English physician who pioneered vaccination. In Jenner's day, smallpox was a major killer. His discovery in 1796 that inoculation with cowpox gives immunity to smallpox was a great medical breakthrough.

Jenner observed that people who worked with cattle and contracted cowpox from them never subsequently caught smallpox. In 1798 he published his findings that a child inoculated with cowpox, then two months later with smallpox, did not get smallpox. He coined the word 'vaccination' from the Latin word for cowpox, vaccinia.

Jenner was born in Berkeley, Gloucestershire, on 17 May 1749, the son of a vicar. He was educated locally and in 1761 apprenticed to a surgeon in Sodbury. In 1770 he went to London to study anatomy and surgery under John Hunter, who took Jenner as his first boarding pupil at St George's Hospital in London. Hunter believed strongly that doctors could improve their treatments if they watched their patients and their surroundings closely, and taught Jenner the importance of observation and deduction. Returning to Gloucestershire in 1773, Jenner set up in private practice in Berkeley, where he regularly visited all parts of the local area, observing his patients closely.

One of the biggest killers at the time was smallpox, a viral disease that showed itself in scabs on a person's skin and almost always led to the death of the victim. In 1788 an epidemic of smallpox swept Gloucestershire and Jenner offered inoculations with live vaccine in spite of the tragedies that had previously accompanied this practice. Inoculation was well known in eastern countries, and had been brought to England in 1721 by Lady Mary Wortley Montagu, the wife of the British ambassador to Turkey. The treatment involved taking pus from the scab of a recovering smallpox patient and transferring it to an open cut in the person to be inoculated. The idea was that they would get a mild dose of smallpox and then be immune to the disease in future. However, despite the success of some practitioners, such as Jan Ingenhousz, who inoculated the royal family, inoculation was dangerous if the pus given to the healthy person was too strong, as they could contract a fatal dose of the disease. Despite Jenner's offers many people refused to be inoculated.

Jenner had heard that local milkmaids who had had the mild disease of cowpox (a disease affecting the teats of cows and later the hands of their milkers) never got smallpox, and this was confirmed when, in the course of his inoculations, he noticed that people who had suffered from cowpox, remained quite unaffected by the smallpox inoculation; they did not even produce the symptoms of a mild attack of smallpox (as did other patients). Over the course of 25 years he observed that he was unable to infect previous cowpox victims with smallpox, and that where whole families succumbed to smallpox, a previous cowpox victim remained healthy; he noted 16 cases where a person who had contracted cowpox later failed to catch smallpox. He also noticed that whereas inoculation with cowpox appeared to protect the patient from smallpox, it did not give immunity against cowpox itself. In his study of cowpox, Jenner was the first to coin the word 'virus'.
In 1796 Jenner carried out a live experiment on one of his patients, James Phipps, a healthy eight-year-old boy. Jenner made two small cuts in the boy's arm and worked a speck of cowpox into them. A week later, the patient had a slight fever (the usual reaction) but quickly recovered. Some weeks later, Jenner repeated the inoculation, this time using smallpox matter. The boy remained healthy, showing that he had been given immunity, and vaccination was born (named after *vaccinia*, the medical name for cowpox; *vacca* is Latin for cow).

Jenner could not explain why the method worked, as he did not have access to the germ theory work of the French chemist Louis Pasteur; it was not until the 1860s and 1870s that Pasteur, and the German chemist Robert Koch made the discoveries that would provide the link between germs and disease in humans. However, Jenner continued with his experiments, collecting evidence to convince a sceptical public.

Initially Jenner faced broad opposition to his new discovery. Cartoons appeared in newspapers suggesting that people who were vaccinated with cowpox would turn into cows. There was widespread fear and misunderstanding of Jenner's ideas. Jenner's idea was too radical for many in the medical profession, and his status as a country doctor meant that many city doctors looked down on him. Some doctors opposed Jenner because his new idea threatened the income they made using the inoculation technique. When he reported his findings to the Royal Society, the fellows considered that he should not risk his reputation by presenting anything 'so much at variance with established knowledge' and refused to publish them. In 1798 Jenner published his work privately, calling it *An Enquiry into the causes and effects Variola Vaccinae, known by the name of Cowpox*.

Within a few years vaccination was a widespread practice. By 1806 Jenner had received £30,000 from Parliament to support his work. He not only improved his technique but also found a way of preserving active vaccine. The technique was adopted in the USA, where it was publicly promoted by President Thomas Jefferson, and in France, where Napoleon Bonaparte had all of his troops vaccinated and even released some British prisoners of war out of respect for Jenner's work. Jenner's book was translated around the world, reaching Asia by 1815. In the face of a steep rise in cases in Britain in the 1860s, the British government made vaccination compulsory for all British citizens in 1871. By 1890 smallpox had virtually been eradicated from Britain. When the French government financed the building of the Pasteur Institute in Paris in 1888, Pasteur made a public statement at the opening ceremony, praising Jenner's pioneering work. Nearly 200 years later, Jenner's discovery of vaccination led to the worldwide eradication of the disease. He may be considered to be one of the pioneers of immunology.

Jenner was also interested in natural history, one of his favourite hobbies being birdwatching. He studied the habits of the cuckoo, which often lays its eggs in the nest of the hedge sparrow. It had been thought that the hen hedge sparrow threw out her young from the nest to make room for the developing cuckoo, but Jenner's patient observations revealed that it was the young cuckoo itself that heaved its competitors out of the nest. In 1788 he reported these findings to the Royal Society, who published them.

He died at his home village of Berkeley on or around 26 January 1823.

**quotations**

Jenner, Edward

**essays**

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