

COVID-19 VACCINES: Talking to Patients

Additional resources:

- [SHA Website Frequently Asked Questions](#)
- [PrOTCT PLAN for the COVID-19 vaccination discussion](#)
Communications Cheat Sheet
- [Answering questions about COVID-19 vaccines: a guide for healthcare providers](#) Center for Effective Practice
- [CMPA Frequency Asked Questions about Vaccines](#)
- [19 To Zero](#) Tools for healthcare workers to advocate for safe behaviour and vaccination
- [AMA Resource- Be A Positive Vaccine Clinic](#)
- [Primary Care COVID Immunization Toolkit](#)

For complete information on the COVID-19 Vaccine in Canada:

[An Advisory Committee Statement \(ACS\) National Advisory Committee on Immunization \(NACI\) Recommendations on the use of COVID-19 Vaccines](#)

Vaccine FAQs

1. [Are the COVID-19 vaccines safe?](#)
2. [How do we know mRNA vaccines are safe considering this is the only mRNA vaccine to ever receive approval?](#)
3. [Can mRNA vaccines alter a person's DNA?](#)
4. [How do viral vector-based vaccines, like AstraZeneca Work?](#)
5. [Should I get the AstraZeneca vaccine if I am offered it?](#)
6. [Which COVID-19 vaccines are approved for use in Canada?](#)
7. [Are there differences between vaccination companies? – should patients wait for a vaccine if they feel a later one is better?](#)
8. [How effective are the approved COVID-19 Vaccines?](#)
9. [What are the side effects of the vaccine?](#)
10. [What about the long term effects of the vaccine?](#)
11. [Rollout plan: When can patients expect to be vaccinated?](#)
12. [Rollout plan: How is the vaccine being rolled out?](#)
13. [Rollout plan: How was the rollout plan developed?](#)
14. [Rollout plan: Where will patients be vaccinated?](#)
15. [When will I get my second dose?](#)
16. [How do we approach vaccination for our pregnancy and breastfeeding patients?](#)
17. [How do we approach vaccination for our immunocompromised patients?](#)
18. [How long after COVID infection should a patient wait to receive the vaccine?](#)
19. [Can we provide a Doctor's note indicating that our patient is high priority to receive the vaccine due to their medical conditions?](#)
20. [Can patients get multiple vaccines including the COVID vaccine at once?](#)
21. [Can you still carry and spread the virus if you've been vaccinated?](#)
22. [Will the vaccine still work if the virus mutates?](#)
23. [Why is immunization important?](#)
24. [What if a patient is allergic to ingredients in the COVID-19 vaccine?](#)
25. [Can COVID-19 vaccines cause infertility or miscarriage?](#)

26. [Can the COVID19 vaccine cause menstrual irregularities?](#)
27. [Can someone who has been vaccinated 'shed the virus' and put others at risk?](#)

1. Are the COVID-19 vaccines safe?

Yes, the vaccines are safe. Even though the overall development and approval timeline for the COVID-19 vaccines were quick, they still underwent the normal, rigorous, three-phase trials while maintaining the same standards in evaluating its safety and efficacy. The COVID-19 vaccine trials were primarily comprised of healthy adults aged 18 – 55 of varying ethnic backgrounds, although some elderly individuals with weakened immune systems were also included. (Doctors of BC, 2021)

Having safe and effective COVID-19 vaccines available will be an important tool to help with the long-term management of COVID-19. Health Canada is prioritizing the review of all COVID-19 drugs and vaccines.

With four vaccine options currently available in Saskatchewan, it's understandable that individuals want to ensure they have all the latest information available to them in order to make the decision on whether or not to be vaccinated. Health Canada authorized these vaccines after independent and thorough scientific reviews for safety, efficacy and quality. Canadians can feel confident the review process for each vaccine was rigorous and that there are systems in place to continue monitoring the safety and efficacy of COVID-19 vaccines after authorization.

Creating a new vaccine can take years. However, the development of vaccines for COVID-19 is progressing quickly for many reasons, including:

- advances in science and technology
- international collaboration among scientists, health professionals, researchers, industry and governments
- increased dedicated funding

(Government of Canada, 2020)

2. How do we know mRNA vaccines are safe considering this is the only mRNA vaccine to ever receive approval?

Researchers have been studying and working with mRNA vaccines for decades. Interest has grown in these vaccines because they can be developed in a laboratory using readily available materials. This means the process can be standardized and scaled up, making vaccine development faster than traditional methods of making vaccines (Centers for Disease Control and Prevention, 2020).

mRNA vaccines do not affect or interact with our DNA in any way.

- mRNA never enters the nucleus of the cell, which is where our DNA (genetic material) is kept.
- The cell breaks down and gets rid of the mRNA soon after it is finished using the instructions.

COVID-19 mRNA vaccines give instructions for our cells to make a harmless piece of what is called the "spike protein." The spike protein is found on the surface of the virus that causes COVID-19.

COVID-19 mRNA vaccines are given in the upper arm muscle. Once the instructions (mRNA) are inside the immune cells, the cells use them to make the protein piece. After the protein piece is made, the cell breaks down the instructions and gets rid of them.

Next, the cell displays the protein piece on its surface. Our immune systems recognize that the protein doesn't belong there and begin building an immune response and making antibodies, like what happens in natural infection against COVID-19.

At the end of the process, our bodies have learned how to protect against future infection. The benefit of mRNA vaccines, like all vaccines, is that those who are vaccinated gain this protection without ever having to risk the serious consequences of getting sick with COVID-19 (Centers for Disease Control and Prevention, 2020).

3. Can mRNA vaccines alter a person's DNA?

No.

Location – mRNA is active in the cytoplasm of a cell, whereas DNA is protected in the cell's nucleus. The mRNA can NOT enter the nucleus, so the two nucleic acids are never in the same place in the cell.

Process – mRNA is not DNA. So, if a person's DNA was going to be altered, the RNA would have to be made into DNA. This would require a special enzyme which only exists in some viruses. Coronaviruses are not one of them as they have only single-stranded RNA which means that when they enter into a cell's cytoplasm they don't need to be translated. Proteins (like the spike protein) can be made directly from the RNA.

Stability – mRNA is not very stable and can only stay alive in human cells for hours (Alberta Health Services, 2021).

4. How do viral vector-based vaccines, like Astra Zeneca and Johnson & Johnson Work?

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 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. (Government of Canada, 2021)

5. Should I get the Astra Zeneca vaccine if I am offered it?

Yes, the best vaccine is the vaccine being offered to you. If you have concerns about the Astra Zeneca vaccine talk to your primary care provider about the risks and benefits.

NACI recommends that AstraZeneca COVID-19 vaccine should not be used in adults under 30 years of age at this time while the safety signal of Vaccine-Induced Prothrombotic Immune Thrombocytopenia (VIPIT) following vaccination with AstraZeneca COVID-19 vaccine is investigated further. Rare, but serious blood clot side effects have been reported and NACI will continue to review evidence as it emerges, including evidence on mixed COVID-19 vaccine

schedules, to provide advice to public health programs on the potential for completing the series with other vaccine products.

The rate of this adverse event is still to be confirmed, however the risk of developing VIPIT is currently estimated at 4 in 1 million. Birth control pills have a risk of 900 in 1 million, and your risk of being hospitalized if you have COVID-19 is 147,000 in 1 million (Thrombosis Canada, 2021).

Further information on signs and symptoms of this adverse event and treatment can be found on [Health Canada's website](#).

6. Which COVID-19 vaccines are approved for use in Canada?

To date, four products are approved by Health Canada:

- [Pfizer-BioNTech](#) received approval on Dec. 9, 2020.
- [Moderna](#) received approval on Dec. 23, 2020.
- [AstraZeneca](#) received approval on February 26th, 2021.
- [Janssen Inc](#) received approval on March 5th, 2021.
- [Novavax Inc.](#) is currently under review.

7. Are there differences between vaccination companies? – should patients wait for a vaccine if they feel a later one is better?

As for all vaccines and treatments that are authorized in Canada, Health Canada will review the evidence and scientific data. They will then decide whether to authorize the COVID-19 vaccine and will only do so when the evidence shows that the vaccine:

- is safe, effective and of good quality and
- demonstrates that the benefits outweigh the risks

These measures will help make safe and effective vaccines and treatments available faster in Canada.

The vaccine you are offered is the best vaccine. All of the vaccines that we have available for use in Canada are safe and effective. There are of course differences between vaccine brands. You may even have a preference based on your comfort level or other considerations.

However, what we can say is that what is offered to you is the best one to keep you safe and protected as soon as possible, for as long as possible.

8. How effective are the approved COVID-19 Vaccines?

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. This means that people may not be fully protected against COVID-19 until at least 14 days after 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. This means that people may not be fully protected against COVID-19 until at least 7 days after the second dose (Government of Canada, 2020).

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 (Government of Canada, 2021).

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 (Government of Canada, 2021).

9. What are the side effects of the vaccine?

There might be some mild symptoms a day or two after receiving the vaccine. The most common side effects are localized pain or redness or swelling at the injection site. Other symptoms may include mild fever, chills or feeling tired. As with all vaccines, there's a chance that there will be a serious side effect, but these are rare. A serious side effect might be something like an allergic reaction.

All residents will be asked to report any adverse or unexpected reactions to their local public health nurse, a pharmacist, doctor, or nurse practitioner as soon as possible (Government of Saskatchewan, 2021).

An allergic reaction is an exaggerated immune system response to a foreign antigen. Anaphylaxis is extremely rare but can be life threatening. It is treatable and occurs in less than 1 in 1 million people vaccinated. Triggers include: Food, drugs, venoms (such as bee stings) and biologic agents (Government of Saskatchewan, 2021).

10. What about the long-term effects of the vaccine?

No one has had the vaccine in their body for more than a year. Only time and accurate tracking will tell for sure; scientists have to look for unusual patterns of disease in groups of vaccinated people.

That is why everyone who gets vaccinated is being encouraged to track and report any symptoms they may feel in the short and long term, and to tell their health provider.

Health officials are already watching out for any patterns of problems that are out of the ordinary. So far, they have not seen any. But the scrutiny on these vaccines, and the fact that there are many more varieties of the COVID-19 vaccine now being tested, mean that we would have an early warning and alternatives.

Meanwhile, the threat of COVID-19 is very real right now. It is killing hundreds of Canadians every day, and leaving many others with lasting symptoms and disability from the disease. We also know that COVID-19 infection can cause long-term and serious medical conditions. Most people who have coronavirus disease 2019 recover completely within a few weeks. But some people — even those who had mild versions of the disease — continue to experience symptoms after their initial recovery.

These people sometimes describe themselves as "long haulers" and the condition has been called post-COVID-19 syndrome or "long COVID-19."

Older people and people with many serious medical conditions are the most likely to experience lingering COVID-19 symptoms, but even young, otherwise healthy people can feel unwell for weeks to months after infection. The most common signs and symptoms that linger over time include:

- Fatigue

- Shortness of breath
- Cough
- Joint pain
- Chest pain

Other long-term signs and symptoms may include:

- Muscle pain or headache
- Fast or pounding heartbeat
- Loss of smell or taste
- Memory, concentration or sleep problems
- Rash or hair loss

(Mayo Clinic, 2020)

11. Rollout plan: When and where can patients expect to be vaccinated?

Saskatchewan's COVID-19 Vaccine Distribution Plan is built on the foundation of age as the main risk factor.

Phase 1 is focused on vaccinating high-risk populations, people of advanced age, and health care workers that have been identified as a priority.

Phase 2 is focused on vaccinating the general population by age, as well as the clinically extremely vulnerable and people in emergency shelters and group homes.

In phase 2, vaccines will be available at 226 vaccination clinics in 181 communities across the province. In addition to SHA clinics, there will be many other clinics including:

- Participating pharmacies (last year 385 pharmacies in 113 different communities participated in the flu immunization program)
- Participating physicians' offices
- First Nations clinics
- Community-based settings
- Partnerships with large businesses/industries

The Province has been announcing clinics in communities as vaccines become available to specific populations. Monitor your local news and check the below website regularly for COVID-19 vaccination clinics.

<https://www.saskhealthauthority.ca/news/releases/pages/search.aspx?k=covid+vaccine&sc=News+Releases&category>

When it is your turn to be vaccinated information will be publicly shared to let you know how to register and where to find a clinic near you. Information will be shared via local media, social media, online ads, local publications, posters, direct mail and news conferences. [\(Government of Saskatchewan, 2021\)](#).

When it is your turn to receive a vaccine

Confirm your eligibility on the [Government of Saskatchewan website](#).

Booking Over the Phone Call 1-833-SASKVAX (1-833-727-5829)

Book online saskatchewan.ca/COVID19-vaccine

For full information on eligibility and what to expect visit the [SHA Appointments website here](#).
[How to book an appointment one-pager](#).

Public Notifications

Information will be publicly shared to let you know:

- When it's your time to be vaccinated.
- How to register for a vaccine appointment.
- The different types of immunization clinics available.
- How to find the closest clinics to you.

Information will be included in:

- Advertising in local media
- Social media
- Online ads
- Local publications
- Posters
- Direct mail
- News conferences

12. Rollout plan: How is the vaccine being rolled out?

Phase 1: Vaccine rollout began in December 2020, and includes:

- Targeted immunization of priority populations
- Planned administration of 202,052 doses.
- This phase includes:
 1. Long-term care and personal care home residents and staff.
 2. Health care workers in emergency departments, intensive care units, COVID-19 wards and COVID testing and assessment staff, respiratory therapists; code blue and trauma teams; and EMS, road and air transport teams.
 3. Residents 70 years and older in all communities
 4. Residents over the age of 50 living in remote/Northern Saskatchewan.
 5. Additional health care workers included in priority sequencing for Phase 1 as announced February 16, 2021. These additional workers include:
 - Individuals directly involved in delivering COVID-19 immunizations in Phase 2 including physicians (up to 2,600), pharmacists (up to 1,200) and other SHA health care providers involved in delivering COVID-19 immunizations;
 - Anesthesia/operating rooms;
 - All other critical care areas;
 - Hemodialysis;
 - Vaccination teams;
 - Radiology technicians;
 - ECG/echo;
 - Phlebotomy/lab workers handling COVID-19 specimens; and

- Home care (direct care providers).

Phase 2: Began March 18th, 2021

- Focused on vaccinating the general population in 10-year increments.
- The beginning of phase 2 includes:
 - People with underlying health conditions who are clinically extremely vulnerable
 - Targeted vaccinations to select congregate living (group homes, those with intellectual disabilities)

13. Rollout plan: How was the rollout plan developed?

The first phase of Saskatchewan's vaccine delivery plan focuses on priority populations who are at a higher risk of exposure to the virus or more at risk of serious illness – high risk health care workers, elderly residents in care homes, seniors over 80 and residents in northern remote communities. Immunization will occur as vaccine is delivered to the province. It will continue to be very important for all residents to continue following public health measures while the vaccination program is delivered.

The National Advisory Committee on Immunization (NACI) provided federal and provincial health agencies with recommendations on key populations for early COVID-19 immunization. They identified those at high risk of severe illness and death such as people with advanced age as well as workers essential to maintaining the COVID-19 response such as health care workers.

Provincial and territorial governments are responsible for delivering vaccination programs. Each will make their decisions based on these recommendations and the transmission seen in their individual jurisdictions.

Why Focus on Age?

Age is the number one risk factor for severe outcomes, hospitalizations and deaths related to COVID-19. People of advanced age are more likely to be clinically extremely vulnerable or living with other chronic conditions.

14. Rollout plan: Where will patients be vaccinated?

Depending on vaccine flow, the goal is for all residents to be able to access the vaccine where they live or work. Vaccinations will be done in Long Term Care and Personal Care Homes in phase one. Phase 2- mass immunization clinics, and by physicians, nurse practitioners and pharmacists.

Phase 2 of vaccine distribution will occur throughout the province at public health clinics and other vaccination delivery sites. Vaccination will also be available through pharmacies and participating physician offices.

The Province has been announcing clinics in communities as vaccines become available to specific populations. Monitor your local news and check the below website regularly for COVID-19 vaccination clinics.

<https://www.saskhealthauthority.ca/news/releases/pages/search.aspx?k=covid+vaccine&sc=News+Releases&category>

15. When will I get my second dose?

We are currently not booking 2nd dose appointments for the COVID-19 vaccine. Keep your vaccine card and watch for further updates about 2nd dose appointments.

Beginning March 5, all vaccines administered in Saskatchewan will be a first dose, with second doses administered at an interval of up to four months. Residents will be contacted when they are eligible to book their second dose appointment, based on completing the vaccination sequencing and supply.

This delayed second dose strategy does not apply to long-term care and personal care residents and staff who have yet to receive their full two-dose series or to any existing second-dose appointments.

All residents who receive their first dose will still be eligible to receive their second dose when the supply is available. We are currently not booking 2nd dose appointments for the COVID-19 vaccine for all other individuals. Please keep your vaccine card and watch for further updates about 2nd dose appointments (Government of Saskatchewan, 2021).

16. How do we approach vaccination for our pregnancy and breastfeeding patients?

The SHA has provided the following document to guide providers and patients discussing vaccination during pregnancy or breastfeeding.

[COVID-19 Vaccine During Pregnancy or Breastfeeding Discussion with Obstetrical Care Provider](#)

NACI:

- The COVID-19 vaccine should not be offered to individuals who are pregnant, until after completion of pregnancy, or breastfeeding until further evidence is available. However, a complete series of COVID-19 vaccine may be offered to pregnant or breastfeeding individuals in the authorized age group if a risk assessment deems that the benefits outweigh the potential risks for the individual and the fetus, and if informed consent includes discussion about the absence of evidence on safety and efficacy in the use of COVID-19 vaccine in this population.

Society of Obstetricians and Gynecologists of Canada (SOGC):

- For individuals who are at high risk of infection and/or morbidity from COVID-19, it is the SOGC's position that the documented risk of not getting the COVID-19 vaccine outweighs the theorized and undescribed risk of being vaccinated during pregnancy or while breastfeeding, and therefore vaccination should be offered.
- Informed consent must include discussion about the insufficient evidence on safety and efficacy in this population.
- If the client consents to vaccination, the client will sign a waiver
- In the face of scientific uncertainty, it would be prudent to delay pregnancy by 28 days or more after the administration of the complete two-dose vaccine series of an mRNA COVID-19 vaccine.

17. How do we approach vaccination for our immunocompromised patients?

[SHA 0109 Immune Suppressed Individuals - Benefit/Risk Information](#) (January 18, 2021)

[SHA 0110 Autoimmune Conditions - Benefit/Risk Information](#) (January 18, 2021)

NACI recommends that a complete vaccine series with a COVID-19 vaccine may be offered to individuals with an autoimmune condition in the authorized age group in these populations if a

risk assessment deems that the benefits outweigh the potential risks for the individual, and if informed consent includes discussion about the insufficiency of evidence on the use of COVID-19 vaccine in these populations. (Discretionary NACI Recommendation)

Summary of evidence and rationale:

- Currently, there is limited evidence that having an autoimmune condition is an independent risk factor for severe COVID-19, though evidence is evolving.
- Currently, there is very limited data on COVID-19 vaccination in individuals who have an autoimmune condition. Although participants with autoimmune conditions who were not immunosuppressed were not excluded from trials, they constitute a very small proportion of trial participants and represent a very narrow range of autoimmune conditions.
- The spectrum of autoimmune conditions is diverse. The relative degree of autoimmunity in individuals with autoimmune conditions is variable depending on the underlying condition, the severity and progression of disease and use of medications that impact immune function. Therefore, the balance of benefits and risks must be made on a case-by-case basis.
- Other applications of mRNA technologies have been for the treatment of cancer, which required an immune response directed against an individual's cancer cells. This raised the theoretical concern that mRNA vaccines for infectious diseases would behave similarly, eliciting inflammation and possibly exacerbating existing autoimmune diseases. Current applications of mRNA technology for COVID-19 vaccines have been optimized to reduce this risk.
- Active surveillance in these vaccine recipients is strongly encouraged. NACI will monitor the evidence as it evolves and update recommendations as needed.

(Government of Canada, 2021)

18. How long after COVID infection should a patient wait to receive the vaccine?

In the current context of limited vaccine supply and to allow for the protection of a larger number of at-risk individuals, immunization with COVID-19 vaccine may be delayed for 90 days following a Polymerase chain reaction (PCR)-confirmed SARS-CoV-2 infection if the infection occurred before the first COVID-19 vaccine dose, as reinfections reported to date have been rare within the first three months following infection. However, if this is challenging from a feasibility perspective, these individuals may be immunized before the 90 days. Due to the severe health risks associated with COVID-19 and the fact that re-infection with COVID-19 is possible, vaccine should be offered to you regardless of whether a patient already had COVID-19 infection (Shahab, 2021).

At this time, experts do not know how long someone is protected from getting sick again after recovering from COVID-19. The immunity someone gains from having an infection, called natural immunity, varies from person to person. Some early evidence suggests natural immunity may not last very long.

It is presently unknown how long immunity produced by vaccination lasts until there is more data on how well the vaccines work.

Both natural immunity and vaccine-induced immunity are important aspects of COVID-19 that experts are trying to learn more about (Center for Disease Control, 2021).

19. Can we provide a Doctor's note indicating that our patient is high priority to receive the vaccine due to their medical conditions?

People with underlying health conditions that are clinically extremely vulnerable are eligible for vaccination.

NOTE: People with the following conditions will receive letters, notifying them of their eligibility for Phase 2 priority sequencing, regardless of age. This letter is required in order to book an appointment.

[Government announced April 13, 2021](#) that young adults ages 16 and 17 who are considered clinically extremely vulnerable are included in priority vaccination. Vulnerable 16 and 17 year olds will receive an eligibility letter from their physician and will need to use the 1-833-SaskVax telephone number to book.

- Solid organ transplant recipients.
- People with specific cancers:
 - People with cancer who are undergoing active chemotherapy.
 - People with lung cancer who are undergoing radical radiotherapy.
 - People with cancers of the blood or bone marrow such as leukemia, lymphoma or myeloma who are at any stage of treatment.
 - People having immunotherapy or other continuing antibody treatments for cancer.
 - People having other targeted cancer treatments that can affect the immune system, such as protein kinase inhibitors or PARP inhibitors.
 - People who have had bone marrow or stem cell transplants in the last six months or who are still taking immunosuppression drugs.
- People with severe respiratory conditions including all cystic fibrosis, severe asthma and severe chronic obstructive pulmonary disease (COPD).
- People with rare diseases that significantly increase the risk of infections (such as severe combined immunodeficiency (SCID), homozygous sickle cell disease).
- People on immunosuppression therapies sufficient to significantly increase risk of infection (biologic modifiers, high dose steroids, AZT, cyclophosphamide).
- People who had their spleen removed.
- Adults with very significant developmental disabilities that increase risk.
- Adults on dialysis or with chronic kidney disease (stage 5).
- Women who are pregnant with significant heart disease, congenital or acquired.
- Significant neuromuscular conditions requiring respiratory support.
- Projected finished: Fall 2021 (depending on available vaccine supplies)

20. Can patients get multiple vaccines including the COVID vaccine at once?

In the absence of evidence, it would be prudent to wait for a period of at least 28 days after the administration of the complete two-dose vaccine series of an mRNA COVID-19 vaccine before the administration of another vaccine (except in the case where another vaccine is required for post-exposure prophylaxis) due to the elicitation of an inflammatory cytokine response.

It would be prudent to wait for a period of at least 14 days after the administration of another vaccine before administering a COVID-19 vaccine to prevent erroneous attribution of an AEFI to a particular vaccine.

21. Can you still carry and spread the virus if you've been vaccinated?

The vaccine will protect people from getting sick from the virus, but it's possible that patients could still carry the virus and be contagious to others even though they have been immunized. More will be learned as the clinical trials will continue for another 2 years, and so in the meantime, continue wearing masks and practicing physical distancing.

22. Will the vaccine still work if the virus mutates?

Genetic variants of viruses such as the one that causes COVID-19 (SARS-CoV-2) are not uncommon and many variants of this virus have been observed around the world this year. These new variants include mutations (i.e., changes to the genetic material in the virus) on the "spike" protein, which may result in the virus becoming more infectious and spreading more easily between people. These new variants of concern include mutations that seem to make the virus more infectious, allowing it to spread more easily. They may also affect the severity of the disease. At this time, there's evidence that some variants may have an impact on certain drugs and vaccines. However, more research is needed to confirm these findings.

The Pfizer/BioNTech and Moderna vaccines recently authorized for use in Canada have been tested against a number of other viral variants, without impact on efficacy. Health Canada will monitor the emerging variants closely and work with manufacturers and international regulators to assess the impact of the new variants on vaccine efficacy.

The variants don't currently affect diagnosis through authorized laboratory tests.

Given the limited data on the new variants, more research is needed to confirm these early findings. The Canadian and global medical, public health and research communities are actively evaluating these variants and other significant mutations.

(Government of Canada, 2020).

There are some important limitations to the data on which these analyses are based. A relatively small number of people were included in the analyses and from a small number of settings, so more data is being collected and the position will become clearer over the coming weeks (GOV.UK, 2021).

The best way to limit and suppress the transmission of COVID-19 is for people to continue taking the necessary precautions to keep themselves and others safe.

23. Why is immunization important?

Although some individuals are at greater risk for severe complications, without immunization, even healthy Saskatchewanians are at risk of severe illness and even death from this virus.

With the arrival of the COVID-19 vaccine in Saskatchewan, the spread of the virus will be reduced, and the most vulnerable and at-risk populations will be increasingly protected from COVID-19. The vaccine will also help reduce the strain on the healthcare system and allow elective surgeries, and other postponed services to continue.

Everyone must do their part to protect one another. Immunization is the single most effective means of protecting yourself, your loved ones and the greater community from COVID-19 (Alberta Health Services, 2021).

24. What if a patient is allergic to ingredients in the COVID-19 vaccine?

It's possible that some patients may have an allergic reaction after receiving COVID-19 vaccine. Individuals with known allergies to any of the components of the vaccine should not receive it (Alberta Health Services, 2021).

The components of the Pfizer-BioNTech vaccine include:

- Medicinal ingredient:
 - Tozinameran (mRNA encoding the Spike protein for the SARS-CoV-2 virus)
- 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 dehydrate
 - monobasic potassium phosphate
 - potassium chloride
 - sodium chloride

The components of the Moderna vaccine include:

- 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

The components of the Janssen COVID-19 Vaccine

- 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

The components of the AstraZeneca COVID-19 Vaccine

- 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

25. Can COVID-19 vaccines cause infertility or miscarriage?

No, COVID-19 vaccines have not been linked to infertility or miscarriage.

The Society of Obstetricians and Gynecologists of Canada (SOGC) estimates 15 -20 percent of pregnancies end in a miscarriage. There has not been any correlation found that COVID 19 vaccinations cause miscarriages or increase the women's risk of experiencing one.

A sophisticated disinformation campaign has been circulating online, claiming that antibodies to the spike protein of COVID-19 produced from these vaccines will bind to placental proteins and prevent pregnancy. This disinformation is thought to originate from internet postings by a former scientist known to hold anti-vaccine views.

These postings are not scientifically plausible, as COVID-19 infection has not been linked to infertility. Also, no other viral infection or vaccination-inducing immunity by similar mechanisms has been shown to cause infertility. Antibodies to the spike protein have not been linked to infertility after COVID-19 infection. There is no scientific reason to believe this will change after vaccination for COVID-19.

While there are no formal studies, the best evidence comes from women who got sick with COVID-19 while pregnant. While data clearly indicate pregnant women are at higher risk of hospitalization due to COVID-19 infection, there is no evidence of increased miscarriage rates.

During natural infection, the immune system generates the same antibodies to the spike protein that COVID-19 vaccines would. Thus, if COVID-19 affected fertility, there already would be an increase in miscarriage rates in women infected with COVID-19. This has not happened. (Mayo Clinic Health System, 2020)

26. Can the COVID19 vaccine cause menstrual irregularities?

Menstruation is a complex process, and can be influenced by many things, such as environmental changes, stress, sleep and some medications. The lining of the uterus is in fact considered to be an active part of the immune system. When your immune system is working hard because you're vaccinated or sick, you may experience changes in how the endometrium reacts. In this way it is possible that the vaccine affects menstruation somehow.

But, one thing to keep in mind is that anytime you look at a large group of people, there will always be some people experiencing changes in their menstrual cycle. For example, if you looked at a million people who drank water today, there will be some people who experienced changes in their menstrual cycle. That doesn't mean that drinking water causes changes in the menstrual cycle - it's just what happens when you look at a large number of people. With hundreds of millions of vaccines being given worldwide, there will be some people who experience changes in their menstrual cycle too. The key is to figure out whether the vaccine causes it, and whether it is something to be concerned about. Researchers are confident that the vaccine is safe, and that there is not enough data to suggest that there should be concerns over potential changes to the menstrual cycle. In addition, medical experts continue to assert that the COVID-19 vaccine does not impact fertility. The COVID-19 vaccine is not shed after vaccination, so being around recently vaccinated individuals would not be expected to affect someone's cycle either.

The good news is that any changes you experience in your menstrual cycle after getting the vaccine are temporary, so it shouldn't be a reason not to get a shot. However, women with concerns should speak with their doctor since cycles can be delayed for other reasons as well (Immunization BC, 2021).

27. Can someone who has been vaccinated 'shed the virus' and put others at risk?

No. Viral shedding occurs after an individual gets infected by a viable (living) virus.

Vaccinated people do not shed any virus because the vaccines do not contain whole, living viruses. The vaccines also do not cause whole viruses to be created. The current vaccines approved for use in Canada do not contain live SARS-CoV-2 virus.

There are two classes of approved COVID-19 vaccines in Canada: mRNA vaccines, and viral vector-based vaccines. Both mRNA COVID-19 and viral vector-based vaccines cannot cause infection with SARS-CoV-2, and therefore cannot cause viral shedding of SARS-CoV-2 (Ottawa Public Health, 2021).

Bibliography

- Alberta Health Services. (2021, January 11). *Alberta Health Services*. Retrieved from Covid 19 Frequently Asked Questions: <https://www.albertahealthservices.ca/topics/Page17295.aspx>
- Center for Disease Control. (2021, January 5). *Center for Disease Control*. Retrieved from Benefits of Getting a COVID-19 Vaccine: https://www.cdc.gov/coronavirus/2019-ncov/vaccines/facts.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fvaccines%2Fvaccine-benefits%2Ffacts.html

- Centers for Disease Control and Prevention. (2020, December 18). *Centers for Disease Control and Prevention*. Retrieved from Understanding mRNA COVID-19 Vaccines: <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines/mrna.html>
- Doctors of BC. (2021, January 5). *Doctors of BC*. Retrieved from COVID-19 vaccines: are they safe?: <https://www.doctorsofbc.ca/together-health/covid-19-vaccines-are-they-safe>
- GOV.UK. (2021, January 22). *GOV.UK*. Retrieved from NERVTAG paper on COVID-19 variant of concern B.1.1.7: <https://www.gov.uk/government/publications/nervtag-paper-on-covid-19-variant-of-concern-b117>
- Government of Canada. (2020, 12 16). *Government of Canada*. Retrieved from Vaccines and treatments for COVID-19: Progress: <https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/prevention-risks/covid-19-vaccine-treatment.html>
- Government of Canada. (2020, December 24). *Government of Canada*. Retrieved from Statement on the variants of COVID-19 virus found in the United Kingdom and South Africa: <https://www.canada.ca/en/health-canada/news/2020/12/statement-on-the-variants-of-covid-19-virus-found-in-the-united-kingdom-and-south-africa.html>
- Government of Canada. (2020, 12 23). *Government of Canada*. Retrieved from COVID-19 Vaccines: <https://www.canada.ca/en/health-canada/services/drugs-health-products/covid19-industry/drugs-vaccines-treatments/vaccines.html>
- Government of Canada. (2021, 02 26). *About the AstraZeneca COVID-19 vaccine*. Retrieved from Government of Canada: <https://www.canada.ca/en/health-canada/services/drugs-health-products/covid19-industry/drugs-vaccines-treatments/vaccines/astrazeneca.html>
- Government of Canada. (2021, 04 08). *AstraZeneca COVID-19 vaccine: What you should know*. Retrieved from Government of Canada: <https://www.canada.ca/en/health-canada/services/drugs-health-products/covid19-industry/drugs-vaccines-treatments/vaccines/astrazeneca.html>
- Government of Canada. (2021, January 12). *Government of Canada*. Retrieved from Recommendations on the use of COVID-19 vaccines: <https://www.canada.ca/en/public-health/services/immunization/national-advisory-committee-on-immunization-naci/recommendations-use-covid-19-vaccines.html#a7>
- Government of Canada. (2021, 03 05). *Government of Canada*. Retrieved from Janssen COVID-19 vaccine: What you should know : <https://www.canada.ca/en/health-canada/services/drugs-health-products/covid19-industry/drugs-vaccines-treatments/vaccines/janssen.html>
- Government of Saskatchewan. (2021). *COVID-19 Vaccine Question and Answer*. Retrieved from Government of Saskatchewan: <https://www.saskatchewan.ca/government/health-care-administration-and-provider-resources/treatment-procedures-and-guidelines/emerging-public-health-issues/2019-novel-coronavirus/covid-19-vaccine/covid-19-vaccine-information/covid-19-vaccine-question-and-a>
- Government of Saskatchewan. (2021). *Government of Saskatchewan*. Retrieved from Covid 19 Vaccine Information: <https://www.saskatchewan.ca/government/health-care-administration-and-provider-resources/treatment-procedures-and-guidelines/emerging-public-health-issues/2019-novel-coronavirus/covid-19-vaccine/covid-19-vaccine-information>
- Government of Saskatchewan. (2021). *Government of Saskatchewan*. Retrieved from Moderna Covid 19 Learning Module: <https://www.saskhealthauthority.ca/news/service-alerts->

emergency-events/covid-19/vaccine-info-health-care-providers/Documents/Moderna%20COVID-19%20Vaccine/CV-19-LM0002-Moderna-COVID-19-Vaccine-Learning-Module.pdf

- Government of Saskatchewan. (2021, 02 09). *Government of Saskatchewan*. Retrieved from Vaccine Delivery Phases: <https://www.saskatchewan.ca/government/health-care-administration-and-provider-resources/treatment-procedures-and-guidelines/emerging-public-health-issues/2019-novel-coronavirus/covid-19-vaccine/vaccine-delivery-phases>
- Immunization BC. (2021, April 29). *Can I get the COVID-19 vaccine while I am menstruating (having my period)? Will it affect my cycle? Will it make my period heavier?* Retrieved from Immunization BC: <https://immunizebc.ca/ask-us/questions/can-i-get-covid-19-vaccine-while-i-am-menstruating-having-my-period-will-it-affect>
- Immunize BC. (2021, January 12). *Immunize BC*. Retrieved from Covid 19 Frequently Asked Questions: <https://immunizebc.ca/covid-19-vaccine-frequently-asked-questions>
- Mayo Clinic. (2020, November 17). *Mayo Clinic*. Retrieved from COVID-19 (coronavirus): Long-term effects: <https://www.mayoclinic.org/diseases-conditions/coronavirus/in-depth/coronavirus-long-term-effects/art-20490351>
- Mayo Clinic Health System. (2020, December 8). *Mayo Clinic Health System*. Retrieved from COVID-19 vaccine myths debunked: <https://www.mayoclinichealthsystem.org/hometown-health/featured-topic/covid-19-vaccine-myths-debunked>
- Ottawa Public Health. (2021, May 06). *Frequently asked questions about COVID-19 vaccination*. Retrieved from Ottawa Public Health: <https://www.ottawapublichealth.ca/en/shared-content/frequently-asked-questions-about-covid-19-vaccination.aspx#Can-someone-who-has-been-vaccinated-shed-the-virus-and-put-others-at-risk>
- Shahab, D. S. (2021, January 12). Retrieved from COVID-19 Vaccine Immunization Recommendations for Persons with a Current or a Prior History of SARS-CoV-2 Infection: <https://www.saskhealthauthority.ca/news/service-alerts-emergency-events/covid-19/vaccine-info-health-care-providers/Documents/Moderna%20COVID-19%20Vaccine/Dr-Shahab-COVID-19-Vaccine-Current-or-Prior-History-of-SARS-CoV-2-Infection.pdf>
- Thrombosis Canada. (2021, 04 12). *Thrombosis Canada*. Retrieved from COVID-19 Vaccines & Blood Clot Risk: <https://thrombosiscanada.ca/blood-clots-and-covid-19/>