The NEW ENGLAND JOURNAL of MEDICINE

Perspective

The Stress of Bayesian Medicine — Uncomfortable Uncertainty in the Face of Covid-19

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"Have you heard about Covid toes?" My wife, while working through her clinical notes from her pediatrics practice that day, asked the question with a tone of resignation.

I hadn't, but I quickly searched the Web and found a number of reports of rashes on the toes of children infected with SARS-CoV-2. I remembered from medical school that rashes were a relatively common symptom in children with viral infections, but the fact that kids were showing any signs of SARS-CoV-2 infection was worrisome.

"Yikes. Did you see that today?" I asked.

"No, I just read about it," she sighed. "I'm sure we'll be getting calls."

A statistic commonly cited by medical educators is that the corpus of medical knowledge doubles approximately every 2 years. But though that may very well be true in the aggregate, the day-to-day practice of medicine does not change at a breakneck pace. The treatment of the vast majority of human ailments is based on decades of knowledge and is built on a foundation of research into normal human body functioning and the origin and nature of disease states and the ways in which the field of medicine can detect and treat them.

In my experience, the medical profession tends to select for individuals who crave a particular kind of mastery. Over many years, we immerse ourselves in the science and practice of healing, memorizing information from books and articles that give us the most accurate picture of myriad illnesses and their treatment. Though sometimes a single paper might break through and reach the front lines of medicine in a matter of months, the truth is that these changes usually occur slowly, allowing physicians to carefully update their knowledge and retain their claim on expertise.

Covid has blown a hole in that version of medicine.

In mid-March 2020, as it became clear that the Covid crisis would be advancing on Boston, Massachusetts General Hospital (MGH), where I practice psychiatry, asked for volunteers to help at the surge testing site, located in what had been an indoor ambulance bay next to MGH's emergency department. I was lucky enough to be able to serve as a clinical evaluator alongside attending physicians from other departments as diverse as surgery, radiology, and medicine. It had

been a decade since I had treated patients for nonpsychiatric conditions, so I'd done my best to memorize the standing information on symptoms and history that would meet the criteria for a Covid test or a transfer to the emergency department. On my second day, I got a new printout of these criteria and noted that it no longer included diarrhea but did include muscle pain. I asked the head nurse about the new list. She told me the criteria had been changed overnight because of new evidence that had been reviewed by the lead clinicians in charge of the Covid response.

Though I suspect such improvisation in the face of changing information and conditions may be common for people in some other professions, it was not what most of us in medicine were used to. At one point, I heard a senior attending discussing with the clinical manager a patient who didn't technically meet criteria for testing but had substantial risk factors. Pointing to the list of criteria on the wall, he asked what was the point of having criteria if they weren't followed. These criteria had not been formulated over years by blue-ribbon committees, but were intended to help guide a work in progress.

In talking with colleagues over the ensuing months, I've repeatedly detected a kind of "Bayesian fatigue": a stress-induced dysphoria that is experienced when the corpus of knowledge that one has acquired over years to decades and that is the foundation of one's work becomes less important than information that's being gathered from disparate sources in real time. This constant revision affects not only our clinical work, but our personal lives as well. When we're asked by our family and friends whether they should snatch up antimalarials, whether ibuprofen might worsen their symptoms, or just "When will this end?" we have to tell them, "We can't really be sure yet." I suspect most of my colleagues are used to getting questions about issues outside their fields of expertise, but never at such a high volume and not when we can't rely on trusted online resources, curbside consults with colleagues, or especially our prior fund of knowledge.

It's not that clinicians have been flying blind. In the past few months, there has been a tremendous surge in knowledge, based both on the adaptation of practices used to treat similar viral illnesses and on new research being conducted on such a massive scale that the daily updates to our knowledge can at least be considered better quality. I've been astounded at the pace at which my colleagues have adapted to new information, even as uncertainty exacts a psychological toll on top of all the other ones this crisis has imposed on them.

I also know, especially as a psychiatrist, that medicine is not an exact science. I have no doubt that most of my colleagues would agree in principle. Yet the widely accepted "art" of medicine to which many of us subscribe is often thought of as an art within a set of constraints: we lay out our tests, orders, and medications following a clinical iambic pentameter that is cautious, thorough, and confident. Although we might not always arrive at a definitive diagnosis, treatment, or prognosis, we know we are taking a time-honored approach that is comprehensive and thoughtful, worthy of the lives that patients place in our hands.

I suspect it's the loss of even that kind of stability that has generated a new and particular kind of angst among physicians. Such conditions make it hard for us to provide one of the most important things we can offer patients: reassurance. Reassurance that no matter what, we are here as healers who have worked for years or decades to attain the knowledge and skills to plot the best possible, best informed course for their care. Or reassurance that the unfounded claims made on the social media platforms patients read daily are in fact false. Such reassurance is itself a form of healing: it can give patients the comfort of feeling that we truly know an illness and can make accurate predictions about its resolution.

Since those scary early days in March, we have learned more about diagnosing and treating Covid-19. Clinicians can apply emerging best practices that are shared among new networks of physicians around the world that have sprung into being since the pandemic began. The most promising treatments are now being studied in trials that used the highest-standard methods. These developments have helped clinicians adjust care far more quickly than they might have been capable of before the pandemic arrived. Still, even in this chronic-on-acute state into which the pandemic has evolved, physicians will continue to face unexpected shocks such as the early approval of medications and vaccines before completion of their clinical trials or newly emerging presentations of clinical complications.

Physicians will remain in the difficult position of communicating news of this disease to patients, friends, and loved ones when there is no consensus on important details and potentially growing uncertainty. My hope is that we will at least be prepared for new disruptions to our clinical comfort zones as we continue to do the best we can for our patients and communities.

Disclosure forms provided by the author are available at NEJM.org.

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This article was published on October 7, 2020, at NEJM.org.

DOI: 10.1056/NEJMp2018857