students for
HERD IMMUNITY

VACCINE INFORMATION

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Q. What is a vaccine?

A. A **vaccine** is a medical innovation that helps protect you from serious illness if you become infected with a disease. A specific vaccine will prepare your body to fight a specific disease before you actually get exposed to the bacteria or virus that causes it.

Generally, vaccines are administered through a needle injection, but some researchers are also trying to make vaccines deliverable through nasal sprays and oral tablets.

Q. How do vaccines work?

A. Vaccines work by stimulating your body's **immune system**, which fights off diseases. When you get a shot, the vaccine enters your body. The vaccine includes a compound that helps your immune system recognize a specific virus or bacteria. This might be a part of the virus or bacteria or a weakened version of it. This will *not* give you the disease, but it will show your immune system what to look out for when the real attacker shows up in the future.

In response to this compound in the vaccine, your immune system will generate **antibodies** to eliminate it. Antibodies are proteins that your body makes to destroy specific compounds that it recognizes as foreign and potentially harmful.

In addition to antibodies, your body also generates **memory cells**, which remember exactly how to recognize this compound in the future. The next time this specific virus or bacteria tries to invade your body, these memory cells will quickly recognize them again. This way, your immune system can initiate a swift response to fight the virus or bacteria off and keep you from getting the disease.

Q. Why is it important to get vaccinated?

A. Vaccines train your own body's immune system to help protect you from becoming very sick from a preventable disease. On an individual level, vaccines help each of us build our own immunity to diseases that are often highly contagious and severe.

But getting vaccinated not only helps protect you—it also helps protect the people around you, too! This is possible because vaccines help communities safely reach **herd immunity**.

Herd immunity is when a high enough percentage of a community becomes immune to a disease. At this point, further spread of the disease becomes unlikely. This helps protect everyone from the disease, especially people who are too young or too sick to get the vaccine, or people with weak immune systems.

Vaccines have allowed many communities to reach herd immunity for diseases that used to be very serious and deadly. Many of these diseases, such as smallpox, are now well-controlled or mostly eradicated in certain parts of the globe. The more people are vaccinated, the closer our communities get to herd immunity. Because of this, it's important that as many people as possible get vaccinated as soon as they can.

Q. What are boosters? Why do I need them?

A. For some diseases, just one dose of a vaccine might be enough to protect you for a long time. But for other diseases, you might need more than one dose of the vaccine to be fully protected. These additional doses are called **booster shots** (or simply **boosters**), and might be needed for a number of reasons.

Even after receiving a dose of a vaccine, your body's immune system might become less effective at responding to the virus or bacteria over time. In this case, an additional dose of the vaccine might be necessary to boost your immunity to the disease.

Some vaccines might also become less effective over time due to viral mutations. Viruses can mutate (change) over time, which can be a problem for our immune systems since the antibodies that are made to destroy viruses are highly specific to a particular form of that exact virus. If a virus changes too much too quickly, a new version of the vaccine might need to be made to help our immune system quickly recognize the unfamiliar, mutated version of the virus. This is why people need to get a new flu shot every year, as the viruses that cause influenza (the flu) mutate very quickly.

Q. Are vaccines safe?

A. Yes, vaccines are safe. Vaccines undergo a detailed and rigorous process of trials and tests before they're made available to the public. These clinical trials are conducted and reviewed by scientists and public health officials, and they test the safety and effectiveness of the vaccine.

Q. How are vaccines developed?

A. There are multiple phases of **clinical trials** that vaccines must go through before they become available to us.

First is the **preclinical phase**, where a vaccine candidate is tested and evaluated in animal subjects to determine whether it is safe and has the potential to prevent a disease.

If the vaccine is found to be promising in this phase, then it moves on to **human clinical trials**, which have three phases, which all work to assess whether the vaccine is safe and effective in humans. Each phase of these clinical trials includes a greater number of volunteers, from 20-80 healthy volunteers in phase 1 to thousands in phase 3.

Once the clinical trials are conducted, public health officials review data in rigorous detail and determine whether the vaccine is safe and effective enough to be used by the public.

If the vaccine passes all of these trials and reviews, then it becomes **authorized** for use, and is now available to the public!

Even after the vaccine passes all of these trials and becomes authorized for use by the public, regulatory bodies and public health officials continue to monitor its safety and efficacy. Because of this, you can rest assured that any authorized vaccines are confirmed by many people and a significant amount of data to be safe and effective.

Q. How do I know what vaccines I've gotten?

A. The easiest way to find out what vaccines you've gotten is to ask your primary care provider. They will be able to share a record of all your past vaccines with you.

If you don't have a primary care provider, we highly recommend getting one. A primary care provider will help you stay up to date with your current and future vaccines on a regular basis, as well as other important aspects of your health.

Q. I got a vaccine once but I got sick right after. Does this mean the vaccine gave me the disease?

A. No, vaccines cannot give you the disease they are meant to protect you from. Vaccines are explicitly designed to not include any live viruses or bacteria that have the ability to give you the disease. A vaccine that has the potential to give someone the disease would not be able to pass all the necessary trials and would not become authorized for public use.

If you feel uncomfortable or feel sick after receiving the vaccine, this is not you getting the disease. Instead, what is happening is that your immune system is launching a small-scale response to the compound in the vaccine. This is the compound that is typically a part of or a weakened version of the virus or bacteria, and lets your body learn what to look out for when it comes into contact with the real deal.

During this small-scale response, some people might feel sore, tired, or feverish. Other people might not feel any side effects at all. But one thing's for certain—everyone who receives the vaccine will get an immunity boost that will protect them from getting seriously ill from the disease in the future!

Q. Where can I get vaccinated?

A. You can get most of the standard, recommended vaccines at your doctor's office. Certain vaccines, like the annual flu shot or the COVID-19 booster, may also be available at other locations, such as local pharmacies, health clinics, health departments, and travel clinics.

Provincial or state health department websites are a great resource to find out exactly where you can get vaccinated in your area. We encourage you to look up your province or state's vaccine resources for yourself, and share them with your family or people in your community.

SOURCES CDC, HHS, Government of Canada, WHO, History of Vaccines, Connecticut Department of Health, Nature, Medical News Today, Baylor College of Medicine, Mayo Clinic, Ottawa Citizen, Philadelphia Department of Public Health

If you have more questions about vaccines, speak to your doctor or primary care provider

For more information, visit: studentsforherdimmunity.com.