

## Medical Advances Timeline

460 BCE	Birth of <a href="#">Hippocrates</a> , Greek physician and founder of the first university. Considered the father of medicine. Hippocrates bases medicine on objective observation and deductive reasoning, although he does accept the commonly held belief that disease results from an imbalance of the four bodily <a href="#">humors</a> (an idea that persists for centuries).
c.130 CE	Birth of <a href="#">Galen</a> , considered by many to be the most important contributor to medicine following Hippocrates. Born of Greek parents, Galen resides primarily in Rome where he is physician to the gladiators and personal physician to several emperors. He publishes some 500 treatises and is still respected for his contributions to anatomy, physiology, and pharmacology.
910	Persian physician <a href="#">Rhazes</a> is the first to identify smallpox, as distinguished from measles, and to suggest blood as the cause of infectious disease.
1590	Dutch lens grinder Zacharius Jannssen invents the <a href="#">microscope</a>
1628	<a href="#">William Harvey</a> publishes <i>An Anatomical Study of the Motion of the Heart and of the Blood in Animals</i> , describing how blood is pumped throughout the body by the heart, and then returns to the heart and recirculates. The book is very controversial but becomes the basis for modern research on the heart and blood vessels.
1656	Experimenting on dogs, English architect <a href="#">Sir Christopher Wren</a> is the first to administer medications intravenously by means of an animal bladder attached to a sharpened quill. Wren also experiments with canine blood transfusions (although safe human blood transfusions only became feasible after Karl Landsteiner develops the ABO blood-typing system in 1900).
1670	<a href="#">Anton van Leeuwenhoek</a> refines the microscope and fashions nearly 500 models. Discovers blood cells and observes animal and plant tissues and microorganisms.
1747	<a href="#">James Lind</a> , a Scottish naval surgeon, discovers that citrus fruits prevent <a href="#">scurvy</a> . He publishes his <i>Treatise of the Scurvy</i> in 1754, identifying the cure for this common and dangerous disease of sailors, although it takes another 40 years before an official Admiralty order dictates the supply of lemon juice to ships.
1796	<a href="#">Edward Jenner</a> develops a method to protect people from <a href="#">smallpox</a> by exposing them to the cowpox virus. In his famous experiment, he rubs pus from a dairymaid's cowpox postule into scratches on the arm of his gardener's 8-year-old son, and then exposes him to smallpox six weeks later (which he does not develop). The process becomes known as <a href="#">vaccination</a> from the Latin <i>vacca</i> for cow. Vaccination with cowpox is made compulsory in Britain in 1853. Jenner is sometimes called the founding father of immunology.
1800	<a href="#">Sir Humphry Davy</a> announces the anaesthetic properties of nitrous oxide, although dentists do not begin using the gas as an anaesthetic for almost 45 years.
1816	<a href="#">René Laënnec</a> invents the stethoscope.
1818	British obstetrician James Blundell performs the first successful transfusion of human blood.
1840	Semmelweis first use of antiseptic to prevent infection in surgery.
1842	American surgeon <a href="#">Crawford W. Long</a> uses ether as a general anaesthetic during surgery but does

	not publish his results. Credit goes to dentist William Morton.
1844	Dr. Horace Wells, American dentist, uses nitrous oxide as an anaesthetic.
1846	Boston dentist <a href="#">Dr. William Morton</a> demonstrates ether's anaesthetic properties during a tooth extraction.
1849	<a href="#">Elizabeth Blackwell</a> is the first woman to receive a medical degree (from Geneva Medical College in Geneva, New York).
1867	<a href="#">Joseph Lister</a> publishes <i>Antiseptic Principle of the Practice of Surgery</i> , one of the most important developments in medicine. Lister was convinced of the need for cleanliness in the operating room, a revolutionary idea at the time. He develops antiseptic surgical methods, using carbolic acid to clean wounds and surgical instruments. The immediate success of his methods leads to general adoption. In one hospital that adopts his methods, deaths from infection decrease from nearly 60% to just 4%.
1870s	<a href="#">Louis Pasteur</a> and <a href="#">Robert Koch</a> establish the germ theory of disease. According to germ theory, a specific disease is caused by a specific organism. Before this discovery, most doctors believe diseases are caused by spontaneous generation. In fact, doctors would perform autopsies on people who died of infectious diseases and then care for living patients without washing their hands, not realizing that they were therefore transmitting the disease.
1879	First vaccine for <a href="#">cholera</a>
1881	First vaccine for <a href="#">anthrax</a>
1882	First vaccine for <a href="#">rabies</a>
1890	Emil von Behring discovers <a href="#">antitoxins</a> and uses them to develop <a href="#">tetanus</a> and <a href="#">diphtheria</a> vaccines.
1895	German physicist <a href="#">Wilhelm Conrad Roentgen</a> discovers <a href="#">X rays</a> .
1896	First vaccine for <a href="#">typhoid fever</a> .
1897	<a href="#">Ronald Ross</a> , a British officer in the Indian Medical Service, demonstrates that <a href="#">malaria</a> parasites are transmitted via mosquitoes, although French army surgeon Charles Louis <a href="#">Alphonse Laveran</a> identified parasites in the blood of a malaria patient in 1880. The <a href="#">treatment</a> for malaria was identified much earlier (and is still used today). The Qinghao plant ( <i>Artemisia annua</i> ) was described in a Chinese medical treatise from the 2nd century BCE; the active ingredient, known as artemisinin, was isolated by Chinese scientists in 1971 and is still used today. The more commonly known treatment, quinine, was derived from the bark of a tree called Peruvian bark or Cinchona and was introduced to the Spanish by indigenous people in South America during the 17th century.
1897	First vaccine for <a href="#">plague</a> .
1899	Felix Hoffman develops <a href="#">aspirin</a> (acetyl salicylic acid). The juice from willow tree bark had been used as early as 400 BC to relieve pain. 19th century scientists knew that it was the salicylic acid in the willow that made it work, but it irritated the lining of the mouth and stomach. Hoffman synthesizes acetyl salicylic acid, developing what is now the most widely used medicine in the world.
1901	Austrian-American <a href="#">Karl Landsteiner</a> describes blood compatibility and rejection (i.e., what happens

	when a person receives a blood transfusion from another human of either compatible or incompatible <a href="#">blood type</a> ), developing the ABO system of <a href="#">blood typing</a> . This system classifies the bloods of human beings into A, B, AB, and O groups. Landsteiner receives the 1930 Nobel Prize for Physiology or Medicine for this discovery.
1906	<a href="#">Sir Frederick Gowland Hopkins</a> suggests the existence of vitamins and concludes they are essential to health. Receives the 1929 Nobel Prize for Physiology or Medicine.
1907	First successful human <a href="#">blood transfusion</a> using Landsteiner's ABO blood typing technique
1913	Dr. Paul Dudley White becomes one of America's first cardiologists, a doctor specializing in the heart and its functions, and a pioneer in use of the <a href="#">electrocardiograph</a> , exploring its potential as a diagnostic tool.
1921	Edward Mellanby discovers <a href="#">vitamin D</a> and shows that its absence causes <a href="#">rickets</a> .
1922	<a href="#">Insulin</a> first used to treat <a href="#">diabetes</a> .
1923	First vaccine for <a href="#">diphtheria</a> .
1926	First vaccine for <a href="#">pertussis</a> (whooping cough).
1927	First vaccine for <a href="#">tuberculosis</a> .
1927	First vaccine for <a href="#">tetanus</a> .
1928	Scottish bacteriologist <a href="#">Sir Alexander Fleming</a> discovers <a href="#">penicillin</a> . He shares the 1945 Nobel Prize for Physiology or Medicine with <a href="#">Ernst Chain</a> and <a href="#">Sir Howard Florey</a> .
1935	First vaccine for <a href="#">yellow fever</a> .
1935	<a href="#">Dr. John H. Gibbon, Jr.</a> , successfully uses a heart-lung machine for extracorporeal circulation of a cat (i.e., all the heart and lung functions are handled by the machine while surgery is performed). Dr. Gibbon uses this method successfully on a human in 1953. It is now commonly used in open heart surgery.
1937	First vaccine for <a href="#">typhus</a> .
1937	Bernard Fantus starts the first <a href="#">blood bank</a> at Cook County Hospital in Chicago, using a 2% solution of sodium citrate to preserve the blood. Refrigerated blood lasts ten days.
1943	Microbiologist <a href="#">Selman A. Waksman</a> discovers the antibiotic <a href="#">streptomycin</a> , later used in the treatment of tuberculosis and other diseases.
1945	First vaccine for <a href="#">influenza</a> .
1952	Paul Zoll develops the first cardiac <a href="#">pacemaker</a> to control irregular heartbeat.
1953	<a href="#">James Watson</a> and <a href="#">Francis Crick</a> at Cambridge University describe the structure of the <a href="#">DNA</a> molecule. <a href="#">Maurice Wilkins</a> and Rosalind Franklin at King's College in London are also studying DNA. (Wilkins in fact shares Franklin's data without her knowledge.) Watson, Crick, and Wilkins share the Nobel Prize for Physiology or Medicine in 1962 (Franklin had died and the Nobel Prize only goes to living recipients).

1954	<a href="#">Dr. Joseph E. Murray</a> performs the first kidney transplant between identical twins.
1955	<a href="#">Jonas Salk</a> develops the first <a href="#">polio</a> .
1957	Dr. Willem Kolff and Dr. Tetsuzo Akutzu implant the first <a href="#">artificial heart</a> in a dog. The animal survives 90 minutes.
1962	First oral polio vaccine (as an alternative to the injected vaccine).
1964	First vaccine for <a href="#">measles</a> .
1967	First vaccine for <a href="#">mumps</a> .
1967	South African heart surgeon <a href="#">Dr. Christiaan Barnard</a> performs the first human heart transplant.
1970	First vaccine for <a href="#">rubella</a> .
1974	First vaccine for <a href="#">chicken pox</a> .
1977	First vaccine for <a href="#">pneumonia</a> .
1978	First <a href="#">test-tube baby</a> is born in the U.K.
1978	First vaccine for <a href="#">meningitis</a> .
1980	Insulin produced from genetically engineered bacteria
1980	W.H.O. ( <a href="#">World Health Organization</a> ) announces smallpox is eradicated.
1981	First vaccine for <a href="#">hepatitis B</a> .
1982	Dr. William DeVries implants the <a href="#">Jarvik-7</a> artificial heart into patient Barney Clark. Clark lives 112 days.
1983	HIV, the virus that causes <a href="#">AIDS</a> , is identified.
1992	First vaccine for <a href="#">hepatitis A</a> .
1996	Dolly the sheep becomes the first mammal <a href="#">cloned</a> from an adult cell (dies in 2003).
1998	First vaccine for <a href="#">lyme disease</a> .
2000	Human Genome Project, all human genes identified
2005	First face transplant
2009	First baby from embryos screened for eye cancer gene