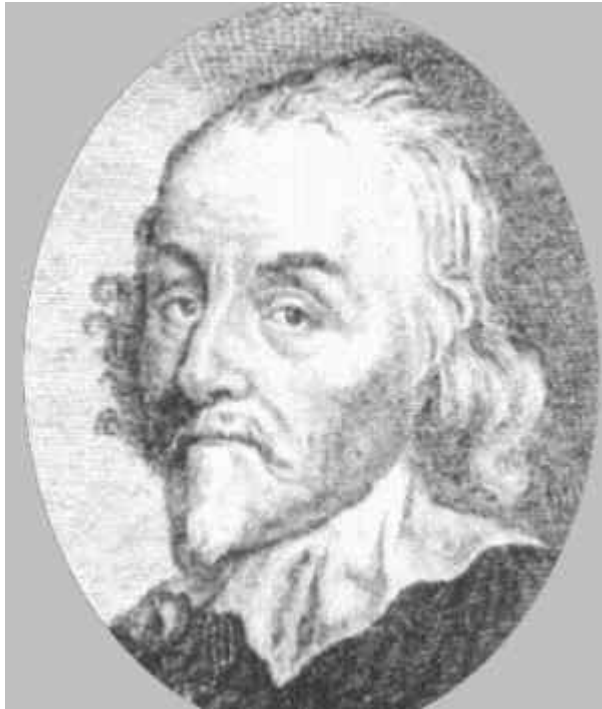


## Fact File - William Harvey

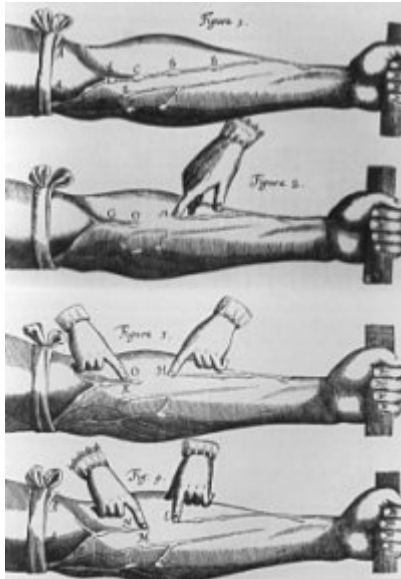


### Early life

William Harvey was born in 1578 in Folkstone, England, the eldest of seven sons. He went to Cambridge University and then studied medicine at the University of Padua. He married Elizabeth Brown, daughter of the court physician to Queen Elizabeth I and King James I. This brought him to the notice of rich and influential people, and he quickly moved up the career ladder, becoming a very successful man. Eventually, Harvey became court physician to both King James I and King Charles I.

### Experiments

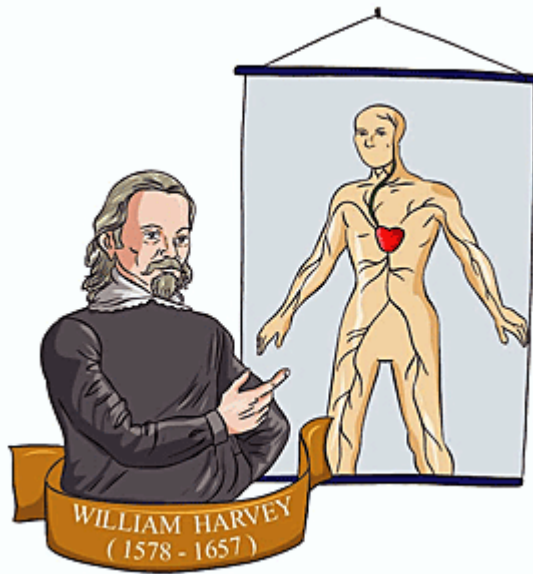
While acting as doctor to the court, Harvey carried out lots of research into human biology and physiology. He was very interested in the blood flow in the human body. Most doctors of the time accepted the teachings of Galen and felt that the lungs were responsible for moving the blood around the body but Harvey questioned these beliefs and investigated them scientifically.



An illustration from Harvey's book published in 1628.

Harvey carried out many experiments, both dissections and physiological experiments on animals. His observations of dissected hearts showed that the valves in the heart allowed blood to flow in only one direction. Direct observation of the heartbeat of living animals showed that the ventricles contracted together, dispelling Galen's theory that blood was forced from one ventricle to the other. Dissection of the septum of the heart showed that it contained no gaps or perforations. When Harvey removed the beating heart from a living animal, it continued to beat, thus acting as a pump, not a sucking organ. Harvey also used mathematical data to prove that the blood was not being consumed. Removal of the blood from human cadavers (dead bodies) showed that the heart could hold roughly two ounces of blood. By calculating the number of heartbeats in a day and multiplying this by two ounces, he showed that the amount of blood pumped was far greater than the amount that the body could possibly make. He based this figure on how much food and liquids a person could eat during a day. To Harvey, this showed that the teaching by Galen that the blood was being consumed by the organs of the body was false. Blood had to be flowing through a 'closed circuit' instead. Even though he lacked a microscope, Harvey theorized that the arteries and veins were connected to each other by capillaries, which would later be discovered by Marcello Malpighi some years after Harvey's death.

Harvey asked simple, pointed questions such as why did both the lungs and the heart move if only the lungs were responsible for causing circulation of blood? Why should, as Galen suggested, structurally similar parts of the heart have very different functions? Why did 'nutritive' blood appear so similar to 'vital' blood?



### Reaction to Harvey's discovery

Harvey's lecture notes show that he believed in the role of the heart in circulation of blood through a closed system as early as 1615. Yet he waited 13 years, until 1628, to publish his findings. Why did he wait so long? The study and practice of medicine as originally taught by Galen, was almost sacred at the time Harvey lived. No one dared to challenge it. To rebel against the teachings of Galen could quickly end the career of any doctor. Perhaps this is why Harvey waited - and if so his fears were proved accurate.

After Harvey's work was published, many other doctors and scientists rejected him and his findings. Some of his patients deserted him. Using different assumptions of the amount of blood contained in the heart, scientists argued that the blood could indeed be consumed. Controversy raged for a full twenty years after publication of Harvey's book. Yet, with time, more and more people accepted Harvey's ideas.

Harvey's new understanding of the circulation of the blood had very little effect on the practice of medicine in his lifetime, yet it became the foundation for all modern research on the heart and cardiovascular medicine. It has been said that Harvey's proof of the continuous circulation of the blood within a contained system was the seventeenth century's most significant achievement in physiology and medicine - in fact, his work is considered to be one of the most important contributions in the history of medicine.

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