

How Doctors Think

Jerome Groopman, M.D.



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AUTHOR'S NOTE

In order to protect their privacy, the names and certain identifying characteristics of all of the patients whose medical histories are described in this book have been changed. In addition, Dr. Karen Delgado, Dr. Bert Foyer, Dr. Wheeler, Rick Duggan, and Drs. A, B, C, D, and E are fictitious names.

FOR MY MOTHER
Ayshet chayil
(*a woman of valor*)

We carve out order by leaving the
disorderly parts out.
—William James

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Introduction

ANNE DODGE HAD LOST COUNT of all the doctors she had seen over the past fifteen years. She guessed it was close to thirty. Now, two days after Christmas 2004, on a surprisingly mild morning, she was driving again into Boston to see yet another physician. Her primary care doctor had opposed the trip, arguing that Anne's problems were so long-standing and so well defined that this consultation would be useless. But her boyfriend had stubbornly insisted. Anne told herself the visit would mollify her boyfriend and she would be back home by midday.

Anne is in her thirties, with sandy brown hair and soft blue eyes. She grew up in a small town in Massachusetts, one of four sisters. No one had had an illness like hers. Around age twenty, she found that food did not agree with her. After a meal, she would feel as if a hand were gripping her stomach and twisting it. The nausea and pain were so intense that occasionally she vomited. Her family doctor examined her and found nothing wrong. He gave her antacids. But the symptoms continued. Anne lost her appetite and had to force herself to eat; then she'd feel sick and quietly retreat to the bathroom to regurgitate. Her general practitioner suspected what was wrong, but to be sure he referred her to a psychiatrist, and the diagnosis was made: anorexia nervosa with bulimia, a disorder marked by vomiting and an aversion to food. If the condition was not corrected, she could starve to death.

Over the years, Anne had seen many internists for her primary care before settling on her current one, a woman whose practice was devoted to patients with eating disorders. Anne was also evaluated by numerous specialists: endocrinologists, orthopedists, hematologists, infectious disease doctors, and, of course, psychologists and psychiatrists. She had been treated with four different antidepressants and had undergone weekly talk therapy. Nutritionists closely monitored her daily caloric intake.

But Anne's health continued to deteriorate, and the past twelve months had been the most miserable of her life. Her red blood cell count and platelets had dropped to perilous levels. A bone marrow biopsy showed very few developing cells. The two hematologists Anne had consulted attributed the low blood counts to her nutritional deficiency.

Anne also had severe osteoporosis. One endocrinologist said her bones were like those of a woman in her eighties, from a lack of vitamin D and calcium. An orthopedist diagnosed a hairline fracture of the metatarsal bone of her foot. There were also signs that her immune system was failing; she suffered a series of infections, including meningitis. She was hospitalized four times in 2004 in a mental health facility so she could try to gain weight under supervision.

To restore her system, her internist had told Anne to consume three thousand calories a day, mostly in easily digested carbohydrates like cereals and pasta. But the more Anne ate, the worse she felt. Not only was she seized by intense nausea and the urge to vomit, but recently she had severe intestinal cramps and diarrhea. Her doctor said she had developed irritable bowel syndrome, a disorder associated with psychological stress. By December, Anne's weight dropped to eighty-two pounds. Although she said she was forcing down close to three thousand calories, her internist and her psychiatrist took the steady loss of weight as a sure sign that Anne was not telling the truth.

That day Anne was seeing Dr. Myron Falchuk, a gastroenterologist. Falchuk had already gotten her medical records, and her internist had told him that Anne's irritable bowel syndrome was yet another manifestation of her deteriorating mental health. Falchuk heard in the doctor's recitation of the case the implicit message that his role was to examine Anne's abdomen, which had been poked and prodded many times by many physicians, and to reassure her that irritable bowel syndrome, while uncomfortable and annoying, should be treated as the internist had recommended, with an appropriate diet and tranquilizers.

But that is exactly what Falchuk did not do. Instead, he began to question, and listen, and observe, and then to think differently about Anne's case. And by doing so, he saved her life, because for fifteen years a key aspect of her illness had been missed.

This book is about what goes on in a doctor's mind as he or she treats a patient. The idea for it came to me unexpectedly, on a September morning three years ago while I was on rounds with a group of interns, residents, and medical students. I was the attending physician on

"general medicine," meaning that it was my responsibility to guide this team of trainees in its care of patients with a wide variety of clinical problems, not just those in my own specialties of blood diseases, cancer, and AIDS. There were patients on our ward with pneumonia, diabetes, and other common ailments, but there were also some with symptoms that did not readily suggest a diagnosis, or with maladies for which there was a range of possible treatments, where no one therapy was clearly superior to the others.

I like to conduct rounds in a traditional way. One member of the team first presents the salient aspects of the case and then we move as a group to the bedside, where we talk to the patient and examine him. The team then returns to the conference room to discuss the problem. I follow a Socratic method in the discussion, encouraging the students and residents to challenge each other, and challenge me, with their ideas. But at the end of rounds on that September morning I found myself feeling disturbed. I was concerned about the lack of give-and-take among the trainees, but even more I was disappointed with myself as their teacher. I concluded that these very bright and very affable medical students, interns, and residents all too often failed to question cogently or listen carefully or observe keenly. They were not thinking deeply about their patients' problems. Something was profoundly wrong with the way they were learning to solve clinical puzzles and care for people.

You hear this kind of criticism—that each new generation of young doctors is not as insightful or competent as its forebears—regularly among older physicians, often couched like this: "When I was in training thirty years ago, there was real rigor and we had to know our stuff. Nowadays, well..." These wistful, aging doctors speak as if some magic that had transformed them into consummate clinicians has disappeared. I suspect each older generation carries with it the notion that its time and place, seen through the distorting lens of nostalgia, were superior to those of today. Until recently, I confess, I shared that nostalgic sensibility. But on reflection I saw that there also were major flaws in my own medical training. What distinguished my learning from the learning of my young trainees was the nature of the deficiency, the type of flaw.

My generation was never explicitly taught how to think as clinicians. We learned medicine catch-as-catch-can. Trainees observed senior physicians the way apprentices observed master craftsmen in a medieval

guild, and somehow the novices were supposed to assimilate their elders' approach to diagnosis and treatment. Rarely did an attending physician actually explain the mental steps that led him to his decisions. Over the past few years, there has been a sharp reaction against this catch-as-catch-can approach. To establish a more organized structure, medical students and residents are being taught to follow preset algorithms and practice guidelines in the form of decision trees. This method is also being touted by certain administrators to senior staff in many hospitals in the United States and Europe. Insurance companies have found it particularly attractive in deciding whether to approve the use of certain diagnostic tests or treatments.

The trunk of the clinical decision tree is a patient's major symptom or laboratory result, contained within a box. Arrows branch from the first box to other boxes. For example, a common symptom like "sore throat" would begin the algorithm, followed by a series of branches with "yes" or "no" questions about associated symptoms. Is there a fever or not? Are swollen lymph nodes associated with the sore throat? Have other family members suffered from this symptom? Similarly, a laboratory test like a throat culture for bacteria would appear farther down the trunk of the tree, with branches based on "yes" or "no" answers to the results of the culture. Ultimately, following the branches to the end should lead to the correct diagnosis and therapy.

Clinical algorithms can be useful for run-of-the-mill diagnosis and treatment—distinguishing strep throat from viral pharyngitis, for example. But they quickly fall apart when a doctor needs to think outside their boxes, when symptoms are vague, or multiple and confusing, or when test results are inexact. In such cases—the kinds of cases where we most need a discerning doctor—algorithms discourage physicians from thinking independently and creatively. Instead of expanding a doctor's thinking, they can constrain it.

Similarly, a movement is afoot to base all treatment decisions strictly on statistically proven data. This so-called evidence-based medicine is rapidly becoming the canon in many hospitals. Treatments outside the statistically proven are considered taboo until a sufficient body of data can be generated from clinical trials. Of course, every doctor should consider research studies in choosing a therapy. But today's rigid reliance on evidence-based medicine risks having the doctor choose care

passively, solely by the numbers. Statistics cannot substitute for the human being before you; statistics embody averages, not individuals. Numbers can only complement a physician's personal experience with a drug or a procedure, as well as his knowledge of whether a "best" therapy from a clinical trial fits a patient's particular needs and values.

Each morning as rounds began, I watched the students and residents eye their algorithms and then invoke statistics from recent studies. I concluded that the next generation of doctors was being conditioned to function like a well-programmed computer that operates within a strict binary framework. After several weeks of unease about the students' and residents' reliance on algorithms and evidence-based therapies alone, and my equally unsettling sense that I didn't know how to broaden their perspective and show them otherwise, I asked myself a simple question: How should a doctor think?

This question, not surprisingly, spawned others: Do different doctors think differently? Are different forms of thinking more or less prevalent among the different specialties? In other words, do surgeons think differently from internists, who think differently from pediatricians? Is there one "best" way to think, or are there multiple, alternative styles that can reach a correct diagnosis and choose the most effective treatment? How does a doctor think when he is forced to improvise, when confronted with a problem for which there is little or no precedent? (Here algorithms are essentially irrelevant and statistical evidence is absent.) How does a doctor's thinking differ during routine visits versus times of clinical crisis? Do a doctor's emotions—his like or dislike of a particular patient, his attitudes about the social and psychological makeup of his patient's life—color his thinking? Why do even the most accomplished physicians miss a key clue about a person's true diagnosis, or detour far afield from the right remedy? In sum, when and why does thinking go right or go wrong in medicine?

I had no ready answers to these questions, despite having trained in a well-regarded medical school and residency program, and having practiced clinical medicine for some thirty years. So I began to ask my colleagues for answers.* Nearly all of the practicing physicians I queried were intrigued by the questions but confessed that they had never really thought about how they think. Then I searched the medical literature for studies of clinical thinking. I found a wealth of research that modeled

"optimal" medical decision-making with complex mathematical formulas, but even the advocates of such formulas conceded that they rarely mirrored reality at the bedside or could be followed practically. I saw why I found it difficult to teach the trainees on rounds how to think. I also saw that I was not serving my own patients as well as I might. I felt that if I became more aware of my own way of thinking, particularly its pitfalls, I would be a better caregiver. I wasn't one of the hematologists who evaluated Anne Dodge, but I could well have been, and I feared that I too could have failed to recognize what was missing in her diagnosis.

Of course, no one can expect a physician to be infallible. Medicine is, at its core, an uncertain science. Every doctor makes mistakes in diagnosis and treatment. But the frequency of those mistakes, and their severity, can be reduced by understanding how a doctor thinks and how he or she can think better. This book was written with that goal in mind. It is primarily intended for laymen, though I believe physicians and other medical professionals will find it useful. Why for laymen? Because doctors desperately need patients and their families and friends to help them think. Without their help, physicians are denied key clues to what is really wrong. I learned this not as a doctor but when I was sick, when I was the patient.

We've all wondered why a doctor asked certain questions, or detoured into unexpected areas when gathering information about us. We have all asked ourselves exactly what brought him to propose a certain diagnosis and a particular treatment and to reject the alternatives. Although we may listen intently to what a doctor says and try to read his facial expressions, often we are left perplexed about what is really going on in his head. That ignorance inhibits us from successfully communicating with the doctor, from telling him all that he needs to hear to come to the correct diagnosis and advice on the best therapy.

In Anne Dodge's case, after a myriad of tests and procedures, it was her words that led Falchuk to correctly diagnose her illness and save her life. While modern medicine is aided by a dazzling array of technologies, like high-resolution MRI scans and pinpoint DNA analysis, language is still the bedrock of clinical practice. We tell the doctor what is bothering us, what we feel is different, and then respond to his questions. This dialogue is our first clue to how our doctor thinks, so the book begins

there, exploring what we learn about a physician's mind from what he says and how he says it. But it is not only clinical logic that patients can extract from their dialogue with a doctor. They can also gauge his emotional temperature. Typically, it is the doctor who assesses our emotional state. But few of us realize how strongly a physician's mood and temperament influence his medical judgment. We, of course, may get only glimpses of our doctor's feelings, but even those brief moments can reveal a great deal about why he chose to pursue a possible diagnosis or offered a particular treatment.

After surveying the significance of a doctor's words and feelings, the book follows the path that we take when we move through today's medical system. If we have an urgent problem, we rush to the emergency room. There, doctors often do not have the benefit of knowing us, and must work with limited information about our medical history. I examine how doctors think under these conditions, how keen judgments and serious cognitive errors are made under the time pressures of the ER. If our clinical problem is not an emergency, then our path begins with our primary care physician—if a child, a pediatrician; if an adult, an internist. In today's parlance, these primary care physicians are termed "gatekeepers," because they open the portals to specialists. The narrative continues through these portals; at each step along the way, we see how essential it is for even the most astute doctor to doubt his thinking, to repeatedly factor into his analysis the possibility that he is wrong. We also encounter the tension between his acknowledging uncertainty and the need to take a clinical leap and act. One chapter reports on this in my own case; I sought help from six renowned hand surgeons for an incapacitating problem and got four different opinions.

Much has been made of the power of intuition, and certainly initial impressions formed in a flash can be correct. But as we hear from a range of physicians, relying too heavily on intuition has its perils. Cogent medical judgments meld first impressions—gestalt—with deliberate analysis. This requires time, perhaps the rarest commodity in a healthcare system that clocks appointments in minutes. What can doctors and patients do to find time to think? I explore this in the pages that follow.

Today, medicine is not separate from money. How much does intense marketing by pharmaceutical companies actually influence either

conscious or subliminal decision-making? Very few doctors, I believe, prostitute themselves for profit, but all of us are susceptible to the subtle and not so subtle efforts of the pharmaceutical industry to sculpt our thinking. That industry is a vital one; without it, there would be a paucity of new therapies, a slowing of progress. Several doctors and a pharmaceutical executive speak with great candor about the reach of drug marketing, about how natural aspects of aging are falsely made into diseases, and how patients can be alert to this.

Cancer, of course, is a feared disease that becomes more likely as we grow older. It will strike roughly one in two men and one in three women over the course of their lifetime. Recently there have been great clinical successes against types of cancers that were previously intractable, but many malignancies remain that can be, at best, only temporarily controlled. How an oncologist thinks through the value of complex and harsh treatments demands not only an understanding of science but also a sensibility about the soul—how much risk we are willing to take and how we want to live out our lives. Two cancer specialists reveal how they guide their patients' choices and how their patients guide them toward the treatment that best suits each patient's temperament and lifestyle.

At the end of this journey through the minds of doctors, we return to language. The epilogue offers words that patients, their families, and their friends can use to help a physician or surgeon think, and thereby better help themselves. Patients and their loved ones can be true partners with physicians when they know how doctors think, and why doctors sometimes fail to think. Using this knowledge, patients can offer a doctor the most vital information about themselves, to help steer him toward the correct diagnosis and offer the therapy they need. Patients and their loved ones can aid even the most seasoned physician avoid errors in thinking. To do so, they need answers to the questions that I asked myself, and for which I had no ready answers.

Not long after Anne Dodge's visit to Dr. Myron Falchuk, I met with him in his office at Boston's Beth Israel Deaconess Medical Center. Falchuk is a compact man in his early sixties with a broad bald pate and lively

eyes. His accent is hard to place, and his speech has an almost musical quality. He was born in rural Venezuela and grew up speaking Yiddish at home and Spanish in the streets of his village. As a young boy, he was sent to live with relatives in Brooklyn. There he quickly learned English. All this has made him particularly sensitive to language, its nuances and power. Falchuk left New York for Dartmouth College, and then attended Harvard Medical School; he trained at the Peter Bent Brigham Hospital in Boston, and for several years conducted research at the National Institutes of Health on diseases of the bowel. After nearly four decades, he has not lost his excitement about caring for patients. When he began to discuss Anne Dodge's case, he sat up in his chair as if a jolt of electricity had passed through him.

"She was emaciated and looked haggard," Falchuk told me. "Her face was creased with fatigue. And the way she sat in the waiting room—so still, her hands clasped together—I saw how timid she was." From the first, Falchuk was reading Anne Dodge's body language. Everything was a potential clue, telling him something about not only her physical condition but also her emotional state. This was a woman beaten down by her suffering. She would need to be drawn out, gently.

Medical students are taught that the evaluation of a patient should proceed in a discrete, linear way: you first take the patient's history, then perform a physical examination, order tests, and analyze the results. Only after all the data are compiled should you formulate hypotheses about what might be wrong. These hypotheses should be winnowed by assigning statistical probabilities, based on existing databases, to each symptom, physical abnormality, and laboratory test; then you calculate the likely diagnosis. This is Bayesian analysis, a method of decision-making favored by those who construct algorithms and strictly adhere to evidence-based practice. But, in fact, few if any physicians work with this mathematical paradigm. The physical examination begins with the first visual impression in the waiting room, and with the tactile feedback gained by shaking a person's hand. Hypotheses about the diagnosis come to a doctor's mind even before a word of the medical history is spoken. And in cases like Anne's, of course, the specialist had a diagnosis on the referral form from the internist, confirmed by the multitude of doctors' notes in her records.

Falchuk ushered Anne Dodge into his office, his hand on her elbow, lightly guiding her to the chair that faces his desk. She looked at a stack of papers some six inches high. It was the dossier she had seen on the desks of her endocrinologists, hematologists, infectious disease physicians, psychiatrists, and nutritionists. For fifteen years she'd watched it grow from visit to visit.

But then Dr. Falchuk did something that caught Anne's eye: he moved those records to the far side of his desk, withdrew a pen from the breast pocket of his white coat, and took a clean tablet of lined paper from his drawer. "Before we talk about why you are here today," Falchuk said, "let's go back to the beginning. Tell me about when you first didn't feel good."

For a moment, she was confused. Hadn't the doctor spoken with her internist and looked at her records? "I have bulimia and anorexia nervosa," she said softly. Her clasped hands tightened. "And now I have irritable bowel syndrome."

Falchuk offered a gentle smile. "I want to hear your story, in your own words."

Anne glanced at the clock on the wall, the steady sweep of the second hand ticking off precious time. Her internist had told her that Dr. Falchuk was a prominent specialist, that there was a long waiting list to see him. Her problem was hardly urgent, and she got an appointment in less than two months only because of a cancellation in his Christmas-week schedule. But she detected no hint of rush or impatience in the doctor. His calm made it seem as though he had all the time in the world.

So Anne began, as Dr. Falchuk requested, at the beginning, reciting the long and tortuous story of her initial symptoms, the many doctors she had seen, the tests she had undergone. As she spoke, Dr. Falchuk would nod or interject short phrases: "Uh-huh, I'm with you, Go on."

Occasionally Anne found herself losing track of the sequence of events. It was as if Dr. Falchuk had given her permission to open the floodgates, and a torrent of painful memories poured forth. Now she was tumbling forward, swept along as she had been as a child on Cape Cod when a powerful wave caught her unawares. She couldn't recall exactly when she had had the bone marrow biopsy for her anemia.

"Don't worry about exactly when," Falchuk said. For a long moment Anne sat mute, still searching for the date. "I'll check it later in your records. Let's talk about the past months. Specifically, what you have been doing to try to gain weight."

This was easier for Anne; the doctor had thrown her a rope and was slowly tugging her to the shore of the present. As she spoke, Falchuk focused on the details of her diet. "Now, tell me again what happens after each meal," he said.

Anne thought she had already explained this, that it all was detailed in her records. Surely her internist had told Dr. Falchuk about the diet she had been following. But she went on to say, "I try to get down as much cereal in the morning as possible, and then bread and pasta at lunch and dinner." Cramps and diarrhea followed nearly every meal, Anne explained. She was taking antinausea medication that had greatly reduced the frequency of her vomiting but did not help the diarrhea. "Each day, I calculate how many calories I'm keeping in, just like the nutritionist taught me to do. And it's close to three thousand."

Dr. Falchuk paused. Anne Dodge saw his eyes drift away from hers. Then his focus returned, and he brought her into the examining room across the hall. The physical exam was unlike any she'd had before. She had been expecting him to concentrate on her abdomen, to poke and prod her liver and spleen, to have her take deep breaths, and to look for any areas of tenderness. Instead, he looked carefully at her skin and then at her palms. Falchuk intently inspected the creases in her hands, as though he were a fortuneteller reading her lifelines and future. Anne felt a bit perplexed but didn't ask him why he was doing this. Nor did she question why he spent such a long while looking in her mouth with a flashlight, inspecting not only her tongue and palate but her gums and the glistening tissue behind her lips as well. He also spent a long time examining her nails, on both her hands and her feet. "Sometimes you can find clues in the skin or the lining of the mouth that point you to a diagnosis," Falchuk explained at last.

He also seemed to fix on the little loose stool that remained in her rectum. She told him she had had an early breakfast, and diarrhea before the car ride to Boston.