

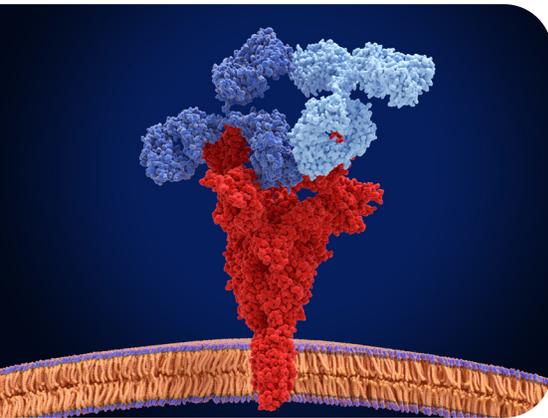
About COVID-19 Vaccines

Building Vaccine Confidence Through Knowledge



How the types of COVID-19 vaccines work

Each type works a bit differently but, in all cases, the body breaks down and eliminates the parts that are injected into the body when they are no longer needed.



Spike protein found on the surface of the COVID-19 virus

mRNA (Messenger ribonucleic acid) Vaccines

This type of vaccine uses genetically engineered mRNA to give your cells instructions for how to make the spike protein found on the surface of the COVID-19 virus. After vaccination, your muscle cells begin making the spike protein pieces and displaying them on cell surfaces. This causes your body to create antibodies. If you later become infected with the COVID-19 virus, these antibodies will fight the virus.

After delivering instructions, the mRNA is immediately broken down. It never enters the nucleus of your cells, where your DNA is kept.

Approved mRNA vaccines:

- Pfizer-BioNTech Comirnaty COVID-19 vaccine: two doses a minimum 21 days apart
- Moderna Spikevax COVID-19 vaccine: two doses a minimum one month apart

Protein Subunit Vaccines

These vaccines use purified nanoparticles of a lab-grown spike protein that mimic the natural spike protein on the surface of the COVID-19 virus. When the particles are injected into the body with an adjuvant (Matrix-M) — a compound that enhances immune response — the body learns to recognize and fight off the virus.

Approved protein subunit vaccines:

- Novavax Nuvaxovid COVID-19 vaccine: two doses 21 days apart

Viral Vector-Based Vaccines

Genetic material from the COVID-19 virus is placed in a modified version of a different virus (adenovirus). When this viral vector gets into your cells, it delivers genetic material from the COVID-19 virus that gives your cells instructions to make copies of the spike protein. Once your cells display the spike proteins on their surfaces, your immune system responds by creating antibodies and defensive white blood cells. If you later become infected with the COVID-19 virus, the antibodies will fight the virus. Viral vector vaccines can't cause you to become infected with the COVID-19 virus or the viral vector virus. Also, the genetic material that's delivered doesn't become part of your DNA.

Approved viral vector-based vaccines:

- AstraZeneca Vaxzevria COVID-19 vaccine: two doses 4 to 12 weeks apart
- Janssen (Johnson & Johnson) COVID-19 vaccine: one dose only

Plant-Based Vaccines

The *Nicotiana benthamiana* plant's natural cell process is used to produce protein virus-like particles (VLPs), which is the non-infectious ingredient that produces the immune response. Once injected, the particles mimic the structure of the virus. The body then develops an immune response against the spike protein.

Approved plant-based vaccines:

- Medicago Covifenz COVID-19 vaccine: two doses 21 days apart

More vaccines may be authorized by Health Canada in the future.



COVID-19 Vaccine Safety

Vaccines were created quickly, but carefully tested for safety.

- extensive testing by independent scientists
- millions of people safely vaccinated
- vaccines do not contain live virus
- mRNA technology in development for over 15 years
- continuous monitoring of adverse reactions

Possible side effects like a sore arm, a mild fever or body aches signal a natural immune response as the body prepares itself to recognize and fight the coronavirus, should it be exposed in the future.

COVID-19 Vaccine Effectiveness

The vaccines are very effective at preventing severe illness, hospitalization and death from COVID-19. The primary series (single or two doses depending on the vaccine) of a COVID-19 vaccine, plus booster dose(s), offers better protection against infection and severe disease than the primary series alone.

Vaccination After Getting COVID-19

While infection alone provides some protection, vaccination after infection helps improve the immune response and may provide better and longer-lasting protection.



Health Canada continues to closely monitor effectiveness of all vaccines.

COVID-19 Vaccine Side-Effects

Some mild to moderate side effects are common but resolve after a few days. The most common side effects include pain at the injection site, headache, fatigue, muscle and joint pain, chills and fever.

It is important to receive the second dose and booster doses even if you experience mild or moderate side effects. You may get the same side effects with your second or booster dose.

Serious side effects are very rare.

They include:

- Hives
- Swelling of mouth and throat
- Trouble breathing, hoarseness or wheezing
- Fever over 40°C or 104°F
- Seizures
- Very rarely, the AstraZeneca (COVISHIELD) vaccine has been associated with a rare form of blood clotting after vaccination (called vaccine-induced immune thrombotic thrombocytopenia, or VITT).

Symptoms include:

- Shortness of breath
 - Chest pain
 - Leg swelling
 - Persistent abdominal pain
 - Sudden onset of severe or persistent worsening headaches or blurred vision
 - Skin bruising (other than at the site of vaccination)
 - Very rare cases of myocarditis and pericarditis following vaccination with COVID-19 mRNA vaccines have been reported.
- Symptoms include:
- Chest pain
 - Shortness of breath
 - Palpitations, or feeling a rapid or abnormal heart rhythm

If you experience serious side effects, you should seek medical help immediately. Do not get a second dose of the vaccine if you have serious side effects following the first dose. Speak to your healthcare provider for advice.