

Who Invented Vaccination? ^[1]

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It is hard to determine who invented vaccination. It may have been used in ancient times in China, India or Persia. But we do know that Edward Jenner was the first person which the first recorded vaccination in the western world.

Edward Jenner and Development of Vaccination

As a natural disease, the origin of smallpox can be traced back to the prehistoric culture when it first appeared around 10,000 BC in northeastern Africa. The mummies, including that of pharaoh Ramses V, provide the earliest most convincing evidence of the existence of smallpox 3000 years ago in the Egyptian Dynasties. Presumably, the Indians contracted the disease from the Egyptian merchants as is mentioned in the ancient Sanskrit text. Then, it appeared in China (1122 BC) and was carried to Japan in the 6th century.

In Europe, the smallpox arrived between 5th to 7th century and spread like a plague with the increase in population, during the Middle Ages and captured all of Europe by the 16th century. It was widespread and fatal all around the world during the 18th century killing 400,000 people annually in Europe alone and devastated the development of western civilization. The killer disease effected peasants and princes alike and was referred to as the speckled monster for disfiguring its survivors. Sadly enough, the infants and children were the most frequent victims of the disease everywhere.

Variolation: The Prevention

It was commonly believed that the survivors of a smallpox attack were immune thereafter and would not catch the disease again. Thus, the preventive measures were attempted by introducing samples from smallpox vesicles into the scratched skin or nostrils of healthy subjects. It was hoped that this imitation of nature could induce some degree of immunity in other people. This process called variolation or inoculation, was practiced in China during 10th century and before that in India around 1000 BC.

The variolation was introduced in England by Lady Mary Wortley Montague (1689-1762); who was smallpox victim herself, by demonstrating its effectiveness in her own children. Though, variolation was later successfully experimented on prisoners as well, yet the ingenious preventive method was risky as the inoculated people suffered a rather virulent attack of the disease.

Edward Jenner: The Father of Immunology

The British physician and scientist Edward Jenner developed and generalized the vaccination technique against the dreadful smallpox disease. Although he did not originate the idea of cowpox attack to confer immunity against smallpox, yet it was his experiments and investigations which transformed a traditional belief into standard procedure to save innumerable millions of lives.

His research was based on careful [case-studies](#) [3] and clinical observation more than a hundred years before scientists could explain the viruses themselves. His groundbreaking discovery laid foundation for the modern-day immunology. It was only the result of his vaccination that to this day, smallpox remains to be the only human infectious disease to have been eradicated from this world.

His Life and Profession

Edward Anthony Jenner was born on May 17, 1749 in the small village of Berkeley in Gloucestershire, England. He lived with his older brother and was raised by his sisters after he was orphaned at the age of 5. His keen interest in nature and science from his early years at school continued throughout his life. After nine years as a surgeon's apprentice he went to St. George's Hospital, London to study anatomy and surgery under the prominent surgeon John Hunter.

Edward Jenner was interested in a wide range of things including hydrogen balloons, the behavior and anatomy of cuckoos, geology and heart diseases. Two years later he left Hunter and returned to Berkeley in 1773 to practice general medicine and surgery as well as continued his work on vaccinations. During that period he also contributed towards medical awareness through his occasional writings in the medical papers. Consequently, his research on the secret life of the cuckoo earned him a fellowship of the Royal Society.

His personal observation, natural instincts and fellowship of the learned men of his time eventually inspired him to develop a vaccine for smallpox.

Development of Vaccination

Edward Jenner himself was inoculated at 8 years of age, and never caught smallpox. During his apprenticeship with Dr. Daniel Ludlow, he heard a dairymaid say,

"I shall never have smallpox for I have had cowpox. I shall never have an ugly pockmarked face."

Fascinated by the folk belief that milkmaids did not get smallpox, Jenner theorized that the

pus in the blisters which milkmaids received from cowpox (a disease similar to smallpox, but much less virulent) protected the milkmaids from smallpox. But he had to wait for an opportunity to transform this anecdote into scientific proof by actively inoculating subjects with cowpox followed by deliberately exposing them to smallpox to determine the presence of immunity. This opportunity presented itself in 1796, when the dairymaid Sarah Nelms contracted cowpox.

On May 14, 1796, he inoculated an 8-year-old boy, James Phipps using matter from Nelms' lesions and observed its reaction. A month later, he inoculated him with the pus from a man with smallpox, but the boy did not contract the disease. Few months later, the experiment was repeated, and again the boy did not come down with smallpox. This had resolved the mystery of cruel smallpox epidemic to be totally eradicated two centuries later, as Jenner himself wrote:

"... the annihilation of the smallpox, the most dreadful scourge of the human species, must be the final result ..."

With his empirical [4] experimentation, Edward Jenner demonstrated this scientific fact that infection with cowpox gave immunity to smallpox. He proved his hypothesis well before the discovery of microbes and the germs theory of diseases. Many would consider Louis Pasteur to be the first immunologist but Edward Jenner remains the first to reach conclusions on a scientific basis after carrying out an experiment to test a hypothesis [5].

Publications

1798	An Inquiry into the Causes and Effects of the Variolae Vaccinae
1799	Further Observations on the Variolae Vaccinae
1800	A Continuation of Facts and Observations relative to the Variolae Vaccinae
1801	The Origin of the Vaccine Inoculation
1823	Presented his 'Observations on the Migration of Birds' to the Royal Society

Death of Edward Jenner

Jenner was found in a state of apoplexy on 25 January 1823, with his right side paralyzed. He never fully recovered, and eventually died at the age of 73 due to an apparent stroke in his native Berkeley, Gloucestershire on 26 January 1823.

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