

“I got AstraZeneca for my first dose. Which vaccine should I get for my second?”

A guide to help you make an informed decision about your second Covid-19 vaccination.

Developed by a group of doctors, pharmacists, scientists, and patients in Canada to make it easier to understand the evidence and expert guidance.

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Why are we talking about this?

If you had AstraZeneca for dose 1, you now have a choice. You can get AstraZeneca for dose 2 or you can get a dose of Moderna or Pfizer instead. Moderna and Pfizer are *mRNA vaccines* and are very similar. AstraZeneca is from another group of vaccines called *viral vector vaccines*.

For this guide, we are sharing expert advice from the National Advisory Committee on Immunization (NACI), the Public Health Agency of Canada, and Health Canada. You can feel confident that you have the most up-to-date science-based information to make your decision.

1. Protection after two doses

The most important decision is to get a second dose of any Covid-19 vaccine. Dose 2 will give you stronger and longer lasting protection from Covid-19. Two doses of AstraZeneca are very effective at preventing serious illness from the original Covid-19 and the early variants.

Early studies show that people generate a very good immune response (measured by antibodies in their blood) when Moderna or Pfizer are used after AstraZeneca. We have used different vaccines for boosters in the past for other viruses like hepatitis A, influenza, and polio. Mixing vaccine types is safe and isn't linked with any long-term side effects. This strategy is effective and suggests that a second dose of Moderna or Pfizer is at least as protective as two doses of AstraZeneca.

2. Protection against new variants

The Delta variant first discovered in India is spreading quickly in Canada. Two vaccine doses protect you against Delta much better than one dose. Two doses of Moderna or Pfizer appear to offer more protection against symptomatic infection from Delta than two doses of AstraZeneca. If you had AstraZeneca for dose 1, we don't know yet if getting Moderna or Pfizer for dose 2 will give you better protection from Delta or future variants.

3. Risk of blood clots

AstraZeneca has been linked with a very rare but serious blood clotting disease called *Vaccine Induced Thrombotic Thrombocytopenia*, or VITT. VITT can be fatal. According to reports from several countries including Canada, there are around 17 cases of VITT for every million people given dose 1 of AstraZeneca. For dose 2, the risk of VITT is estimated to be 2 for every million vaccinated. These estimates may change as more people around the world have dose 2 and we learn more. The Moderna and Pfizer vaccines do not cause VITT.

4. Side effects

It is common to have side effects like a sore arm, fatigue, headache, fever, or sore muscles after AstraZeneca, Moderna, or Pfizer. This is a sign your immune system is working to build protection. We don't know yet if you will have fewer or more side effects if you choose Moderna, Pfizer or AstraZeneca for dose 2.

5. Availability

Canada is currently receiving much more Moderna and Pfizer vaccine than AstraZeneca. This is expected to continue all summer. Much of the global supply of AstraZeneca is being used elsewhere in the world. It may be easier and faster to get Moderna or Pfizer for dose 2.

Understanding the research on using two different Covid-19 vaccine types.

What is known about having AstraZeneca for dose 1 and dose 2?

The United Kingdom (UK) has one of the largest vaccine programs in the world. Real-world data from Public Health England shows that two doses of AstraZeneca are 66% effective in protecting people from a mild, moderate or severe Covid-19 infection.¹ This means they lower a person's chances of getting Covid-19 by 66%. Two doses of Moderna and Pfizer are 93% effective.

Researchers at the University of Edinburgh in Scotland also found that 1 dose of AstraZeneca or Pfizer is 90% effective at preventing people from getting sick enough from COVID-19 that they need to go to the hospital.² Another study from the UK of 150 000 people over age 70 found that 1 dose of AstraZeneca or Pfizer was 80% effective at preventing people from needing hospital care.³

More recently, the Delta variant has spread rapidly in the UK. It is spreading rapidly in Canada too. A new study from the UK suggests one dose of AstraZeneca is 33% effective against symptomatic infection from the Delta variant.⁴ Two doses are 60% effective. The same study showed one dose of Pfizer is 33% effective and two doses of Pfizer are 88% effective against symptomatic infection from the Delta variant. This means that to protect yourself from the Delta variant, it is very important to get two doses.

There is also a risk of the severe blood clotting syndrome, VITT, with AstraZeneca. The current estimate is 2 cases of VITT for every million second doses of AstraZeneca. This may change.

What is known about the effectiveness of having AstraZeneca for dose 1 and Moderna or Pfizer for dose 2?

On June 1, 2021, the National Advisory Committee on Immunization (NACI) advised that Canadians who had AstraZeneca for dose 1 have the option to get Moderna or Pfizer for dose 2.⁵

NACI's advice was partly based on early results from the CombiVacS study in Spain.⁶ CombiVacS enrolled over 600 people who had AstraZeneca for dose 1. They gave two-thirds of participants Pfizer for dose 2, and a control group of 232 people did not receive a second dose yet. Early results found that a dose 2 using Pfizer increased the amount of antibodies generated after 1 dose of AstraZeneca. Many scientists believe this is a sign the combination of AstraZeneca and Pfizer (or Moderna) works well.

Recently, a study in Germany enrolled 340 healthcare workers who had AstraZeneca or Pfizer for dose 1 and gave them Pfizer for dose 2.⁷ Early results show that the AstraZeneca-Pfizer combination gives a similar immune response against many of the variants compared to 2 doses of Pfizer. These results would probably be the same or similar if dose 2 had been Moderna.

There is a larger study in the UK called Com-COV. Com-COV enrolled 800 people and is looking at the benefits and risks of combining AstraZeneca and Pfizer. The results will be reported soon.

¹<https://www.gov.uk/government/news/vaccines-highly-effective-against-b-1-617-2-variant-after-2-doses>

²<https://www.ed.ac.uk/usher/breathe/latest/first-dose-vaccine-effectiveness-update>

³<https://www.bmj.com/content/373/bmj.n1088>

⁴<https://www.medrxiv.org/content/10.1101/2021.05.22.21257658v1>

⁵<https://www.canada.ca/content/dam/phac-aspc/documents/services/immunization/national-advisory-committee-on-immunization-naci/naci-rapid-response-interchangeability-authorized-covid-19-vaccines-en.pdf>

⁶<https://www.isciii.es/Noticias/Noticias/Paginas/Noticias/Presentaci%C3%B3n-resultados-preliminares-CombivacS.aspx>

⁷<https://www.medrxiv.org/content/10.1101/2021.06.01.21258172v1.full.pdf>

What is known about the safety of having Moderna or Pfizer for dose 2?

Scientific studies are key to making sure that vaccines are safe and effective. Real world experience is also important. Many countries around the world are mixing vaccinations with good effects like lower rates of Covid-19 and fewer people needing hospital care. So far, their experience does not suggest any more risk from choosing a different vaccine for dose 2.

You may have more, the same or fewer short term side effects from a dose 2 of Moderna or Pfizer compared to a dose 1 of AstraZeneca. The Com-COV study in the UK showed that people who had AstraZeneca followed by Pfizer 4 weeks later had more side effects than those who had 2 doses of AstraZeneca.⁸ Side effects lasted for 1 - 2 days and included tiredness, fever, and achy muscles. Side effects resolved with rest and over-the-counter medicines. No one needed hospital care. The Spanish and German studies gave the second dose 8 - 12 weeks later. The side effects were similar for people who got AstraZeneca for dose 1 and AstraZeneca or Pfizer for dose 2.

Vaccines help train your immune system to recognize and fight the virus that causes Covid-19. As the immune system starts making antibodies from the vaccine, it is normal to have side effects like the ones reported in these studies. It is like being sore after a good workout – your immune system is learning a new exercise! These expected side effects may last 1 to 3 days.

Every person's immune system is different. Some people have stronger side effects. Others have milder side effects and some people have no side effects at all. It is important to know that these side effects mean the vaccine is working as it should.

Why is it okay to “mix and match” vaccine brands?

“Mixing and matching” means you use one brand or vaccine type for dose 1 and a different vaccine brand or type for dose 2 or later. There is good evidence for mixing and matching vaccine brands from scientific studies and real-world experience. It can be done when there are problems with supply, when a rare but serious side effect is identified, or to get a stronger immune response. It is generally safe and effective.

Similar to AstraZeneca, a rare but serious side effect was identified with the oral polio vaccine in the 1990s. Canadians who needed 4 doses were switched to an injectable polio vaccine. This worked well and was safe. Hepatitis A also uses a 2-dose vaccine. Sometimes, when a brand is used for dose 1 but not available for dose 2, another brand will be used.

Other countries are using a mix-and-match strategy for Covid-19 vaccines, too. For example, in Norway people who received AstraZeneca for dose 1 will be given Moderna or Pfizer for dose 2.

When is the best time to get dose 2?

The original AstraZeneca, Moderna, and Pfizer clinical trials separated dose 1 and dose 2 by 3 - 4 weeks. The 3 - 4 week timing was chosen to finish the trials as fast as possible to get a vaccine and end the pandemic.

Newer research from the AstraZeneca trials showed that people had better protection if dose 2 was given between 8 - 12 weeks. Previous research on Pfizer found that a delayed dose of 8 weeks may also offer better protection. This is also true of many other vaccines. In part, that's why NACI advised Canada to delay the second dose to 16 weeks for all Covid-19 vaccines. A delayed dose 2 would allow more Canadians to get some protection quickly while still getting a good benefit from dose 2.

⁸[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(21\)01115-6/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)01115-6/fulltext)

Now that the Delta variant is spreading, it may be better to get full protection faster. Having an earlier second dose will result in strong protection much sooner, even if waiting a few weeks longer would mean slightly stronger protection.

The vaccine you get may depend on where or how fast you want to get dose 2. For example, if you work in a crowded space or live in a Covid-19 “hot-spot” you might want to get dose 2 as soon as possible. If you work from home, are relatively isolated, and don’t have any personal risk factors (for example, a chronic disease), you may feel you can wait.

If I get Moderna or Pfizer, will I need more than two doses?

The NACI guidance for Canada says that you are “fully immunized” once you have dose 1 of AstraZeneca and dose 2 of AstraZeneca, Moderna or Pfizer. Two doses of Moderna or Pfizer are not needed if you already had dose 1 of AstraZeneca. This approach is being used in other countries as well.

Many countries have travel and activity restrictions based on vaccination status, often referred to as a “vaccine passport”. Each country will have different guidelines, but many of them say that two doses of any approved vaccine is considered fully immunized.

Other things to consider.

The most important thing is to get dose 2. It can be AstraZeneca, Moderna, or Pfizer. As you make your choice, think about what is most important to you.

How did I feel after dose 1 of AstraZeneca?

- Many people felt worried about the risk of severe blood clots and do not want to worry again.
- Many people had side effects such as a sore arm, fatigue, headache, body aches, and chills.
- It is not known if there will be more, the same, or fewer side effects if you get a dose 2 of Moderna or Pfizer.
- You may want to plan for an easy day after dose 2 with any Covid-19 vaccine.

How long will I have to wait for dose 2?

- Canada is getting a large supply of Pfizer and Moderna right now.
- Most people should be able to get a dose 2 of a vaccine by 12 weeks after dose 1, including AstraZeneca, Moderna, or Pfizer.
- Older adults and other high risk groups may be able to get a dose 2 of AstraZeneca, Moderna, or Pfizer now.
- In some places you will be able to get a dose 2 with AstraZeneca faster than if you choose Moderna or Pfizer

How do I decide between Moderna and Pfizer?

- Moderna and Pfizer are essentially the same vaccine and are mRNA (messenger RNA) vaccines.
- Both Moderna and Pfizer provide similar protection against Covid-19.
- Both Moderna and Pfizer have similar side effects.
- Differences in storage requirements mean Pfizer is often given at large vaccine centres and busy pharmacies while Moderna is more often available at primary care clinics and smaller or rural pharmacies.
- Get whichever of Moderna or Pfizer that is easiest or fastest for you.

Being fully vaccinated offers great immune protection from Covid-19, including all the variants studied so far. For 2-dose vaccines like AstraZeneca, Moderna, and Pfizer, “fully vaccinated” means getting 2 doses, even if dose 2 is a different brand than dose 1. The important thing to remember is that a second dose with AstraZeneca, Pfizer or Moderna is better than no second dose at all.

If you have questions or need to discuss further, please contact your doctor, nurse practitioner, or pharmacist before you book your vaccine appointment.

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