Chapter 1

Introduction

Rule # 1 You came to medical school to be a great doctor. That process begins now.

Why did you become a doctor? There may be a number of reasons, but the most important one is the same across the board: to take care of patients. You will read startling amounts of information during medical school, and your training will include many procedures and new techniques, but all of it is in the service of patient care. You are here to make each and every individual patient better.

That process starts now.

It is an amazing privilege to take care of patients. You can read about a disease all that you want, but to be able to speak to and examine a patient with that disease is an unsurpassed learning experience. It is an incredible responsibility as well. You will be asking patients the most intimate and intrusive types of questions. You will be asking patients to offer their arm for a needle, to disrobe for an exam, to let you literally poke and prod at their body. In return, you are responsible for protecting them from harm, and for healing them.

Starting as a medical student, and progressing to a respected physician, is a long, difficult, and intense process. It takes years of education, and years of training. The privileges granted to physicians are remarkable. In return, you have a great responsibility. Your education is in the service of patient care. You have a responsibility to make the most of that education.

What does it take to be a great doctor? There is an impressive body of research devoted to medical student education, and to the factors and interventions that ensure good doctors. Medical educators work hard to ensure that students master these different facets of the practice of medicine.

Why are clerkships so important to the process of producing great doctors?

The areas emphasized in clerkships are those that are integral to becoming a great physician.

Patient care requires the daily use of many skills. On a daily basis, a physician may need to:

Obtain an accurate medication history.
Detect a heart murmur.
Create a differential diagnosis for the patient with abdominal pain.
Interpret an elevated alkaline phosphatase.
Formulate a management plan for the patient with a myocardial infarction.
Communicate that plan through oral discussions and written documentation.
Utilize the talents of an entire health care team to maximize patient care.
Manifest their concern for the patient in every interaction.

Clerkships teach students how to accomplish these difficult, vital skills.

If you don't learn certain skills in medical school, you may never learn them.

Clinical clerkships provide the foundation of successful patient care. They represent a critical time in your education. If you want to become proficient in exam skills, you have to learn now. These aren't skills you can learn from reading a textbook. You need to evaluate patients with these findings, and you need to have a teacher that can demonstrate these findings. You need to be able to ask questions freely in order to learn all the finer points of physical exam skills. This isn't something you can easily do as a resident, and certainly not as a board-certified physician. If you don't know how to assess jugular venous distention by the end of medical school, you may never learn.

While you would assume that medical school teaches you everything you need to know to function well as a resident, that isn't true for all students, particularly those who take a passive approach to learning or those who focus their education on textbook learning. You need to maximize your learning experiences and teaching opportunities on the wards. Passive learning has real consequences.

In one eye-opening study, internal medicine residents were tested on cardiac auscultatory skills. They listened to 12 prerecorded cardiac events. American residents demonstrated poor proficiency, with mean identification rates of only 22%.[1] In another study of resident skills, ECG proficiency was measured. Surprisingly, 58% of residents wrongly diagnosed complete heart block, and only 22% were certain of their diagnosis of ventricular tachycardia.[2] In a study of radiologic proficiency, participants included mainly residents, with some students. In x-rays representing emergency situations, pneumothorax was misdiagnosed by 91% of

participants overall, while a misplaced central venous catheter was missed by 74%.[3]

Skills in patient examination, interpretation of tests, synthesis of information, and medical decision-making are honed through years of practice. Clerkships are only the first step, but provide an invaluable education, with supervisors there to demonstrate, to model, and to teach skills. The best medical students regard clerkships as a unique and invaluable learning experience, difficult to replicate in residency or later through seminars and conferences.

If you don't learn it now, you may have problems as a resident.

Medical school is the time to learn and develop your clinical skills. It's also the time to develop and hone the learned attributes and attitudes that predict success as a physician. In a study of residents with problematic behavior, investigators sought to determine if there were prognostic indicators in their medical school evaluations.[4] The short answer is yes.

Students whose evaluations indicated that they were timid, had problems in organization, displayed little curiosity, and had difficulty applying knowledge clinically, among other types, were more likely to become problem residents. The authors "found a rather robust multilevel correlation between residents who have problems, major or minor, during or after residency, and negative statements, even subtle ones, in the dean's letter." The predictive statements noted in the dean's letter included:

Very nervous, timid initially / Displayed little curiosity / Had difficulty applying knowledge clinically / He came across as confrontational / Maybe somewhat overconfident for his level of training / Lack of enthusiasm and problems in organization / Needs to read more on her own / Lots of effort, uneven outcome

Difficulties during clerkships may predict difficulties as a physician, including disciplinary actions by the State Medical Board.

Clerkships are the foundation of successful patient care. During clerkships, medical students also develop and hone the attributes and attitudes that are required of successful physicians. These are referred to collectively as medical professionalism. "The specific attributes that have long been understood to animate professionalism include altruism, respect, honesty, integrity, dutifulness, honour, excellence and accountability."[5] – Dr. Jordan Cohen, president emeritus, Association of American Medical Colleges.

If you don't hone these traits during medical school, you may have problems as a physician. Unprofessional behavior in medical school is a possible predictor of future disciplinary action. A particularly notable study was performed by Dr. Maxine Papadakis, associate dean for student affairs at the UCSF School of Medicine. She and her team examined the medical school records of 235 graduates of three medical schools. Each

of these physicians had been disciplined by one of 40 state medical boards over a 13-year period. The disciplined physicians were three times more likely than a control group to have negative comments about their professionalism documented in their medical school record.[6]

Another study sought to identify the domains of unprofessional behavior in medical school that were associated with disciplinary action by a state medical board.[7] Three domains of unprofessional behavior were significantly associated with future disciplinary action: poor reliability and responsibility, poor initiative and motivation, and lack of self-improvement and adaptability.

Your core clerkship grades may either limit or expand your future career options.

The skills and traits reflected in core clerkship grades are considered so important to future success as a resident that residency programs use these grades as a major criteria in the selection process. Program directors are decision-makers in the residency selection process. In a survey of over 1,200 residency program directors across 21 medical specialties, grades in required clerkships were ranked as the # 1 factor used in the selection process.[8]

Studies across multiple specialties have supported the predictive nature of clerkship grades. In one study, researchers sought to determine which residency selection criteria had the strongest correlation with performance as an orthopedic surgery resident. The authors concluded that the "number of honors grades on clinical rotations was the strongest predictor of performance."[9] In a study of physical medicine and rehabilitation residents, "clinical residency performance was predicted by clerkship grade honors."[10] In one study of internal medicine residents, performance as a resident was significantly associated with the internal medicine clerkship grade.[11]

In the next 400 plus pages, we review each of the areas that students need to master in clerkships. The book contains a great deal of in-depth content across a range of areas vital to medical student success. It's also arranged to ensure ease of use. The first sections serve as straightforward how-to guides for each of the core clerkships. If you're starting your Pediatrics clerkship, and aren't sure how to write the daily patient progress note, Chapter 4 walks you through that process. If you're starting the Ob/Gyn clerkship, and don't know how to write a delivery note, Chapter 6 provides a template and sample note that details exactly what you'll need to include. The latter chapters provide more wide-ranging content. If you'll be presenting in rounds for the first time, you can turn to the chapter on oral case presentations and review the features you'll need to include. If you are committed to fully protecting your patients from the hazards of hospitalization, Chapter 8 Patients includes several tables that outline the steps that medical students can take, even at their level, to protect their patients. Chapter 22 reviews the impact of collaborative care on patient outcomes, and provides recommendations that students can implement.

The recommendations presented here are based on discussions with numerous faculty members, residents, and students, as well as our own experiences. We've also focused our efforts on evidence-based advice. This evidence-based advice is based on our review of the substantial medical literature in the area of medical student education. The book includes over 400 references from the relevant literature.

Over the next 400 plus pages, you'll learn how to maximize your education during core clerkships, as well as your performance. Your success on the wards will become the foundation of outstanding patient care.

Patients

We begin this chapter with one of the most famous quotes in the history of medicine. "First, do no harm." From ancient times onwards, medical practice has posed dangers to patients. In modern times, those dangers are shockingly common. Medical error is thought to be the third leading cause of death in the US.[12] Those errors include the unbelievable: one report described an average of 27 cases in one year, per New York hospital, of invasive procedures performed on the wrong patient.[13] Some of those dangers have become so commonplace that we consider them routine. When a patient develops a hospital-related infection, we document it as a nosocomial infection and treat the infection without questioning why it occurred. However, many of those infections are preventable, and should never have occurred at all. In this chapter, you'll learn a number of specific measures that medical students can implement to protect their patients, from the use of standardized abbreviations to ensuring that patients receive venous thromboembolism prophylaxis when indicated. We outline how medical students can identify the hazards of hospitalization, thus ensuring that you can act to mitigate those hazards. We review nosocomial infections, and how you may be a culprit through your hands, your clothing, and even your stethoscope.

We also review the type of skills that ensure that patients feel comfortable with your care. The best medical care necessitates that patients trust their physicians and have confidence in both their abilities and the fact that the physician cares about the patient, not just the illness. In this chapter, our focus is on the patient, and how medical students can improve the care provided to patients. We outline steps that students can take, even at their level, to protect their patients from physical harm. We emphasize the different ways in which medical students can enhance patient care, patient education, and patient counseling. On a daily basis, you have the opportunity and the power to enhance the care provided to your patients.

Internal Medicine Clerkship

The field of internal medicine (IM) has a broad impact on all fields of medicine. "Learning about internal medicine – the specialty providing comprehensive care to adults – in the third year of medical school is an important experience, regardless of what specialty the medical student ultimately

pursues," says Dr. Patrick Alguire, the Director of Education and Career Development at the American College of Physicians.[14] Through this clerkship, you will hone your skills in history and physical examination, diagnostic test interpretation, medical decision-making, and management of core medical conditions. These skills are important ones for all physicians, even if you ultimately decide to enter radiology, pathology, emergency medicine, or another field. Overall, internal medicine does stand as the most frequently chosen specialty in the residency match. In 2010, over 3,000 allopathic and osteopathic medical students matched into an internal medicine residency program.

Your IM clerkship grade can impact your career. It's a factor in the residency selection process for all specialties, not just internal medicine. In a survey of over 1,200 residency program directors across 21 medical specialties, grades in required clerkships were ranked as the # 1 factor used in the selection process.[8] "Do well in your clerkship," writes the Department of Medicine at the University of Washington. "Yes, this is obvious – and easier said than done – but it's also important. Most residency programs look closely at the third-year clerkship grade when selecting applicants."[15]

Many medical students find this clerkship formidable. A lack of knowledge isn't the main factor. The main factor is a lack of preparation for your many responsibilities. How do I evaluate a newly admitted patient? What do I need to include in a daily progress note? What information do I need to include in a comprehensive write-up? How do I present newly admitted patients to the attending physician?

In this chapter, templates and outlines are included for each of these important responsibilities. You'll also find a number of tips and suggestions on how to maximize your learning and performance during this rotation. You'll find detailed information that will help you effectively preround, succeed during work rounds, deliver polished oral case presentations, create well-written daily progress notes, and generate comprehensive write-ups.

For students interested in a career in internal medicine, this chapter also details how to strengthen your application. You'll learn how to identify potential mentors and obtain strong letters of recommendation. You'll learn about recommended electives and sub-internships, as well as specifics that detail how to maximize the impact of your application.

Surgery Clerkship

The surgery clerkship provides significant exposure to common surgical problems, and allows you to evaluate the specialty as a potential career choice. Although the bulk of your education will take place on the general surgery service, most rotations provide the opportunity to explore several surgical subspecialties. A surgical clerkship education is very valuable, whether or not you choose to practice in a surgical field. Primary care physicians must be familiar with the evaluation and management of patients in the pre-operative and post-operative settings. An understanding of core surgical principles is important across many fields, including ones such as anesthesiology, dermatology, and emergency medicine.

From a personal standpoint, you or a family member is likely to undergo surgery in your lifetime, and you'll find that an understanding of the pre-operative, operative, and post-operative stages will be valuable.

Regardless of your chosen career, your surgery clerkship grade will be a factor used in the residency selection process, due to an emphasis on core clerkship grades in the residency selection process. In a survey of residency program directors across 21 medical specialties, grades in required clerkships were ranked as the # 1 factor used in the selection process.[8] The University of Colorado Department of Surgery writes that "most surgery programs look very favorably on an 'Honors' grade in your MS3 surgery clerkship rotation and may factor in the grades you received in your Medicine and Ob/Gyn rotations."[16] It's not easy to honor the clerkship. In a survey of medical schools across the country, Takayama found that only 27% of students achieve the highest grade in the surgery clerkship.[17]

Many students approach the surgery clerkship with considerable anxiety. In one study, students were most concerned about fatigue, long hours, workload, insufficient sleep, lack of time to study, mental abuse (getting yelled at or relentless pimping), and poor performance.[18] Unfamiliarity with the operating room environment was also concerning.

In the Surgery Clerkship chapter, we provide tips for operating room success, a checklist for thorough pre-rounding, a step-by-step guide to presenting patients, and time-saving templates for the pre-op, post-op, and op notes. This information will maximize your education as well as your performance.

In 2010, approximately 2,500 allopathic and osteopathic medical students matched into general surgery or a related surgical specialty, such as orthopedic surgery, otolaryngology, plastic surgery, or urology. This chapter includes recommendations for those students interested in pursuing general surgery as a career. When should you do a sub-internship? Should you do an away elective? What are considered negatives in a residency application? These questions, and others, are answered.

Pediatrics Clerkship

During the pediatrics clerkship, students will gain experience and skills in the evaluation and management of common medical problems in infants, children, and adolescents. The Department of Pediatrics at the University of South Alabama writes that "there are few areas in medicine where knowledge of pediatrics will not be necessary."[19] In pediatrics, there is an emphasis on family-centered care. Learning how pediatricians deliver family-centered care will be of benefit, regardless of your medical specialty choice. The Institute for Patient- and Family-Centered Care writes that families "are essential to patients' health and well-being and are allies for quality and safety."[20]

As a core clerkship grade, your performance in Pediatrics is important to residency programs in other specialties. In a survey of over 1,200 residency program directors, grades in required clerkships were ranked as the # 1 factor used in the selection process.[8] In a survey of medical

schools across the country, Takayama found that only 29% of students achieve the highest grade in the pediatrics clerkship.[17]

Dr. Andrew Bremer, a pediatric endocrinologist and assistant professor in the Department of Pediatrics at Vanderbilt University, is the author of the *Pediatrics Clerkship: 101 Biggest Mistakes And How To Avoid Them.* He writes that "the pediatrics clerkship is different in many respects from other core clerkships and students are often uncertain of how best to navigate the transition from adult to pediatric care. The challenges of learning how to interact with pediatric patients, take and perform the pediatric history and physical exam, and present patients during rounds presents a steep learning curve for students in the first few weeks of the clerkship."[21]

In the Pediatrics Clerkship chapter, you'll find templates and outlines to help you fulfill your daily responsibilities and tasks. You'll learn how to effectively pre-round, succinctly and accurately present new and established patients, and develop comprehensive write-ups using our checklist. Do you know what elements to include in the neonatal, growth, and developmental histories? This chapter details those elements.

In the 2010 NRMP Match, over 1,900 allopathic and osteopathic students matched into pediatrics. For those of you interested in pediatrics as a career, this chapter provides insight into the pediatric residency selection process. You'll learn how to ask for letters of recommendation, establish a relationship with a mentor, and choose fourth year electives. Should you do an away elective? Will your USMLE Step 1 score be a cause for concern? This section reviews those questions and others.

Family Medicine

According to the Society of Teachers of Family Medicine, the family medicine clerkship provides "essential patient care knowledge and skills necessary for generic medical school development, regardless of ultimate career choice."[22] The family medicine clerkship teaches students the role of the family physician in the delivery of primary care in the United States. You will learn how to evaluate and manage patients with a wide variety of acute and chronic medical problems.

The experiences in the family medicine clerkship are important to your growth as a physician, regardless of specialty. Physicians in most specialties care for patients in the outpatient setting. Since family medicine clerkships are largely outpatient rotations, you will see medicine as it's practiced in the ambulatory setting. The clerkship will show you how family physicians "identify, prioritize, and manage the multiple medical problems of many patients in time limited visits," writes Dr. Robert Taylor, professor of family medicine at the Oregon Health & Science University.[23]

Through this clerkship, you will hone your skills in interviewing, examination, and clinical problem-solving. These skills are important ones for all physicians, even if you ultimately decide to enter anesthesiology, urology, or another field.

The family medicine clerkship is a core rotation, and your clerkship grade will be a factor in the residency selection process, regardless of your specialty choice. In a survey of medical schools across the country,

Takayama found that only 34% of students achieve the highest grade in the family medicine clerkship.[17] In the 2010 NRMP match, over 1,400 allopathic and osteopathic applicants secured positions in family medicine residency programs.

Obstetrics and Gynecology Clerkship

All medical students benefit from an increased knowledge of women's health. The Department of Obstetrics and Gynecology at Yale University writes that "physicians of all specialties will care for female patients who present with reproductive health issues, whether it is a teen seeking contraception, a young athlete with amenorrhea, a pregnant woman with an autoimmune disease, a patient with type II diabetes and abnormal uterine bleeding, or a post-menopausal woman with breast cancer and symptoms of hypoestrogenemia."[24]

Although only 5% of U.S. medical school graduates enter the specialty, the obstetrics and gynecology clerkship is a core clerkship, and therefore this grade will be utilized in the residency selection process of any field. According to the Department of Obstetrics and Gynecology at University of California Davis, "USMLE scores and clerkship grades (especially in ob/gyn, surgery, and internal medicine) are considered factual data and ranked high."[25] However, honoring the rotation is challenging. "Obstetrics and gynecology is a difficult field, and it takes a truly outstanding student to earn an Honors grade in the clerkship," writes Dr. Yasuko Yamamura, clerkship director of the University of Minnesota obstetrics and gynecology rotation.[26] In a survey of medical schools across the country, Takayama found that only 29% of students achieve the highest grade in the obstetrics and gynecology clerkship.[17]

In the Obstetrics and Gynecology chapter, you'll find outlines and templates that will enable you to complete the daily responsibilities unique to the field, including templates for the delivery note, obstetric admission history and physical exam, and postpartum notes following vaginal delivery and Cesarean section. Do you know what LOP, TOA, or IUGR stand for? This chapter reviews the commonly used abbreviations in obstetrics and gynecology.

The chapter ends with recommendations for students who wish to pursue obstetrics and gynecology as a career. Dr. Vicki Mendiratta, clerkship director of the UCSF obstetrics and gynecology clerkship, writes that the "3rd year is an excellent time to review your credentials to date" and to "make reasonable recommendations regarding your residency options."[27] You'll learn the data on student qualifications from the 2010 NRMP match. You'll also learn specific ways to strengthen your residency application, as well as suggestions on how to identify a mentor and schedule electives.

Psychiatry Clerkship

Psychiatric disease is highly prevalent, and physicians in all specialties need to be familiar with a variety of psychiatric diseases. The skills learned in this core clerkship are essential for all students, irrespective of

specialty choice. All physicians must ensure that patients with psychiatric disease are recognized, diagnosed, and treated correctly. In fact, most patients with psychiatric illness initially present to primary care physicians and specialists, not psychiatrists. “It is known that among outpatients attending specialist clinics, about 15% of those given a diagnosis have an associated psychiatric disorder, and an average of 20 – 30% of those given no medical diagnosis have a psychiatric disorder.”[28]

While less than 5% of U.S. medical school graduates match into the field, your psychiatry clerkship grade will be used as a factor in the residency selection process for all fields, as all place considerable value on core clerkship grades. In a survey of medical schools across the country, Takayama found that only 35% of students achieve the highest grade in the psychiatry clerkship.[17]

Even for students who’ve completed a number of clerkships, the psychiatry clerkship poses unique challenges, and can be anxiety-provoking. Dr. Kimberly McLaren is an assistant professor of psychiatry at the University of Washington and the author of the book, *Psychiatry Clerkship: 150 Biggest Mistakes And How To Avoid Them*. She states that a variety of factors contribute to this apprehension, including the need to learn a new psychiatric “language,” as well as the need to learn how to interact with psychiatric patients.[29] In this field, students must leave the comfort zone of the medical-style interview and examination. “Medical students rotating through psychiatry often feel like tourists in a strange country. A new language and new customs confront them at every turn,” writes Dr. Glen Gabbard, professor of psychiatry at the Baylor College of Medicine.[29]

In the Psychiatry Clerkship chapter, you’ll learn how to present patients and complete write-ups. You may already be knowledgeable about these tasks, but presentations and write-ups in psychiatry are completely different from those in other specialties. In one study, major problem areas identified in medical student psychiatry write-ups included inadequate gathering of developmental histories, omission of sexual histories, brief mental status descriptions, and no attempts at developing a biopsychosocial formulation.[30] In this chapter, you’ll find outlines and templates to guide you through the unique facets of psychiatric examinations and documentation. Checklists for the mental status exam highlight for students unique specifics, such as psychomotor activation, affect, perception, and sensorium. Other outlines help in the creation of a biopsychosocial formulation, as well as the multi-axial DSM diagnosis.

If you’re interested in psychiatry as a career, this chapter also provides a number of recommendations for strengthening your application, including suggestions for identifying a mentor, scheduling electives, and obtaining strong letters of recommendation.

The New Rotation

"The clinical years, especially the third year, are in some ways a very harsh experience. It is frightening to feel you are ignorant in a setting where sick people are depending on you for care… You worry about making a mistake. You worry about hurting someone. On a different level, you worry about making a fool of yourself, about looking stupid on rounds."[31]

— From *A not entirely benign procedure: four years as a medical student* by Perri Klass MD.

Transitioning from one rotation to another is stressful. Just when students determine which behaviors, actions, and attitudes are valued and rewarded, it's time to rotate to the next clerkship. Every new rotation represents new responsibilities, a new team, a new physical environment, and an entirely new facet of medicine. These factors all impact student performance at the start of every single new rotation. In this chapter, you'll learn the basics: the resources you'll need to accomplish your work, as well as suggestions on how to learn the chart, the electronic medical record, and your physical environment.

We provide concrete recommendations on how to remain in control of all the data and tasks related to patient care. This is a challenge for even experienced physicians. In an observational time and motion study, doctors were interrupted nearly seven times per hour, and alarmingly, "doctors failed to return to 18.5% of interrupted tasks."[32]

In this chapter, you'll learn how to adapt to your new role and responsibilities quickly and how to integrate professionally into your new team and environment. You will learn the questions that should be asked of every new resident, intern, and attending, as well as ways to make the best possible first impression. When your team recognizes your potential, and rewards you with increased responsibility, you can begin to make meaningful contributions to patient care.

Admitting Patients

Admitting a patient to a hospital would appear to be a straightforward process, and yet it can be remarkably complex. Evaluating the patient, formulating a diagnosis, creating a therapeutic plan, accurately conveying that plan to the entire patient care team, and ensuring that it's carried out properly by all the multiple individuals involved in patient care is a complex process. It's a process with many steps, each of which can go wrong.

As a medical student, your goal is to function as the patient's intern, as well as become the team's expert on this patient. As the expert on the patient, you play a vital role in ensuring the best patient care, and it starts with the first minutes of admission. Evaluations must be thorough, and they must be accurate, and yet this often proves challenging. Start with something as seemingly straightforward as the medication history. When researchers evaluated agreement between the patient and physician regarding their medications (defined as congruence) they found a rate of only 58% for residents.[33]

You can ask about a patient's medications, but you won't always get the correct answer. Some patients rely on memory, while others bring in a typed list of their medications. Others may bring in their brown bag or plastic grocery bag full of medication bottles and hand them over to you. In any of these cases, you won't just be able to copy information about drug names and dosages from the list or bottles. In this section, you'll learn the process and the questions you need to ask to ensure complete accuracy.

Every component of the patient history is essential to reaching an accurate diagnosis. In one study, 76% of diagnoses made by clinicians were suggested or established by the history.[34] While integral to patient care, obtaining an accurate history can be difficult. One study looked at medical students who self-assessed their communication skills with simulated patients.[35] Eliciting information was found to be the most frequently noted weakness, cited by 35% of participants. Faculty members who work with poorly performing students note several specific problems with history taking. "Many low-scoring students focused prematurely, failing to ask open-ended questions or adequately characterize the chief complaint. Respondents also observed students being too focused on the history of present illness, omitting or incompletely exploring the pertinent past medical, social, or family history, particularly as they related to the chief complaint."[35]

In this chapter, you'll learn the potential pitfalls in evaluating patients. You'll learn how to avoid these pitfalls, and ensure both thorough and accurate patient evaluations.

We provide a step by step approach to the evaluation of a newly admitted patient, starting from the patient information template, to obtaining prior medical records, to reviewing pre-admission clinical data, to the formulation of your assessment and plan.

Finally, we review the admission orders. You'll learn the checklist that is required whenever you write any new or updated medication order. In one study, researchers found that prescribing errors were common and contributed to over half of all significant adverse but preventable drug events.[36] These are preventable drug events, and if we as a profession are committed to seeing that number reduced, we need to focus on prescribing errors. You'll learn the concrete steps that you can take to reduce these errors, from double-checking dosage calculations, to checking for renal impairment, to always checking for drug-drug interactions, and to special considerations with verbal orders. We also outline dangerous abbreviations. Examples include Q.D., which may be misread as QID. In such a case, a patient might receive a medication four times daily instead of the intended once daily. Another example is the use of µg [micrograms] which may be mistaken for mg [milligrams]. Older faculty have been using these abbreviations for decades. While still in use in some institutions, these abbreviations are dangerous enough that many institutions are committed to seeing that they are eradicated.

Laboratory Tests

The state of lab testing in America can be summarized succinctly:

Physicians waste a lot of money on lab tests.

Many of us don't know enough about lab testing.

This ignorance can lead to medical errors.

The Centers for Disease Control wrote that "medical education on laboratory testing is inadequate. Despite the integral role of laboratory testing in the practice of medicine, formal teaching of laboratory medicine is a relatively neglected component of the medical school curriculum."[37]

The end result is that medical school graduates often enter practice with significant deficiencies in this area. This has significant consequences. The misinterpretation of test results may significantly impact patient care, increasing morbidity and mortality due to missed diagnoses or wrong diagnoses.

From a monetary standpoint, according to the U.S. Congressional Budget Office, approximately $700 billion per year is spent on diagnostic tests that do not improve health outcomes.[38]

Although lab testing in modern medicine is integral to patient care, many physicians have received relatively little formal instruction in either the ordering of lab tests or their interpretation. Major medical textbooks, often utilized resources in patient care, may not help. Dr. George Lundberg, Editor in Chief Emeritus of Medscape and Former Editor of *JAMA*, wrote that "guidance on diagnostic testing in medical textbooks often consist of little more than listings of tests that may be abnormal in a given disease. Both the number and complexity of diagnostic tests have increased rapidly, requiring physicians to have not only considerable knowledge of the properties of individual tests but also a strategy for their sequential interpretation."[39]

Yet this area is of vital importance. Lab test abnormalities are extremely common. In a study of patients admitted to the general medicine service at a city hospital, 29% of the tests obtained were abnormal.[40]

In another study of patients admitted to an inpatient psychiatry unit, 25% had an abnormal LDH, while 14% had an abnormal alkaline phosphatase.[41] These numbers highlight the fact that no matter what field of medicine you practice, you must learn how to interpret and manage abnormal lab tests.

The fact that your deficiencies in this area can harm your patient brings more urgency to the issue. Dr. Laposata, director of laboratory medicine at Vanderbilt University Hospital, wrote that "medical error from incorrect laboratory test selection and result interpretation is rapidly becoming a more serious problem as the test menu becomes larger and more complex."[42] Reviews of malpractice claims have shown that incorrect interpretation of laboratory test results is a major cause of missed or delayed diagnoses.[43] Even errors in specimen collection can impact the patient, as when the sample is hemolyzed or when the tubes are filled in the incorrect order.

This is clearly an area of vital importance for medical students. Multiple organizations, including the Clerkship Directors of Internal Medicine,

Society of General Internal Medicine, and the Academy of Clinical Laboratory Physicians and Scientists have identified the selection and interpretation of appropriate diagnostic or lab studies as key competencies for medical students.[44, 45]

In this chapter, we introduce the principles of laboratory medicine. You will learn about lab test errors, and how to recognize and prevent them. You'll learn the step-by-step approach to the interpretation of lab tests. Lastly, we include a sample algorithm that demonstrates this approach to lab test interpretation, reproduced from the *Clinician's Guide to Laboratory Medicine: Pocket*, a guide authored by Dr. Desai.

Attending Rounds

Attending rounds are a formal meeting of the team that are led by the attending physician. During rounds, team members discuss the patients on the team in order to establish the diagnostic and therapeutic plan. Your main interaction with the attending will take place during this time.

Rounds present a great educational opportunity, and just by listening to the specifics of patient care recommendations you'll learn a great deal. However, rounds also serve an evaluative function. Since you'll interact most often with your attending during rounds, your participation in rounds is one of the main ways your attending will assess your progress. Therefore, this participation has a significant impact on your clinical evaluation.

For an accurate evaluation of your performance, attendings need their students to participate in rounds. However, the literature shows that medical students often function as a passive audience. In fact, one study revealed that students talked only 4% of the time.[46] This poses real difficulties for students; this reticence may be interpreted as a lack of knowledge or a lack of interest. In one study evaluating problem students, among 21 types the "excessively shy, nonassertive" student was the second most frequently encountered problem type in obstetrics and gynecology, the fourth in surgery, and the fifth in internal medicine, pediatrics, and psychiatry.[47]

You need to be prepared during rounds. This involves evaluating your patient fully, knowing all of the clinical data, and becoming an expert on the patient's diagnoses. This allows you to prepare for both the clarifying and probing questions that will be asked during rounds. While data shows that a significant percentage of these questions involve simple recall, one study showed that nearly 20% of questions "required analysis of data or the demonstration of deeper thinking processes."[48] Often these are open-ended questions such as "What do you think about…?", "What would you do at this point?", and "What if this patient were 70 instead of 35?" For example, Dr. Samuels, a faculty member at the Penn State University College of Medicine, engages students by "asking them questions…what are you thinking…how do these two go together…if this were different what would you do?"[49]

In this chapter, you'll learn effective techniques that will enable you to answer these questions. You will be introduced to the RIME method of evaluation, developed originally by Dr. Louis Pangaro, and learn how this method can help you answer higher order questions.[50]

You'll learn the basics as well: how to ensure that bedside rounds are conducted properly. Throughout this chapter, you will learn how to interact with attendings, and how to make the most of their teaching. These rules will enhance your clinical education as well as your overall rotation performance.

Oral Case Presentation

During an oral case presentation [OCP], students will formally "present" a patient to the team. Oral communication skills are vital in patient care, and the development of these skills is emphasized during core clerkships. Poor skills have the potential to directly impact patient care. In a study of malpractice claims, researchers found that incomplete or inaccurate transfer of clinical information frequently occurred between residents and attending physicians. Transfer of information resulted in a patient care error in 32% of cases.[51]

Poor communication skills also impact a student's evaluation. Faculty and resident ratings account for the majority of a student's grade in core rotations. These ratings include comments on specific skills, such as a student's ability to take a history and perform a physical examination. However, attendings rarely or infrequently observe students in these areas. In fact, in a survey of medical students at the end of their third year, 51% reported never having a faculty member observe them while taking a history.[52] Therefore, many faculty draw conclusions about a student's ability in these areas from the quality of the oral case presentation (OCP).

Pulito wrote that "in the clinic setting, for example, if a student presents a patient to an attending and is verbally facile, succinctly describing a focused history and physical examination, the inference may be drawn that the student expeditiously obtained the relevant history and performed an appropriate examination."[53]

In recent years, organizations such as the Association of American Medical Colleges (AAMC), Clerkship Directors of Internal Medicine (CDIM), and the Accreditation Council for Graduate Medical Education (ACGME) have emphasized the importance of communication skills. In fact, the AAMC considers the development and acquisition of communication skills a core learning objective for medical students.

In this chapter, you will learn how to effectively transfer important clinical information between team members. You'll learn the mechanics of the OCP, including proper format, components, transitions, and level of detail. You'll learn about the different facets of oral presentations that affect their quality, including volume, pace, tone, and nonverbal communication. You'll learn specific techniques to decrease anxiety. In short, you'll learn how to deliver high quality oral case presentations, the type that facilitate patient care, improve team efficiency, become a valuable learning experience, and best reflect your excellence in patient care.

Write-up

Communication skills are of vital importance in patient care, and the development of written communication skills is emphasized heavily in core clerkships. The American Association of Medical Colleges issued a report stating that schools must ensure that, prior to graduation, students "have the ability to communicate effectively, both orally and in writing, with patients, patients' families, colleagues, and others with whom physicians must exchange information in carrying out their responsibilities."[54]

Studies of medical errors have found that documentation errors are common and dangerous. In a chart review of resident physician progress notes in a neonatal intensive care unit, researchers found discrepancies in 61.7% of notes with respect to weight, vascular lines, or medications.[55] Discrepancies in the documentation of medications were found in 27.7% of notes, including omission of information as well as documentation of inaccurate information.

The accuracy of student documentation has also been studied. Senior medical students were videotaped examining standardized patients.[56] The patient encounter was then compared to the information documented by students in the patient note. Researchers found that only 4% of the notes accurately reflected what occurred during the encounter. The problems identified included under-documentation, over-documentation, and inaccurate documentation.

In another study, Jefferson Medical College researchers had students examine standardized patients.[57] While the students documented their findings, patients completed checklists identifying the history and physical exam elements performed by students. When students' notes and patients' checklists were compared, an under-documentation rate of 29% was found, a rate similar to experienced physicians.

Recognizing the importance of written communication, the USMLE Step 2 Clinical Skills Examination evaluates the ability of students to *document* the findings of encounters with standardized patients.

The written case presentation, or write-up, is a detailed account of the patient's clinical presentation. Its major purpose is to help you develop the written communication skills needed to take care of patients, specifically the ability to communicate patient information in an organized and succinct way.

During rotations, you'll be asked to prepare write-ups on the patients you admit. Your write-ups may be placed in the medical record, along with those of the resident and attending. Student write-ups, because they are usually more detailed than any other evaluation, are often referenced by other physicians. Their importance in patient care should not be underestimated.

In your future career, you'll find that any written documentation obtained from a physician encounter can also be used for billing, in epidemiological research, and as evidence during malpractice litigation.

You may be required to submit one or more write-ups to your attending or clerkship director as part of your clerkship grade. This highlights another purpose of the student write-up: it serves an important evaluative function. The website www.usmle.org describes an interesting aspect of

medical education on the wards: "During recent field trials, 20 percent of the fourth-year students who completed a survey said they had been observed interacting with a patient by a faculty member two or fewer times. One in 25 said they had never been observed by a faculty member."[58]

If you aren't observed while taking care of patients, how can attendings evaluate your ability to perform a thorough history and physical? The oral case presentation and written case presentation become proxies for direct observation.

When you submit your write-up, reviewers will evaluate your ability to perform a comprehensive patient evaluation and appropriately record the results of this evaluation. In addition to your ability to collect information, reviewers will assess additional skills. Kogan and Shea wrote that "Assessment of the write-up is believed to be important because it evaluates a student's ability to collect information; identify, prioritize, and evaluate problems; demonstrate clinical reasoning; develop management plans; and communicate through a written record. These are important clinical skills that students are expected to be proficient in prior to graduation."[59]

In this chapter, we review each section of the write-up, and review the specifics of each section. You will learn the proper order and format of the write-up, starting with subjective data, moving to objective data, then the assessment, and finally the plan, with evidence of your reasoning and references included. You'll learn all the information that must be included in the history of present illness, as well as information on how to create a thorough problem list. You'll also learn a step-by-step approach to creating a high quality assessment and plan, including a discussion of the differential diagnosis and the inclusion of appropriate references from the current medical literature.

Outpatient Setting

You'll spend a substantial period of your third year in the outpatient setting. According to the report "Medical Schools in the United States, 2008-2009", published by *JAMA*, students spent varying amounts of time in the ambulatory setting during required third year clerkships, ranging from 23% in surgery to 91% in family medicine.[60] Fifty-four schools had a separate ambulatory care clerkship, during which nearly the entire time was spent in the ambulatory setting.

The ability to rotate in an outpatient setting provides distinct opportunities. In a study comparing the experiences of third year students in the ambulatory versus inpatient setting, students in the outpatient rotation "felt more like doctors, more responsible for patients, and more able to know and help their patients." They also reported better relationships with their teachers.[61]

Experience in outpatient medicine is also required training for the USMLE CS exam. The USMLE Clinical Skills (USMLE Step 2 CS) exam is required for graduates of US medical schools. The exam simulates a typical day in the outpatient setting, lasting eight hours and requiring focused examinations of patients with a variety of presenting complaints.

The absolute best way to prepare for this type of exam is to hone your skills as a physician in the outpatient setting.

At the same time, outpatient medicine poses a number of unique challenges. For medical students used to the luxury of time in the inpatient setting, the clinic with its need for thoroughness and efficiency, along with speed, is a major challenge. Operating under time constraints requires a change in your approach, starting with the need for focused histories and exams, as well as concise presentations. Just as challenging, you'll have to learn how to formulate assessments and plans based solely on these focused exams, as you typically won't have the results of laboratory tests.

In this chapter, you'll learn the questions to ask your preceptor at the start of the rotation, and how best to quickly orient yourself to the new setting. You'll learn how to begin an outpatient visit, and how to focus on the correct patient issues, which is more challenging than one would suspect. In a videotaped analysis of histories performed by senior medical students, 24% of all students did not ascertain the patient's main problems.[62]

Education in the outpatient setting can hone a student's assessment skills. In a study of the surgery clerkship, researchers found that students have greater opportunities to develop their critical thinking skills in the outpatient setting.[63] When compared to the inpatient setting, students in the clinic were more often the first to elicit the history (59.6 vs 4.3% of cases), perform the physical exam (70.2 vs 8.7% of cases), and generate the hypotheses (29.8 vs 2.2% of cases). This chapter will help you with these skills. You'll learn how to focus your exam, how to present succinctly, and how to analyze the focused and often incomplete data obtained from a single outpatient encounter.

Evaluations

"Different doctors…achieve competency in remarkably similar ways, despite working in disparate fields. Primarily, they recognize and remember their mistakes and misjudgments, and incorporate those memories into their thinking. Studies show that expertise is largely acquired not only by sustained practice but by receiving feedback that helps you understand your technical errors and misguided decisions."

— By Jerome Groopman MD
author of *How Doctors Think*[64]

Feedback is a critical tool in medicine. Physicians utilize feedback from patients, from colleagues, and from their own observations of patient outcomes in order to improve patient care. In clerkships, the main purpose of formal evaluations is to provide valuable feedback that students can act upon to improve patient care.

Clerkship evaluations are also used to grade students. These grades, and comments on evaluation forms, are taken seriously by residency programs. In our companion book, *The Successful Match*, we review all the factors that form the basis of residency selection. The most important factor is grades in required clerkships.

There is a growing body of literature devoted to the study of accurate evaluation. Evaluating a student's performance on a clinical rotation is challenging. In the basic sciences, the process is straightforward, as the evaluation is completely objective: what score did the student receive on the exam? In clinical rotations, subjective factors become much more important.

How do medical schools evaluate students' clinical performance? A number of methodologies are utilized, including written examinations and review of required assignments (write-ups). However, faculty and resident ratings are used in almost all U.S. core clerkships, and typically account for the majority of a student's grade.

This chapter will help you understand all the factors that impact these ratings. You'll learn about the evaluation form, and the use of formal feedback. You'll learn the ways in which you can use this knowledge to improve your provision of patient care and increase your chances of clerkship success. You'll also learn about the inherent difficulties in subjective evaluations, and how you can ensure that these issues don't affect your evaluation.

You'll learn about the variability that may occur even when evaluating the same performance. In one study of over 200 faculty internists, participants watched a videotape of a resident performing a work-up of a new patient.[65] When faculty rated the clinical skills of the resident, significant disagreement was found. With one resident, 5% rated the overall clinical performance as unsatisfactory, 5% rated it as superior, 26% rated it as marginal, and 64% rated it as satisfactory. Investigators concluded that evaluators base their ratings on different criteria and standards, and may assign different weights to these criteria.

In this chapter, you'll learn about each of these different criteria that are used in the subjective evaluations of clerkship performance. You'll learn about the major impact of oral case presentations and formal patient write-ups on your clerkship performance. You'll learn about factors that can cloud your evaluation, such as central tendency, recency bias, and primacy bias, and the measures that you can take to avoid a rating error.

You'll also learn how to seek formal feedback, how to ask for specific feedback, and how to utilize these to improve your clinical performance. You'll learn to prepare for negative feedback which, while essential for growth, can be distinctly uncomfortable. Your response to feedback gives others a sense of your professionalism, and therefore is important.

No matter what field of medicine you plan to go into, your grades in each and every clerkship have the potential to impact your future career options. While the final clerkship grade is important, individual comments made on the evaluation form may also impact your future career choices. While MSPE comments are generally positive, negative comments <u>are</u> included. In an analysis of nearly 300 MSPEs, negative comments included:[66]

> "His most annoying attribute, he failed to show appropriate respect for his colleagues."

> "She did not turn in write-ups on time and was felt by many to be defensive in the face of constructive criticism."

Throughout this chapter, you'll learn about the factors that impact your evaluation, and how you can ensure evaluations that accurately reflect your provision of outstanding patient care.

Written Exam

In terms of ensuring that you have the most potential career options, standardized examinations do matter. Core clerkship grades are a major factor in the residency selection process, and the end of rotation exam factors into this grade. While it varies from rotation to rotation, the written exam typically accounts for 20 to 40% of a student's clerkship grade.

In general, a superb performance on the written exam won't make up for a poor performance on the wards. Clinical evaluations are still most important. However, even if you earn outstanding clinical evaluations, simply obtaining a passing exam score may not be sufficient to achieve a clerkship grade of honors. In some rotations, you have to exceed a certain exam score or percentile to be considered for an overall clerkship grade of honors.

Studying for the written exam should begin on Day # 1 of the rotation, especially with short rotations that may last only a few weeks. Clerkship days often start early and end late, leaving little time to study. In the basic sciences, students get used to coasting in the first few weeks, and then doing their heavy studying closer to exam time. Clinical rotations don't allow for that type of preparation, as the workload is heavy throughout the rotation.

Exam preparation involves three main facets: the hands-on process of patient care, didactic lectures, and extensive reading. Providing care for your patients, learning from their real-life examples of typical medical histories and physical exam findings, and having those experiences reinforced and strengthened by teaching from your residents and attending is an invaluable learning experience. A number of studies have shown that student performance on NBME subject examinations improves with increasing clerkship experience.[67, 68, 69, 70] In a study of over 1,800 students from 17 U.S. medical schools, caring for more patients per day was associated with higher NBME internal medicine exam scores. Most clerkship directors felt that students should follow 3-4 patients at a time.[71]

Exam preparation will include extensive reading, and should include textbooks as well as the medical literature. In-depth reading about each of your patients is very effective, especially when this type of active learning is done correctly. In this chapter, you'll learn the questions that should guide your reading on each patient. With every single problem on the patient's problem list, you'll need to review a number of aspects, including symptoms, differential diagnoses, how to differentiate these diagnoses, the tests used to confirm the diagnosis, the prognosis, and pathogenesis, among others.

We also provide concrete recommendations for taking the exam. You should first determine if the exam will be an essay, multiple choice, or a standardized exam. If your clerkship uses the NBME (National Board of Medical Examiners) subject examination, you can review the content of the exam at www.nbme.org. At their website, the NBME has made avail-

able the content of each subject examination, including the percentage of questions that will come from different areas.

Rotation Success

You never just want to be the medical student on the team. You want to be recognized as a vital member of the health care team, making significant contributions to the care of your patient.

Providing excellent patient care is your number one goal in medical school. Receiving recognition for that excellence is a related topic, and one that encompasses additional factors. In order to succeed on a rotation, you need to learn how to quickly adapt to a new culture and new responsibilities.

Some new clerks make the mistake, early on, of focusing exclusively on learning how to perform patient care tasks. However, your team members are also concerned with many other aspects of patient care. These include your ability to work effectively with other team members, your ability to learn new subject material, your communication skills with patients and the medical team, and your overall work ethic. Many of these traits are the same that patients will use to evaluate your skills and effectiveness.

In this chapter, you'll learn how to effectively convey these additional traits. You'll learn that it's acceptable to make the "right" kind of mistakes, which are those associated with the learning process. You'll learn how to avoid the wrong type of mistakes, which are those associated with professionalism.

The ability to anticipate potential outcomes is important in medical care. Many medical students can adequately respond to a change in a patient's condition by modifying the plan. However, excellent medical students anticipate. In any admission, there are only three potential outcomes: the patient may improve, stay the same, or worsen. Outstanding students anticipate a plan for each of these outcomes.

We discuss the traits required of all practicing physicians, including integrity, credibility, and initiative. In the real-life situations of patient care, you will be challenged, and you need to be prepared. In a survey of students at Johns Hopkins University School of Medicine, 13 to 24% admitted to cheating during the clinical years of medical school.[72] Examples included "recording tasks not performed" and "lying about having ordered tests."

For many of these traits, evaluations are, of necessity, highly subjective. We provide examples of how you can demonstrate, in a concrete fashion, each of these traits. In one example, the Association of Professors of Gynecology and Obstetrics encourage students to "take initiative. 'How can I help out? I'll write the note on that patient' goes a long way to make the team function better and gives the residents more time to teach you."[73] Another suggestion is to "teach the team. Volunteer to help the team by reading about topics in depth and by sharing what you have learned with the group."

Attendings

Have the physical exam skills of physicians deteriorated over the years? It's widely believed that they have. This may be related to an increased dependence on lab testing and radiologic imaging, as well as clinical skills training in medical school and residency. According to Dr. Sal Mangione, director of the physical diagnosis curriculum at Jefferson Medical College, too little time is spent during medical school learning these skills. "Surveys have indicated that less than 16% of attending time may be spent at the patient's side."[74]

These issues have real consequences. In one eye-opening study, over 300 internal medicine residents were tested on cardiac auscultatory skills. They listened to 12 prerecorded cardiac events. It was found that their proficiency was poor, with mean identification rates of only 22% in American residents.[1]

We devote a full chapter to attending physicians. Your teachers on the wards, attendings have a great deal of knowledge and experience that they can impart. This type of education, based on the care of actual patients, is completely different from anything you'll learn in textbooks. Clinical clerkships are a critical time in your education. If you want to become proficient in exam skills, you have to learn now. These aren't skills you can learn from reading a textbook. You need to evaluate patients with these findings, and you need to have a teacher that can demonstrate these findings. You need to be able to ask questions freely in order to learn all the finer points of physical exam skills. This isn't something you can easily do as a resident, and certainly not as a board-certified physician. If you don't know how to assess jugular venous distention by the end of medical school, you may never learn.

The best attendings have an ability to model and teach patient care that is unforgettable, and in this chapter we provide suggestions on how to work with attendings known to be great teachers. In one study, researchers determined that "attending faculty's clinical teaching ability has a positive and significant effect on medical students' learning."[75] They found that ratings of teaching ability were strong predictors of students' performance on the end-of-clerkship NBME subject examination.

The attending physician is the leader of the team. His or her primary goal is to ensure that the patients assigned to the team receive the best possible care. The attending is also responsible for providing a solid educational experience for the resident, intern, and medical students. They may also have significant influence over your future career. They are responsible for clerkship evaluations, and these are considered by many program directors to be the best indicators of potential for residency success.

In order to be an outstanding physician, you must provide outstanding patient care. However, you typically won't be observed by the attending during direct patient care. Since your interactions will often be limited to attending rounds, your excellence in patient care must be conveyed by other methods. These involve being well-read on your patients' problems, delivering solid oral patient presentations, turning in thoughtful and thorough patient write-ups, and giving outstanding talks.

In this chapter, you'll learn specific recommendations that help maximize your medical education and ensure the best working relationship with your attending. This includes specifics on increasing participation in attending rounds and techniques of active listening. We also highlight areas that can prove problematic for students. Recognition of these problems can hopefully help prevent these issues. In one study, residents and attendings were asked to comment on "problem" students. Frequent problems included bright with poor interpersonal skills, excessively shy or non-assertive, over-eager, cannot focus on what is important, disorganized, and a poor fund of knowledge.[76]

Working as a Team

Physicians never care for patients alone. It takes a team of health care professionals working together effectively to provide the best patient care, and research has increasingly found that collaborative care improves outcomes. In response to this growing literature, organizations, including the Institute of Medicine and Accreditation Council for Graduate Medical Education, have urged medical schools to educate students about the roles of non-physician providers. As a third year student, you'll spend most of your time with the intern, resident, and attending. However, your team also includes nurses, social workers, pharmacists, physical therapists, lab technicians, and other professionals. Your success as a physician depends on maximizing the combined efforts of each of these health care professionals. The most successful physicians live this daily.

Research has shown that collaborative relationships between team members leads to improved patient outcomes. In a study done in the intensive care unit, Knaus found that greater interaction of staff in different disciplines was associated with lower patient mortality.[77] In a study of surgical patients, relational coordination across disciplines was associated with reduced pain and shorter length of stays among total hip and knee arthroplasty patients.[78]

Despite this knowledge, in practice, collaboration and communication between professionals often doesn't occur. In one study of randomly selected hospitalized patients, nurses and physicians were interviewed.[79] Nurses reported communicating with physicians only 50% of the time. The authors wrote that "there was no agreement between nurses and physicians on planned tests or procedures for the day in 25% and 11% of instances, respectively. There was no agreement between the nurses and physicians on planned medication changes for the day in 42% of instances." In chapter 22, we review the benefits of collaboration with all members of the healthcare team, including nursing professionals.

You'll work most closely with your nuclear team, which consists of an attending, resident, interns, and students. Maximizing the effectiveness of your nuclear team involves significant teamwork. The teaching you receive from these professionals may be formal or informal, and is invaluable, and we review ways to maximize this teaching.

In one study, interviews with attendings and residents were conducted to determine what behaviors make students "good" or "bad" clerks. Supervisors viewed behavior as positive when students acted "for

the sake of patient care, for the sake of their own learning, or for the sake of their own team."[80] Behavior was considered negative if students were thought to be shirking responsibility or "acting for the sake of appearance." In this chapter, we provide advice on how to work effectively with all team members. You'll learn practical measures that you can take to maximize the effectiveness of the team, and you'll learn how to prepare for and manage the inevitable conflict that occurs when a team is working together so closely in an intense environment.

Giving Talks

The typical medical student talk, which we've sat through many times, usually follows this script:

Introduction: "The subject of my talk is pulmonary embolism."

Content: unrealistically extensive overview of a massive topic relying heavily on major medical textbooks

Conclusion: "Well, I guess that's all I have."

It's easy to make that talk significantly more impressive and memorable.

Introduction: *"Substantial and unacceptable."* Those were the words of Dr. Kenneth Moser, referring to the morbidity and mortality rate of venous thromboembolism ...[81] A major issue in reducing these high rates is enhancing early diagnosis. In my talk today, I'll review recent advances in diagnostic techniques of pulmonary embolism."

Content: in-depth review of a focused topic utilizing references from the recent medical literature

Conclusion: "As the recent literature has shown, the diagnosis of pulmonary embolism may clearly be challenging. As in the case of our patient Mr. Smith, however, a combination of diagnostic methods leads to improved sensitivity."

Being asked to give a talk is a common and anxiety-provoking student experience. Medical students are often asked to give a talk to the team, usually pertaining to an issue that arises during rounds. While this is usually an anxiety-provoking, or even dread-inducing experience, preparing and presenting a talk is a great opportunity to demonstrate your knowledge and grasp of clinical issues. Your stellar performance can definitely impress the team. While you can't control what an attending might ask during rounds, you do have complete control over your talk. With sufficient preparation and practice, you should be able to deliver an outstanding talk.

In this chapter, you'll learn specific recommendations to improve the quality and impact of your talks. You'll learn the importance of choosing the correct topic. In a study of medical student talks, students were informed to avoid overviews or large topics.[82] As an example, rather than talking about pneumonia, students were asked to focus on a particular

aspect of pneumonia. Despite this recommendation, faculty evaluations noted that 35% of presentations were too broadly focused.

You'll learn how to perform an audience analysis, including the questions that ensure a talk tailored to the audience's level of expertise and learning needs, as well as the types of resources to utilize. You'll read a number of styles of introductions, as well as concluding statements, that capture an audience's interest. These introductory and concluding statements are all ones that you can easily incorporate into any topic. You'll learn techniques that enhance the quality of your speaking and the quality of your audiovisual aids. You'll learn how to reduce the anxiety common to public speaking, and you'll learn specific techniques on how to respond to questions, an anxiety-provoking situation for even experienced speakers.

References

[1]Mangione S. Cardiac auscultatory skills of physicians-in-training: a comparison of three English-speaking countries. *Am J Med* 2001; 110(3): 210-6.

[2]Berger J, Eisen L, Nozad V, D'Angelo J, Calderon Y, Brown D, Schweitzer P. Competency in electrocardiogram interpretation among internal medicine and emergency medicine residents. *Am J Med* 2005; 118(8): 873-80.

[3]Eisen L, Berger J, Hegde A, Schneider R. Competency in chest radiography. A comparison of medical students, residents, and fellows. *J Gen Intern Med* 2006; 21(5): 460-5.

[4]Brenner A, Mathai S, Jain S, Mohl P. Can we predict "problem residents"? *Acad Med* 2010; 85(7): 1147-51.

[5]Cohen J. Professionalism in medical education, an American perspective: from evidence to accountability. *Med Educ* 2006; 40(7): 607-17.

[6]Papadakis M, Teherani A, Banach M, Knettler T, Rattner S, Stern D, Veloski J, Hodgson C. Disciplinary action by medical boards and prior behavior in medical school. *N Engl J Med* 2005; 353(25): 2673-82.

[7]Teherani A, Hodgson C, Banach M, Papadakis M. Domains of unprofessional behavior during medical school associated with future disciplinary action by a state medical board. *Acad Med* 2005; 80(10 Suppl): S17-20.

[8]Green M, Jones P, Thomas J. Selection criteria for residency: results of a national program directors survey. *Acad Med* 2009; 84(3): 362-7.

[9]Dirschl D, Dahners L, Adams G, Crouch J, Wilson F. Correlating selection criteria with subsequent performance as residents. *Clin Orthop Relat Res* 2002; 399: 265-71.

[10]Amos D, Massagli T. Medical school achievements as predictors of performance in a physical medicine and rehabilitation residency. *Acad Med* 1996; 71(6): 678-80.

[11]Fine P, Hayward R. Do the criteria of resident selection committees predict residents' performances? *Acad Med* 1995; 70(9): 834-8.

[12]Starfield B. Is US health really the best in the world? *JAMA* 2000; 284: 483-5.

[13]Institute of Medicine. *To Err is Human: Building a Safer Health System.* Washington, DC: National Academy Press; 2000.

[14]What medical students need to know about the internal medicine rotation. http://www.acponline.org/pressroom/ess_clerk.htm. Accessed January 30, 2011.

[15]University of Washington Medicine Clerkship Website. http://depts.washington.edu/medclerk/drupal/pages/Careers-Internal-Medicine. Accessed January 28, 2011.

[16]Univeristy of Colorado Department of Surgery. http://www.ucdenver.edu/academics/colleges/medicalschool/education/studentaffairs/studentgroups/SurgicalSociety/Pages/FAQ.aspx. Accessed January 30, 2010.

[17]Takayama H, Grinsell R, Brock D, Foy H, Pellegrini C, Horvath K. Is it appropriate to use core clerkship grades in the selection of residents? *Curr Surg* 2006; 63(6): 391-6.

[18]Pettitt B. Medical student concerns and fears before their third-year surgical clerkship. *Am J Surg* 2005; 189(4): 492-6.

[19]Univeristy of South Alabama Pediatrics Clerkship Handbook. http://www.usouthal.edu/peds/reshome/documents/PEDIATRICCLERKSHIPHANDBOOK4.10.pdf. Accessed January 30, 2011.

[20]Institute for Patient- and Family-Centered Care. http://www.ipfcc.org/advance/topics/primary-care.html. Accessed January 30, 2011.

[21]Bremer A, Goldstein B, Nirken M, Desai S. *Pediatrics Clerkship: 101 Biggest Mistakes And How To Avoid Them*. Houston; MD2B: 2005.

[22]The Family Medicine Clerkship Curriculum. http://www.stfm.org/documents/fmcurriculum(v3).pdf. Accessed January 30, 2011.

[23]Taylor R. *Fundamentals of Family Medicine: The Family Medicine Clerkship Textbook*. New York; Springer-Verlag: 2003.

[24]Yale University Department of Obstetrics and Gynecology. http://medicine.yale.edu/obgyn/education/medstudents/index.aspx. Accessed January 30, 2011.

[25]University of California Davis Department of Obstetrics and Gynecology. www.ucdmc.ucdavis.edu/gme/ppts/residency_advice_1.pps. Accessed January 30, 2011.

[26]University of Minnesota Department of Obstetrics and Gynecology. http://www.obgyn.umn.edu/education/medstudent/clerkship/home.html. Accessed January 30, 2011.

[27]University of Washington Department of Obstetrics and Gynecology. http://depts.washington.edu/obgyn/clerkship/electives.html. Accessed January 30, 2011.

[28]World Psychiatric Association. http://www.wpanet.org/detail.php?section_id=8&content_id=109. Accessed January 30, 2011.

[29]McLaren K, Martin C, Hebig P. *Psychiatry Clerkship: 150 Biggest Mistakes And How To Avoid Them*. Houston: MD2B; 2005.

[30]Roman B, Trevino J. An approach to address grade inflation in a psychiatry clerkship. *Acad Psychiatry* 2006; 30(2): 110-5.

[31]Klass P. *A not entirely benign procedure: four years as a medical student*. New York; Kaplan Publishers: 2010.

[32]Westbrook J, Coiera E, Dunsmuir W, Brown B, Kelk N, Paoloni R, Tran C. The impact of interruptions on clinical task completion. *Qual Saf Health Care* 2010; 19(4): 284-9.

[33]Bikowski R, Ripsin C, Lorraine V. Physician-patient congruence regarding medication regimens. *J Am Geriatr Soc* 2001; 49(10): 1353-7.

[34]Peterson M, Holbrook J, Hales D, Smith N, Staker L. Contributions of the history, physical examination, and laboratory investigation in making medical diagnoses. *West J Med* 1992; 156: 163-5.

[35]Hauer K, Teherani A, Kerr K, O'Sullivan P, Irby D. Student performance problems in medical school clinical skills assessments. *Acad Med* 2007; 82(10 Suppl): S69-S72.

[36]Bates D, Cullen D, Laird N, et al. Incidence of adverse drug events and potential adverse drug events. Implications for prevention. *JAMA* 1995; 274(1): 29-34.

[37]Division of Laboratory Systems, Centers for Disease Control and Prevention. Patient-centered care and laboratory medicine: national status report: 2008-2009 update. https://www.futurelabmedicine.org/reports%5CLaboratory_Medicine_National_Status_%20Report_08-09_Update--Patient-Centered_Care.pdf. Published May 2009. Accessed May 18, 2010.

[38]Controlling Health Care Costs while Promoting the Best Possible Health Outcomes. http://www.acponline.org/advocacy/where_we_stand/policy/controlling_healthcare_costs.pdf. Accessed on January 30, 2011.

[39]Wong E, Lincoln T, Lundberg G. Ready! Fire!...Aim! An inquiry into laboratory test ordering. *JAMA* 1983; 250 (18): 2510-13.

[40]Ferguson R, Kohler F, Chavez J, Puthumana J, Zaidi S, Shakil H. Discovering asymptomatic biochemical abnormalities on a Baltimore internal medicine service. *Md Med J* 1996; 45(7): 543-6.

[41]Arce-Cordon R, Perez-Rodriguez M, Baca-Baldomero E, Oquendo M, Baca-Garcia E. Routine laboratory screening among newly admitted psychiatric patients: is it worthwhile? *Psychiatr Serv* 2007; 58(12): 1602-5.

[42]Laposata M. CDC Website. http://wwwn.cdc.gov/cliac/pdf/Addenda/cliac0906/AddendumL.pdf. Accessed January 30, 2011.

[43]Gandhi T, Kachalia A, Thomas E, Puopolo A, Yoon C, Brennan T, et al. Missed and delayed diagnoses in the ambulatory setting: a study of closed malpractice claims. *Ann Intern Med* 2006; 145: 488-96.

[44]Clerkship Directors in Internal Medicine (CDIM) and Society of General Internal Medicine (SGIM). Core Medicine Clerkship Guide: A Resource for Teachers and Learners, Version 3.0. http://www.im.org/Resources/Education/Students/Learning/Documents/OnlineCDIMCurriculum.pdf. Published 2006. Accessed May 18, 2010.

[45]Smith B, et al. Educating medical students in laboratory medicine: a proposed curriculum. *Am J Clin Pathol* 2010; 133(4): 533-42.

[46]Foley R, Smilansky J, Yonke A. Teacher-student interaction in a medical clerkship. *J Med Educ* 1979; 54(8): 622-6.

[47]Hunt D, Caroline J, Tonesk X, Yergan J, Siever M, Loebel J. Types of problem students encountered by clinical teachers on clerkships. *Med Educ* 1989; 23: 14-8.

[48]Williamson K, Ya-Ping K, Steele J. Gunderman R. The art of asking: teaching through questioning. *Acad Radiology* 2002; 9(12): 1419-22.

[49]Taylor E, Tisdell E, Gusic M. Teaching beliefs of medical educators: perspectives on clinical teaching in pediatrics. *Med Teach* 2007; 29: 371-6.

[50]Pangaro L. A new vocabulary and other innovations for improving descriptive in-training evaluations. *Acad Med* 1999; 74: 1203-7.

[51]Singh H, Thomas E, Petersen L, Studdert D. Medical errors involving trainees. A study of close malpractice claims from 5 insurers. *Arch Intern Med* 2007; 167(19): 2030-6.

[52]Howley L, Wilson L. Direct observation of students during clerkship rotations: a multiyear descriptive study. *Acad Med* 2004; 79 (3): 276-80.

[53]Pulito A, Donnelly M, Plymale M, Mentzer R Jr. What do faculty observe of medical students' clinical performance. *Teach Learn Med* 2006; 18(2): 99-104.

[54]Association of American Medical Colleges. Learning Objectives for Medical Student Education: Guidelines for Medical Schools (MSOP Report). Washington, DC: Association of American Medical Colleges; 1998.

[55]Carroll A, Tarczy-Hornoch P, O'Reilly E, Christakis D. Resident documentation discrepancies in a neonatal intensive care unit. *Pediatrics* 2003; 111: 976-80.

[56]Szauter K, Ainsworth M, Holden M, Mercado A. Do students do what they write and write what they do? The match between the patient encounter and patient note. *Acad Med* 2006; 81 (10 Suppl): S44-7.

[57]Worzala K, Rattner S, Boulet J, Majdan J, Berg D, Robeson M, Veloski J. Evaluation of the congruence between students' postencounter notes and standardized patients' checklists in a clinical skills examination. *Teach Learn Med* 2008; 20(1): 31-6.

[58]USMLE website. http://www.usmle.org/news/cse/step2csfaqs1103.htm. Accessed December 23, 2009.

[59]Kogan J, Shea J. Psychometric characteristics of a write-up assessment form in a medicine core clerkship. *Teach Learn Med* 2005; 17(2): 101-6.

[60]Barzansky B, Etzel S. Medical schools in the United States, 2008-2009. *JAMA* 2009; 302(12): 1349-55.

[61]Kalet A, Earp J, Kowlowitz V. How well do faculty evaluate the interviewing skills of medical students? *J Gen Intern Med* 1992; 7(5): 499-505.

[62]Rutter D, Maguire G. History-taking for medical students. *Lancet* 1976; 2(7985): 558-60.

[63]Boehler M, Schwind C, Dunnington G, Rogers D, Folse R. Medical student contact with patients on a surgery clerkship: is there a chance to learn? *J Am Coll Surg* 2002; 195(4): 539-42.

[64]Groopman J. *How doctors think?* New York; Houghton Mifflin Company: 2007.

[65]Noel G, Herbers J, Caplow M, Cooper G, Pangaro L, Harvey J. How well do internal medicine faculty members evaluate the clinical skills of residents? *Ann Intern Med* 1992; 117(9): 757-65.

[66]Shea J, O'Grady E, Wagner B, Morris J, Morrison G. Professionalism in clerkships: an analysis of MSPE commentary. *Acad Med* 2008; 83 (10 Suppl): S1-4.

[67]Manley M, Heiss G. Timing bias in the psychiatry examination of the National Board of Medical Examiners. *Acad Psych* 2006; 30: 116-9.

[68]Reteguiz J, Crosson J. Clerkship order and performance on Family Medicine and Internal Medicine National Board of Medical Examiners exams. *Fam Med* 2002; 34: 604-8.

[69]Hampton H, Collins B, Perry K, Meydrech E, Wiser W, Morrison J. Order of rotation in third year clerkships: influence on academic performance. *J Reprod Med* 1996; 41: 337-40.

[70]Cho J, Belmont J, Cho C. Correcting the bias of clerkship timing on academic performance. *Arch Pediatr Adolesc Med* 1998; 152: 1015-8.

[71]Griffith C, Wilson J, Haist S, Albritton T, Bognar B, Cohen S, Hoesley C, Fagan M, Ferenchick G, Pryor O, Friedman E, Harrell H, Hemmer P, Houghton B, Kovach R, Lambert D, Loftus T, Painter T, Udden M, Watkins R, Wong R. Internal medicine clerkship characteristics associated with enhanced student examination performance. *Acad Med* 2009; 84(7): 895-901.

[72]Dans P. Self-reported cheated by students at one medical school. *Acad Med* 1996; 71(1 Suppl): S70-72.

[73]The Obstetrics and Gynecology Clerkship: Your Guide to Success," the Association of Professors of Gynecology and Obstetrics. http://www.apgo.org/binary/Clerkship%20Primer%20Online%20Version.pdf. Accessed January 20, 2011.

[74]Kelly C. Good diagnostic skills should begin at the bedside. *ACP Internist.* February 2001. http://www.acpinternist.org/archives/2001/02/diagnostics.htm. Accessed January 30, 2011.

[75]Stern D, Williams B, Gill A, Gruppen L, Woolliscroft J, Grum C. Is there relationship between attending physicans' and residents' teaching skills and students' examination scores? *Acad Med* 2000; 75(11): 1144-6.

[76]Hunt D, Caroline J, Tonesk X, Yergan J, Siever M, Loebel J. Types of problem students encountered by clinical teachers on clerkships. *Med Educ* 1989; 23: 14-8.

[77]Knaus W, Draper E, Wagner D, Zimmerman J. An evaluation of outcome from intensive care in major medical centers. *Ann Intern Med* 1986; 104: 410-8.

[78]Gittell J, Fairfield K, Bierbaum B, et al. Impact of relational coordination on quality of care, postoperative pain and functioning, and length of stay: a nine-hospital study of surgical patients. *Med Care* 2000; 38: 807-19.

[79]O'Leary K, Thompson J, Landler M, Kulkarni N, Haviley C, Hahn K, Jeon J, Wayne D, Baker D, Williams M. Patterns of nurse-physician communication and agreement on the plan of care. *Qual Saf Health Care* 2010; 19(3): 195-9.

[80]Lavine E, Regehr G, Garwood K, Ginsbury S. The role of attribution to clerk factors and contextual factors in supervisors' perceptions of clerks' behaviors. *Teach Learn Med* 2004; 16(4): 317-22.

[81]Moser KM: Venous thromboembolism. *Am Rev Respir Dis* 1990 Jan; 141(1): 235-49.

[82]Kernan W, Quagliarello V, Green M. Student faculty rounds: a peer-mediated learning activity for internal medicine clerkships. *Med Teach* 27(2): 140-4.