

## Questions and Answers about Vaccines

### Q: Are vaccines safe?

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Vaccines used in Canada are safe and effective. They are developed to meet the highest standards and are continually monitored for safety and effectiveness both in Canada and around the world before they are approved for use.

On average, it takes about 10 years of research and development before a vaccine is considered for approval by [Health Canada](#). Following approval, the [National Advisory Committee on Immunization](#) recommends how the vaccine should be used. Once vaccines are made available to the public, they are regularly monitored for safety by:

- the [Public Health Agency of Canada](#) through its Canadian Adverse Events Following Immunization Surveillance System (CAEFISS); and
- [IMPACT](#) (Immunization Monitoring Program ACTIVE), a paediatric hospital-based national active surveillance network.

As with any medical procedure, immunization has some risks. Individuals may react differently to vaccines. When considering immunization, both the risks and the benefits should be discussed with a qualified health care provider. The benefits of immunization are substantial and well documented.

You will find more information on vaccine safety [here](#).

### Q: How do vaccines work?

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Vaccines protect people from disease by introducing a portion of a bacterium or weakened virus into the body to trigger an immune response, just as though you had been exposed to a disease naturally. Vaccines work because they trick your body into thinking it is being attacked by the actual disease, so it produces antibodies to protect you. The virus or bacteria in a vaccine won't make you sick; instead, the vaccine prepares your body with a defense (antibodies) that protects against the disease and the potential complications that can be caused by that disease.

### Q: What ingredients are found in vaccines?

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The ingredients found in vaccines all have an important role to play to make sure the vaccine remains effective and safe. All the ingredients in vaccines are found in small quantities and can be found naturally in the food we eat and in nature.

The main ingredients of a vaccine are dead or weakened viruses or bacteria.

Vaccines can also contain:

1. Adjuvants: to help the body's immune system respond better to vaccines
2. Additives and preservatives: to help maintain the quality and effectiveness of the vaccine

## Q: What additives and preservatives are added to vaccines?

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Additives and preservatives are added to vaccines to maintain the quality and effectiveness of vaccines. Below are examples of some of the ingredients that can be found in vaccines and why they are added.

**Additives:** help vaccines stay effective during storage.

### Example: Gelatin

Some vaccines contain gelatin to protect them against freeze-drying or heat. Gelatin is also used as a stabilizer in live vaccines. However, the use of gelatin in vaccines as an additive has been reduced, even though the incidence of allergic reactions is currently very low.

**Preservatives:** help keep vaccine vials from getting contaminated with germs.

### Example: Thimerosal

Thimerosal is an ethyl mercury derivative. It is a preservative used only in multi-dose vials of vaccines, and not in single-dose vials or syringes. Low doses of thimerosal have not been shown to produce any negative health effects. Nevertheless, no vaccine in Canada since March 2001 for routine use in children contains thimerosal, with the exception of some influenza vaccines. DTaP, polio and Hib vaccines have not contained this preservative since 1997-98. The MMR vaccine used in Canada has never contained thimerosal.

**Adjuvants:** help the body create a better immune response to a vaccine. Without adjuvants such as aluminum salts and squalene added to vaccines, people would need more frequent doses of vaccines to be protected against viruses and bacteria.

### Example: Aluminum salts

Aluminum salts (aluminum hydroxide, aluminum phosphate, or potassium aluminum sulfate) are used as adjuvants, substances added to a vaccine to enhance and strengthen the immune system's response. Aluminum is naturally present in our environment, including air, food, earth and water, and presents little risk to people. The safety of aluminum salts has been established over the past 70 years, with millions of people being vaccinated with aluminum-containing vaccines.

### Example: Squalene

Squalene is a naturally occurring substance often found in plants, animals and humans, as well as foods and cosmetics. It is a compound produced by the liver and circulates freely throughout the bloodstream. Squalene has been added as an adjuvant to some seasonal influenza vaccines in Canada to increase the immune response and improve their efficacy for certain age groups.

**Vaccine residuals** are substances that are added as part of the production process to make the vaccine, but are removed from the final product.

### Example: Formaldehyde

Formaldehyde is sometimes used in the manufacturing process of vaccines to inactivate viruses and toxins. However, it is mostly removed during the purification process. Formaldehyde occurs naturally in the human body and helps with metabolism. There is approximately ten times the amount of formaldehyde in a baby's body at any time than there is in a vaccine.

## **Q: Will multiple injections overwhelm the immune system?**

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No. Every day our bodies come into contact with millions of germs, causing our immune systems to work continuously to protect us. Therefore, exposure to antigens (parts of weak or dead viruses or bacteria) in vaccines is easily handled by our immune systems.

In fact, our immune system needs to be challenged continually to stay vigorous. Modern biotechnology has reduced the number of antigens in today's vaccines. For example, in 1980 the diphtheria, tetanus and acellular pertussis (DTaP) vaccine had 3017 antigens. At present, infants receiving recommended vaccines starting at two months of age come into contact with only 34 antigens – just 34 antigens among the millions handled every day by our immune systems.

## **Q: Can you get sick from vaccines?**

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No. vaccines cannot make you sick and you cannot get the disease from the vaccine. Most vaccines do not contain live virus, and those vaccines that do contain live viruses cannot make you sick. Vaccines that have live viruses are severely weakened to the point that is enough to trigger an immune response, but not to cause any illness.

## **Q: Do vaccines cause severe reactions?**

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Just like any medication, vaccines can cause some reactions.

Some people can experience mild reactions from vaccines, such as:

- pain, redness or swelling at the injection site
- mild fever after the vaccination

Depending on the vaccine received, some people may also experience a mild rash, fatigue and aches. All these are common reactions and resolve in a few days.

Severe reactions, such as an allergic reaction to a vaccine, are rare. If you or your child has had a serious allergic reaction to a previous dose of a vaccine, talk to your healthcare provider.

## **Q: Do vaccines cause autism?**

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No. Vaccines do not cause autism.

Medical researchers and scientists around the world have not found a link between vaccines and autism. The study that had initially reported a link between the measles-mumps-rubella (MMR) vaccine and autism was retracted in 2011.

Evidence-based reviews performed by the U.S. Institute of Medicine (IOM) have rejected any causal associations between the measles-mumps-rubella (MMR) vaccine and autism spectrum disorders in children. In addition to these reviews, a Danish research team studied children born between 1991 and 1998 (537,303 children) and concluded that there is no difference in the rate of autism between vaccinated and unvaccinated children.

Some speculation has tried to link thimerosal (a preservative added to multi-dose vaccines to protect vaccines from contamination with germs) in the MMR vaccine to autism, but the MMR vaccine routinely used in Canada has never contained thimerosal. DTaP, polio and Hib vaccines have not contained this preservative since 1997-98.

Although the reason for the increase in autism is not yet conclusively known, one explanation may be the broader definition and inclusion of many more behaviours and learning disorders within autistic spectrum disorders.

### Q: What is community immunity?

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Immunizations protect not only the people who get immunized – they protect the people around them, too.

When most of the people in a community have been immunized against a contagious disease, it greatly reduces the spread of disease and the chance of an outbreak of that disease. This is called ‘community immunity’, or ‘herd immunity’.

If fewer people get immunized, it will be much easier for a contagious disease to spread. And diseases that may not be serious for adults can do serious harm to small children.

Community immunity protects newborns who are too young to be immunized, people who cannot be vaccinated for medical reasons (immunocompromised, organ transplants, cancer treatment, allergic reactions), and people with weaker immune systems, such as the elderly. For these groups, ‘community immunity’ is vital.

Getting immunized, and immunizing your children, is not just about personal protection: it’s also about community protection.

### Q: Are childhood immunizations safe?

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Vaccines are safe, and the immunization schedule is safe.

The routine childhood immunization schedule is based on scientific evidence, recommended by the [National Advisory Committee on Immunization](#), and supported by Immunize Canada’s member organizations.

The recommended schedule is designed to protect children before they are exposed to vaccine-preventable diseases. The earliest and safest time for your child’s routine immunizations to begin is at the age of 2 months. Some vaccines need 2 or 3 doses before they can offer full protection, so it is important to begin early to provide optimal protection.

While it is true that newborn babies are immune to some diseases (since they receive antibodies from their mothers), this immunity lasts only a few months after the baby is born. There are many serious vaccine-preventable diseases for which babies do not receive protective antibodies from their mothers: diphtheria, whooping cough, polio, tetanus, hepatitis B, and *Haemophilus*

*influenzae* type b. It is important to vaccinate young children before they are exposed to these diseases.

Delaying vaccines is not recommended; it can be risky to your child's health. Vaccines work best when they are given on time, including all recommended doses.

### **Follow the recommended immunization schedule for your province or territory.**

Routine vaccination is offered at no charge to Canadians, but schedules may differ among provinces and territories. Click [here](#) to learn more about the recommended schedule for your province or territory.

### **Q: Do vaccines contain human cells or tissues?**

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No. Vaccines do not contain human cells, blood or tissue.

Human cell lines may be used in the early stages of production to grow viruses for vaccine production. All cells, however, are removed during the purification stage of vaccine development; therefore, there are no human cells in the actual vaccine that you receive or your child receives.

Human albumin is derived from screened blood donors. It is currently used in very small quantities to grow viruses that can then be used in live-virus vaccines such as MMR or MMRV. Once viruses are harvested in the lab, albumin is removed. Recombinant (man-made) albumin is used as a stabilizer in some vaccines.

### **Q: Where can my family and I be vaccinated?**

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Vaccination services are offered by family physicians, paediatricians, pharmacists (services may vary across jurisdictions), local public health offices and some walk-in clinics.

If you are travelling outside Canada, contact a [travel health clinic](#) or public health office in your area for more information.

### **Q: Where can I access my immunization record?**

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Contact your health care provider or local public health office to get a copy of your immunization records.

If you do not already have a card or booklet to keep track of your immunizations, ask your health care provider or local public health office if they provide these. You can also download the [CANImmunize](#) app to track your immunizations.

It is your responsibility to keep your own record of vaccines you have received. Immunize Canada does not keep records of immunizations.

## Q: What are homeopathic ‘vaccines’ or ‘nosodes’?

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Some complementary health care professionals offer homeopathic ‘vaccine alternatives’ or ‘nosodes’.

According to Health Canada, “Nosodes are not and never have been approved by Health Canada to be vaccine alternatives, but have been promoted and used for such purposes by some complementary health care professionals and anti-vaccination advocates. No homeopathic product should be promoted as an alternative to vaccines because there are no substitutes for vaccines. Children given nosodes instead of vaccinations are at risk of developing serious and potentially fatal childhood illnesses such as measles, mumps, rubella, polio, whooping cough, etc. Vaccination is the best way to prevent such serious diseases by protecting yourself, your family and your community.”

Immunize Canada. [Read. Learn. Understand. False claims about homeopathic nosodes.](#)

Government of Canada. [Information on Homeopathic Products.](#)

Canadian Paediatric Society. Position paper: [Nosodes are no substitute for vaccines.](#)

*Immunize Canada, 2018*