Diagnosketch: A Visual Guide to Medical Diagnosis for the Non-Medical Audience

Created and Illustrated by
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INTRODUCTION

Diagnosketch is a visual aid to explain medical diagnoses to patients **at the bedside.** It uses simplified images to illustrate complicated anatomy and concepts. The title, *Diagnosketch,* combines the term "diagnosis" with the term "sketch," paralleling the way the book combines a medical diagnosis with a simplified sketch. It includes common pathologies seen in an acute care setting, especially ones that are easier to explain with pictures.

Many American patients are unfamiliar with human anatomy and common medical diagnoses. Research from the US Department of Education estimates that only 12% of English-speaking adults in the United States have proficient health literacy skills.[1] Studies indicate that almost 90% of adults have difficulty understanding health information that is currently available.[2] These patients are often unequipped to make important decisions about their own health care.

Diagnosketch improves health care literacy for the non-medical population. It simplifies human anatomy and pathophysiology into memorable, understandable images. It relies on the concept of "picture superiority effect." The picture superiority effect states that HEARING information will lead to 10% retention of the content, but HEARING and SEEING information leads to 65% retention of content. *Diagnosketch* not only explains difficult concepts to patients, but also helps patients remember them.

Diagnosketch serves as the visual guide that medical professionals use with every patient at the bedside. Excellent medical care involves diagnosing and treating disease, but just as importantly, communicating well with patients. *Diagnosketch* helps achieve this goal.

KEY COMPONENTS OF *DIAGNOSKETCH*

Simplicity

The images in the book intentionally simplify information to help educate a non-medical audience. The images leave out details that may not be clinically relevant and overemphasize those that are. Although the general anatomy is correct, certain organs are exaggerated. For example, the gallbladder is quite small in the human abdomen, yet in the images, it is depicted much larger to emphasize its clinical relevance. Also, human physiology has been simplified with colors. For example, in some images blood vessels are depicted in red whether they carry oxygenated or deoxygenated blood. In addition, the images intentionally leave out smaller anatomical structures (like nerves and smaller blood vessels) for simplicity's sake.

Practicality

The images in the book depict only the most common diagnoses seen in an acute care setting and only those that would benefit from an image. In busy settings, sometimes the health care encounter lasts just a few minutes. *Diagnosketch* presents a simple, clear image that improves understanding as quickly and efficiently as possible. In addition, the labels are minimal and are written in colloquial, non-medical language. This encourages the patient to listen to the explanation from the medical professional, rather than read and become confused by complicated medical terminology.

[1] Kutner, M., Greenberg, E., Jin, Y., & Paulsen, C. (2006). *The Health Literacy of America's Adults: Results From the 2003 National Assessment of Adult Literacy* (NCES 2006-483). Washington, DC: US Department of Education, National Center for Education Statistics.

[2] US Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2010). *National Action Plan to Improve Health Literacy*. Washington, DC: Author.

Inclusivity

The images in the book intentionally use various skin tones and physical features to represent the diversity seen across patients in various medical settings. Different diagnoses can affect any ethnicity. Aside from problems that affect a particular biological sex, diagnoses are depicted in the male or the female in a non-specific way.

HOW DOES *DIAGNOSKETCH* WORK?

Diagnosketch consists of 100 images of medical illnesses commonly diagnosed in an acute care setting. It is meant to be used **at the bedside** to help communicate complicated concepts to a non-medical audience quickly. Most medical encounters between doctors and patients occur verbally. Although visual aids are sometimes used, they are not standard. This book changes this paradigm by incorporating a simplified, colorful graphic visual to assist patients to better understand their diagnoses in real time.

Imagine the following scenario:

A patient presents to the emergency room for severe abdominal pain. You run tests: blood, urine, ultrasound. You diagnose cholecystitis. You **verbally** explain to your patient that her gallbladder is infected, and that she will need emergency surgery. Your patient looks dumbfounded. She never expected this. She thought that she might have eaten something bad but is now on her way to surgery? She quietly pretends that she understands but does not really know where her gallbladder is located, let alone what it does. She does not even know what questions she should ask. You sense that she does not completely understand everything, so you quickly grab a paper towel and sketch a crude image of her anatomy. Although you'd like to stay longer, you feel the pressure of a waiting room full of patients, still waiting to be seen. You rush out, knowing that although you expertly diagnosed her condition and arranged for proper treatment, you could have communicated better.

Now imagine that same patient, but this time you use *Diagnosketch*. You return to the patient's room and explain her condition verbally **AND** visually. You show your patient where her gallbladder is in relation to her other organs. You show her a gallstone and explain how it blocked her biliary tract. You show her how this caused her pain and eventually her infection. She asks pertinent questions, and you give her immediate answers. You have a two-way dialogue. In just a few minutes, you have relieved her fears and increased her anatomical knowledge. You know that you communicated in a way that she understands. When you walk out of the room, you feel confident in your skills as both a master clinician/diagnostician and, just as importantly, a master communicator.

HOW IS *DIAGNOSKETCH* ORGANIZED?

Diagnosketch is organized into seven different categories by organ systems. The categories are: skin, EENT (eye, ear, nose, throat), cardiopulmonary, gastrointestinal, genitourinary, orthopedics, and neurology. The last section, Miscellaneous, includes images that do not fit into particular organ system. There is a section on sample scripting that corresponds to each image. This section includes sample wording that serves as a starting point for better patient communication. Finally, there is an Index that includes both the medical jargon and more colloquial language a patient may use, making it easier to quickly find a particular image. Notice that on a particular image, where possible, each title is written in a colloquial language with the medical terminology listed underneath. Notice also that the labels are written in colloquial language to simplify what is happening for the non-medical patient.

Different images are helpful at different stages of a patient encounter. There are three major categories of images: diagnosis images, procedure images, and concept images.

Diagnosis images: are used to explain basic diagnoses and basic anatomy (e.g. biliary colic, kidney stone, pulmonary embolism). Many of these simplified images have a "normal" side and an "abnormal" side so that the patient can easily compare what their body part is supposed to look like with what it looks like when affected. The images also may use the "1, 2, 3 approach" that show three common problems for a particular disease (e.g. diverticulosis, diverticulitis, diverticular abscess/perforation).

Procedure images: are used to explain a procedure to a patient before performing it (e.g. IV insertion, nasogastric tube insertion, drainage of paronychia).

Concept images: are used to explain a concept visually (e.g. how to alternate ibuprofen with acetaminophen for fever reduction; how diabetes mellitus actually causes high glucose; what "code status" means).

Obviously, the images can be used in whatever way is most helpful. Here are a few real-life examples of where *Diagnosketch* has been helpful in the acute care setting:

- A nurse showed the image of "Digestion" to explain to a reluctant 10-year-old why she had to drink a bottle of contrast for an abdominal CT scan to rule out appendicitis. After the patient learned her anatomy and understood that her appendix would "light up" when she drank the contrast, she willingly drank the entire bottle without a fuss. This saved hours of time in a busy emergency room.
- A physician showed the image of "Back pain—side view" to explain the anatomy of the back to a disgruntled patient who felt that he needed an x-ray. After he understood his anatomy and why an x-ray was not indicated, he was happy to avoid unnecessary radiation exposure. This also saved the cost of an unnecessary test.
- A physician showed the image of "Urinary retention" to explain to an uncomfortable older gentleman how his enlarged prostate blocked his bladder, making it impossible to urinate. After he learned his anatomy, he felt comfortable with the insertion of the foley catheter and experienced much relief.
- A nurse showed the image of "Intravenous insertion" to her patient in the triage bay to explain how an IV works. She hoped to dispel the common misconception that an IV is a needle that stays in the arm when it is just a flexible piece of plastic.
- A physician showed the image of a "Heart attack" to the anxious male who presented with chest pain after smoking cocaine. After he visually saw how cocaine could cause his heart muscle to die, he vowed to never use it again. This potentially deterred future drug usage.

HOW DO PATIENTS FEEL AFTER SEEING *DIAGNOSKETCH*?

Patients often ask for a copy of the *Diagnosketch* image to take home. Sometimes, they take a picture on their cell phone to explain to their family members later. Many patients have access to the internet at home and can extensively research their diagnosis. Yet, once they leave the hospital, they almost always do not. Instead, they rely on the simple, familiar images that the medical professional explained to them that they understand.

There are many beautiful anatomy books available with detailed pictures. There are hundreds of images on the internet about anatomy and diagnoses. There is helpful information on discharge paperwork from a hospital or clinic. Diagnosketch does not try to compete with these very useful resources. Instead, it serves as the first basic primer to understanding the medical diagnosis. Once the medical encounter ends, the patient is now equipped with solid knowledge of basic anatomy and physiology and encouraged to further investigate more complicated medical information.

Diagnosketch is a quick, useful tool that greatly enhances the patient's experience. All images are in one place. All images are at a simplistic level of detail. And, all images are clinically useful and relevant to the medical problem at hand.

ABOUT THE AUTHOR/ILLUSTRATOR

I have worked as an emergency medicine physician for 20 years and have seen poor health literacy affect my patients firsthand. For this reason, I developed *Diagnosketch*. I believe that each patient deserves customized knowledge about their anatomy and pathology relevant to their health care encounter.

Early in my career, I drew stick figures and anatomy on paper towels or on whiteboards in my patients' rooms. I saw the utility of visual aids to explain medical concepts. Over the years, I created better images that incorporated real-time patient feedback. I tried many different iterations: everything from more realistic, traditional images to super "cartoony" images. I found that the perfect style of illustration lies between the two. The style in *Diagnosketch* works best because it relays accurate information in a simple, colorful, and nonthreatening way. It gets the point across without being too cartoony or "dumbed down." I now use these images with the majority of my patients. It is satisfying to know that I have not only treated diseases but also helped my patients understand their diagnoses.

I realized that we, as medical professionals, do a great job diagnosing disease. We run blood tests, urine tests, x-rays, and CT scans. We come up with an accurate diagnosis and start proper treatments. Yet, sometimes, when we try to explain everything to our patients, we may not communicate the information as clearly as possible. I hope that *Diagnosketch* will be used to fill this gap.

Diagnosketch is a multiyear project with multiple revisions and rounds of feedback. I welcome your suggestions, comments, and feedback to make it a useful tool for all patient education needs. Thank you.

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