow nasal cannula
Examples of Cardiovascular/Circulation Skills			
Manual CPR	Mechanical CPR		Cardioversion, electrical
Auto-/semiautomatic defibrillation	Telemetry monitoring devices		Manual defibrillation
Examples of Medication Administration Routes			
Intramuscular auto-injector	Oral	Subcutaneous	Transdermal
Intranasal, premeasured	Sublingual	Intravenous	Rectal

Abbreviations: CPAP, continuous positive airway pressure; CPR, cardiopulmonary resuscitation; $ETCO_2$, end-tidal carbon dioxide.

Note: The 2019 National EMS Scope of Practice Model serves as a foundation for states to build their own model. It is intended to illustrate the operation of each level of EMS provider and the progression from one level to another. It is not inclusive of every skill a state may allow.

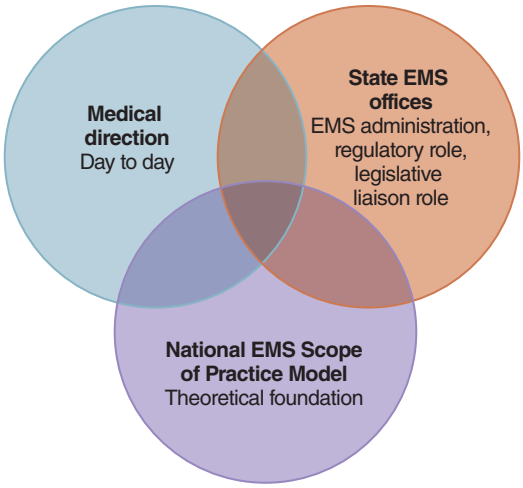

FIGURE 1-3 Hierarchies of the 2019 National EMS Scope of Practice Model.

should provide regular oversight and support to EMS personnel (**FIGURE 1-3**). For example, the medications that will be carried on an ambulance or where patients are transported are the day-to-day operational concerns on which the medical director, and often state, regional, or local EMS advisory boards, will have direct input.

The national guidelines are intended to ensure consistent delivery of EMS across the country. The only way a medical director can allow an EMT to perform a skill is if the state has already approved that skill. The medical director can limit the scope of practice but cannot expand it beyond state law. Expanding the scope of practice requires state approval.

You can download the complete list of approved skills in the National EMS Scope of Practice Model at www.ems.gov.

Public Basic Life Support and Immediate Aid

With the development of EMS and increased awareness of the need for immediate emergency care, millions of laypeople have been trained in BLS/CPR. In addition to CPR, many people take first aid courses as well as other task-specific courses such as Stop the Bleed that focus on bleeding control and other simple skills that may be required to provide immediate essential care. These courses are designed to train people so those in the workplace—teachers, coaches, child care providers, and others—can provide the necessary critical care in the minutes before EMTs or other responders arrive at the scene.

One of the most dramatic developments in prehospital emergency care is the increased availability of **automated external defibrillators (AEDs)** deployed in public places for use by untrained members of the general public. These devices, some no larger than a cell phone, detect treatable life-threatening cardiac dysrhythmias (ventricular fibrillation and ventricular tachycardia) and deliver the appropriate electrical shock to the patient without the need for a trained health care operator.

In addition to professional EMRs, EMTs often encounter a variety of people on the scene who are eager to help. You will encounter members of the public trained in first aid and CPR, physicians and nurses, and other well-meaning people with or without prior training and experience. Identified and used properly, these people can provide valuable assistance. At other times, they can interfere with operations and even create problems or danger for themselves or others. It will be your task in your initial scene size-up to identify the various people on the scene and orchestrate well-meaning attempts to assist.

Emergency Medical Responder

Because the presence of a person who is trained to initiate BLS and other urgent care cannot be ensured, the EMS system includes immediate care by EMRs, such as law enforcement officers, firefighters,

Street Smarts

Whether you accept or reject offers of assistance from nonaffiliated people on-scene, communication is key. Trained health care providers and emergency responders expect professional courtesy, even if you decide to decline assistance. Use clear verbal and nonverbal communication to accept or reject offers of help, and, if you are accepting help, be sure to give clear directions to those providing it. If you are rejecting help, be professional and polite, but firm. Being professional is always the right thing to do, and it is what you would prefer to see when viewing any recordings of your interactions with the public.

FIGURE 1-4 Emergency medical responders, such as law enforcement officers, are trained to provide immediate basic life support until EMTs arrive on the scene.

FIGURE 1-5 Paramedic education and training cover a wide range of advanced life support skills.

park rangers, ski patrollers, or other organized rescuers who often arrive at the scene before the ambulance and EMTs (**FIGURE 1-4**). EMR training provides these people with the skills necessary to initiate immediate care and work with the EMTs on their arrival. The EMR course focuses on providing immediate care with limited equipment prior to the arrival of an ambulance. It also familiarizes students with the additional procedures, equipment, and packaging techniques that EMTs may use and that EMRs may be called on to assist.

Emergency Medical Technician

EMS courses are competency-based. That is, the courses are designed to help students reach a level at which they can apply their KSAs to meet the minimum performance required to practice at their level of certification. The time to achieve this competence varies depending on factors that include prior student experience, program resources, or EMS educators' teaching methods. Thus, the total hours it may take to complete each level of the program will vary and is sometimes determined by state law. Although EMR courses are estimated to take approximately 50 to 80 hours, EMT courses may require approximately 150 to 200 hours to provide the essential knowledge and skills required to provide basic emergency care in the field. On arrival at the scene, you and any other EMTs who have responded should assume responsibility for the assessment and care of the patient and follow the proper packaging and transport of the patient to the ED, if appropriate.

Advanced Emergency Medical Technician

The AEMT course is designed to add knowledge and skills in specific aspects of ALS to providers who have been trained and have experience in providing emergency care as EMTs. These additional skills include IV and intraosseous (IO) therapy, use of advanced airway adjuncts, and the knowledge and skills necessary to administer a limited number of medications. The AEMT course ranges between 200 and 400 hours. The purpose of this level of EMS provider is to deliver an expanded range of skills beyond the EMT. In some parts of the United States, the availability of paramedics is limited. AEMTs help to fill the gap by providing limited ALS care in regions where paramedics are not available.

Paramedic

The paramedic completes an extensive course of education and training that significantly increases knowledge and mastery of basic skills and covers a wide range of ALS skills (**FIGURE 1-5**). This course ranges from 1,000 to well over 2,000 hours, divided between classroom and internship training. Increasingly, this training is offered within the context of an associate's degree or bachelor's degree college program.

TABLE 1-3 EMS Agenda 2050 Components of an EMS System

A People-Centered EMS System	
1.	Comprehensive, quality, convenient care
2.	Evidence-based clinical care
3.	Efficient, well-rounded care
4.	Preventive care
5.	Comprehensive and easily accessible patient records

Components of the EMS System

EMS Agenda 2050 is a multidisciplinary, national review of all aspects of EMS delivery. The goal is to develop a more cohesive and consistent system across the country. The document features five key aspects of a people-centered EMS system, as outlined in (**TABLE 1-3**).

The vision of EMS Agenda 2050 is that a people-centered EMS system is one in which people receive comprehensive, quality care in the most comfortable and convenient place. This care is based on sound research focused on producing the right outcomes. In this people-centered system, patients who need it will receive transport that is safe and efficient (not necessarily at a high rate of speed or with lights and sirens). Care in a people-centered system will focus not only on life-saving interventions, but also on reducing physical, emotional, and psychological suffering. Such EMS systems will be an integrated part of a larger health care system focused on proactively preventing injuries and illnesses rather than reactively responding to treat them. EMS clinicians will have access to and be able to contribute to a patient's comprehensive medical record, allowing not only improvements of treatment for individual patients, but also updates in prevention, diagnosis, and treatments as our understanding and technology advance.

The EMS Agenda 2050 guiding principles include an EMS system design that is as follows:

- Inherently safe and effective, so the entire system from start to finish is designed to minimize exposure to injury, infections, illness, or stress
- Integrated and seamless, where EMS is fully integrated with all other aspects of health care and is engaged with other emergency services and within the communities in which they operate
- Reliable and prepared, ensuring EMS care is delivered consistently and compassionately and is guided by sound research at all times, by all EMS providers, at all levels, or from all agencies
- Socially equitable, so that access to care and the quality of care are not determined by a patient's age, socioeconomic status, gender, ethnicity, or where they live
- Sustainable and efficient, meaning systems must be fiscally responsible, providing value to the community with a minimum of waste and a maximum of accountability
- Adaptable and innovative, evolving to meet the changing needs of the people whom they serve by continuously evaluating new tools and techniques, education programs, and system designs

Public Access

Easy access to help in an emergency is essential. In most of the country, an emergency communication center that dispatches fire, police, rescue, and EMS units can be reached by dialing 9-1-1. At the communication center, trained dispatchers obtain the necessary information from the caller and, following dispatch protocols, dispatch the ambulance crew and other equipment and responders that may be needed (**FIGURE 1-6**). This communication center is called a **public safety access point**.

In an enhanced 9-1-1 system, the address of the caller is displayed on a screen. Most emergency communication centers are equipped with special equipment allowing people with speech or hearing disabilities to communicate with the dispatcher via a keyboard and text messages. In some areas, rather than 9-1-1, a different special published emergency number may be used to call for EMS. Mobile apps are playing an evolving role in allowing laypeople trained in CPR to be alerted of a cardiac arrest in their area and connecting them with the location of the nearest public AED.

FIGURE 1-6 Trained dispatchers obtain information about the call and then send responders to the scene as needed.

A system called **emergency medical dispatch (EMD)** assists dispatchers in providing callers with vital instructions to help them deal with a medical emergency until EMS crews arrive. Dispatchers are trained and provided scripts to help them relay relevant instructions to the callers. The system helps dispatchers select appropriately resourced units to respond to a request for assistance. It is the dispatcher's duty to relay all relevant and available information to the responding crews in a timely manner. Keep in mind that current technology does not typically allow the dispatcher to directly see what is going on at the scene; therefore, it is not uncommon for you to find the reality of the call quite different from the dispatch information.

Using the information provided by the caller, the dispatcher will select the appropriate parts of the emergency system that need to be activated. Over one-half of EMS support is provided by a governmental entity such as a fire agency (about 45%) or other nonfire governmental agency (20%). Private services deliver about one-fourth of EMS support. Other models seen less frequently include hospital-based programs and Native American tribal services.

Human Resources

The human resources component deals with people. Who delivers the care? How are these people compensated for their time and energy? What is the role that volunteer providers play? How do other members of the medical community interact with and participate within the EMS world? These are some of the questions discussed within the component of human resources.

One of the goals of EMS Agenda 2050 is to encourage the creation of EMS systems that provide an environment where talented people want to work and can turn their passion into a rewarding career. Several objectives need to be accomplished to help make a career in EMS a lasting one. Efforts are

YOU are the Provider

Your partner records the patient's vital signs on the patient care report as you ask the patient additional questions regarding her back pain. She tells you her lower back began hurting about a month ago; however, she has never been evaluated by a physician. She denies injuring her back. She further denies any other symptoms or past medical history.

Recording Time: 4 Minutes	
Respirations	16 breaths/min; regular and unlabored
Pulse	88 beats/min; strong and regular
Skin	Pink, warm, and dry
Blood pressure	126/66 mm Hg
Oxygen saturation (Spo_2)	99% (on room air)

Your assessment of the patient's back does not reveal any obvious deformities, swelling, or bruising, and her vital signs are stable. The patient requests you take her to the hospital.

4. How is patient care integrated across health systems when a patient is transported to the hospital?

being made to ensure that EMS providers can move from one state to another more seamlessly. One of the functions of the National EMS Scope of Practice Model is to create stable foundations on which each level of EMS provider is grounded. The net effect is to encourage a more consistent definition of "what is an EMT" so providers can move more freely about the country. National Registry certification often facilitates licensure in other states. The Interstate Commission for EMS Personnel Practice aims to increase the ability of EMS providers to practice in other states through the Recognition of EMS Personnel Licensure Interstate CompAct (REPLICA). REPLICA is not a form of EMS licensure reciprocity. It simply extends a privilege for EMS personnel from member states to practice on a short-term or intermittent basis under approved circumstances in other member states.

Medical Direction

Each EMS system has a physician **medical director** who authorizes the EMTs in the service to provide medical care in the field. Although in some systems the individual EMTs may not regularly encounter their medical director, in virtually all systems the appropriate care for each injury, condition, or illness encountered in the field is determined by the medical director and is described in a set of written standing orders and protocols. Standing orders are part of protocols, and they designate what the EMT is required to do for a specific complaint or condition. Providers are not required to consult medical direction before implementing standing orders.

The medical director is the ongoing working liaison between the medical community, hospitals, and the EMTs in the service. If treatment problems arise or different procedures should be considered, they are referred to the medical director for his or her decision and action. To ensure the proper training standards are met, the medical director determines and approves the continuing education and training that are required of each EMT in the service.

Medical control is provided either off-line (indirect) or online (direct), as authorized by the medical director. Online medical control consists of direction given over the phone or radio directly from the medical director or a designated physician such as a base station physician at a receiving hospital. The medical direction can be transferred by the physician's designee; it does not have to be transferred by the physician himself or herself. Off-line medical control consists of standing orders, training, and supervision authorized by the medical director. Each EMT must know and follow the protocols developed by his or her medical director.

The service's protocols will identify an EMS physician or other designee, usually at a local hospital, who can be reached by radio or telephone for medical control during a call. This is a type of direct online medical control. On some calls, once the ambulance crew has initiated any immediate urgent care and gives their radio report, the online medical control physician may either confirm or modify the proposed treatment plan or may prescribe any additional special orders that the EMTs are to follow for that patient. The point at which the EMTs should give their radio report or obtain online medical direction will vary.

Legislation and Regulation

Although each EMS system, medical director, and training program has latitude, their training, protocols, and practices must conform to the EMS legislation, rules, regulations, and guidelines adopted by each state. The state EMS office is responsible for authorizing, auditing, and regulating all EMS, training institutions, courses, instructors, and providers within the state. In most states, the state EMS office obtains input from an advisory committee made up of representatives of the services, service medical directors, medical associations, hospitals, training programs, instructors' associations, EMT associations, and the public in that state.

At the local level, each EMS system operates in a designated **primary service area (PSA)** in which it is responsible for the provision of prehospital emergency care and the transportation of the sick and injured to the hospital. Typically, each EMS function is administered by a senior EMS official. Daily operations and overall direction of the service are provided by an appointed chief executive officer and several other officers who serve under him or her. To provide clear guidelines, most services have written operating procedures and policies. When you join a service, you are expected to learn and follow them.

Integration of Health Services

EMS does not work in a vacuum. EMS personnel travel to people's homes and to vehicle crashes and other scenes where illness and injury occur. Once on scene, they deliver care and transport the patient to a care facility. Integration of health services means that the prehospital care you administer is coordinated with the care administered at the hospital. When you deliver a patient to the ED you are simply transferring that patient to another care provider. The excellent care that you began should be continued in the ED. This component helps to decrease errors, to increase efficiencies, and, most of all, to ensure the patient receives comprehensive continuity of care.

Some EMS systems have collaborated with local hospitals to improve patient outcomes associated with time-sensitive treatment like heart attacks, trauma, and stroke. This is accomplished through special training in the EMS system and certain hospital departments. For example, when paramedics determine a patient is experiencing a heart attack, they alert the ED. In turn, the personnel in the ED notify the cardiac catheterization team. In other cases, you may be directed to transport the patient directly to a cardiac specialty center capable of providing the necessary intervention. As a result, the key personnel are ready to begin critical treatments as soon as the patient arrives at the hospital. Similar activities take place for stroke and trauma patients.

Mobile Integrated Health Care and Community Paramedicine

Mobile integrated health care (MIH) is a method of delivering health care that utilizes the prehospital spectrum of care resources. It has evolved with the goal of facilitating improved access to health care at an affordable price. In the MIH model, health care is provided within the community, rather than at a physician's office or hospital. An integrated team of health care professionals, including EMS providers, delivers health care services in the community, and connects patients with other valuable resources such as social services. An advantage of this model is that it offers access to care for patients within communities who may have limited medical resources, and leads to better service for those who are homebound or disabled.

This new branch of health care is causing the evolution of additional training levels for EMS providers. The developing field of **community paramedicine** involves experienced paramedics who receive advanced education and training to equip them to provide services within a community. In addition to the patient care services a paramedic would typically provide, services provided by community paramedics may include performing health evaluations, monitoring chronic illnesses or conditions, obtaining laboratory samples, administering immunizations, and serving as a patient advocate.

Street Smarts

A patient may experience only once what you may witness hundreds of times. Understand and be empathetic to the patient's anxiety. Although it may not appear to be an emergency to you, it is considered an emergency by your patient and his or her family members. Treat them with respect. Your patients and their family members will always remember how you acted when you were with them.

Information Systems

EMS is not unlike any other profession in today's world. Without computers, the job would be much more difficult. An information system allows EMS providers to efficiently document the care that has been delivered. Once that information is stored electronically, it can be used to improve care. For example, how many times has a department seen patients with chest pain? What is the average on-scene time for major trauma patients? How many AED runs has the department had? These questions and many more can be answered using the information gathered from computerized medical records.

This information is used for a variety of purposes. It can be used to construct educational sessions for the department. Data from ambulance activity logs may be used to justify hiring more personnel. Examining the types of patients and their frequency can provide the foundation for the purchase of new equipment and guide continuing education sessions. This information can also be combined with other database resources, such as from a hospital, to determine patient outcomes. Departments from around the country are sending

information to Washington, DC, so a national snapshot of EMS activities can be obtained. Information gathered by NEMSIS can be found at www.nemsis.org. This information will be used to better plan for the needs of EMS systems today and in the future.

Evaluation

In any EMS system, there are several individuals and organizations that are responsible for ensuring that high-quality care is being provided. The office of EMS in each state, along with the licensing bureau, works to ensure that only EMS providers who meet the minimum standards are licensed to provide care to the public. The medical director is responsible for maintaining **quality control**, ensuring that all staff members under his or her supervision meet appropriate medical care standards on each call. Chief officers and supervisors for each EMS function are responsible for ensuring delivery of quality care under their watch. Finally, each individual EMS provider is responsible for maintaining high-quality care for his or her own practice.

A commitment to quality does not mean that an EMS agency should have a punitive culture where errors are treated by shame and blame. A more productive approach to managing quality is to adopt a Just Culture. Just Culture is a strategy that promotes a learning culture that holds employees accountable for behavioral choices by balancing fairness and accountability. At the same time, these agencies focus on identifying risks within their system and attempt to design it for safety. This encourages trust within the agency and promotes reporting of errors and mishaps so their causes can be found and measures developed to prevent them from occurring in the future.

Continuous Quality Improvement

Continuous quality improvement (CQI) is a quality management process that encourages team members at every level of the health care system to ask, "How are we doing now?" and "What can we do to be better?" CQI is a proactive process of development capitalizing on strengths and addressing challenges.

The CQI process is an essential element of any organization where the consequences of failure are potentially very harmful to either the patient, the team, or the community. In order to prevent failures, high consequence business such as EMS or the airline industry strive to be high reliability organizations (HROs). To be an HRO means that the organization has a commitment to teamwork, a culture of safety, and a commitment to CQI in an effort to prevent errors.

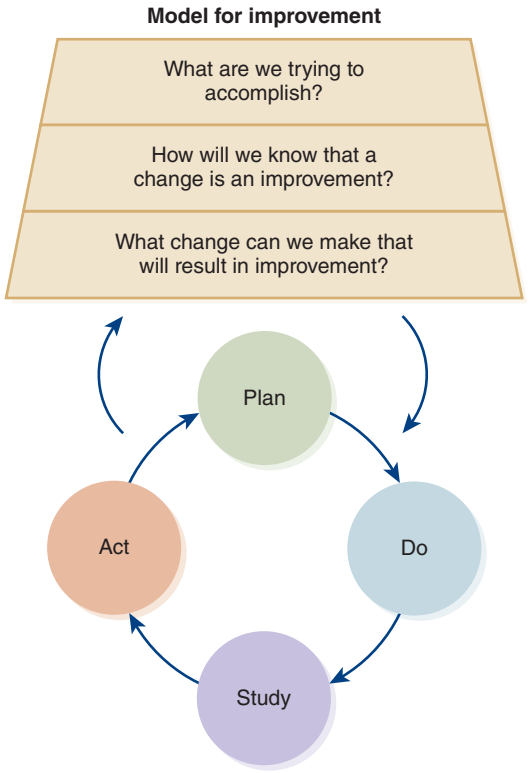

FIGURE 1-7 Plan-do-study-act cycle.

Reproduced with permission from "Model for improvement." Boston, Massachusetts: Institute for Healthcare Improvement; 2020. Available at http://www.ihi.org/resources/Pages/HowtoImprove/default.aspx.

In CQI, information is gathered about processes, performance, and outcomes. Evaluation of this information generates ideas to improve performance and efficiency, these ideas are tried and also evaluated, and the cycle continues. This cycle is known as plan-do-study-act (**FIGURE 1-7**). The *plan* phase involves gathering and analyzing information, such as run forms, call data, outcomes data, or information from crews and others. Analysis of this data may lead to ideas to improve the level of care, efficiency, or outcomes. The *do* phase then enacts these ideas. The *study* phase evaluates any significant positive or negative changes that resulted from the implementation of the new idea. If the change is positive, then a larger part of the EMS system adopts the change in the *act* phase. At every level, CQI is a learning and improvement process rather than simply a way to punish identified problems.

Words of Wisdom

The terms *quality assurance* and *quality improvement* are often used interchangeably. They are different, however. Quality assurance (QA) measures care against a predefined standard or benchmark. Quality improvement is a continuous cycle that measures the behavior and implements actions to improve performance.

Patient Safety

Another function of the evaluation process is to determine ways to limit or eliminate human error and improve patient safety. During the delivery of EMS, as with any occupation, there are times when errors can happen. Driving to the scene can be hazardous. As you are lifting and moving a patient, the patient can be dropped. Communicating with other EMTs or transferring the patient to the ED presents circumstances where errors can happen. Remember, errors can occur at any point during the call, and they can result in harm to the patient, the public, and you.

Errors are not inevitable, though. If the circumstances of the errors are understood, it may be possible to eliminate or at least minimize them. There are many ways to examine medical errors. This textbook focuses on errors from three possible sources—as a result of a rules-based failure, a knowledge-based failure, or a skills-based failure (or any combination of these). For example, does the EMT have the legal right to administer the particular medication that the patient needs? Has the medical director given permission to administer the drug? If not, a rules-based failure has occurred if the EMT administers the medication. Does the EMT know all of the pertinent information about the medication being delivered? If not, a breakdown at this point, such as the administration of the wrong medication, would be referred to as a knowledge-based failure. Is the equipment operating and being used properly? If not, a skills-based error has occurred. Attitudes, including bias, can contribute to all of these types of errors, and an error can come from multiple sources.

Limiting errors requires the efforts of both the EMS agency and EMS personnel. Agencies need to have clear protocols, which are detailed plans that describe how certain patient issues, such as chest pain or shortness of breath, are to be managed. These protocols need to be understood by all EMTs within the service.

The environment can also contribute to errors. Are there ways to limit distractions? How do we

YOU are the Provider

The patient is placed onto the stretchter in a position of comfort using pillows to support the uncomfortable areas of her back, and loaded into the ambulance. You and the paramedic are in the back with the patient coaching her to relax as your EMT partner drives to the hospital. You reassess the patient shortly after you begin transport to the hospital.

Recording Time: 12 Minutes	
Level of consciousness	Conscious and alert
Respirations	16 breaths/min; regular and unlabored
Pulse	90 beats/min; strong and regular
Skin	Pink, warm, and dry
Blood pressure	120/62 mm Hg
Spo_2	97% (on room air)

Within a few minutes, the patient tells you her back pain has begun to subside.

5. What safety concerns apply to this call and what are some ways to address those concerns?

improve lighting so EMTs can see well? How organized is the equipment? Can the EMT find what he or she needs in a timely manner? Environmental considerations can be managed using many approaches. Sometimes the solution is as easy as ensuring flashlights are available on all ambulances. Consider having police assistance on certain types of EMS calls or getting the assistance of an EMS supervisor. Perhaps a new type of equipment bag will provide better organization. Typically, when trying to reduce environmental factors regarding errors, this means having the right people with the right equipment in place.

EMTs can also help to reduce errors. Your job is to protect the patient from harm and to deliver high-quality medical care. This is one of your most important responsibilities. You are a patient care advocate—you speak for patients on their behalf. Keeping this responsibility in mind will help you to limit errors.

There are other ways errors can be reduced. When you are about to perform a skill, ask yourself, "Why am I doing this?" Knowing the reason for your actions gives you time to reflect and make a more informed decision. Even within EMS, rarely do you have to act so quickly that you do not have a moment to consider what it is you are doing and why. If you have considered what to do and cannot come up with a solution, ask for help. Talk with your partner, contact medical control, or call your EMS supervisor.

Another way to help limit medical errors is to use checklists and reference sheets. These can help keep you from missing key steps or key information, especially in times where your task load is high or the environment is particularly difficult to work in. Emergency physicians have many reference materials available to them. Physicians recognize they cannot memorize everything, so referencing a book or an Internet resource helps ensure the accuracy of their memory. Apps are also available for some checklists.

Finally, after a troublesome call, sit down and talk. Talk with your partner and/or your supervisor. Discussing the events that just happened provides an excellent avenue for learning. Your discussions can help lead to changes in protocol, how equipment is stocked, or even the purchase of new equipment.

System Finance

All EMS departments need a funding system that allows them to continue to provide care; however, the type of system needed depends on many variables.

Departments may have paid personnel, volunteer personnel, or a mix of both. Financial resources are available for EMS departments through taxation, fee for service, paid subscription, donations, federal/state/local grants, fundraisers, or combinations of these resources. Which financial system is used depends on the needs and makeup of each EMS department.

How are EMTs involved with the financial side of EMS? You may think the financial activities belong to those who work in the office. Proper documentation by the EMS provider can significantly impact an agency's ability to process medical insurance claims, provide eligibility for financial grants for training or equipment, and provide evidence of competent practices. You may be asked to gather insurance information from patients, secure signatures on certain documents such as Health Insurance Portability and Accountability Act (HIPAA) notifications, or obtain written permission from patients to bill their health insurance company. All of these steps are important to the health care process as well as the viability of the EMS organization for which you work or volunteer.

Also, as the health care system in the United States evolves, billing is changing at every level. In 2020, the Centers for Medicare and Medicaid Services (CMS) implemented a pilot program in a small group of EMS agencies, known as Emergency Triage, Treat, and Transport (ET3). Rather than an EMS system getting paid only for transportation to an ED, ET3 strives to reimburse EMS systems for providing the right patient with the right care at the right time. This program allows transport to EDs for patients who need that level of care but also sets up a payment model for patient transport to alternative destinations, such as urgent care centers or doctors' offices, or on-scene treatment with no transport.

Education Systems

Your education and training will be conducted by many knowledgeable EMS educators. In most states, the instructors who are responsible for coordinating and teaching the EMT course and continuing

education courses are approved and licensed by the state EMS office or agency. In some states, to be credentialed to teach, an instructor must have extensive medical and educational training and teach for a designated period while being observed and supervised by an experienced instructor.

Paramedic programs, and in the future AEMT training programs, must adhere to national standards established by the CAAHEP (Commission on Accreditation of Allied Health Education Programs) and its EMS review branch, the CoAEMSP (Committee on Accreditation for the Emergency Medical Services Professions).

When you no longer have the structured learning environment that is provided in your initial training course, you must assume responsibility for directing your own study and learning. As an EMT, you are required to attend a specified number of hours of continuing education approved for EMTs each year to maintain, update, and expand your knowledge and skills. In many services, the required hours are provided by the training officer and medical director. In addition, most EMS education programs and hospitals offer a number of regular continuing education opportunities in each region. You may also attend state and national EMS conferences to help keep you current about local, state, and national issues affecting EMS. Because there are many levels of licensing, you should ensure that the continuing education you receive is approved for the EMT. You may decide to remain an EMT or to achieve a higher level of training and certification, but whatever you choose, the key to being a good EMT and providing high-quality care is your commitment to continual learning and increasing your knowledge and skills.

Knowledge and skills that are learned in any profession weaken when they are not used on a continual basis. Consider the steps involved in CPR, for example. If you have not used these skills since your original training, it is unlikely you will perform CPR proficiently. Frequent continuing education, refresher courses, simulations, and computer-based or manikin-based self-education exercises are measures you can take to maintain your skills and knowledge.

Prevention and Public Education

The next two components of the EMS system are closely associated with each other. Prevention and public education are aspects of EMS where the focus is on public health. **Public health** examines the health needs of entire populations with the goal of preventing health problems. Although there are many definitions possible for public health, the prevention of health problems seems to provide a good overarching framework.

Health care in the United States is currently in a state of flux. The high-tech, on-demand style of care that is prevalent has two major drawbacks. One, it is very expensive. In the United States, according to the CMS, as of 2018 more than 17.7% of the US gross domestic product was accounted for by health care. Two, it may not deliver a better product. The US government reports people born in the United States have an average life expectancy of 79 years. There are 29 other countries where people live longer. If we are spending such large sums on health care, shouldn't we be living longer?

What needs to be addressed is the concept of prevention. The concept of prevention applies to both the patient and the EMS provider. Eating right, exercising, and using other stress management techniques can help prevent medical emergencies. It may seem strange, but the goal of education should be to create an environment where the need for EMS is decreased.

The focus of the public health arm of health care is prevention. Public health is proactive and works to prevent illness and injury. A good example of public health at work is in the common product, salt. In the United States, most table salt is sold with the additive iodine. It was discovered years ago that a condition known as goiter (abnormally large thyroid gland) is caused by a decrease in iodine levels within people's diets. The solution was to add this important element into a commonly used food source. Today, goiters are rare within the United States. **TABLE 1-4** demonstrates other significant accomplishments of the public health system.

EMS is able to work with public health agencies on both primary and secondary prevention strategies. **Primary prevention** focuses on strategies that will prevent the event from ever happening. Poliomyelitis (polio) was a devastating disease that caused death and disability for thousands of Americans in the early 1900s. A vaccine was developed to prevent the disease. In the span of one generation, the disease was virtually eliminated. Vaccinations

TABLE 1-4 Examples of Public Health Accomplishments

Vaccination programs	Clean drinking water
Fluoridation of water supplies	Seat belt laws
Helmet laws	Tobacco use laws
Sewage systems	Restaurant inspections
Formation of the Food and Drug Administration	Prenatal screenings

are a good example of primary prevention within public health.

There are several ways EMTs can contribute to primary prevention efforts. You can become involved in programs that educate the community about pool safety and car seat installation or in-home safety and fall prevention programs for older adults. Other opportunities include teaching first aid and CPR to various groups within your area. Remember, small actions can lead to big differences!

In a **secondary prevention** strategy, the event has already happened. The question is, how can we decrease the effects of the event? Helmets and seat belts do not prevent the accident from happening, yet they do prevent serious injuries from occurring due to the accident. The next time you drive down a major roadway, take note of the construction of the guardrails. There have been significant changes in guardrail construction over the years as more information has become available on what happens during a vehicle collision.

As an EMT, you may also be involved in the surveillance of illnesses and injuries. Information from the patient care reports that are generated by EMS personnel can be used to determine if a serious, widespread condition exists. For example, EMS reports can provide statistical information to the local government about collisions. Injury surveillance data can be used to determine ways to improve a dangerous intersection, to prevent crashes from ever happening, or to limit the severity of injuries to drivers.

As discussed earlier, you can help educate the public. People may not understand why an accident has happened. A parent allows her 5-year-old child to ride a bicycle without wearing a helmet. The child falls and cuts the top of her head. You can work with the parents professionally, respectfully, and kindly to help educate them on how to prevent this injury from occurring in the future.

Teaching people how to perform compression-only CPR, how to help a choking victim, or how to stop serious bleeding are all aspects of public education. Public education increases public respect for EMS. When people understand what it means to work on an ambulance and provide care to the sick and injured, they are more likely to consider EMS a vital part of the public health care system. This change in attitude can be powerful and lead to increased EMS funding and greater respect for EMS as a profession.

EMS Research

Why do EMTs perform the skills they do? How many ambulances does a city need? Should we remain on the scene and stabilize the patient or should we rapidly transport the patient? These questions and thousands more like them help determine the shape and impact of EMS on the community. The answers to these questions are derived from research and application of the scientific method. In the early days of EMS, expert opinion guided which tools and techniques EMS providers employed. While EMS care at the time was provided with the best information available, virtually all aspects of health care today utilize **evidence-based medicine (EBM)**. EBM is focused on procedures that have proven useful in improving patient outcomes. While not every aspect of EMS has enough research to be truly evidence-based, many EMS systems and states now consult the *National Model EMS Clinical Guidelines* from the National Association of State EMS Officials. These treatment guidelines are based on a review of current research and expert consensus. All aspects of the EMT role are currently being researched, not only within the academic community, but increasingly within the practitioner community, as every EMT has something to contribute to improving the role.

As an EMT, you will be involved in research through gathering data from every call you go on. Additionally, you may be involved in a specific research project. For example, you may be part of a study to determine how much oxygen should be given to patients with shortness of breath. Your

job is to carefully follow the research protocol and record all of the pertinent information about these patients. The information gathered is analyzed by others to answer these questions and the results are shared with the rest of the EMS community to change patient care practices. Modern medical practice is based on such research.

It is important to stay current on the latest advances in health care. On a regular basis, the International Liaison Committee on Resuscitation (ILCOR), along with its member, the American Heart Association, update guidelines based on current medical evidence. The ILCOR guidelines are an excellent example of evidence-based medical decision making in progress. These changes occur as results of research become available.

Roles and Responsibilities of the EMT

As an EMT, you will often be the first health care professional to assess and treat the patient; as such, you have certain roles and responsibilities (**TABLE 1-5**) and are expected to possess certain attributes (**TABLE 1-6**). The guiding principle for EMS personnel is "everything you do needs to be done with the patient in mind." What is in the best

TABLE 1-5 Roles and Responsibilities of the EMT

- Keep vehicles and equipment ready for an emergency.
- Ensure the safety of yourself, your partner, the patient, and bystanders.
- Operate the emergency vehicle.
- Be an on-scene leader.
- Evaluate the scene.
- Call for additional resources as needed.
- Gain patient access.
- Perform a patient assessment.
- Give emergency medical care to the patient while awaiting the arrival of additional medical resources.
- Give emotional support to the patient, the patient's family, and other responders.
- Maintain continuity of care by working with other medical professionals.
- Resolve emergency incidents.
- Uphold medical and legal standards.
- Ensure and protect patient privacy.
- Give administrative support.
- Constantly continue your professional development.
- Cultivate and sustain community relations.
- Give back to the profession.

YOU are the Provider

The patient's condition has remained stable throughout transport. After reassessing her, the paramedic asks you to call in your patient report to the receiving facility. Your estimated time of arrival is 8 minutes.

Recording Time: 19 Minutes	
Level of consciousness	Conscious and alert
Respirations	14 breaths/min; regular and unlabored
Pulse	70 beats/min; strong and regular
Skin	Pink, warm, and dry
Blood pressure	118/60 mm Hg
Spo_2	98% (on room air)

You deliver the patient to the ED in stable condition and give your verbal report to a staff nurse. The patient thanks you and your crew for taking such good care of her. You depart the hospital and return to service. On the way back to the station, the paramedic reviews your call and your performance.

6. What is the purpose of reviewing an EMS call?

TABLE 1-6 Professional Attributes of EMTs

Attribute	Description
Integrity	Consistent adherence to a code of honest behavior
Empathy	Aware of and thoughtful toward the needs of others
Self-motivation	Able to discover problems and solve them without direction
Appearance and hygiene	Uses persona to project a sense of trust, professionalism, knowledge, and compassion
Self-confidence	A state of being in which you know what you know *and* know what you do not know; able to ask for help
Time management	Able to perform or delegate multiple tasks, ensuring efficiency and safety
Communications	Able to understand others and have them understand you
Teamwork and diplomacy	Able to work with others and to know your place within a team; able to communicate while giving respect to the listener
Respect	Places others in high regard or importance; understands others are more important than self
Patient advocacy	Constantly keeps the needs of the patient at the center of care
Careful delivery of care	Pays attention to detail; makes sure what is being done for the patient is done as safely as possible

interest of the patient? This approach is referred to as being a patient advocate.

Often, patient outcomes depend on the care you provide in the field and your identification of patients who need prompt transport. You are responsible for all aspects of EMS, from the preparation of the equipment, to the delivery of care, to providing a good example for others within the community.

Professional Attributes

As an EMT, whether you are paid or a volunteer, you are a health care professional. Part of your responsibility is to make sure patient care is given a high priority without endangering your own safety or the safety of others. Another part of your responsibility to yourself, other EMTs, the patient, and other health care professionals is to maintain a professional appearance and manner at all times. Appearance, including uniforms, hair length, and tattoos, are usually regulated by the policies of your department (**FIGURE 1-8**). Your attitude and behavior must reflect that you are knowledgeable and sincerely dedicated to serving anyone who is injured or in an acute medical emergency. A professional appearance and manner help to build confidence and ease the patient's anxiety. You are expected to perform under pressure with composure and self-confidence. Patients and families who are under stress need to be treated with understanding, respect, and compassion.

Most patients will treat you with respect and appreciation, but some will not. Some patients are uncooperative, demanding, unpleasant, ungrateful, and verbally abusive. You must be nonjudgmental and overcome your instincts to react poorly to such behavior. Remember, when people are hurt, ill, under stress, frightened, despondent, under the influence of alcohol or drugs, or feel threatened, they will often react with inappropriate behavior, even toward those who are trying to help and care for them. Every patient, regardless of his or her attitude, is entitled to compassion, respect, and the best care that you can provide.

A

B

FIGURE 1-8 A. A professional appearance and demeanor help build confidence and ease patient anxiety. **B.** An unprofessional appearance may promote distrust and create the perception of incompetence.

Street Smarts

Professionalism extends beyond appearance and the activities you perform on a daily basis. As a professional, you have a responsibility to your partner, colleagues, patients, and profession to maintain a current level of knowledge.

Most people in this country can obtain proper routine medical care when they are ill and are supported by relatives and friends who will help to take care of them. However, when you are called to a home for a medical problem that is clearly not an emergency, remember that for some patients, calling an ambulance and being transported to the ED is the only way for them to obtain medical care.

As a new EMT, you will be given a lot of advice and training from the more experienced EMTs with whom you serve. Some may voice a callous disregard for some types of patients. Do not be influenced by the unprofessional attitude of these providers, regardless of how experienced or skilled they appear.

As a health care professional and an extension of physician care, you are bound by patient confidentiality. You should not discuss your findings or any disclosures made by the patient with anyone but those who are treating the patient or in limited situations, as required by law, the police, or other social agencies. When discussing a call with others, you should be careful to avoid revealing any information that might disclose the name or identity of patients you have treated. Be careful not to gossip about calls and patients with others, even in your own home. The protection of patient privacy has drawn national attention since the passage of HIPPA. You should be familiar with the requirements of this legislation, especially as it applies to your particular practice.

YOU are the Provider SUMMARY

1. How do your roles and responsibilities as an EMT compare to those of other EMS provider certification/licensure levels?

EMRs, EMTs, AEMTs, and paramedics responding to the same call may have different levels of education, training, and scopes of practice, or may even work for different agencies, which may alter their specific roles somewhat. However, all levels of EMS personnel share the same fundamental roles and responsibilities—providing *safe and effective* emergency medical care to the sick and injured, and in many cases, transporting patients to an appropriate medical facility. The EMT curriculum provides more depth than that of the EMR, including increased knowledge of anatomy, physiology and pathophysiology, more comprehensive assessment skills, and additional treatment options to stabilize patients initially and provide fundamental care. For more severely ill or injured patients, more advanced assessment and treatment options may be needed by an AEMT who has additional knowledge and skills, including invasive techniques such as intravenous access, advanced airways, as well as additional medications that can be administered. A paramedic has an even greater scope of practice with more in-depth knowledge, diagnostic skills, and advanced treatment, electrical therapy, and medication options.

2. How do the National Scope of Practice Model and the National EMS Education Standards affect an EMT's ability to assess and treat a patient?

The National EMS Scope of Practice Model describes four levels of EMS practice, each with a different scope of practice and each requiring different types of education and training. The National EMS Education Standards outline the knowledge and competencies that should be taught to students in each of these four levels of EMS practice. These documents serve as a national framework from which the foundation of each state's scope of practice is developed, and help to determine the roles and responsibilities of EMS providers in the locality or agency where they serve. This initial education will be enhanced by a provider's experience and contact with patients, by reflecting on those experiences, and by feedback received from others.

3. Does this patient need any treatment at the scene that can be provided by an EMT?

Your role is to take care of patients whether the situation is what you would personally consider an emergency or not. You should assume an emergency exists until a thorough and accurate assessment by someone qualified to distinguish an emergent medical condition from a nonemergent condition proves otherwise. In addition to repeating the patient's vital signs and reassessment as needed, and providing comfort measures, there is no immediate treatment that can be provided by an EMT. If the patient is transported to the hospital, an EMT will also need to consider methods to most safely and comfortably move, carry, and transport the patient.

4. How is patient care integrated across health systems when a patient is transported to the hospital?

Delivering excellent and compassionate care and providing transportation to a higher level of care should be the norm. When a patient is transported to a hospital, the responsibility for the assessment and treatment of the patient started at the scene is transferred to a higher level of care. This integration of care can be enhanced by complete and detailed communication of information from the scene and of history gathered by EMS personnel to the receiving staff. This may start before arrival with prenotification when appropriate or by consultation with online medical direction about treatment options. Verbal reports to hospital staff on arrival at the hospital pass along essential details that may help staff to make preliminary decisions about laboratory tests, radiologic studies, or the need for immediate treatment. In addition, your report provides information about the treatment given before arrival and the results of that treatment. Your verbal report can then be followed by a more complete and detailed written report with additional details or explanations.

5. What safety concerns apply to this call and what are some ways to address those concerns or to avoid errors?

Safety concerns and the possibility of errors affecting the safety of the patient occur in many ways on EMS calls. Safe transport is a major issue that needs to be considered during every phase of the call. Following traffic laws related to driving an emergency vehicle, proper restraint of driver and all passengers with appropriate seat belts or ambulance cot straps, avoiding distractions, and caution when moving through traffic can all contribute to safe transport. Similarly, proper lifting and carrying techniques, including the appropriate use of equipment and having sufficient manpower to safely lift and move a patient,

YOU are the Provider SUMMARY *continued*

are essential to prevent injury to the patient and the crew. It is essential that EMS providers maintain current knowledge about the treatments they provide through continuing education and skill practice. Familiarity with current protocols and policies can also decrease errors, as well as carefully considering whether a treatment is appropriate or needed in the current circumstances. It can be beneficial to refer to tools such as copies of protocols or to discuss treatment choices with medical direction or a crew member in order to avoid errors. Communication errors can occur as well, especially in chaotic environments, as information can be misunderstood or inadvertently not communicated to other crew members or hospital staff. To help avoid miscommunication, talk in a clear, concise manner in common language and verify directions or medical orders by repeating them back to the sender so that both parties know that the information was correctly received.

6. What is the purpose of reviewing an EMS call?

A review of an EMS call can provide feedback regarding how you cared for the patient and met his or her physical and emotional needs. It should not be punitive or fault-finding; it is an educational tool to enhance your patient care skills. EMTs must be open to constructive criticism; this is how you learn and become more skilled emergency care providers. Informal reviews are ideal learning opportunities because information about the call is still fresh. Later formal critiques, such as those that are conducted as part of the CQI process, are designed to ensure that safe and effective patient care is consistently provided by all EMS providers in the system. This review may lead to changes and analysis of their effects on patient care at a system level. Formal CQI may also be used to provide feedback to an individual provider or crew, which may include positive reinforcement or recommendations for improvement.

EMS Patient Care Report (PCR)

Date: 9-30-19	**Incident No.:** 010109	**Nature of Call:** Back pain		**Location:** 325 Blossom Ave.	
Dispatched: 0720	**En Route:** 0720	**At Scene:** 0723	**Transport:** 0735	**At Hospital:** 0750	**In Service:** 0801

Patient Information

Age: 48 **Sex:** F **Weight (in kg [lb]):** 64 kg (141 lb)	**Allergies:** None **Medications:** Ibuprofen **Past Medical History:** None **Chief Complaint:** Back pain

Vital Signs

Time: 0727	**BP:** 126/66	**Pulse:** 88	**Respirations:** 16	**Spo_2:** 99%
Time: 0735	**BP:** 120/62	**Pulse:** 90	**Respirations:** 16	**Spo_2:** 97%
Time: 0742	**BP:** 118/60	**Pulse:** 70	**Respirations:** 14	**Spo_2:** 98%

EMS Treatment (circle all that apply)

Oxygen @ L/min via: **NC NRM Bag mask**		**Assisted Ventilation**	**Airway Adjunct**	**CPR**
Defibrillation	**Bleeding Control**	**Bandaging**	**Splinting**	**Other:** Comfort care

YOU are the Provider SUMMARY *continued*

Narrative
Unit 1 dispatched emergency to a private residence for back pain.
Chief Concern: Lower back pain
History: 48-year-old woman reports lower back pain, which has been present for the past month. She denied injuring her back; she further denied any other symptoms or past medical history. Medications include ibuprofen for pain. The patient stated she has not been evaluated by a physician for her back pain; however, because it has progressively worsened, she called 9-1-1.
Assessment: On arrival at the scene, found the patient sitting on the couch in her living room. She was conscious and alert; her airway was patent; and her breathing was adequate. Assessment of patient's back revealed no gross evidence of deformity, swelling, or bruising. Pulse, sensory, and motor functions were grossly intact in all extremities.
Treatment (Rx): Obtained vital signs. En route, patient expressed her pain had begun to subside. Reassessment revealed that she remained conscious and alert with stable vital signs. Provided reassurance and reassessment throughout remainder of transport.
Transport: Placed patient onto stretcher and placed her in position of comfort, loaded her into the ambulance, and began nonemergency transport to the hospital. Delivered patient to ED without incident and gave verbal report to staff nurse.
End of report

Prep Kit

Ready for Review

- The standards for prehospital emergency care and the providers who deliver it are governed by the laws in each state and are typically regulated by a state office of EMS.
- Ambulances in EMS systems are staffed by EMTs who have been trained to the EMT, AEMT, or paramedic level according to recommended national standards and have been licensed by the state they serve.
- An EMT has training in basic emergency care knowledge, skills, and attitudes, focusing on initial care and transport of patients that includes identification, assessment, and treatment of many emergency and nonemergency conditions.
- An AEMT has training in specific aspects of ALS care, such as IV therapy and the administration of certain emergency medications.
- A paramedic has extensive training in ALS, including endotracheal intubation, emergency pharmacology, cardiac monitoring, and other advanced assessment and treatment skills.
- EMRs, such as law enforcement officers, firefighters, park rangers, ski patrollers, or other organized rescuers often arrive at the scene before the ambulance and EMTs.
- After the EMTs size up the scene and assess the patient, they provide the emergency care and transport that is indicated based on their findings and ordered by their medical director in the service's standing orders and protocols or by the physician who is providing online medical direction.
- The National EMS Scope of Practice Model, developed by NHTSA, provides overarching guidelines as to what skills each level of EMS provider should be able to accomplish.
- EMS Agenda 2050 is a multidisciplinary, national review of all aspects of EMS delivery that provides a framework for the creation of improved, people-centered systems of care.
- You will often be the first health care professional to assess and treat the patient; as such, you have certain roles and are expected to possess certain attributes.