Tenuous Tether

trials, SMART, HPTN 052, and START settle the debate concerning early initiation of ART. Clinicians and patients can now be assured that ART's benefits outweigh the risks for the infected person, regardless of CD4+ T-cell count. Public health officials can confidently support early treatment, recognizing the spillover public health benefits for HIV prevention. Moreover, IPERGAY provides important new data that support the use of PrEP for preventing HIV infection in high-risk populations.

An audio interview with Dr. Fauci is available at NEJM.org

Taken together, these studies provide an evidence-based blueprint for effective treatment and prevention of HIV infection and will serve as critical tools in the fight to end the HIV–AIDS pandemic. However, in order to realize that promise, the political will must be mobilized to match the scientific evidence and provide the financial and human resources necessary to dramatically scale up HIV testing and treatment around the world. The science has spoken. There can now be no excuse for inaction.

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

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Tenuous Tether

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In 1816, René Laennec was confronted with a young woman "laboring under general symptoms of diseased heart, and in whose case percussion and the application of the hand were of little avail on account of the great degree of fatness."[1] Physical examination required "immediate auscultation" — placement of the ear to the chest. Laennec engaged in immediate contact with patients often, but in this case, he could not do so: "In the case of females it is not only indelicate but often impracticable; and in that class of person found in the hospital it is disgusting."

In a move that has become legendary, he "rolled a quire of paper into a kind of cylinder and applied one end of it to the region of the heart and the other to my ear . . . and could thereby perceive the action of the heart in a manner much more clear and distinct than I had ever been able to do by the immediate application of my ear." Calling on his training as a flutist, he coined the terms we still associate with auscultation today, publishing his findings in 1819.[1] Laennec thus invented "mediate auscultation," which eliminated, for almost two centuries, yet another direct interaction between physicians and their patients — but also improved diagnosis and understanding of diseases.

Movement away from patients was not removal altogether, and in some respects, the distance introduced was beneficial. It was moderate, and physicians remained tethered to their patients, shifting from an ear-to-chest posture to a face-to-face interaction.

Today, however, the tether is fraying, and the auditory stethoscope is all but obsolete. Auscultation is a fading art. Physicians who hear murmurs call for an echocardiogram with little additional effort at sound differentiation — falling prey not only to the loss of physical examination acumen and the allure of images, but also to a belief in the physical exam's futility.

Echocardiography can discern disease better than humans can — but at what price? The ordering physician doesn't do the imaging, is rarely present when the examination is done, and often reads the report without viewing the images. Masterful technicians perform echocardiography but rarely engage in patient care. A hand-held echocardiography device may one day displace the stethoscope in the clinician's pocket.[2] But even if it does, special skills will be required to perform a study oneself, and physicians may find it easier to defer to dedicated technicians.

Innovation has made us better physicians and changed the face of medicine. Our hospital has

Laennec at a Patient's Bedside, by Théobald Chartran, 1816.

"Laënnec à l'hôpital Necker ausculte un phtisique devant ses élèves" ("Laennec examines a consumptive patient with a stethoscope in front of his students at the Necker Hospital," monaural stethoscope in his hand).

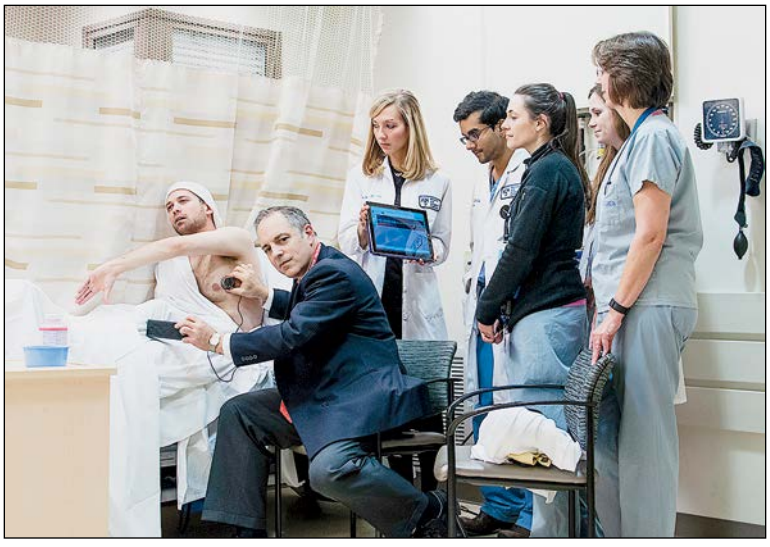
embraced technology: electronic documentation, for example, has erased all vestiges of the handwritten word. Though it takes time to learn and can be limiting, the electronic medical record leads to fewer lost records, greater quality control, and immediate access from remote sites. One can now monitor patients without coming into contact with them, perhaps to an unfortunate degree. For instance, we were recently called regarding the transfer of a patient from the cardiac unit of an outlying hospital; all the numbers and images confirmed that the patient needed higher-level care. Yet when asked whether the patient was cold to the touch, the referring physician said she couldn't tell — she was off-site, "nowhere near the patient, remotely monitoring five intensive care units and 60 patients." If for that reason alone, we accepted the transfer.

Remote care is becoming increasingly common. As we move deeper into the electronic age, we are pulled farther from our patients. The electronic record has become the gateway to patients, especially with residents' duty-hour limits eroding physician–patient contact. House officers must document everything and monitor all that is documented, spending more time face to face with a computer terminal and less with patients, becoming like our referring physician — remotely monitoring patients who may lie only feet from the computer.

Ultimately, what set Laennec apart from his peers is that he worked to optimize his device and then used it on patients to change physicians' approach to disease. Although his voluminous monograph describes the device in detail, it spends more time describing how what he heard through his stethoscope changed the way he thought, as it enabled him to define new aspects of diseases through enhanced interactions with patients. The classic portrait of Laennec depicts him with his ear to the chest of an emaciated, consumptive patient, stethoscope in hand, with nurse, surgeon, and eager students by his side (see painting). He used his stethoscope to explain diseases, not sounds. This legacy of teaching by the bedside — not just his device — is acknowledged as among his greatest contributions.

The modern stethoscope is a transcendent teaching tool, not just a private hearing aid. We recently linked an electronic stethoscope to a speaker to be used at the patient's bedside. A master clinician elicits the heart sounds, manipulating the stethoscope position and performing maneuvers to highlight the dynamics of cardiac auscultation. Auditory signals can be stored and displayed on an electronic tablet for review. The fidelity of

National Library of Medicine.



The Authors Demonstrating Modern Electronic Auscultation, 2015.

The technology involved is a ThinkLabs One stethoscope, linked to a Jambox speaker and a Microsoft Pro3 tablet with the displayed and annotated phonocardiogram. Photo taken at Brigham and Women's Hospital, Boston.

the stethoscope is superb, and speaker projection enables everyone in the room to hear and understand what the patient is experiencing (see photo).

In teaching at the bedside, explanations of the finer elements of auscultation are less important than what the sounds tell us. The sounds served as a nidus for bedside teaching. The delineation of the components of pericardial friction rub, the timing and dynamics of the second Korotkoff sound, and the first appreciation of a diastolic Graham Steell murmur and its correlate signs allow us to review the history of medicine and emerging concepts in clinical–pathological association.

Projected sounds also engage our patients, for they hear what we hear (often for the first time) and appreciate what we are doing (also often for the first time), which binds them to us and us to them. One patient with severe mitral regurgitation commented, "No doctor has ever offered to let me listen. Now I can hear what makes me feel this way, and for that I thank you."

We are not the first to use electronic stethoscopes, nor the first to suggest that auscultation is best taught at the bedside. But our point is that it is not only the teaching of auscultation that is improved when physician and patient are tethered to one another, but also the teaching of patient care and the practice of clinical medicine. In this instance, both clinical care and teaching center around what we hear from a device resting on the patient's chest as we all stand around the bed. We are face to face and hand to chest with our patients, and they — not our computer screens — are our focus. Modern technology has created modern medicine, and it can, if we use it correctly, draw us closer to, rather than farther away from, our patients.

Laennec revolutionized medicine not only because of the device he invented but also because of how he used it. His legacy lives on because it is not limited to a monaural tube but includes the idea that we must in a sense become part of our patients — physically engaging them so that we can feel what they feel, sense how they suffer, and fully comprehend what they are trying to tell us. Rather than letting the collation of data characterize us as clinicians, we would do better to see ourselves as "those who visit patients in their beds." That is the literal meaning of the Latin *clinicus*, from the Greek *klinike (techne)*, "(practice) at the sickbed." Devices that bring us closer to the bed breathe new life into our roles as healers. The stethoscope can help us diagnose and teach, but above all it ties us to our patients; reinforcing this tripartite tether preserves our all-too-tenuous link to our patients.

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