

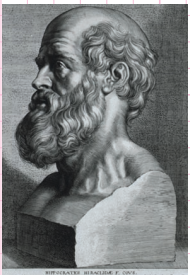
Milestones in knowledge of heart and vascular disorders

Palaeolithic era *Spain* Oldest anatomical drawing in El Pindal cave of a mammoth with a dark smudge at the shoulder, which is thought to represent the heart.

2698–2598 BCE *China* Huang Ti, the Yellow Emperor, was thousands of years ahead of his time in writing in *Nei Ching* (Canon of Medicine): “The blood current flows continuously in a circle without a beginning or end and never stops” and “all the blood is under control of the heart”. He also recorded the association between salt intake and a “hardened pulse”.

1550 BCE *Egypt* Papyrus Ebers stated that after death the heart becomes the witness of the body’s behaviour during life. To avoid incriminating testimony, the Egyptians buried the heart separately from the body.

600 BCE *Greece* Alcmaeon noted empty arteries in animals after death and inferred that arteries normally contained air.

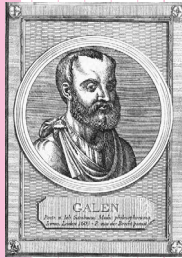


400 BCE *Greece* Hippocrates, the Father of Medicine (460–370 BCE), challenged the belief that illness was caused by the gods; he

believed illness was caused by an imbalance of the four bodily humours: yellow bile, black bile, blood, and phlegm. He was also the first to recognize stroke.

310–250 BCE *Egypt* Erasistratus described the heart, veins, arteries and valves, but claimed that

arteries contained “pneuma” (air or spirit or soul), which was replaced each time a person breathed; when an artery was cut, blood rushed in as the pneuma escaped.



131–201 CE Graeco-Roman physician Claudius Galen, with knowledge gained from animals killed by Roman gladiators,

described the heart and the movement of blood in the arteries, but claimed that the liver was the centre of the circulation and that the blood passed from the right to the left side of the heart.

980–1037 *Persia* Avicenna (Ibn Sina) stated that the heart is located centrally to all organs of the body, and that the left side of the heart was created as a store of spirit and soul.

1210–1288 *Syria* Ibn al-Nafis described the pulmonary and coronary circulation in *The Perfect Man*.

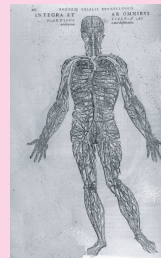
1452–1519 *Italy* Leonardo da Vinci incorrectly drew the liver as the centre of circulation. But he stated “vessels in the elderly through the thickening of the tunics, restrict the transit of the blood.” This is one of the earliest descriptions of arteriosclerosis.

1509–1553 *Spain* Michael Servetus described the pulmonary circulation in his book *Christianismi Restitutio*.

1510–1559 *Padua, Italy* Matteo Realdo Colombo described the heart valves.

1525–1603 *Rome, Italy* Andrea Cesalpino noted that the circulation system is a closed system, and was the first in modern times to coin the term “blood circulation”.

1553–1619 *Padua, Italy* Hieronymus Fabricius demonstrated valves in veins, which help to “prevent dilatation of veins”.



1555 *Padua, Italy* Andreas Vesalius (1514–1564) stated that the heart, and not the liver, was the centre of the circulation.

1559 *Italy* Riva di Trento discovered that there are two coronary arteries, each supplying blood to half of the heart.

1628 *England* William Harvey (1578–1657), a physician, published his thesis that the heart pumped blood around the body, in *De Motu Cordis*.

mid-1600s *Switzerland* Jacob Wepfer found that patients who died with “apoplexy” had bleeding in the brain. He also discovered that a blockage in one of the brain’s blood vessels could cause apoplexy.

1706 *France* Anatomy professor Raymond de Vieussens first described the structure of the heart’s chambers and vessels.

1712–1780 *England* John Fothergill both forecast the role of psychosocial factors and advised

that a restricted diet “might greatly retard the progress” of coronary heart disease.

1677–1761 *England* Stephen Hales, an English clergyman and scientist, first measured blood pressure by inserting a brass tube into the artery of a horse. This was a scientific experiment, published in 1733, demonstrating that the heart exerts pressure in order to pump blood. The horse died.

1745–1827 *Italy* Alessandro Volta discovered that electric energy was produced by heart muscle contractions.

1749–1832 *England* Edward Jenner, better known for smallpox vaccine, made the essential link between angina pectoris and disease of the coronary arteries.

1752–1832 *Italy* Antonio Scarpa described arterial aneurysm.



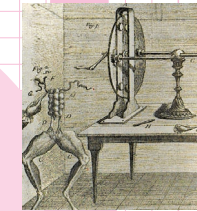
1772 *England* William Heberden (1710–1801) described angina pectoris: “they who are afflicted with it, are seized while

they are walking (especially if it be uphill, and soon after eating) with a painful and most disagreeable sensation in the breast, which seems as if it would extinguish life if it were to increase or to continue; but the moment they stand still, all this uneasiness vanishes”. He was also the first to write about hyperlipidaemia as a risk factor when he noticed that the serum of an obese patient who suddenly died was “thick like cream”.

1775 *Scotland* John Hunter (1728–1793), a surgical pathologist, wrote “in a sudden and violent transport of anger, he fell down and expired immediately”, illustrating the importance of

emotion, stress and anger in precipitating coronary death. Hunter himself suffered from angina pectoris and died suddenly after a violent argument with a hospital colleague.

1785 *England* William Withering described the use of digitalis in coronary heart disease in his monograph *An Account of the Foxglove*. Foxglove had been used for centuries by American Indians.



1791 *Italy* Luigi Galvani discovered that electrical stimulation of a frog’s heart led to contraction of the cardiac muscle.

1799 *England* Caleb Hillier found something hard and gritty in the coronary arteries during an autopsy and “well remembered looking up to the ceiling, which was old and crumbling, conceiving that some plaster had fallen down”. He discovered, however, that the vessels had hardened, and stated that “a principle cause of the syncope anginosa is to be looked for in disordered coronary arteries”.

1815 *England* London surgeon Joseph Hodgson claimed inflammation was the underlying cause of atherosclerosis and it was not a natural degenerative part of the ageing process.

1815 *France* M.E. Chevreul named the fatty substance extracted from gallstones “cholesterol” from the Greek “khole” (bile) and “stereos” (solid).

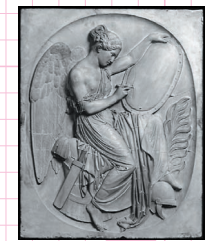
1819 *France* Rene Theophile Laennec (1781–1826), invented the stethoscope. He rolled paper into a cylinder while examining a young woman with cardiac

symptoms as he was reluctant to apply his ear to the chest.

1838 *France* Louis René Lecanu showed that cholesterol was present in human blood.

1841 *Austria* Carl Von Rokitansky championed the thrombogenic theory, proposing that deposits observed in the inner layer of the arterial wall derived primarily from fibrin and other blood elements rather than being the result of a purulent process. This theory came under attack from Rudolf Virchow.

1843 J. Vogel showed that cholesterol was present in atherosclerotic plaques.



1844 *Denmark* First pathology report of plaque rupture in a coronary artery in Bertel Thorvaldsen, the celebrated neoclassical

Danish artist and sculptor, who died of sudden cardiac death in the Royal Theatre in Copenhagen.

1850 Ventricular fibrillation first described.

1850s Ophthalmoscope invented, allowing direct visualization of arteries at the back of the eye.

1852 *England* Fatty material in the coronary arteries described by Sir Richard Quain, which he attributed to nutrition. He linked the fatty heart to “languid and feeble circulation, a sense of uneasiness and oppression in the chest, embarrassment and distress in breathing, coma, syncope, angina pectoris, sudden death...”