Section 1

Principles of Emergency Medicine

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The emergency department (ED) is a challenging environment for patients, families, and medical personnel. Many challenges result from our practice’s principles: available at any time for any patient with any complaint. Patients who come to the ED are not familiar with us personally, yet must feel confident about our abilities to help them during their time of greatest concern. Their needs may be as straightforward as an excuse note for work or a prescription refill in the middle of the night, or as complex as an acute illness or injury, an exacerbation of a chronic condition, or a cry for help if depressed or suicidal. Even providing reassurance about a child’s fever to a concerned parent is a critical function of emergency physicians (EPs).

Qualities successful EPs exhibit include intelligence, sensitivity, humility, insight, proficiency making decisions with and acting on limited information, and the ability to multi-task. Being skillful negotiators, working well with individuals having different backgrounds and ethnicities, and advocating strongly for patients at all times are essential qualities. In addition to these traits, EPs must be experts in trauma and medical resuscitation of adults and children, and in sharing news with patients and family members about the outcomes of these events.

The majority of patients use the ED infrequently. Many may be experiencing this setting for the first time. Patients’ lack of familiarity with this environment, fear, stress, waiting times, painful procedures, and overall discomfort often preclude them from having a positive experience. These are only some of the issues that patients contend with in the ED.

EPs confront numerous challenges when taking care of patients presenting to the ED. Perhaps the greatest challenge is the spectrum of diseases which EPs must be able to identify. Rather than having to know only the first 15 minutes of an illness, EPs must be familiar with all stages of all illnesses, often presenting in atypical fashion. In addition, time pressures inherent to providing emergency care, the lack of existing relationships with patients, unfamiliarity with their medical history, and the inability to review patients’ medical records challenge EPs daily. EPs must rapidly and simultaneously evaluate, diagnose and treat multiple patients with multiple conditions, often with limited information, without confusing subtle nuances between patients. They must be insightful, anticipatory, and prepared to act and react to prevent morbidity and, when possible, mortality. Considering worse case scenarios is fundamental to EM practice. Most importantly, EPs must be comfortable providing detailed, often devastating information in a concise yet understandable manner to patients and family members who may have different cultural backgrounds.

It is indeed a privilege to be in a position to offer care to patients during what is likely to be their time of greatest need. Approaching patients sensitively, recognizing their apprehension, pain, concerns, and perhaps shame is critical to our mission. This is true no matter how trivial a patient’s problem may seem. Often, patients consult with EPs to seek approval about their desire to leave a spouse, to get an opinion regarding a physician’s recommendation for surgery, or to receive confirmation that they are making the right decision about a parent, child, or loved one. Serving in this capacity, without judgment, is not only appropriate but also essential.

It is imperative that EPs approach each patient with an open mind, committed to identify and address not only the presenting problem but also any coexisting problems. For example, a patient with the history and presenting complaint of esophageal reflux may in fact have acute coronary syndrome (ACS). A patient with the apparent problem of insomnia may have an underlying concern about his or her safety, security, or mental wellness. The ability of an EP to evaluate each patient using history-taking and physical examination abilities, as well as laboratory or radiography interpretation skills, when appropriate, is only a portion of our armamentarium. An experienced EP’s “sixth sense” is something that, over time, has become recognized and respected by non-EM colleagues.

Unfortunately, the ED environment is not always conducive to privacy. Despite the Health Insurance Portability and Accountability Act (HIPAA) of 1996 and Protected Health
Information (PHI) for patients, attempts to maintain patient confidentiality in the ED present a continuous challenge. Discussions about patient care issues between health care providers, staff, patients, and family members often take place behind nothing more than a curtain. Shared spaces, hallways, lack of private rooms or beds, and the demands of time-pressured discussions, often in open spaces, over the phone, or with consultants stretch efforts at maintaining patient confidentiality. The leadership role that EPs have in the ED affords them the opportunity to demonstrate respect for patient confidentiality and to remind others of the importance of upholding this principle.

Recently, there has been tremendous publicity regarding medical errors and patient safety. Human error may occur at any time, but is more likely during high patient volumes or when multiple complicated patients of high acuity present simultaneously. Error has been demonstrated to occur more frequently when provider fatigue is greatest (for example, at the end of a challenging shift or after being awake all night). Systems errors are even more likely to occur during these circumstances. Attention has been placed on reducing errors and improving patient safety, using the airline industry as an example. Airline pilots, however, are not required to fly more than one plane at the same time, while simulating take-off, landing, and changing course. The EM community should embrace the federal government’s attention to medical systems and its role in medical error, as patient safety is a top priority. Hospital quality committees review errors of omission and commission, medication errors, errors in patient registration, and errors of judgment. Given the pace of the ED environment, it is remarkable that more errors do not occur. The rapid need for patient turnover, room changes, and test result reporting does not occur with such immediacy in most other areas of the hospital. Hospital administrators with limited insight about the uniqueness of EM practice should focus attention to, and provide support for, this essential aspect of patient care.

EPs must recognize that patients signed over to them at the end of a shift pose increased risk. These patients typically have laboratory or X-ray results pending, are being observed for continued improvement or worsening in their condition, or are waiting for consultants. They should have treatment and disposition plans in place, predetermined by the EP who initially evaluated them based on anticipated outcomes. However, it may be these signed-over patients do not have well-established dispositions and need a new EP’s perspective. In such cases, it is better to inform the receiving EP that a good understanding about what is going on with that patient does not exist than leave things vague or unclear. As long as patients present to EDs at any time, patients signed over at shift’s end will continue to challenge our ability to provide safe care within our practice.

Scope of the problem

A landmark article by Schneider, et al. from the EM literature defines our specialty as one “…with the principle mission of evaluating, managing, treating and preventing unexpected illness and injury.” As emergency medical care is an essential component of a comprehensive health care delivery system, it must be available 24 hours a day. EPs provide rapid assessment and treatment of any patient with a medical emergency. In addition, they are responsible for the initial assessment and care of any medical condition that a patient believes requires urgent attention. One key aspect of this commentary is that patients may believe they require urgent attention, when in fact they do not. It remains our mission to provide patients the opportunity to receive sensitive medical care and reassurance even under this circumstance. EPs also provide medical support for individuals who lack access to other avenues of care. As the number of uninsured and underinsured persons in the US increases, and growing numbers of health clinics close, many of these individuals will use the ED for their primary as well as emergency care. This has placed a tremendous burden on the safety net provided by the specialty of EM.

In 2000, ED visits climbed to 108 million, a 14% increase from 1997. In California, patients visiting EDs were found to be sicker than ever before, with an increase in critical emergency care visits by 59% between 1990 and 1999. Although there were just over 4,000 EDs in 2000, the number of EDs has decreased as hospitals and trauma centers are forced to close. The number of EPs in clinical practice reported by the American College of Emergency Physicians (ACEP) in 1999 was just under 32,000, a decrease from 1997. There has been an increase in the number of nurse practitioners and physician assistants trained to work in emergency care settings, and many hospitals are staffing urgent care and fast-track areas with these practitioners.
With decreased funding available for non-ED clinics, and increasing numbers of patients without health insurance who use the ED as their primary (or only) source of health care, the worsening of ED overcrowding is inevitable.

Hamilton describes the clinical practice of EM in his textbook as one that “…encompasses the initial evaluation, treatment, and disposition of any person at any time for any symptom, event, or disorder deemed by the person – or someone acting on his or her behalf – to require expeditious medical, surgical, or psychiatric attention.” This philosophy creates tremendous challenges, as well as opportunities, unique to the specialty of EM. EDs must be fully staffed and always prepared while never entirely certain of patient needs at any given moment. Despite statistics on the number of patients presenting at different times on different days in different months, no one can predict the exact number of medical staff needed to care for even one emergency patient. Clearly, staffing an ED to be fully operational is an expensive proposition given this scenario.

**Clinical scope of the problem**

Table 1.1 provides the ten most common reasons for patients to visit the ED, according to a 2001 survey. Patients come to the ED due to only a few general categories of problems or complaints. These may be grouped as follows, listed in decreasing frequency.

**Table 1.1 Top 10 reasons for an ED visit (2001, National Hospital Ambulatory Medical Care Survey – CDC-P)**

1. abdominal pain (6,789,000)
2. chest pain (5,798,000)
3. fever (4,383,000)
4. headache (2,963,000)
5. shortness of breath (2,701,000)
6. back symptoms (2,595,000)
7. cough (2,592,000)
8. pain (2,335,000)
9. laceration (2,322,000)
10. throat symptoms (2,043,000)

**Pain**

Pain is the most likely reason for patients to seek medical care at an ED. It can be traumatic or atraumatic in nature. Chest, abdominal, head, extremity, low back, ear, throat, and eye pain are only a few examples.

**Difficulty with …**

This can be difficulty with breathing, vision, urination, swallowing, concentration, thinking, balance, coordination, ambulation, or sensation. Difficulty controlling seizure activity would also fall into this broad category.

**Fever**

Fever is common in children, and of great concern to parents. It can be a presenting complaint in adults as well. Conditions causing fever include viral or bacterial infections, such as upper respiratory infection (URI), gastroenteritis, otitis media, urinary tract infection (UTI), cellulitis, pneumonia, and bronchitis. Surgical conditions (such as appendicitis, cholecystitis, atelectasis, and postoperative wound infections), obstetric-gynecologic problems (such as pelvic or cervical infections, mastitis, postpartum infections), deep venous thrombosis (DVT), drugs and drug interactions, cancer, tick-borne infections, malaria or other parasitic infections, vasculitis, and arthritis are other conditions causing fever.

**Bleeding**

Bleeding may be painful or painless, and may or may not have other associated symptoms. Examples include lacerations, vaginal bleeding (with or without pregnancy), gastrointestinal (GI) bleeding, epistaxis, and hematologic illnesses such as anemia, von Willebrand’s disease, or hemophilia (often resulting in spontaneous bleeding).

**Social concerns**

Social issues for which patients come to the ED include an inability to care for oneself, a change in behavior (either organic or functional), drug and/or alcohol-related problems, homelessness, hunger, or concerns of family members that something might be wrong.

In EM, it is essential that care is coordinative, meaning that EPs should seek assistance with patient care, relying on more than just the patient to assess the situation. Family members often provide additional information about illness progression that patients fail to recognize or
approach to the emergency patient

Anatomic essentials

Anatomic essentials for the patient presenting to the ED are covered in detail throughout the text. Airway, Breathing, Circulation, Disability, and Exposure are crucial to the initial evaluation and management of emergency patients with emergent or urgent conditions. This may be true for conditions that do not seem emergent at the time, such as the airway of a talking patient recently exposed to intense heat (fire, smoke, or steam). The airway is essential not only for gas exchange, but for protection against aspiration. It may be used for the administration of certain medications. With conditions causing increased intracranial pressure (ICP), airway management with modest hyperventilation results in cerebral vasoconstriction, one aspect of therapy. Breathing is not only dependent on the lungs, but on the thoracic cavity, respiratory musculature, and central nervous system (CNS). Circulation may be compromised as a result of hemorrhage, dehydration, vascular catastrophes, cardiovascular collapse, or vasconstriction or vasodilatation in response to shock. Evaluating disability includes a careful yet focused neurological exam, including an assessment of the level of consciousness, mini-mental status, and evaluation of motor, sensory, reflexes, cranial nerves, and cerebellar function as appropriate. A thorough understanding of neurovascular supply to extremities, especially following traumatic lacerations or injuries, helps identify limb threats or potential morbidity. Knowledge of dermatomes is also helpful when assessing neurologic symptoms. The Alertness, Verbal response, Pain response, Unresponsive (AVPU) scale and the Glasgow Coma Scale (GCS) are two simple evaluation tools that can be recorded to describe general neurologic status of a patient, as well as follow neurologic change over time. Exposure is essential so injuries are not missed, as well as to consider possible environmental elements that may contribute to the presentation (e.g., heat, cold, water, toxins).

History

The patient’s history has always been considered one of the most important elements in determining a final diagnosis. It is accepted that the history (and physical examination) can determine the diagnosis in up to 85% of patients. A patient’s history should focus on the current problem(s), allowing room to identify additional information and determine its relevance. When patients present in extremis, the traditional approach to obtaining the patient’s history must be abandoned. In this situation, history and physical examination information must be obtained concurrently. EPs are often forced to rely on clinical assessment and impression, and utilize many important diagnostic studies during their decision-making. Some studies that assist in establishing a final diagnosis, such as an electrocardiogram (ECG), glucose, urine dipstick, and other bedside tests can be obtained while gathering historical data. However, establishing a final diagnosis is not always possible during the course of the patient’s evaluation in the ED. Fortunately, having a final diagnosis is not always necessary, as an appropriate disposition with follow-up evaluation and tests during hospitalization or as an outpatient may be of far greater importance.

When approaching any emergency patient, a brief introduction using the appropriate prefix (doctor or medical student) is preferred by patients. It is reasonable to include with this introduction relevant background information, such as your current level and specialty of training. A gentle yet professional touch, such as a handshake or touch of the wrist is a kind gesture. This gesture of reaching out to a patient is favorable received in general. Before questioning a patient about his or her present illness or medical history, sit down at the patient’s bedside if the situation allows. This not only eliminates towering over a patient, but demonstrates that you are interested in what he or she has to say, and plan.
to be present and listen for a while (even if this time is short). Patients recall that the amount of time their physician spent with them was greater if their physician sat down during the interaction. After sitting down, listen to what the patient has to say. Physicians interrupt their patients early and often, and EPs are some of the biggest offenders. Look patients in the eye so they know you are present, listening, and care about their concerns. If you will be taking notes during the interview, do so following a short period of good eye contact. Demonstrate respect for a patient’s well-being and privacy by offering a pillow, blanket, adjusting their bed, assisting with covering their person, or providing water (if appropriate). This can be done in a few seconds at the start of each patient interaction.

When possible, use open-ended questions to elicit historical information about a patient’s condition. This allows patients to describe their concerns using their own terms. Certainly, some questions require yes or no answers (“Do you have diabetes?”). There will be times when directed questions are required, such as to a patient in extremis, or when a patient does not answer questions promptly or concisely. However, most patients will get to the point in a relatively short time.

The P-Q-R-S-T mnemonic assists with gathering important historical elements of a presenting complaint from a patient. Using the example of “pain,” questions relating to the history of a painful condition include (Table 1.2):

### Table 1.2 P-Q-R-S-T mnemonic for history

| P | is for provocative/palliative, as in “What makes this pain worse or better?” |
| Q | is for the quality of pain, as in “Describe your pain?” or, “Is your pain sharp or dull?” |
| R | is for region/radiation, as in “What region of body does this pain occur?” and “Does it radiate, or move, to any other location(s)?” |
| S | is for severity, which may be communicated using a numeric scale from 0–10 or a happy-sad faces scale. |
| T | is for timing/temporal relationships associated with the pain. Questions might include “When did the pain start?”, “How long did the pain last?”, and “What were you doing when the pain started” (eating, exertion, watching television, going to bed)?” |

Additional historical information to learn may be obtained using the mnemonic A-M-P-L-T-O-E (Table 1.3).

### Table 1.3 A-M-P-L-T-O-E mnemonic for additional history

| A | is a reminder to discuss allergies to medications, latex, seasonal allergens, or other things. |
| M | is for medications, including prescription and nonprescription. Surprisingly, many patients do not consider acetaminophen, ibuprofen, oral contraceptives, insulin, or vitamins (including herbal remedies) to be medications, and do not offer this information. |
| P | is for previous or past medical history, which may provide a clue to the present condition. If this patient has had a similar illness before, he or she may have it again, or is at greater risk for it to recur. |
| L | is for last meal, perhaps the least helpful of these questions. Last meal does, however, relate to airway protection in the event of procedural sedation or a surgical procedure. |
| T | is for tetanus status, which should be updated every 5–10 years, depending on the type of wound and its likelihood for being tetanus-prone. |
| O | is for other associated symptoms/operations. Associated symptoms may assist in reaching a diagnosis, and may afford the opportunity to relieve discomfort. Some patients do not include previous surgeries in their medical history. |
| E | is for events/EMS/environment, which include the events leading up to the illness, the role of the emergency medical system (EMS) during transport (interventions, complications), if applicable, and any environmental influences on the presentation (heat, cold, rave or other party). |

Information regarding a patient’s family and social history should also be reviewed. Family members with similar illnesses or conditions who present similarly to this patient are important to identify. Examples include a strong family history of cardiac or thromboembolic disease, appendicitis, gallbladder disease, or cancer. Social history includes the patient’s living situation, marital status, use or abuse of tobacco, alcohol, and/or drugs, occupation, and handedness (in the setting of neurologic disease or extremity trauma).

Several key questions might therefore include:

- How did the pain begin (sudden vs. gradual onset)?
- What were you doing when the pain began?
- What does the pain feel like?
- On a scale of 0–10, how severe is the pain?
- Where is your pain?
- Has it always been there?
- Does the pain radiate anywhere else?
- Does anything make the pain better or worse?
- Have you had this pain before?
• Have any family members had pain similar to this?
• What do you think is the cause of your pain?

Associated symptoms are important, as many diseases have a specific collection of symptoms associated with them. The concept of *parsimony* is an important one, in which a diagnosis has a higher likelihood of being correct if one disease can be used to explain the entire constellation of associated symptoms. This provides a more likely explanation than the coincidence of more than one disease being responsible. Additional caution should occur with patients at the extremes of age (newborn and elderly), as the likelihood of serious infections, decreased physiologic reserve, and comorbid or coexisting conditions increases in these patients. Some key associated symptoms are listed in Table 1.4. Warning signs in the history are provided in Table 1.5:

### Table 1.4 Key associated symptoms

- **Cardiopulmonary symptoms**
  - Cough, dyspnea, orthopnea, palpitations, dizziness, syncope, and chest pain.
- **Gastrointestinal symptoms**
  - Abdominal pain, nausea, vomiting, anorexia, constipation, diarrhea, and bleeding.
- **Genitourinary symptoms**
  - Dysuria, frequency, urgency, hematuria, and pneumaturia.
- **Obstetric/Gynecologic symptoms**
  - Pregnancy, menses, age of menarche, contraception, fertility, sexual activity, sexually-transmitted infections, vaginal discharge or bleeding, dyspareunia, previous surgeries, recent procedures, and other pelvic infections.
- **Neurologic symptoms**
  - Weakness, difficulty speaking, concentrating, swallowing, or thinking, imbalance, sensory changes, visual problems, and headache.

### Table 1.5 Warning signs in the history

1. Sudden onset of symptoms (especially first time)
2. Significant worsening of symptom(s) which had been stable
3. True loss of consciousness or alteration of consciousness
4. Cardiopulmonary symptoms (dyspnea, chest pain or pressure)
5. Extremes of age (newborn, elderly)
6. Immune compromise (HIV-positive, AIDS, cancer, diabetes, or on immunosuppressant therapy such as chemotherapy or chronic steroids)
7. Poor historian, including language barriers
8. Repeated visit(s) to a clinic or ED, especially recent
9. Incomplete immunizations
10. Patient signed over at the end of a shift

is best to do a detailed, problem-pertinent physical examination so that important findings are not missed. In addition, concentrating on associated organ systems that may have a role in the illness is recommended. These areas may provide clues to the etiology of the pain or illness. In fact, establishing a comprehensive differential diagnosis for that patient’s complaint and examining areas of the body that may contribute to the condition allows EPs to prioritize the likelihood of other diagnoses causing the symptoms. As this chapter describes the approach to the emergency patient, it will address only the general appearance, vital signs, and physical examination pearls in general. Other chapters provide greater detail for a particular condition or constellation of symptoms.

### General appearance

This may be the most important element of the physical examination for EPs, as it assists with determining who is sick and who is not. Experienced EPs can look at patients and have a reasonably accurate idea of who needs to be hospitalized. This is one reason why EPs feel concern for patients in the waiting room, whom they have not yet visualized. General appearance is particularly important in the pediatric population, as social interaction, playfulness, physical activity (including strength of cry) and hydration status (amount of tears, for example) are significant findings that can be identified within moments. The younger the patient is, the more difficult it is for EPs to determine wellness based on general appearance alone. The fact that a patient’s general appearance is less helpful to EPs at the extremes of age makes caring for these patients more challenging.
Vital signs

Vital signs are important for all emergency patients. A complete set of vital signs should be obtained and repeated during the emergency visit. Often, the vital signs are obtained in triage and not repeated until many hours later when patients are placed in examination rooms. Many EDs have policies that vital signs must be repeated for patients in the waiting room. This is a wise strategy, even though abnormal vital signs may not require action. EPs should at the very least review one complete set of appropriate vital signs on every patient, and address each abnormal vital sign (or consider why it is abnormal). At times, rechecking the vital signs is extremely important, such as the heart rate in a patient with ACS or acute myocardial infarction (AMI), the respiratory and heart rates in patients with breathing difficulty, or the temperature of a child who experienced a febrile seizure. It is of far greater importance to recheck the temperature of a previously afebrile patient with a possible surgical condition or serious bacterial infection than a febrile child’s temperature following acetaminophen or ibuprofen if they are now well-appearing, playful, and at low-risk for a febrile seizure. Orthostatic vital signs (heart rate and blood pressure in supine, sitting, and standing positions) are inherently time-consuming, unreliable, and nonspecific. However, if the situation suggests that these measurements would be in the patient’s best interest, they may provide useful information (Table 1.6). It is good practice to recheck a patient’s vital signs prior to discharge.

Table 1.6 12 Vital signs to consider

1. General appearance (perhaps the most important and underutilized vital sign)
2. Temperature (rectal temperature should be considered in newborns or infants, and the elderly who are hypothermic, tachypneic and mouth-breathing, or in patients with alterations of consciousness)
3. Heart rate (including strength, quality, and regularity)  
4. Respiratory rate (often miscalculated due to multiplication error)
5. BP (consider orthostatic BP; although may be falsely negative; also consider BP measurements in each arm or upper and lower extremities in certain conditions)
6. Oxygen saturation (pulse oximetry)
7. Blood sugar (bedside glucose), which provides an immediate value for situations including an altered LOC, a diabetic with the likelihood of abnormally high or low glucose, or when glucose is the only blood test necessary
8. Pain score (from 0–10, or happy–sad faces scale), repeated frequently and after interventions as indicated
9. GCS (best eye opening, verbal, and motor responses) or other methods which measure LOC or mental status, such as AVPU or mini-mental status examination
10. Visual acuity (for patients with visual or neurologic complaints)
11. ETCO₂ for intubated patients
12. Fetal heart tones (for pregnant patients)

AVPU: alertness, verbal response, pain response, unresponsive.
BP: blood pressure.
ETCO₂: end-tidal carbon dioxide.
GCS: Glasgow Coma Scale.
LOC: level of consciousness.

Pearls specific to the physical

Be professional

A professional greeting and introduction should evoke warmth and kindness. Patients want to know that the EP they “have” (they did not “choose”) is considerate, sensitive, thoughtful, competent, and listens well; in other words, a true professional. Most patients aren’t interested in a joke or a discussion of current events when they are in the ED, at least not immediately. EPs should wear clean and appropriate clothing, be polite, well-mannered, well-groomed, and appear well-rested. A current hospital ID badge with name and photograph should be prominently displayed. A health care provider should never bring food or beverages into the examination room.

Go slowly

Try not to rush patients, or to seem rushed, despite how busy you may be. Speak slowly and clearly, with increased volume for elderly patients should they need it. Warm and clean hands are essential for patient comfort. If you are using gloves, tell patients that this is your practice for all patients. A well-lighted, warm room (if possible) is also preferred. Having a chaperone of the same gender as the patient present is always a good idea, especially during examination of private (genitals, breasts, pelvic and rectal) areas. Again, let patients know that this is your standard practice and you are doing it for their benefit (even if you are protecting yourself as well). Having translators or family members present (when appropriate) also makes patients more comfortable.
Be gentle
Do not proceed immediately to the area of pain, and do not palpate a tender area using more pressure than is absolutely necessary. If possible, try to distract patients while you examine a painful area. This is especially true for pediatric patients. Always examine the joints above and below an injured area, as other injuries may coexist due to transmitted forces. Remove all constricting jewelry and clothing distal to an injured area, as swelling due to dependent edema is likely to occur. Patients may not appreciate this gesture at the time, but it will be valuable in terms of patient safety and preventing damage to an item that may require removal later.

Be thoughtful
Use language that patients and family members understand. It does not impress patients when physicians use technical jargon to look smart. If patients are not familiar with abbreviations or terms that you have used, they may not be comfortable asking for their meaning. For example, despite the common use of the abbreviation “MI” for myocardial infarction, many people do not know what it means. You may tell a patient that he had an MI, only to be asked later if he suffered a heart attack. In children, consider efforts to involve parents with the examination, such as looking in a parent’s throat or ear first. Other skills to use when examining children include letting the child touch your stethoscope or otoscope before using it. Involve older children in the examination by asking which ear they would prefer be examined first. Recognize that hospital gowns are not flattering; it is a kind gesture to assist a patient by offering to tie his or her gown, especially if they are going to leave their ED gurney.

Be thorough
This is important so that critical findings or other clues to the patient’s final diagnosis are not missed. For example, lacerations, contusions, rashes, or bruises might imply spouse abuse. If it may be relevant to the presenting complaint, expose the patient’s skin during the examination of the body region. Rashes may be present which identify life-threatening infectious diseases or may eliminate the need for further diagnostic studies (e.g., meningococcemia or herpes zoster).

Be efficient
An entire physical examination does not need to be done on every patient. For example, a funduscopic examination does not need to be performed on a patient presenting with an ankle injury. Furthermore, examine patients starting with the position they are in, rather than from head-to-toe, which can save time. For example, if the patient is supine in the gurney, consider examining their abdomen before their lungs.

Differential diagnosis
Following the history and physical examination, with careful review of the vital signs, a differential diagnosis should be established. This differential diagnosis should be as comprehensive as possible, as it suggests which diagnostic tests should be obtained, and in which order. This differential diagnosis also establishes which therapeutic approaches should be initiated, if they have not already begun.

Diagnostic testing
Diagnostic testing in the ED is performed to include (“rule in”) or exclude (“rule out”) conditions responsible for the patient’s symptoms. As such, it is imperative that EPs have a sense of
Laboratory studies

Because of the time pressures for patient dispositions, many tests have been or are being developed that can be done at the bedside, to decrease the turnaround time for results. Known as “point-of-care” testing, one classic example is the bedside glucose test. Numerous implications of this rising technology’s role in EM have been studied. Current research using new bedside tests of cardiac markers and other tests of cardiac function is ongoing. Treadmill tests on low-risk cardiac patients have been performed from (or in) the ED to risk-stratify patients regarding their need for hospitalization. Bedside ultrasonography is a similar test being utilized by EPs with increased frequency to assist with patient diagnosis, treatment, and disposition. As more hospitals and EDs subscribe to these concepts, and more physicians gain skills in these areas, these tests will assume an even greater role in the evaluation and treatment of emergency patients. Unfortunately, regulations have removed many tests from the ED that were previously performed there, such as pregnancy tests and microscopic evaluation of vaginal flora. Having these tests done in a laboratory increases the time to receive results, if for no other reason than sample transport time. The implications of increased laboratory turnaround time are enormous given ED closures, lack of ED and hospital bed availability, and increased patient volumes in EDs across the US. Some tests are being ordered or performed by certified nurses during the triage process, as patients register for evaluation by EPs. These tests include urine collection to screen for pregnancy, blood, or infection. ECGs to evaluate cardiac function, and radiographs. There has been extensive research to develop rules to assist health professionals with determining a patient’s need for an X-ray. If these clinical criteria are met, trained nurses in many institutions may order X-rays from the triage area in an effort to streamline care and reduce overall patient time in the ED. Examples of some rules found in the literature include the Ottawa ankle, knee, and foot rules, the Pittsburgh knee rule, the Nexus rule for cervical spine radiographs, and several head computed tomography (CT) rules. Depending on the situation, nurses generally use the extremity rules in their practice, while physicians apply the C-spine and head CT rules. Some EDs have a physician or nurse order necessary blood tests and send them to the lab from the triage area, in an effort to improve patient throughput.

Electrocardiography

With ECGs, it is a good idea to obtain old ECGs whenever possible to allow comparison with the new (current) ECG. This is of particular importance in patients with abnormal conduction, abnormal intervals, or abnormal ST and T wave segments. ECGs should be repeated in the ED if patients develop chest pain or if their chest pain resolves, whether spontaneously or following intervention. The importance of serial ECGs cannot be overemphasized in the setting of ACS, or if the possibility of a cardiac etiology for chest pain is entertained. ECGs are invaluable in patients with acute ST-segment elevation MI (STEMI), as the determination for thrombolysis or percutaneous coronary intervention (PCI) is time-sensitive from the time of the first diagnostic ECG. They also serve as useful adjuncts in the evaluation of several toxic ingestions or presenting symptoms such as weakness, dizziness, abdominal pain, back pain, confusion, or alterations of mental status.

Radiologic studies

Regarding the use of radiology in diagnostic testing, physicians seem to rely on imaging to a greater extent than they did years ago. This is due in part to the greater role imaging plays in patient care, the increased availability of CT scanners, the manner in which physicians are currently trained, and the increased concern over litigation. Nevertheless, obtaining radiologic imaging (especially CT) has become a standard that physicians must recognize, and that patients often demand. Not ordering radiologic studies to identify certain conditions may be indefensible, as these tests are sensitive, specific, and readily available 24 hours a day in nearly all EDs. The development of guidelines to help determine which patients require X-rays has provided physicians the ability to safely reduce the number of radiographs ordered. EPs use bedside ultrasonography as part of their physical examination skill set in many hospitals, often with the support of radiology. This situation arose out of the need for EPs to have ultrasound available to their patients on a 24-hour basis, to identify hemoperitoneum following abdominal trauma,