

Auenbrugger, Corvisart and Laennec: Three Generations that Forged the Basis of Chest Examination

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Knowledge that is not transmitted bears no fruit, and our tradition should help us avoid this painful wasting of wisdom. There are many examples of the impact of tradition on the evolution of medical knowledge and technology, but one of the clearer ones is the story that linked the lives of three great physicians, Leopold Auenbrugger, Jean Corvisart and Theophile Laennec, who learned from one another, and together wrote a new chapter in the history of medicine.

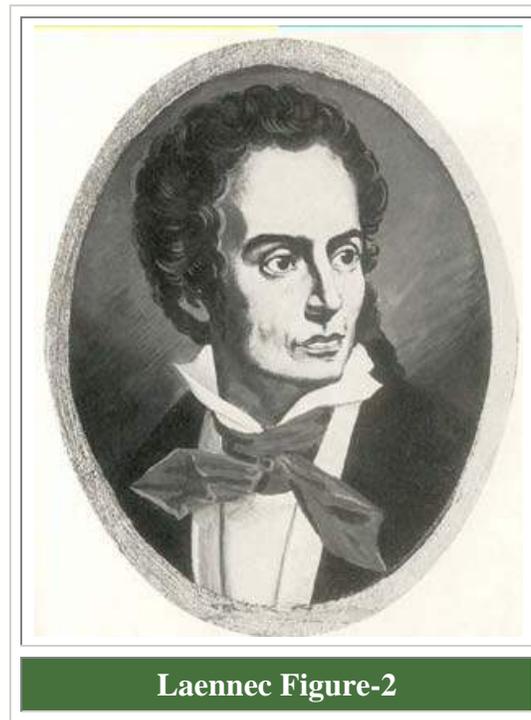
Since ancient Egyptian and Mesopotamian times, chest inspection and palpation had been the basis of the respiratory system. Auscultation had been included in the ancient medical examination but it only gained real relevance in 1761, when the Italian physician Morgagni, described the correlation between some alterations of normal body sounds and pathologic states. In those times the physician performed immediate auscultation by laying his ear on the patient's chest wall to listen to his lung and heart sounds.

In the middle of the eighteenth century, Leopold Auenbrugger (1722-1809), an Austrian physician added thoracic percussion to the physician examination of the chest. He had acquired experience in the diagnosis of respiratory diseases while working in the Spanish Military Hospital of Vienna. He had noticed that when he struck softly the chest of a healthy person, he obtained a sound similar to that produced by a drum, while in the ill person this sound differed depending on the nature of the lung disorder, its location and extension. For seven years he devoted himself to the study of his discovery comparing from his necropsy findings with what he had "observed" by percussion in terminal patients. In 1761 he published a paper: *Inventum novum ex percussione thoracis humanis*. His work was not noticed until 47 years later when Jean Corvisart, Emperor Napoleon's physician (Figure 1), translated Auenbrugger's book into French.

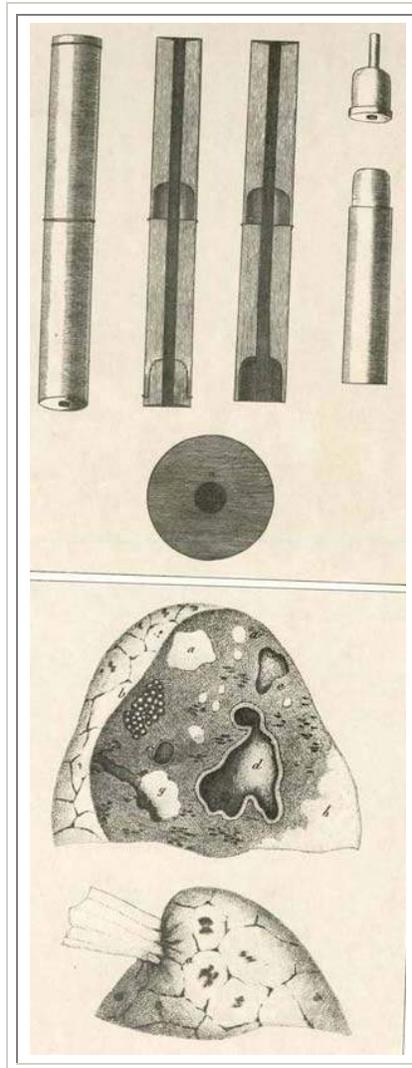


Corvisart Figure-1

Years later, Corvisart (1759-1821) became the mentor of a young French physician, Théophile Laennec (1781-1826) (Figure 2). Corvisart introduced Laennec to immediate auscultation and to the concept of chest percussion. In so doing, he acted as a link between the senior Auenbrugger and his young pupil. Laennec was not fully convinced about the value of immediate auscultation because of its restrictions: First, it was not easy to hear the chest sounds by this method, especially in obese patients and secondly it threatened the modesty of his female patients.



In 1816, as he was walking to his hospital, he saw a group of children playing in a yard. In their game, a child would scratch on one end of a beam and another, placing his ear on the opposite end, would hear the sound so produced. Laennec saw that he could apply the physics principles of this game to improve his auscultation of the patient's chest. Initially he made a cylinder from a sheet of paper and he applied one end of this tube to his ear and the other to the patient's precordial thoracic area and was able to hear the heart sounds more clearly. He had invented mediate auscultation to overcome the limitations of the immediate one. He tried many designs before he adopted one that consisted of a light wooden tube, four centimeters wide and 30 centimeters long, one end of which was funnel-shaped. He named his invention, stethoscope, from the Greek stethos – the chest and scope – to view, because it enabled the physicians to “see” the inside of the chest. The current binauricular stethoscope comes from an enhancement by George Cammann, 41 years after Laennec’s invention (Figure 3).



Drawings of the first stethoscope designed by Laennec-Figure 3

Between 1816 and 1819, Laennec studied the chest sounds intensely using his invention and making correlations between lung and heart "mediate" auscultation and his findings at necropsy, as Auenbrugger had done when he had described his method of chest percussion.

In 1819, he published all his observations in a book entitled: *Traité de l'auscultation médiate et des maladies des puomons et du coer.*

Also Laennec described new auscultatory signs such as pectoriloquia: a sound heard in lung consolidation and in superficial lung cavities consisting of an intense increase of the patient's voice and egophonia: a sound heard above the upper limits of a pleural effusion consisting of a distortion of the patient's voice sounding like a goat's bleat. In addition, he described such

medical entities as emphysema, lobar pneumonia, pneumothorax and atrophic cirrhosis. One of the diseases to which he gave the most study was tuberculosis; in fact he was the first physician to point out the trend of patients suffering chronic depression to develop tuberculosis. His interest in tuberculosis probably came from the fact that, when he was a child, his mother had died of this disease. Ironically, one of his pupils used pectoriloquia, one of the auscultatory signs that Laennec had described as a marker of fatal pulmonary tuberculosis, to diagnose Laennec's tuberculosis of which he later died at the age of 45 years.

Despite the current advances in the diagnosis of respiratory disease such as the computerized scan or magnetic resonance imaging, physical examination of the chest is still crucial for daily medical care. First of all, before ordering any complementary investigation every physician should have at least one diagnostic hypothesis based on information obtained from the interview and physical examination. On the other hand, information obtained by such examination frequently is important to an accurate clinical diagnosis, regardless of the value of further studies. Also the examination offers important psychological advantages. Physical proximity of physician and patient offers an opportunity to develop the magic atmosphere between them. Abstract concepts such as hope and confidence become real in the doctor's presence. This is the modern concept of "the physician as a remedy himself" described by Michael Balint, but it was understood by the priest/magician healers ancient cultures.

The contributions of Auenbrugger, Corvisart, and Laennec are important to medical practice and will continue to be so for tomorrow's doctors too. The history of these physicians illustrates how medical tradition links older knowledge with innovations and thus allows science to evolve and overcome its limits.

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