# Emergency Medicine Clerkship Primer

A Manual for Medical Students

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## A Manual for Medical Students

CDEM
Clerkship Directors in Emergency Medicine


The "Clerkship Directors in Emergency Medicine" (CDEM), formed in 2008, is the first "Academy" within the membership of the Society for Academic Emergency Medicine (SAEM). CDEM members are medical student educators who are committed to enhancing medical student education within our specialty. CDEM will provide an opportunity for emergency medicine clerkship directors and medical student educators to join forces, collaborate, and become a unified voice at the national level.

CDEM thanks the Department of Emergency Medicine, University of Rochester School of Medicine and Dentistry for its support of the editing and design of this primer.

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An electronic version of this primer in Adobe Acrobat (for reproduction) is available on the CDEM Web site



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# *Preface*

The focus of *Emergency Medicine Clerkship Primer: A Manual for Medical Students* is to assist medical students throughout their emergency medicine clerkship. Although the target audience for this manual is primarily junior and senior medical students, we believe that emergency medicine interns and off-service residents will benefit from the majority of the topics reviewed. Our goal is to produce a high-quality, professional guide that highlights the uniqueness of our specialty. This guide should provide the reader with a detail-oriented approach to thinking like an emergency physician—essentially a "how to" manual. The *Primer* can be considered a supplement to the many high-quality emergency medicine texts currently available. However, different from these, the *Primer* focuses on aspects of our specialty that are often overlooked or underrepresented in traditional textbooks. Before the development of this *Primer*, a comprehensive manual such as this was not available to the masses of medical students across the country. Good luck on your emergency medicine rotation.

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# *Foreword*

By the time this *Primer* arrives for your review, Emergency Medicine will be celebrating its 40th anniversary as an organized specialty realm of practice. Formal recognition by the rest of traditional medicine came nearly two decades later, but for those who understood the vision when it first appeared, four decades of service is the right number.

As you prepare for your clerkship, please recognize our chosen specialty has several gifts in store for you. First, its faculty and residents recognize the responsibility we have to train you to understand and operate in our realm. Undergraduate medical education is a serious pursuit for emergency physicians, and your clerkship director holds a position of esteem in the department. We understand the potential impact of early intervention as well as or better than any other practitioner. In education, a shared truth or corrected perception can last a lifetime, and this is what we plan to offer each of you who spend time with us.

In addition, we offer a unique contribution to your medical education. We are not trying to sell our specialty to you or trying to "convert" you from your chosen direction toward ours. What we have to offer is a unique environment and an opportunity to practice fundamental skills to which you have had limited exposure thus far in medical school. The most important of these is acute care decisionmaking. That is a unique moment, usually unanticipated, when a patient forces you to make a series of decisions surrounded by uncertainty but of great importance nonetheless. Time is not your friend, and you quickly find there is nothing "cookbook" about having a well-organized and thoughtful plan of approach in such a circumstance. You will not only exercise new regions of the brain, you will also get to use your hands when working with us. Technical skills and accompanying virtuosity are critical elements in the day-in, day-out practice of emergency medicine. Many of these skills—vascular access, airway management, lumbar puncture and suturing—are all a part of a reasonable skill set for a senior medical student. Commitment to learning these skills can be highly variable in medical school, and opportunities to practice them may be limited. However, in the emergency department, you should have the opportunity to put them to use every day, just as we do.

Lastly, think of working in an environment where more than 115 million undifferentiated patients come to see you or your equivalent over the course of each year. Patients' illnesses and injuries are not always

what they seem to be, and you will learn to respect that statement like never before. The approach to unraveling a voiced complaint on the part of a patient while thinking about all of the worst possibilities of potential origin is a very different way of thinking than most of your experiences to date. We believe that you will find this experience will serve you well, both with us and beyond.

Our specialty interacts with every other specialty, often at the raw interface of the unplanned admission on a 24-hour, 7-day clock. We know that most of you completing this clerkship will not choose emergency medicine, although more and more students do each year. We are excited for your future careers in primary care, surgery, pediatrics, medicine subspecialties, and others, but we know that we will see you again in one guise or another. Therefore, it is important to us that you are well treated, remember what goes on here, and leave with some degree of understanding and a modicum of respect and appreciation. Therefore, you should expect to be treated well but with discipline and high expectations.

One clear gesture in our effort to make your experience with us most rewarding is this *Primer*. Read it completely early in your experience with us, reread it as you see a wide variety of patients, and use it to help order and integrate the other teachings we will send your way. We are proud of what we do and the safety net role we play in our nation's health care system. We welcome you while you are with us and look forward to a long-term relationship, day and night, no matter what specialty you may choose. Take care of yourselves and the people around you.

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# *Contents*

CHAPTER 1

# *Introduction to the Specialty of Emergency Medicine*

For centuries, physicians have been called on to provide emergency care for patients. However, in the house of medicine, the formal specialty of emergency medicine is still relatively young—measured in decades. Emergency medicine developed differently from perhaps many of the other more traditional medical and surgical specialties. In the case of emergency medicine, public demand more than scientific inquiry fueled the formation and growth of the specialty. In the 1950s and 1960s, with more physicians seeking specialty training, the number of general practitioners began to decline. At that time, hospitals were becoming more modernized and technologically advanced. Ultimately, these factors, along with the changing demographic and social conditions of the post–World War II era, led to an increased public reliance on hospital emergency departments for the provision of unanticipated medical care. Unfortunately, a uniform system for providing high-quality emergency care did not exist. At that time, junior medical and surgical house officers staffed many hospital emergency departments with little or no attending supervision. Most of these physicians did not have the necessary clinical skills to properly care for the increasing complexity of cases seeking medical attention. It was also becoming evident that the physician staffing patterns were inadequate to keep up with the ever-increasing patient volume.

*Change began in the early 1960s when a group of physicians left their respective practices and devoted their full-time practice to the care of emergency department patients.*

Change began in the early 1960s when a group of physicians left their respective practices and devoted their full-time practice to the care of emergency department patients. In 1961, four physicians, led by James Mills, MD, started the first full-time emergency medicine practice at Alexandria Hospital in Virginia. That same year, a group of 23 community physicians began providing around-the-clock emergency department coverage at Pontiac General Hospital in Michigan. By the late 1960s, hundreds of "emergency physicians" were in practice throughout the country. In 1968, John Wiegenstein, MD, and seven other full-time emergency physicians founded the American College of Emergency Physicians (ACEP), our specialty's first professional medical society. Later that same year, during the first national meeting, ACEP was recognized as the national emergency medicine organization. The American Academy of Emergency Medicine (AAEM), a new professional society, was founded in 1993 to promote fair and equitable practice environments for emergency physicians.

The first emergency medicine residency-training program was established at the University of Cincinnati in 1970. That same year, the University

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Association of Emergency Medical Service (UA/EMS) was founded by medical school faculty practicing emergency medicine, followed by the formation of the Society of Teachers in Emergency Medicine (STEM) in 1975. These two organizations merged in 1989 to form the Society for Academic Emergency Medicine (SAEM), our specialty's current premier academic organization promoting research and education. In 1974, the Emergency Medicine Residents Association (EMRA) was formed. By 1981, there were 56 emergency medicine residency-training programs across the country. As of 2008, there are 143 accredited allopathic and 37 accredited osteopathic emergency medicine residency training programs in the United States. Formed in 1989, the Council of Emergency Medicine Residency Directors (CORD) is an educational and scientific organization whose purpose is to improve the quality of emergency medical care and to establish and maintain high standards of excellence in emergency medicine training programs.

One of the first steps toward formal recognition of our specialty occurred in 1973 when emergency medicine was granted a provisional section council seat in the American Medical Association House of Delegates; permanent status was granted in 1975. In 1976, the American Board of Emergency Medicine (ABEM) was formed. Thereafter, ACEP and ABEM embarked on the process of establishing primary board certification status for the specialty of emergency medicine. In 1979, the American Board of Medical Specialties (ABMS) formally recognized ABEM. Ten years later, in 1989, ABMS granted ABEM primary board status, thus formally recognizing emergency medicine as the 23rd primary medical specialty.

The emergence of osteopathic physicians in the field of emergency medicine occurred in 1975 when the American College of Osteopathic Emergency Physicians became an affiliate college of the American Osteopathic Association (AOA). By 1978, the American Osteopathic Board of Emergency Medicine (AOBEM) was established as an affiliate specialty board of the AOA. The following year, the first osteopathic emergency medicine residency-training program was established at the Philadelphia College of Osteopathic Medicine.

Over the last 30 years, the growth of emergency medicine has continued at an extraordinary pace. The future of our specialty is especially bright as we continue to attract high-quality medical students interested in pursuing a career in emergency medicine. Our specialty represents one of the few medical specialties that has shown a consistent and steady increase in the number of residency positions offered in the national residency matching program, representing 6.3% of all PGY-1 positions offered in the 2008 match (National Resident Matching Program, 2008). Emergency medicine is now the fourth most common specialty that US graduating medical students choose to enter, behind internal medicine, family medicine, and pediatrics (Newton et al., 2003). Collectively, across the country, emergency medicine residency-training programs graduate approximately 1,500 emergency physicians each year.

In 2008, the SAEM's Board of Directors approved the formation of the Academy of Clerkship Directors in Emergency Medicine (CDEM). CDEM consists of medical student educators who are committed to enhancing undergraduate medical education within our specialty.

## Suggested Reading

Newton DA, Grayson MS. Trends in career choices by US medical school graduates. *JAMA*. 2003;290:1179–1182.

*This article describes trends in career choices for US medical school graduates from 1987–2002.*

National Resident Matching Program. *Results and Data. Table 7, All Applicants Matched to PGY-1 Positions by Specialty, 1999–2007*. Available at: www.nrmp.org/data/resultsanddata2007.pdf. Accessed March 25, 2008.

*This document reports the results from the 2007 National Residency Match.*

National Resident Matching Program. *Advance Data Tables: 2008 Main Residency Match*. Available at: www.nrmp.org/data/advancedatatables 2008.pdf. Accessed May 16, 2008.

*This document reports the results from the 2008 National Residency Match.*

Zink BJ. *Anyone, Anything, Anytime: A History of Emergency Medicine*. Philadelphia, Pa: Mosby; 2006.

*This book reviews the history of emergency medicine, chronologically covering issues such as the earliest concepts of emergency care, the development of national professional organizations, the establishment of the board examination, the accreditation of emergency medicine residency-training programs, and the subsequent expansion of the specialty.*

CHAPTER 2

# *Introduction to the Emergency Medicine Clerkship*

*Every shift is different and can bring with it a wealth of educational and patient care-related opportunities.*

Welcome to your emergency medicine clerkship. Traditionally, the majority of medical schools offer clinical emergency medicine rotations for senior medical students who have completed their core third-year rotations. Although some schools provide an elective or selective opportunity, others, approximately one third, provide a mandatory clinical experience for medical students. As an acute care rotation, the emergency medicine clerkship will provide you with the opportunity to draw from all of your past clinical experiences when caring for patients.

Rotating through a busy emergency department can be a daunting task for any medical student. New residents, faculty, ancillary staff, or even perhaps a new hospital can all add to the unease associated with starting a clinical rotation. The emergency department is at times chaotic, with numerous unexpected emergent patient presentations and distractions. Our specialty operates in an environment that is different from both the ambulatory care and inpatient settings; our doors never close. The patient volume, high acuity, and varied pathology all add to the challenge of practicing emergency medicine. In addition, the shift work scheduling of students, residents, and faculty can lend itself to educational challenges. On the one hand, you may have limited continuity with your preceptor; on the other hand, your clinical schedule usually affords you the opportunity to work with many different residents and attending physicians. Every shift is different and can bring with it a wealth of educational and patient care–related opportunities. Because of the hectic and sometimes frenzied pace of the emergency department, it is important to understand your role while caring for patients. Many clinical rotations allow a senior medical student to function in a role similar to that of a junior house officer with some additional guidance and supervision. In the emergency department, you will have the opportunity and responsibility to provide patient care in a structured environment under the direct supervision of a senior emergency medicine resident or attending physician.

*Every patient that you encounter should be treated as you would want a family member treated.*

As in other clinical rotations, it is imperative to understand your limitations. First and foremost, remember that your attending physician is ultimately in charge of and responsible for the care the patient receives. That being said, it is still likely that as a “student doctor,” you may examine a patient before the senior emergency medicine resident or attending physician does. This level of autonomy also brings with it inherent responsibility. If during any of your patient encounters, you feel that your patient is “sick or potentially sick” (e.g., abnormal vital signs, shortness of breath,

chest pain, abdominal pain with peritoneal findings, change in mental status), alert your supervisor immediately. In addition, certain aspects of the physical examination are usually performed in the presence of residents or faculty. Find out whether your clerkship director has a policy or guideline regarding the participation of medical students in performing pelvic, rectal, breast, and genitourinary examinations.

*If during any of your patient encounters you feel that your patient is "sick or potentially sick," alert your supervisor immediately.*

Throughout your medical school training, you have performed countless histories and physical examinations (H&PEs). Typically, it may take 45 to 60 minutes to perform a comprehensive H&PE. Because the nature of emergency medicine is a complaint driven rather than disease-based specialty, most patients can be evaluated in a focused fashion. Focusing your evaluation to the presenting chief complaint is one of the cornerstones of emergency medicine practice. That being said, this task is not as easy as it appears because of the ingrained nature of the comprehensive approach to the H&PE. Realize that by focusing your patient evaluation and by being thorough, you may actually increase your efficiency when caring for patients. Undoubtedly, your emergency medicine clerkship should provide you with countless opportunities to further your evaluation and management skills, regardless of your intended career path.

Another particularly important aspect of your emergency medicine clerkship is the sign in–sign out transition of care. This is the time when one shift ends and the next begins. The attending physician completing his or her shift signs out any outstanding patient-related issues to the incoming attending: pending test results, patients that need to be reevaluated, dispositions that need to be made, and the like. As a student rotating through the emergency department, the shift change can be a complex and confusing time. Most physicians are trying to tie up a number of loose ends during the last 15 or so minutes of their shifts. Therefore, it is a good idea to try to complete all patient-related tasks promptly when you are nearing the end of your shift, especially if your shift coincides with that of the attending. Your clerkship director may have a policy regarding your sign in–sign out responsibilities. If not, we offer the following general guidelines to ensure a smooth transfer of patient care at the sign in–sign out transition:

- Try to complete all patient-related duties before the completion of your shift.
- Always inform the attending physician before you leave the emergency department at the conclusion of your shift. This will help to ensure that all patient-related matters have been addressed.

### Tips for a Successful Rotation

- Use your resources; if you have any questions, ask the nurses, the senior emergency medicine resident, or the attending physician.
- Be on time for your clinical shifts.
- Ask for help early on if needed.
- Always be professional in your interactions with patients and staff.
- Always be a patient advocate and offer compassionate care.
- Read about interesting cases.
- Contact the site director or clerkship director if you anticipate any scheduling conflicts or if you have any questions.

- At the end of your shift, do not sign out to an incoming student unless specifically instructed to do so by the senior emergency medicine resident or attending physician.
- When you start a clinical shift, evaluate the next new patient to be seen.

While rotating through the emergency department, you may see attitudes and behaviors that may be foreign to your own personal value system. You should deal with these as a professional. Every patient that you encounter should be treated as you would want a family member treated. You should also treat all staff members (e.g., physicians, nurses, patient care assistants) with respect, and likewise, you should expect the same in return. While rotating through the emergency department, consider the tips for a successful rotation shown on the previous page.

Keep in mind the added level of responsibility expected of you throughout this rotation. Communicate effectively with both your patients and the staff members involved with their care. Pay close attention to the needs of your patients because you may be in a position to greatly affect their care and the perception of the care provided in the emergency department. Follow your patients closely. Are they comfortable? Are their needs being met? What can you do to further assist with their care? Remember, you are an important part of the health care team.

Lastly, if you are contemplating a career in emergency medicine, this rotation is a great opportunity to see if our specialty is a good fit for you. Talk to the faculty and residents and seek out the clerkship director and the residency director. Alternatively, if you are interested in any of the other medical or surgical specialties, an emergency medicine rotation is a great opportunity to expose you to a wide variety of patients and an opportunity to perform basic procedures under direct supervision. Most of all, enjoy the experience.

## Suggested Reading

*Additional information regarding emergency medicine can be found on the Web sites of national organizations. The following references are a place to start.*

American Academy of Emergency Medicine. Available at: http://aaem.org/index.php. Retrieved January 23, 2008.

Clerkship Directors in Emergency Medicine, an Academy of the Society for Academic Emergency Medicine. Available at: www.saem.org/CDEM. Retrieved March 3, 2008.

Emergency Medicine Residents Association. Available at: www.emra.org. Retrieved January 23, 2008.

CHAPTER 3

# *Emergency Medicine Clerkship Goals and Objectives*

*Your emergency medicine clerkship goals and objectives will provide you with a framework for the clinical and nonclinical expectations that have been set for you by the clerkship director.*

Your learning objectives, sometimes referred to as competencies, provide you with an educational template necessary to achieve the goals of your rotation. Clerkship goals and objectives are often developed on the basis of a combination of perceived educational need, faculty or institutional resources, and proposed national curricular guidelines. The clerkship objectives should be available to all residents and faculty members directly involved in medical student education. In its accreditation standards, the Liaison Committee on Medical Education (LCME) further describes the educational program for the MD degree and the rationale for the development of educational objectives (LCME, 2007). LCME is recognized by the US Department of Health as the accrediting authority for medical education programs that lead to the MD degree in the United States.

Your emergency medicine clerkship goals and objectives will provide you with a framework for the clinical and nonclinical expectations that have been set for you by the clerkship director. In general, the majority of your rotation objectives will be met through direct patient care. Understanding the goals and objectives of your emergency medicine rotation will allow you to better understand the expectations that your clerkship director has set for you. Taken one step further, the achievement of your rotation goals and objectives will serve as the basis for your summative evaluation at the conclusion of your rotation and assist the clerkship director in determining your final clerkship grade. Reviewing your rotation goals and objectives should not be viewed as a mere formality.

In 2006, the Fourth Year Medical Student National Curriculum Guide was published in the *Annals of Emergency Medicine* (Manthey et al., 2006). This comprehensive curricular guide was developed by a task force representing the six national emergency medicine organizations. The curricular guide outlines the objectives and core educational topics that are central to our specialty. The rotation objectives are presented in a competency-based format modeled after the six core competencies developed by the Accreditation Council for Graduate Medical Education (ACGME), the organization that oversees and regulates graduate medical education training programs in the United States:

- Patient care
- Medical knowledge

- Practice-based learning and improvement
- Systems-based practice
- Professionalism
- Interpersonal and communication skills

Although some objectives could logically fall under multiple competencies, for the purpose of organization and clarity, each is placed in only one category. An introduction to the core competencies is discussed in detail in the introduction to the core competencies section of the *Primer*. Although the national task force recommendations are not requirements, it is likely that the objectives of your clerkship will reflect some of these recommendations. Remember, your clerkship goals and objectives are by nature designed to ensure that all students, regardless of intended career path, have a broad exposure to emergency medicine. Common clerkship goals and objectives include a list of core clinical skills that a student will be expected to complete or in which a student will be able to demonstrate some measure of proficiency by the conclusion of the rotation. These can include, but are not limited to, the following:

- Performing a complaint-directed H&PE
- Developing a case-specific differential diagnosis
- Presenting cases in a clear and concise fashion
- Demonstrating an understanding of the use and interpretation of commonly ordered diagnostic studies
- Developing and assisting with implementation of appropriate case management plans
- Demonstrating an adequate fund of knowledge
- Demonstrating proficiency with basic procedural skills

*Regardless of your intended career path, an emergency medicine rotation can expose you to interesting and diverse pathology.*

Because of the unique nature of emergency medicine, additional specialty-specific objectives may include evaluating the undifferentiated patient, recognizing an immediate life-threatening illness, being aware of worst-case diagnoses, and undertaking proper patient disposition and outpatient follow-up plans. Furthermore, specific objectives may list expectations regarding student–patient encounters, such as evaluating patients with classic chief complaints (i.e., abdominal pain, headache, chest pain, shortness of breath, and back pain) or performing a specific number of selected procedures [e.g., arterial blood gas (ABG) sampling, insertion of intravenous (IV) catheters, laceration repair, phlebotomy]. It is useful for the student to periodically review the clerkship objectives during the course of the rotation and reflect on his or her areas of achievement as well as on any area requiring further attention. As a medical student, you should also consider your own personal goals and objectives. Individual goals should be straightforward and may be as simple as improving electrocardiogram (ECG) interpretation skills, developing proficiency in phlebotomy, learning how to clinically clear the cervical spine of a patient with neck pain, and the like. Regardless of your intended career path, an emergency medicine rotation can expose you to interesting and diverse pathology.

In summary, review your emergency medicine clerkship goals and objectives at the beginning of the rotation. Discuss your personal goals with your supervising physicians so that they may assist you in achieving them. Understanding what is expected of you is the first step in making your clinical experience the best that it can be.

## Suggested Reading

Liaison Committee on Medical Education. *Functions and Structure of a Medical School: Standards for Accreditation of Medical Education Programs Leading to an MD Degree*. Washington, DC: Association of American Medical Colleges; 2004 with updates as of February 2007. Available at: www.lcme.org/functions2007jun.pdf. Accessed April 9, 2008.

*This document outlines the accreditation standards for medical school training in the United States.*

Manthey DE, Coates WC, Ander DS, et al. Task Force on National Fourth Year Medical Student Emergency Medicine Curriculum Guide. Report of the Task Force on National Fourth Year Medical Student Emergency Medicine Curriculum Guide. *Ann Emerg Med*. 2006;47:E1–E7.

*This document provides recommendations for design and implementation of a national fourth-year undergraduate emergency medicine curriculum.*

CHAPTER 4

# *Unique Educational Aspects of Emergency Medicine*

*The emergency department provides health care for patients presenting at any time for any reason. . . . Our specialty truly provides a safety net to the millions of under- or uninsured people in this country.*

Regardless of your intended career path, the pathology and variety of illness encountered throughout your emergency medicine rotation will provide you with a great opportunity to learn. The importance of emergency medicine education at the undergraduate level is acknowledged by its inclusion in the LCME Educational Objectives (revised, June 2007), which state "educational opportunities must be available in multidisciplinary content areas such as emergency medicine."

Emergency medicine offers a truly unique educational experience for medical students for several reasons. First, there is an endless stream of patients. In recent years, more than 115 million visits were made annually to emergency departments across the country; half of these visits were categorized as urgent or emergent in acuity. These figures continue to rise, with annual emergency department visits increasing by 26% in the past decade **(**Institute of Medicine, 2006). Second, the emergency department provides health care for patients presenting at any time for any reason. Patient presentations range from the unexpected, life-threatening emergency to the more routine primary care problems encountered by patients with limited access to the health care system. Third, learners are exposed to patients with an undifferentiated complaint instead of a preliminary or confirmed diagnosis. More than 25% of all emergency department patient encounters present with seven common chief complaints (Nawar et al., 2007):

- Abdominal pain
- Chest pain
- Fever
- Back pain
- Headache
- Shortness of breath
- Vomiting

Finally, because the doors of the emergency department never close, unscheduled health care is provided to all regardless of age, ethnicity, economic status, or the ability to speak English. Our specialty truly provides a safety net to the millions of under- or uninsured people in this country.

Because of the unique population, pathology, and patient presentations, you are likely to encounter clinical scenarios with which you would otherwise have little or no direct contact with in other health care settings. You should view all of your patient encounters as educational opportunities. Where else could you encounter the acutely poisoned patient; interact with prehospital care providers; manage acute trauma; encounter environmental emergencies such as hypothermia, frostbite, or burns; treat an acute stroke or myocardial infarction; provide obstetrical care; all in the same shift? Your emergency medicine clerkship will help reinforce your medical interviewing and physical examination skills. Taken one step further, you will have an opportunity to focus and hone your ability to develop a case-specific differential diagnosis and implement patient management plans. Each of these and many other topics will be discussed in more detail in other sections of the *Primer*.

The emergency department can also provide you with procedural opportunities that are likely unparalleled in other clinical rotations. In a typical rotation, you may have an opportunity to perform phlebotomy, insert peripheral IV catheters or nasogastric tubes (NGTs), perform a lumbar puncture or arthrocentesis, and repair simple lacerations. From an educational standpoint, the ability to perform a particular procedure or exercise a clinical skill is but one facet of your development as a young physician. With repetition, proficiency in procedural skills often develops over time. However, it is often of equal if not greater importance, especially early in your training, to attain the understanding of *why* and *when*, not just *how*. This understanding should be a part of your emergency department clerkship.

Another key aspect of your education is to further enhance your ability to understand how certain diagnostic studies are used in the emergency department. By the completion of this rotation, you should have the opportunity to interpret dozens of radiographs [chest and abdominal plain films, computed tomography (CT) scans and ultrasounds], commonly ordered laboratory studies (basic metabolic profiles, complete blood counts, hepatic functions, ABGs, and cardiac enzymes), and 12-lead ECGs.

In addition, you will work with a number of medical professionals who can help you further develop certain intangible clinical skills, such as multitasking, time management, conflict resolution, and role modeling of professional behavior. These skills are best learned on the job by working with seasoned clinicians. This is also true for developing your case presentation skills and learning how to best interact with your consultants and other members of the health care team.

No matter how well your emergency medicine rotation is organized, much of what you get out of it is going to be based on what you put into it. Set individual goals based on your career interests. Supplement your clinical experience by reading about common chief complaints or certain illnesses that you encounter. Our goal is to help you along the path to becoming the best physician you are capable of being. The emergency department affords you with a wealth of clinical and educational opportunities.

## Suggested Reading

Institute of Medicine. *The Future of Emergency Care: Key Findings and Recommendations from the Institute of Medicine*. Washington, DC: National Academies; 2006. Available at: www.iom.edu/CMS/3809/16107/35007/35040.aspx. Accessed March 6, 2008.

*This fact sheet reports key findings and recommendations from the series of reports on the future of emergency care in the United States.*

Liaison Committee on Medical Education. *Functions and Structure of a Medical School: Standards for Accreditation of Medical Education Programs Leading to an MD Degree*. Washington, DC: Association of American Medical Colleges; 2004 with updates as of February 2007. Available at: www.lcme.org/functions2007jun.pdf. Accessed April 9, 2008.

*This document outlines the accreditation standards for medical school training in the United States.*

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*This article reviews nationally representative data on emergency department care in the United States. Data are from the 2005 National Hospital Ambulatory Medical Care Survey (NHAMCS).*

Russi CS, Hamilton GC. A case for emergency medicine in the undergraduate medical school curriculum. *Acad Emerg Med*. 2005;12:994–998.

*This commentary reviews the benefit of undergraduate emergency medicine training, why emergency medicine is not fully integrated into the medical school curriculum, and how emergency medicine can best contribute to undergraduate medical education.*

CHAPTER 5

# *Differences Between the Emergency Department, the Office, and the Inpatient Setting*

Throughout medical school, you will encounter patients in many clinical arenas: the inpatient wards, the public health clinic, the private office, the hospital outpatient clinic, and of course the emergency department. Although medicine at its core involves taking care of patients, the approach and sequence of steps involved in caring for patients will be different depending on the health care setting in which they are encountered. When evaluating a patient, the health care provider (nurse, medical student, resident, or attending) needs to develop an approach tailored to the specific health care setting and available resources.

*Although some patients will present to the emergency department with complaints that could otherwise be cared for in an ambulatory care setting, many unexpected emergencies such as trauma, myocardial infarction, stroke, pneumonia, anaphylaxis, and others come through the doors at all hours of the day and night.*

Think of the ambulatory care and hospital outpatient clinic setting. In this clinical venue, unexpected emergencies occur; however, they are few and far between. The acuity level is low, with 1% of patient encounters requiring referral to the emergency department or for hospital admission (Middleton et al., 2007, Cherry et al., 2007). Some patients will require diagnostic studies (laboratory tests or diagnostic imaging). Fortunately in this setting, the majority of these are routine, and most are obtained electively. Many patients requiring diagnostic studies will need to be referred to an off-site laboratory, diagnostic imaging center, or hospital to undergo testing. Therefore, the results of many of these diagnostic studies are not available to the ordering physician for days. Although many private offices and outpatient clinics have a system in place allowing unscheduled walk-in visits, the overwhelming majority of patient visits are scheduled, and patients are cared for on a first-come-first-served basis. When patients are sick, or when the office is closed, patients are referred to the emergency department. In addition, the majority of pa-

### Case Study

*Consider the patient with an elevated blood pressure measurement who is referred to the emergency department for evaluation from a local health clinic. The patient is asymptomatic, without complaints of headache, chest pain, or shortness of breath. His repeat blood pressure measurement in the emergency department is 186/98 mmHg. In such a case, a targeted H&PE and selected diagnostic work up will be needed to exclude any acute complications of elevated blood pressure such as the involvement of key target organs (i.e., eyes, brain, heart, lungs, and kidneys). The goal is not necessarily to establish baseline laboratory values, to obtain diagnostic studies for future comparison or even to necessarily normalize the blood pressure at this time.*

*The emergency department has both an ethical and legal obligation to evaluate every patient who presents for care to determine whether he or she has a medical emergency, regardless of ability to pay for health care.*

tients seeking medical care in an ambulatory care or outpatient clinic setting are established patients compared with the emergency department, where the overwhelming number of physician–patient encounters are new visits.

Traditionally, approximately half of all outpatient encounters are made to primary care physicians, with many of these visits being for preventive care. The most common reasons for a patient to visit an outpatient clinic include progress visit, general medical examination, routine prenatal care, cough, and sore throat. Together, these types of patient visits account for 20% of all outpatient clinic visits (Middleton et al., 2007). By contrast, the emergency department provides care to the acutely ill or injured. In the emergency department, nursing triage guidelines are designed to ensure that more seriously ill patients are cared for first. The acuity level is also much greater than the ambulatory care or outpatient clinic setting. Across the country, approximately 12% of all emergency department patient encounters require hospital admission (Nawar et al., 2007), with 16% of patients admitted to a critical care bed. Anecdotally, high-acuity, high-volume emergency departments will admit 20% to 25% of cases to the hospital. Compared with the outpatient setting, a greater number of emergency department patient encounters require a diagnostic workup. This may include laboratory tests or advanced imaging techniques such as CT scans and magnetic resonance imaging (MRI). The majority of diagnostic tests performed in the emergency department by design provide results to the ordering physician within minutes to hours. Although some patients will present to the emergency department with complaints that could otherwise be cared for in an ambulatory care setting, many unexpected emergencies such as trauma, myocardial infarction, stroke, pneumonia, anaphylaxis, and others come through the doors at all hours of the day and night. Some of these cases require emergency subspecialty consultation, a service that is often difficult to provide in an ambulatory care setting.

In addition, the emergency department has both an ethical and legal obligation to evaluate every patient who presents for care to determine whether he or she has a medical emergency, regardless of ability to pay for health care (Emergency Medical Treatment and Active Labor Act or EMTALA). One third of the nation's emergency departments are considered high safety net sites. These institutions serve a disproportionately high number of Medicaid and uninsured patients, a dramatically different payer mix than that of the routine ambulatory care population.

In the inpatient setting, patient encounters often occur after a preliminary or definitive diagnosis has been made by another health care provider, many times by the emergency physician. Across the country, emergency departments are responsible for approximately 55% of all hospital admissions (Owens et al., 2006). Physicians caring for inpatients face legitimate challenges, some diagnostic, others therapeutic or social, such as short- or long-term placement issues. We all know that medical emergencies occur in the inpatient population; luckily they are not as common as in the emergency department. When they do occur, the health care team often has the benefit of prior rapport with the patient and family, along with some understanding of the patient's medical condition before the event at hand. This is in stark contrast to unexpected emergencies that present to the emergency department requiring prompt resuscitation and stabilization without the benefit of an adequate history of present illness (HPI) or knowledge of the patient's medical history, prenatal care, medications, and the like.

The emergency department also differs dramatically from both the inpatient and ambulatory care setting in a few other areas. First and fore-

most, the emergency department never closes, and the volume of patients cared for is not limited by the number of patient care spaces. Although it is foreseeable that patients with nonurgent complaints will need to wait until an appropriate patient care area is available before they will be evaluated, the sick or unexpected emergencies are at times cared for in less-than-optimal patient care areas, such as a hallway. In the emergency department, the spectrum of patients ranges from the young to the very old, representing disease states of the newborn to the various complications seen in the elderly nursing home resident. The clinical scenarios encountered are also unique to this setting and can range from routine medical and surgical pathology to environmental emergencies, toxic exposures, substance abuse, trauma, psychiatric emergencies, and more.

It is also necessary to realize that patient-specific goals are different in the emergency department from other health care settings. This can directly translate into a better understanding of the specialty-specific approach to a particular clinical scenario or chief complaint. Understanding how emergency physicians approach particular clinical problems will allow students to better place the educational and patient care objectives of their rotation in perspective. See the case study shown in this chapter an example.

Focusing on the problem at hand is key to managing most cases in the emergency department. Whether we are talking about a complaint-directed H&PE, case presentation skills, or a case-specific differential diagnosis, the art of focusing—that is, being able to see the forest through the trees, identifying and relaying pertinent positive or negative case specific information—is crucial to understanding the role of the emergency physician and providing excellent patient care. Remember, the focus of the emergency department is different from other health care settings. Therefore, your approach to certain chief complaints or patient presentations may need to be modified to keep in line with providing optimal and efficient care in the emergency department.

One final point that deserves mentioning is that the patient presenting to the emergency department must be considered at higher risk for po-

## Comparison of the Three Patient Care Settings

| Emergency Department | Inpatient Setting | Office/Outpatient Setting |
|---|---|---|
| Low–moderate–high acuity | Low–moderate acuity | Low acuity |
| 12% of patients require hospital admission | N/A | 1% of patients require hospital admission |
| Undifferentiated patients with complaint-based presentations | Admitted patients have a preliminary diagnosis | Routine medical and follow-up care account for a majority of patient visits |
| No prior rapport with patient and family | After initial evaluation, will develop rapport with patient and family | Usually have established rapport with patient and family |
| Most diagnostic studies ordered are urgent or emergent | Diagnostic studies ordered can be nonurgent, urgent, or emergent | Most diagnostic studies ordered are nonurgent |
| Results of diagnostic studies available within minutes to hours | Results of diagnostic studies available within hours to days | Results of diagnostic studies available within days |
| No scheduled visits; patients are evaluated in order of acuity | Most admissions are unscheduled | Scheduled visits on a first-come-first-served basis, occasional unscheduled visits |

tential serious illness than a similar patient presenting to an office or other outpatient clinic setting. Many patients presenting to the emergency department have acute symptoms. These complaints may reflect more serious underlying pathology when compared with the patient who is willing or able to wait several days for an outpatient appointment. In addition, patients choosing to come to an emergency department for an evaluation rather than going to an outpatient office should alert the caregiver that the patient may believe he or she is too sick to wait for a scheduled appointment; at times, they are right.

Thus, patient care in the emergency department is quite different from other health care settings. It is important to be aware of these differences so that, as a medical student, you understand that the clinical and bedside skills needed to succeed in the emergency department are different from skills needed to succeed in other settings. Understanding and embracing these differences will allow for a more educational and enjoyable experience.

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CHAPTER 6

# *Undifferentiated and Differentiated Patients*

The clinical environment of the emergency department is both challenging and exciting. Open 24 hours a day, 7 days a week, the emergency department can serve as both the point of first contact and the bastion of last resort for an incredibly diverse group of patients with differing and unexpected medical needs. Unique among medical specialties, the mission and charge of the emergency physician is to care for all patients regardless of financial resources, severity of illness, or even the nature of the complaint. Whereas other specialists focus on a particular body system or category of illness, the emergency physician must be prepared to treat patients across the spectrum of disease and age. Each patient represents a mystery, an unknown quantity for the clinician. It is the unwavering fact that anyone can come through the doors at any time, which presents us with one of our greatest clinical challenges: the undifferentiated patient.

*Unique among medical specialties, the mission and charge of the emergency physician is to care for all patients regardless of financial resources, severity of illness, or even the nature of the complaint.*

## Approach to the Undifferentiated Patient

When you first encounter a patient in the emergency department, you must make an instantaneous assessment of both the severity of the threat to the patient's life and limb and the need for immediate intervention. This determination is often made within a few moments of your patient encounter; that is, is the patient sick or not sick? Sometimes this decision may be easy, such as the patient with a gun shot wound to the chest or a patient presenting in severe respiratory distress. Many times, however, the distinction between "sick and not sick" may be much more subtle. Consider the following cases: an 80 year-old nursing home resident with a fever; a 40 year-old patient with a history of asthma presenting slightly diaphoretic, breathing 35 times per minute; a patient presenting postictal after a new onset seizure. All of these patients may be critically ill and require immediate intervention, and the skilled medical student, resident, or attending must be able to recognize this. As a student, your primary role if you identify a "sick or potentially sick" patient is to immediately notify your supervising physician—you will see this as a recurring theme. In a patient with abnormal vital signs who appears stable, it may be appropriate to repeat the vital signs yourself and then notify your supervisor promptly if they remain abnormal.

In determining the severity of a patient's illness and the need for immediate intervention, the emergency physician relies on a combination of clinical experience and instinct, integrating all of the available informa-

### Be a Medical Pessimist

Don't make assumptions until you have ruled out all high morbidity and mortality conditions. The classic example is the pregnant young woman who presents with abdominal pain. On the top of your differential list should always be ectopic pregnancy.

tion into his or her decisionmaking process. Findings that may indicate severe illness include abnormal vital signs and an alteration in mental status (depressed level of consciousness or agitation). The astute clinician should recognize these findings as indicative of a potentially life-threatening condition and should act on them promptly. Perhaps the most important measure of the severity of patient illness is physician "gestalt," that is, the gut instinct that something just is not right. This is one of the most important qualities a physician can develop.

Once a critical illness is identified, the physician must be prepared to act. In many cases, this means forgoing the natural progression from obtaining a medical history to performing a physical examination to formulating an assessment, and implementing a management plan. These cases often require the clinician to immediately focus the H&PE and jump right to case-specific management. Although the specific intervention will vary for individual patients, some general treatment principles should be followed. At times, you may hear your supervisor refer to the "emergency department safety net." This term refers to the initiation of cardiac monitoring, obtaining vascular access, and providing supplemental oxygen if needed.

## Assessing ABCDs of Resuscitation

As specialists in resuscitation, an emergency physician's first priority is assessing the airway (A), breathing (B), and circulation (C), followed by an evaluation of neurologic disability. Ignoring deficiencies in one of these areas will inevitably lead to worsening of the patient's clinical condition. Indications for emergency airway management may include hypoxia, hypercarbia, altered mental status, failure to tolerate oral secretions, and the anticipation of a worsening clinical condition. Remember, the ABCs are about much more than just intubation. In any ill patient, careful attention must be paid to oxygenation status, respiratory effort and pattern, and blood pressure and the presence of any neurologic deficit. In addition to evaluating disability, the "D" should always stand for measurement of serum glucose followed by administration of dextrose if a patient with an altered mental status is found to be hypoglycemic.

## Addressing Abnormal Vital Signs

At the very least, if a patient has abnormal vital signs, vitals should be repeated and monitored closely. As a general rule, certain conditions (i.e., hypotension, severe hypertension with target organ damage, hyperthermia, hypothermia, bradycardia, tachycardia, tachypnea, and bradypnea) will require intervention and stabilizing measures initiated early in the course of their evaluation. These actions may include, but are not limited to, cardioversion of unstable tachyarrhythmias, supplemental oxygen, passive or active rewarming, or administration of intravenous fluids.

As a corollary, the effect of such interventions needs to be closely monitored. Remember, the underlying cause of all abnormal vital signs should be investigated. This axiom can not be overstated. Vital sign abnormalities are often the result, not necessarily the cause, of a systemic insult. The investigation into the etiology of the abnormal vital signs should be delayed until stabilizing measures are initiated.

### Findings of Potentially Serious Illness

- Heart rate > 120 *or* < 60 beats/minute
- Respiratory rate > 20 *or* < 10 breaths/minute
- Systolic blood pressure < 90 mmHg
- Temperature > 38 *or* < 35°C
- Hypoxia
- Altered mental status
- Hypoglycemia *or* hyperglycemia

## Treating Pain

An absolute tenet of emergency medicine practice is to treat the patients' pain. Pain-related complaints are far and away the most common reason for patients presenting to the emergency department, with abdominal pain and chest pain being the two most frequent chief complaints. To-

gether, these complaints represent more than 13 million emergency department visits annually across the country (Nawar, 2007). Not only is it morally imperative to provide analgesia, it is the right thing to do. Providing pain relief with an appropriate dose of an analgesic should not interfere with physical examination findings of peritonitis or accuracy of selected diagnostic imaging studies.

*In determining the severity of a patient's illness and the need for immediate intervention, the emergency physician relies on a combination of clinical experience and instinct, integrating all of the available information into his or her decisionmaking process.*

## Approaching the Stable Patient

Once the clinician is assured that the patient is stable, he or she should use a focused, systematic approach to evaluation and management. Paramount to this is obtaining an accurate history. It is important to allow the patient to provide the history in his or her own words. The use of open-ended questions allows patients to describe their condition and presenting complaints as they experience them. Examples of appropriate open-ended questions include the following: "What brings you to the hospital today?" or "How can I help you today?" Patients should be allowed sufficient time to describe their symptoms, while the clinician listens carefully for clues to the underlying diagnosis. After the patient has been given time to explain his or her complaints, the caregiver should ask appropriate follow-up questions to fill in any gaps. Although these questions are often open ended as well, a more directed inquiry may be necessary. The clinician should seek information that can help clarify the patient's diagnosis or point toward an appropriate workup. Be a medical pessimist Never assume that a patient's complaint represents a benign issue until all high morbidity and mortality conditions have been considered and sufficiently excluded.

## Be a Medical Pessimist

Don't make assumptions until you have ruled out all high morbidity and mortality conditions. The classic example is the pregnant young woman who presents with abdominal pain. On the top of your differential list should always be ectopic pregnancy.

Approach each patient, regardless of complaint, with a broad differential diagnosis, with the most serious conditions at the top of your list, that is, the "worst first" mentality. For example, always assume that chest pain could be caused by one of many potential life-threatening processes (e.g., acute coronary syndrome, pulmonary embolism, pericarditis, pneumothorax, pneumonia, aortic dissection, or esophageal rupture). Less serious diagnoses can be considered once these processes have been eliminated. This, of course, does not mean that every patient with chest pain requires cardiac enzymes, a CT scan, an ECG, and the like, but it is prudent to consider all high-risk diagnoses in each patient rather than rejecting them outright because of the patient's age or an atypical presentation. By taking an accurate history and performing a focused physical examination, many of these differentials can be effectively excluded without an extensive workup. The healthcare provider can use the initial H&PE to narrow the differential diagnosis, focusing in on likely causes to guide the evaluation.

## Keeping an Open Mind

It is important not to limit the differential diagnoses based solely on the patient's chief complaint and presenting symptoms. Although this information is vital, limiting your differential diagnosis can be dangerous. Consider the elderly diabetic patient who presents with nausea and vomiting. Focusing only on gastrointestinal causes may delay the diagnosis of other potentially serious conditions such as diabetic ketoacidosis or myocardial ischemia. It is imperative to listen to the patient, but it is just

as important at times to step back and think outside of the box. By keeping an open mind and not getting locked in, you will avoid the potential pitfall of honing in on a particular diagnosis before all of the information is available, also known as "premature closure." Just as it is dangerous to assume a patient has a benign condition, it is equally wrong to jump to a diagnosis too quickly. Do not be afraid to change your diagnostic considerations as additional information or test results become available. When test results, or responses to therapy, do not fit with the presumed diagnosis, reevaluate the patient.

### Following the Best Path

You can't always walk a straight line; sometimes patient care follows a roundabout path. When evaluating the undifferentiated patient, it is not always possible to progress gradually from H&PE to diagnostics to treatment. Often it is necessary to perform two or more of these tasks simultaneously. In the critically ill patient, the emergency physician will often be deciding which diagnostic tests are needed while simultaneously conversing with, examining, and treating the patient. In addition, the response to an intervention may help guide additional testing strategies. A patient presenting with an exacerbation of asthma that improves with bronchodilator therapy might not require a chest radiograph or ABG, whereas a nonresponder might.

## Differentiated Patients

Certain subsets of patients present a special challenge in the emergency department and deserve brief mention. Although a detailed discussion of these issues is beyond the scope of this manual, be aware of the inherent complexity in caring for these patients. Some groups of differentiated patients include the elderly, children, psychiatric patients, and the chronically ill. The differentiated patient can also present a diagnostic challenge for the emergency physician. An approach to these encounters should be performed in a logical and systematic fashion to avoid the pitfalls of a delay or misdiagnosis.

### Elderly Patients

*When working with the elderly, end-of-life issues may need to addressed with both the patient and the family, which can be a daunting task.*

Elderly patients can present some of the most difficult diagnostic challenges for the emergency physician. This group is at high risk for a number of reasons. Life-threatening cardiac, pulmonary, vascular, and neurologic conditions are far more common in this population, and the elderly are more likely than the general population to have significant underlying health problems. Geriatric patients are often taking multiple medications, which may contribute to their presentation or may interact with prescribed therapies. They also have decreased physiologic reserves, which affects their response to critical illness or injury. Problems with memory in some patients can also limit your ability to obtain a clear history, further complicating the clinical encounter. In addition, the presentation of certain medical conditions (e.g., myocardial infarction) may be atypical, with vague, nonspecific symptoms actually being the harbinger of serious underlying illness. In the elderly, a bacterial infection is not always associated with a fever or leukocytosis. This finding may inadvertently lessen the suspicion of an infectious etiology. Weakness and confusion are common presenting complaints that can represent a whole spectrum of disease, including infectious, cardiac, endocrine, and neurologic conditions. Finally, when working with the elderly, end-of-life issues may need to addressed with both the patient and the family, which can be a daunting task.

When evaluating a geriatric patient, it is prudent to be both vigilant and conservative at the same time. Consider a broad differential diagnosis, keeping in mind that typical diseases may present atypically. Use as many sources as possible to obtain a medical history, including family members, past medical records, the primary care physician, or nursing home records, when applicable. When the history or symptoms are vague, or the patient is unable to provide detailed information, clinicians should have a low threshold for obtaining diagnostic studies. The geriatric emergency department patient also presents a clinical challenge as this subset (65 years of age or older) of patients are sicker than the general population and represent the greatest percentage (41%) of hospital admissions of all age groups (Nawar, 2007). Finally, if an elderly patient is going to be discharged, it is important to ensure that he or she will have adequate social support and access to follow-up medical care.

## Pediatric Patients

As with the elderly, obtaining a history from a young child can be difficult. In preverbal children, the information must be obtained entirely from the parents or other caretakers. Even with older children, anxiety and misunderstanding can prevent the emergency physician from getting an accurate history. Remember, infants are at risk for serious bacterial infection, although the introduction of haemophilus and pneumococcal vaccines has significantly decreased this threat. In addition, be aware of the high prevalence of maltreatment and neglect in this population and consider abuse in all pediatric patient encounters.

*Emergency physicians need to remember that children are not just little adults.*

Whenever possible, children should be examined with their parents present to minimize anxiety, unless the health care provider suspects abuse. The exception is adolescents, who may feel more comfortable discussing personal issues without their parents present. These encounters, however, should be chaperoned by an additional health care provider, preferably of the same gender as the patient.

Emergency physicians need to remember that children are not just little adults. The spectrum of disease across the pediatric population is vastly different from that of the adult population. Seasonal variations of illness are more common, and clinical presentations of disease in infants and toddlers may be different as compared to adolescents and adults. The healthcare provider should be familiar with the different size and type of equipment required for pediatric resuscitation and medication doses as these also differ from adult patients.

## Patients With a History of Psychiatric Illness

Patients with a history of psychiatric illness is another challenging subset of patients encountered in the emergency department. It is important to exclude organic pathology before attributing a patient's presentation to a functional illness. Be a patient advocate, especially in these cases. In addition, many of these patients take medications that have a high likelihood of side effects and toxicity. Others are noncompliant, which can result in an exacerbation of their underlying mental health condition. Deciphering between functional and organic etiologies of patient presentations is challenging and not always straightforward.

## Patients With Chronic Health Conditions

It is becoming more and more commonplace to encounter emergency department patients who have chronic health conditions such as ischemic heart disease, hypertension, diabetes, congestive heart failure, asthma,

chronic obstructive pulmonary disease, depression, and end stage renal disease. These patients suffer from the same maladies as the general population but may at times be at higher risk for complications because of their chronic health condition or prescribed medical therapy. Approach even the stable appearing patient with a complex medical history with a degree of skepticism.

When caring for a patient with a complex medical history, be careful not to glance over details that might prove to be important. Consider the following:

- As in all cases, initiate stabilizing care immediately if necessary.
- In a stable patient, procede in a logical systematic fashion performing a focused yet thorough H&PE.
- Spend time reviewing the past medical or surgical history to better familiarize yourself with the extent of the patients chronic health condition.
- Review pertinent medical records and contact the patient's primary care physician when indicated.
- Consider whether the presenting complaint is related to or complicated by the underlying chronic health condition.
- If the patient is presenting with an exacerbation of a chronic illness (e.g., asthma, congestive heart failure), try to place the severity of the current presentation in context with prior exacerbations.
- Consider using risk reduction strategies such as medication reconciliation to prevent prescribing errors or adverse medication effects that can occur with patients on multiple medications.

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CHAPTER 7

# *Performing a Complaint-Directed History and Physical Examination*

Performing a focused, complaint-directed H&PE is the cornerstone of diagnosis and treatment in the emergency department. In the majority of cases, a focused differential diagnosis and eventual disposition can be derived from the initial H&PE. Although a single piece of historical information or finding on physical examination may not rule in or rule out a particular diagnosis, taken in aggregate, the H&PE is a powerful diagnostic tool that drives further evaluation. The H&PE provides much of the information necessary to develop a patient-specific problem list, which allows you to formulate your differential diagnosis. Subsequently, as you master the art of focusing your H&PE, you will improve your diagnostic skills and care for patients with increased comfort and efficiency.

*Early on, the emergency department safety net (cardiac monitoring, IV access, and supplemental oxygen) should be incorporated into the management of all potentially sick patients.*

Each specialty has a slightly different approach to performing an H&PE. In the emergency department, our approach to the H&PE is partly time sensitive because of patient volume and acuity. In the emergency department, the depth of the H&PE will be based on the patient's complaint, sometimes brief and focused, other times more comprehensive. Remember, the time required to perform a comprehensive H&PE for a new patient visit in an office practice is vastly different than the time necessary to evaluate many patients that you will encounter in the emergency department. In emergency medicine, you must balance the time needed to perform a focused but inclusive H&PE with the time-sensitive nature of diagnosis, treatment, and disposition. A recommended rule of the thumb for students is to complete your initial evaluation within 10 to 15 minutes. However, regardless of the patient complaint, your evaluation should be thorough.

The primary goal of the complaint-directed H&PE is to diagnose or exclude potentially life- or limb-threatening disease or injury. More simply stated, the goal is to determine who is "sick" and who is "not sick," a familiar theme that you will hear more than once in this *Primer*. The other goal is to exclude any potential causes of serious morbidity and, if possible, to arrive at the correct diagnosis. The dynamic differential diagnosis developed from your H&PE is what drives many of the case-specific questions that you will ask the patient during the encounter. The more information you gather during the H&PE, the more your differential diagnosis narrows and the more detailed and specific your evaluation becomes. Although the H&PE are often performed simultaneously, in this section we will discuss them separately.

*Think of the medical history as a conversation with a purpose. It starts by identifying the chief complaint; that is, why did the patient come to the hospital?*

## Primary Survey

For the majority of patients you will encounter, it will be obvious that their airway is unobstructed, that they are breathing without distress, and that there is no sign of systemic hypoperfusion. However, some of the patients that you encounter may have acute life- or limb-threatening presentations that cannot afford even the minimal 10 to 15 minutes required for a focused H&PE. In these cases (e.g., trauma, hypotension, shortness of breath, chest pain, altered mental status), your approach to the H&PE will deviate from the traditional approach of interviewing the patient followed by a systematic but focused physical examination.

When a patient presents with a serious health condition, the initial goal of the primary survey is to identify any immediate life-threatening condition and intervene as warranted. This is accomplished by approaching the patient in a systematic fashion. A classic example of this strategy is taught in the advanced trauma life support course. When evaluating a victim of trauma (or a seriously ill medical patient), focus first on evaluating airway patency and assessing for signs of airway obstruction. The next step is to evaluate the patient to ensure adequate oxygenation and ventilation. This may require exposure of the neck and chest; inspection, palpation, auscultation of the chest; pulse oximetry; and perhaps even obtaining an ABG in selected cases. See the case study shown on this page for an example.

As a medical student, it is always important to realize that you will be working under the guidance of a senior emergency medicine resident or an attending physician. If at any time you encounter a critically ill patient, you should immediately notify your supervisor—another recurring theme. Remember, in the emergency department, the varied pathology and high acuity often causes the health care provider to deviate from the standard approach of obtaining a medical history followed by a physical examination. Early on, the emergency department safety net (cardiac monitoring, IV access, and supplemental oxygen) should be incorporated into the management of all potentially sick patients.

## The Medical History

The depth and detail of your medical interview will vary depending on the patient's chief complaint. Some patients will present to the emergency department with a very straightforward complaint or injury: sore throat, twisted ankle, cutaneous abscess, laceration, and the like. Other com-

### Case Study

*Consider a patient who presents after penetrating trauma to the right anterior chest. An emergency physician would identify that the patient has a patent airway, that he can phonate normally, but that he appears to be in significant respiratory distress. On further evaluation after full exposure, a 1-cm stab wound to the right anterior chest wall, fourth intercostal space, midclavicular line is noted. On palpation of the right chest, subcutaneous air is discovered, and, on auscultation, breath sounds are diminished. His blood pressure is 70/40 mm Hg; his skin is cool and clammy. Rapidly putting the case together, the patient has subcutaneous air, decreased breath sounds on the side of the injury, and hypotension. Because a rapid primary survey was performed in a systematic fashion, a life-threatening condition (suspected tension pneumothorax) was immediately identified. Emergently, this patient would undergo needle decompression of the pneumothorax followed by the placement of a chest tube.*

plaints such as weakness, dizziness, or abdominal pain in the elderly will require a much more extensive medical interview. Because of the complaint-oriented nature of our patient presentations, it is important for you to learn how and when to focus your medical interviewing skills. Remember, a focused history does not mean cursory.

Think of the medical history as a conversation with a purpose. It starts by identifying the chief complaint; that is, why did the patient come to the hospital? For most ambulatory emergency department patient encounters, this information can often be obtained from the nursing triage form. In the emergency department, a triage nurse interviews ambulatory patients before they see a physician. The purpose of this brief, limited evaluation is to determine the order in which patients need to be evaluated. The triage form will provide you with some basic information, but it should not be a substitute for obtaining or verifying information directly from the patient. Information commonly documented on a nursing triage form includes the patient's chief complaint, past medical history, medications, allergies, and vital signs. When interviewing a patient, a simple opening statement can often provide you with a wealth of information. For example; "Hello Mr. Smith, I am student doctor_____. How can I help you today?" or "What seems to be wrong today?" Open-ended questions will allow the patient to respond in his or her own words. It is important not to interrupt patients when they are responding to your opening statement. Demonstrating exemplary listening skills will help you develop rapport with your patient. The upfront information that you obtain from the patient will serve to direct you as you investigate the HPI.

For many chief complaints, certain basic information should be obtained: the onset of the problem, the location of the complaint, the duration of the problem, and the quality of the pain. At times it may be necessary to supplement this question with specific modifiers (e.g., sharp, dull, pressure).

Other key features that may be necessary to obtain include the presence of aggravating or alleviating factors, response to prior therapy or treatment, associated symptoms, and risk factors for certain medical conditions such as coronary artery disease or venous thromboembolism. A mnemonic to remember when trying to obtain cardinal characteristics of a patient's chief complaint is "OPQRST" (onset, provocative/palliative, quality, region, radiation, severity, timing, temporal relationships, and therapeutics). Obtaining an accurate history is the first of many crucial steps that will allow you to offer the best care to your patients. Remember, many times, a preliminary diagnosis will be made on the basis of the history alone. This will depend of course on your ability to elicit, synthesize, and interpret the relevant information.

Other important aspects of the medical history are a complaint-directed review of systems (ROS); past medical, surgical, and obstetrical history; social and family history; medications; and allergies. Early on, some medical students have difficulty focusing their ROS questioning. At the bedside, it is common to intertwine questions that pertain to both the HPI and the ROS. However, it is usually not necessary to perform a comprehensive ROS evaluation on patients in the emergency department. One recommended approach that can be used after completion of your focused H&PE is to ask the patient if there is anything else that they would like to talk about that was not already covered. For most patients, a thorough evaluation can be obtained by focusing on the presenting problem. However, never ignore a pertinent finding that is discovered even incidentally when interviewing or examining a patient.

### Basic Information to Gather

- **Onset:** Identify when the problem started, the surrounding circumstances, and the severity of the complaint when it began.
- **Location:** If it is a painful complaint such as chest pain or abdominal pain, ask the patient to point where it hurts and elicit whether the pain has moved to a different location since it started.
- **Duration:** Determine how long the patient has been having the complaint and whether it has been constant or intermittent. If the complaint is intermittent, it may be of importance to establish how long each episode lasts.
- **Quality:** How does the patient describe his or her complaint or pain?

*An appreciation of the general appearance of the patient is crucial. Simply stated, how does the patient look when you walk into the room?*

In certain clinical scenarios, it will be beneficial to obtain additional history (if possible) from witnesses, family, or prehospital personnel. For example, when evaluating a 45-year-old male restrained driver involved in a motor vehicle accident, fire department personnel can provide valuable information. Was the patient trapped in the car? Was the windshield cracked or the steering wheel deformed? Was there intrusion of the driver's side door into the vehicle? What was the condition of the patient at the scene? Was the patient able to self-extricate?

In the emergency department, a number of patient-related barriers can affect your ability to obtain an accurate or thorough history. These include encounters with young children, the actively psychotic, the debilitated or demented, patients presenting with an altered mental status, and patients with limited English proficiency. Remember that as a result of federal mandates, a hospital must offer and provide language assistance services to patients with limited English proficiency, including bilingual staff or interpreter services, at no cost to the patient, in a timely manner during all hours of operation. In general, to limit miscommunication or bias, family and friends should not be used to provide interpretation services, except at the request of the patient.

Keep in mind that when describing their presenting complaint, some patients will use certain terms that have a different meaning to them than to you. This may be encountered in the patient who complains of a migraine headache. Many patients presenting with the complaint of a headache have not had a formal evaluation but will use the term migraine headache. This is likely because of the common misuse of the term *migraine* by the lay public. Another example is the use of the term dizziness. This commonly used descriptive, when looked at more closely, may reflect any of the following meanings: lightheadedness, unsteadiness, or vertigo. Other patients may have cultural differences or language difficulties that can affect their ability to describe certain complaints or conditions. Remember, when patients describe their symptoms, they may use different language than you would use to describe the same symptoms. This can make it more difficult to determine what is wrong with the patient and may lead to frustration. If you are having difficulty understanding a patient describing his or her symptom complex, try to have him or her explain it in different terms or repeat it back to ensure that you both understand each other. Many times, it can be helpful to summarize and clarify the history with the patient. Please keep in mind the cultural differences that you may encounter in the emergency department and be sensitive to these issues if they arise.

## Physical Examination

The physical examination usually starts with an appreciation of the general appearance of the patient, followed by an immediate review of the vital signs (blood pressure, heart rate, respiratory rate, and temperature). With the advent of noninvasive bedside testing, many physicians consider pulse oximetry testing the fifth vital sign. Beware of the statements "vital signs are stable" or "vital signs are within normal limits." Remember, the normal range of vital signs varies with the age of the patient. It is much more important to appreciate the vital signs in context to the presenting complaint and bedside examination. A patient with a history of poorly controlled hypertension with a blood pressure of 102/58 mm Hg technically has a normal pressure; however, in this case, the patient is relatively hypotensive. In some cases, baseline vital signs obtained from old medical records may be of assistance. Often, vital sign trends are much more important than isolated readings. Also, keep in mind that elevated blood pressure measurements are as common in the emergency department pop-

ulation as they are in the general population. Many of these patients do not require acute intervention to lower their blood pressure.

An appreciation of the general appearance of the patient is crucial. Simply stated, how does the patient look when you walk into the room? The concept of "sick or not sick" can often be made at the bedside during the first 5 to 10 seconds of the encounter. The more patients you encounter, the better you will become at making this determination. Up to this point, the assessment of the vital signs and an appreciation of the general evaluation should have taken just a minute or two. A seasoned clinician will determine whether to continue with a systematic evaluation or to deviate from this traditional approach and perform a focused physical examination and initiate diagnostic or therapeutic measures as warranted.

Remember, the template for performing a comprehensive head to toe physical examination has its place; however, in many circumstances, a patient presenting to the emergency department does not require a comprehensive examination. In the stable patient presenting with a minor or nonurgent complaint, your physical examination can proceed in a systematic, yet focused, fashion. The exam should follow the typical order of inspection, palpation, percussion, and auscultation, if applicable. An adequate knowledge of surface and bony anatomy will be helpful, especially in patients presenting with musculoskeletal complaints. In some patients with nonspecific complaints or when you need to perform a more comprehensive evaluation, think of the physical examination as a screening tool. If pertinent or positive findings are detected, a more detailed and focused exam can then be performed supplanted by additional bedside or other diagnostic tests.

In certain clinical scenarios such as abdominal pain, shortness of breath, or altered mental status, avoid the pitfall of relying solely on your initial examination. Presentations such as these require serial examinations to ensure a response to therapy or to identify a change in condition during the time the patient is being observed. A change in condition for better or worse may affect your ultimate disposition of the patient. Another pitfall to avoid when performing your physical examination is inadequate exposure of the affected area. At times because of emergency department overcrowding, a patient may be in a treatment area that is not conducive to a proper examination An example may be the patient with right lower quadrant abdominal pain who is in a hallway bed. If warranted, move the patient to a separate examination area to perform a proper evaluation.

*In certain clinical scenarios, such as abdominal pain, shortness of breath, or altered mental status, avoid the pitfall of relying solely on your initial examination.*

Despite the importance and utility of the H&PE, it is also useful to acknowledge its limitations. It is uncommon that a single historical feature or physical examination finding will reveal the diagnosis in many patients. This is especially important to remember in catastrophic diseases, which may not present classically. For example, the lack of vaginal bleeding does not rule out an ectopic pregnancy. That being said, medical interviewing and physical examination skills are crucial to providing excellent patient care. The constellation of signs, symptoms, and examination findings will help direct your diagnostic workup.

## Suggested Reading

Bickley LS, Szilagyi PG. *Bates Guide to Physical Examination and History Taking*. Philadelphia, Pa: Lippincott, Williams, & Wilkins; 2007.

*This introductory text highlights the medical interview process and physical examination techniques.*

Goldberg C. *A Practical Guide to Clinical Medicine.* Available at: http://medicine.ucsd.edu/clinicalmed/introduction.htm. Accessed January 23, 2008.

*This is a clinical education Web site for medical students.*

JAMA. *Rational Clinical Exam*. Available at: http://jama.ama-assn.org/cgi/collection/rational_clinical_exam. Accessed January 23, 2008.

*This series reviews an evidence-based approach to the diagnostic evaluation and diagnosis of a number of medical conditions.*

Seidel HM, Ball JW, Dains JE, Benedict GW. *Mosby's Guide to Physical Examination*. St. Louis, MO. Mosby; 2003.

*This is an introductory text highlighting the medical interview process and physical examination techniques.*

CHAPTER 8

# *Data-Gathering Skills*

The at-times hectic world of the emergency department is an imperfect setting in which to rapidly diagnose and treat everyday injuries and potentially life-threatening conditions. A large part of the emergency physician's job is gathering information from a wide variety of sources to construct an accurate picture of the patient's clinical condition.

*A detailed history is often the key to diagnosis.*

A detailed history is often the key to diagnosis. However, obtaining an adequate history in the emergency department can be challenging. Remember, at times medical information will have to be obtained from multiple sources. Keeping this in mind, you should always try to gather as much medical information as possible directly from the patient.

We are well aware that it can be difficult to elicit a clear and concise history of present illness from some patients. This can be related to an underlying or acute medical condition, a language barrier, or the patient's level of formal education. However, it is important to resist the temptation to limit your data gathering because of an inability to obtain detailed information from your patient. Spending additional time with the patient to clarify certain details or to use other resources can be invaluable. Remember, think creatively and do not get frustrated. The case study presented here gives an example of when "thinking outside the box" can help you get potentially life-saving medical information that may have otherwise been difficult or impossible to obtain.

The box on the next page contains a checklist of suggestions to consider when you are having difficulty getting a clear and concise medical history. Even when the patient is capable of providing a detailed and accurate history, it may be of help to verify certain aspects of the history with

### Case Study—Thinking Creatively

*A patient presents to the hospital with abdominal pain and vomiting for 3 days. He has a complicated medical history, including diabetes, hypertension, thyroid disease, and congestive heart failure. He does not recall the names of most of his medications and has never received medical care at your facility. Although this patient can not recall the names of his medications, he likely knows the name and location of the pharmacy where he gets his prescriptions filled. Thinking out of the box, calling the pharmacy, and speaking with a pharmacist may provide valuable medical information that otherwise would have been difficult to obtain.*

### Suggestions for Taking a Clear and Concise Medical History

- Slow down and focus on one question at a time.
- Try not to interrupt patients while they are responding.
- Start your patient interview with open-ended questions. Use follow-up closed-ended questions for clarification.
- Use simple language; avoid the use of medical jargon.
- If the patient has a difficult time focusing, redirect with clarifying questions.
- If a language barrier is present, obtain a professional interpreter. Avoid using family or friends for translation, if at all possible.
- If you are getting frustrated, take a brief break. Get enough information to start the evaluation and return a short time later to refine the history.

friends or family to make sure no key detail goes unaddressed. To ensure patient confidentiality, it is important that you get the patient's permission before discussing any aspect of his or her medical history with friends or family. Other commonly used alternative sources of historical information include the following:

- **Nurses:** Always read the triage nurse's notes, and do not forget to look at the nursing record. You can also ask nurses for their initial impression. Nurses can tell you whether the patient was accompanied by family or friends who may be in the waiting room.
- **Emergency medical service (EMS) personnel:** It is always a good idea to talk with the EMS personnel. They can often provide key details about the condition of the patient at the scene or treatment rendered by bystanders or other first responders. In addition, they may provide important details about social conditions that are valuable when attempting to make disposition decisions.
- **Old medical records:** Obtaining the old medical records for a patient can provide valuable information about the patient's medical condition, especially if a patient is unable to provide a concise history. Medical records may confirm what a patient has already told you, add details that the patient does not recall, or clarify the results of previous diagnostic procedures.

Sometimes the history is just not available. The nature of emergency medicine is that we must develop management plans and intervene based, at times, on little or no information. Either we are unable to obtain a good history and will have to base our plan on other available information, physical exam, and diagnostic tests or the patient is in extremis and the time-sensitive nature of the presentation precludes the physician from obtaining a detailed history (e.g., gunshot wound to the chest). Remember, the goal of data gathering in the emergency department is to obtain the necessary information required to provide high-quality patient care. At times limited information can suffice, and other times more detailed information is needed to provide high-quality care.

CHAPTER 9

# *Developing a Case-Specific Differential Diagnosis*

By this time in your medical school training, you should be familiar with the traditional concept of a differential diagnosis in which a list of possible diagnoses is generated and ruled in or out until a final diagnosis is identified. Like other fields of medicine, developing a differential diagnosis list is essential to the care of emergency patients, but the process of developing a differential diagnosis in emergency medicine is distinctive.

In the traditional model, the patient's signs and symptoms are categorized into a problem list (e.g., headache, chest pain, back pain). The differential diagnosis is generated from the patients' problem list. In emergency medicine, we not only focus on the likely diagnosis but must also think about the potentially life-threatening diagnoses or other problems that could endanger the patient if delayed or missed. We may actually never make the final diagnosis, but we can at least exclude life-threatening conditions.

*In emergency medicine, we not only focus on the likely diagnosis but must also think about the potentially life-threatening diagnoses or other problems that could endanger the patient if delayed or missed.*

## Medical Decisionmaking

Several cognitive strategies are used in the medical decisionmaking process. These strategies include hypotheticodeductive, algorithmic, pattern recognition, rule-out-worst-case scenario, exhaustive, and event driven strategies. Each of these strategies has advantages and disadvantages. To avoid error, it is helpful for clinicians to understand which strategies they are using and what the limitations are of the particular strategy.

## Hypotheticodeductive Decisionmaking

Hypotheticodeductive is the most common decisionmaking strategy. A preliminary diagnosis is made on the basis of a series of inferences. This strategy is most like the old fashioned detective who gathers clues about a particular suspect. The working diagnosis is tested and refined as new data are discovered. It is important for this hypothesis to be tested and

### Case Study

A 45-year-old man presents in the winter months with a complaint of headache and nausea. His complaints started yesterday, and appear worse in the morning and improve throughout the day. As a medical detective, if you do not consider carbon monoxide toxicity and attribute his complaints to a nonspecific illness, you will miss a critical diagnosis.

*A good clinician needs to be mindful of the concept of premature closure.*

verified. Failure to change course as contradictory information is gathered can lead to misdiagnosis because of premature closure. An advantage of the hypotheticodeductive method is that it is flexible.

### Algorithmic Decisionmaking

In the algorithmic method, a series of steps is followed to simplify the decisionmaking process. An example could be chest pain pathways or pulmonary embolism diagnostic algorithms. This type of model is easy to teach and can improve the care for certain patients; however, algorithms are often too inflexible to cover all situations. The one-size-fits-all approach to patients can lead to problems if a patient presentation does not fit the algorithm.

### Pattern Recognition

In pattern recognition, a series of signs and symptoms are clumped together into a known grouping. Pattern recognition is often used by seasoned clinicians with extensive clinical experience. Pattern recognition is subject to premature closure and anchoring bias, in which physicians continue to stick with the original diagnosis despite conflicting data. Anchoring bias refers to the tendency to rely too heavily or to "anchor" on one piece of information during the decisonmaking process. Failure to incorporate new data is known as confirmation bias. Confirmation bias can be compared to closed-mindedness. This pattern of decisionmaking refers to the tendency to add weight or value to facts that confirm or support one's beliefs, while ignoring or undervaluing the relevance of contradictory information.

### Rule-Out-Worst-Case Scenario

The rule-out-worst-case-scenario method is designed to eliminate the life-threatening diagnosis for a given clinical presentation rather than to focus on the likely diagnosis. This style may, at times, lead to extensive workups and excessive use of resources. Less-experienced clinicians often use this method because it is least likely to lead to catastrophic results. However, the diagnosis of less common and noncritical diseases will often be delayed or missed completely when using the rule-out-worst-case-scenario method.

### Exhaustive Decisionmaking

In the exhaustive method, all the possible data are gathered in an indiscriminate pattern and then sorted through. This method also can lead to excessive workups and is very time-consuming—the typical "shot gun approach."

### Event-Driven Decisionmaking

In event-driven decisionmaking, clinicians respond to the clinical scenario and treat the symptoms with limited thought as to the underlying cause. An intervention is made, and the situation is reassessed. The clinician may at times back into the diagnosis on the basis of response to therapy. This strategy is often used for a critically ill patient such as one

#### Case Study

Consider a 71-year-old male who presents to the emergency department with a traumatic right flank pain. The most important condition to consider in this presentation is an abdominal aortic aneurysm. Although the patient may be much more likely to have a kidney stone, failure to consider abdominal aortic aneurysm in your differential could have potentially catastrophic consequences if missed.

in acute respiratory failure. The event-driven strategy is often combined with the rule-out-worst-case-scenario method. The event-driven method is particularly well suited to the emergency department environment; however, it tends to be reactive rather than proactive.

*Eliminating life-threatening conditions from the differential is more important than making the correct diagnosis of a benign condition*

## Putting Decisionmaking to Work

Ruling out potential life-threatening presentations is a high priority in emergency medicine. Eliminating life-threatening conditions from the differential is more important than making the correct diagnosis of a benign condition, see the accompanying case. The important point is that if a particular illness, condition, or injury is not considered, sooner or later it may be missed.

A good clinician needs to be mindful of the concept of premature closure. This occurs when an incorrect diagnosis is made at an early stage of the patient encounter. In these cases, the differential diagnosis is too narrow, and the healthcare provider fails to consider other possibilities that could account for the patient's presenting complaint. As a result, an incorrect diagnosis is pursued, and the true underlying condition may be missed. Keep an open mind and a broad differential. As new information is acquired, or if the patient's condition changes, the differential should be reassessed and adjusted. If the new data do not support the leading diagnosis, other conditions need to be considered. Premature closure and failure to continually reassess the differential diagnosis can lead to catastrophic results.

When creating a differential diagnosis, it is extremely important to create a list that includes all of the likely diagnoses as well as all of the potentially life-threatening conditions, even if they are uncommon or less likely. There is an old saying that "you cannot make a diagnosis that you do not think about." Taken one step further, if you do not think of a particular diagnosis, you will miss it. The case studies in this chapter describe such examples.

So how do you begin to build a differential diagnosis? As a junior learner with limited clinical experience, a good differential is more often drawn from your fund of medical knowledge and less from your clinical experience. For this reason, because emergency medicine is in many ways a complaint-driven specialty, it is helpful to review both common and potentially serious causes of routinely encountered chief complaints. Starting your rotation with a solid fund of medical knowledge will allow you to develop more in-depth differentials from day one.

In the end, developing a differential diagnosis in emergency medicine is an active process incorporating a variety of decisionmaking skills. Data gathering, hypothesis testing, and treatment often occur simultaneously. Clinicians need to be particularly careful to avoid premature closure on cases to avoid error. The true art of developing and working through your differential diagnosis is often made by the balance of ruling out the life-threatening conditions and correctly diagnosing the likely conditions. Remember that not every diagnosis will be made in the emergency department. The importance of developing a case-specific differential is that your assessment of the case will have a profound impact on your diagnostic testing and management.

## Suggested Reading

Sandu H, Carpenter C, Freeman K, et al. Clinical decision making: opening the black box of cognitive reasoning. *Ann Emerg Med.* 2006;48:713–719.

*This article describes the decisionmaking process and the different cognitive strategies used to make decisions.*

CHAPTER 10

# *Diagnostic Testing in the Emergency Department*

*The healthcare provided in the emergency department has benefited greatly from advances in diagnostic testing.*

Advances across all aspects of medicine have taken place in the last 25 years. These advances have resulted in improved quality of life for the US public, as well as more timely diagnosis of many medical conditions. The healthcare provided in the emergency department has benefited greatly from advances in diagnostic testing. Just 25 years ago it was difficult to obtain more than basic labs and plain radiographs for patients cared for in the emergency department. Today, because of advances in technology and the greater availability of diagnostic tests, definitive care can be initiated much earlier in the course of a patient's presentation.

The emergency department in some ways can be viewed as a diagnostic testing center in which a physician can coordinate a patient's care and the results of most diagnostic tests are known within a few hours. The importance of diagnostic imaging to the efficient practice of emergency medicine cannot be overstated. In most centers, advanced diagnostic imaging, ultrasounds, CT scans, and even MRI studies can be obtained quickly and have a pronounced effect on patient care by providing a prompt definitive diagnosis for conditions such as intracranial hemorrhage, pulmonary embolus, aortic aneurysm or dissection, and more.

However, with the ease in obtaining these studies comes a price. According to the American College of Radiology, diagnostic imaging is the fastest growing medical expenditure in the United States, with an annual growth rate of 9% (Bettmann and Weinreb, 2007). This is three times that of general medical expenditures. In emergency departments across the country from 1995 to 2004, the number of MRI and CT scans performed nearly quadrupled, and the number of ultrasounds more than doubled (*JAMA*, 2006). Remember that the ease of obtaining certain diagnostic tests, including advanced imaging studies, should not preclude or serve as a surrogate for performing a thorough H&PE.

Before ordering a diagnostic test, ask yourself a few questions: "What am I going to do with the test results?" "How is this test going to help me confirm or exclude the diagnosis?" "How will the test result affect my diagnostic strategy, management, or final disposition?" These simple yet important questions can help guide the proper use of a number of diagnostic tests ranging from relatively inexpensive blood tests to very expensive diagnostic imaging studies. Diagnostic tests should primarily be ordered to rule in or rule out a particular condition based on the differential diagnosis generated from the patient's H&PE. However,

diagnostic tests are often ordered for a variety of reasons, including clinical suspicion of disease, dogma, perceived standard of care, a consultant's or primary care physician's request, a patient's request, and risk management concerns. Remember, in the real world there are times when you may need to order a diagnostic test that is not necessarily evidence based. Sometimes, what we do is based on pattern recognition and anecdotal experience. Experience may be the only pseudoscience behind the diagnostic workup of certain patients. As mentioned previously, a consultant physician may influence the diagnostic tests that are ordered for a particular patient. An example may be the patient presenting with abdominal pain. Your consultant may request that you order a complete blood cell count and an obstruction series. If you have a high clinical suspicion for acute appendicitis, it should not be lessened by a normal white cell blood count or a nondiagnostic obstruction series. Consultant interactions may also serve as an opportunity to educate your colleagues when differences of opinion are raised as to the utility of a particular diagnostic test.

Before ordering a diagnostic test, ask yourself a few questions:

- What am I going to do with the test results?
- How is this test going to help me confirm or exclude the diagnosis?
- How will the test result affect my diagnostic strategy, management, or final disposition?

The medical literature has reported validated approaches for diagnostic testing of certain conditions. Clinical decision rules, such as the Ottawa ankle and foot rules, the Nexus criteria the Canadian cervical spine rules, and others can be implemented to assist with the proper use of diagnostic tests (Steill et al., 1992, 1993, 2000; Hoffman, 2000). However, it must be remembered that the practice of medicine is an art as well as a science. With this in mind, there will be times when a particular diagnostic test is not indicated. To ensure that your patient expectations are being addressed, communicate your thought process with your patient as to why you do not feel that a particular test is indicated. As a student or physician, use this opportunity to educate your patients. Remember, the value of communication with patients cannot be overemphasized.

## Statistical Considerations Related to Diagnostic Testing

### Sensitivity and Specificity

As much as we would like otherwise, many diagnostic tests are not absolute, and interpretation of the results may not be as simple as yes or no or black or white. A number of the tests have a range of probability for the correct answer. Many tests have the possibility of giving us a true-positive (TP), false-positive (FP), true-negative (TN), or false-negative (FN) result. Therefore, it is important to understand the statistical concepts of sensitivity and specificity. Sensitivity refers to the likelihood of a test being positive or abnormal in the presence of disease. Mathematically, sensitivity is expressed as follows:

$$\text{sensitivity} = TP/(TP + FN)$$

The higher the sensitivity of a test is, the lower the number of false negatives will be. A test with a high sensitivity also means that a negative result has a high probability of truly being negative because of the low number of false negatives. Highly sensitive tests are able to reasonably rule out disease. A test that has poor sensitivity has a high likelihood of false-negative results.

Specificity refers to the likelihood of the test being negative or normal in the absence of disease. It is represented mathematically as follows:

$$\text{specificity} = TN/(TN + FP)$$

A test that has high specificity means that it has a low rate of reporting false positives. A test that has poor specificity has a high likelihood of false-positive results.

The sensitivity and specificity of a test is not affected by the prevalence (the proportion of diseased patients in the population). However, the predictive value of a test is affected by the prevalence of disease in the population. Positive predictive value (PPV) refers to the likelihood of the patient truly having the disease when the test is positive or abnormal. PPV is represented mathematically as follows:

$$PPV = TP/(TP + FP)$$

Negative predictive value (NPV) refers to the likelihood that the patient does not have the disease when the test is negative or normal. NPV is represented as follows:

$$TN/(TN + FN)$$

Predictive values are highly affected by prevalence of disease in a given population. The lower the prevalence of a disease is, the higher the risk of a false-positive result will be and the lower the positive predictive value will be for a particular test.

## Probability

Another important point to consider is the diagnostic testing theory of pretest and posttest probability. Probability relates to the concern that you have regarding a particular patient's having an illness or condition and how that concern may or may not be affected by the diagnostic test results. An example of using pretest–posttest probability in the evaluation of chest pain is given in the box on this page. When assessing probability, emergency physicians take into account trends and risk factors. A series of articles published in the *Journal of the American Medical Association* titled "The Rational Clinical Exam" reviews the current literature regarding a number of clinical conditions and provides evidence-based recommendations as to the usefulness of certain diagnostic tests in ruling in or ruling out a particular condition (*JAMA*, 2008).

## Ultrasound Testing by Emergency Physicians

In the past decade, the use of bedside ultrasound by emergency medicine residents and faculty in academic medical centers has become commonplace. The application of this technology is also becoming more avail-

### Case Study—Examining Probability

*For example, your patient is a 24-year-old, previously healthy, athletic male who presents with sharp fleeting chest pain lasting 5 minutes without shortness of breath while jogging earlier today. In the emergency department, he is without complaints. His ECG shows sinus rhythm with T-wave inversions $V_1$–$V_3$. Another patient is a 63-year-old man. He smokes cigarettes and has a history of poorly controlled hypertension. Earlier today, he experienced 20 minutes of left-sided chest pain with exertion, radiating to his left shoulder, associated with shortness of breath and diaphoresis. His ECG shows normal sinus rhythm and is unchanged from an earlier ECG. The first patient has a relatively low pretest probability for cardiac chest pain. His ECG is not normal, but in a healthy young man, the T-wave inversions are nonspecific at best. These findings have been commonly noted to be a normal variant in young healthy adults. The posttest probability (after the ECG was performed) that the 24-year-old patient has cardiac chest pain is still very low and is essentially unchanged by his abnormal ECG. However, the case of the 63-year-old patient with chest pain is very different. The pretest probability that he is having cardiac chest pain is relatively high. He has multiple risk factors for coronary artery disease, and his history is suggestive of cardiac chest pain. Although his ECG is normal, his posttest probability of having cardiac chest pain is no less concerning.*

able to community emergency physicians as well. The use of ultrasound as a diagnostic modality has been incorporated into the 2007 Model of the Clinical Practice of emergency medicine, a comprehensive document representing the essential information and skills necessary for the clinical practice of emergency medicine by board certified emergency physicians. The incorporation of bedside ultrasound by trained emergency physicians has been shown to improve patient outcomes and quality and efficiency of patient care provided in the emergency department. The need to improve patient care has been the single most important driving factor responsible for the migration of this diagnostic imaging modality out of the walls of the department of radiology. Clinical decisions regarding specialty consultation, operative management, and disposition can now at times be made in minutes as opposed to hours. The use of ultrasound by emergency physicians does not in any way supplant the need for adequate follow up diagnostic imaging or confirmatory studies in selected patients. The role or focus of emergency medicine bedside ultrasound (EMBU) is set forth to answer a few simple straightforward questions. EMBU is often used in selected clinical presentations to confirm or exclude conditions such as hemoperitoneum, pericardial effusion, abdominal aortic aneurysm, cholelithiasis, and intrauterine gestation.

## Conclusion

Diagnostics, including point of care testing in the emergency department, continues to evolve. As our technology continues to advance, we will undoubtedly have greater access to the results of a multitude of diagnostic studies in a timely fashion. We must still continue to strive to practice medicine in a cost-effective manner that benefits our patients and does not overburden them and the health care system with unnecessary, and at times overused, testing.

## Suggested Reading


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*This statement discusses the appropriate use of radiographic imaging.*

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*This article reports the results of the National X-Radiography Utilization Group.*

*JAMA*. Quickstats: number of emergency department (ed) visits with diagnostic imaging ordered or performed—United States, 1995 and 2004. *JAMA*. 2006;296:762. Available at: http://jama.ama-assn.org/cgi/content/full/296/7/762. Accessed February 7, 2008.

*This article reports the number of emergency department visits with diagnostic imaging ordered or performed.*

*JAMA*. The rational clinical exam. Available at: http://jama.ama-assn.org/cgi/collection/rational_clinical_exam. Accessed February 7, 2008.

*This is an ongoing review of the current literature on a number of clinical conditions that provides evidence-based recommendations of the usefulness of various diagnostic tests in ruling in or ruling out a particular condition.*

Stiell IG, Greenberg GH, McKnight RD, et al. A study to develop clinical decision rules for the use of radiography in acute ankle injuries. *Ann Emerg Med*. 1992;21:384–390.

*This study reports the development of a clinical decision rule for the use of radiography in acute ankle and foot injuries.*

Stiell IG, Greenberg GH, McKnight RD, et al. Decision rules for the use of radiography in acute ankle injuries. Refinement and prospective validation. *JAMA*. 1993;269:1127–1132.

*This study further refines and validates a clinical decision rule for the use of radiography in acute ankle and foot injuries.*

Stiell IG, Wells GA, Vandemheen KL, et al. The Canadian C-spine rule for radiography in alert and stable trauma patients. *JAMA*. 2001;286:1841–1848.

*This article describes the Canadian C-spine rule and its application in alert stable trauma patients.*

*2007 Model of the Clinical Practice of Emergency Medicine*. Available at: https://www.abem.org/public/_Rainbow/Documents/2007%20EM%20Model.pdf. Accessed March 6, 2008.

*This document was generated by a taskforce charged with revising the core content of emergency medicine and includes an extensive list of conditions seen and treated in the emergency department, subdivided into one of three acuity levels.*

CHAPTER 11

# *Developing Your Plan of Action*

While focusing on your "plan of action" (diagnostic evaluation and therapeutic intervention), it is necessary to realize that in many emergency department patient encounters, care is provided in a roundabout fashion. Because of the urgency of patient presentations, we do not always have the luxury of providing care in a structured manner the same way as in a low-acuity outpatient setting. Almost every shift, we evaluate patients with head trauma, acute respiratory distress, altered mental status, and many other complaints that require the care provider to make certain critical decisions early on in the evaluation, many times before a comprehensive H&PE is completed. The evaluation of a "sick or potentially sick" patient cannot be performed in series; care must be provided in a parallel fashion. At times, the ordering of select diagnostic studies or the need to initiate therapeutics is evident immediately. The overall plan, including the speed and order of implementation, will be dictated by your concern for the patient's well-being. The case study on the next page provides an example of providing parallel care in an emergency department setting.

Some patients that you encounter will be straightforward and nonurgent in nature. For these patients, you have the luxury of time. A focused H&PE can be performed. A problem list and differential diagnosis can be developed. A few minutes can be spent reviewing the medical literature about a certain aspect of the patient's presentation. However, decisions need to be made, some after careful consideration and reflection, others immediately. For each patient you encounter you need to ask yourself, "What needs to be done for this patient?" and "What needs to be done now?" Every patient is different. Some cases are not urgent, allowing decisions to be made in a sequence that permits observation or the response to therapy to guide further care. Other cases are urgent or emergent and require immediate action.

Knowing if a patient is "sick or potentially sick" can many times be determined from the doorway, but sometimes it is not immediately clear. Certain findings, however, should be alarming: confusion; diaphoresis; cool, clammy skin; abnormal vital signs; and sudden severe pain are just a few clues that your patient may be sick. If the patient appears sick or if you believe there is a possibility that they have a serious underlying condition (e.g., cardiac chest pain, shortness of breath, a cold extremity, focal weakness, sudden onset of severe abdomen or back pain), immediately curtail your evaluation and find your supervisor.

*If the patient appears sick or if you believe there is a possibility that they have a serious underlying condition (e.g., cardiac chest pain, shortness of breath, a cold extremity, focal weakness, sudden onset of severe abdomen or back pain), immediately curtail your evaluation and find your supervisor.*

## Understanding the Meaning of Vital Signs

Make sure all vital signs have been taken, and repeat them yourself if needed. Abnormal vital signs may be one of the first red flags encountered when evaluating a patient. However, do not forget that the patients with "normal" vital signs may still harbor a serious underlying condition. Vital signs vary with age and have to be viewed in context with the clinical presentation. Although isolated vital sign measurements can be significant, a persistent trend can be much more revealing as to the seriousness of the underlying condition or response to therapy. Vital sign abnormalities in general occur as a response to a variety of systemic insults. Aside from cardiac rhythm disturbances (symptomatic bradycardia and tachycardia), a thorough evaluation may be necessary to identify the underlying condition responsible for the abnormal vital signs (e.g., dehydration, hypovolemia, infection).

### Temperature

Oral temperature readings can be falsely low in patients with an elevated respiratory rate. Inquire about recent antipyretic (e.g., acetaminophen, aspirin, nonsteroidal anti-inflammatory medications) use, because these medications may mask a febrile episode. This may be especially important in an infant younger than 3 months of age whose entire workup may be based on whether he or she is febrile (temperature > 38ºC or 100.4ºF). Septic patients, particularly the very young and very old, may not mount a febrile response to an infection and may on occasion present as hypothermic. Central nervous system injury, drug abuse, adrenal insufficiency, end-stage renal disease, and thyroid disorders can also affect basal body temperature or temperature regulation.

### Pulse

The heart rate (HR) must be interpreted with attention to the age of the patient, especially when caring for infants and small children. Tachycardia in one age group may very well be a normal finding, whereas in another, it may be pathologic. Conversely, a well-conditioned athlete may have a resting HR in the 40s. For adolescents and adults, the maximum sustained HR can be estimated with the following formula:

$$\text{maximum sustained HR} = (220 - \text{age in years}) \times 0.85$$

Take, for example, two patients. The first is 25 years old; the other is 85 years old. Each has a HR of 140 beats per minute. As you can see, using

### Case Study

*Consider the patient who fell at home. He is an elderly male who slipped in the bathroom, striking his head. The care provided should entail a rapid evaluation of his airway, breathing, and circulation while simultaneously applying cervical spine stabilization, obtaining vital signs, inserting a peripheral IV line, and performing a focused secondary examination looking to uncover other potential traumatic injuries or neurologic impairment. A brief medical history may uncover information that can have a profound effect on how this patient would be initially cared for. If he were taking warfarin, it would be prudent to obtain an emergent CT scan of the head even if the patient had a normal neurologic examination. If the patient reported dizziness or palpitations before the fall, a cardiac workup might be necessary. The quick decisions that need to be made in this case—"Is his airway patent?" "Does he need an urgent CT scan of the head or cervical spine?" "Does he need an ECG, cardiac monitoring, and the like?"—are all crucial decisions that should be made at the bedside during the first few minutes of his evaluation. These decisions are all being made in parallel with the treatment necessary to stabilize the patient.*

this formula, an HR this fast is much more concerning in the elderly patient, regardless of the cause. The pulse also has to be taken in context with other vital signs. The HR increases by approximately 10 beats per minute for each degree Fahrenheit of temperature elevation above normal. In addition, patients taking medications that slow conduction through the atrioventricular node (β-blockers, calcium channel blockers, and digoxin) may not mount a tachycardic response to physiologic stress.

### Respiratory Rate

Count the rate yourself with a watch. Not everyone has a respiratory rate of 20 beats per minute. Infants are commonly noted to be periodic breathers. For these patients, it is necessary to count the respiratory rate for 30 seconds to 1 minute to get a more accurate measurement. The respiratory rate tells only one side of the story and provides little information as to the oxygenation or ventilatory status of the patient. Close attention needs to be paid to the respiratory effort, including the presence of retractions, accessory muscle use, and adventitious breath sounds. Also remember that some patients will have pulmonary manifestations of systemic disease states resulting in tachypnea (respiratory rate > 20 per minute; sepsis, pulmonary embolism, diabetic ketoacidosis, lactic acidosis, and salicylate toxicity).

### Blood Pressure

Do not confuse the concept of "stability" with normal blood pressure. Hypotension is a late sign of shock; this is especially true in children. In cases of class II hemorrhage (loss of 15%–30% blood volume), findings usually include tachycardia, tachypnea, cool clammy skin, delayed capillary refill, and a decrease in pulse pressure, yet the systolic blood pressure (BP) may be in the normal range. The decrease in pulse pressure occurs because of increased levels of circulating catecholamines causing an increase in peripheral vascular resistance, thus raising diastolic BP. These patients are in compensated shock.

BP readings as well as other vital signs such as heart rate also have to be taken in context with the age of the patient. In infants and young children, it is common for the normal BP reading to be lower than adolescents and adults. A formula for estimating the BP in young children is as follows:

$$BP = 80 + (2 \times \text{age in years})$$

In adults, elevated BP readings in the emergency department are as common as in the adult ambulatory population. Some of these readings are transient, reflecting the clinical scenario at hand, and do not necessarily indicate underlying hypertension. Rarely do isolated elevated BP readings need to be urgently addressed in the emergency department.

Orthostatic hypotension and orthostatic vital signs in general are used in the bedside assessment of patients with known or suspected fluid loss, syncope, intravascular volume depletion, or autonomic dysfunction. At times, the use and misuse of orthostatic vital sign measurements revolve around the misinterpretation of the results, confusion as to what actually constitutes a positive finding, and the technique used to determine the measurements. A more in-depth review of this topic can be found in Roberts and Hedges' *Clinical Procedures in Emergency Medicine* (2004).

### Pulse Oximetry

Sometimes referred to as the fifth vital sign is a simple-to-perform, accurate, noninvasive assessment of the oxygen saturation ($SaO_2$). The $SaO_2$ correlates well with the partial pressure of arterial oxygen ($PaO_2$), the

*Because of the urgency of patient presentations, we do not always have the luxury of providing care in a structured manner as in a low-acuity outpatient setting.*

relationship being described by the oxyhemoglobin dissociation curve. Despite its many advantages, pulse oximetry monitoring has some limitations. Although it is a noninvasive measurement of oxygenation status, no information is provided regarding the ventilatory status of the patient. In cases of suspected hypercarbia, an ABG analysis should be performed to determine the partial pressure of arterial carbon dioxide ($PaCO_2$). In addition, pulse oximetry measurements can be only as accurate as empiric calibration curves. $SaO_2$ values less than approximately 75% to 80% may be inaccurate because they are commonly extrapolated from healthy volunteer control subjects. The presence of both carboxyhemoglobin (COHb) and methemoglobin (MetHb) can have significant effects on pulse oximetry readings when present in elevated concentrations. In patients with elevated COHb levels, pulse oximetry typically overestimates the $SaO_2$. For approximately every 1% of COHb, the pulse oximeter overestimates the $SaO_2$ by approximately 1%. Because of light absorbance qualities, in the presence of high concentrations of MetHb, the $SaO_2$ as measured by pulse oximetry will approximate 85%. When either of these conditions is suspected, it is recommended to check an arterial or venous blood sample using a co-oximeter. Other factors affecting pulse oximetry readings include bright ambient or infrared light, peripheral vasoconstriction, motion artifact, and dark nail polish. Lastly, because it is possible to have a delayed detection of an hypoxic event, do not solely rely on pulse oximetry to determine oxygenation status.

## Conclusion

This chapter represents a starting point from where you should approach a patient when you are formulating your plan of action. The attention paid to your primary survey and secondary survey, vital signs, and the gestalt of "sick versus not sick" will be crucial to guide your initial diagnostic evaluation and need for therapeutic intervention.

## Suggested Reading

Roberts JR, Hedges J. *Clinical Procedures in Emergency Medicine*, 4th ed. New York, NY: W.B. Saunders; 2004.

*This text provides a comprehensive review of commonly performed procedures in emergency medicine.*

CHAPTER 12

# *Diagnosis—Is It Possible? Is It Necessary?*

*The primary role of the emergency department is, by definition, to handle "emergency medical conditions."*

Although the goal of establishing a definitive diagnosis appears logical in the vast majority of emergency department–patient encounters, the reality is that this is a nearly impossible task and often an unrealistic expectation of the general public. Accepting the humbling nature and at times the uncertainty of the specialty of emergency medicine is absolutely necessary. A closer examination of the challenges and goals of our specialty offers a distinct perspective on the ability to and the importance of establishing a definitive diagnosis in the emergency department.

The overarching goal in the practice of medicine is to assess a patient's signs and symptoms and perform the necessary evaluation to achieve a clear diagnosis and thereby initiate treatment. In the practice of emergency medicine, however, some patients are admitted to the hospital and others are discharged home without a definitive diagnosis. Although this may sound frustrating and even deficient when first contemplated, examining the goals of the emergency department help shed light on why this happens. The primary role of the emergency department is, by definition, to handle "emergency medical conditions." What, then, constitutes an emergency? Although this topic has been extensively debated, the term *emergency medical condition* means a medical condition manifesting itself by acute symptoms of sufficient severity (including severe pain) such that the absence of immediate medical attention could reasonably be expected to result in (EMTALA):

- Placing the health of the individual (or, with respect to a pregnant woman, the health of the woman or her unborn child) in serious jeopardy
- Serious impairment to bodily functions
- Serious dysfunction of any bodily organ or part
- With respect to a pregnant woman who is having contractions
  - that there is inadequate time to effect a safe transfer to another hospital before delivery
  - that transfer may pose a threat to the health or safety of the woman or the unborn child

An emergency is any condition in which a patient is likely to suffer morbidity or mortality if left undiagnosed and untreated. The goal,

## Case Study

*Consider a middle-aged man who presents to the emergency department with chest pain. The emergency physician should consider all of the life-threatening causes of chest pain when evaluating such a patient: myocardial ischemia/infarction, pulmonary embolism, aortic dissection, pneumonia, pneumothorax, to name a few. As the clinician gathers data from the patient's H&PE and ancillary testing, he or she will assess how likely each of these diagnoses is and will decide which, if any of these need to be evaluated further before the patient may be discharged safely or admitted to the hospital. In some cases, all that may need to be performed is a thorough H&PE. In other cases, the patient may require a chest radiograph, ECG, D-Dimer testing, or a CT angiogram. Every case is different, and the use of resources and the extent of the diagnostic evaluation should be guided by the differential diagnosis.*

therefore, when assessing a patient who presents to the emergency department, is to identify and treat conditions that could result in morbidity and mortality if left undiagnosed and untreated. It is with this in mind that we assess the importance of establishing a definitive diagnosis.

After evaluating an emergency department patient, a clinician generates a differential diagnosis on the basis of the information gathered and the results of selected bedside tests (e.g., accu check, urine dipstick, urine pregnancy, pulse oximetry, peak flow). An appropriate differential diagnosis should include any potentially life-threatening conditions along with other more common causes of the patient's presenting complaint. Steps are then taken to rule out any possible life-threatening conditions. Reasonable efforts are often made to arrive at a definitive diagnosis; however, quite often, the emergency department workup fails to identify the cause of the patient's symptoms. The case study on this page provides a specific example that may help illustrate this scenario better.

Patients may feel dissatisfied when the emergency department physician cannot provide a definitive diagnosis for their complaint. Reassuring the patient that there is not a serious cause of their symptoms while acknowledging their concern may help. Sometimes an explanation as to the limitations of the emergency department evaluation may help allay the patient's frustrations and fears. Patients should always be encouraged to follow up with their primary care provider when any ambiguity in making a definitive diagnosis occurs. Discharge instructions should emphasize the importance of prompt outpatient follow-up.

In summary, identifying a definitive diagnosis, although desired by patients and fulfilling for clinicians to provide, is often elusive. The fundamental goal of an emergency department assessment is to exclude harmful or life-threatening conditions whose diagnosis should not be delayed.

## Suggested Reading

Social Security Online. *Social Security Act: Section 1867. Examination and Treatment for Emergency Medical Conditions and Women in Labor (EMTALA)*. Available at: www.ssa.gov/OP_Home/ssact/title18/1867.htm#t. Accessed March 6, 2008.

*This Web site reviews the important aspects of EMTALA.*

CHAPTER 13

# *Disposition of the Emergency Department Patient*

Disposition (admission vs. discharge) is, of course, the ultimate endpoint for all emergency department visits. However, this does not mean you should begin to think about it toward the end of the patient encounter. On the contrary, a good clinician thinks about patient disposition from the moment he or she enters the room. Imagine you pick up the chart of a 64-year-old male patient with a history of diabetes and hypercholesterolemia who presents to the emergency department with chest pain and shortness of breath. Even before you walk into the patient's room, you should start to think about the differential diagnosis, diagnostic workup, therapeutic management, and of course disposition.

*A good clinician thinks about patient disposition from the moment he or she enters the room.*

By reviewing the "stopgaps" in the admission process, the concept of timely disposition can be placed in better context. In a typical ambulatory presentation to the emergency department, a patient undergoes a triage assessment, usually by a nurse, followed by a brief interview by a registrar to obtain medical insurance and other demographic information. These steps may at times take 30 minutes or more. Next, depending on the availability of a treatment room, the presentation of unexpected emergencies, and staffing resources, a patient may still wait in the waiting room for some time before being brought back to the emergency department for an evaluation. After a patient is brought back into the treatment area, he or she is often reevaluated by a nurse before being evaluated by a physician. Add to this the time it takes to perform a H&PE, obtain a chest radiograph, draw blood, wait for test results, and more, you could easily add 2 or 3 or additional hours to the patient's stay before disposition is addressed. Assuming all of these steps are performed in series, you can easily see how a patient presenting with what initially appeared to be a nonurgent complaint can spend many hours in the emergency department. This timeline does not take into account the time that some patients must then endure as they wait in the emergency department for an inpatient bed to become available. If some of these steps are performed in parallel—that is, bedside registration, nursing standing orders for selected clinical presentations, early disposition for the straightforward admission—many hours could easily be taken off the back end, and a patient could be expedited through the system with much more efficiency.

*By addressing the disposition early during a patient's evaluation, you can easily save many hours on the back end, thus reducing a patients stay in the emergency department and improving patient satisfaction and patient flow.*

The case study on the next page gives an example of planning for disposition early. By addressing the disposition early during a pa-

*As a patient care advocate, we need to ensure that a patient fully understands the benefit of hospitalization and appropriate treatment and the risk of leaving AMA . . . If you encounter a patient who wants to leave AMA, always alert you supervisor.*

tient's evaluation, you can easily save many hours on the back end, thus reducing a patient's stay in the emergency department and improving patient satisfaction and patient flow. Of course, the best disposition for a patient is not always clear cut. Some patients will be admitted without a clear diagnosis, whereas others require admission because of social or other contributing factors. A number of these issues and contributing factors need to be considered that may affect the ultimate disposition of a patient:

- Access to follow-up health care
- Ability to fill medication prescriptions
- Level of functional independence or ability to ambulate
- Ability of the patient to care for himself or herself at home (e.g., activities of daily living, dressing, bathing)
- Family and social support network
- Suspicion of child or elder abuse

Once you have decided to admit a patient to the hospital, the next step will be to determine which service he or she should be admitted to. In many cases, this will be obvious—a patient with acute appendicitis should be admitted to the surgery service, a patient with chest pain who requires a cardiac rule-out should be admitted to the medicine service. But sometimes this will not be clear. When these situations arise, you will need to be your patient's advocate to avoid or minimize conflict as to who will care for the patient. For example, an elderly patient suffers a hip fracture after a fall. Should this patient be admitted to the orthopedic service with an internal medicine consult to manage her hypertension and diabetes? Or would she be better served by being admitted to the medicine service to manage her comorbidities and have the orthopedic consultant manage the hip fracture? It may prove helpful at times to involve the patient's primary care physician. He or she would certainly want to be updated on the patient's condition and may have a preferred referral pattern that can help mitigate these potential disposition conflicts. Finally, you will have to decide what type of hospital bed a patient will need, that is, a medical–surgical floor bed, telemetry monitoring, step-down bed, or an intensive care unit (ICU) bed. This decision is often based on the stability of the patient; the expected course of the acute illness; and the need for cardiac monitoring, intensive nursing care, and the like. Some of the nuances of an ICU bed versus a step-down bed or a step-down bed versus a telemetry bed may be institution dependent and should always be determined on a case-by-case basis. In addition, con-

### Case Study

*Imagine you pick up the chart of a 64-year-old male patient with a history of diabetes and hypercholesterolemia who presents to the emergency department with chest pain and shortness of breath. Even before you walk into the patient's room, you should start to think about the differential diagnosis, diagnostic workup, therapeutic management, and of course disposition. A patient such as this should be immediately brought back to the treatment area. The initial nursing assessment and registration could be performed at the bedside. In a high-functioning emergency department, this patient should have an ECG performed, be connected to a cardiac monitor, and often have IV access initiated before a formal evaluation by a physician. In this type of case, the eventual disposition can be made early on in his evaluation. In many institutions, a preliminary admission order can be made before obtaining the results of all diagnostic studies.*

sider in selected circumstances the need for contact or respiratory precautions or the need for reverse isolation precautions.

A special situation arises when you believe a patient should be admitted, but he or she refuses to stay and wants to leave against medical advice (AMA). As a patient care advocate, we need to ensure that a patient fully understands the benefit of hospitalization and appropriate treatment and the risk of leaving AMA. By doing so, the patient can make an informed decision. To make this decision, we must ensure to the best of our ability that the patient has medical decisionmaking capacity. All reasonable efforts should be used to help resolve issues surrounding the patient leaving AMA. At times, a patient may just be frustrated or hungry, concerned about the hospital bill, or perhaps concerned about missing work. Some of these issues may be able to be resolved, others cannot. If a patient is going to leave AMA, it is best to develop an alternative treatment plan that the patient can adhere to, including the need for close outpatient follow-up or return to the emergency department for reevaluation. Written documentation in the medical record should detail the conversation that the physician and patient had regarding the risks of leaving and the benefits of hospitalization. If you encounter a patient who wants to leave AMA, always alert your supervisor.

In summary, keep the disposition of the patient in mind early in the course of the evaluation. If expedited in a timely fashion, proper disposition may lead to improved patient care and satisfaction with the emergency department evaluation.

CHAPTER 14

# *Discharge Instructions*

*The importance of providing adequate discharge instructions to communicate with both patients and primary care physicians cannot be overstated.*

Three quarters or more of the patients cared for in a busy emergency department will be discharged home, some after a brief evaluation, others after a more extensive evaluation and hours of observation. For the many patients discharged, outpatient follow-up and reevaluation are required to provide "closure" for the presenting complaint. The importance of providing adequate discharge instructions to communicate with both patients and primary care physicians cannot be overstated.

Discharge instructions serve a number of important purposes. They inform the patient of the known, suspected, or preliminary diagnosis and the name of their treating physician. In addition, properly written discharge instructions can inform the patient and his or her primary care physician about the extent of the evaluation performed, including preliminary diagnostic test results and medications administered in the emergency department. This may also be of help when a patient returns unexpectedly to the same or another emergency department. Discharge instructions can also outline a plan for outpatient follow-up care with the patient's primary care physician and can explain circumstances under which a patient should return to the emergency department.

Near the top of most standardized discharge instructions is a space to enter the patient's diagnosis; the diagnosis may need to be entered in writing or through an electronic discharge instruction system. Care must be taken in choosing the proper wording for a discharge diagnosis. A patient's definitive diagnosis is sometimes not known at the time of discharge from the emergency department. A definitive diagnosis, such as "strep throat," should be listed only when this diagnosis is in fact known (i.e., in a patient with sore throat and a positive rapid strep test). For many clinicians, there is a temptation to list diagnoses that are suspected but not confirmed. A patient with vomiting and diarrhea may have viral gastroenteritis; however, the vomiting and diarrhea may also represent an atypical presentation of early appendicitis. When discharging such a patient, the safe practice is to list "vomiting and diarrhea" as the diagnosis. After a listing of the diagnosis in the discharge instructions, it is helpful to briefly summarize the evaluation and treatment that was performed, diagnostic test results, and medications administered.

The next part of the discharge instructions should delineate a treatment plan for the patient. Although the treatment plan is often verbally reviewed with the patient before discharge, patients will frequently forget

elements of the plan if they are not written down. For example, the treatment plan for a patient with an ankle sprain might include the following: "Apply ice to ankle for 20 minutes at a time, 4 to 5 times per day. Elevate your leg to minimize swelling. Use crutches as needed for comfort." Medications are often part of the treatment plan and should be clearly explained. For example, "Take ibuprofen 600 mg (1 tablet) for pain every 8 hours with a full meal."

Another component of written discharge instructions is a clearly stated plan for follow-up care. Specify with whom the patient should follow up and in how many days follow-up should occur. If needed, provide the appropriate specialty clinic phone number for the patient. Remember, based on the type of health insurance, some patients may need to obtain a referral from their primary care physician before they will be able to follow up with a specialist.

The final component of the discharge instructions is perhaps the most important. This includes an explanation of reasons to return to the emergency department. This section should list any relevant symptoms the patient should watch for and should include a generic statement that encourages the patient to seek medical care immediately for any concerning symptoms. For example, a patient with minor head trauma might be discharged with the following instructions: "Return immediately if you develop vomiting, worse headache, weakness or numbness, visual changes, difficulty speaking or walking, confusion, or for any other concerns."

Several factors contribute to well-written discharge instructions. All discharge instructions should be written in language that can be easily understood by a layperson. It is important to avoid the use of medical jargon. Research suggests that, in general, when providing written health care information, the contents should be written at the sixth-grade reading level. The majority of patients seen in the emergency department do not have medical training and will not understand "CXR neg," "f/u w/PCP in 2d," "Keflex 500 mg PO QID," or many of the other abbreviations we routinely use. Anticipatory guidance about the proper use of newly prescribed medications, particularly analgesics, is important to limit the likelihood of side effects.

It is also of importance to realize that an estimated 50% of the adult US population—approximately 90 million people—have low health literacy and may have difficulty understanding health-related information provided by a physician, including written discharge instructions (Ruddell, 2006). It has been further estimated that 1 in 5 adults cannot read the front page of a newspaper (Ruddell, 2006). In addition, a strong inverse relationship exists between increasing age of the population and low health literacy. According to the 2000 US population census, more than 11% of the population (30 million people) was born outside of the United States (Ruddell, 2006). Approximately 21 million of these immigrants exhibit limited English proficiency (LEP; limited ability to speak, understand, read or write English) (Ruddell, 2006). Patients exhibiting LEP present a number of obstacles to the health care provider regarding diagnosis and management. Language barriers can lead to a lack of adherence to specified treatment plans and have been associated with more emergency department patient visits. Just as interpreter services are used to communicate with a patient during his or her evaluation, interpreter services should be used to review instructions before discharge. If available, have the discharge instructions translated into the patient's primary language.

Another important component of well-written discharge instructions is that they clearly explain any outstanding test results that need follow-

*Care must be taken in choosing the proper wording for a discharge diagnosis. A patient's definitive diagnosis is sometimes not known at the time of discharge from the emergency department. A definitive diagnosis, such as "strep throat," should be listed only when this diagnosis is in fact known*

up. For example, depending on the practice pattern of your particular hospital, a final radiology interpretation by an attending radiologist may not be available at the time of the patient's discharge. An appropriate way to communicate this to the patient may be, "Preliminary review of the CT scan of your head did not show any acute abnormality. Please follow up with your primary care physician to obtain the official interpretation of this study." Likewise, although a rapid strep test may be negative in the emergency department, a formal throat culture, if taken, may still be pending at the time the patient is discharged, and the patient must be instructed on how to follow up on this result.

In summary, discharge instructions play several critical roles. They help a patient understand what is known about their condition and what was done for them in the emergency department. They also provide a plan for treatment and follow-up and reasons to return to the emergency department. Taking the time to generate well-thought-out discharge instructions is a habit that should be formed early.

## Suggested Reading

Ruddell J. *Effective Patient-Physician Communication: Strengthening Relationships, Improving Patient Safety, Limiting Medical Liability.* Lebanon, Pa: Westcott Professional Publications, 2006.

*This is an educational module on effective patient–physician communication.*

CHAPTER 15

# *Documentation*

Although as important as verbal communication skills, written documentation is unfortunately understressed in many clinical areas. The medical record allows us to communicate with our colleagues and can provide a glimpse into the caregiver's thought process. Traditionally, entries in the medical record are handwritten. However, depending on the resources and system used at your particular facility, the "emergency department treatment record" may be dictated and transcribed or computer generated. Some institutions may use a complaint-based templated charting system (either handwritten or electronic) to promote accurate documentation. An advantage of templated charting systems is that they prompt the caregiver to answer patient-related questions that may enhance and streamline the coding and billing process. A disadvantage or limitation of the pure templated chart is that it is mostly a checkbox and slash documentation tool that provides little opportunity for the care provider to document in paragraph form his or her thought process. When a templated chart is reviewed days or weeks later, it may be difficult to get a true sense of the patient presentation. An example of a templated emergency department chart for a complaint of chest pain can be found at www.tsystem.com/library/media/images/sample-ep-chest-pain-front.jpg.

*The medical record should be used to document the patient's encounter with the goal of communicating your thought process in a manner that can be helpful to future practitioners caring for that particular patient.*

Handwritten charts have their advantages and disadvantages. The main advantage of a handwritten chart is the ability to document in the medical record in real time at the bedside as care is being provided. The chart can be completed in parallel to providing patient care. However, a number of limitations exist with handwritten charts; first and foremost is legibility. Illegible or confusing handwriting by clinicians in addition to the use of dangerous medication abbreviations has been shown to be an underlying factor associated with many medication errors. Another limitation can be the variability of thoroughness or completeness of the medical record. With handwritten charts, the depth of the documentation is very dependent on the practitioner. Some practitioners will take the approach of documenting the minimum necessary information to achieve a particular billing level or to convey the pertinent facts of the case. Time constraints also may affect the depth of documentation. Brief or minimal documentation does not necessarily reflect a lack of attention to detail.

*It is important that the emergency department treatment record reflect the full extent of the evaluation and treatment performed in the emergency department.*

Regardless of the method of documentation used to complete the emergency department treatment record, the principles of documentation

*Remember the time honored saying, "If it isn't documented, it didn't happen."*

are the same. The medical record should be used to document the patient's encounter with the goal of communicating your thought process in a manner that can be helpful to future practitioners caring for that particular patient. Each encounter should be documented and at a minimum contain pertinent elements of the H&PE, assessment, and plan. This is the "SOAP note" format (subjective, objective, assessment, plan). Your approach to completing the medical record should mirror your approach to performing the H&PE—focused but thorough. However, as a medical student, documentation in the medical record, specifically in the emergency department, may be limited because of guidelines set forth for teaching physicians by the Centers for Medicare and Medicaid Services. These guidelines can be viewed at www.cms.hhs.gov/MLNProducts/downloads/gdelinesteachgresfctsht.pdf.

A brief review of these guidelines follows. A medical student may document services in the treatment record; however, the teaching physician may refer only to the student's documentation of an evaluation and management service that is related to the ROS and past medical, family, and social history. The teaching physician must verify and document the HPI, the physical examination, and the medical decisionmaking process. These guidelines do not necessarily curtail the degree of involvement that students have with a patient or limit their autonomy. Although your ability to document in the emergency department treatment record may be limited, your understanding of the importance of proper documentation is nonetheless essential. Please check with your clerkship director to clarify the documentation guidelines for the particular clinical site to which you are assigned. A template H&PE form that you can use for your emergency department patient encounters is included at the end of this section.

It is important that the emergency department treatment record reflect the full extent of the evaluation and treatment performed in the emergency department. Remember that the patient's chart contains more than just the physician's note. It contains other equally important elements, such as registration data, nursing notes and assessments, and prehospital run sheets, if applicable. You also have the added responsibility of reviewing this information, specifically nursing and prehospital notes, for accuracy or any discrepancies. The following are a few helpful hints for documentation:

- Date and time all of your notes in the medical record.
- Write your notes legibly.
- If you make a mistake, draw one line through it and sign your initials.
- Document a focused but thorough H&PE.
- Document vital signs and address abnormalities.
- Document the results of all diagnostic tests you have ordered.
- When you speak to a consultant, document name and times.
- Document the patient's response to therapy.
- Document repeat examinations.
- Document your thought process (medical decisionmaking).
- Never write derogatory comments in the medical record.
- Never change or add comments to the medical record after the fact. It may be appropriate to add an addendum, but only if it is properly timed and dated.

- Document your procedures.
- If a patient leaves AMA, document that you have explained the specific risks of leaving AMA.
- Document plans for outpatient care and follow-up.

Last, in the event of an unanticipated bad outcome, patient complication, or death, the chart in its entirety may be reviewed in a peer-review process or in a malpractice suit if the case proceeds to litigation. In these situations, your documentation serves as your main defense. Remember the time honored saying, "If it isn't documented, it didn't happen." Keep in mind that, at times, you may have a difference of opinion with a colleague or a less-than-professional interaction with a consultant. If this occurs, it is never acceptable to use the medical record to fight with colleagues—the so called "chart wars." If a consultant is not answering a page, simply note, "At the time of this dictation, Dr. XXX has not called back." Similarly, if you disagree with a consultant's plan, document this using nonjudgmental language. It can also be helpful to record the specific times of certain events in complicated cases or to add addendum notes if the condition of the patient changes or if the patient is in the emergency department for an extended period of time.

Adherence to coding and billing guidelines will also influence documentation. Although a review of these guidelines is beyond the scope of this Primer, recognize that patients are billed according to the complexity of their visit. To substantiate this billing, there must be enough documentation of the H&PE and medical decisionmaking elements to support the level of care provided.

Although you are developing your own personal style of documentation, consider who will be potentially reading your chart (e.g., other medical students, billing personnel, nurses, residents, attendings, and possibly lawyers). By doing so, it will become more clear what your documentation should and should not consist of. In addition, you should never write anything in the medical record that you would be uncomfortable having shown to a jury. Although it might seem like an added burden at times, especially during a busy shift, proper documentation is of paramount importance.

## Suggested Reading

Center for Medicare and Medicaid Services. *Guidelines for Teaching Physicians, Interns, and Residents*. Washington, DC: Department of Health and Human Services; 2007. Available at: http://web.msm.edu/compliance/TPguidelines.9.06.pdf. Accessed March 6, 2008.

*This document outlines documentation guidelines for physicians in a teaching setting who are paid under the Medicare Physician Fee Schedule.*

Template H&PE Form

# NOT PART OF THE MEDICAL RECORD

| | |
|---|---|
| Chief Complaint: | |
| History of Present Illness (Key elements; onset, location, duration, quality, modifying factors, associated symptoms): | |
| LMP: | Last Tetanus: |
| **Past Medical History** | **Physical Examination** |
| | Vital signs: |
| | General appearance: |
| | HEENT: |
| | Heart: |
| Past Surgical History: | Lungs: |
| Family History: | Abdomen: |
| Social History: | Genitourinary: |
| Medications: | Extremities: |
| Allergies: | Neuro: |
| Pertinent ROS: | Skin: |
| **Differential Diagnosis**<br><br>1.<br>2.<br>3.<br>4.<br>5. | **Treatment Plan** |

CHAPTER 16

# *Enhancing Your Oral Case Presentation Skills*

The ability to present a case in a clear, concise, and organized fashion is a skill in and of itself separate from the ability to obtain a detailed H&PE. Because few medical interviews are directly observed, the oral case presentation serves as a surrogate assessment of your ability to perform an accurate H&PE, to analyze and synthesize relevant clinical data, and to formulate a well-thought-out treatment plan. From an educational standpoint, your case presentations allow the preceptor to gauge your understanding of the case. This is important to remember because most of the educational discussion with your preceptor revolves around your presentation. Regarding your presentation, your preceptor generally has two fundamental goals. The first will be to focus on patient-related issues to better understand what is wrong with the patient. The second will be to ascertain your understanding of the case to focus his or her teaching points better. Your preceptor will be asking you questions that are patient centered and diagnosis driven. He or she will be functioning as an expert consultant and will focus on areas of the presentation that require further clarification or areas that were missed. Your preceptor will ask questions to further clarify specific aspects of the HPI, such as onset, location, duration, quality, aggravating or alleviating factors, and the like. Your preceptor may also ask you direct questions to better access your knowledge base. "What antibiotics should we use to treat this patient?" "What is the differential diagnosis of right upper quadrant pain?" Alternatively, your preceptor may inquire about your overall assessment of the case by asking you, "What do you think is wrong with the patient?" or "What diagnostic studies should we order?" Questions such as these are higher order questions and explore your clinical reasoning and problem-solving abilities.

*From an educational standpoint, your case presentations allow the preceptor to gauge your understanding of the case.*

Your case presentations in the emergency department should generally be brief and focused. The traditional case presentation should include a directed opening statement. Included in the opening statement should be the patient's chief complaint and any pertinent past medical history. For example—

> *Mr. Brown is a 54-year-old male with a history of hypertension and noninsulin-dependent diabetes who presents with left-sided exertional chest pain and shortness of breath.*

By linking pertinent information early in your presentation, your preceptor can better focus on the case. After the opening statement, you should present a more detailed description of the HPI and perti-

*Case presentations in the emergency department should generally be brief and focused.*

nent ROS. An important point to remember is that some information obtained during the medical interview will, in retrospect, be extraneous and not relevant to the presenting complaint. Throughout your presentation, it is necessary to focus on aspects of the medical history that are relevant to the presenting complaint and to exclude irrelevant information. Additional information that should be included in the traditional case presentation is a detailed past medical history, medications, allergies, a directed physical examination, diagnostic impression, and a diagnostic and treatment plan. Although exceptions exist, most cases can be presented in 2 to 3 minutes. This is in stark contrast to the more comprehensive format used for inpatient case presentations, which typically are much longer.

An alternative approach is the assessment-oriented case presentation. Cases that lend themselves well to this approach are those in which the diagnosis is or appears to be straightforward. The presentation begins, rather than ends, with your assessment and plan, followed by information that supports your conclusions. This style of case presentation is commonly used by physicians with more clinical experience—mid-level and senior residents. When using an assessment-oriented presentation style, the directed opening statement should include the diagnostic impression followed by a treatment plan. For example—

> *Mr. Brown is a 54-year-old male who presents with what seems to be cardiac chest pain. I would like to obtain an ECG, chest radiograph, cardiac enzymes, give him an aspirin, and admit him to a monitored bed for a cardiac rule-out.*

After this opening statement, additional historical data, including pertinent positive and negative features, can then be presented that supports the clinical assessment. For example—

> *He presents with left-sided exertional chest pain described as pressure and shortness of breath. His chest pain started approximately 2 hours ago while climbing stairs and was relieved after resting, and so forth.*

*When using an assessment-oriented presentation style, the directed opening statement should include the diagnostic impression followed by a treatment plan.*

It is common for assessment-oriented case presentations to be used when calling an emergency department patient in to the admission team or when discussing a case with a consultant. Admission or consultant presentations have a different focus than standard or traditional case presentations. When a consultant is contacted, a provisional or preliminary diagnosis has usually been made, and you are calling the consultant to assist in the care of the patient. It will be helpful to your consultant if early in your discussion, you make him or her aware of why you are calling. A typical exchange would be as follows:

> *Hello, this is Michael Stevens. I am a senior medical student working in the emergency department with Dr. Tarver. I am calling you about a patient that we would like you to see in consultation. Our patient is a previously healthy, 38-year-old, right-hand dominant male. His name is Richard Seaver. He has a displaced midshaft fracture of his right radius and ulna that occurred after slipping on the ice approximately 1 hour ago. His distal pulses are intact, and he can move all of his fingers. We have placed his forearm in a volar splint.*

This type of presentation is focused and contains relevant information that will be requested by the consultant. If the consultant would like additional information, it can easily be provided. By providing clinically relevant information in this assessment-oriented fashion, we are not overburdening our consultant or an admitting team with a lengthy presenta-

tion over the telephone that is difficult to follow. It is good form to speak to the admitting team or consultant in more depth in person to answer any questions that they may have.

The assessment-oriented presentation is also commonly used by emergency medicine residents and attending physicians during sign in–sign out rounds. Typically, when an attending physician transfers the care of his or her patients to the incoming attending, he or she will be caring for patients who have an established diagnosis and who will be admitted to the hospital and others with a preliminary diagnosis and pending diagnostic studies. At times, it may be necessary to sign out a dozen or more patients. Because of the patient volume and time constraints, it is necessary to focus the "sign outs" to the relevant information: known or preliminary diagnosis, pending diagnostic studies, likely disposition, and any other matters that need to be addressed.

Finally, each preceptor has his or her own unique reasoning process and preferences regarding the style of case presentation expected from a student. Because of the limited preceptor continuity during your emergency medicine clerkship, you will work with supervisors with different teaching styles and different expectations. Some expect more information, some expect less. Some faculty members will remember many details; others may ask you for information that you were about to provide or have already covered. There are few absolutes regarding styles of case presentations. Some physicians prefer the "cut-to-the-chase" approach; others prefer the organized chronologic detailed case presentation, whereas others may have you present the case at the patient's bedside.

## Suggested Reading


Elliot DL, Hickam DH. How do faculty evaluate students' case presentations? *Teach Learn Med*. 1997;9:261–263.

*The authors identify characteristics that internal medicine faculty associate with competent third-year students' oral case presentations.*

Green EH, Hershman W, DeCherrie L, et al. Developing and implementing universal guidelines for oral patient presentation skills. *Teach Learn Med*. 2005;17:263–267.

*A prospective before-and-after study based on the premise that oral case presentation skills can be improved by standardizing the content formula of oral case presentations and introducing an assessment-oriented model for the summary.*

Maddow CL, Shah MN, Olsen J, et al. Efficient communication: assessment-oriented oral case presentation. *Acad Emerg Med*. 2003;10: 842–847.

*This paper reviews the assessment-oriented oral case presentation and reports a prospective case-controlled study comparing emergency medicine resident case presentations, according to the style used.*

CHAPTER 17

# *Interacting With Consultants and Primary Care Physicians*

*Consultation is a necessary and essential part of the practice of emergency medicine.*

In emergency medicine practice, we interact daily with specialty consultants and our patients' primary care physicians. In addition, we must relay important patient-related health information to the inpatient service assuming care of our admitted patients. Communication is also necessary to facilitate follow-up care after a patient is discharged from the emergency department. Many times this task can be accomplished with clearly stated written discharge instructions; however, a phone call to the patient's primary care provider or to a specialist may be needed to facilitate follow-up care in a timely fashion. It is therefore imperative that we communicate effectively with other members of the health care team.

Consultation is a necessary and essential part of the practice of emergency medicine. Because of the challenges we face providing care across the spectrum of age and illness, emergency physicians rely on the consultation process to assist in delivering high-quality health care. "Emergency department consults" vary in urgency from the routine nonurgent consult to the "stat" consult, in which a specialist is needed at the bedside of a patient requiring an emergent procedure or operation. For effective consultation to occur, students must better understand the process. Consultations are often initiated over the phone. Some occur during routine business hours, whereas others unfortunately occur in the middle of the night. Keep this in mind, as many of our professional colleagues are not "shift workers" like most emergency physicians, and many will have clinical responsibilities the next day. For this reason, do not burden consultants with routine or nonurgent phone calls during sleeping hours. From the consultant's stand point (and rightly so), nonurgent patient evaluations or procedures can often wait until the next morning. That being said, in an emergency, do not hesitate to involve a specialist if his or her services are required to assist in the care of the patient, regardless of the time of day.

Effective communication is one of the keys to a mutually beneficial interaction and relationship with your consultant. As a general rule, consider the following when talking with a consultant:

- Speak clearly and start slowly, especially if you've woken a consultant from sleep.
- Introduce yourself by name as a medical student and give the name of your supervising resident or faculty.

- Learn with whom you are speaking (name, service, position), not only to document this information but also to confirm that you are speaking with the correct person or service.
- Be respectful and expect respect in return.
- Be focused and direct with your presentation.

  Often, it is best to begin with a diagnosis (known or suspected) rather than the traditional case presentation. For example, you may start your assessment-oriented presentation to your surgical consultant with the following:

  > *Hi Dr. Stevens, I am Michael Jones, a senior medical student working with Dr. Taylor in the emergency department. We are consulting you on a 24-year-old male who we are concerned has acute appendicitis. He presents with approximately 4 hours of abdominal pain that has migrated to his right lower quadrant associated with a fever of 101°F, nausea, and anorexia. On physical examination, his heart rate is 88, his blood pressure is 136/84 mm Hg, and he has rebound tenderness in the right lower quadrant. We would like you to come to the emergency department to evaluate him.*

- Be flexible with your presentation style.
- With experience, you will realize that some consultants prefer a detailed presentation, whereas others are satisfied with a focused presentation over the phone and a more detailed presentation at the bedside.
- Speak your consultants' languages, and tailor the presentation to the specific service.
- Whether you are describing a fracture for an orthopedist or interpreting an ECG for a cardiologist, it is necessary to communicate effectively to facilitate the best patient care.
- All consultations should be initiated with a goal in mind. This goal may range from facilitating an admission to a particular service, a recommendation for antibiotics or a bedside consultation. At times, it will be necessary to explain to the consultant exactly why you are calling him or her. Keeping this in mind; excellent communication skills will work in your favor. Remember, a subtle yet important distinction exists between telling a surgical consultant "you need to take this patient to the operating room" versus "I have a patient that I believe needs to go to the operating room."
- Summarize the expectations or agreements communicated at the end of your conversation. This should help avoid any misunderstandings. Examples might include how urgently the patient needs to be seen or how long before the consultant expects to see the patient in the emergency department. This is also a good time to clarify whether the consultant has further questions or needs additional information.
- Document the discussion with your consultant. Include the consultant's name, service, time you spoke, and a brief notation regarding the conversation (i.e., "9:00 PM, case discussed with Dr. Michaels, orthopedics. He will be down to see the patient in 30 minutes.").

*All consultations should be initiated with a goal in mind. Effective communication is one of the keys to a mutually beneficial interaction and relationship with your consultant.*

Keeping these points in mind, the effective partnership established between emergency physicians, consultants, and primary care phy-

*Outstanding communication and interpersonal skills are necessary to be a successful clinician.*

sicians will undoubtedly result in improved health care outcomes for all patients who present to the emergency department for unscheduled care. However, despite our best efforts, there are times when an interaction with a professional colleague is challenging. Some of these situations may result because of time pressures and workload frustrations and should not be taken personally. Other times, challenging interactions may occur as a result of differences of professional opinion, different expectations, or, on rare occasion, unprofessional behavior. It is important to emphasize that, if an interaction occurs with a colleague that you view as unprofessional (i.e., condescending language), avoid the tendency to be unprofessional in return. If a situation such as this should arise, it is always of utmost importance to keep in mind the patient's best interest and well-being.

In summary, outstanding communication and interpersonal skills are necessary to be a successful clinician. In many ways, putting forth the effort to have collegial working relationships with your professional colleagues is as important as striving to enhance patient satisfaction. Like any other activity in medicine, the art of consultation and communication is important for patient care and consultant or primary care physician satisfaction. If necessary, rehearse your presentation with your supervising faculty or resident before presenting the case to a consultant. Discuss the most important features of the case, including strategies to use if specific questions or concerns are raised. Be direct and concise, clearly expressing your goals to the consultant or primary care physician. Flexibility with your communication style is crucial, because consultants from different specialties generally prefer emergency department presentations to have slightly different styles. Because consultants and primary care providers are integral to emergency medicine practice, learning the importance of professional interactions early in your training is critical to your future success as an emergency physician.

## Suggested Reading


Garmel GM. Conflict resolution in emergency medicine. In: Adams J, ed. *Emergency Medicine*, Elsevier (expected publication date 2008).

*This chapter is a review of the challenging topic of conflict resolution, including a discussion of the consultation process. This chapter also describes approaches to improve interactions with colleagues.*

Guertler AT, Cortazzo JM, Rice MM. Referral and consultation in emergency medicine practice. *Acad Emerg Med.* 1994;1:565–571.

*This article describes the referral and consultation process in emergency medicine, sharing how their appropriate use can improve the quality of patient care.*

Holliman CJ. The art of dealing with consultants. *J Emerg Med.* 1993;11:633–640.

*This is a classic article that presents guidelines for interactions with consultant physicians. Descriptions of several political issues and the importance of maintaining good relations with consultants, and how these relate to emergency care, are provided.*

Lee RS, Woods R Bullard M, et al. Consultations in the emergency department: a systematic review of the literature. *Emerg Med J.* 2008;25:4–9.

*This review discusses many important aspects of the consultation process in emergency medicine.*

Murphy-Cullen CL, Morgan LW, Streiff I, et al. Consultation skills for residents. *J Med Educ.* 1988;63:873–875.

*This article focuses on consultation skills needed by residents. It also discusses pitfalls in the consultation process.*

Salerno SM, Hurst FP, Halvorson S, et al. Principles of effective consultation: an update for the 21st century consultant. *Arch Intern Med.* 2007;167:271–275.

*This research is the result of a survey completed by primary care and specialty consultants addressing the "ideal" relationship with consultants. The main conclusion of this article is that specialty-dependent differences exist in consult preferences of physicians.*

CHAPTER 18

# *Patient Satisfaction—Meeting Patients' Expectations*

*The perception of what we do as health care providers is based on patient satisfaction and meeting patient expectations.*

Much of the perception of what we do as health care providers is based on patient satisfaction and meeting patient expectations. Although most of the clinical and preclinical training we receive as physicians revolves around developing the skills to provide excellent patient care, little emphasis is placed on enhancing patient satisfaction (people skills). For those of us who have had the roles reversed, the frustrations encountered by patients can be better placed in context. Together with the taxing environment of a busy, slightly chaotic emergency department, you have a recipe for disaster unless you can remember that we are all in the customer service business. Often, the little things such as saying "I am sorry that you have been waiting so long, but how can I help you?," "I will be right with you," "You look cold, can I get you a blanket?," can go a long way in comforting a patient, developing rapport, and improving patient satisfaction. Patients who are made comfortable and treated with respect are more often satisfied with their care.

## What Do Patients Want?

Patients want to be kept informed: They are more likely to be satisfied with their emergency department experience if kept informed about their condition, plans for treatment, and any delays that they may encounter during their stay in the emergency department. Some patients also present to the emergency department with expectations of receiving a diagnostic test or a medication prescription. Others may fear the diagnosis of a serious health condition. Our role is also to comfort and educate our patients. By doing so, we can better meet their expectations.

Patients want to be cared for in a timely manner: When presenting to the emergency department, many patients view their complaint as an emergency and therefore expect to be cared for in a timely manner. Not surprisingly, there is a strong correlation between dissatisfaction and excessive emergency department wait times. Interestingly, perceived wait times correlate more strongly with patient satisfaction than do actual wait times.

Patients want to receive high-quality health care. It is not a surprise that patients expect to receive high-quality health care when they present to the emergency department. However, patients' and the physician's perception of high-quality do not necessarily coincide. A patient's perception of high-quality is determined largely by the nature of his or her interpersonal interactions with the health care team, the adequacy of information pro-

### Patient Wish List

- Patients want to be kept informed.
- Patients want to be cared for in a timely manner.
- Patients want to receive high-quality health care.

vided, and the resolution of symptoms. The emergency physician, however, may judge quality differently, often focusing on ruling in or out serious health conditions, avoiding unnecessary diagnostic testing, and expediting disposition rather than being able to make a definitive diagnosis or being able to alleviate all of the patient's presenting symptoms.

*Patient satisfaction is increasingly being recognized as a key service goal by hospital administrators, patient advocacy groups, hospital accreditation organizations, and, of course, patients.*

## Why Patient Satisfaction Matters

First and foremost, patients deserve to be satisfied. No matter how you look at what we do, we are in the patient satisfaction business. Patient satisfaction is increasingly being recognized as a key service goal by hospital administrators, patient advocacy groups, hospital accreditation organizations, and, of course, patients.

Satisfaction affects patient care: Between 5% and 10% of patients leave the emergency department without being seen by a physician or leave AMA before their course of treatment is complete. Long wait times and perceived inadequacy of care are major contributors to patients' leaving the emergency department prematurely. These patients are at risk for potentially serious adverse outcomes that might be avoided with greater attention paid to patient satisfaction.

## How Can I, As a Medical Student, Make a Difference?

Medical students can play a significant role in enhancing patient satisfaction. At times, students are one of the first health care providers to be involved in the care of a patient. Because of this, they play an important role and can have a dramatic impact on patient satisfaction. Patients who report positive student–patient encounters regardless of the health care setting (inpatient, ambulatory care, or emergency department) are more comfortable discussing personal health information and being examined by a medical student and anticipate greater benefit from future medical student involvement than patients who reported having prior student encounters that were not positive (Wald, 2007). In addition, most emergency department patients have positive perceptions of medical students, particularly patients who have had prior medical student interaction.

### Provide Information to Patients

Students generally have more free time than other members of the emergency department care team, and they are in a unique position to be able to spend time with their patients without compromising other duties. Students can greatly enhance patient satisfaction by keeping patients informed about their condition and plans for their care and by ensuring that they understand potential delays in their emergency department course. Obviously, students should not communicate information to patients that they themselves do not fully understand. Students should not hesitate to say, "I don't know, but I can find out," when confronted with difficult questions. Discussing truly sensitive topics, delivering bad news, or informing a patient of unexpected test results are best left to more senior members of the health care team.

### Reduce Perceived Wait Times

Students are generally not in a position to affect actual wait times or to have a dramatic effect on moving patients through the system. However, they may be able to lessen a patient's perception of long waiting times, particularly once the patient has been placed in a treatment room but has not yet been seen by the physician or if they are waiting for test results. They can do this by inquiring about and attending to their patients' needs. Patients are likely to perceive wait times spent in physical

*Students often spend more time with their patients than other members of the emergency department team and may be uniquely aware of their needs and concerns.*

discomfort or boredom as longer than they really are. Small gestures such as providing blankets for warmth, reading material or companionship, or something to eat (assuming the patient is not NPO) are likely to go a long way toward improving patient's comfort and shortening their perceived wait times.

## Be an Advocate for Your Patients

Students often spend more time with their patients than other members of the emergency department team and may be uniquely aware of their needs and concerns. Ironically, students often perceive their own role as superfluous and assume that everything they know about their patients is known by the rest of the team. Nothing could be further from the truth, and students can play a key role in ensuring that their patients' needs are met. When patients have needs that they are unable to meet themselves, students should make other members of the care team aware of those needs and work with the care team to meet them. This may mean asking the nurse to evaluate a suspected infiltrated IV catheter, asking the resident to order analgesia for a patient who is in pain, or asking the attending to help explain the implications of an abnormal test result. The important issue is that students advocate for their patients while ensuring that their patients are comfortable, well informed, and well cared for by the emergency department team.

## Suggested Reading


Boudreaux ED, Mandry CV, Wood K. Patient satisfaction data as a quality indicator: a tale of two emergency departments. *Acad Emerg Med.* 2003;10:261–268.

*This cross-sectional, observational study evaluated specific factors in patient satisfaction.*

Chan TC, Killeen JP, Kelly D, Guss DA. Impact of rapid entry and accelerated care at triage on reducing emergency department patient wait times, lengths of stay, and rate of left without being seen. *Ann Emerg Med.* 2005;46:491–497.

*This prospective observational study sought to determine the effect of a new rapid entry and accelerated care at triage process on the frequency of patients who leave before being seen in one emergency department.*

Hedges JR, Trout A, Magnusson AR. Satisfied patients exiting the emergency department (SPEED) study. *Acad Emerg Med.* 2002;9:15–21.

*This prospective, cross-sectional study in an urban university hospital assessed patients' actual and self-perceived waiting times in the emergency department.*

Magaret ND, Clark TA, Warden CR, et al. Patient satisfaction in the emergency department—a survey of pediatric patients and their parents. *Acad Emerg Med.* 2002;9:1379–1387.

*This convenience sample survey of pediatric patients and their caregivers in a pediatric emergency department assessed the patients' and caregivers' satisfaction, as measured by a variety of criteria.*

Wald DA, Yeh K, Ander DS, et al., on behalf of the Emergency Medicine Medical Student Educators Research Group. Patient perceptions of medical students in their health care. How much do first impressions count? *Annals Emerg Med.* 2007;50:6A.

*This self-administered survey of emergency department patients reports the attitudes and perceptions of patients regarding the involvement of medical students with their health care.*

CHAPTER 19

# *Providing Anticipatory Guidance*

*Providing anticipatory guidance is an important part of the student–patient encounter in the emergency department.*

Although more commonly discussed in its role in pediatrics and adolescent medicine, providing anticipatory guidance is an important part of the student–patient encounter in the emergency department. As you interview your patient, you will learn about his or her lifestyle habits, tobacco use, alcohol consumption, illicit substance use, medication compliance, and the like. You can have an active role in preventive care guidance. The following paragraphs cover a number of topics that can be addressed at one time or another during your patient encounters in the emergency department. It is unlikely, and maybe even somewhat counterproductive because of time constraints, to address every one of these topics with each patient you encounter. Instead, it may be best to selectively approach each case in an individual fashion and provide anticipatory guidance to your patients on what you determine to be the most high-yield topics.

## Smoking Cessation

Cigarette smoking remains the leading cause of preventable morbidity and mortality in the United States, accounting for more than 400,000 deaths annually (Centers for Disease Control and Prevention, 2006). In the primary care setting, screening and counseling have been shown to be effective methods of improving smoking cessation. Although less studied in the emergency department, consider screening patients for tobacco use and outpatient referral to their primary care physician for initiation of a smoking cessation program. Brief counseling or providing self-help literature may also be reasonable interventions in the emergency department.

## Alcohol Abuse

Excessive alcohol use is the third leading cause of preventable deaths in the United States, resulting in an estimated 75,000 alcohol attributable deaths annually (Midanik et al., 2004). These patients are at risk of developing chronic liver disease, hepatic carcinoma, and acute alcohol poisoning. Excessive alcohol contributes significantly to unintentional injuries, including motor vehicle collisions, falls, drownings, and burns, as well as many intentional acts of violence. Consider screening emergency department patients for excess alcohol use and provide patient information for treatment as warranted. A simple-to-apply alcohol abuse screening tool is "CAGE," which is shown in the accompanying box.

**Alcohol Abuse Screening Tool**

"C" – Have you ever felt that you should cut down on your drinking?

"A" – Have people annoyed you by criticizing your drinking?

"G" – Have you ever felt guilty about your drinking?

"E" – Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover (eye-opener)?

Answering yes to any of these questions should lead you to suspect excessive alcohol use and to pursue more detailed questioning.

## Fall Prevention in the Elderly

Falls are the leading cause of injury-related death in elderly patients and are the leading cause of injury related visits to the emergency department for patients over the age of 65 years (Fuller, 2000). Strategies to decrease falls include installing handrails on both sides of a stairway, as well as grab bars next to the toilet, tub, and shower. Clutter and throw rugs in walkways should be removed, and nonslip mats should be placed in bathtubs and on shower floors. The entire home of elderly patients should be well lit, and regular physical activity to build lower body strength and balance should be encouraged. When caring for an elderly patient in the emergency department, it may be reasonable to review fall prevention strategies.

## Traumatic Brain Injury Prevention

More than 1.4 million people sustain a traumatic brain injury annually in the United States, resulting in approximately 50,000 deaths and more than 200,000 hospitalizations each year (National Center for Injury Prevention and Control, 2007). These injuries are caused by falls (28%), motor vehicle collisions (20%), objects (19%) and assaults (11%; National Center for Injury Prevention and Control, 2007). Preventive steps against traumatic brain injury including using a seatbelt at all times when riding in a motor vehicle and placing children in child safety or booster seats until they are old enough for a seatbelt. Window guards protect children from falling out of open windows. Safety gates should be placed at the top and bottom of stairways if young children are in the home. Playground surfaces should be made of shock-absorbent materials. Fall prevention techniques listed previously for the elderly also protect young children from head injury.

Bicycle helmets are known to reduce the risk of bicycle-related head injury by 80%, but helmets are worn by only 15% of children and 19% of adults. Their use should be encouraged in children and adults when riding a bicycle, motorcycle, snowmobile, scooter, or all-terrain vehicle. Helmets should also be used during horseback riding, skiing, snowboarding, inline skating, ice skating, skateboarding, baseball, and contact sports such as hockey or football. In selected circumstances, anticipatory guidance for strategies designed to reduce the incidence of traumatic brain injury can be provided to patients and their families in the emergency department.

## Seatbelt and Pediatric Safety Seat Use

In 2007, seatbelt use in the United States by all motorists was estimated to be at 82% (Glassbrenner and Ye, 2007). It has also been well established that the use of seatbelts saves lives, as evidenced by the vehicle occupant fatality rate declining over the past 10 years as seatbelt use has steadily increased. Further, it is estimated that almost 60% of fatalities involving passenger cars and light trucks were unrestrained (National Highway Traffic Safety Administration, 2002). The use of age- and size-appropriate restraint devices for children reduces serious and fatal injuries by more than half. More specifically, child safety seats reduce the risk of fatal injuries by 71% for infants and by 54% for toddlers (Glassbrenner and Ye, 2005). Additional information regarding child safety seats can be found on the American Academy of Pediatrics Web site (www.aap.org/family/carseatguide.htm) and the National Highway

Traffic Safety Administration Web site (www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.9f8c7d6359e0e9bbbf30811060008a0c/). Because restraint use by children often parallels the driver's use, encourage parents to buckle up as well. Advocacy for the use of seatbelts and pediatric safety seats for our emergency department patients is imperative.

## Poisoning, Accidental Overdose, and Medication Noncompliance

The overwhelming majority (84%) of poison exposures are unintentional, with 51% of exposures occurring in children younger than 6 years (Watson et al., 2005). Even though most exposures are unintentional, the majority of poisoning fatalities in adolescents and adults were intentional. However, the number of reported fatalities in children younger than 6 years (largely unintentional) has remained unchanged for the past two decades. Categories of substances with the largest number of reported exposures include analgesics, cleaning products, cosmetics, sedatives, hypnotics, and antipsychotics. The following categories of substances were associated with the largest numbers of fatalities: analgesics, sedatives, hypnotics, antipsychotics, antidepressants, stimulants, and street drugs.

Patients or their caregivers should be advised to keep medications and household chemical products in their original containers and to store them in a childproof cabinet. They should carefully follow the directions on all medication and chemical product labels. Remind patients and their caregivers to avoid taking medication in front of children, to not call medicine candy and, likewise, never store household chemicals in a food or beverage container. Poisonous house or yard plants should be removed from the home. All families should have the Poison Control Center number readily available. This is another important issue to discuss with caregivers who have small children living in the household.

All too often, we find that patients do not take their medications or do not take them as prescribed. Antibiotics doses are commonly missed, whereas analgesics, particularly acetaminophen-containing products, are taken in excess or parents administering them to young children inadvertently miscalculate doses. The unintentional excess administration of these with other medications can result in significant consequences. Many prescription and over-the-counter analgesics and other preparations contain acetaminophen or ibuprofen. Some patients unknowingly take multiple medications with the same active ingredients. Gastrointestinal side effects or renal toxicity can be associated with excess ingestion of ibuprofen, whereas hepatotoxicity can occur with excess administration of acetaminophen-containing products.

Medication noncompliance can occur for a number of reasons, including lack of adequate finances, intolerable side effects, misunderstanding, religious or cultural objections to certain prescribed therapies, or a false sense of omnipotence. It is important to try to understand the reasoning behind patients' decision to forego medication so you are better able to address their specific concerns. Alternatively, some patients feel that the dose their physician prescribed is not relieving their symptoms, so they take a stronger dose or take their medication more frequently than prescribed. Because of the reasons listed here, it may be reasonable to review your patients' medications with them to limit the likelihood of complications related to excess or inappropriate medication administration.

## Drowning

Drowning remains a leading cause of unintentional deaths in the United States and was responsible for more than 3,300 deaths in 2004. Many of

### Poison Control Hotline

1-800-222-1222

This number will route the call to a local poison center based on the area code and exchange of the caller. The number is functional 24 hours a day in the 50 states, the District of Columbia, the US Virgin Islands, and Puerto Rico.

these unintentional drownings (78%) were men (Injury Center, 2007a). A number of risk factors for drowning and submersion injuries have been identified: lack of supervision and barriers such as pool fencing, recreation activities in natural water settings, recreational boating, alcohol use, and patients with seizure disorders.

In children ages 1 to 4 years old, most drowning occurs in a swimming pool, and the majority of these children were out of their parents' sight for less than 5 minutes. For those with a seizure disorder, drowning most commonly occurs in the bathtub. Strategies for drowning prevention include parental vigilance, safety latches on bathroom doors to prevent infant or toddler entry, safety fencing around household pools, and showering as the preferred method of cleansing for those with a seizure disorder. Anticipatory guidance for preventing water-related injuries may be more applicable to the summer months and to patients living in warmer climate areas.

## Smoke Detectors

Four out of five fire-related deaths occur in the home, and approximately half of home fire deaths occur in homes without smoke detectors. Most fire victims die from smoke or toxic gas inhalation, rather than from the burns (Injury Center, 2007b). Those at greatest risk of fire-related death and injury include children younger than 5 years, the elderly, and those who live in rural areas or substandard housing (Injury Center, 2007b). Preventive measures include installing and maintaining smoke alarms and carbon monoxide detectors on every floor of the home. Flammable objects, including loose fitting clothing, should not be near the stove or space heater. Matches and lighters should be kept out of the reach of children. Smoking in bed should be prohibited, and lit cigarettes or candles should not be left unattended. In addition, unattended cooking is a leading cause of scald burns in young children and residential fires. A family fire escape plan, including a designated outdoor meeting site, should be in place and practiced biannually.

## Childproofing the Home

In addition to the preventive measures listed previously, electric socket plugs lessen the risk of electrocution injury. In addition, it is advisable that small toy pieces, balloons, button batteries, and a variety of small or sharp household objects be kept out of a small child's reach. Hot water heaters should be adjusted so that the temperature does not exceed 120°F. By doing so, you can dramatically decrease the likelihood of causing a deep partial thickness or full thickness scald burn.

## Hypertension

Blood pressure evaluation is the most common screening test performed in the emergency department. It has been estimated that more than 50 million Americans (1 in 4 adults) have high blood pressure warranting some form of treatment (Hajjar and Kotchen, 2003). Of these hypertensive patients, almost 30% were unaware of their illness, and 42% were not being treated (Hajjar and Kotchen, 2003). In the emergency department, elevated blood pressure readings roughly approximate that of the general ambulatory population. Uncontrolled hypertension is a risk factor for the development of cardiovascular disease. The relationship between blood pressure and cardiovascular disease is consistent, continuous, and independent of all other risk factors. For patients discharged from the emergency department who have elevated blood pressure readings,

it is advisable that they follow up with their primary care provider, as outlined in the *Seventh Report of the Joint National Committee Prevention, Detection, Evaluation, and Treatment of High Blood Pressure* (National High Blood Pressure Education Program, 2004).

## Suggested Reading


Boudreaux GC, Hunter K, Bos S, et al. Predicting smoking stage of change among emergency department patients and visitors. *Acad Emerg Med*. 2006;13:537–542.

*This prospective survey of 1010 emergency department patients and visitors assessed smoking-related variables.*

Centers for Disease Control and Prevention: National Center for Injury Prevention and Control Web site. Available at: www.cdc.gov/ncipc/cmprfact.htm. Accessed January 12, 2008.

*This Web site hosts a variety of injury topics and fact sheets for preventative teaching, which can be implemented in the Emergency Department.*

Centers for Disease Control and Prevention. *Cigarette Smoking-Related Mortality* (updated September 2006)**.** Available at: www.cdc.gov/tobacco/data_statistics/Factsheets/cig_smoking_mort.htm. Accessed March 11, 2008.

*This fact sheet highlights the cigarette-related mortality in the United States.*

Doll L, Bonzo S, Mercy J, et al. *Handbook of Injury and Violence Prevention*. New York, NY: Springer; 2006.

*This book on focuses on different injury prevention interventions and reviewing evidence-based strategies for successful implementation.*

D'Onofrio G, Degutis LC. Preventive care in the emergency department: screening and brief intervention for alcohol problems in the emergency department: a systematic review. *Acad Emerg Med*. 2002;9:627–638.

*This systematic review of various alcohol screening and intervention programs in the emergency department found a positive effective of emergency department intervention for alcohol abuse.*

Fuller GF. Falls in the elderly. *Am Fam Physician*. 2000;61:2159-2168, 2173-2174.

*This article reviews the topic of falls in the elderly providing a comprehensive review of this issue.*

Glassbrenner D, Ye TJ. *Seat Belt Use in 2007—Overall Results*. Traffic Safety Facts: Research Note. Washington, DC: National Highway Traffic Safety Administration; 2007. DOT HS 810 841. Available at: www.nhtsa.gov/nhtsa/announce/810_841.pdf. Accessed March 11, 2008.

*This article provides an overview of seatbelt use in the United States.*

Hajjar I, Kotchen TA. Trends in prevalence, awareness, treatment, and control of hypertension in the United States, 1988–2000. *JAMA*. 2003;290:199–206.

*This articles uses past National Health and Nutrition Examination Survey data to report on the trends in hypertension.*

Injury Center. *Water Related Injuries*. Washington, DC: Centers for Disease Control and Prevention; 2007a. Available at: www.cdc.gov/ncipc/factsheets/drown.htm. Accessed March 11, 2008.

*This fact sheet highlights water-related injuries in the United States.*

Injury Center. *Fire Deaths and Injuries: Fact Sheet*. Washington, DC: Centers for Disease Control and Prevention; 2007b. Available at: www.cdc.gov/ncipc/factsheets/fire.htm. Accessed March 11, 2008.

*This fact sheet review statistics about fire-related deaths and injuries.*

Midanik LT, Chaloupka FJ, Saitz R, et al. Alcohol-attributable deaths and years of potential life lost—United States, 2001. *MMWR Weekly*. 2004;53(37):866–870. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/mm5337a2.htm. Accessed March 11, 2008.

*This report highlights the alcohol-attributable deaths in the United States.*

National Center for Injury Prevention and Control. *Traumatic Brain Injury*. CDC Fact sheet; 2007. Available at: www.cdc.gov/ncipc/factsheets/tbi.htm. Accessed March 11, 2008.

*This fact sheet highlights the topic of traumatic brain injury in the United States.*

National High Blood Pressure Education Program. *Seventh Report of the Joint National Committee: Prevention, Detection, Evaluation, and Treatment of High Blood Pressure*. Bethesda, MD: National Heart, Lung, and Blood Institute; 2004. Available at: www.nhlbi.nih.gov/guidelines/hypertension/jnc7full.pdf. Accessed March 10, 2008.

*This is a comprehensive report on the prevention, detection, evaluation, and treatment of high blood pressure.*

National Highway Traffic Safety Administration. *Traffic Safety Facts 2001: A Compilation of Motor Vehicle Crash Data from the Fatality Analysis Reporting System and the General Estimates System*. Washington, DC: National Highway Traffic Safety Administration, U.S. Department of Transportation; 2002. Available at: www-nrd.nhtsa.dot.gov/Pubs/TSF2001.PDF. Accessed March 11, 2008.

*This report provides statistics on traffic crashes of all severities.*

Watson WA, Litovitz LT, Rogers GC, et al. 2004 Annual report of the Association of Poison Control Centers Toxic Exposure Surveillance System. *Am J Emerg Med*. 2005;23:589–666.

*This article reviews data on poisonings reported to the Association of Poison Control Centers Toxic Exposure Surveillance System.*

CHAPTER 20

# *Procedural Skills*

If you feel that you are not yet experienced in performing basic medical procedures, you are not alone. Graduating medical students have a wide variety of procedural skill experience. A number of medical students complete their core third-year clerkships without performing venipuncture, peripheral IV access, urethral catheterization, or ABG sampling. Your emergency medicine clerkship may help alleviate some of these issues by providing you with exposure to a wide variety of procedures that may not be as readily encountered on other clinical rotations. You should take advantage of this opportunity and perform as many procedures as possible to build confidence in your skills before graduation.

*Ample opportunities often exist to perform procedures throughout your emergency medicine clerkship.*

Although your clinical experience will vary day to day and between clinical training sites, ample opportunities often exist to perform procedures throughout your emergency medicine clerkship. The procedures most commonly performed by students are peripheral IV access and phlebotomy. Even though many medical schools do not have a formal process to ensure that a student is competent or proficient in performing these skills, they are nonetheless very important. Many students, interns, and residents will be called on to perform these basic yet necessary skills. Regarding procedural instruction, it is equally important to understand which patients truly need IV access and the various options available for crystalloid fluid administration (e.g., normal saline, half-normal saline, $D_5$ normal saline). Students should also gain experience in procedurally related tasks such as connecting IV fluid tubing, troubleshooting a clogged IV, maintaining proper technique for collecting blood cultures, and determining which color blood tubes are required

**Categories of Procedural Opportunities in the Emergency Department for Medical Students**

- Procedures typically performed independently with direct supervision: IV access, phlebotomy, NGT insertion, ABG sampling, urethral catheterization, simple laceration repair
- Procedures typically performed in an assist role, but sometimes playing an independent role: arthrocentesis, central venous access, incision and drainage of a cutaneous abscess, lumbar puncture
- Procedures typically observed: orotracheal intubation, tube thoracostomy, transvenous pacemaker insertion

## Procedural Skills Web Sites

- *New England Journal of Medicine*, "Videos in Clinical Medicine" http://content.nejm.org/misc/videos.shtml?ssource=recentVideos
- McGraw-Hill, **"**Access Emergency Medicine" www.accessem.com/public/about_aem.aspx
- Elsevier, "Procedural Consults" http://app.proceduresconsult.com/Learner/Default.aspx
- University of California San Francisco/San Francisco General Hospital, emergency medicine residency Web site www.emresidency.ucsf.edu/ (under resources, select "educational material")
- University of Maryland, emergency medicine residency Web site www.umem.org/res_student.php

for specific chemistry or hematology testing. The same can be said for other procedures that are performed by students and house staff: NGT insertion, ABG sampling, urethral catheterization, and laceration repair, to name a few. It is important to remember that the psychomotor skill involved with performing many procedures improves with repetition. However, it is essential that you become familiar with the indications and contraindications for performing specific procedures.

Procedural opportunities in the emergency department can often be categorized into one of three different groups. The first group includes procedures you will likely perform independently with direct supervision: IV access, phlebotomy, NGT insertion, ABG sampling, urethral catheterization, simple laceration repair, and the like. The next group includes those procedures that you will likely assist with, but at times may have more of an independent role: arthrocentesis, central venous access, incision and drainage of a cutaneous abscess, and lumbar puncture. The final category includes those procedures that because of the complexity and urgency of the situation, you will likely observe: orotracheal intubation, tube thoracostomy, and transvenous pacemaker insertion. Your direct participation in performing or assisting with any procedure is always up to the discretion of the attending physician. This decision is often based on a number of factors, including the student's experience with performing the procedure, the complexity of the procedure, the comfort level of the patient, and the inherent risk to the patient. That being said, it is still likely that you will have the opportunity to be involved.

### How Can I Become More Comfortable in Performing Procedures?

One of the first steps in becoming more comfortable is to familiarize yourself with the procedure(s) that you would like to learn to perform. These can be procedures that you have a high likelihood of performing, or they can be selected procedures that are uncommon or that you are less familiar with. Couple this choice with your career interests, and you have a good place to start. You can easily take advantage of the wealth of information available to you in hardcopy textbooks or on the Internet. Three excellent resources are as follows:

- Roberts and Hedges, *Clinical Procedures in Emergency Medicine*, 2004
- Rosen and Chan, *Atlas of Emergency Procedures*, 2002
- Custalow, *Color Atlas of Emergency Department Procedures*, 2004

The Roberts and Hedges text is available in full-text version through MD Consult for which some medical schools have institutional subscriptions. The *New England Journal of Medicine* publishes an online series titled "Videos in Clinical Medicine" (http://content.nejm.org/misc/

videos.shtml?ssource=recentVideos). These procedural videos highlight a number of common and advanced procedural skills and are accompanied by a summary PDF article further reviewing the topic. McGraw-Hill's "Access Emergency Medicine" is another Web-based resource that contains a broad range of emergency cases with accompanying procedural videos (www.accessem.com/public/about_aem.aspx). Elsevier also offers an online educational resource titled "Procedural Consults." This resource reviews a number of basic and advanced procedures (http://app.proceduresconsult.com/Learner/Default.aspx). A number of these online resources require individual or institutional subscriptions to fully access the educational material. The University of California San Francisco/San Francisco General Hospital emergency medicine residency Web site contains a number of educational procedural videos (www.emresideny.ucsf.edu). Additional advanced procedural videos can also be found on the University of Maryland emergency medicine residency Web site under the section of procedural videos (www.umem.org/res_student.php).

Remember, each student will have a different procedural experience throughout his or her emergency medicine clerkship. This is in part because of the variety and complexity of patients encountered and, to some extent, the interest or proactiveness of the student. It may be more important for some students, based on career aspirations, to partake in certain procedures. Communicate your interests with your supervisors and the nursing staff to further enhance your procedural opportunities. Again, we recommend not focusing solely on the technical skill required to perform a particular procedure but also emphasizing the rationale of why a particular procedure needs to be performed.

## Suggested Reading


Coberly L, Goldenhar LM. Ready or not, here they come: acting interns' experience and perceived competency performing basic medical procedures. *J Gen Intern Med*. 2007;22:491–494.

*This prospective survey of fourth-year medical students on an internal medicine rotation found that students do not perform basic procedures during their subinternship rotations and that procedural performance correlates with feelings of competency.*

Custalow C. *Color Atlas of Emergency Department Procedures*. Philadelphia, Pa: Elsevier Saunders; 2005.

*This text provides a comprehensive review for more 65 emergency procedures.*

Fincher RM, Lewis LA. Learning, experience, and self-assessment of competence of third-year medical students in performing bedside procedures. *Acad Med*. 1994;69:291–295.

*This survey of 100 third-year medical students found that students performed procedures on patients infrequently.*

Roberts JR, Hedges J. *Clinical Procedures in Emergency Medicine*. 4th ed. 2004. Philadelphia, Pa: Elsevier Saunders; 2004.

*This text provides a comprehensive evidence based review on a multitude of procedures performed in the emergency department.*

Rosen P, Chan TC, Vilke G, Sternbach G, Mass EW. *Atlas of emergency procedures*. 2nd. St. Louis, Mo: Mosby Press; 2004

*This text provides a comprehensive review of more than 100 commonly performed emergency procedures.*

Wu EH, Elnicki DM, Alper EJ, et al. Procedural and interpretive skills of medical students: experiences and attitudes of third-year students. *Acad Med*. 2006;81:S48–S51.

*This survey of 171 third-year medical students from seven institutions found that a majority of students had never performed important procedures, such as lumbar puncture, thoracentesis, paracentesis, or blood cultures.*

CHAPTER 21

# *Suggested Reading and Other Educational Resources for Medical Students*

At this point in your medical school training, most of your reading efforts should be directed toward textbooks and review articles. It is also reasonable to supplement your core reading with recently published journal articles. Here are a few suggestions to help focus your approach to reading during your emergency medicine clerkship:

- Keep track of your patient encounters. Set aside 20 to 30 minutes each day (a somewhat realistic goal) and try to read about one of the interesting cases that you addressed that day.
- Pick one or more emergency medicine topics that you are interested in but not very familiar with. By researching the topic(s), you will develop additional knowledge about a particular subject.
- Focus some of your reading on common emergency department complaints (e.g., abdominal pain, chest pain, shortness of breath). Additional reading in these areas will help to broaden your general fund of knowledge.

A number of excellent educational resources are available to students completing an emergency medicine clerkship. These can be found in various forms, ranging from classic hardcopy textbooks to state-of-the-art online resources. Here we have attempted to identify some key educational resources that will help you learn more about the clinical practice of emergency medicine. Some of these online resources are free, whereas others require individual or institutional subscriptions to fully access the educational material. Our specialty also has a number of high-quality peer-reviewed journals, as shown in the box on this page.

Because of the overwhelming number of high-quality, Web-based educational sites, it is only possible to provide you with a glimpse of the avail-

*A number of excellent educational resources are available to students completing an emergency medicine clerkship. These can be found in various forms, ranging from classic hardcopy textbooks to state-of-the-art online resources.*

**Peer-Reviewed Emergency Medicine Journals**

- *Academic Emergency Medicine* (www.aemj.org)
- *American Journal of Emergency Medicine* (http://ajemjournal.com/)
- *Annals of Emergency Medicine* (www.annemergmed.com/)
- *Journal of Emergency Medicine* (www.elsevier.com/locate/jemermed)

able resources. It is very likely that with a little time, you can find many other online educational resources that can provide a wealth of information. The information contained here does not necessarily reflect endorsement by the editors or contributing authors.

Regardless of your preference—hardcopy textbooks, review or journal articles, online or PDA—an endless amount of educational resources are available to enhance your learning opportunities during your emergency medicine clerkship.

## Online Educational Resources

- UpToDate is one of the most commonly used online resources for medical information (www.uptodate.com/). This resource is specifically designed to answer the clinically relevant questions that arise in daily practice of medicine. An emergency medicine–specific database is under development.
- eMedicine is another Web-based resource that contains topic reviews by experts in the field (www.emedicine.com).
- EMedHome is an online resource for emergency physicians that contains monthly articles, clinical cases, clinical pearls, podcasts, and more (www.emedhome.com/index.cfm).
- National Center for Emergency Medicine Informatics (NCEMI) contains links to leading abstracts in emergency medicine specialty journals, treatment algorithms, calculators for various clinically related topics, and other links (http://ncemi.org).
- McGraw-Hill's Access Emergency Medicine is a comprehensive online resource that allows users to quickly search the diagnosis and treatment of a broad range of emergency cases. The site contains links to a number of emergency medicine texts, procedures, videos, and an image bank (www.accessem.com/index.aspx).
- Molson Medical Informatics Student Projects site is a rapidly growing collection of multimedia projects in medical teaching. Developed by McGill University medical students under the supervision of the McGill Medical Faculty (http://sprojects.mmi.mcgill.ca).
- MedicalStudent.com is a digital library of authoritative medical information for all students of medicine (www.medicalstudent.com).
- Family Practice Notebook is intended to aid primary care providers in their pursuit of optimal patient care (www.fpnotebook.com/index.htm).
- R2 Digital Library is a Web-based resource that links health sciences book content from leading publishers. This service is available exclusively through hospital, academic, and institutional libraries (www.r2library.com).
- Lexi-Comp Online is a clinical information tool consisting of a series of drug information databases (http://online.lexi.com/crlonline?siteid=9862).
- Blackwell Synergy provides online access to full-text journals in many specialties of medicine (www.blackwell-synergy.com).
- ScienceDirect provides online access to full-text journals in many specialties of medicine (www.sciencedirect.com).
- MDConsult is an integrated online resource that offers access to complete medical textbooks in many specialties and full-text articles from

a number of peer-reviewed journals and the *Clinics of North America Series* (www.mdconsult.com/php/83552018-2/homepage).

- ECG Wave-Maven, developed by educators at Harvard Medical School, is an ECG self-assessment program for students and clinicians (http://ecg.bidmc.harvard.edu/maven/mavenmain.asp).
- EMPACS features annotated radiological studies conducted in an emergency department setting and allows users to search by modality, body region, gender, age, and keywords (www.empacs.org/scripts/mainlogin.php).
- PubMed provides access to citations from the biomedical literature (www.ncbi.nlm.nih.gov/sites/entrez or www.pubmed.gov).
- Google is a comprehensive search engine that can be used to locate an extensive amount of medical information (www.google.com).
- Google Scholar provides a simple way to broadly search for scholarly literature: peer-reviewed papers, theses, books, abstracts, and articles from academic publishers, professional societies, preprint repositories, universities, and other scholarly organizations (http://scholar.google.com).

## Other Educational Resources

In addition to the many online resources, a number of classic textbooks serve as resources. These books are comprehensive and provide concise reviews of a wide range of emergency medicine topics. Some of these texts are used as educational resources for emergency medicine residency training programs and emergency medicine clerkships.

### Classic Emergency Medicine Textbooks

- Rosen's *Emergency Medicine: Concepts and Clinical Practice* is a text that strives to be a definitive emergency medicine resource. It is a well-organized text with more than 200 chapters that cover all the major topics in emergency medicine today.
- Tintinalli's *Emergency Medicine: A Comprehensive Study Guide* covers an extensive range of emergency medicine topics in succinct, clinically focused chapters. This text has gone through many editions and strives to keep abreast of the many medical advances that affect emergency medicine. This book also comes in a pocket version and review book called *"Just the Facts"* that are both widely used.
- Hawood-Nuss' *Clinical Practice of Emergency Medicine* is organized for easy reference and is clinically focused. The latest edition emphasizes evidence-based medicine.
- Roberts and Hedges' *Clinical Procedures in Emergency Medicine* provides a comprehensive review of the various procedures that are performed by emergency medicine specialists. Each procedure is reviewed in an evidence-based fashion.

### Other Emergency Medicine Textbooks

Several other textbooks are directed toward medical students and residents early in their emergency medicine careers. Many of these are excellent resources that provide concise reviews of a number of emergency medicine topics and are often affordable on a student's budget.

- Hamilton's *Emergency Medicine: An Approach to Clinical Problem-Solving* uses case studies to focus on common chief complaints that present

to the emergency department and takes the reader through the thought process needed to manage these patients.

- Mahadevan and Garmel's *An Introduction to Clinical Emergency Medicine* offers a well-organized approach to the undifferentiated emergency medicine patient and contains many excellent illustrations, images, and radiographs.
- Mitchell and Medzon's *Introduction to Emergency Medicine* covers basic principles commonly found in the introduction to emergency medicine course.
- Stones and Humphries' *Current Emergency Diagnosis and Treatment* provides a problem-oriented, clinically relevant review of a wide range of emergency medicine topics.
- *National Medical Series for Independent Study (NMS Series) Emergency Medicine* provides a concise review of clinical topics and provides a strategy for managing patients in the emergency department.
- Greenberg's *Text Atlas of Emergency Medicine,* featuring more than 1,100 full-color illustrations, is a visual guide to the diagnosis and management of medical and surgical emergencies.
- Roppolo's *Emergency Medicine Handbook: Critical Concepts for Clinical Practice* provides essential information and practical advice for use in the emergency department.
- Rosen and Barkin's *5-Minute Emergency Medicine Consult* provides practical information related to 600 clinical problems. Coverage of each disorder includes clinical presentation, prehospital concerns, diagnosis, treatment, and disposition.
- *First Aid for the Emergency Medicine Clerkship* is particularly directed to medical students and serves as a guide for how to excel during a clerkship. This text focuses on core material and common exam questions and provides tear-out cards with useful information on how to function well during an emergency medicine clerkship.
- *Deja Review Emergency Medicine* offers a review of clinical cases frequently seen in emergency medicine. The text is designed for the medical student preparing for the USMLE Step 2 exam.

### Personal Digital Assistants

Personal digital assistants (PDAs) offer another opportunity to have access to a wide range of educational material at your fingertips. PDA software commonly used by students during an emergency medicine clerkship includes Epocrates, 5-Minute EM Consult, PEPID, and Dr. Drugs. Some of the previously referenced texts are also available in PDA format. USBMIS and Skyscape are two of the biggest makers of PDA medical software (https://secure.usbmis.com/store/home.php?cat=5 and www.skyscape.com/estore/store.aspx?category=4).

## Suggested Reading


Jang DH. *Deja Review Emergency Medicine*. New York, NY: McGraw-Hill Co.; 2007.

Stead LG, Stead SM, Kaufman MS. *First Aid for the Emergency Medicine Clerkship*. 2nd ed. New York, NY: McGraw-Hill Co.; 2006.

Greenberg MI, Hendrickson RG, Silverberg M, et al. *Greenberg's Text-Atlas of Emergency Medicine*. Philadelphia, Pa: Lippincott Williams & Wilkins; 2005.

Hamilton GC, Sanders AB, Strabge GR, et al. *Emergency Medicine: An Approach to Clinical Problem-Solving*. 2nd ed. Philadelphia, Pa: Elsevier-Saunders; 2003.

Hawood-Nuss A, Wolfson AB, Linden CH, et al. *Clinical Practice of Emergency Medicine*. 4th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2005.

Mahadevan SV, Garmel GM. *An Introduction to Clinical Emergency Medicine*. New York, NY: Cambridge University Press; 2005.

Mitchell EL, Medzon R. *Introduction to Emergency Medicine*. Philadelphia, Pa: Lippincott Williams & Wilkins; 2004.

Plantz SH, Wipfler EJ. *National Medical Series for Independent Study (NMS Series) Emergency Medicine*. 2nd ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2006.

Roberts JR, Hedges J. *Clinical Procedures in Emergency Medicine*. 4th ed. Philadelphia, Pa: WB Saunders; 2003.

Roppolo LP, Davis D, Kelly S, et al. *Emergency Medicine Handbook: Critical Concepts for Clinical Practice*. Philadelphia, Pa: Elsevier; 2007.

Schaider JJ, Hayden SR, Wolfe RE, et al. *Rosen and Barkin's 5-Minute Emergency Medicine Consult*. 3rd ed. Philadelphia, Pa: Lippincott Williams & Wilkins, 2007.

Mark JA, Hockberger RS, Walls RM, et al. *Rosen's Emergency Medicine: Concepts and Clinical Practice*. 6th ed. Philadelphia, Pa: Mosby Elsevier; 2006.

Stone CK, Humphries R. *Current Emergency Diagnosis and Treatment*. 6th ed. New York, NY: McGraw-Hill Co.; 2008.

Tintinalli J, Kelen G, Stapczynski J. Tintinalli's *Emergency Medicine: A Comprehensive Study Guide*. 2003. 6th ed. New York, NY: McGraw-Hill Co.; 2003.

CHAPTER 22

# *How to Get the Most Out of Your Emergency Medicine Clerkship*

*Active learning often requires more upfront effort from the learner, but in return, the teaching can become more individualized.*

By becoming an "active learner," you can optimize your experience in the emergency department, thus achieving your own personal educational goals. Active learning often requires more upfront effort from the learner but, in return, the teaching can become more individualized. Several ways to engage in active learning that will enhance your rotation experience include the following: prepare before your rotation, solicit feedback, set your own goals, verbalize an assessment and management plan, prepare follow-up cards, maintain a "peripheral brain," develop a question log, have a positive attitude, and exhibit professionalism.

## Prepare Before Your Rotation

Before your rotation starts, spend a few weeks reading about common chief complaints encountered in the emergency department. These topics are covered in various emergency medicine textbooks and numerous educational Web sites. By spending time reviewing these topics, you can build on your fund of medical knowledge from Day 1 of your rotation. Common chief complaints you will encounter in the emergency department are shown in the box on this page.

### Common Complaints in the Emergency Department

- Abdominal pain
- Altered mental status
- Back pain
- Chest pain
- Fever
- Headache
- Musculoskeletal injury, trauma, and wound care
- Nausea and vomiting
- Shortness of breath
- Sore throat

## Solicit Feedback

### Solicit Feedback From Your Supervisors

Receiving feedback about your clinical performance is crucial for medical students to reinforce behaviors or skills performed well or to highlight areas that could benefit from improvement. Feel welcome to solicit feedback on your performance from your supervisors. This can be done at the conclusion of a case presentation, after a patient encounter, or at the end of a clinical shift.

When actively soliciting feedback, ask focused questions (see the box on the next page). Focused questions make it easier for the supervisor to give you concrete feedback on a particular skill or action.

### Solicit Feedback From a Nurse

Nurses are an integral part of the emergency department team. Soliciting feedback from the nurses serves two functions. First, it demonstrates that you value their opinion. Second, nurses often can provide valuable in-

### Suggestions for Soliciting Feedback

- Having seen a few of my notes, what could I do to improve my documentation?
- Do you have any suggestions how I can better focus my case presentations?
- How do you think I can improve my procedural skills?
- I would like to get better at reading ECGs, do you have any suggestions?

sight into your patient and staff communication skills, order writing, and basic procedural skills such as phlebotomy.

*Feel welcome to solicit feedback on your performance from your supervisors. This can be done at the conclusion of a case presentation, after a patient encounter, or at the end of a clinical shift.*

## Set Your Own Goals

Throughout your rotation, you will be supervised by a number of different faculty members and residents. This is often the case because of the shift work scheduling that is inherent to our specialty. As a result, you will experience less continuity with your teachers compared with other clinical rotations. When you work with a new preceptor, it can be helpful to let them know about your career interests and individual goals that you have set for yourself for the rotation. This will help your supervisor focus his or her teaching and possibly direct certain cases or procedural opportunities your way to further enhance your experience. Individual goals might include the following:

1. Procedures (e.g., suturing skills, ABG sampling, or bedside ultrasonography)
2. Examination skills (e.g., cardiac, neurologic, or musculoskeletal)
3. General approach to a type of patient (trauma, septic, or seizure)
4. Chart documentation
5. Interpretation skills (e.g., reading orthopedic plain films or ECGs)
6. Presentation skills (e.g., to supervisor or consultants or at rounds)

## Verbalize an Assessment and Management Plan

One trait that often sets stellar students apart from others is the ability to formulate and verbalize an assessment and management plan when presenting a case to their preceptor. When presenting a case, many students can verbalize their H&PE findings. However, many students will pause after presenting the subjective and objective portions of a case as if expecting feedback, reassurance, or validation. Instead, verbalize what you think is going on with your patient, the differential diagnosis (from emergent to least emergent, sharing the likelihood of each), and your proposed management plan. Rather than functioning as just a "reporter" of information, at this stage in your training, you should be functioning as an "interpreter" of the data and a "manager" of the patient. By providing your differential diagnosis, assessment, and plan, you will be giving your supervisor greater insight into your knowledge base and thought process.

## Prepare Follow-up Cards

The lack of follow-up of emergency department patients is a perceived negative aspect of emergency medicine that some medical students cite in their career decisionmaking process. To continually learn and improve, students should maintain index cards of interesting patients who are

admitted to the hospital or discharged home. Checking hospital records or talking with the admitting team a few days later can lead to invaluable learning experiences. You can also talk with your supervisor about calling a patient who was discharged home to see how he or she is doing. Obtaining follow-up should be a long-term means to engage in active learning, not only during medical school but also during residency training and beyond. An added benefit of obtaining follow-up of admitted patients is that the student can now inform the supervisor of the interesting outcomes or diagnoses. This demonstrates to the supervisor that you are actively trying to learn outside of your time in the emergency department and are engaging in practice-based learning.

### Maintain a "Peripheral Brain"

There are many pearls of wisdom to be learned during your emergency medicine clerkship. Writing these down on index cards or inputting them into a PDA can further solidify information retention. During your emergency medicine clerkship, add relevant bedside teaching points, lecture concepts, and publication data. This may include high-yield items such as indications for thrombolytic therapy in acute myocardial infarction or stroke, the pneumonia severity index scoring system from the PORT study, and NEXUS criteria for clinical clearance of the cervical spine. This "peripheral brain" should be continually updated throughout medical school, residency, and postresidency.

### Develop a Question Log

During each shift, generate a list of questions to research some time during the rotation. Questions can be based on any aspect of patient care and can include reviewing medication information, managing a case, developing a differential diagnosis, formulating a diagnostic workup for a particular presentation, or reviewing a procedural technique. Research the literature and read more about your patient's disease process when you get home. While on shift, as a self-reminder, you can e-mail yourself this list of "homework" questions. Reading about clinically relevant topics that you have encountered helps build your knowledge base.

### Have a Positive Attitude

The emergency department team thrives on working cohesively as a group and is, as a whole, an enthusiastic and high-energy team. Instructors are more amenable to teaching students if they demonstrate an enthusiasm for learning, want to be in the emergency department, and are open to feedback.

### Exhibit Professionalism

This is your time to shine in the eyes of the faculty. Arrive early, work hard, and stay late. You do not want to be thought of as the student who just wants to get the shift over with. Do not spend your time surfing the Internet. You are in the emergency department to learn. Stay on top of your patients. When something happens with one of your patients, you should be the first one to know about it. If a lab result is not back in a timely fashion, call the lab to see if it has received the specimen. Dress appropriately for the emergency department: scrubs or professional attire (no tee shirts, sweatshirts, or blue jeans). Make sure your patients are well cared for at all times. Remember, you are your patient's student doctor.

**How to Be an Active Learner**

- Solicit feedback.
- Set goals.
- Verbalize an assessment and management plan.
- Prepare follow-up cards.
- Maintain a peripheral brain.
- Develop a question log.
- Have a positive attitude.
- Exhibit professionalism.

## Students Applying to Emergency Medicine Residency Training Programs

One last tip for maximizing your emergency medicine clerkship applies primarily to those applying for an emergency medicine residency position. Because students rarely work consistently with the same faculty member, letters of recommendation for residency applications may be difficult to obtain. Often, clerkship directors will write a composite letter, summarizing the comments from various faculty members who have worked with you. If, however, you are going to request a letter from a single faculty member, it is important that you let the faculty member on shift know that you are applying to emergency medicine so he or she will pay special attention to your skills and knowledge base. It is no secret that you will eventually be asking for a letter of recommendation from the department, and the evaluators will want to have something specific to write about. If possible, with permission, consider modifying your clinical schedule to work multiple shifts with the same faculty member. By doing so, faculty members will have the opportunity to work with you on several shifts and will be able to provide a more detailed letter of recommendation. This may or may not be possible and is often based on the number of students working clinically in the emergency department during a particular rotation.

*One trait that often sets stellar students apart from others is the ability to formulate and verbalize an assessment and management plan when presenting a case to your preceptor.*

## Summary

Getting the most out of your emergency medicine clerkship revolves around maintaining a positive attitude, working diligently, and taking an ongoing and active role in learning. Applying this philosophy will serve you well during medical school, in residency training, and beyond.

## Suggested Reading

Mahadevan SV, Garmel GM. The outstanding medical student in emergency medicine. *Acad Emerg Med.* 2001;8:402–403.

*This article describes strategies for medical students to use during their emergency medicine rotation.*

Pangaro L. A new vocabulary and other innovations for improving descriptive in-training evaluations. *Acad Med.* 1999;74:1203–1207.

*This article provides a new evaluation approach to help faculty evaluate trainees. This approach describes the progress of trainees from "reporter" to "interpreter" to "manager" to "educator" status (RIME methodology).*

CHAPTER 23

# *Introduction to the Core Competencies*

*Graduate medical education training programs are now expected to show evidence of how they use educational outcomes to improve individual resident and overall program performance.*

In keeping with its mission to ensure and improve the quality of graduate medical education, the ACGME Outcomes Project Advisory Committee has identified six general competencies for residents. These six competencies were endorsed by the ACGME in February 1999. The six core competencies are as follows:

- Patient care
- Medical knowledge
- Professionalism
- Systems-based practice
- Practice-based learning and improvement
- Interpersonal and communication skills

As of 2002, all graduate medical education training programs accredited by the ACGME are responsible for requirements related to the competencies. In the past, residency training emphasized structure and process components. This emphasis will become less critical over time as more emphasis is placed on outcome measures. Graduate medical education training programs are now expected to show evidence of how they use educational outcomes to improve individual resident and overall program performance. Currently, we are in Phase 3 of the Outcomes Project (July 2006–June 2011). This phase includes full integration of the competencies and their assessment with learning and clinical care. The final phase (July 2011 and beyond) includes expansion of the competencies to include models of excellence. [More details about the ACGME Outcomes Project are available at www.acgme.org/outcome/. The most recent version (2007) of the program requirements for graduate medical education in emergency medicine can be found at www.acgme.org/acWebsite/downloads/RRC_progReq/110emergencymed07012007.pdf.]

*Patient care as defined by ACGME should be "timely, effective, appropriate, and compassionate for the management of health problems and the promotion of health."*

The recently published *National Fourth Year Medical Student Emergency Medicine Curriculum Guide* emphasizes the use of these six core competencies as a framework for the learning objectives of an undergraduate emergency medicine curriculum. These competencies were selected for two reasons. First, they clearly outline the knowledge, skills, and attitudes that should be instilled in a physician in training. Second, they allow the evaluation of students and residents to be consistent and uniform and ease the transition between medical school and residency. This section

of the *Primer* will review each of the six core competencies and highlight those that pertain to the undergraduate curriculum. An in-depth review of each of the six competencies as they relate to the specialty of emergency medicine, specifically residency training, can be found in the journal *Academic Emergency Medicine (Acad Emerg Med.* 2002;9:1211–1277). Many aspects of the core competencies can be applied at the medical student level, especially during a fourth-year clerkship.

*As defined by the ACGME, medical knowledge relates to the ability to demonstrate "an investigatory and analytic thinking approach to clinical situations, to know and apply the basic and clinically supportive sciences which are appropriate to their discipline."*

## Patient Care

Patient care as defined by ACGME should be "timely, effective, appropriate, and compassionate for the management of health problems and the promotion of health." To do this, the student must be able to obtain an accurate history and perform a physical examination concisely focused on the patient's complaint. In the emergency department, the student should be able to identify correctly and immediately any life-threatening illnesses. Patient management skills should include the ability to develop an appropriate evaluation and treatment plan. The student should monitor the patient for response to the outlined therapy and alter this therapy as indicated. The student should also follow through on patient care to include proper disposition and follow-up care when the patient is discharged from the emergency department.

Within the confines of procedural competence, students should be able to list the indications and contraindications of basic procedures they may perform in the emergency department. The basic procedures listed in the National Curriculum include ECG procurement and interpretation, Foley catheter placement, interpretation of cardiac monitoring, NGT insertion, peripheral IV access, pulse oximeter reading, splint application, wound closure, and venipuncture.

Under the auspices of health promotion, the student should discuss any preventable illness or injury as the case presents itself in the evaluation of a patient. This would include items such as smoking cessation, seatbelt and helmet use, and medication compliance. Many of these topics are addressed in detail in the *Primer* section on anticipatory guidance. The student should educate the patients to the extent that they can understand and assist in implementation of their outpatient care plans. Students should also ensure that patients understand their discharge instructions, can arrange for follow-up care, can afford as well as comprehend how to use medications, and understand when to return for further evaluation.

Other aspects of the patient care core competency as defined by the ACGME that were not abstracted into the medical student curriculum include making informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment. Although mastery may be beyond the scope of experience and knowledge of the student, it certainly should be taught by the instructor and is a critical skill to begin developing. The use of information technology to support patient care decisions and patient education is particularly important and will become an increasingly important part of patient care as the student progresses through residency training and beyond. Any opportunity for the student to use available educational resources to make an informed decision about diagnostic studies or therapeutic intervention is an opportunity to develop and refine this skill and certainly is to be encouraged. Although residents are expected to perform competently all medical and invasive procedures considered essential for the area of practice, students often have limited procedural opportunities before their emergency medicine rotation. The emergency medicine rotation, however, is likely your best opportunity

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to learn procedural skills. Use this educational opportunity to your advantage.

A final aspect of this core competency as defined by the ACGME includes the ability "to work with health care professionals, including those from other disciplines, to provide patient-focused care." This aspect of patient care is interwoven with professionalism and interpersonal and communication skills.

## Medical Knowledge

As defined by the ACGME, medical knowledge relates to the ability to demonstrate "an investigatory and analytic thinking approach to clinical situations, to know and apply the basic and clinically supportive sciences which are appropriate to their discipline." The National Curriculum aimed to more clearly define these expectations as they relate to medical students. The competency of medical knowledge extends far beyond one's fund of factual knowledge.

Students are expected to develop the skills necessary to evaluate an undifferentiated patient under a realm of chief complaints that include abdominal or pelvic pain, alteration or loss of consciousness, chest pain, gastrointestinal bleeding, headache, shock, shortness of breath, vaginal bleeding, eye pain or vision changes, overdose, weakness and dizziness, and traumatic complaints. Students are expected to develop a list of differential diagnoses, based on the patient's presentation, which is prioritized not just by likelihood but by potential severity as it relates to morbidity and mortality.

In evaluating patients, a student should learn the indications, contraindications, and proper interpretations of the results of common diagnostic procedures and tests. Most importantly, students should cultivate an appreciation of pretest probabilities and risk. More important than any test result is the insight you need to develop throughout your career of when to trust, and when not to trust, that result.

Further adapting the definition of the medical knowledge core competency for our specialty includes the immediate recall of selected information for the care of critical patients, an understanding of the use of medical resources for the immediate care of the patient, and the ability to apply this information to undifferentiated patient presentations. The traditional definitions used for competencies such as medical knowledge cross the boundaries of the other competencies. Medical knowledge in emergency medicine includes the acquisition of information from the patient (communication and interpersonal skills) and the application or delivery of the care (patient care).

## Practice-Based Learning and Improvement

Practice-based learning and improvement is defined by the ACGME as "the ability to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve patient care." Practice-based learning can be learned through the systematically evaluating patient care and population features; teaching other students and health care professionals; and applying knowledge gained from a systematic evaluation of the medical literature, including study design and statistical methodology.

## Continuous Quality Improvement

As a student, you may not be aware of, or have access to, the continuous quality improvement (CQI) process that all hospital departments have

in place. The CQI process is one venue in which patient care, department process issues, and other sensitive information are communicated in a legally protected environment. If there are any questions or concerns about the care a physician or resident has provided, it is openly discussed and the documentation is reviewed for standard of care, systems issues, or documentation factors that may have contributed to an error or adverse outcome. Reviewed events are examined on several levels (systematic methodology) based on outcome, physician care, physician documentation, and resident supervision. The physicians involved are notified of the outcome and of suggestions for improvement. Opportunities to improve hospital and departmental practices are likewise identified and implemented.

*As defined by the ACGME, systems-based practice is the "demonstrable awareness of and responsiveness to the larger content and system of health care and the ability to effectively call on system resources to provide care that is of optimal value."*

### Journal Club

Throughout medical school, students are exposed to journal club or a similar activity in which original research from the medical literature is critically appraised, often to answer a clinical question. Before graduation, medical students should be introduced to the concept of reviewing the medical literature. This useful skill will be further reinforced during residency training. By understanding research methodology, you will be able to incorporate scientifically based principles into current practice, that is, evidence-based medicine.

### Life-Long Self-Assessment and Continuous Osteopathic Learning Assessment

The Life-Long Self-Assessment (LLSA) and the Continuous Osteopathic Learning Assessment (COLA) are now being required for maintenance of emergency medicine board certification as a way to ensure that practicing emergency physicians keep current on recent literature. The annual LLSA and COLA examination covers articles or readings that have been chosen by a panel formed by the ABEM and the AOBEM, respectively.

The ACGME expects postgraduate trainees to use information technology to manage information, access online medical information, and be able to support self-directed learning. Many teaching institutions have software and other educational materials that may be used for your own or patient education. Online resources such as Up to Date or MD Consult and many others are available and can prove useful in bedside teaching and learning.

Teaching other health care professionals is an effective way to learn and represents an important contribution that you can make toward improving patient care. This can be as simple as teaching nurses, technicians, or more junior students disease pathophysiology at the bedside or explain-

### Systems-Based Decisionmaking

*Consider a patient who requires a CT scan of the abdomen with oral and IV contrast. After the decision has been made to obtain this study, the patient needs to have a peripheral IV placed to administer IV contrast. What if this is difficult, and he or she requires multiple attempts? This takes time and nursing resources. The patient will often be required to have a basic metabolic profile performed to evaluate his or her renal function and of course drink oral contrast. Considering these steps, it may take 4 to 5 or more hours from the time that the study is ordered until the CT is officially interpreted by an attending radiologist. Adding to this time can be the unexpected emergencies and delays that can occur with transport, obtaining laboratory results, or other sick or injured patients requiring advanced imaging. Some hospital emergency departments may have access to only one CT scanner. Therefore, decisions will have to be made regarding resource utilization, allowing the more urgent patients to be imaged sooner than the less urgent patients.*

*A system is defined as interrelated components comprising a unified whole. Systems thinking is a technique for seeing and understanding interrelationships and the processes and barriers to change.*

ing the underlying rationale for your patient orders. More formal opportunities to teach may be available within your own institution. External formal courses to consider taking are advanced trauma life support, advanced cardiac life support, and pediatric advanced life support.

Practice-based learning and improvement is a career-long responsibility by which you remain current with all aspects of patient care. Practicing evidence-based medicine demonstrates your commitment to continually providing the best care for your patients.

## Systems-Based Practice

As defined by the ACGME, systems-based practice is the "demonstrable awareness of and responsiveness to the larger content and system of health care and the ability to effectively call on system resources to provide care that is of optimal value." It therefore extends beyond the individual patient's bedside to include an understanding of how your practice is affected by other practitioners, patients, and society at large, while considering the cost of health care and the allocation of health care resources. Understanding the "system" also involves learning how types of practices and health care delivery systems vary from one another, ways to advocate for patient care and assist patients in dealing with system complexities, and how to partner with healthcare managers and health care providers to assess, coordinate, and improve healthcare. Finally, competence with systems-based practice requires that you recognize how your actions and the system relate to each other.

A system is defined as interrelated components comprising a unified whole. Systems thinking is a technique for seeing and understanding interrelationships and the processes and barriers to change. The outcome desired for our medical practice—our unified mission—is to provide high-quality patient care.

Access to routine health care is also a systems-based concern. It was estimated in 2004 that about 47 million Americans (16%) were without health insurance, a figure that continues to rise annually (Facts of Health Insurance Coverage, 2008). African Americans and Hispanics represent a disproportionate percentage of uninsured patients in this country. In addition, patients older than 65 and ethnic minorities use the emergency department for health care services at a rate much greater than that of the general population. Further, more than 19 million emergency department visits annually are by patients without health insurance (Nawar, 2007). Lastly, approximately 20% of the uninsured population reports that their usual source of health care is the emergency department (Facts of Health Insurance Coverage, 2008).

In the 1990s as a way to promote a more efficient and cost-effective provision of health care, health maintenance organizations (HMOs) attempted to restrict the use of the emergency department for nonurgent patient complaints. At that time, various HMOs required a hospital emergency department to contact them to authorize reimbursement for the provision of emergency care. This resulted in significant consumer dissatisfaction. In recent years, the preauthorization requirements for patients requiring emergency medical services have been waived.

A systems-based approach to a patient's health care may begin at home with the use of emergency medical services to transport a patient to a local emergency department. This extends through the clinical workup and management in the emergency department, possible hospitalization, follow-up care, and beyond. For many patient encounters, a decision has to be made regarding what, if any, diagnostic studies need to be performed. This appears to be a simple-enough task, but even this decision

has ramifications. Does the test need to performed at 1:00 AM, or can the patient have the test performed the following morning or electively after discharge from the emergency department? Some diagnostic imaging studies (MRI, certain ultrasounds, or vascular studies) require a technician to come to the hospital from home during off hours. Other tests may take hours to complete. Remember, an ultrasound of the abdomen or a CT scan of the brain costs money, and a patient or his or her insurance company is billed an extraordinary fee for these services. A hospital has to use laboratory technicians, phlebotomists, x-ray and CT technicians, transporters, nurses, and the like, all representing a cost to the overall health care system. In the larger picture, the overutilization or indiscriminate use of limited health care resources continues to drive up the cost of medical care. This is just one facet of what we as emergency physicians deal with when looking at the overall picture of a systems-based practice.

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Some patients may require the assistance of a social worker or case manager. At some institutions, these resources are limited. This service is invaluable and may make the difference between a hospital admission or being able to safely discharge a patient home. Different system-related issues also arise for the patient that you plan to discharge home. At times, this may be because of the availability of follow-up health care, access to a specialist, ability to care for oneself, or the ability to pay for a new medication. Does the patient have access to follow-up heath care? Can the patient pay for his or her medication prescription? If the patient will be discharged before all test results are available (e.g., urine culture, formal radiograph interpretation), does your emergency department have a system in place to ensure that the final results or radiograph interpretation discrepancy will be reported to the patient in a timely fashion?

What if you were caring for a patient who could not recall important details of his or her past medical history? The retrieval of old medical records can be helpful for understanding pertinent aspects of the patient's past medical history, medications, allergies, prior diagnostic test results, and the like. What mechanism is in place for the emergency physician or student to obtain this information? Some hospitals have an electronic medical record that makes all of this information easily available, whereas other hospitals may still rely on a paper system, which creates many difficulties when old records are urgently needed. Although an electronic medical record or other computer-based information retrieval system can allow easy access to the medical record, prior test results, and more, it is a costly undertaking and requires a strong commitment from the hospital administration to provide the resources to develop the infrastructure. Not many years ago, to access old medical records in some institutions, a student or physician would have to go to the medical records department and read through a handwritten copy of the chart.

The Emergency Medical Treatment and Active Labor Act (EMTALA) is a federal statute enacted in 1986 and can be viewed as a nondiscriminatory statute. The basis for this legislation was to ensure that a patient presenting to an emergency department be provided with "an appropriate medical screening examination" to determine whether he or she is suffering from an "emergency medical condition" regardless of his or her ability to pay for medical care. The statute also governs a number of other issues that directly affect the practice of emergency medicine, including patient transfers and on-call physicians. Additional information on this topic can be found in Naradzay (2008).

Remember, systems-based practice involves CQI. This can be intradepartmental (morbidity and mortality conferences) or interdepartmental (hospitalwide peer review or performance improvement committees). Keep in mind that we are all part of one large system.

*The ACGME defines* professionalism *as the following: "consistently demonstrate respect and compassion to others, manage conflict, and behave in a manner consistent with their values."*

## Professionalism

The ACGME defines *professionalism* as the following: "consistently demonstrate respect and compassion to others, manage conflict, and behave in a manner consistent with their values." Professionalism should be viewed as an academic virtue, not just an expected set of behaviors. However, professionalism is often less tangible and more difficult to evaluate than factual knowledge. Unprofessional behavior can run the gamut of behaviors, including substance abuse, lying, cheating, unexcused absences, or falsifying medical records. Unprofessional behavior in medical school is associated with future subsequent disciplinary action by a state medical board.

Professionalism involves the knowledge and ability to act in an ethical fashion, including the ability to be sensitive to patients regardless of culture, age, or gender. Students exhibit professionalism through their motivation, integrity, honesty, and reliability. Furthermore, a student should interact appropriately with other members of the health care team and show respect for the people they encounter during shifts, including staff, peers, patients, and patients' families. Professionalism is also demonstrable in clinical management decisions, especially the ethical principles pertaining to the provision of withholding of clinical care, confidentiality of patient information, and informed consent. Regarding medical professionalism, students should be held to the same standards as physicians. They should demonstrate a responsiveness to the needs of patients and society that supersedes self-interest; be accountable to patients, society, and the profession; and demonstrate a commitment to excellence and ongoing professional development.

Typically, professionalism is observed in the clinical setting as well as the classroom. Adhering to an acceptable dress code and arriving on time for shifts are also within the realm of professionalism. These virtues are under constant observation by our colleagues, hospital administrators, staff, and of course patients and their families. Professional behavior is an expectation for all of us (students, residents, and attendings). As a medical student in the emergency department, your professionalism will be evaluated by your supervising resident or attending physician. As you enter residency training, it is likely that your professional behavior and virtues will be evaluated on multiple levels. Within the ACGME toolbox of assessment methods, a "360-degree evaluation instrument" can be used to assess professional behaviors as well as other competencies; 360-degree evaluations consists of measurement tools that can be completed by peers, subordinates, patients, and their families [ACGME Outcomes Project and Accreditation Council for Graduate Medical Education American Board of Medical Specialties (ABMS), 2000].

## Interpersonal and Communication Skills

The ACGME defines *interpersonal and communication skills* as "the ability to communicate with colleagues, staff, and family and to employ effective interpersonal skills that revolve around the care of a patient." These skills go far beyond the ability to interview a patient and obtain an adequate history and are vital to the development of a competent, caring physician. Students must be able to demonstrate interpersonal and communication skills that result in effective information exchange and interaction with patients, families, and staff. This skill will become increasingly important when dealing with issues such as obtaining informed consent, delivering bad news, and resolving conflicts. The public has an expectation that a physician should be able to communicate in a caring and compassionate manner.

Interpersonal and communication skills encompass the effective establishment of a relationship with a patient and the ability to communicate with others on the health care team to deliver sound medical care. Students must also use effective listening skills and elicit and provide information using nonverbal, explanatory, questioning, and writing skills—each of which is crucial to your ability to work effectively with others as a member of the health care team. In addition, each of us needs to be aware of the image that we project and how we are perceived by others.

*The ACGME defines* interpersonal and communication skills *as "the ability to communicate with colleagues, staff, and family and to employ effective interpersonal skills that revolve around the care of a patient."*

As emergency physicians, we pride ourselves on our interpersonal and communication skills. Every day we interact with patients and families in pain and stressful situations. We have to develop rapport with our patients when they are most vulnerable, and at times we have to deliver bad news. Our frequent interactions with primary care physicians, subspecialty consultants, and admission teams demand that we communicate effectively with our professional colleagues to provide high-quality medical care.

## Suggested Reading


Accreditation Council for Graduate Medical Education (ACGME). *ACGME Program Requirements for Graduate Medical Education in Emergency Medicine*. 2007. Available at: www.acgme.org/acWebsite/downloads/RRC_progReq/110emergencymed07012007.pdf. Accessed March 10, 2008.

*This document outlines the program requirements for emergency medicine residency training.*

ACGME Outcomes Project and Accreditation Council for Graduate Medical Education American Board of Medical Specialties (ABMS). *Toolbox of Assessment Methods. 2000*. Available at: www.acgme.org/Outcome/assess/Toolbox.pdf. Accessed March 10, 2008.

*This document includes descriptions of assessment methods.*

Naradzay JFX. COBRA laws and EMTALA. *eMedicine*; 2006. Available at: www.emedicine.com/emerg/topic737.htm. Accessed March 10, 2008.

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Nawar EW, Niska RW, Xu J. National Hospital Ambulatory Medical Care Survey: 2005 Emergency Department Summary. *Adv Data Vital Health and Stat. 2007*;386:1–32. Available at: www.cdc.gov/nchs/data/ad/ad386.pdf. Accessed April 18, 2008.

*This article reviews nationally representative data on emergency department care in the United States. Data are from the 2005 National Hospital Ambulatory Medical Care Survey (NHAMCS).*

Stahmer SA, Ellison SR, Jubanyik KK, et al. Integrating the core competencies: proceeding from the 2005 Academic Assembly Consortium. *Acad Emerg Med.* 2007;14:80–94.

*This report provides a summary discussion of the status of integration of the core competencies into emergency medicine training programs in 2005.*

CHAPTER 24

# *Advice for Medical Students Considering Emergency Medicine as a Career*

*Two important questions will help guide a student's decision as he or she considers emergency medicine as a career. "Is emergency medicine the right choice for me?" and "Am I the right choice for emergency medicine?"*

Some medical students will focus on a career path early in medical school, whereas many others will identify their interests during their third year of medical school as they are experiencing clinical rotations. Some however, may still enter their senior year of medical school not being sure what career path is awaiting them. Two important questions will help guide a student's decision as he or she considers emergency medicine as a career. "Is emergency medicine the right choice for me?" and "Am I the right choice for emergency medicine?"

These two questions are equally important. For students to make an informed decision about their interest in emergency medicine as a career, they should be knowledgeable about what lies ahead of them in residency training and beyond. Although it is never too late to consider emergency medicine as a career, the earlier the better. Because most if not all students who will be receiving this manual are in their clinical years, we are approaching the advice section from the standpoint of a junior or senior medial student. Seek out resources at your home institution; contact the emergency medicine clerkship director, research director, residency director, or chairperson. Emergency medicine residents may also serve as a source of information. Consider contacting the emergency medicine chief resident at your institution. It is never too early to find a clinical advisor who can provide advice as you embark along the road to find out what is the best specialty match for you. It is not mandatory that your clinical advisor practice the specialty that you are interested in; however, the best person to provide advice about our specialty is an emergency physician, with the same being said for other specialties. You may also consider enlisting the help of your medical school to provide you with a list of names and contact information for recent medical school graduates who are presently enrolled in an emergency medicine residency program. Valuable information can be obtained from someone who was in your shoes just a year or two ago. Emergency medicine residents can be a valuable resource for information pertaining to specific emergency medicine residency programs, the residency application and interview process, and general information regarding emergency medicine residency training.

You should also consider spending some time shadowing one or more of the emergency medicine faculty members at your institution. This can be accomplished during evening or weekend hours when you have more free time. Shadowing serves a few purposes. First and foremost, it gives

### Emergency Medicine Organizations With Dedicated Information Available for Medical Students

- American Academy of Emergency Medicine *(http://aaem.org/index.php)*
- Emergency Medicine Residents Association *(www.emra.org/)*
- Clerkship Directors in Emergency Medicine *(www.saem.org/CDEM/)*

you an opportunity for more exposure to the specialty of emergency medicine, thus allowing you to make a better-informed decision about your career interests. By spending some time in the emergency department, you will get to know the residents and attendings and become more familiar with how the emergency department works. Lastly, by spending time in the emergency department you can gain valuable clinical experience.

To determine if emergency medicine is the right career for you, or if you have already decided, consider taking a look at the following resources;

- *AAEM Rules of the Road for Medical Students* is an online textbook written by emergency medicine residents and faculty that addresses many issues pertinent to medical students applying to emergency medicine residency training (www.aaemrsa.org/rules_road.shtml).
- *The Medical Student Survival Guide* is a resource for students applying to emergency medicine residency training (www.emra.org/emra_bookstore.aspx?id=34122).
- An Applicant's Evaluation of an Emergency Medicine Internship and Residency (Koscove, 1990). This article contains a list of suggested interview questions that may be of assistance for the student applying to emergency medicine residency training.
- Evaluating Applicants to Emergency Medicine Residency Programs (Balentine et al., 1999). This article reviews the literature related to the selection process of medical students to emergency medicine residency programs.
- Selection Criteria for Emergency Medicine Residency Applicants (Crane and Ferraro 2000). This article provides criteria used by emergency medicine residency selection committees to select their residents.

In addition, a number of professional organizations within our specialty have dedicated information available for medical students, which can be of help to review; these include the American Academy of Emergency Medicine, the Emergency Medicine Residents Association, and the Clerkship Directors in Emergency Medicine.

*To make the best decision possible about your career path, you should try to be as informed as possible.*

Other resources that students, regardless of career interest, should be aware of, they include the following:

1. AMA FREIDA Online is a database with more than 8,200 graduate medical education programs accredited by the ACGME, as well as more than 200 combined specialty programs (www.ama-assn.org/ama/pub/category/2997.html).
2. *Characteristics of Applicants Who Matched to Their Preferred Specialty in the 2007 NRMP Main Residency Match* is a publication that provides data on applicants to various specialties and compares statistics with applicants that matched versus those who did not match (https://services.aamc.org/Publications/showfile.cfm?file=version95.pdf&prd_id=197&prv_id=238&pdf_id=95).

*Emergency medicine residency training emphasizes an approach to crisis management.*

3. *AAMC Roadmap to Residency: From Application to the Match and Beyond* is a publication that provides comprehensive information about the process of applying to graduate medical education programs in the United States (https://services.aamc.org/Publications/showfile.cfm?file=version78.pdf&prd_id=183&prv_id=222&pdf_id=78).

Emergency medicine is not for everyone. This can be said for every other medical and surgical specialty. Emergency medicine is an increasingly popular specialty sought after by some of the best and brightest medical students. Although not exclusionary, the specialty is becoming more competitive. In 2008, more than 98% of PGY-1 positions offered were filled on match day (National Resident Matching Program, 2008). Results from the 2007 match reported that the mean USMLE Step 1 score for U.S. seniors matching in emergency medicine residency training programs was 220, and the mean for USMLE step 2 scores was 227. Each of these scores is above the national mean.

To make the best decision possible about your career path, you should try to be as informed as possible. Try to get advice from multiple sources. We will review for you some of the unique aspects of our specialty that appear to be reasons why an increasing number of students choose emergency medicine. Emergency physicians pass the "airplane litmus test." You probably are asking yourself, what is the airplane litmus test? Remember these words, "Is there a doctor on board?" It's kind of a frightening statement if you are at 35,000 feet above the Atlantic Ocean. What other specialist could you envision who is better prepared to handle an in-flight unexpected medical emergency? Emergency medicine residency training emphasizes an approach to crisis management. On a day-to-day basis, we are faced with patients presenting across all spectrums of age, pathology, and severity. Our doors never close. The specialty of emergency medicine is actually growing in breadth and scope of practice, whereas many other specialties are becoming increasingly specialized and narrow in focus. Emergency physicians are becoming proficient with bedside ultrasonography, procedural sedation, airway management, and other skills. Over the past decade, emergency physicians have also made tremendous inroads into a number of medical school administrations across the country serving as course and clerkship directors, developing standardized patient and procedural skills programs, and directing Simulation Centers. Some of the more exciting aspects of our specialty are highlighted here:

1. Every shift is different. This is an understatement. There is no routine day at work. Shift work also provides for some degree of flexibility, allowing you to balance your career with your personal life.

2. The approach to patient care is team based. The emergency physician leads the team of nurses, ancillary staff, residents, and students to help manage and treat a multitude of patients. Cohesive camaraderie is an appealing part of our specialty.

3. The emergency physician is the ultimate detective. Emergency physicians encounter endless numbers of undifferentiated patients. Some presentations are straightforward, and others require an in-depth, systematically applied evaluation. Emergency physicians are the ultimate diagnosticians in the medical community.

4. Decisionmaking ability is critical. Almost on a daily basis, emergency physicians are faced with making critical decisions. Patients come into the emergency department in cardiac arrest, in respiratory distress, with acute abdominal pain, with an altered mental status, and more. Certain cases require split-second decisionmaking, whereas others allow for more thought and reflection.

5. Varied practice opportunities. There are a wide variety of practice opportunities and models available for emergency physicians. These range from the university-based academic emergency medicine physician to the community-based emergency physicians. Many opportunities exist for fellowship training, including EMS and disaster medicine, toxicology, pediatric emergency medicine, sports medicine, ultrasound, administration, education, hyperbaric medicine, critical care, and more. Because of the diversity of training, emergency physicians can also branch out into other venues, including practicing cruise ship medicine, managing international outreach programs, managing large-venue domestic events, or providing medical command for citywide or statewide EMS systems.

Despite the many opportunities within our specialty, emergency medicine is not a good career choice for everyone. As with any medical or surgical specialty, there are some perceived negative aspects to the field. These include the following:

1. Lack of patient continuity and follow-up: Emergency physicians practice in an environment that is very different from an office-based physician. We do not have our own private patients. Therefore, we rarely have the opportunity for any long-term relationship with our patients. Although many emergency departments have their "frequent flyers," the majority of physician–patient encounters are like two ships passing in the night, never to be seen again. However, some emergency physicians call a patient after discharge to find out how the patient is feeling or contact the inpatient team or primary physician to obtain follow-up information.

2. Shift work. Although shift work has its benefits, it also has its drawbacks. Shift work can be taxing on the body and cause disruption in the sleep–wake cycle because of its effect on the circadian rhythm. Emergency physicians work days, evenings, nights, weekends, and holidays. Because the emergency department never closes, shift work scheduling requires that someone always be working, sometimes during less-than-desirable times.

3. Nonurgent complaints. Close to 50% of the patients seen in emergency departments across the country are for nonurgent complaints. Unlike the overdramatization of the emergency department on television, many patients we encounter will have low-acuity complaints such as a sore throat, cough, congestion, minor trauma, and the like. In reality, this is not the case because many patients we encounter will have run-of-the-mill complaints such as a sore throat, cough, congestion, minor trauma, and the like. Many of these cases can be adequately cared for in an ambulatory care setting, but for any number of reasons, the emergency department serves as the primary site of health care for a large number of these patients. For some emergency physicians, this can be a source of frustration.

4. The emergency department is a fishbowl. For those who work in the emergency department, it is not uncommon for the practice of medicine to be viewed as if we are working in a fishbowl, meaning everyone can look in from the outside. This is commonly referred to as "Monday morning quarterbacking." Everything is easier when looked at in retrospect. A bad patient outcome or an unexpected turn of events can at times be inappropriately magnified. Some people do not handle this type of scrutiny well.

There are certain qualities and personality traits that might suggest you are a "fit" for emergency medicine. Because of the unpredictable and

collaborative approach to providing care in the emergency department, emergency physicians are extremely adept at multitasking, making time-sensitive decisions despite limited patient information, remaining calm under pressure, and thinking creatively in troubleshooting day-to-day problems. To excel in our specialty, you must also have excellent communication skills and enjoy working closely as a team with nurses and other ancillary staff.

Remember, making a career choice must be an informed decision. Seek out a mentor and an advisor. Gather information and solicit advice from as many different sources as possible. Ask many questions. Making a career choice is one of the biggest decisions you will ever make in your life. Put the time in to make the right decision.

Good luck and enjoy your rotation!

## Suggested Reading


Antoine Kazzi, A, Schofer, JM. *AAEM Rules of the Road for Medical Students.* 2003. Available at: www.aaemrsa.org/rules_road.shtml. Accessed March 10, 2008.

*This is a comprehensive review of topics of interest for the medical student interested in emergency medicine.*

Balentine J, Gaeta T, Spevack T. Evaluating applicants to emergency medicine residency programs. *J Emerg Med.* 1999;17:131–134.

*This article reviews the literature related to the selection process of medical students applying for emergency medicine residency programs.*

Crane JT, Ferraro CM. Selection criteria for emergency medicine residency applicants. *Acad Emerg Med. 2000;7:54–60.*

*This article reports the results of a survey of emergency medicine residency directors regarding selection criteria for applicants to emergency medicine residencies.*

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*This book includes a number of topics of interest for the medical student interested in emergency medicine.*

Koscove EM. An applicant's evaluation of an emergency medicine internship and residency. *Ann Emerg Med.* 1990;19:774–780.

*This article reviews pertinent information that an applicant to emergency residency programs should consider.*

National Resident Matching Program. *Results and Data*. Table 7, All Applicants Matched to PGY-1 Positions by Specialty, 1999–2007. Available at: www.nrmp.org/data/resultsanddata2007.pdf. Accessed March 25, 2008.

*This document reports the results from the 2008 National Residency Match.*

# *Abbreviations and Acronyms*

| | |
|---|---|
| AAA | abdominal aortic aneurysm |
| AAEM | American Academy of Emergency Medicine |
| ABEM | American Board of Emergency Medicine |
| ABG | arterial blood gas |
| ABMS | American Board of Medical Specialties |
| ACEP | American College of Emergency Physicians |
| ACGME | Accreditation Council for Graduate Medical Education |
| AMA | against medical advice |
| AOA | American Osteopathic Association |
| AOBEM | American Osteopathic Board of Emergency Medicine |
| CDEM | Academy of Clerkship Directors in Emergency Medicine |
| COHb | carboxyhemoglobin |
| CORD | Council of Emergency Medicine Residency Directors |
| CQI | continuous quality improvement |
| CT | computed tomography |
| ECG | electrocardiogram |
| EMBU | emergency medicine bedside ultrasound |
| EMRA | Emergency Medicine Residents Association |
| EMS | emergency medical service |
| EMTALA | Emergency Medical Treatment and Active Labor Act |
| EPs | emergency physicians |
| FN | false-negative |
| FP | false-positive |
| H&PE | history and physical examination |
| HMO | health maintenance organization |
| HPI | history of present illness |

| | |
|---|---|
| HR | heart rate |
| ICU | intensive care unit |
| IV | intravenous |
| LCME | Liaison Committee on Medical Education |
| LEP | limited English proficiency |
| LLSA | life-long self-assessment |
| MetHb | methemoglobin |
| MRI | magnetic resonance imaging |
| NGT | nasogastric tube |
| NPV | negative predictive value |
| PaCO2 | partial pressure of arterial carbon dioxide |
| PaO2 | partial pressure of arterial oxygen |
| PDA | personal digital assistant |
| PPV | positive predictive value |
| ROS | review of systems |
| SAEM | Society for Academic Emergency Medicine |
| SaO2 | oxygen saturation |
| SOAP | note format (subjective, objective, assessment, plan) |
| STEM | Society of Teachers in Emergency Medicine |
| TN | true negative |
| TP | true positive |
| UA/EMS | University Association of Emergency Medical Service |