

SOGC Statement on COVID-19 Vaccination in Pregnancy

Original date: December 18, 2020

Revised Date: January 11, 2021

Please note that the revised statement does not change the SOGC's position on the COVID-19 vaccine during pregnancy. The SOGC supports vaccination and the following statement outlines the considerations.

Pre-amble

The SOGC acknowledges the need for guidance related to the COVID-19 vaccine and pregnancy and during lactation. We recognize the difficulty facing women and their health care providers at this time, due to the absence of clinical trials that can support evidence-informed recommendations about the COVID-19 vaccine for pregnant and breastfeeding populations. Information related to COVID-19, the impact of the disease on pregnancy and data related to COVID-19 vaccines in development are rapidly evolving. The information contained herein is subject to change as further evidence becomes available and currently applies to the RNA based COVID-19 vaccines.

Consensus Statement: Women who are pregnant or breastfeeding should be offered vaccination at anytime if they are eligible and no contraindications exist.

This decision is based the women's personal values and an understanding that the risk of infection and/or morbidity from COVID-19 outweighs the theorized and undescribed risk of being vaccinated during pregnancy or while breastfeeding. Women should not be precluded from vaccination based on pregnancy status or breastfeeding.

SARS-CoV-2 and the impact on pregnancy

Most pregnant women who become infected with SARS-CoV-2 will have mild-to-moderate symptoms and many can be asymptomatic.¹ However, both Canadian and international data from large studies spanning multiple jurisdictions demonstrate that approximately 8-11% of pregnant women will require hospitalization for COVID-related morbidity and between 2-4% of pregnant women will require admission to an intensive care unit (ICU).^{2, 3, 4} Compared to non-pregnant individuals with COVID-19, pregnant individuals are at increased risk of invasive ventilation with an equivalent mortality to age-matched peers.^{2, 4} The risk of severe morbidity from COVID-19 in

pregnant women appears to be associated with risk factors including age \geq 35 years old, asthma, obesity, preexisting diabetes, preexisting hypertension and heart disease.^{2,4}

COVID-19 Vaccines

On December 9th, 2020, Health Canada authorized the first COVID-19 vaccine in Canada: Pfizer-BioNTech COVID-19 vaccine.⁵ This vaccine is presently the only COVID-19 vaccine authorized for human use in Canada although several other companies have filed for approval with Health Canada including Moderna and AstraZenica who have an mRNA platform and an adenovirus vector platform, respectively. The Pfizer-BioNTech COVID-19 vaccine uses a new mRNA vaccine platform. This model consists of messenger RNA (mRNA) encapsulated by a lipid nanoparticle (LNP) which allows the mRNA entrance into host (human) cells. The mRNA in the vaccine codes for the SARS-CoV-2 spike protein, utilized by the virus to bind to human receptors and promote viral replication. The vaccine provides the host cell instructions to manufacture only this spike protein and express it on its surface. Recognizing the spike protein as a foreign antigen, the host immune system is then activated to produce an immune response.⁶ The mRNA does not enter the nucleus or alter human DNA and human cells do not have the machinery to allow it to do so.

The Pfizer-BioNTech COVID-19 vaccine is administered as a series of two intramuscular injections administered 21-28 days apart.⁷ The safety and efficacy Pfizer-BioNTech COVID-19 vaccine has been demonstrated for adults 16 years and older in Phase II and Phase III trials involving the randomization of approximately 44,000 individuals.⁸ These trials demonstrated a vaccine efficacy of 94.6% for preventing symptomatic COVID-19 cases at least 7 days following the second dose.⁸

The available safety data is based on an interim analysis of 37,586 adults of whom approximately 9,500 individuals had at least 2 months of follow-up after receiving the vaccine. Safety monitoring will continue for 2 years following vaccine administration. There were no clinically meaningful differences in adverse events or severe adverse events in the vaccine group compared to control except for lymphadenopathy which occurred in 0.3% of the vaccine group compared to <0.1% of the placebo group. The most commonly reported side effects from the vaccine were pain at the injection site (66-83%), fatigue (51-59%) and headache (39-52%). Fever was reported in 11-16% of patients, particularly following the second dose.⁸

Pregnant and breastfeeding women were excluded from the Phase II and Phase III studies for the Pfizer-BioNTech COVID-19 vaccine. However, there were 23 women (12 in the vaccine arm and 11 in the placebo arm) who reported pregnancies during the trial and are being followed for pregnancy outcomes with no reports of adverse effects to date. Currently, there are no other safety or efficacy data available for pregnant or breastfeeding women. The Developmental and Reproductive Toxicity (DART) animal studies for the Pfizer-BioNTech vaccine are ongoing and the results anticipated for mid-December 2020. According to the American College of Obstetricians & Gynecologists (ACOG), no major safety signals have been identified.⁹

To date, Phase III data is available for two other COVID-19 vaccines. The Moderna mRNA-1273 vaccine also utilizes mRNA vaccine technology with the SARS-CoV-2 spike protein as its antigenic target. In Phase III trials randomizing 30,000 individuals, the vaccine was reported to have 94.1% efficacy against symptomatic COVID-19 with no serious safety concerns identified during the initial 2 month follow-up period.¹⁰ The Oxford-AstraZeneca ChAdOx1 nCoV-19 vaccine is not an mRNA vaccine, instead it utilizes a Chimpanzee adenovirus vector vaccine platform and preliminary Phase III data from 11,636 participants demonstrates an overall vaccine efficacy of 70.4% against symptomatic COVID-19 disease.¹¹ Unfortunately, all the vaccines for which Phase III results are available excluded pregnant or breastfeeding women from their trials.

Similarly, breastfeeding women were also excluded from the Phase III trials available at present. Therefore, there is no data on the safety of COVID-19 vaccines in lactating women or the effects of mRNA vaccines on the breastfed infant or on milk production. Because mRNA vaccines are not considered live virus vaccines, they are not hypothesized to be a risk to the breastfeeding infant.¹²

Considerations for COVID-19 Vaccination During Pregnancy and Breastfeeding

Decades of experience with other vaccines administered during pregnancy would suggest that we could expect a similar efficacy for the COVID-19 vaccines in pregnant women compared to non-pregnant women. Vaccines in general are immunogenic, safe, and efficacious when delivered to pregnant women. While there have been no red flags or hypothesized mechanisms for potential harm associated with administration of an mRNA vaccine during pregnancy, until more data is available, the potential risks of vaccination to a pregnant individual and fetus remain unknown. What *is* known, however, is that an unvaccinated pregnant individual remains at risk of COVID-19 infection and remains at heightened risk of severe morbidity if infected compared to non-pregnant counterparts.

Severe infection with COVID-19 carries risks to both maternal and fetal health. While pregnancy itself does not appear to increase the risk of becoming infected with SARS-CoV-2, pregnant individuals may be in work-related (e.g., health-care worker, front line workers etc.) or community situations (e.g., caregiver, indigenous communities, outbreak setting, etc.) where the risk of infection is considerable. Owing to maternal age or underlying comorbidities, some pregnant individuals are at high risk of severe COVID-related morbidity.

NACI has advised “COVID-19 vaccine **should not** be offered to populations excluded from clinical trials until further evidence is available. **However**, if a risk assessment deems that the benefits of vaccine outweigh the potential risks for the individual (e.g., where the risk of severe outcomes of COVID-19 and risk of exposure to SARS-CoV-2 is high) or for the fetus/infant (in the case of pregnancy/breastfeeding) and if informed consent includes discussion about the insufficient evidence in this population, then a complete series of authorized COVID-19 vaccines **may be** offered to pregnant and breastfeeding individuals.⁶

We **recommend** that pregnant and breastfeeding individuals who are eligible for the COVID-19 vaccine due to exposure risk, medical status, or other circumstances should be able to make an informed decision by having access to up-to-date information about the safety and efficacy of the vaccine (including clear information about the data that is not yet available) and information about the risks of COVID-19 infection for them. The concern around vaccination in the absence of evidence of safety in pregnancy has been debated in the literature. The [PREVENT](#) Working Group state, “the absence of evidence and the mere theoretical or even documented risk of fetal harm is generally not sufficient to justify denying pregnant women access to a vaccine in an outbreak or epidemic.” During an epidemic, the default should be to offer vaccines to pregnant women alongside other affected populations.^{9, 13, 14}

Universal exclusion of pregnant women from receipt of the COVID-19 vaccine based on an undocumented and hypothetical risk to the fetus would leave pregnant women vulnerable to severe morbidity, which could also compromise fetal health. Conversely, lack of safety and efficacy data for this population precludes making a recommendation for routine COVID-19 vaccination for all pregnant and breastfeeding individuals.

Pregnant and breastfeeding individuals will likely look to their prenatal care provider to assist in making decisions weighing the risks and benefits so that they might arrive at a well informed and autonomous decision that is right

for them as an individual. Such a discussion should prioritize patient autonomy and should include, but not be limited to assessment of:

- Local epidemiology and risk of community acquisition of COVID-19
- Workplace situation and risk of work-related acquisition of COVID-19
- Individual risk for COVID-related morbidity including consideration for comorbidities including advanced maternal age, immunosuppressive conditions, pre-existing diabetes, pre-existing hypertension, obesity or chronic respiratory conditions
- Gestational age
- Available data related to the safety of the vaccine during pregnancy and lactation
- Data that is not yet available related to the safety and efficacy of the vaccine for pregnant and breastfeeding women
- Individual beliefs and personal risk assessment of the available data.

Individuals who proceed with vaccination

Individuals should be informed of the expected side effects following vaccination. While pain at the injection site, fatigue and headache are the most commonly reported symptoms following vaccination, fever was reported 16% of the time for younger non-pregnant individuals.⁸ Pregnant patients can be counselled to treat mild post-vaccination fevers with antipyretics (e.g., acetaminophen). Active surveillance is ongoing for the Pfizer-BioNTech COVID-19 vaccine. As such, prenatal care providers are encouraged to inform themselves on local procedures for active surveillance and notify the appropriate channels when a pregnant or breastfeeding mother is receiving a dose of the vaccine.

Inadvertent pregnancy following vaccination

Individuals who are discovered to be pregnant during their vaccine series or shortly afterward should *not* be counselled to terminate pregnancy based on having received the vaccine. If conception is presumed to predate the first dose, it is recommended to follow the same procedures for active surveillance (as available) as would be activated if the pregnancy was known at the time of vaccination.

Where pregnancy is detected during the vaccine series (i.e. following the first dose, but ahead of the second dose), the decision of whether to complete the vaccine series during pregnancy should be based on an assessment of the

potential risks of not being completely vaccinated during pregnancy vs. the potential risks of receiving the vaccine during pregnancy (as discussed above) and women should not be precluded or forced to delay the vaccine series.

Individuals contemplating pregnancy

For an individual planning a pregnancy, it is recommended to complete the entire COVID-19 vaccination series (where possible) to achieve maximal vaccine efficacy ahead of pregnancy. It is not known whether an individual should delay pregnancy following receipt of the vaccine and a risk-benefit discussion for those planning pregnancy should occur similar to the discussion for pregnant and breastfeeding women.

Future research

As the evidence evolves, it is becoming clear that pregnant and postpartum women may represent a population at increased risk of COVID-related morbidity. Severe COVID-19 infection during pregnancy has important implications for both maternal and fetal health. NACI acknowledges that people of reproductive age constitute a substantial proportion of the Canadian population, yet no data on the use of COVID-19 vaccine in pregnancy are available. We support NACI's recommendation for the inclusion of pregnant women in clinical trials of COVID-19 vaccines to ensure that this population has equitable access to COVID-19 vaccine options informed by robust safety, immunogenicity, and efficacy data.¹⁵

This statement has been endorsed by The Canadian Fertility and Andrology Society (CFAS).

References

1. Maru S, Patil U, Carroll-Bennett R, et al. Universal screening for sars-cov-2 infection among pregnant women at elmhurst hospital center, queens, new york. PLoS One. 2020;15:e0238409. Available at <https://www.ncbi.nlm.nih.gov/pubmed/33301498>.
2. Allotey J, Stallings E, Bonet M, et al. Clinical manifestations, risk factors, and maternal and perinatal outcomes of coronavirus disease 2019 in pregnancy: Living systematic review and meta-analysis. BMJ. 2020;370:m3320. Available at <https://www.ncbi.nlm.nih.gov/pubmed/32873575>.
3. Money D. Canadian surveillance of covid-19 in pregnancy: Epidemiology, maternal and infant outcomes. Report #1: Released december 2nd, 2020early release: Maternal and infant outcomes (march 1, 2020 to september 30, 2020) from three canadian provinces 2020. Available at https://med-fom-ridresearch.sites.olt.ubc.ca/files/2020/12/CANCOVID-Preg-report-1-BC-AB-ON-data_02DEC2020-V2.pdf.
4. Zambrano LD, Ellington S, Strid P, et al. Update: Characteristics of symptomatic women of reproductive age with laboratory-confirmed sars-cov-2 infection by pregnancy status - united states, january 22-october 3, 2020. MMWR Morb Mortal Wkly Rep. 2020;69:1641-7. Available at <https://www.ncbi.nlm.nih.gov/pubmed/33151921>.
5. Health Canada. Drug product database online query. Available at <https://health-products.canada.ca/dpd-bdpp/index-eng.jsp>.
6. National Advisory Committee on Immunization. Vaccines and treatments for covid-19: Progress. Health Canada. Available at <https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/prevention-risks/covid-19-vaccine-treatment.html>.
7. Pfizer-biontech covid-19 vaccine: Covid-19 mrna vaccine, suspension for intramuscular injection (product monograph). Available at <https://covid-vaccine.canada.ca/info/pdf/pfizer-biontech-covid-19-vaccine-pm1-en.pdf>.
8. Polack FP, Thomas SJ, Kitchin N, et al. Safety and efficacy of the bnt162b2 mrna covid-19 vaccine. N Engl J Med. 2020. Available at <https://www.ncbi.nlm.nih.gov/pubmed/33301246>.
9. The American College of Obstetricians and Gynecologists. Vaccinating pregnant and lactating patients against covid-19. 2020. Available at <https://www.acog.org/clinical/clinical-guidance/practice-advisory/articles/2020/12/vaccinating-pregnant-and-lactating-patients-against-covid-19>.
10. Moderna announces primary efficacy analysis in phase 3 cove study for its covid-19 vaccine candidate and filing today with u.s. Fda for emergency use authorization. Moderna. 2020. Available at <https://investors.modernatx.com/node/10421/pdf>.
11. Voysey M, Clemens SAC, Madhi SA, et al. Safety and efficacy of the chadox1 ncov-19 vaccine (azd1222) against sars-cov-2: An interim analysis of four randomised controlled trials in brazil, south africa, and the uk. Lancet. 2020. Available at <https://www.ncbi.nlm.nih.gov/pubmed/33306989>.

12. Cohn A, Mbaeyi S. What clinicians need to know about the pfizer-biontech covid-19 vaccine. Centers for Disease Control and Prevention (CDC). 2020.
13. The PREVENT Working Group. Pregnant women & vaccines against emerging epidemic threats: Ethics guidance for preparedness, research, and response. 2018. Available at https://www.who.int/immunization/sage/meetings/2018/october/1_PREVENT_Recs_Excerpts_for_SAGE.PDF.
14. Advisory Committee on Immunization Practices. Interim considerations for covid-19 vaccination of healthcare personnel and long-term care facility residents. Centers for Disease Control and Prevention (CDC). 2020. Available at <https://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/covid-19/clinical-considerations.html>.
15. National Advisory Committee on Immunization. Research priorities for covid-19 vaccines to support public health decisions. Health Canada. 2020. Available at <https://www.canada.ca/en/public-health/services/immunization/national-advisory-committee-on-immunization-naci/research-priorities-covid-19-vaccines.html>.