

Investigation 1.1: Types of Medical Doctors

Have you watched an old cowboy movie? Back in the time of the “wild west” anyone shot in a gunfight or banged up in a fistfight got dragged off to the “Doc.” The town seemed to have only one “Doc.” If a gambler or gunslinger got shot during the time the “Doc” was delivering a baby out at the Ferguson spread, for example, the fate of that gunslinger often proved sub-optimal, if you know what I mean.

Today, if you or I fall sick or are injured we have a variety of types of doctors we might elect to have patch us up. Why do we need so many? What was wrong with the old system where a single doctor took care of whatever folks needed? Perhaps one might answer that question by saying, “The human body has so much complexity, no one doctor can know everything needed to fix every part.” That answer does not explain completely why towns long ago only needed a single “Doc.” The human body has not grown more complex in the last few centuries. Perhaps a better answer might go, “The total number of things we now know how to fix in the human body appears to exceed the brain power of any single human to master.”

Some historians have suggested that Thomas Jefferson knew everything that humans knew when he was alive. Jefferson certainly studied a significant array of topics in his life, but even he probably never learned everything. In any case, we all understand that today a human life does not last long enough and the brain does not have sufficient neurons, to even come close to mastery of all the skills and information available in this world. So, practitioners of medicine have picked out specific, limited areas (we commonly call them specialties) to master and practice. No doctor today claims to know how to treat the human skin plus all its contents.

In this section, we will introduce you to a long list of medical practice **specialties** and try to link them to parts of the human body, or to categories of treatment methods. Doing that gives you a useful concept of what sort of physician you might want to see for a specific illness or injury. Before we do that, we want to suggest an additional concept.

The knowledge and methods of treatment that we call medical science appear unlikely to ever stop growing, evolving, and improving. We might expect then that traditional specialties will spawn more subdivisions. We call subdivisions of medical specialties “**sub-specialties**.” Consider this example. **Cardiology** designates the specialty of doctors who treat diseases of the heart. In the 1930’s Dr. Werner Forssmann demonstrated the possibility of threading a small tube, called a **catheter**, from a vein in his own arm all the way up to his chest ending up inside his own heart. That demonstration launched over a span of decades a long list of diagnostic and treatment procedures Cardiologists can perform. Cardiologists who do these sorts of procedures have created a sub-specialty called **Invasive Cardiology**. In the future as knowledge keeps expanding, we might need sub-sub-specialties, and even sub-sub-sub-specialties. Can you anticipate a problem with such a future for medical care as physicians become more and more focused on just one tiny piece of medical care?

Over the last decade or two, public health experts have come to recognize that medical practitioners appear to make more and more mistakes as they try to cure **diseases** and treat **injuries**. Some of that must come from the fact that so much knowledge has made rapid decision making overwhelming. Also, since medical treatments constantly grow more effective, indeed more powerful, mistakes in using the

wrong treatment grow more devastating, even deadly. Some experts have concluded that healthcare practitioners must need more training, more knowledge, to prevent mistakes. More knowledge? We just said too much information appears to have created the problem. We have made the point in this book that anyone electing a career in the healing arts should expect to continue studying and learning endlessly, but will more education prevent mistakes? Does more education stop people from leaving something important off their grocery list or stop people from losing their car keys? Of course, it does not. Human beings make mistakes because the human brain does not work flawlessly. As we learn more about how our brain does the amazing things it can do, we also see the reasons that it makes mistakes.

One category of mistakes in healthcare appears to arise from our current way of moving patients to specialists or sub-specialists to get the proper treatment. Primary Care physicians see patients who do not have a diagnosis. The **Primary Care** specialist makes a tentative diagnosis and commonly sends the patient on to another specialist. If the first step in the process of getting to the right specialist goes amiss, the patient has a very difficult time getting the correct treatment. The specialist or sub-specialist getting the patient from the Primary Care doctor tends to find a diagnosis within his or her **domain** to explain the patient's problem, perhaps without fully considering all the possible alternative diagnoses that lie in other specialties. Fortunately, many specialists do recognize when a patient came to them by mistake and needs to restart the process, but too many patients fail to recover from an initial mistake in this referral process.

Have you heard the expression “**tipping point**?” The notion of a tipping point describes the process, often seen, in which a long series of gradual changes suddenly brings about a totally new solution or approach to replace an old method of doing things. Since the authors of this book expect our readers to have not yet selected a career, we think it appropriate to warn you that the existing structure of medical specialties that keeps hatching sub-specialties probably is approaching a tipping point. We appear to need a new way to manage medical knowledge and make sure every patient has precisely the right diagnosis before getting directed to an expert in a specific treatment.

How might the future deal with the never-ending growth in medical knowledge and techniques? No one can actually forecast the future, but we might guess that on the other side of this tipping point in medical care, practitioners will stop trying to cram more medical knowledge into their heads and instead rely increasing on what we now call “**artificial intelligence**” to guide them, to double check their conclusions, and even to enhance their procedural skills in healing. Many believe “artificial intelligence” can both reduce mistakes and make procedures more **fault tolerant**. Exactly how that might happen may depend upon you, if indeed you select for yourself a career in the medical arts.

Ray Kurzell, a leader in artificial intelligence research, has coined the term “**hybrid thinking**” to describe the way in which human minds might work with computer systems in the future to enhance human performance in complex fields of work, and even in routine human activities. Humans have unique capabilities to consider ideas outside of what might seem logical while computers never forget details and can search through vast amounts of information without tiring. “Hybrid thinking” represents the promise of combining these two, quite different skillsets to achieve what today we view as impossible. Could we make healthcare immune to errors?

The authors of this book hope, if you do enter a healthcare career, that you will make sure that the future of medical practice retains the highly important aspects of the **doctor-patient relationship** and

caring as it changes the things necessary to eliminate errors that do harm. Recognizing that a tipping point lies ahead might indeed make a healthcare career choice even more exciting for people who want their lives to change the world for the better.

In the meantime, doctors decide during their training how they would like to help people by picking one area to study in great depth. They then spend several years learning and practicing what they have learned in just that one area. As we have said, a doctor cannot easily know everything, even within his or her one area of specialization, because discoveries just keep coming. So, all practitioners need **lifelong learning**, plus we must find ways to make that process more consistent and less prone to errors by using evolving concepts like “hybrid thinking.”

In this chapter, we hope to introduce you to how today’s array of physician specialties might line up to diagnose a patient’s condition or assist a patient in their efforts to regain their health. Let’s now introduce you to a few medical specialties, just to give you an idea of what categories exist. We cannot begin to cover them all.

A **Gerontologist** specializes on the process of aging and helps patients deal with the ravages of growing old. We start with the Gerontologist because the authors of this book consider that specialty highly important in their personal lives. The Gerontologist works at the opposite end from the **Pediatrician** who, you recognize, specializes in children and their unique diseases.

Should you get seriously injured, which we hope never happens, you might meet a **Trauma Surgeon** in the Emergency Room. A Trauma Surgeon goes through four years of medical school, then does a residency in General Surgery, and finally adds a fellowship in Trauma surgery. Wow! **Medical school** makes one into a doctor. A **residency program** lasting usually three to six years, depending upon the specialty, turns that doctor into a specialist. And then a **fellowship** lasting one to three years makes the specialist into a sub-specialist. Does that sound utterly impossible? If you talk to the individuals who go through these programs, they will tell you they only focus on one day at a time and the pace and excitement of the work leaves little time or energy for counting the days.

Let’s get back to your poor body we are pretending to lie badly injured in an emergency room. If you have damaged your chest doing something bad to your lungs or heart a **Cardiothoracic Surgeon** might come to your aid. If instead you banged up your head badly, you would want a **Neurosurgeon** to take your case. On the other hand, if the bones in your leg were broken, an **Orthopedic Surgeon** would take over. Fortunately, you would not be required to figure out which kind of doctor you needed; the **Emergency Physician** (a specialist in emergency care) would figure out for you which specialists you need.

Suppose alternatively you were not feeling well, but were not so sick that you needed to go to the emergency room. In that case your Primary Care doctor would sort out what kind of doctor would best solve your issues. Primary Care doctors come from several specialties, specialties that have offices open to patients trying to figure out what is making them not feel well. Those specialties include **Family Practice, Internal Medicine, Pediatrics**, and often **Gynecology** for female patients.

Let’s quickly meet some more specialists. An **Oncologist** takes care of patients who have cancer. A **Radiation Oncologist** sees patients with cancer who need to receive radiation to destroy a cancerous tumor. A **Psychiatrist** works with patients who have depression, anxieties, and other feelings that

disrupt their lives. A **Neurologist** sees patients who have issues with their nerves causing symptoms like muscle twinges, numbness, tingling, headaches, or weakness in arms and legs. A **Hematologist** gets called when a patient has abnormal blood. A **Nephrologist** or **Urologist** might help you with problems with your kidneys and urinary bladder.

What medical specialist do we hardly ever meet in person, but often see on television shows? You probably know a lot about that specialist, the **Pathologist**. Pathologists we call on to figure out what caused someone's death; they appear frequently in mystery stories. You might not appreciate that pathologists constantly help other physicians figure out a diagnosis by studying samples of fluid and tissue sent to them in their laboratories. The life of a Pathologist can prove very challenging and even exciting.

The list of medical specialists goes on and on: **Dermatologist, Otolaryngologist, Obstetrician, Anesthesiologist, Cardiologist, Infectious Disease Specialist, Toxicologist, Podiatrist, Plastic Surgeon, Pulmonologist, Neonatologist**.... but we will leave you to look up the categories that peak your interest.

Now let's pretend you have finished medical school and completed a residency in Family Practice. You have opened an office and patients come to you so you can sort out their symptoms. You can imagine you might feel very lonely having all that responsibility placed on you, but in fact you would recognize that you have all sorts of other medical specialists available to help you out. When physicians ask other physicians for help them, they call that "making a **referral**." Try your hand at figuring out who might help you with these patients: (We put answers at the bottom for you to look at after you work on these cases. Sometimes more than one answer can prove valid.)

- (1) A 45-year-old male patient complains of ringing in his ears, a symptom he has had on-and-off for two months. You decide to refer the patient to a specialist. Which one?
- (2) An 87-year-old female repeatedly is getting lost in her own neighborhood when she goes for a walk. The woman's daughter brings her to your office for help. Who might have special skills to help this woman?
- (3) The mother of a 13-year-old boy brings him to your office. Her son fell off his skateboard while doing ramp jumping in the backyard. He has a swollen, very tender arm. You order an x-ray, which shows a break in the radius bone of the lower arm. What specialist takes care of broken bones?
- (4) A 57-year-old man comes to you concerned that he occasionally feels light headed and dizzy. He cannot identify any specific activity that causes this to happen. When you listen to his heart you hear an irregular heart beat and an unusual sloshing sound between the normal beats of the heart. Pick a specialist for him, but don't get distracted by his light headedness symptom.
- (5) A 35-year-old female comes to you complaining of pain starting in her right hip and shooting down her right leg. This all started after she moved into a new apartment and lifted lots of furniture and heavy boxes. You find the patient cannot feel sharpness on the skin of the right leg when touched with a pointed probe and she cannot feel the difference between a warm and cold wet gauze touching her right leg. What specialist might she best see?
- (6) A mother brings in a 9-year-old girl to see you after the family's pet cat scratched the youngster's face. The mother heard of a disease called "cat scratch fever." You would not treat the child with antibiotics despite the mother's concern, but when you examine the wound you

see a surprisingly deep cut on the right cheek below her eye that goes deep enough to require stitches. What specialist would best manage a deep cut on a child's face?

1-Otolaryngologist (aka. Ear Nose & Throat Specialist), 2-Neurologist, 3-Orthopedist, 4-Cardiologist, 5-Neurologist, Neurosurgeon, or Orthopedist could all constitute appropriate referrals for this patient, 6-Plastic Surgeon or Emergency Room Specialist (Emergency Room Specialists suture wounds routinely, although a Plastic Surgeon would prove helpful to revise any scar that might persist after the wound healed).

We may now have your head spinning with the vastness of the types of physicians that exist now, not to mention the possibility of even more types sprouting up in the future. You might find yourself wondering, "How can anyone figure out what path to take with so many roads available?" Please rest assured, you do not need to pick a destination when you start your path to a career. The individual choices you will make in your life along your way will always prepare you well for the next choice you will need to make. Right now, we want you to enjoy the view, sort of like enjoying the beauty of a forest without trying to examine every tree.