COVID-19 Health Basics

Who can get COVID-19 vaccines?

COVID-19 vaccine development has occurred at an unprecedented pace. The first vaccines were authorized for emergency use in the United States in December 2020—less than a year after the genetic sequence of the SARS-CoV-2 coronavirus was discovered.

Four COVID-19 vaccines are available in the Unites States:

- Pfizer-BioNTech mRNA vaccine (Comirnaty): This vaccine has full Food and Drug Administration (FDA) approval for people ages 12 or older, and it emergency use authorization for children ages 6 months to 11 years. The initial series consists of two doses given three weeks apart for people ages 5 and older, or three doses for younger children.
- Moderna mRNA vaccine (Spikevax): This vaccine has full FDA approval for adults ages 18 or older and emergency use authorization for children and adolescents ages 6 months to 17 years. The initial series consists of two doses given four weeks apart.
- Johnson & Johnson (Janssen) adenovirus vector vaccine: This single-dose vaccine has emergency use authorization for adults ages 18 or older who cannot or do not wish to receive the mRNA vaccines. Unlike the mRNA vaccines, which require special cold storage, it can be stored in a standard refrigerator.
- Novavax protein subunit vaccine (Nuvaxovid): This vaccine has emergency use authorization for adults ages 18 or older. The initial series consists of two doses given three weeks apart.

Because vaccine protection wanes over time and new variants are better able to evade protection, one or more booster doses are recommended for most people. The newest boosters have been updated to target more recent variants. Click here for the CDC's current booster recommendations.

Vaccine safety and effectiveness
Vaccine researchers have taken several different approaches. The Pfizer-BioNTech and Moderna vaccines use lipid nanoparticles, or fat bubbles, to deliver bits of genetic material (messenger RNA) that encode instructions for making the spike protein

the coronavirus uses to enter cells. When injected, the cells produce the viral protein, triggering an immune response.

The Johnson & Johnson (J&J) vaccine uses a weakened adenovirus—similar to viruses that cause the common cold—as a vector to deliver genes that encode the coronavirus spike protein. A vaccine from AstraZeneca and the University of Oxford (not authorized in the United States) uses a chimpanzee adenovirus vector. The Novavax vaccine uses SARS-CoV-2 spike proteins grown in insect cells. All of the vaccines stimulate the production of antibodies that prevent SARS-CoV-2 from entering cells. They also induce memory B-cell and T-cell immune responses that protect against severe illness.

All of the authorized vaccines were shown to be highly effective at preventing severe illness, hospitalization and death. They also appear to reduce the risk of developing long COVID. However, they do not reliably prevent infection or transmission, and they do not work as well against newer SARS-CoV-2 variants. Immunocompromised people, such as those receiving certain types of cancer treatment, those with advanced or untreated HIV and organ transplant recipients, may not respond as well to vaccines and may need additional doses.

All of the vaccines are generally safe and well tolerated. The most common side effect is temporary soreness, redness or swelling at the injection site. Some recipients experience flu-like symptoms, such as fever or fatigue. Severe allergic reactions (anaphylaxis) are rare and usually can be managed with medical care. The J&J or AstraZeneca vaccines can rarely cause an unusual blood clotting disorder. A small number of people who receive the Pfizer-BioNTech or Moderna vaccines develop myocarditis, or heart inflammation; this is more common among young men.

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