

Why Do People Need Shots?

Have you ever had a doctor or nurse give you a shot? You may get a shot after you are already sick. Or, you may get a shot to keep you from getting sick. Bacteria and viruses can both cause some very serious illnesses. For example, 200 years ago, many people got an infectious disease called *smallpox*. Unfortunately, many people who were infected died. To learn more about why shots are so important, read more about smallpox.

A serious infectious disease: Smallpox

fatal: deadly

Smallpox is a serious, contagious, and often **fatal** disease. Smallpox is caused by the variola (vair-ee-OH-luh) virus. Humans are the only natural hosts of the variola virus. That means only humans can get smallpox, and only humans can transmit smallpox to someone else.

Smallpox symptoms include a rash, high fever, headache, backache, and fatigue (tiredness). But, smallpox is most easily recognized by the type of rash it causes. The rash is in the form of small blisters that are filled with fluid and crusted over. Smallpox rash usually appears on exposed parts of the body: the face, arms, palms, lower legs, and soles of the feet.

Generally, face-to-face contact is required to spread smallpox from one person to another. Smallpox also can be spread through direct contact with infected bodily fluids. That means if someone touches an object such as laundry or a blanket that has smallpox on it, they may get infected.



The “pox” means “spotted.” It refers to bumps that appear on an infected person, as shown in this photo.

A person with smallpox becomes **contagious** when they get a fever. They become more contagious when they get the rash. At this stage, the infected person is usually very sick. They may be **quarantined** from moving freely in their community, so they cannot infect other people. An infected person is contagious until the last smallpox scab falls off.

contagious:
able to pass on to others.

quarantine:
restriction on movement to stop the spread of a disease.

How can diseases be prevented?

Have you ever heard of smallpox? Has anyone in your family had smallpox? You probably answered "no" to both of these questions. Why? Because scientists have discovered how to prevent smallpox through **vaccination**. You or someone you know may have had a vaccine--a shot in your arm--for influenza (the flu), for example.

Edward Jenner was one of the first scientists to discover how to protect people from diseases through vaccination. He listened people tell stories about who got sick and who did not get sick. He analyzed data and began to notice patterns in the stories he heard. The patterns made him think that **immunization** might work.

The year was 1796. There were no cars, no telephones, and no electricity in houses. Edward Jenner heard that the people responsible for milking cows did not get smallpox. However, they often got a disease similar to smallpox from milking the cows. It was called *cowpox*. Unlike smallpox that killed many victims, people who got cowpox only had a few blisters, felt a little tired, and had some aches.

vaccination: the process by which a substance that protects a person from a disease is put into their body.

immunization: a medical treatment that helps protect from disease.



Jenner putting fluid from a cowpox blister into a cut on a child's arm.



*Getting a **vaccination** (also called an **immunization**). People also call this getting a "shot."*

vaccine: a substance that protects a person from a disease; from the Latin *vacca* for cow.

Jenner began to think that maybe cowpox protected them. He tried an experiment. With the permission of an eight-year-old child's father, Jenner gave the child the cowpox virus in his arm. The child had a few aches but did not get very sick. Later, Jenner exposed the same child to smallpox. The child did not get sick. It seemed that the cowpox virus was giving protection from smallpox. Several months later, Jenner again exposed the child to smallpox. Again the child stayed healthy. Jenner had found a way to prevent smallpox. The cowpox virus was acting as a **vaccine**.

How Important Are Vaccinations?

eradicated: wiped out, destroyed

Immunization has saved millions of lives in the last 200 years. Up until the 1970s, almost everyone was vaccinated against smallpox. In 1980, smallpox was declared **eradicated**. People no longer needed to be immunized for smallpox because no one was getting it any more. Vaccines are one reason that people now live longer, healthier lives. Diseases that great-grandparents and grandparents worried about are no longer threats. Since Edward Jenner, vaccinations have been made for many diseases. Most children are vaccinated in the first two years of their lives. Scientists continue to develop vaccines for illnesses. They use new technology to study bacteria and viruses. But they are building on the work of earlier scientists, like Jenner. His questions, observations, and investigations led him to figure out that immunization was possible.

Stop and Think

1. Why don't people worry about smallpox today?
2. What is the purpose of a vaccine?
3. In your opinion, do you think vaccines are still important today? Explain your ideas.
4. Extension: Search the internet or talk to an adult about *COVID-19*. What can you learn about a *COVID-19* vaccine?

What's the Point?

Scientists have developed many ways to protect people from some serious diseases. Using vaccinations, they have eradicated some disabling and deadly diseases. Smallpox is one of those. Scientists are still developing new vaccines.