

Date: April 16, 2021

All of the information included in this post is reflective of current knowledge from credible sources, as of the date shown above. These sources include; Toronto Public Health, Ontario Health, as well as the Government of Canada website. Other sources that were referenced include the Pfizer Canada and Moderna websites, as well as the AstraZeneca and Johnson & Johnson websites. Reliable news sources were also consulted for this post.



### **COVID-19 Vaccines Explained**

Currently, there are four COVID-19 vaccines that have been approved for use in Canada, however only three have been administered in the country so far. The Pfizer, Moderna and AstraZeneca vaccines have all been made available to prioritized groups of the Canadian public, however the Johnson & Johnson vaccine has never been used in the country. This is because a shipment of the vaccine has never arrived to Canada.

#### **Pfizer and Moderna**

The Pfizer and Moderna vaccines are very similar, in that they are both mRNA vaccines. This means that these vaccines deliver genetic instruction for our cells to make viral proteins themselves. The body will then begin to train itself to fight these proteins, which results in the body building immunity to the same protein found in COVID-19.

Both the Pfizer and Moderna vaccines are very effective against the COVID-19 virus. Clinical trials found Pfizer's vaccine to be 95 percent effective, while Moderna's vaccine was a close second, with an effectiveness of 94.1 percent in clinical trials.

The Pfizer and Moderna vaccines require two doses to be fully immunized. The recommended amount of time between doses is 21-28 days. The Ontario government is currently delaying second doses of all vaccines, for up to 4 months, in order to get one dose out to more of the population.

For both the Pfizer and Moderna vaccines, no severe or life-threatening side effects have been reported.

The Pfizer and Moderna vaccines have been the most commonly distributed in Canada, and are being administered at Ontario hospitals and COVID-19 vaccine clinics only. These vaccines are not being administered at Ontario pharmacies. To book an appointment to receive a dose of the Pfizer or Moderna vaccine, register using the following link once eligible: <https://covid-19.ontario.ca/book-vaccine/>

## **AstraZeneca**

The AstraZeneca vaccine works differently than the mRNA vaccines. This is because it was built using a kind of virus called an adenovirus, which causes colds in chimpanzees. This type of vaccine represents a newly approved method of vaccination that has been studied for many years. The adenovirus is altered to carry a gene for the coronavirus protein, which then trains a person's immune system to recognize the actual coronavirus if it enters the body. This vaccine requires two doses for full immunization.

In the most recent clinical trial done in the United States, the AstraZeneca vaccine showed an efficacy rate of 76 percent against COVID-19. This is lower than the Pfizer and Moderna vaccines, however AstraZeneca states that their vaccine is 100 percent effective against severe or critical forms of the disease. This means that it helps to prevent severe symptoms of the virus.

In recent news, it has been reported that the AstraZeneca vaccine has a small risk of causing severe blood clots. There have been a few people who died as a result of the clots, and therefore the vaccine is currently being investigated by health agencies around the world. The rare type of blood clotting that the vaccine can cause is called cerebral venous sinus thrombosis (CVST), and it has been found to happen most commonly in younger women who receive the shot. There are currently no known ties between the vaccine and why a person develops a blood clot, and this is under investigation.

The AstraZeneca vaccine is currently only being distributed at select Ontario pharmacies, and only to people who are 55 and older. To register for an AstraZeneca vaccine, you are able to make an appointment with a pharmacy, and a full list can be found here: <https://covid-19.ontario.ca/vaccine-locations>

## **Johnson & Johnson**

The Johnson & Johnson (J&J) vaccine uses the same technology as the AstraZeneca vaccine, however J&J uses a human adenovirus, or cold virus, while AstraZeneca uses a chimpanzee version. The J&J vaccine only requires one dose, and it has shown to be the least effective of the vaccines approved by Health Canada in fighting off COVID-19. Its efficacy rate in clinical trials stands at 66 percent.

Canada has not yet received a shipment of the J&J vaccine, however it has been approved for use in the country. In the U.S., there have been recent reports of severe blood clotting as a result from this vaccine. U.S. health regulators paused its use of the vaccine in the country after six women between the ages of 18 and 48 experienced this side effect, and one of them died. Health Canada has said that it is following this issue closely, and that it will be reviewing data on the vaccine as it gets released.

## **Vaccine Distribution**

Currently, Canada is receiving more deliveries of the Pfizer vaccine than any other vaccine. Scheduled deliveries of the Pfizer vaccine have been arriving to Canada on a weekly basis, and Canada expects to continue receiving over one million doses of the vaccine every week until the

end of May. Greater quantities of the vaccine are expected to be delivered by June and July. Overall, Canada has secured 48 million doses of the Pfizer vaccine to be delivered over time, which is enough to fully vaccinate more than half of the population.

Moderna has just announced that they will be cutting delivery supply of their vaccine to Canada by half through to the end of April. The expected delivery was 1.2 million doses by the end of the month, and this has now been reduced to 650,000. Moderna has said that this is due to a slower than anticipated ramp up of their production capacity.

There is uncertainty about future shipments of the AstraZeneca and Johnson & Johnson vaccines, as neither have set schedules for delivery. Currently, there have been 2.3 million doses of the AstraZeneca vaccine arrive to the country, as a result of smaller deals Canada has made with COVAX, India and the United States, rather than the main contract with AstraZeneca. AstraZeneca has committed to delivering one million doses of the vaccine sometime in June. Johnson & Johnson deliveries are expected to begin arriving in Canada by the end of April.

### **Delay in the Second Dose**

Ontario made the announcement several weeks ago that all appointments for second doses of any vaccine would be delayed by four months. This was done in order to give more people in the province one dose of a vaccine, and this applies to all vaccines being distributed. The province has made statements about this guideline possibly changing once there is more supply, however no further information on this has been announced.

It is important to note that although this is not ideal, as clinical trials studied a second dose that was received within 21-28 days, one dose of the vaccine is still very effective in preventing severe symptoms of COVID-19. Recent studies in the United Kingdom and Israel have shown that receiving one dose of the vaccine can have 80 percent efficacy against the virus, and that it can prevent severe illness and death.

**Sources:**

<https://globalnews.ca/news/7755742/covid-vaccine-blood-clot-risks-comparison/>

<https://globalnews.ca/news/7568788/canada-covid-19-differences-between-vaccines/>

<https://www.cbc.ca/news/world/astrazeneca-trial-efficacy-1.5963123>

<https://www.cbc.ca/news/health/vaccines-covid-blood-clots-research-1.5989719>

<https://www.canada.ca/en/health-canada/services/drugs-health-products/covid19-industry/drugs-vaccines-treatments/vaccines/janssen.html>

[https://covid-19.ontario.ca/covid-19-vaccines-ontario?qclid=Cj0KCQjw6-SDBhCMARIsAGbI7UhOMibfs\\_KOFYBGZSjX72b4jtHPJ7CuuLKLOYmdlTIG9v-j-s\\_gLUEaAh1HEALw\\_wcB&gclid=aw.ds#covid-19-immunization-program](https://covid-19.ontario.ca/covid-19-vaccines-ontario?qclid=Cj0KCQjw6-SDBhCMARIsAGbI7UhOMibfs_KOFYBGZSjX72b4jtHPJ7CuuLKLOYmdlTIG9v-j-s_gLUEaAh1HEALw_wcB&gclid=aw.ds#covid-19-immunization-program)

<https://www.astrazeneca.com/covid-19.html>

<https://www.inj.com/johnson-johnson-statement-on-cdc-advisory-committee-meeting-on-company-covid-19-vaccine>

<https://www.pfizer.ca/statement-pfizer-supply-additional-eight-million-vaccine-doses-canada>

<https://www.modernatx.com/mrna-technology/science-and-fundamentals-mrna-technology>

<https://www.toronto.ca/home/covid-19/covid-19-protect-yourself-others/covid-19-vaccines/>