A Comparison Chart of Authorized COVID-19 Vaccines in Canada

(As of March 10, 2021)

Product Name	Pfizer BioNTech	Moderna	AstraZeneca [1]	Janssen (J&J)
Date of authorization in Canada	December 9, 2020	December 23, 2020	February 26, 2021	March 5, 2021
Doses ordered for Canada	Up to 76 M	44M	22M	Up to 38M
Type of vaccine	mRNA (Messenger ribonucleic acid)	mRNA (Messenger ribonucleic acid)	Non-replicating Chimpanzee adenovirus viral vector	Non-replicating Adenovirus 26 viral vector
How it works	mRNA vaccines teach cells how to make a protein that will trigger an immune response without using the live virus that causes COVID-19. Once triggered, our body then makes antibodies. These antibodies help us fight the	See BioNTech	Viral vector-based vaccines use a harmless virus, such as an adenovirus, as a delivery system. This "vector" virus is not the virus that causes COVID-19. Adenoviruses are among the viruses that can cause the common cold. There are many different	Viral vector-based vaccines use a harmless virus, such as an adenovirus, as a delivery system. This "vector" virus is not the virus that causes COVID-19. Adenoviruses are among the viruses that can cause the common cold. There are many

[1] Canada has authorized 2 manufacturers of this vaccine:

- AstraZeneca (brand name AstraZeneca COVID-19 Vaccine)
- Verity Pharmaceuticals and Serum Institute of India (SII) in collaboration with AstraZeneca (brand name COVISHIELD Vaccine)

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	infection if the real virus does enter our body in the future. 'RNA' stands for ribonucleic acid, which is a molecule that provides cells with instructions for making proteins. Messenger RNA (mRNA) vaccines contain the genetic instructions for making the SARS-CoV-2 spike protein, which is found on the surface of the virus that causes COVID-19. When a person is given the vaccine, their cells will read the genetic instructions like a recipe and produce the spike protein. After the protein piece is made, the cell breaks down the instructions and gets rid of them. The cell then displays the protein piece on its surface. Our immune system recognizes that the protein doesn't belong there and begins building an immune response and making antibodies.		types of adenoviruses, and many have been used as delivery systems for other vector-based vaccines for decades. When a person is given the vaccine, the vector virus contained within the vaccine produces the SARS-CoV-2 spike protein. This protein is found on the surface of the virus that causes COVID-19. This protein will not make you sick. It does its job and goes away. Through this process, the body is able to build a strong immune response against the spike protein without exposing you to the virus that causes COVID-19.	different types of adenoviruses, and many have been used as delivery systems for other vector-based vaccines for decades. When a person is given the vaccine, the vector virus contained within the vaccine produces the SARS-CoV-2 spike protein, which is found on the surface of the virus that causes COVID-19. This protein will not make you sick. It does its job and goes away. Through this process, the body is able to build a strong immune response against the spike protein without exposing you to the virus that causes COVID-19.
Authorized ages for use	16 years of age and older May be offered to individuals 12 to 15 years of age if a risk assessment deems that the benefits of vaccination outweigh the potential risks for the individual (e.g., where the risk of severe outcomes of COVID-19 and/or risk of exposure to SARS-CoV-2 is high) and if	18 years of age and older	18 years of age and Older Learn more here.	18 years of age and older

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	informed consent includes discussion about the insufficient evidence in these populations.			
Dose	0.3 mL (30 mcg of mRNA)[i]	0.5 mL (100 mcg of mRNA)	0.5 mL (5 x 1010 viral particles)	0.5 mL
Schedule [ii]	2 Doses, 3 weeks apart	2 Doses, 4 weeks apart	2 Doses, 4 to 12 weeks apart	Single dose
Route of Administration	IM	IM	IM	IM
Primary storage requirements pre-puncture	-80°C to -60°C[iii]	-25°C to -15°C[iv] [iii]	+2ºC to +8ºC	+2ºC to +8ºC
Storage requirements pre-puncture [iii]	120 hours (5 days) at +2°C to +8°C AND/OR 2 hours up to +25°C	30 days at +2°C to +8°C AND/OR 12 hours at +8°C to +25°C	+2ºC to +8ºC	+2ºC to +8ºC
Diluent	Yes	No	No	No
Usage limit post-puncture	6 hours at +2°C to +25°C[v]	6 hours at +2°C to +25°C	6 hours at room temperature (up to +30ºC) or 48 hours at +2ºC to +8ºC.	3 hours at room temperature (up to +25ºC OR 6 hours at +2ºC to +8ºC
Formats available	Multi-dose vial (6 doses)[i] preservative-free	Multi-dose vial (10 doses), preservative-free	Multi-dose vial (8-and 10-dose presentations), preservative-free	Multi-dose vial (5 doses), preservative-free

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Efficacy	95% beginning 1 week after the second dose[vi]	94.1% beginning 2 weeks after the second dose[vi]	62% beginning 2 weeks after the second dose[vi]	66% beginning 2 weeks after vaccination[vi]
How long before significant protection?	For the vaccine to work best, you need to get 2 doses: a single dose and then a second dose 21 days later[vii]. Immunity develops over time. It takes about 2 weeks to develop significant protection against COVID-19. For the greatest protection, you will need the second dose. Based on studies in about 44,000 participants, the Pfizer-BioNTech COVID-19 vaccine was 95% effective in preventing COVID-19 beginning 1 week after the second dose.	For the vaccine to work best, you need to get 2 doses: a single dose and then a second dose one month apart[vii] Immunity develops over time. It takes about 2 weeks to develop significant protection against COVID-19. For the greatest protection, you will need the second dose. Based on studies in about 30,000 participants, the Moderna COVID-19 vaccine was 94.1% effective in preventing COVID-19 beginning 2 weeks after the second dose.	For the vaccine to work best, you need to get 2 doses: a first dose and then a second dose 4 to 12 weeks later[vii] Immunity develops over time. It takes about 2 weeks to develop significant protection against COVID-19. For the greatest protection, you will need the second dose. The AstraZeneca COVID-19 vaccine showed an effectiveness of about 62% in preventing symptomatic COVID-19 disease beginning 2 weeks after the second dose. This effectiveness rate is based on an analysis of results from participants who had received the 2-dose regimen that will be used in Canada.	Based on studies in about 43,000 participants, the Janssen COVID-19 vaccine was 66% effective in preventing symptomatic COVID-19 disease beginning 2 weeks after vaccination. Immunity develops over time. You won't develop significant protection against COVID-19 for at least 2 weeks.
Efficacy against Variants of Concern	COVID-19 mRNA vaccines have shown promising early results against variant B.1.1.7. As effectiveness of the first dose against other variants of concern is emerging, ongoing monitoring will be required.	COVID-19 mRNA vaccines have shown promising early results against variant B.1.1.7. As effectiveness of the first dose against other variants of concern is emerging, ongoing monitoring will be required.	AstraZeneca vaccine has shown promising early results against variant B.1.1.7. As effectiveness of the first dose against other variants of concern is emerging, ongoing monitoring will be required.	Unknown
Side effects	Pain at site of injection, body chills, feeling tired and feeling feverish.	Pain at site of injection, body chills, feeling tired and feeling feverish.	Pain at site of injection, body chills, feeling tired and feeling feverish.	Pain at site of injection, body chills, feeling tired and feeling feverish.

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Serious side effects	50 cases of anaphylaxis in people who received the vaccine, mostly women. Four cases of Bell's palsy, a type of temporary facial paralysis, reported in people who received the vaccine. This is not more than would be expected in the general population.	21 cases of anaphylaxis in people who received the vaccine, all in women. Four cases of Bell's palsy reported in the clinical trials including 3 in the vaccine group, and 1 in the placebo group. This is not more than would be expected in the general population.	Four total serious side effects, including two cases of transverse myelitis. Health Canada is aware of reports of adverse events in Europe following immunization with the AstraZeneca COVID-19 vaccine, but emphasize the benefits of the vaccine continue to outweigh its risks. Health Canada authorized the vaccine based on a thorough, independent review of the evidence and determined that it meets Canada's stringent safety, efficacy and quality requirements. To date, no adverse events (including blood clots) related to the AstraZeneca COVID-19 vaccine, or the version manufactured by the Serum Institute of India, have been reported to Health Canada or the Public Health Agency of Canada.	One person went to the hospital for fever associated with the vaccine. Four other serious cases were not related to the vaccine. No serious cases of anaphylaxis were reported.
Pregnancy and lactation[viii]	Women who are pregnant or breastfeeding should be offered vaccination at any time during pregnancy if they are eligible and no contraindications exist.	Women who are pregnant or breastfeeding should be offered vaccination at any time during pregnancy if they are eligible and no contraindications exist.	Women who are pregnant or breastfeeding should be offered vaccination at any time during pregnancy if they are eligible and no contraindications exist.	Women who are pregnant or breastfeeding should be offered vaccination at any time during pregnancy if they are eligible and no contraindications exist.
Seniors 65+	Yes	Yes	Not recommended until more data.	Yes
Lowered immune function	May be offered if a risk assessment deems that the benefits of vaccination outweigh the potential risks for the individual (e.g., where the risk of severe outcomes of COVID-19 and/or risk of exposure to SARS-CoV-2 is high) and if informed consent includes discussion about the insufficient evidence in these populations.	May be offered if a risk assessment deems that the benefits of vaccination outweigh the potential risks for the individual (e.g., where the risk of severe outcomes of COVID-19 and/or risk of exposure to SARS-CoV-2 is high) and if informed consent includes discussion about the insufficient evidence in these populations.	May be offered if a risk assessment deems that the benefits of vaccination outweigh the potential risks for the individual (e.g., where the risk of severe outcomes of COVID-19 and/or risk of exposure to SARS-CoV-2 is high) and if informed consent includes discussion about the insufficient evidence in these populations.	May be offered if a risk assessment deems that the benefits of vaccination outweigh the potential risks for the individual (e.g., where the risk of severe outcomes of COVID-19 and/or risk of exposure to SARS-CoV-2 is high) and if informed consent includes discussion about the insufficient evidence in these populations.

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Autoimmune diseases	May be offered, if a risk assessment deems that the benefits of vaccination outweigh the potential risks for the individual (e.g., where the risk of severe outcomes of COVID-19 and/or risk of exposure to SARS-CoV-2 is high) and if informed consent includes discussion about the insufficient evidence in these populations.	May be offered, if a risk assessment deems that the benefits of vaccination outweigh the potential risks for the individual (e.g., where the risk of severe outcomes of COVID-19 and/or risk of exposure to SARS-CoV-2 is high) and if informed consent includes discussion about the insufficient evidence in these populations.	May be offered, if a risk assessment deems that the benefits of vaccination outweigh the potential risks for the individual (e.g., where the risk of severe outcomes of COVID-19 and/or risk of exposure to SARS-CoV-2 is high) and if informed consent includes discussion about the insufficient evidence in these populations.	May be offered, if a risk assessment deems that the benefits of vaccination outweigh the potential risks for the individual (e.g., where the risk of severe outcomes of COVID-19 and/or risk of exposure to SARS-CoV-2 is high) and if informed consent includes discussion about the insufficient evidence in these populations.
Allergies	People with a history of allergic reactions to vaccine ingredients including polyethylene glycol, and anyone with a history of allergic reactions to polysorbate.	People with a history of allergic reactions to vaccine ingredients including polyethylene glycol, and anyone with a history of allergic reactions to polysorbate.	Not yet available.	Anyone who's had a severe allergic reaction to an ingredient in the vaccine.
Vaccine ingredients	**Medicinal ingredient: mRNA** *Non-medicinal ingredients* • ALC-0315 = ((4-hydroxybutyl)azanediyl) bis(hexane-6,1-diyl)bis(2-hexyldecanoate) • ALC-0159 = 2-[(polyethylene glycol)-2000]-N,N-ditetradecylacetamide • 1,2-Distearoyl-sn-glycero-3-phosphocholine • cholesterol • dibasic sodium phosphate dihydrate • monobasic potassium phosphate • potassium chloride	**Medicinal ingredient: mRNA** *Non-medicinal ingredients* • 1,2-distearoyl-sn-glycero-3-phosphocholine (DSPC) • acetic acid • cholesterol • lipid SM-102 • polyethylene glycol (PEG) 2000 DMG • sodium acetate • sucrose • tromethamine • tromethamine hydrochloride • water for injection	**Medicinal ingredient: Adenovirus vector vaccine** *Non-medicinal ingredients* • disodium edetate dihydrate (EDTA) • ethanol • L-histidine • L-histidine hydrochloride monohydrate • magnesium chloride hexahydrate • polysorbate 80 • sodium chloride • sucrose • water for injection	**Medicinal ingredient: adenovirus vector vaccine** *Non-medicinal ingredients* • 2-hydroxypropyl-β-cyclodextrin (HBCD) • citric acid monohydrate • ethanol • hydrochloric acid • polysorbate-80 • sodium chloride • sodium hydroxide • trisodium citrate dehydrate • water for injection

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	• sodium chloride • sucrose • water for injection			

References:

Vaccines for COVID-19 (Government of Canada)

Recommendations on the use of COVID-19 vaccines (Government of Canada)

National Advisory Committee on Immunization: Statements and Publications (Government of Canada)

Vaccination Recommendations for Special Populations (Health Canada)

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[i] After dilution, one vial contains 6 doses of 0.3 mL each. However, vial labels and cartons may state that after dilution, a vial contains 5 doses of 0.3 mL. Information in the product monograph supersedes the number of doses stated on vial labels and cartons. Low dead-volume syringes and/or needles can be used to extract 6 doses from a single vial. If standard syringes and needles are used, there may not be sufficient volume to extract a 6th dose from a single vial. Refer to the product monograph available through Health Canada's Drug Product Database for choice of diluent, dilution instructions and type of syringes which can be used to extract 6 doses from a single vial.

[ii] Authorized schedule. For NACI recommendations on intervals between doses refer to Table 2 for details

[iii] Protected from light during storage

[iv] Do not store on dry ice or below -40ºC

[v] After dilution, vaccine must be used within 6 hours

[vi] It is important to note that it is **not possible to directly compare the efficacy of different vaccines to one another** at this time, as they were not directly compared within the clinical trials themselves. Each vaccine was studied in a separate trial conducted at different times, using different populations and conditions. In addition, given that the AstraZeneca and Janssen vaccines were studied in separate trials with different populations, the representation of various age groups is different which limits what we are able to conclude in terms of comparative efficacy. With all this in mind, here is a brief breakdown on efficacy data from the clinical trials with respect to age:

Adults 18 to 64 Years of Age: Clinical trials for both vaccines were limited to those aged 18 years or older.

- The Janssen vaccine was shown to be 66% effective overall in preventing moderate to severe COVID-19.

- The AstraZeneca vaccine was found to have an efficacy of 62% in generally preventing symptomatic COVID-19. The efficacy appears to be greater if there is a longer time period between the first and second doses.
- Both of these vaccines were found to confer significant protection against severe disease, hospitalization, and death — suggesting that even if you do get sick with COVID-19, you are likely not to become as severely ill.

65 Years and Above:

- The Janssen vaccine demonstrated consistent protection across all race and age groups, including adults 65 years of age or older. Almost 20% of the participants in the clinical trials were 65 years of age or older, and no differences in safety or efficacy were seen compared to the younger age groups.
- For the AstraZeneca vaccine, there was an insufficient number of clinical trial participants aged 65 years and older who contracted COVID-19 to confirm the extent of efficacy of this vaccine for this age group. However, real world data from other countries increasingly shows that the vaccine may be effective in older age groups with no safety concerns.

[vii] NACI rapid response: Extended dose intervals for COVID-19 vaccines to optimize early vaccine rollout and population protection in Canada: NACI recommended that in the context of limited COVID-19 vaccine supply, jurisdictions should maximize the number of individuals benefiting from the first dose of vaccine by extending the interval for the second dose of vaccine up to four months. **The impact on variants of concern** by extending the interval between doses is unknown, but there is currently no evidence that an extended interval between doses will either increase or decrease the emergence of variants of concern.

[viii] SOGC Statement on COVID-19 Vaccination in Pregnancy