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## A brief history of some important medical tools: remembering the past

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# A brief history of some important medical tools: remembering the past

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## Abstract

Our current daily routine is so comfortable that we forget about the past. Nothing in medicine has been gained without effort and behind these routine tools, there is a long history that most of us ignore.

This article pretends to be a short review of the origins and evolution of three significant advances in medicine: the thermometer, the stethoscope and the endoscope.

## Clinical thermometer: the beginning

Fever was considered at that time positive as help detoxify the body from toxins or pathogens through sweating. They knew as well that it could turn lethal.

Hippocrates taught his students to examine patients' temperature with their own hands and to reduce it if raised by using techniques such as bloodletting. When blood was let, the patient cooled indicating that fever was subsiding.

Next step: the thermoscope!

In 1593 Galileo (or at least this is what it is thought) developed a rudimentary device to measure the temperature called today Galileo's thermometer.

This consisted of a sealed glass tube filled with water and several floating glass spheres containing a coloured liquid. Each bubble had a little metal tag attached that indicated temperature.

[https://www.youtube.com/watch?v=W\\_xc-6662f8](https://www.youtube.com/watch?v=W_xc-6662f8) to check how Galileo's thermometer actually works

Adding numerical scales

In 1612, Sanctorius of Justipolitanus added a numerical scale to the thermoscope and applied this to medicine. The accuracy was poor and it required a long time to measure the oral temperature.

In 1629, Joseph Solomon Delmedigo published the first illustration of a sealed liquid-in-glass thermometer which had a bulb at the bottom and a numerical scale but he actually did not create it. However, Grand Duke of Tuscany did.

Later, Christiaan Huygens in 1665 added the original centigrade scale, covering from the freezing to the boiling point of water.

In 1714, Fahrenheit made the first thermometer using mercury which was more accurate than water.

Scales continued to evolve and in 1742, Celsius developed the Celsius scale, dividing the temperature from the boiling to the freezing point of water.

**Despite all the improvements, thermometers remained largely neglected until late 19th century.**

De Haen studied diurnal changes in temperature of normal subjects and also with fever. He also noted the acceleration of the pulse when temperature raised. Unfortunately the thermometer continued neglected. But in 1868 Carl Wunderlich published temperature recordings in over 25000 patients made with a thermometer used in the axilla. He introduced the temperature charts into hospitals and established a range of normal temperature from 36.6 to 37.5 centigrades.

The thermometer he used was a foot long and required 20 minutes to register the temperature. Unfortunately the size of this tool was still an issue but Aitkin made a new one more manageable in 1852.

For the first time, thermometer could be removed from the axilla to read it, making it very convenient.

However, Thomas Clifford Allbutt considered the length still inconvenient and designed a portable thermometer in 1866 which measured 6 inches and recorded a temperature in 5 minutes. This was a record at the time.

Finally, thermometers disseminated and today the measurement of temperature is an unavoidable routine.

## Endoscopes: the art of looking inside

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**The earliest examination through an ancestor endoscope was attempted by the ancient Greeks and Romans BC.**

Physicians have been able to look into human orifices through specula with the little illumination of a candle or oil lamp being reflected internally with mirrors.

Hippocrates knew about rectoscopes and there is evidence of some specula recovered from the ruins of Pompeii.

Vaginal specula were described in the Babylonian Talmud (AD 257). And Abulcasis of Cordoba, a great Arab surgeon, used a glass mirror to review the inside of the uterine cervix (around AD 1000).

But it was not until Philip Bozzini in 1805 when for the first time, he examined a living human body directly through a tube he created called a light guiding instrument.

In 1853, the French Antoine Jean Desormeaux, developed a tool to assess the inside of the bladder and he called it "endoscope" for the first time.

Adolph Kussmaul succeeded at checking inside the stomach of a living human body in 1868. He tried on a sword-swallower, who "swallowed" a straight 47 cm long metal tube with a diameter of 13 mm.

Many other endoscopes have been designed to examine different areas in the body but the first flexible one was designed by Rudolph Schindler in 1932 to examine the stomach.

Nowadays this is a routine procedure, and the devices are much more comfortable.

## Briefly the stethoscope: eavesdropping?

Stethoscope is derived from the two Greek words, stethos (chest) and scopos (examination).

In the early XVIII century, physicians performed immediate auscultation by placing their ear directly on the patient to hear internal sounds but that was awkward and in 1816 Laennec decided not to perform immediate auscultation in a young female, so he rolled a sheet of paper to create a tube and he could hear clearly the heart sounds. Bingo! The first stethoscope done.

Much improvements since but the basics are the same.

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