Summary

Although stethoscope was invented by French physician René-Théophile-Hyacinthe Laennec (1781-1826) in 1816, its wider clinical application started only after the publication of his book entitled De l’Auscultation Médiate ou Traité, du Diagnostic des Maladies des Poumons et du Cœur in 1819. Its invention coincided with the development of the ‘hospital medicine’ in the post-revolutionary Paris during the first quarter of the 19th century. It has enabled then contemporary physicians to explain the correlation between the patient symptoms and the clinical findings and thus has helped the shift from the humoral pathology towards the solitary pathology.

Keywords: René-Théophile-Hyacinthe Laennec, history of medicine, 19th century, stethoscope, scientific revolution, clinic, hospital medicine, Paris

René-Théophile-Hyacinthe Laennec was born in Quimper in Brittany in France on the 17th February 1781. He finished his grammar school in Nantes, and despite his father’s wishes, who wanted him to become a lawyer like himself, he went to study medicine at the University of Paris. During his studies he became acquainted with famous clinician Jean Nicolas Corvisart Desmarests

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(1755-1821) who reintroduced the percussion, discovered by Austrian physician Leopold Auenbrugger (1722-1809) half a century before, into a regular clinical examination. These were turbulent years in the French and the world history, which had started with the French Revolution in 1789, which led to the abolishment of the French Monarchy and the proclamation of the French Republic. It then continued with the Napoleonic era (1798-1815) which had seen changes from the Directory Period, through the Consulate Era, to the Empire Period, and finally ending with the Bourbon Restoration under king Louis the XVIII, continuing with king Charles the X. The turbulent years ended with king-citizen Louis-Philippe, who was overthrown in the Revolution of 1848. These major political changes have influenced all aspects of life including medicine as well.1

In his book Medicine at the Paris Hospital, 1794-1848 American historian of medicine Erwin Ackerknecht introduces a term ‘hospital medicine’ in order to describe the medical reform which has developed in Paris during the mentioned years. He talks of succession of reformers such as Philippe Pinel (1745-1826) who established modern psychiatry and Marie Francois Xavier Bichat (1771-1802) who founded modern histology.2

Together with the above-mentioned Corvisart, and although working at different hospitals (Pitié-Salpêtrière, The Hôtel-Dieu and Hôpital de la Charité), they have managed to switch medicine from the then prevalent humoral pathology, which perceived diseases through the humoral imbalance, towards the still current solitary pathology, which connected diseases with the particular organs, and thus according to American philosopher of science Thomas Kuhn have caused a ‘scientific revolution’ of paradigm

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In his book *The Birth of the Clinic – An archaeology of medical perception*, French philosopher of science Michel Foucault uses for it a term ‘clinical revolution’ and talks of the epistemological transformation in which the discoveries of pathological medicine served in the foundation of clinical medicine, based on learning and seeing, which was in the contrast with proto-clinic, based on teaching and saying, and which has finally led to the correlation of the patient symptoms with the clinical findings.

He uses the same term ‘clinic’ to describe both the clinical method of the examination of the patients and the teaching institution for the future physicians, founded by the French Revolutionaries as the ‘new age hospitals’ which as such were part of a wider cognitive revolution, which has included changes in the organisation of schools, prisons, workshops and barracks as well.

In the above described milieu came Laennec with his invention of stethoscope (Greek stéthos - chest and skopé - examination) in 1816 as an acoustic medical device for auscultation, or listening, to internal sounds.

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in a human or animal body. It came at the right moment and at the right place to enable physicians to make the above described correlation between the patient symptoms and the clinical findings, and thus has made the skip from the humoral pathology towards the solitary pathology easier and faster, which without it would be far harder and far slower. Stethoscope thus represents according to John Webster an exemplary revolutionary instrument described as the one that either solves a totally new problem or uses a new principle or concept to solve an old problem in a better way that displaces the old methods. Invention of stethoscope occurred while Laennec was working at the Hôpital Necker - Enfants Malades in central Paris. The mentioned hospital was founded in 1778 by Madame Necker, wife of Jacques Necker, minister of Louis XVI, by remodelling of an old monastery Hospice de Charite into the hospital, and as such represents the oldest paediatric hospital in the world. Prior to the French Revolution it was a Catholic institution known as the Hôpital de l'Enfant Jesus, run by the Catholic Sisters of Charity, where a baptism certificate and a confession were requirements for

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the admission. Today it is a teaching hospital affiliated with the University of Paris Descartes. Laennec described his invention in his book entitled *De l’Auscultation Médiate ou Traité, du Diagnostic des Maladies des Poumons et du Coeur.*

According to his words he was approached by a young obese pregnant woman with the general symptoms of a diseased heart. Due to her condition and her figure, a direct auscultation by placing his head directly on her chest was out of question, so instead he used a tightly rolled up piece of paper to press against her chest. His inspiration for it came from seeing the school children playing with the long hollow sticks by holding their ears to one end of the stick while the opposite end was scratched with a pin, with the stick transmitting and amplifying the scratch. His first stethoscope was a monaural wooden tube with dimensions 25 cm by 2.5 cm resembling an ear trumpet, which was probably influenced by his experience in flute playing. Further experimentation has enabled him to refine his design by constructing a stethoscope composed from the three detachable parts, which was far more

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superior in the transmittance of the thoracic chest sounds.\textsuperscript{11}

In accordance with the above described practice of the connecting the patient symptoms with the clinical findings, Laennec followed his dying patients with chest ailments from their bedsides to the autopsy tables, which has enabled him to correlate the sounds captured by the stethoscope with the specific pathological changes. He thus studied peritonitis, described pulmonary phthisis today known as pulmonary tuberculosis, and coined the terms rhonchi, rales or crepitations, and egophony. He presented his findings in his above-mentioned book, published in two volumes in 1819, which already in 1820 was translated into English, Italian and German. He also described metastases of melanoma to the lungs and subsequently coined the term melanoma. His research interests were wide so he subsequently gave his name

to Laennec’s cirrhosis for the appearance of regenerated liver comprised of the small lobules separated by the fibrous tissue, Laennec’s thrombus for an antenatal thrombus in the heart, Laennec’s pearls for a sputum produced by the asthmatics, and Laennec–Mueller–von Bergmann–Hamman symptom

Figure 7. Robert A. Thom, 1960. A newer picture of Laennec as he auscultates a boy.

Figure 8. Necker-Enfants Malades Hospital in Paris in De Sèvres Street with a Laennec memorial.
for a crunching sound occurring over the precordium area in the cases of the spontaneous mediastinal emphysema.\(^{12, 13, 14}\)

Laennec’s career flourished after the invention of the stethoscope. In 1822 he became a lecturer and in 1823 a professor at the College de France which was followed by a position of a head of the medical clinic at the Hôpital de la Charité. He was a devout Catholic all his life, known for his charity to the poor, and thus proving that the scientific research is compatible with the religious faith. Before his death he bequeathed his own stethoscope to his nephew as the ‘greatest legacy of his life’. He died of tuberculosis at the age of 45 on the 13th August 1826 in Ploare in Brittany in France.\(^{15}\)

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**Ključne riječi:** René-Théophile-Hyacinthe Laënnec; povijest medicine; 19. stoljeće; stetoskop; znanstvena revolucija; klinika; bolnička medicina; Pariz