1 Introduction to Emergency Medical Care

Standard

Preparatory (EMS Systems; Research); **Public Health**

Competency

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

Core Concept

- The chain of human resources that forms the EMS system
- How the public activates the EMS system
- Your roles and responsibilities as an EMT
- The process of EMS quality improvement

Objectives

After reading this chapter, you should be able to:

1. 1.1 Define key terms introduced in this chapter.
2. 1.2 Give an overview of the historical events leading to the development of modern Emergency Medical Services (EMS). (pp. 3–4)
3. 1.3 Describe the importance of each of the National Highway Traffic Safety Administration standards for assessing EMS systems. (pp. 4–5)
4. 1.4 Describe the components of an EMS system that must be in place for a patient to receive emergency medical care. (pp. 5–6)
5. 1.5 Compare and contrast the training and responsibilities of EMRs, EMTs, AEMTs, and Paramedics. (pp. 7–8)
6. 1.6 Explain each of the specific areas of responsibility for the EMT. (pp. 8–9)
7. 1.7 Give examples of the physical and personality traits that are

desirable for EMTs. (pp. 9–10)

8. 1.8 Describe various job settings that may be available to EMTs. (p. 11)
9. 1.9 Describe the purpose of the National Registry of Emergency Medical Technicians. (pp. 11–12)
10. 1.10 Explain the purpose of quality improvement programs in EMS programs. (pp. 12–13)
11. 1.11 Explain EMT's role in the quality improvement process. (p. 13)
12. 1.12 Explain medical direction as it relates to EMS systems. (pp. 13–14)
13. 1.13 List ways in which research may influence EMT practice. (pp. 15–22)
14. 1.14 Give examples of how EMS providers can play a role in public health. (pp. 14–15)
15. 1.15 Given scenarios, decide how an EMT may demonstrate professional behavior. (pp. 9–11)

Key Terms

- designated agent , *p. 13*
- evidence-based , *p. 15*
- medical direction , *p. 13*
- Medical Director , *p. 13*
- 911 system , *p. 6*
- off-line medical direction , *p. 13*
- on-line medical direction , *p. 13*

- patient outcomes , *p.* *15*
- protocols , *p.* *13*
- quality improvement , *p.* *12*
- standing orders , *p.* *13*

Chapter Introduction

WHEN A PERSON is injured or becomes ill, it rarely happens in a hospital with doctors and nurses standing by. In fact, some time usually passes between the onset of the injury or illness and the patient's arrival at the hospital, time in which the patient's condition may deteriorate, time in which the patient may even die. The modern Emergency Medical Services (EMS) system has been developed to provide what is known as *prehospital* or *out-of-hospital* care. Its purpose is to get trained personnel to the patient as quickly as possible and to provide emergency care on the scene, en route to the hospital, and at the hospital until care is assumed by the hospital staff. The Emergency Medical Technician (EMT) is a key member of the EMS team.

As you begin to study for a career as an EMT, you will want to answer some basic questions, such as, "What is the EMS system?" "How did it develop?" and "What will be my role in the system?" This chapter will help you begin to answer these questions.

The Emergency Medical Services System

How It Began

In the 1790s the French began to transport wounded soldiers away from the scene of battle so they could be cared for by physicians. This is the earliest documented Emergency Medical Service. However, no medical care was provided for the wounded on the battlefield. The idea was simply to carry the victim from the scene to a place where medical care was available.

Other wars inspired similar emergency services. For example, during the American Civil War, Clara Barton began such a service for the wounded and later helped establish the American Red Cross. During World War I, many volunteers joined battlefield ambulance corps. And during the Korean Conflict and the Vietnam War, medical teams produced further advances in field care, many of which led to advances in the civilian sector, including specialized emergency medical centers devoted to the treatment of trauma (injuries).

Nonmilitary ambulance services began in some major American cities in the early 1900s—again as transport services only, offering little or no emergency care. Smaller communities did not develop ambulance services until the late 1940s, after World War II. Often the local undertaker provided a hearse for ambulance transport. In locations where emergency care was offered along with transport to the hospital, the fire service often was the responsible agency.

The importance of providing hospital-quality care at the emergency scene —that is, beginning care at the scene and continuing it, uninterrupted, during transport to the hospital—soon became apparent. The need to organize systems for such emergency prehospital care and to train personnel to provide it also was recognized.

“Where else can you work with great people, have fun, and make a

difference? Welcome to EMS.”

EMS Today

During the 1960s, the development of the modern EMS system began. In 1966 the National Highway Safety Act charged the U.S. Department of Transportation (DOT) with developing EMS standards and assisting the states to upgrade the quality of their prehospital emergency care. Most

EMT courses today are based on models developed by the DOT.

In 1970 the National Registry of Emergency Medical Technicians was founded to establish professional standards. In 1973 Congress passed the National Emergency Medical Services Systems Act as the cornerstone of a federal effort to implement and improve EMS systems across the United States.

Since then, the states have gained more control over their EMS systems, although the federal government continues to provide guidance and support. For example, the National Highway Traffic Safety Administration (NHTSA) Technical Assistance Program has established an assessment program with a set of standards for EMS systems. The categories and standards set forth by NHTSA, summarized in the following list, will be discussed in more detail throughout this chapter and the rest of this textbook.

- Regulation and policy. Each state EMS system must have in place enabling legislation (laws that allow the system to exist), a lead EMS agency, a funding mechanism, regulations, policies, and procedures.
- Resource management. There must be centralized coordination of resources so that all victims of trauma or medical emergencies have equal access to basic emergency care and transport by certified personnel, in a licensed and equipped ambulance, to an appropriate facility.
- Human resources and training. At a minimum, all those transporting prehospital personnel (those who ride the ambulances) should be trained to the EMT level using National EMS Education Standards that are taught by qualified instructors.
- Transportation. Safe, reliable ambulance transportation is a critical component. Most patients can be effectively transported by ground ambulances. Other patients require rapid transportation, or transportation from remote areas, by helicopter or airplane.
- Facilities. The seriously ill or injured patient must be delivered in a timely manner to the closest appropriate facility.
- Communications. There must be an effective communications

system, beginning with the universal system access number (911), dispatch-to-ambulance, ambulance-to-ambulance, ambulance-to-hospital, and hospital-to-hospital communications.

- Public information and education. EMS personnel may participate in efforts to educate the public about their role in the system, their ability to access the system, and prevention of injuries.

- Medical direction. Each EMS system must have a physician as a Medical Director accountable for the activities of EMS personnel within that system. The Medical Director delegates medical practice to nonphysician providers (such as EMTs) and must be involved in all aspects of the patient-care system.

- Trauma systems. In each state, enabling legislation must exist to develop a trauma system including one or more trauma centers, triage and transfer guidelines for trauma patients, rehabilitation programs, data collection, mandatory autopsies (examination of a body to determine cause of death), and means for managing and ensuring the quality of the system.

- Evaluation. Each state must have a program for evaluating and improving the effectiveness of the EMS system, known as a quality improvement (QI) program, a quality assurance (QA) program, or total quality management (TQM).

With the development of the modern EMS system, the concept of ambulance service as a means merely for transporting the sick and injured passed into oblivion. No longer could ambulance personnel be viewed as people with little more than the strength to lift

(A) (B)

Figure 1-1

New methods of delivering Emergency Medical Services: (A) By bicycle. (B) By mobile EMS unit.

a patient into and out of an ambulance. The hospital emergency department was extended, through the EMS system, to reach the sick and injured at the emergency scene. “Victims” became patients, receiving prehospital assessment and emergency care from highly trained professionals. The “ambulance attendant” was replaced by the Emergency Medical Technician (EMT).

A current development in some areas is use of the term *out-of-hospital care*, rather than *prehospital care*, as EMS personnel begin to provide primary care for some conditions and in some circumstances without transport to a hospital (Figure 1-1). However, the term *prehospital care* will be used in the remainder of this text.

Components of the EMS System

To understand the EMS system, you must look at it from the patient's viewpoint rather than from that of the EMT (Figure 1-2). For the patient, care begins with the initial phone call to the Emergency Medical Dispatcher (EMD). The EMS system responds to the call for help by sending to the scene available responders, including Emergency Medical Responders, EMTs, and advanced life support providers (Advanced EMTs and Paramedics). An ambulance will transport the patient to the hospital.

Core Concept

The chain of human resources that forms the EMS system

From the ambulance, the patient is received by the emergency department. There, the patient receives laboratory tests, diagnosis, and further treatment. The emergency department serves as the gateway for the rest of the services offered by the hospital. If a patient is brought to the emergency department with serious injuries, care is given to stabilize the patient, and the operating room is readied to provide further lifesaving measures.

Some hospitals handle all routine and emergency cases but have a specialty that sets them apart from other hospitals. One specialty hospital is the trauma center. In some hospitals a surgery team may not be available at all times. In a trauma center, surgery teams capable of the comprehensive treatment of trauma patients are available twenty-four hours a day.

In addition to trauma centers, there are also hospitals that specialize in the care of certain conditions and patients, such as burn centers, pediatric centers, cardiac centers, and stroke centers.

As an EMT, you will become familiar with the hospital resources available in your area. Many EMS regions have specific criteria for transporting patients with special needs. Choosing the right hospital may actually be a lifesaving decision. Of course, it is important to weigh the patient's

condition against the additional transport time that may be required to take him to a specialized facility. On-line medical direction (discussed later) may be available to help with this decision.

Dispatchers and EMTs are key members of the prehospital EMS team. (The levels of EMS training will be discussed later in the chapter.) Many others make up the hospital portion of the EMS system. They include physicians, nurses, physician's assistants, respiratory and physical therapists, technicians, aides, and others.

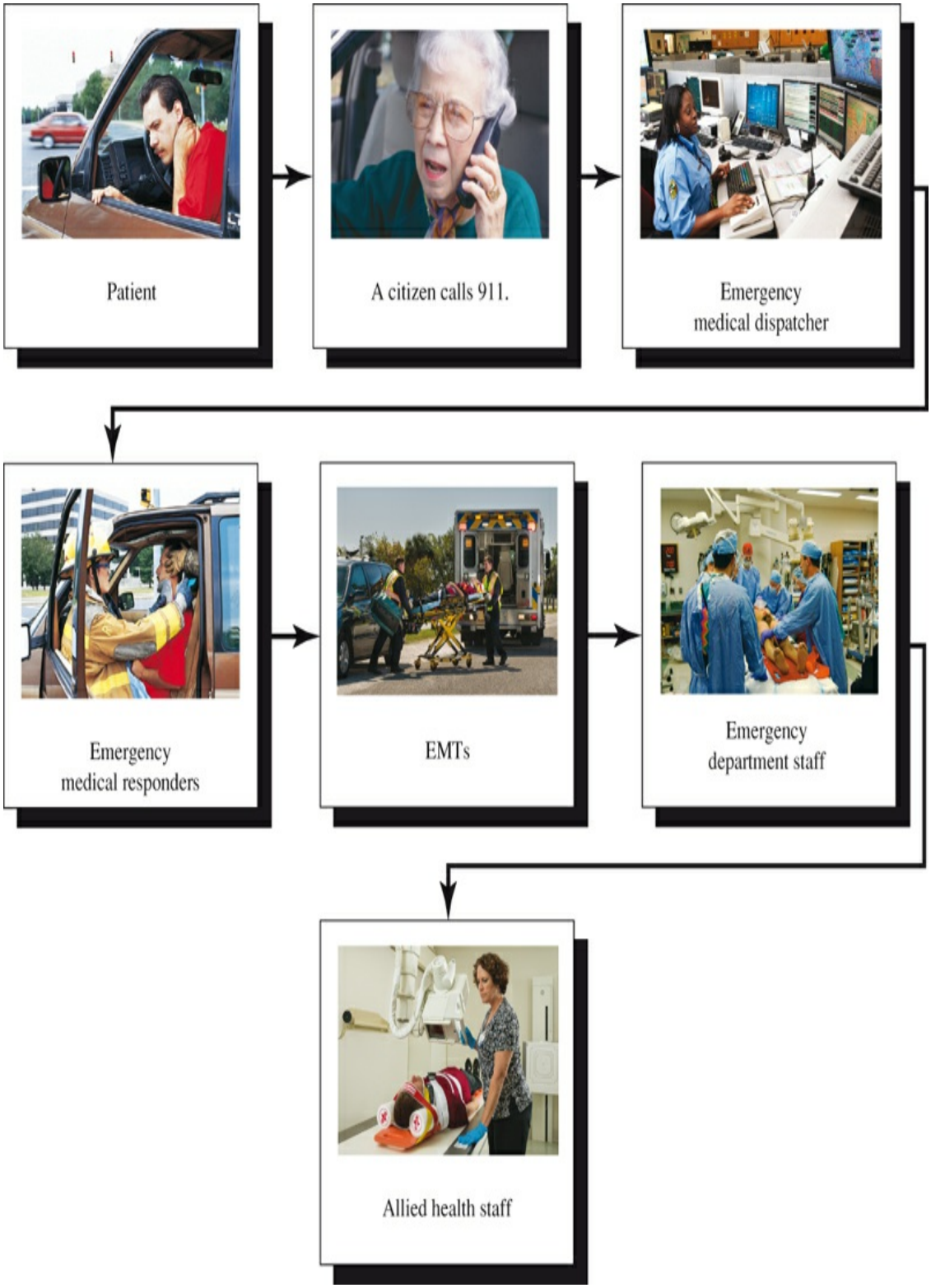

Figure 1-2

The chain of human resources making up the EMS system.

(Emergency Department staff photo: © Edward T. Dickinson, MD)

Core Concept

How the public activates the EMS system

Accessing the EMS System

Most localities have a 911 system for telephone access to report emergencies. A dispatcher answers the call, takes the information, and alerts EMS or the fire or police departments as needed. Since the number 911 is designed to be a national emergency number, there will be a time when someone may dial 911 from any phone in the country and be connected to the appropriate emergency center.

911 system

> a system for telephone access to report emergencies. A dispatcher takes the information and alerts EMS or the fire or police department as needed. *Enhanced 911* has the additional capability of automatically identifying the caller's phone number and location.

Many communications centers have *enhanced 911*. This system has the capability of automatically identifying the caller's phone number and location. If the phone is disconnected or the patient loses consciousness, the dispatcher will still be able to send emergency personnel to the scene.

There are still a few communities that do not have 911 systems. In these locations a standard seven-digit telephone number must be dialed to reach ambulance, fire, or police services. Dialing 911 where a 911 system is not in operation will usually connect the caller to an operator who will attempt to route the call to the appropriate dispatch center. This adds an extra step and extra time to the process, so it is important to make sure that the emergency numbers in use in a local area are prominently displayed on all telephones.

Another development in the communication and dispatch portion of the

EMS system is the training and certification of EMDs. These specially trained dispatchers not only obtain the appropriate information from callers, but they also provide medical instructions for emergency care. These include instructions for CPR, artificial ventilation, bleeding control, and more. Research has consistently pointed to the importance of early access and prompt initiation of emergency care and CPR. The EMD is one example of the EMS system providing emergency care at the earliest possible moment.

Levels of EMS Training

There are four general levels of EMS training and certification (described in the following list). These levels vary from place to place. Your instructor will explain any variations that may exist in your region or state.

1. Emergency Medical Responder (EMR) **(previously called first responder).** This level of training is designed for the person who is often first at the scene. Many police officers, firefighters, and industrial health personnel function in this capacity. The emphasis is on activating the EMS system and providing immediate care for life-threatening injuries, controlling the scene, and preparing for the arrival of the ambulance.

2. Emergency Medical Technician (EMT) **(previously called EMT-Basic).** In most areas, the EMT is considered the minimum level of certification for ambulance personnel. EMTs provide basic-level medical and trauma care and transportation to a medical facility.

3. Advanced Emergency Medical Technician (AEMT) **(previously called EMT-Intermediate).** The AEMT, like the EMT, provides basic-level care and transportation as well as some advanced-level care, including use of advanced airway devices, monitoring of blood glucose levels, and administration of some medications, which may include intravenous and intraosseous administration.

Critical Decision Making A Key Concept

Critical decision making is a very important concept. It essentially means that an **EMT** takes in information from the scene, the patient assessment, and other sources and makes appropriate decisions after synthesizing—or interpreting—all the information. There are times when the information you obtain initially won't be enough to be a basis for decision making, so you will need to ask more questions and perform additional examinations to get everything you need to make a decision.

It may be difficult to see how this all fits together now. Before long, however, you'll be learning and practicing patient assessment and care. Some examples of critical decision making that will be a part of the assessment and care you will perform include:

1.

- Deciding which hospital to transport someone to. Should you take your patient to the closest hospital or to a more distant specialty hospital?

- Deciding whether you should administer a medication to a patient. Will it help the patient's current condition? Could it make the condition worse?

When you begin to work with more experienced EMTs, you will come across many who are smart and know what to do and how to treat patients (both clinically and personally). These are the EMTs you would want to take care of you or your family should EMS be needed. These EMTs are good critical decision makers.

4. Paramedic **(previously sometimes called EMT-Paramedic).** The Paramedic performs all of the skills of the EMT and AEMT plus advanced-level skills. The Paramedic provides the most advanced level of prehospital care.

Roles and Responsibilities of the EMT

Core Concept

Your roles and responsibilities as an EMT

As an EMT, you will be responsible for a wide range of activities. In addition to patient assessment and emergency care, your responsibilities will include preparation, a safe response to the scene, safe transportation to the hospital, and transferring the patient to hospital personnel for continuity of care. The following are specific areas of responsibility for the EMT.

- Personal safety. It is not possible to help a patient if you are injured before you reach him or while you are providing care, so your first responsibility is to keep yourself safe. Safety concerns include dangers from other human beings, animals, unstable buildings, fires, explosions, and more. Though emergency scenes are usually safe, they also can be unpredictable. You must take care at all times to stay safe.

- Safety of the crew, patient, and bystanders. The same dangers you face will also be faced by others at the scene. As a professional, you must be concerned with their safety as well as your own.

- Patient assessment. As an EMT, one of your most important functions will be assessment of your patient, or finding out enough about what is wrong with your patient to be able to provide the appropriate emergency care. Assessment always precedes emergency care.

- Patient care. The actual care required for an individual patient may

range from simple emotional support to lifesaving CPR and defibrillation. Based on your assessment findings, patient care is an action or series of actions that your training will prepare you to take to help the patient deal with and survive his illness or injury.

- Lifting and moving. Since EMTs are usually involved in transporting patients to the hospital, lifting and moving patients are important tasks. You must perform them without injury to yourself and without aggravating or adding to the patient's existing injuries.

- Transport. It is a serious responsibility to operate an ambulance at any time, but even more so when there is a patient on board. Safe operation of the ambulance, as well as securing and caring for the patient in the ambulance, will be important parts of your job as an EMT.

- Transfer of care. Upon arrival at the hospital, you will turn the patient over to hospital personnel. You will provide information on the patient's condition, your observations of the scene, and other pertinent data so that there will be continuity in the patient's care. Although this part of patient care comes at the end of the call, it is very important. You must never abandon care of the patient at the hospital until transfer to hospital personnel has been properly completed.

- Patient advocacy. As an EMT, you are there for your patient. You are an advocate, the person who speaks up for your patient and pleads his cause. It is your responsibility to address the patient's needs and to bring any of his concerns to the attention of the hospital staff. You will have developed a rapport with the patient during your brief but very important time together, a rapport that gives you an understanding of his condition and needs. As an advocate, you will do your best to transmit this knowledge to help the patient continue through the EMS and hospital systems. In your role as an advocate, you may perform a task as important as reporting information that will enable the hospital staff to save the patient's life or as simple as making sure a relative of the patient is notified. Acts that may seem minor to you may often provide major comfort to your patient.

EMTs may also be involved in community health initiatives such as injury prevention. The EMT is in a position to observe situations where injuries

are possible and help correct them before injuries, or further injuries, are sustained. Hospital personnel do not see the scene and cannot offer this information. An example might be a call to the residence of a senior citizen who has fallen. You make observations about improper railings or slippery throw rugs or shoes and bring this to the attention of the patient and his family. Another place where injury prevention may be beneficial is with children. If you respond to a residence where there are small children and you observe potential for injury (e.g., poisons the child can access or unsafe conditions such as a loose railing), your interventions can make a difference. These community health issues are discussed throughout the book and can be found in these chapters: “Poisoning and Overdose Emergencies,” “Pediatric Emergencies,” and “Geriatric Emergencies.”

Traits of a Good EMT

Certain physical traits and aspects of personality are desirable for an EMT.

Physical Traits

Physically you should be in good health and fit to carry out your duties. If you are unable to provide needed care because you cannot bend over or catch your breath, then all your training may be worthless to the patient who is in need of your help.

You should be able to lift and carry up to 125 pounds. Practice with other EMTs is essential so you can learn how to carry your share of the combined weight of the patient, stretcher, linens, blankets, and portable oxygen equipment. For such moves, you need coordination and dexterity as well as strength. You will have to perform basic rescue procedures, lower stretchers and patients from upper levels, and negotiate fire escapes and stairways while carrying patients.

Your eyesight is very important in performing your EMT duties. Make certain that you can clearly see distant objects as well as those close at hand. Both types of vision are needed for patient assessment, reading labels, controlling emergency scenes, and driving. Should you have any eyesight problems, they must be corrected with prescription eyeglasses or

contact lenses.

Be aware of any problems you may have with color vision. Not only is this important to driving, but it could also be critical for patient assessment. Color of the patient's skin, lips, and nail beds often provides valuable clues to the patient's condition.

You should be able to give and receive oral and written instructions and communicate with the patient, bystanders, and other members of the EMS system. Eyesight, hearing, and speech are important to the EMT; thus, any significant problems must be corrected if you are going to be an EMT.

Personal Traits

Good personal traits are very important to the EMT (Figure 1-3). You should be:

- Pleasant to inspire confidence and help to calm the sick and injured.
- Sincere to be able to convey an understanding of the situation and the patient's feelings.
- Cooperative to allow for faster and better care, establish better coordination with other members of the EMS system, and bolster the confidence of patients and bystanders.
- Resourceful to be able to adapt a tool or technique to fit an unusual situation.
- A self-starter to show initiative and accomplish what must be done without having to depend on someone else to start procedures.
- Emotionally stable to help overcome the unpleasant aspects of an emergency so needed care may be rendered and any uneasy feelings that exist afterward may be resolved.
- Able to lead to take the steps necessary to control a scene, organize bystanders, deliver emergency care, and, when necessary, take charge.

- Neat and clean to promote confidence in both patients and bystanders and to reduce the possibility of contamination.
- Of good moral character and respectful of others to allow for trust in situations when the patient cannot protect his own body or valuables and so all information relayed is truthful and reliable.
- In control of personal habits to reduce the possibility of rendering improper care and to prevent patient discomfort. This includes never consuming alcohol within eight hours of duty and not smoking when providing care. (Remember: Smoking can contaminate wounds and is dangerous around oxygen delivery systems.)
- Controlled in conversation and able to communicate properly to inspire confidence and avoid inappropriate conversation that may upset or anger the patient or bystanders or violate patient confidentiality.

Figure 1-3

A professional appearance inspires confidence.

- Able to listen to others to be compassionate and empathetic, to be accurate with interviews, and to inspire confidence.
- Nonjudgmental and fair, treating all patients equally regardless of race, religion, or culture. There are many cultural differences you will encounter among patients. Figure 1-4 highlights one example of the cultures you may encounter in EMS. You will find additional features involving cultural issues throughout the book.

Education

An EMT must also maintain up-to-date knowledge and skills. Since ongoing research in emergency care causes occasional changes in procedure, some of the information you receive while you are studying to become an EMT will become outdated during your career.

There are many ways to stay current. One way is through refresher training. Most areas require recertification at regular intervals. Refresher courses present material to the EMT who has already been through a full course but needs to receive updated information. Refresher courses, which are usually shorter than original courses, are required at two- to four-year intervals.

Figure 1-4

Your patients may come from a wide variety of cultures. As an example, Muslims such as this woman from Afghanistan have standards of modesty that may require examination by an EMT of the same sex.

(A) (B)

Figure 1-5

There is a wide variety of career opportunities for EMTs, including work in (A) urban/industrial settings and (B) rural/wilderness settings.

(Photo B: © Edward T. Dickinson, MD)

Continuing education is another way to stay current. This type of training supplements the EMT's original course. It should not take the place of original training. For example, you may wish to learn more about pediatric or trauma skills or driving techniques. You can obtain this education in conferences and seminars and through lectures, classes, videos, or demonstrations.

It is important for you to realize that education is a constant process that extends long past your original EMT course.

Where Will You Become a Provider?

As an EMT, you will have a wide variety of opportunities to use the skills you will learn in class. EMTs are employed in public and private settings, such as fire departments, ambulance services, and urban/industrial or rural/wilderness settings (Figure 1-5). In fact, many fire departments require their firefighters to be cross-trained as both firefighters and EMTs.

You may be taking this course to volunteer. A large portion of the United States is served by volunteer fire and Emergency Medical Services. Your willingness to participate in training to help others is both necessary for and appreciated by your community.

National Registry of Emergency Medical Technicians

The National Registry of Emergency Medical Technicians (NREMT), as part of its effort to establish and maintain national standards for EMTs, provides registration to EMRs, EMTs, AEMTs, and paramedics. Registration is obtained by successfully completing NREMT practical and computer-based knowledge examinations. Holding an NREMT registration may help in reciprocity (transferring to another state or region). It is usually considered favorably when you apply for employment, even in areas where NREMT registration is not required (Figure 1-6).

Many states use the National Registry examinations as their certification exams. If your state or region does not use the registry exam, ask your instructor how you can sit for the examination. Upon passing the exam and obtaining registry, you will be entitled to wear the NREMT patch.

The National Registry is also active in EMS curriculum development and other issues that affect EMS today. For information, contact:

- National Registry of Emergency Medical Technicians
- 6610 Busch Boulevard
- P.O. Box 29233

- Columbus, OH 43229
- 614-888-4484
- www.nremt.org

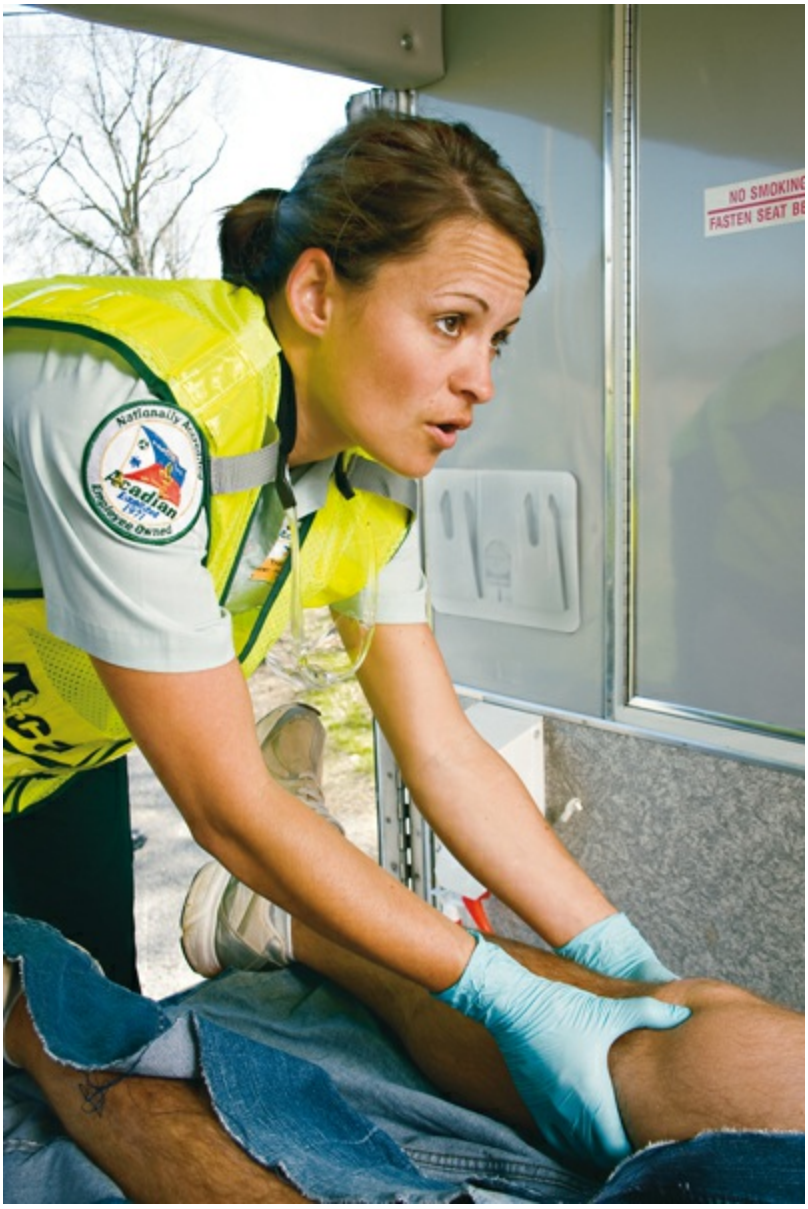

Figure 1-6

In many states an EMT candidate must have passed the NREMT exam to be licensed and certified by the state. This EMT practices in Louisiana, one state that requires NREMT registration.

Quality Improvement

Core Concept

The process of EMS quality improvement

Quality improvement, an important concept in EMS, consists of continuous self-review with the purpose of identifying aspects of the system that require improvement. Once a problem is identified, a plan is developed and implemented to prevent further occurrences of the same problem. As implied by the name, quality improvement is designed and performed to ensure that the public receives the highest quality prehospital care.

quality improvement

> a process of continuous self-review with the purpose of identifying and correcting aspects of the system that require improvement.

A sample quality improvement review might go as follows:

> As part of a continuous review of calls, the Quality Improvement (QI) committee has reviewed all of your squad's run reports that involve trauma during one particular month. The committee has noted that the time spent at the scene of serious trauma calls was excessive. (You will learn in later chapters that time at the scene of serious trauma should be kept to a minimum because the injured patient must be transported to the hospital for care that cannot be provided in the field.)
>
> The QI committee has brought this fact to the attention of the Medical Director and the leadership of the ambulance squad. As a result, better protocols have been instituted. Monthly squad training is developed that covers topics such as how to identify serious trauma patients and requires skill practice to reinforce techniques of trauma care. (Later in the year, the QI committee will review the same criteria to ensure that the extra training has been effective in improving the areas that were found to be deficient.)

During the review, the QI committee has also identified calls during which the crews followed procedures and performed well. A letter has been sent to these EMTs commending them for their efforts.

As an EMT, you will have a role in the quality improvement process. In fact, a dedication to quality can be one of the strongest assets of an EMT. There are several ways you can work toward quality care. These include:

- Preparing carefully written documentation. Call reviews are based on the prehospital care reports that you and other crew members write. If a report is incomplete, it is difficult for a QI team to assess the events of a call. If you are ever involved in a lawsuit, an inaccurate or incomplete report may also be a cause for liability. Be sure the reports you write are neat, complete, and accurate.

- Becoming involved in the quality process. As you gain experience, you may wish to volunteer for assignment to the QI committee. In addition, quality improvement has a place on every call. An individual ambulance crew can perform a critique after each call to determine things that went well and others that may need improvement. Have another EMT or advanced EMT look over your report before turning it in to ensure it is accurate and complete.

- Obtaining feedback from patients and the hospital staff. This may be done informally or, in some cases, formally. Your organization may send a letter to patients that asks for comments on the care they were given while under your care. Hospital staff may be able to provide information that will help strengthen your caregiving skills.

- Maintaining your equipment. It will be difficult to provide quality care with substandard, damaged, or missing equipment. Although the ingenuity of EMTs should never be underestimated, it could be dangerous to administer oxygen or provide cardiac defibrillation without proper, functional equipment. Check and maintain equipment regularly.

- Continuing your education. An EMT who was certified several years ago and has never attended subsequent training will have a problem providing quality care. Seldom-used skills deteriorate without practice. Procedures change. Without some form of regular continuing education, it will be difficult to maintain standards of

quality.

Quality improvement is another name for providing the care that you would want to have provided to you or a loved one in a time of emergency. That is the best care possible. Maintaining continuous high quality is not easy; it requires constant attention and a sense of pride and obligation. Striving for quality—both in the care you personally give to patients and as a collective part of an ambulance squad—is to uphold the highest standards of the EMS system.

Medical Direction

Each EMS service or agency has a Medical Director, a physician who assumes the ultimate responsibility for medical direction, or oversight of the patient-care aspects of the EMS system. The Medical Director also oversees training, develops protocols (lists of steps for assessment and interventions to be performed in different situations), and is a crucial part of the quality improvement process. An EMT at a basic or advanced level is operating as a designated agent of the physician. This means that, as an EMT, your authority to give medications and provide emergency care is actually an extension of the Medical Director's license to practice medicine.

Medical Director

a physician who assumes ultimate responsibility for the patient-care aspects of the EMS system.

medical direction

oversight of the patient-care aspects of an EMS system by the Medical Director. *Off-line medical direction* consists of standing orders issued by the Medical Director that allow EMTs to give certain medications or perform certain procedures without speaking to the Medical Director or another physician. *On-line medical direction* consists of orders from the on-duty physician given directly to an EMT in the field by radio or telephone.

protocols

lists of steps, such as assessments and interventions, to be taken in different situations. Protocols are developed by the Medical Director of an EMS system.

designated agent

an EMT or other person authorized by a Medical Director to give medications and provide emergency care. The transfer of such authorization to a designated agent is an extension of the Medical Director's license to practice medicine.

The physician obviously cannot physically be at every call. This is why EMS systems develop standing orders. The physician issues a policy or protocol that authorizes EMTs and others to perform particular skills in certain situations. An example may be the administration of glucose. Glucose is very beneficial to certain diabetic patients who are experiencing a medical emergency. The Medical Director issues a standing order that allows EMTs to give glucose in certain circumstances without speaking to the Medical Director or another physician. This kind of "behind the scenes" medical direction is called off-line medical direction.

standing orders

a policy or protocol issued by a Medical Director that authorizes EMTs and others to perform particular skills in certain situations.

off-line medical direction

standing orders issued by the Medical Director that allow EMTs to give certain medications or perform certain procedures without speaking to the Medical Director or another physician.

Certain other procedures that are not covered by standing orders or protocols require the EMT to contact the on-duty physician by radio or telephone prior to performing a skill or administering a medication. For example, EMTs carry aspirin, which is beneficial to many—but not all—patients who have possible cardiac symptoms. Prior to administering aspirin, you may be required to consult with the on-duty physician. You would use a radio or cell phone from the ambulance to provide patient information to the physician. After receiving your information, the physician would instruct you on whether and how to administer the

aspirin. Orders from the on-duty physician given by radio or phone are called on-line medical direction. On-line medical direction may be requested at any time you feel that medical advice would be beneficial to patient care.

on-line medical direction

> orders from the on-duty physician given directly to an EMT in the field by radio or telephone.

Protocols and procedures for on-line and off-line medical direction vary from system to system. Your instructor will inform you what your local policies are. Always follow your local protocols.

Point of View

"I was driving along, not a care in the world, when all of a sudden this car pulled out from a side street—and pulled right in front of me. I couldn't brake in time. I couldn't steer in time. The crash made thunder seem like a whisper. I didn't just hear it. I felt it. The next thing I knew I was sitting in my car and it was smoky. I thought it was on fire. Then I noticed the air bag, which must've gone off. People were running up to my window to ask if I was OK. I felt so foggy, I didn't even know what to say.

"A fireman came up to my window and asked how I was doing. By then I had a minute to think and compose myself. It felt like I'd cry if I opened my mouth to say anything. The ambulance came in, and the EMTs and firefighters worked to get me out of the car. The fireman who came to my window must've climbed into the backseat. I could feel hands alongside my head.

"The collar felt like it was going to choke me. The board was uncomfortable. And everything was so, so loud. But what I remember most, more than the crash or the hospital or the bills, were the kind words the fireman said from behind me. In spite of everything going on that day, his reassuring, kind voice is my best memory from the whole miserable day. It was like an angel being there for me."

As you begin your training as an EMT, you will learn many clinical skills. For this patient, you will perform an assessment, immobilize the neck and spine, take vital signs, and transport the patient—perhaps to a trauma center.

You will also provide emotional reassurance and support in this time of crisis. It has been said that you should treat your patients as you would want your family to be treated. This is a good rule.

“Point of View” features such as this one will appear throughout the text. Their purpose is to present an emergency from the *patient’s* perspective because understanding how the patient feels is a critical element in developing people skills. The clinical skills you learn are vital to your success in becoming an EMT. However, people skills are essential for you to thrive as an EMT.

The EMS Role in Public Health

From clean drinking water and sewage systems to the decline of infectious diseases through vaccination, we have reaped the benefits of public health. Although public health has many definitions, it is generally considered to be the system by which the medical community oversees the basic health of a population. Additional efforts by the public health system include prenatal care, reducing injury in children and geriatric patients, campaigns to reduce the use of tobacco, and campaigns to reduce the incidence of obesity through better diet choices.

EMS has a role in many public safety issues including:

- Injury prevention for geriatric patients. When on a call to a patient's home, the EMT can identify things that may cause falls such as footwear or rugs (Figure 1-7). EMS may also run blood pressure clinics and offer methods for the elderly to present medications and medical history to EMTs in the event of emergency (e.g., file of life).

- Injury prevention for youth. EMS is frequently involved in car-seat clinics, distribution of bicycle helmets, and other programs for youth.

- Public vaccination programs. More and more EMS providers are being trained and allowed to provide vaccination clinics for the public. Seasonal flu and variations such as H1N1 are examples of vaccinations that are frequently offered by EMS providers. Some regions are beginning to allow specially trained EMS providers to take routine vaccinations (e.g., routine childhood vaccinations) out to the public—especially in areas where many children do not have routine well care and are at risk.

- Disease surveillance. On the front lines, EMS reports may serve as an indication that a trend in injury or disease is beginning. Such trends may range from flu to violence to terrorist attacks.

Developing around the country are programs that use EMS providers in different and innovative public health roles. These programs vary from location to location according to need but are collectively referred to as Mobile Integrated Health Care. Unlike hospital- or

Figure 1-7

EMTs play important roles in public safety issues such as providing fall-prevention advice to geriatric patients.

office-based medicine, EMS is always in the field, in patients' homes, and in the public eye. This visibility and access is vital to getting health services at the point they are needed and to identify areas where injuries and disease may be prevented.

One thing is certain: EMS does more than just respond to emergencies. In your future as an EMT, you will likely play an even greater role in public health.

Research

Medicine is based on research. Some—but not all—of the procedures you will be trained to perform have been developed as a result of research. If you believe this should be changed, you are not alone. Experts universally agree that research must play a greater role in EMS for it to continue to evolve as a respected profession. Many of the things we do are based on tradition—simply stated, because that is how we have always done them. Many other techniques were developed from hospital procedures and applied to the field.

Although teaching how to perform or even interpret research is beyond the scope of your EMT class, it is important for you to know the importance of research and how it will shape the future of EMS.

Two ways research impacts EMS are through a focus on improving patient outcomes and through evidence-based techniques.

patient outcomes

> the long-term survival of patients.

evidence-based

> description of medical techniques or practices that are supported by scientific evidence of their safety and efficacy, rather than merely on supposition and tradition.

Although our concern may seem to be whether patients make it to the hospital alive, we must remember that EMS is part of a larger system. What we do also affects the patient's long-term survival. If something appears to help in the short term but has no effect in the long term, it is not useful. This research into long-term results (patient outcomes) allows us to make the best decisions for the patient's overall care.

Evidence-based decision making means that the procedures and knowledge we use in determining what care works is based on scientific evidence. A scenario involving evidence-based decision making might go like this:

You are at the ambulance bay when an experienced member of your crew is talking with your Medical Director about adding a new medication to the EMT scope of practice. This member has heard that the new drug has been successful in other local squads and has seen it in magazines for EMS providers.

Your Medical Director finds it interesting but asks the member for evidence. “Check the literature,” he says. “If we can find evidence that this makes a difference in outcomes and doesn’t have a significant risk, we’ll take a look at it.”

Figure 1-8

Many EMS/rescue operations adopt new procedures and equipment on the basis of research providing evidence that they are effective.

The evidence-based process here demonstrates the general procedures needed to make these decisions. It includes:

- Forming a hypothesis. In this case, the experienced provider felt that a new medication would be safe to use and beneficial.
- Reviewing literature. The provider goes to the local college library and searches medical literature to determine if the new medication has been studied—especially for use by EMTs (Figure 1-8).
- Evaluating the evidence. The provider meets with the Medical Director to review the literature. If there was no literature, they could decide to create a research project to study it in the organization or region.
- Adopting the practice if evidence supports it. It turns out that the medication has been studied and appears safe. The Medical Director is convinced that the medication should be brought into the EMT scope of practice. Training sessions are scheduled prior to implementation.

The Basics of EMS Research

Moving to evidence-based medicine is not simple. EMS is not an easy field to gather research in, and serious challenges exist. As a provider, you should understand the value of research not only to your profession but to your everyday practice. There are simple steps you can take to improve your understanding and to help move EMS toward a more evidence-based approach.

The dynamic nature of our treatment setting makes research difficult at best. We encounter many obstacles to research that simply are not there in other areas of the health care field. Often the environment we work in is unstable, our encounters are brief, and our data collection is disjointed and lacks centralization. Furthermore, we face many ethical dilemmas. Obtaining consent from critical patients is frequently challenging at best. We do have many opportunities to create valid and important studies on prehospital care, but to do so we must promote the best practices of research so our outcomes can truly guide us to high-quality care.

Not all research is created equal. There are good studies, and there are bad studies. As we evolve in an evidence-based environment, we should strive to embrace the best practices of conducting and evaluating research (Figure 1-9). The finer points of medical research are by no means a simple topic, and a thorough examination of how to evaluate research is beyond the scope of this text. However, there are broad concepts that can be helpful to consider.

Remember that the process of research is the same whether you are an EMS researcher or a scientist in a laboratory. We all rely on the *scientific method*, a process of experimentation

Figure 1-9

EMS must strive to embrace best practices of conducting and evaluating research to provide high-quality care for our patients.

(© Daniel Limmer)

for answering questions and acquiring new knowledge that was developed by Galileo almost four hundred years ago. In this method, general observations are turned into a *hypothesis* (or unproven theory). Predictions

are then made, based on the hypothesis, and these predictions are tested to either prove or disprove the theory. For example, you might note that applying a bandage seems to control minor external bleeding. To use the scientific method, you might hypothesize that bandages do indeed control bleeding better than doing nothing at all. You could conduct a randomized control study to test your hypothesis by randomly assigning patients to the "bandage group" or to the "do-nothing group." You could then measure the amount of bleeding in each group and compare your results. Although there are some ethical issues with your study, this experiment would help you prove or disprove the value of bandaging. Furthermore, if your experiment was done properly, your results would hold up if the study were repeated, regardless of who conducted the experiment. That is the value of quality research. Unfortunately, not all research can live up to these quality markers.

In medicine, exacting and comprehensive studies are both difficult and time consuming to conduct. In most cases we make decisions based on a broad variety of different sources. Unfortunately much of what we do still relies on the "best-guess strategy"; however, as we progress, we rely more and more on research studies. When making decisions based on evidence (especially patient-care decisions), it is clearly best to base the decision on many studies, not just a single work. The strength of your conclusion is significantly increased when a variety of studies point to the same conclusion.

The key is to obtain an objective opinion. When more than one study points to the same conclusion, it is more likely to be free from opinion and *bias*. Many individual studies are clouded by bias. Bias occurs when research is influenced by prior inclinations, beliefs, or prejudices. Bias influences a study when the outcomes are manipulated to fit an expected outcome instead of measured objectively against the hypothesis. Although this can occur when researchers have a financial gain in a particular outcome, it more commonly occurs simply from poor methods used to conduct the research. In the true scientific method, outcomes are not bent to conform to previously held notions but rather are examined objectively and evaluated based solely on the facts. Valid research embraces this idea and uses methods designed to limit outside influences.

Methods of Reducing Bias

Some methods of research are considered more valid than others. Research methods are typically judged by how well they avoid potential bias and exclude the possibility of error. Weigh the following considerations: prospective versus retrospective, randomization, control groups, and study group similarity.

Prospective versus Retrospective

Retrospective reviews look at events that have occurred in the past. Health care has frequently used retrospective reviews to consider the outcomes of therapies previously performed. In contrast, prospective studies are designed to look forward. Methods are designed to test therapies and outcomes that will occur in the future. Prospective studies are generally easier to control than retrospective studies, as rules and regulations can be put in place in advance to control errors and prevent bias. Retrospective studies cannot be controlled in such a way. Retrospective studies can certainly be considered valid, but a prospective method is generally considered more valid.

Randomization

High-quality studies use randomization. In medicine this type of study typically compares one therapy against another, and bias is controlled by assigning patients to one therapy or the other randomly, as opposed to having predetermined groups. Randomization also improves objectivity when analyzing outcomes. In high-quality studies, the researcher and the patients may not even know which therapy is being received by whom. This process is called *blinding* and can be either single blinded (the researcher knows who gets what therapy but the patients don’t) or double blinded (neither the patient nor the researcher knows what therapy is being used on that particular patient). When a study is blinded, it is very difficult to influence outcomes in any way, and the results are far more likely to be objective.

Control Groups

The use of a control group helps to evaluate outcomes fairly. In medicine, a control group is usually a group of patients who are receiving a therapy that is already commonly known or commonly used. The control group outcomes can be compared to the outcomes of the test group that is receiving a new therapy, showing whether or not the new therapy has better outcomes than the old one. In our previous bandaging study, we compared the bandaging group against a do-nothing group. In that case, the do-nothing group would be our control group. By including this group, we can not only evaluate the outcome of bandaging but also compare those outcomes against a different (do nothing) strategy. This comparison of test-group outcomes to control-group outcomes adds weight and value to the analysis.

Study Group Similarity

If a group of patients is being used to test a new treatment, it is important that subjects in that group have a certain degree of similarity. Let's say, for example, that we want to test a new airway device's impact on survival in trauma patients. We have designed and implemented a study to compare the use of the new device against a group of patients that received care without using the device. In our study let's say that the EMTs were allowed to choose whom they wanted to use the new device on. When we look at our results, we find that the group that the device was used on had a much higher mortality rate. At face value we might assume that this means the device did not work. However, as we analyze the results, we find that the group assigned to the new device was much sicker than the group that did not receive the device. In this case the EMTs thought it would be best to use the new device only in the worst-off patients. Did more people in the test group die because of the device, or did more people die simply because they were hurt worse from the beginning? It is difficult to say, and therein is the difficulty in comparing a therapy used with two vastly different groups. Consider also the challenges in comparing different age groups, different treatment protocols, or different sexes.

Types of Medical Research

No study can be completely free from bias; however, as you have seen,

certain methods help to minimize the impact of subjectivity. Because of the dynamic and often sensitive nature of medicine, a large variety of research is used to reach conclusions on therapies and treatment. Ideally systematic reviews guide our most important decisions, but more commonly a combination of research studies and research methods guides the decisions that are made. Consider the following types of medical research:

- Case studies/case reports. Case studies and case reports review the treatment of a single patient or a series of patients. Frequently they report on unusual circumstances or outcomes. There is no control group, and these reports are always retrospective. They are certainly not as valid as randomized studies, but they often help us formulate larger questions to be investigated.

- Cohort/concurrent control/case-control studies. In these types of studies, two therapies or groups of patients are compared, but subjects are not necessarily randomized. For example, you might compare the outcomes of one service that uses CPAP against the outcomes of another service that does not. A cohort study might follow patients who have a specific disease and compare them to a group of patients that does not have the disease. In both these studies, you are comparing two groups and have a control group, but the results are not randomized. Frequently, case-control studies are retrospective, looking at two groups of events or outcomes that occurred in the past. All of these studies can be valid and yield important information, but they also can be prone to bias in that it is difficult to control all aspects of similarity and methods among the different groups.

- Randomized controlled trials (RCTs). In an RCT, researchers randomly assign eligible subjects into groups to receive or not receive the intervention being tested. A control group is used to compare the tested theory against a known outcome. In 2000 Marianne Gausche-Hill and her colleagues looked at pediatric intubation in Los Angeles County, California. In their study, children needing airway management were randomized, based on the day of the week, to either an intubation group or a bag-valve-mask (BVM) group. Outcomes of these patients were then studied. Objectivity was improved because subjects were randomized, and the results were more meaningful because they could compare outcomes of the

intubation group against those of the control BVM group.

In medicine, drugs are frequently tested in randomized studies using a placebo for the control group. Patients are often randomized to receive either the real drug that is being tested or a "sugar pill" that has no effect. Frequently these studies also use a blinding process so neither the providers carrying out the study nor the patients know who is taking which path. In this type of study, the results for those receiving the new medication can be compared against those in the placebo control group to accurately assess the effect of the new therapy.

- Systematic review. In a systematic review, a series of studies pertaining to a single question are evaluated. Their results are reviewed, summarized, and used to draw evidence-based conclusions. It is important to remember that a systematic review is made up of not one but many different research experiments.

- Meta-analysis. A meta-analysis is not a study itself but rather is a compilation of different studies looking at a single topic. A meta-analysis will summarize the work of those other studies and frequently will comment on outcomes of those studies. In many cases, these are similar to a systematic review but frequently are much smaller in scale.

It is important to remember that every study should be reviewed independently. The fact that it is a randomized control study does not ensure that its results are valid. That said, methodology does play a role in evaluations of a study's importance. The American Heart Association qualifies the validity of research in a linear fashion using a "Level of Evidence" designation. It assigns varying levels of importance based on how a study was conducted. This progression is useful in evaluating the importance of data and can be used as a framework for considering the utility of a particular study.

- Level of Evidence 1. In this sliding scale, the highest level (most valuable) set of data would result from *randomized controlled trials (RCTs)* or meta-analyses of RCTs.

- Level of Evidence 2. These studies use concurrent controls without true randomization. Because they are often retrospective and because

the methods are more difficult to control without randomization, these types of studies are often less reliable.

- Level of Evidence 3. These studies use retrospective controls. There is little control of these experiments, as the testing is based on events that have already occurred. Because of this, it is difficult to ensure similar circumstances among research subjects. Although the data from retrospective studies may be useful, it can be prone to bias.

- Level of Evidence 4. These are studies without a control group (e.g., case series). In these studies, only one group is looked at and it is not compared to a second group. Here there is no control group to examine the results against. Important information may be gained, but outcomes are difficult to truly evaluate without comparing to a similar patient who received a different therapy.

- Level of Evidence 5. These studies are not directly related to the specific patient/population (e.g., different patient/population, animal models, mechanical models, and so on). These studies are common in EMS and are frequently used to evaluate prehospital treatments. Unfortunately their data are prone to a wide range of interpretations as we must make assumptions that what works in different populations or under different circumstances would also work in the world of EMS.

Questions to Ask When Evaluating a Research Study

Regardless of the type of study you are reading, you should always review research in a way that helps you identify bias or flaws in the methodology. There is certainly a great deal more to learn about the evaluation of medical research, but there are some important questions to consider when reading a study. Consider the following questions:

1. Was the study randomized, and was the randomization blinded?

2. If more than one group was reviewed, were the groups similar at the start of the trial?

3. Were all eligible patients analyzed? If some were excluded, why were they excluded? Bias often occurs by removing data that leads in a different direction from your hypothesis. Often the removal of patients from a study can identify potential problems.

4. Were the outcomes really due to the therapy? Consider the previously discussed example of the new airway device being used on only the sickest patients. Occasionally outcomes can be measured that would have happened randomly. For example, a company could invent a new device that, they say, would make the sun rise tomorrow at 6:00 a.m. Although they could certainly produce a study that demonstrates the predicted outcome, that outcome would have occurred whether the device was used or not. A powerful study is one that can be reproduced with the same results in relatively different circumstances.

5. Is the outcome truly relevant? Many studies show differences among treatments but no real relevance. For example, a study might show that a new medication increases the return of spontaneous circulation in sudden cardiac arrest compared to a placebo control group. Getting a pulse back in more patients is important, but that result is not really relevant if exactly the same number of patients die at the conclusion of care as compared to the control group.

There are many good resources on evaluating evidence-based medicine, and there is a great deal more information available about evaluating research. Learning more about this topic as a provider will help you understand the decisions and discussions that are ongoing both in EMS and in health care in general. Classes, textbooks, and many other tutorials can improve your capability to read and evaluate research. This is especially true with regard to statistical analysis, but you do not have to be a statistician to be a critical consumer of research. Although some believe it is easy to lie with statistics, it is even easier to lie without them.

Questions to Ask Before Participating in EMS Research

There is no better way to learn about research than to become involved in a research study. In EMS we face a future where insurance reimbursements

for specific treatments may be based on validated outcomes. Therefore, your role as an EMS provider in research is especially important. Aside from reading and discussing research, the EMS provider of the future will be on the front line of conducting research. We now know that the only way to truly prove our worth and prove the importance of our prehospital therapies is to evaluate them through clinical trials. As a provider, there are a variety of ways you may be involved in EMS research.

At the most basic level, your good documentation may help improve future studies. As EMS systems begin to collaborate and centralize run-report data, this information may help guide any number of potential studies. EMS leaders will consider skills used, locations, times of day, and many other reported outcomes as they design the EMS practices of the future. The time you take to accurately and thoroughly document your call may be an essential component of evidence-based medicine and may significantly impact the decisions that are made regarding how you do business.

You may also take part in a research study. Your service, local hospital, or region may participate and enroll patients into a specifically designed experiment. In this case it is important to follow all the instructions you are given. Making exceptions or not following the instructions can insert bias or even eliminate your data from consideration. Participating in a study such as this is an important way to learn more about medical research. Not only might your service benefit from the information learned in the study, but participation often gives you valuable insight into research methods and procedures.

Before you participate in a research study, you should make sure you get satisfactory answers to these questions:

- What is the title of the study? Although this may be your first study, there may be others going on at the same time in your area. You need to be sure which study you are participating in.

- Who are the principal investigator and primary contact? The principal investigator (PI) is the person in charge of the entire study. There is often a primary contact person who handles day-to-day matters. You need to know whom to reach out to if you have a question and how to contact that person.

- What is the research question or hypothesis? You should understand

what the study is trying to show or discover.

- What are the study's inclusion criteria? Which patients will be included in the study?

- What are the study's exclusion criteria? Which patients will not be included in the study?

- What EMS data is needed? If additional data beyond what you typically document will be needed, you will need to understand what information that is and how to record it (e.g., on a case report form).

- How will informed consent be handled? One of the foundations of ethical research is the authority of any person to decide whether to participate in a research study. Because of the environment EMS works in, a patient may be under so much stress that is not possible to give truly informed consent at the scene. In cases such as this, there may be a special allowance to delay getting informed consent until after the patient is at the hospital.

- If a treatment is going to be randomized, how will that happen? If only some patients will be getting an intervention, you need to understand how that will be determined. You may be told to open a sealed envelope when you encounter a suitable patient, or certain days may be reserved for an intervention, while others are not.

- What samples will need to be collected? This is often a blood sample, but if you don't draw blood, this will not affect you.

- What are the potential benefits to the patient? Some studies have clear potential benefits for a patient (e.g., a potentially lifesaving medication), while others may be trying to discover new knowledge that does not directly benefit that particular patient (e.g., why some trauma patients have clotting problems later).

- What are the potential risks to the patient? Every potential subject of a study has the right to know what risks are associated with that study.

- What institutional review board has approved the study? Any study conducted on human subjects should be approved by a group of

people at a university or hospital who have the responsibility to protect the subjects, maximize the potential benefits, and minimize the risks.

- Has the EMS agency's Medical Director approved the study? Your Medical Director is responsible for the care your EMS agency provides and must be a part of any research on patients.

- Has the EMS agency's administration approved the study? Responsible research is done by an organization, not just an individual. The EMS agency needs to approve any study to be prepared for questions from the public and patients, to provide for any additional needed supplies, to protect the organization, and ultimately to advocate for the patients they serve.

As you progress as a provider, perhaps you will take part in designing a study. As an EMT, you are on the forefront of prehospital medicine and can play an important role in shaping the future of prehospital medicine. Many hospitals and EMS systems conduct research routinely. Your Medical Director or local or state official may be able to offer opportunities if you would like to get involved.

Special Issues

EMTs are people and people make mistakes. You may have seen in your local news about errors that have occurred in the hospital and have resulted in lawsuits. All of medicine—including EMS—recognizes this as a serious issue. The chapter “Medical/Legal and Ethical Issues” will cover this topic in detail.

In the coming weeks and through the chapters that follow in this textbook, you will be studying to become an EMT. As part of your course, your instructor will advise you on local issues and administrative matters, such as a course description, class meeting times, and criteria including physical and mental requirements for certification as an EMT, as well as specific statutes and regulations regarding EMS in your state, region, or locality.

The Americans with Disabilities Act (ADA) has set strict guidelines preserving the rights of Americans with disabilities. If you have a disability or have questions about the ADA, ask your instructor for more information.

Chapter Review

Key Facts and Concepts

- The EMS system has been developed to provide prehospital as well as hospital emergency care.
- The EMS system includes 911 or another emergency access system, dispatchers, EMTs, the hospital emergency department, physicians, nurses, physician’s assistants, and other health professionals.
- The EMT’s responsibilities include safety; patient assessment and care; lifting, moving, and transporting patients; transfer of care; and patient advocacy.
- An EMT must have certain personal and physical traits to ensure the ability to do the job.
- Education (including refresher training and continuing education), quality improvement procedures, and medical direction are all essential to maintaining high standards of EMS care.

Key Decisions

1.

Making accurate decisions in patient care is the hallmark of a competent EMT. This feature will be used throughout this text to help you identify these significant decisions and relate their importance in emergency care.

Since this is a nonclinical chapter, picture yourself applying for a job or being interviewed for membership in a volunteer squad. How would you answer the following questions asked in the interview?

- Why do you think EMS makes a difference?

- If EMS is about helping people, how do you anticipate helping people as an EMT?
- Can EMS have a role in injury prevention or public health?
- How will EMS look in the future?

Chapter Glossary

designated agent

an EMT or other person authorized by a Medical Director to give medications and provide emergency care. The transfer of such authorization to a designated agent is an extension of the Medical Director's license to practice medicine.

evidence-based

description of medical techniques or practices that are supported by scientific evidence of their safety and efficacy, rather than merely by supposition and tradition.

medical direction

oversight of the patient-care aspects of an EMS system by the Medical Director.

Medical Director

a physician who assumes ultimate responsibility for the patient-care aspects of the EMS system.

911 system

a system for telephone access to report emergencies. A dispatcher takes the information and alerts EMS or the fire or police departments as needed. *Enhanced 911* has the additional capability of automatically identifying the caller's phone number and location.

off-line medical direction

standing orders issued by the Medical Director that allow EMTs to give certain medications or perform certain procedures without speaking to the Medical Director or another physician.

on-line medical direction

orders from the on-duty physician given directly to an EMT in the field by radio or telephone.

patient outcomes

the long-term survival of patients.

protocols

lists of steps, such as assessments and interventions, to be taken in different situations. Protocols are developed by the Medical Director of an EMS system.

quality improvement

a process of continuous self-review with the purpose of identifying and correcting aspects of the system that require improvement.

standing orders

a policy or protocol issued by a Medical Director that authorizes EMTs and others to perform particular skills in certain situations.

Preparation for Your Examination and Practice

Short Answer

1. What are the primary components of the Emergency Medical Services system?

2. What are some of the special designations that hospitals may have?

Name the specialty centers you have in your region.

3. What are the four national levels of EMS training and certification?
4. What are the roles and responsibilities of the EMT?
5. What are desirable personal and physical attributes of the EMT?
6. What is the definition of the term *quality improvement*?
7. What is the difference between on-line and off-line medical direction?

Critical Thinking Exercises

Of course you want to be the best EMT you can be. The purpose of this exercise will be to consider some ways to accomplish that goal.

1. What qualities would you like to see in an EMT who is caring for you? How can you come closer to being this kind of EMT?
2. You are devoting a considerable amount of time to becoming an EMT. How do you plan to refresh your knowledge and stay current once you are out of the classroom?

Street Scenes

As a new EMT, you are assigned to Station 2 to ride with Susan Miller, a seasoned EMS veteran with seven years on the job. You have heard that she is a good EMT, and you remember that she helped teach some of your skill sessions. She was a good instructor—patient, understanding, and considerate.

When you arrive at the station, you find out she has been delayed and you will be riding with Chuck Hartley instead. When you are introduced to Chuck, you see that his uniform is unkempt. He tells you to sit until he

needs you.

Your first call of the day is a seventy-year-old female with abdominal pain. As you approach the ambulance, Chuck tells you to get in the back. He'll let you know when you can help. At the scene, after ensuring scene safety, you both enter the patient's home. Chuck doesn't bother to introduce himself and proceeds to ask the patient, "What's wrong, hon?" She describes her symptoms. Chuck tells you to put her on a nasal cannula. As you hook up the O_2, Chuck says in a loud voice, "Didn't you learn anything in EMT class? That liter flow rate is too high."

As the patient is being loaded onto the stretcher, she tries to tell Chuck something that she obviously believes is urgent. Chuck tells her that if it's that important, she can tell the doctor at the hospital.

Street Scene Questions

1. What would have been a more appropriate action for Chuck when the shift started?

2. What behavior characteristics of Chuck's would be considered unprofessional?

3. What would you expect from someone providing initial field training?

When you return to the station, Susan Miller has arrived. This time, when you are introduced, you notice that her uniform is pressed and neat. She asks you about your background and when you finished training. She remembers you from class, she says. Then she tells you there are some things you both need to do. "First let's go to the ambulance and check the equipment. Next I want to explain how we operate on calls. You need to know what equipment we always take to the patient and responsibilities of the crew members."

Just as you are completing your orientation, a call comes in for a fifty-five-year-old male with chest pain. While en route, Susan briefly goes over the routine that she and her partner use. She asks you to take the automatic defibrillator. When you enter the patient's house, Susan introduces herself

and the members of the crew. She asks the patient, “Sir, why did you call 911?” He tells you that he had chest pain but he took a nitroglycerin tablet and now most of the pain is gone. He apologizes for calling.

While you get the vital signs, Susan tells the patient that he did just the right thing by calling EMS. He is reassured and agrees to be transported for further evaluation.

Street Scene Questions

4. What did Susan Miller do that was appropriate and professional?

5. How was Susan’s behavior beneficial to you as a new EMT?

6. What personal traits are the professional standards for EMTs?

During the trip to the hospital, Susan continues to reassure the patient. In fact, she tells you to talk to the patient about his medical history. When you arrive at the hospital, Susan sees that the oxygen tank is getting low, so she asks you to switch “bottles” before moving the patient, but you forget to turn off the tank being replaced. Susan turns it off, sets it aside, looks you in the eyes, and gives you a smile. You both know that you will not forget the next time.

After the call, Susan gives a short critique and discusses the prehospital care report. When you call back in service, you realize that to be a good EMT, you not only need to have good technical skills but, just as important, you also must act as a professional with your patients and with your colleagues.

Introduction to Emergency Medical Care

Terminology

Name:_____ Date:_____

Term	Definition
Designated agent	
Evidence-based	
Medical direction	
Medical director	
911 system	
Off-line Medical direction	

On-line Medical direction	
Patient outcomes	
Protocols	
Quality improvement	
Standing orders	

Intro to Emergency Medical Care Quiz

Test Handout

1. Which of the following is the MOST important reason for EMS providers to participate in research efforts?

   A: To raise the professional image of our occupation.
   B: To improve reimbursement from insurance agencies.
   C: To assist with EMS systems obtaining research grants.
   D: To prove changes in procedures make a positive difference.

2. There is a patient with severe and uncontrolled external bleeding. Which of the following will have the greatest positive impact regarding the outcome of this patient with this type of injury?

   A: The Paramedic.
   B: The Emergency Medical Responder.
   C: The Basic Emergency Medical Technician.
   D: The Advanced Emergency Medical Technician.

3. Which of the following would be the BEST resource for learning about issues and trends in EMS?

   A: Read your textbook.
   B: Attend EMS conferences.
   C: Read your local newspapers.
   D: Watch the news on television.

4. A newly trained EMS student is preparing to take a certification exam. What does passing a certification exam mean to the EMS candidate?

   A: A physician will now endorse the provider to work throughout the state.
   B: The candidate has passed the prerequisite coursework for attending another class.
   C: It recognizes the candidate has demonstrated minimum competencies for the job.
   D: The government grants permission for the candidate to practice his or her new profession independently.

5. You have become licensed as an EMS provider. Which of the following BEST describes your role in the EMS system regarding medical direction?

   A: Your only interaction with the medical director will occur if you need on-line medical direction.
   B: You can only perform the skills and procedures that are allowed within your protocols.
   C: You are authorized to perform the levels within your training without any supervision from medical direction.
   D: You are operating as an extension of the medical director, allowed to perform those skills that you are trained and authorized to perform.

6. Which of the following BEST describes the quality improvement process?

   A: Increasing the level of care provided to patients.
   B: Assessing performance and improving the system.
   C: Assessing individual performance and remediation.
   D: Punishing for poor care and/or poor documentation.

7. You are about to purchase a very expensive piece of medical equipment. What should you do before your purchase?

   A: Review the medical research regarding the use of this equipment.
   B: Call around and purchase what other departments are using.
   C: Rely on the documents provided by the manufacturer.
   D: Purchase the least expensive equipment available.

8. Which of the following best describes “Scope of Practice”? You are allowed to provide any treatment you are:

   A: Trained to do.
   B: Licensed and trained to do.
   C: Authorized and licensed to do.
   D: Licensed, authorized, and trained to do.

9. A partner with more experience suggests that your knowledge level of prehospital therapy is weak because of a lack of experience. Choose the process you should follow if you believe his statement is accurate.

   A: Ask your manager to evaluate your abilities and map out ideas for improvement.
   B: Ask for a leave of absence so that you may return for additional initial education.
   C: Begin working more shifts per pay period to increase your real-life experience.
   D: Schedule yourself immediately for continuing education sessions in the area.

10. Select the statement that MOST accurately describes the registration process for EMS providers.

    A: Registration is a process that grants licenses to providers to work within a state.
    B: Registration is the activity of entering one's name into an official book of record.
    C: Registration is the path a provider follows to be granted permission to practice nationally.
    D: Registration permits the federal government to track continuing education credits for professionals.

11. Which of the following is the MOST important benefit of performing research in the field of EMS?

    A: It reduces changing practice on a whim.
    B: It generates funding to support the research.
    C: It provides EMS with a professional appearance.
    D: It identifies interventions that reduce morbidity and mortality.

12. Which of the following is the goal of quality improvement in AED usage?

    A: To reprimand providers who are improperly using the AED.
    B: To decrease the need for AED usage through prevention.
    C: To determine if the use of an AED is beneficial.
    D: To improve the timeliness of shock delivery.

13. Medical direction should do a quality improvement review of every cardiac arrest call where an AED has been used for what purpose?

    A: To do a trend analysis on AED use within the system.
    B: To hold EMS providers accountable for their actions.
    C: To evaluate the need for additional equipment in the community.
    D: To help identify patients who need treatment other than AEDs.

14. Which of the following systems identifies the caller's location when a 911 call is placed?

    A: Regular 911.
    B: Enhanced 911.
    C: System status management.
    D: Public safety answering point.

15. Which of the following is the BEST reason for collecting data from EMS run reports?

    A: To help assess the safety risks to EMS workers.
    B: It can help identify trends in EMS treatment.
    C: To create award/recognition programs.
    D: It assures proper billing is completed.

Intro to Emergency Medical Care Quiz

Answer Sheet

Intro to Emergency Medical Care
Joshua Blevins

8/6/2019 4:25:22 PM

Student Name: _____

Student ID: _____

	A	B	C	D	A	B	C	D	A	B	C	D
1.	☐	☐	☐	☐								
2.	☐	☐	☐	☐								
3.	☐	☐	☐	☐								
4.	☐	☐	☐	☐								
5.	☐	☐	☐	☐								
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12.	☐	☐	☐	☐								
13.	☐	☐	☐	☐								
14.	☐	☐	☐	☐								
15.	☐	☐	☐	☐								