



Coronavirus COVID-19

BC Centre for Disease Control | BC Ministry of Health



Clinical Guidance on COVID-19 Vaccines for People with Sickle Cell Disease

This guidance is intended for health-care providers and is based on available evidence as of June 16, 2021.

Background and Context

Sickle Cell Disease (SCD) is an inherited blood cell disorder predominantly affecting persons of African ancestry with an estimated prevalence of 1/500 African Canadians. Patients with SCD often have underlying cardiopulmonary co-morbidities that may predispose them to poor outcomes if they become infected with SARS-CoV-2. The majority of adult sickle cell patients also have functional asplenia which contributes to infection severity and adverse outcomes.

This guidance is based on a review of three of the vaccines approved by Health Canada for the prevention of COVID-19 disease caused by the SARS-CoV-2 virus: Pfizer-BioNTech (BNT162b2)¹ and Moderna (mRNA-1273),² which are mRNA vaccines, and AstraZeneca/COVISHIELD (ChAdOx1-S)³ which is a replication-defective-adenoviral-vector ('viral vector') vaccine.

Currently, anyone aged 12+ (born in 2009 and later) in British Columbia is eligible for COVID-19 immunization. At this time, only the Pfizer-BioNTech mRNA vaccine is authorized for youth aged 12 and above,³ and we are expecting that Health Canada will authorize the Moderna mRNA vaccine for 12-17 year olds in the near future. Studies of the COVID-19 vaccines in younger children are ongoing.

As per the National Advisory Committee on Immunization (NACI), the two mRNA vaccines authorized in Canada (Pfizer-BioNTech and Moderna) can be interchanged for the second dose to complete the series, if the vaccine received for the first dose is not available or is unknown. No data currently exist on the interchangeability of the COVID-19 mRNA vaccines. However, there is no reason to believe that mRNA vaccine series completion with a different authorized mRNA vaccine product will result in any additional safety issues of deficiency in protection.

The AstraZeneca/COVISHIELD COVID-19 vaccine program has been stopped in B.C. for first doses, due to rare (1:50,000) but serious Vaccine-Induced Thrombotic Thrombocytopenia (VITT) blood clotting events and the large supply of other vaccines without this safety concern. The risk of VITT is six times lower for the second dose (1:600,000). People who received the AstraZeneca/COVISHIELD vaccine for their first dose have the option of receiving AstraZeneca/COVISHIELD or an mRNA vaccine for their second dose. Receiving a mixed vaccine series (AstraZeneca/COVISHIELD for first dose and an mRNA vaccine for the second dose) is permitted based on small studies that suggest that this is likely safe and likely



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as effective and may be even more effective, but not enough is known to make firm conclusions and data collection is ongoing. There may also be heightened side effects experienced with a mixed vaccine series.

Due to the nature of their hematologic condition, it is strongly advised that sickle cell disease patients who received AstraZeneca as their first dose receive an mRNA vaccine for their second dose whenever possible. The BCCDC has also prepared two information sheets to help navigate that choice for the general population:

For health care professionals: www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Guidelines%20and%20Manuals/Immunization/Vaccine%20Info/COVID-19-vaccine-second-dose-considerations-HCP-QandA.pdf

For patients: www.bccdc.ca/Health-Info-Site/Documents/COVID-19_vaccine/AstraZeneca_2ndDose.pdf

Another viral vector vaccine, Janssen/Johnson & Johnson (Ad26.COVS.2.S), has been approved by Health Canada but will not be part of BC's COVID-19 immunization program at this time. As well, another emerging vaccine candidate developed by Novavax may also be approved by Health Canada in the coming months. This vaccine works differently than the approved vaccines in Canada. This guidance will be updated as more information becomes available.

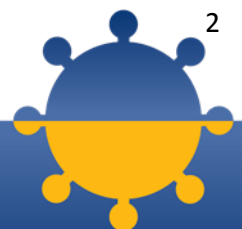
The current interval between doses observed in British Columbia for the general public is 8 weeks. For individuals who have been designated by the Ministry of Health as Clinically Extremely Vulnerable (CEV), as of June 3rd 2021, the dose interval is in line with the manufacturer's recommended dosing interval (21 days for Pfizer-BioNTech, 28 days for Moderna, 8-12 weeks for AstraZeneca/COVISHIELD).

Is COVID-19 immunization recommended for people with sickle cell disease?

COVID-19 vaccines are not contraindicated and should be encouraged for adults and youth with sickle cell disease, including those who have had COVID-19 infection. This recommendation is based on the following review:

- In a UK cohort study, persons with SCD and SARS-CoV-2 infection have increased hazard ratios of hospitalization (4.87 in men and 6.68 in women) and death (4.41 in men and 5.94 in women).⁵
- In an American registry study of 784 patients with SCD and SARS-CoV-2 infection (average age 22 years), 50.5% were hospitalized, 8.2% admitted to ICU, 3.1% required ventilatory support, and the death rate was 2.4%.⁶
- A retrospective electronic medical record study identified 312 patients with COVID-19 and SCD between January and September 2020. Those with SCD had higher 2.0 times higher risk of hospitalization, 2.4 times higher risk of pneumonia, and 3.4 times higher risk of pain crisis compared to matched individuals without SCD.⁷
- The U.S. Centers for Disease Control (CDC) identifies SCD among the medical conditions at high risk for severe COVID-19 disease.⁸
- The American Society of Hematology recommends that given the high levels of efficacy for vaccines and the low rates of vaccine-related adverse reactions, providers should encourage SCD patients to receive COVID-19 vaccinations as soon as possible.⁹

While data specific to the safety and efficacy of COVID-19 vaccines in people with sickle cell disease is currently limited, trials studying vaccine efficacy in people with sickle cell disease are ongoing.⁹ The authors of this guidance agree that the benefits of COVID-19 immunization with these vaccines outweigh any theoretical risks of immunization.



Are COVID-19 vaccines efficacious and safe for people with sickle cell disease?

As sickle cell disease is considered to be a severe underlying medical condition, adults and children with sickle cell disease were excluded from the Pfizer-BioNTech and Moderna COVID-19 vaccine clinical trials. While data collection is ongoing⁹, it is currently unknown if COVID-19 vaccines are as efficacious for patients with sickle cell disease as they were found to be for the clinical trial participants.

Due to the functional asplenia of the majority of adult people with SCD, persons with SCD are immunocompromised.¹⁰ As with most vaccines, there is a potential for blunted immune response in individuals who are immunocompromised due to their disease or treatment.^{11,12} It is therefore possible that persons with SCD may not respond as well to COVID-19 vaccines as the general population and should continue to follow local public health guidelines and adhere to precautionary infection prevention procedures following immunization for as long as SARS-CoV-2 continues to circulate at high rates in the community.

While not specific to COVID-19 vaccines, persons with SCD may be at risk for developing vaso-occlusive pain crises within a few days of immunization with any vaccine and should be counselled to monitor for symptoms and advise their SCD care providers in the event that they develop symptoms.

Currently, there are no serious safety warnings or precautions associated with the Pfizer-BioNTech and Moderna COVID-19 vaccines in persons with SCD beyond those of the general population. If vaccination with the ChAdOx1 nCov-19 (AstraZeneca/COVISHIELD) vaccine is considered, clinicians should be aware of the rare potential for development of venous or arterial thrombosis accompanied by thrombocytopenia 4 to 30 days after vaccination.⁹

Are there any specific contraindications or exceptions for people with sickle cell disease?

Individuals should not receive the vaccines if they have a history of severe allergic reaction to a previous dose of the respective vaccine or any component of the vaccines.¹² For a list of components in the vaccine and packaging consult the respective COVID-19 mRNA vaccine product monographs found at:

- Pfizer BioNTech: <https://covid-vaccine.canada.ca/info/pdf/pfizer-biontech-covid-19-vaccine-pm1-en.pdf>
- Moderna: <https://covid-vaccine.canada.ca/info/pdf/covid-19-vaccine-moderna-pm-en.pdf>
- AstraZeneca: <https://covid-vaccine.canada.ca/info/pdf/astrazeneca-covid-19-vaccine-pm-en.pdf> and COVISHIELD: <https://covid-vaccine.canada.ca/info/pdf/covishield-pm-en.pdf>

People with a history of anaphylaxis without known or obvious cause, and those with suspected hypersensitivity or non-anaphylactic allergy to COVID-19 vaccine components, are advised to consult with an allergist prior to immunization. Health-care providers with patients with a history of severe allergic reactions should refer to the product monographs to review the full ingredient list. Potential allergens that are known to cause type 1 hypersensitivities in the mRNA vaccines include polyethylene glycol (PEG), and Polysorbate 80 in the viral vector vaccine.



Health Canada continues to monitor any adverse events following immunization through their post-authorization surveillance [process](#).

Otherwise, there are no contraindications or exceptions to immunization for individuals within the SCD population beyond those for the general population.

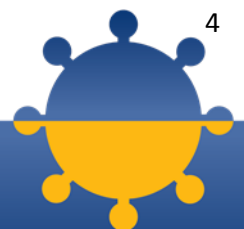
COVID-19 vaccines can be given concomitantly with, or any time before or after any other indicated vaccine. This is a change from the previous recommendation for a 14-day interval before or after receipt of a COVID-19 vaccine. The original advice against co-administration was based on a cautionary approach, as specific studies of co-administration with other vaccines have not been performed. However, substantial data have now been collected regarding the safety of COVID-19 vaccines currently authorized by Health Canada. Extensive experience with non-COVID-19 vaccines has demonstrated that immunogenicity and adverse event profiles are generally similar when vaccines are administered simultaneously as when they are administered alone. The basis for this change in recommendation is referenced to general administrative guidance for vaccines and guidance from the US Advisory Committee on Immunization Practice (ACIP).

Are there specific recommendations or considerations for safe and/or most effective administration?

SCD patients receiving chronic red blood cell exchange should be vaccinated within 10 days following exchange to minimize the potential for developing vaso-occlusive pain crises. Otherwise, there are no additional timing considerations for the administration of the COVID-19 vaccine in SCD patients.

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