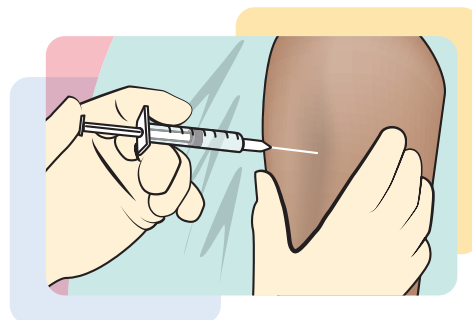


# How Vaccines Work to Prevent Infections

January 12, 2023

Some people are at higher risk to become seriously ill from some viruses or bacteria, also called germs or pathogens. When a germ gets into the body, our immune system responds.

One of the ways our immune system fights infections and prevents future infections by the same germ is by making antibodies. Antibodies are proteins that the body makes to protect us from a specific germ. We have thousands of different antibodies in our body.

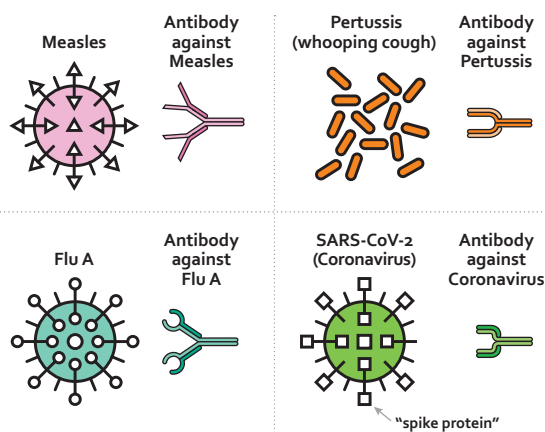


## What is a Vaccine?

A vaccine stimulates your immune system to produce antibodies, exactly like it would if you were infected by a germ. There are different types of vaccines made in different ways. Some vaccines contain parts of a germ, a weakened germ, or killed germ. More recently there are vaccines that contain a strip of RNA (mRNA), which give cells instructions to make antibodies against proteins of a virus. mRNA vaccines do not contain any part of the virus itself. In all cases, vaccines help your body's immune system learn how to protect against the germ target, including making antibodies against the germ. After getting vaccinated, you develop immunity to that disease, without having been infected with the germ. Vaccines protect you from specific germs. So, you need different vaccines to protect against different germs.

Unlike antibiotics or other medicines that treat infections, vaccines prevent infections. Vaccines in use today often have targeted diseases that were once common in the United States. These diseases include tetanus, hepatitis A, hepatitis B, rubella, measles, and whooping cough. Vaccines have helped us wipe out smallpox worldwide, a disease that killed 300 to 500 million people in the 20th century. We are very close to fully wiping out polio using vaccines.

Routine immunization is the cornerstone to controlling vaccine preventable diseases. There are many vaccines recommended for children and



Our immune system naturally responds to new germs that enter our body and makes antibodies that grab on to and defeat the germs. Vaccines stimulate our immune system to make specific antibodies to fight off specific germs, such as the measles. The new COVID-19 vaccine prompts your body to make antibodies against the "spike protein" on the coronavirus.

Image adapted from WHO 'How do vaccines work'  
<https://www.who.int/news-room/feature-stories/detail/how-do-vaccines-work>

for adults to maintain health and prevent disease. Public health agencies and expert medical groups recommend that everyone ensure that they are up to date with routine vaccinations, even during the coronavirus pandemic. For example, if you haven't had a flu shot this season, it would be important to get one. If you are worried about staying safe during healthcare visits, ask the office about their safety practices.

Research continues on vaccines against COVID-19, known as SARS-CoV-2 virus. Studies look at how well and how long the vaccines will protect you.

**Side effect and safety are being tracked as more people get vaccinated.** Studies so far have found the currently available vaccines to be safe and work very well reducing the risk of serious illness and death for people who get vaccinated.

All approved COVID 19 vaccines are available to adults and some vaccines are available for children 6 months and older. It is expected that in near future vaccines will be available for younger children. Booster doses are now being advised and how long protection lasts continues to be studied.

### What is Community Immunity?

**Community immunity is also known as herd immunity.** Community immunity means that there are enough people protected from a germ, whether by vaccination or prior infection, to make the spread of the germ from person to person less likely.

**When there is community immunity, there are not enough people who are still susceptible to the germ for it to spread.** Getting a vaccine not only helps protect you, but it also protects those around you and your community. For a very contagious infection, the level of immunity required has to be extremely high.

**Authors:** Marianna Sockrider, MD, DrPH, Jerry A. Krishnan, MD, PhD

**Reviewers:** Natasha Mubeen Chida, MD, MSPH, Charles S. Dela Cruz, MD, PhD, Tina V. Hartert, MD, MPH, Justin R. Ortiz, MD, MS, Jeffrey Starke, MD, Courtney White, MLS

## R<sub>x</sub> Action Steps

- ✓ Talk to your healthcare provider to see what vaccines you and your children may need.
- ✓ Ask about your own and your child's risk of infection and how quickly a vaccine starts to protect you from the germ it is designed to target.
- ✓ Ask about possible side effects of the vaccine and how you can manage them.
- ✓ Follow the advice in the expert guidelines from the US Centers for Disease Control (CDC) and the World Health Organization (WHO) on which vaccines are recommended for you.
- ✓ Educate yourself about the global and historical effectiveness of vaccine use.

**Healthcare Provider's Contact Number:**

---

## For More Information About Vaccines

### US Centers for Disease Control and Prevention

- <https://www.cdc.gov/vaccines/index.html>

### Infectious Diseases Society of America

- <https://www.idsociety.org>

### World Health Organization

- <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/covid-19-vaccines/how-do-vaccines-work>

### US Department of Health and Human Services

- <https://www.vaccines.gov/basics/types>

### Immunization Action Coalition

- <https://vaccineinformation.org/>

### State & Territorial Health Department Websites

- <https://www.cdc.gov/publichealthgateway/healthdirectories/healthdepartments.html>

### American Academy of Pediatrics—

### Healthy Children.org

- <https://www.healthychildren.org/English/safety-prevention/immunizations/Pages/How-do-Vaccines-Work.aspx>

This information is a public service of the American Thoracic Society. The content is for educational purposes only. It should not be used as a substitute for the medical advice of one's healthcare provider.

