

Vaccination

What is it?

A [vaccine](#) is a preventative therapy designed to prevent you from getting an infection should you come in contact with the causing germ (bacteria, virus or parasite). A vaccine teaches your immune system how to fight against that germ even before meeting it.

They are typically administered by a shot but some exist as nasal sprays or even a medicine you swallow.

They can be administered as 1 dose. Some require 2 doses or more to reach the targeted (optimal) protection.

What does it do?

First, let's review how your immune system fights against an infectious germ.

When a germ manages to enter your body, it can start to replicate itself. As the number of germs multiplies, it starts to damage and kill your cells. These cells can be anywhere in your body, your lungs, your intestines, your brain etc.

As it attacks your cells, you will start to feel ill. It has the capacity of causing serious body harm. Your immune system is constantly scanning your body looking for a germ that should not be there ("an intruder"). When it identifies one, it starts to mount a variety of fighting mechanisms in the hope of containing and eventually eradicating the germ or "intruder".

The main medicinal ingredient in a vaccine is the [antigen](#). There are many technology options used to deliver this antigen to your immune system. An antigen can be a small portion of a dead germ or a dead germ and therefore does not have the capacity to replicate and make you sick. Some vaccines have a weakened germ (bacteria or virus) and will not make people with well functioning immune system ill (1).

The immune system acts like an army. When it encounters the antigen and recognizes it, the army training begins. This antigen stimulates it to prepare a variety of fighting mechanism in order for the "army" to be well trained and ready should it encounter the germ in the future. In this sense, the vaccine is a form of "practice before the test"; It teaches your immune system how to fight a germ efficiently ahead of time. Should the germ enter the body, the army is ready and the germ will not have time to replicate and damage your cells and body.

Is a vaccine safe?

Vaccines approved in the current Canadian Immunization schedule have proven to be safe.

When the vaccine is initially conceived, it goes through a series of trials. Pre-clinical trials done in the laboratory on animals are the first stage of assessing safety and how well the vaccine can stimulate the immune system.

The next stage includes clinical trials. These are performed in 4 phases. Through these phases, there are a number of people who volunteer to try the vaccine. Traditionally, in phase 1, there are a few people, in phase 2, hundreds of people and in phase 3, many thousands of people. During these 3 phases, researchers will assess how efficient the vaccine is and what side effects are experienced. Doctors and other experts in the field will review these results independently. These experts must agree for the vaccine to be safe and effective enough to be made available to the public before governmental agencies grant approval(1).

After a vaccine has been approved and commercialized, it continues to be monitored in phase 4 of clinical trials for adverse events and long-term effects.

Additional information

[Diseases that vaccines prevent](#)

[Vaccine safety](#) (Applicable to vaccines in the current Canadian Immunization schedule)

References

1. Uptodate, Patient education: What you should know about vaccines (The Basics), consulted April 6 2021, <https://www.uptodate.com/contents/what-you-should-know-about-vaccines-the-basics>