

## Chapter 1

# Scrubbing In to Master Medical Terminology

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### *In This Chapter*

- ▶ Getting to know the history of medical terminology
  - ▶ Mastering the basics of word building and pronunciation
  - ▶ Familiarizing yourself with basic parts of your anatomy
  - ▶ Discovering the wide range of systems in the body
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**D**id you realize that when you picked up this book, you were beginning a journey into a whole new language? Don't worry — you haven't grabbed *Greek For Dummies* by mistake — it's all English, or at least "English." But once you get deep into the world of medical terms, you will find that it is a whole new way of speaking. Your journey will indeed take you to ancient Greece as well as to Rome. You will meet some of the pioneers of the medical world. You will gain entrance into a whole new world: your body. All of those confusing terms you hear on *Grey's Anatomy* will soon become second nature to you, and pretty soon you'll be whipping out 50-cent words like a seasoned medical professional.

## *The Tale Behind the Terms*

Medical terminology is made up of the terms that describe human anatomy and physiology (body organs, systems, and their functions), body locations, diseases, clinical, diagnostic imaging, and laboratory testing, together with clinical procedures, surgeries, and diagnoses.

It's important for every one of these things to have a specific name — just as it's important that you have your own unique name — because otherwise how would medical professionals be able to communicate clearly with one

another? You might be able to visit your doctor and say, “I have a pain in my shoulder,” and have him solve the mystery of what is causing that pain. But when your doc communicates that information to, say, a surgeon, it’s crucial to be more specific. There are many working parts to your shoulder, after all, so you wouldn’t want the surgeon to try and fix something that’s not broken. When your doctor tells the surgeon the problem is with the rotator cuff, they are communicating much more clearly, and hopefully surgery and treatment will be a lot better.

The beauty of medical terminology is that it makes such vital communication more succinct and to-the-point. A medical term usually describes in one word a disease or condition that, under normal circumstances, would take several words to describe. *Appendectomy* is a one-word medical term to describe “surgical removal of the appendix.” Now that saves you plenty of breath for more important things, like singing an aria or rooting for the Colts.

You can thank the Greeks and Romans for getting the ball rolling with regard to terminology, Hippocrates and Aristotle especially. Over 2,000 years ago, they saw the need for specific, descriptive medical language and began to create words that matched body parts and functions. Now, although you may secretly curse them as you study for your terminology final, you should also take the time to thank them for saving us a world of confusion.

The foundation of medical terminology is based in both Greek and Latin origin. The Greeks were the founders of modern medicine, but Latin is the basic source of medical terms. With origins in ancient Rome, Latin quickly made its way through the world, solidifying its rep as the language of choice for medicine and science. Building on guidance from the Greek and Latin origins, medical terms began to be professionalized in the mid-1800s. The first medical dictionary appeared in the 1830s shortly after the first edition of *Webster’s American Dictionary of the English Language*.

## *Making Terminology Work for You*

Thankfully, there are ways to wade through the quagmire of medical terms and figure out how to pronounce and use them like a champ. But you have to start at the beginning by breaking down the parts of each word and then deciphering its meaning. Or, to put it in a fancy-schmancy way, you should use etymology. *Etymology* helps you find the origin and historical development of a term. You can use etymology to decipher words with Latin and Greek origins, eponyms (words named after people), and acronyms (modern language terms that stand for longer phrases).

Back to those word parts that you'll break down. There are three you need to know:

- ✓ Roots/combining forms
- ✓ Prefixes
- ✓ Suffixes

*Roots* are the glue that holds all medical terms together. They are the basic form around which the final word is formed. A *combining form* is a combining vowel (usually *o* or *i*) plus the root word, usually with a prefix or suffix added. *Prefixes* appear at the beginning of a word and tell the how, why, where, when, how much, how many, position, direction, time, or status. The *suffix*, always at the end of a word, usually indicates a procedure, a condition, or a disease. While the prefix gives us a clue into what to expect in a word's meaning, the suffix tells us what is happening with a specific body part or system. And, usually, it either entails what is wrong with you or the procedure used to diagnose or fix it.

Oh, but we're not done yet! In fact, the fun of medical terminology has just begun once you figure out the parts of each word. You can put words in plural form (which unfortunately involves way more than adding a simple *s*), find out how to pronounce them, and — the big payoff — use them in the real world.

The breaking down of words that you will learn in this book also helps you with pronunciation. With medical terminology, sounds are not always pronounced the same as in English, and there are no steadfast rules that a combination of specific letters will always be pronounced in the same way. One thing that helps in both the standard English and medical worlds, though, is to learn how to pronounce phonetically, by breaking up the word into smaller parts.

There is an old saying that the only constant is change. With medical terms, the same rule applies. A rule that might work for pronouncing one word might not come close to working for any other word. Be ready to be flexible, because what may seem familiar to you from everyday English might take on a whole new sound as a medical term. Once you can open your mind to all of the possibilities, you'll enter a whole new world of understanding terminology.

## *Building a Foundation of Vocabulary*

Getting the basics of word formation and pronunciation down pat is the hard part. Once you can do that, you can move on to building your word vocabulary. Even though medical professionals like to joke that terminology is like a foreign language (sometimes, yes), don't throw this book out the window just yet. The good news is that you probably already know a lot of medical terms and you can use those to build up the rest of your newfound vocabulary. New terms become easier once you know the reasoning behind most medical terms.

Remember your grade school days when you used all kinds of little tricks to remember things like multiplication tables and the state capitals? The same principle applies to new medical terms. You can make lists of word parts, list words by similar sound, map words, or memorize terms by body system. And those are just a few ideas. Do whatever works for you, even if it's singing terms to the tune of "Sunrise, Sunset" in the shower. We promise not to tell.

## *In Terms of Anatomy*

For our purposes in the land of medical terms, we can compare anatomy to the infrastructure of a building. The walls, floors, bricks, plaster, electrical system, plumbing, and so forth all help keep the building working for the people who inhabit it. Your body's anatomy is no different, which is why you are going to read about these particular terms first. Once you get the basics of what holds your body together, you can go on to find out about the physiological systems that make your body react to both internal and external circumstances.

First on our anatomy checklist is the skeletal system. This is your body's frame, much like the frame of a building. This system, along with its joints, works together with the muscles to give you the support and movement you need every day. The bony skeleton provides the jointed framework for the body, giving it shape. This framework protects vital organs from external injury and provides attachment points for muscles, ligaments, and tendons to make body movement possible.

Working together with the skeleton is the muscular system, in which several different major muscle groups work together. Made up of over 600 muscles and joints, this system is responsible for movement. The skeleton provides attachment points and support for muscles, but it is the muscle tissue's ability to extend and contract that makes movement possible.

Covering all this infrastructure is the integumentary system. Your skin, glands, nails, and hair work like the façade, or outside covering, of a building. They are the things people see when they look at you. The outside of your “building” often shows the world how healthy the rest of your body is. Healthy skin, along with accessory organs glands, hair, and nails, are the hallmarks of healthy insides, so care for them accordingly. Think of this as you would apartment shopping. If the outside of the building looks shoddy, would you want to move in?

Your sensory system is all of the “fun stuff” in your building. The windows, amenities, sound system, and dining facility all bring aesthetic delight to the building’s inhabitants, and your senses work in a similar fashion. Your eyes are the windows to your world. Everything you see from your own face in the mirror each morning to the sight of the most beautiful sunset comes to you courtesy of those peepers. The smell of baking bread, the feel of a fine cashmere sweater, the taste of a great vintage wine, and the sound of a child’s laughter are all made possible by your senses.

It may be hard to imagine that words can describe all of the amazing things your anatomy can do, but believe us when we say that it’s all possible through terminology. And who knows? Perhaps there’s a word out there that hasn’t been created yet that you will coin using what you learn here.

## *All Systems Go*

Once you get those basic working parts ingrained in your brain, you will move on to the physiology terminology. Physiology deals with the remaining body systems that help your fabulous body do its day-to-day work.

First up is the thing that keeps your blood pumping and your life moving forward each day: your heart. More specifically, the cardiovascular system. Your heart does not work in a vacuum. It has supporting players, namely your blood cells and vessels. These parts all work together to supply your body with fresh, clean, oxygenated blood.

Then there is the separate but complementary lymphatic system that works to flush your body of impurities. Most directly associated with immunity, the lymphatic system works in the same context as the cardiovascular system due to the similar makeup of the system and the fact that, once cleaned by the lymph nodes, lymphatic fluid is released directly into the bloodstream. Lymph vessels are arranged in a similar pattern as the blood vessels.

Speaking of oxygenating your blood, think about how that oxygen finds its way into your body. You may not consciously think about it every day, but breathing makes it all possible. The body's trillions of cells need oxygen and must get rid of carbon monoxide, and this exchange of gases is accomplished by the respiratory system. External respiration is the repetitive, unconscious exchange of air between the lungs and the external environment.

You have to breathe, but you also have to eat, and eating is way more fun. Your good buddy the gastrointestinal system helps turn those tasty meals and treats into usable energy for your body. Also called the alimentary or digestive tract, this system provides a tube-like passage through a maze of organs and body cavities, beginning at the mouth, the food entrance into the body, and ending at the anus, where solid waste material exits the body. Voilá! Your delicious Chinese takeout magically turns into . . . well, you know.

Moving on, the complicated endocrine system maintains the chemical balance of the body. It does this by sending chemical messengers called hormones throughout the body via the bloodstream. Hormones regulate and control activity of specific cells or organs. Slowly released hormones control organs from a distance. Endocrine glands are located in different parts of the body. They are said to be ductless, because they have no duct system to transport their secretions. Instead, hormones are released directly into the bloodstream to regulate a variety of functions of body organs. One can stimulate growth, another matures sex organs, and yet another controls metabolism. Your body has both central and peripheral glands.

Even more complicated (are we having fun yet?) is the nervous system. Working like the body's built-in computer system, it is far more complex than your laptop. Messages from the brain are relayed via the spinal cord through nerve fibers that provide connections for incoming and outgoing data. The body has more than *ten billion* nerve cells whose function is to coordinate activities of the body. This system controls our voluntary activities as well as involuntary activities. We speak, hear, taste, see, think, move muscles, and have glands that secrete hormones. We respond to pain, danger, temperature, and touch. We have memory, association, and discrimination. These functions are only a small part of what the nervous system controls.

The nervous system is made up of the central nervous system (CNS), which includes the brain and spinal cord. The peripheral nervous system (PNS) is composed of cranial nerves (that extend from the brain) and spinal nerves (that extend from the spinal cord). The autonomic nervous system (ANS) controls and coordinates the functions of the body's vital organs, such as heartbeat and rate of breathing — functions we don't even think about.

## Down Under Details

Speaking of things you don't usually think about, the urinary system is made up of the kidneys (two), ureters (also two), bladder, and urethra. This system's main function is to remove urea (the nitrogenous waste products of metabolism) from the bloodstream, and excrete it in urine from the body. Nitrogenous waste is difficult to excrete from the body. The main function of the urinary system is to remove urea from the bloodstream.

Urea is formed in the liver from ammonia. The bloodstream carries it (in the same manner as hormones and lymph) to the kidneys, where it passes with water, salts, and acids out of the bloodstream into the kidneys. The kidneys produce the urine that travels through each ureter into the bladder to be excreted via the urethra. Now that's a whole lot of information to impress your friends with at a dinner party. On second thought, maybe not.

When food and oxygen combine in cells to produce energy, the process is known as *catabolism*. In the process, food and oxygen are not destroyed, but small particles making up the food and oxygen are rearranged in a new combination, and the results are waste products. Waste in the form of gas (carbon dioxide) is removed from the body by exhaling through the lungs.

Think about how you were made. No, you weren't discovered under a cabbage leaf. Your mom and dad made you (see *Sex For Dummies* if you don't get our drift here) using their reproductive systems. In the male, it has two main functions: to produce spermatozoa, the male reproductive cell, and to secrete testosterone, the male hormone. The reproductive organs, or gonads, are the testes. They are supported by accessory organs, ducts, glands, and supportive structures. The ducts include the epididymides (epididymis-singular) vas deferens, ejaculatory ducts, and the urethra. Glands include seminal vesicles, prostate, and bulbourethral glands (or Cowper's glands). The supporting structures include the penis, scrotum, and spermatic cords. That's a lot of moving parts.

The female reproductive system produces the female reproductive cell, or sex cell, secretes the hormones estrogen and progesterone, and provides the conditions to establish a pregnancy, together with providing a safe place for the pregnancy to develop and grow. The gonads (ovaries in the female), together with the internal accessory organs consisting of the fallopian (uterine) tubes, uterus, vagina, external genitalia, and breasts (mammary glands) make up the reproductive system in the female. Reproduction is achieved by the union of the female reproductive cell, an ovum, and the male reproductive cell, a spermatozoon (sperm for short), resulting in fertilization.

This is just a quick glance at the kinds of stuff you're going to learn about your body. Of course, the appropriate terms will be discussed in detail along with the simple biology background.

## *The Ultimate Resource: You*

Before you crack open a frosty beverage and celebrate the fact that you've survived the first class of Terminology 101, take a few quick resources with you for the road. A listing of well-known term references, recall devices, and word-building activities will help you take your terminology show on the road and apply it to your own personal real-world situation.

The references mentioned in this book are some of the most well respected. Of course, there are thousands of online and print resources, most of which are reputable. Use your own good judgment when it comes to choosing one as your go-to source. In other words, it might be best to stay away from Joe Bob's House of Medical Terms.

As you go on this journey, remember that ultimately you are your own best source of tips and tricks. Maybe you're a flashcard aficionado. Perhaps you do best when you can visualize the term with the appropriate body system. Or maybe you like a good old pneumonic device like "*i* before *e* except after *c*." No matter how you choose to learn and recall these terms, do what is most comfortable and useful for you. You're the captain of this boat. Now, hoist the sail!