

On becoming a medical detective...

Welcome to the challenging world of **medical investigation**. This world has many players but **medical doctors**, also known as **physicians** or **practitioners**, use medical science to care for patients. As you will soon see, there are many ways doctors help people by using their knowledge of the human body and disease. Think about your last visit to your doctor. Physicians who care for children we call **Pediatricians**. **Family physicians** treat family members of all ages, and other doctors called **specialists** treat more complex medical problems, but within a much more limited spectrum of illness or body system. Some doctors work behind the scenes to help patients whom they never meet. You will learn about some of them later.

Medical detectives use a process very similar to crime scene investigators or any other investigator. Solving a medical puzzle requires finding the cause of the problem, the **diagnosis**, and a solution to make the patient feel better, the **treatment**. In spite of learning all they can from the patient and looking at test results, sometimes doctors have a tough time making the **diagnosis**.

The practice of medicine is very much an **art** as much as it is a **science**. The art of medical practice requires not only mastery of basic scientific knowledge of human anatomy and physiology, but of thinking beyond common pathologic causes to consider less obvious possible causes of patients problems in that analysis.

We call the details about how the human body normally works **physiology**. We call the details of how that process can go wrong **pathophysiology**; the Greek word “**path**” means a feeling or an illness. We call a physician who looks for abnormal human **tissue** under a microscope or with chemical tests in the laboratory a **Pathologist**. All **medical investigators** must understand physiology and pathophysiology to do the detective work required to help their patients. We want to introduce you to the art and science, and adventure, of being a **medical detective**.

Detectives start with a mystery and gather clues to figure out what happened and who caused the trouble. Like a detective solving a mystery, doctors start with what they know, add information by **examining** the patient, perhaps giving the patient some tests to get even more information. When they have all the information they can gather, only then can they solve the puzzle and make a diagnosis. For a medical detective the mystery usually starts with a complaint of pain or a change in how the patient feels. Sometimes patients are unable to tell their doctor about their complaint because they are not conscious. When this happens doctors may have to rely only on their examination of the patient.

The first clues for solving a medical investigation usually come when the patient tells the story of their complaint or illness. We call the patient's story the **history**. Listening to the history the doctor learns how their health status has changed. We call these changes **symptoms**. Symptoms are not the cause of the problem, but are signs that something **abnormal** may be going on. Symptoms give the doctor an idea of where to focus attention.

The physical examination follows, with special attention to areas of pain, discoloration, or swelling related to the complaint. Additional clues come from **X-rays** or **laboratory tests**, such as looking at blood cells under a microscope. We call these additional ways to gather clues **diagnostic testing**. For example, if a patient complains to the doctor of pain in their arm following a fall, an x-ray may show the presence or absence of a break in the bone, called a **fracture**, which cannot be seen using only our eyes.

Physicians and nurse practitioners go through years of training to learn how to **diagnose** the causes of health problems and to become experienced in solving those problems. In this book we hope to provide you a taste of the process and allow you to experience the challenge of using your skills of **observation** and **analysis** to solve the same puzzles that allow doctors and nurses to improve the quality of people's lives. If you feel some frustration in trying to understand everything you need to know to solve these problems, you will not be alone. The best medical specialists in the world share

that same frustration, and they **acknowledge** that frustration keeps them studying and learning every day.

Understanding medical investigation is like any new interest; you need to know what things are called and how they work. Medicine has literally thousands of unique terms and probably almost as many processes. This book will introduce many names and many medical procedures, so you may often need to go to books or the Internet to fully satisfy your curiosity. When you dive deeper into understanding medical investigation the learning process really becomes fun and what you learn will stick with you. You are ready to become a Medical Detective. So let's get started!