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When the tail wags the dog: Clinical skills in the age of technology

"… with the rapid extension of laboratory tests of greater accuracy, there is a tendency for some clinicians and hence for some students in reaching a diagnosis to rely more on laboratory reports and less on the history of the illness, the examination and behavior of the patient and clinical judgment. While in many cases laboratory findings are invaluable for reaching correct conclusions, the student should never be allowed to forget that it takes a man, not a machine, to understand a man."

—Raymond B. Allen, MD, PhD, 1946[1]

Old-fashioned clinical skills are more relevant than ever in an era of technology

From Hippocrates onward, accurate diagnosis has always been the prerequisite for prognosis and treatment. Physicians typically diagnosed through astute interviewing, deductive reasoning, and skillful use of observation and touch. Then, in the past 250 years they added 2 more tools to their diagnostic skill set: percussion and auscultation, the dual foundation of bedside assessment. Intriguingly, both these skills were first envisioned by multifaceted minds: percussion by Leopold Auenbrugger, an Austrian music-lover who even wrote librettos for operas; and stethoscopy by René Laennec, a Breton flutist, poet, and dancer—not exactly the kind of doctors we tend to produce today.

See related article, page 276

Still, the point of this preamble is not to say that eclecticism may help creativity (it does), but to remind ourselves that it has only been for a century or so that physicians have been able to rely on laboratory and radiologic studies. In fact, the now ubiquitous and almost obligatory imaging tests (computed tomography, magnetic resonance imaging, positron-emission tomography, and ultrasonography) have been available to practitioners for only threescore years or less. Yet tests have become so dominant in our culture that it is hard to imagine a time when physicians could count only on their wit and senses.

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CLINICAL SKILLS ARE STILL RELEVANT

Ironically, many studies tell us that history and bedside examination can still deliver most diagnoses.[2,3] In fact, clinical skills can solve even the most perplexing dilemmas. In an automated analysis of the clinicopathologic conference cases presented in the *New England Journal of Medicine*,[4] history and physical examination still yielded a correct diagnosis in 64% of those very challenging patients.

Bedside examination may be especially important in the hospital. In a study of inpatients,[5] physical examination detected crucial findings in one-fourth of the cases and prompted management changes in many others. As the authors concluded, sick patients need careful examination, the more skilled the better.

Unfortunately, errors in physical examination are common. In a recent review of 208 cases, 63% of oversights were due to failure to perform an examination, while 25% were either missed or misinterpreted findings.[6] These errors interfered with diagnosis in three-fourths of the cases, and with treatment in half.

Which brings us to the interesting observation by Kondo et al,[7] who in this issue of the *Journal* report how the lowly physical examination proved more helpful than expensive magnetic resonance imaging in evaluating a

perplexing case of refractory shoulder pain.

This is not an isolated instance. To get back to Laennec, whose stethoscope just turned 200, auscultation too can help the 21st-century physician. For example, posturally induced crackles, a recently discovered phenomenon, are the third-best predictor of outcome following myocardial infarction, immediately after the number of diseased vessels and pulmonary capillary wedge pressure.[8]

The time-honored art of observation can also yield new and important clues. From the earlobe crease of Dr. Frank, to the elfin face of Dr. Williams, there are lots of diseases out there waiting for our name—if only we could see them. As William Osler put it, "The whole art of medicine is in observation."[9]

TECHNOLOGY: MASTER OR SERVANT?

But how can residents truly "observe" when they have to spend 40% of their time looking at computer screens and only 12% looking at people?[10] To quote Osler again, "To educate the eye to see, the ear to hear, and the finger to feel takes time."[9] Yet time in medicine is at a premium. In a large national survey, the average ambulatory care visit to a general practitioner lasted 16 minutes,[11] which makes it difficult to use inexpensive but time-consuming maneuvers. Detection of posturally induced crackles, for example, may require as much as 9 minutes, and a thorough breast examination up to 10.[12] On the other hand, ordering tests costs little time to the physician but a huge sum to patients and society. Paradoxically, "tests" may be quite profitable for the medical-industrial complex. Hence the erosion of clinical skills.

Overreliance on diagnostic technology is particularly concerning when the cost of medicine has skyrocketed. The United States now spends $3.2 trillion a year for healthcare, and much of this money goes into technology.

In fact, high-tech might hurt us even more than in the pocket. It is a sad fact of modern medicine that when unguided by clinical skills, technology can take us down a rabbit hole, wherein tests beget tests, and where at the end there is usually a surgeon, often a lawyer, and sometimes even an undertaker. The literature is full of such cases, to the point that the risk of unnecessary tests has spawned a charming new acronym: VOMIT (victims of modern imaging technology).[13]

I'm not suggesting that we discard appropriate laboratory and radiologic testing. To the contrary. Yet contributions like those of Kondo et al remind us that even in today's medicine, the bedside remains not only the royal road to diagnosis, but also the best filter for a more judicious and cost-effective use of technology.

That filter starts with history-taking ("Listen to the patient" said Osler, "he is telling you the diagnosis."),[9] and continues with the physical examination. In fact, the history typically guides the physical examination. Hence, when the patient's symptoms point away from a particular organ, the examination of that organ may be reduced to a minimum. For instance, in neurologic patients whose history made certain findings unlikely, a Canadian group was able to cut in half the number of core items of their neurologic examination.[14]

Yet when the history flags a system, the clinician needs to go deeper into the examination. It's very much what we do with laboratory tests, moving from screening tests to more advanced inquiries as we tailor our diagnostic studies to the patient's presentation. For that we need validated maneuvers. Recent efforts in this direction have turned the art of physical examination into a science.[15]

Unguided technology can take us down a rabbit hole, wherein tests beget tests

Lastly, patients expect to be examined, and in fact they resent when this doesn't happen.[16] Lewis Thomas called touching our "real professional secret" and "the oldest and most effective art of doctors."[17] It may even have therapeutic value.

TEACHING BEDSIDE DIAGNOSIS

So, if bedside diagnosis is important, what can we do to rekindle it? Probably anything but continue in the old ways. Studies have consistently shown that auscultation does not improve with years of training, and that in fact attending physicians may be no more proficient than third-year medical students.[18] Other areas of the examination have shown similarly depressing trends,[19] thus suggesting that the traditional apprenticeship mode of

learning from both faculty and senior trainees may not be helpful. In fact, it may be akin to Bruegel the Elder's painting of the blind leading the blind, and all ending up in a ditch.

Advanced physical diagnosis courses have thus been advocated, and indeed implemented at many institutions, but usually as electives. Faculty development programs have also been recommended. Still, these interventions may not suffice.

Cutting the cord to technology by serving in a developing country

My hunch is that the rekindling of physical diagnosis may require extreme measures, like putting ourselves in a zero-tech, zero-tests environment. Years ago, I had that kind of cold-turkey experience when I spent a month in a remote Nepali clinic with neither electricity nor running water—and, of course, no cell phone and no Internet. In fact, my only tools were a translator, a stethoscope, and my brain and senses. It was both terrifying and instructive, very much like the time my uncle tried to teach me how to swim by suddenly throwing me into the Mediterranean.

Maybe we should offer that kind of "immersion" to our students. A senior rotation in a technology-depleted country might do a lot of good for a young medical mind. For one, it could remind students that physicians are not only the "natural attorneys of the poor," as Virchow famously put it,[20] but also the ultimate citizens of the world. To quote Dr. Osler again, "Distinctions of race, nationality, color, and creed are unknown within the portals of the temple of Æsculapius."[21] Such an experience might also foster empathy and tolerance for ambiguity, 2 other traits whose absence we lament in today's medicine. More importantly, if preceded by an advanced physical diagnosis course, a rotation in a developing country could work miracles for honing bedside skills, especially if the students are accompanied by a faculty member who can be both inspiring and gifted in the art and science of bedside diagnosis.

Ultimately, this experience could remind our young that the art of medicine is much harder to acquire than the science, and that medicine is indeed a calling and not a trade. Osler said it too, and these are indeed provocative thoughts, but short of provocations and out-of-the-box ideas, the tail will continue to wag the dog. And in the end it will cost us more than money. It will cost us the art of medicine. ■

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