

The Stethoscope— Obsolescence or Marriage

Now, in discussing obsolescence, I am not referring to the habits that single people have to abandon after they walk down the aisle, but rather the recent editorial in this journal entitled, "Is the stethoscope on the verge of obsolescence?"¹ I will start right out by thanking Wilkins for his kind comments on our work and agreeing with him that the stethoscope is not going to be obsolete in the near future. I also agree with his observation that modesty was a contributing factor in Laënnec's enthusiasm for his "cylinder," the term he used to describe his stethoscope. But, there were other factors.

According to popular legend, Laënnec got the idea for the stethoscope by observing children in a park in Paris scratching at one end of a park bench while listening at the other end. This reminded him that sound was better transmitted through solids than air. Allegedly he rushed back to the hospital where he worked and listened to the heart of a patient using a journal he had been carrying. He rolled up the journal to make the prototype of his cylinder. He then heard heart sounds better than anyone had heard them before.

There was also another reason for the utility of the stethoscope that is independent of modesty. Bathing was not a popular activity in Paris in the early 19th century. There were esthetic reasons for not wanting to put your ear on a patient's chest. There were also health reasons. My father invented a variation of the stethoscope. As an intern at Fordham Hospital in 1919 in the Bronx, New York, he rode ambulance to patients who characteristically sewed themselves into their underwear in the fall and cut themselves out of it in the spring. (Brill-Zinsser disease, a

lice-borne disease, was a problem in these folks). His invention was tubing the length of his arm so that he did not get too close to the lice.

One of the amazing things to me in the history of medicine is how well the observations of Laënnec have stood the test of time. He lived in an age when physicians such as he not only took care of patients when they were living but also performed the autopsies after the patients' demise. He not only described the pathologic features of the tubercle but also described the sounds tuberculosis made in the chest of the living. His correlation of clinical signs with pathology led to the first textbook of chest medicine. His work has been cited as revolutionizing medicine—transforming it from an art to a science.²

Using advanced technology, a spin-off from the space age, we recently noticed that "squawks" were not uncommon in patients with pneumonia. We found them in 10% of the patients we studied with our multichannel lung-sound analyzer.^{3,4} I searched the literature to see if they had been described in this very common disease. I did not find them in the modern textbooks of physical diagnosis. I turned to Laënnec in his "Treatise on the Diseases of the Chest." He describes a sound in pneumonia that is present as the disease resolves, and he said that it sounds "like a sort of crepitation like that produced by blowing air into the cellular substance of meat, as practiced in the shambles."^{5*}

* Personal note: I must admit that I did not know what the word shambles meant, although my mother commonly described my bedroom using that term when I was a teenager. In the dictionary, I found out that it was a slaughterhouse. This is particularly embarrassing for me because my great grandfather owned a slaughterhouse.

Curiously, the very same evening that I looked this up, I happened to be reading James Michener's *Centennial*.⁵ He describes a woman in Pennsylvania praising a farmer because he did not pump air into meat he was selling to make it look artificially fresh. I then found out that the practice is still done today in supermarkets. Of course, my colleagues and I got a syringe and 19-gauge needle, and our secretary kindly stopped at the butcher shop on the way to work and brought in some meat. After some effort, we were able to produce a sound that was quite similar to a squawk, proving again that Laënnec was an astute observer.

As noted, I do not believe the stethoscope will become obsolete. I think it actually will become a more precise diagnostic tool. The stethoscope developed a relationship with computers over 3 decades ago.⁶ One of the early advantages of this relationship was that there were improvements in the lung sound nomenclature.⁷ The types of lung sounds could be much more accurately described.⁸ Tape recorders were also helpful in reducing observer variability.⁹ Observer variability is certainly a problem, as has been reported by Wilkins.¹⁰ Having visual representations of sounds and objective acoustic analysis goes a long way to reduce this problem, and visual representations have been shown to be useful in improving teaching.¹¹

It has been interesting to observe the stethoscope/computer relationship change over the past 3 decades, as the computer has become much more powerful and convenient. The courtship began with a mainframe and has progressively involved smaller computers, from large stationary computers, to desktops, to laptops, and most recently to hand-

held computers. The change in processing speed has also been interesting to watch. Our initial efforts involved 2 computers the size of telephone booths talking to each other, processing approximately 6 breaths per hour. Processing can now be done in real time on handheld computers.

I share Wilkins's concern about the potential downside of computerized auscultation further separating the clinician from the patient. However, the reverse can actually result. As he points out, a careful and complete examination of the lung can take up to 10 minutes. This, of course, is time that the patients are not verbally communicating with the caregiver, but breathing with their mouths open. (We will skip the comments of the cynics who say that one of the more useful applications of auscultation is that it can be employed to silence a talkative patient). The computer can obtain information from many sites at once, greatly speeding up the process of data collection. This can allow the clinician more time to communicate with

the patient, while having better, more detailed information to work with.

So we believe that the stethoscope will not become obsolete, but rather will be strengthened by its marriage to the computer. The offspring of this union has allowed more precise documentation and quantification of the sounds that are present in the lung and heart. This in turn will help the clinician have more confidence in the validity of the information obtained by the stethoscope and will improve patient care.

I think Laënnec would bless the nuptials.

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