Clinical Guidance on COVID- 19 Vaccines for People with Thalassemia

This guidance is intended for health-care providers and is based on available evidence as of April 18, 2023.

Thalassemia is an inherited blood cell disorder. Patients with both transfusion-dependent thalassemia (TDT) and non-transfusion dependent thalassemia (NTDT) may have risk factors associated severe SARS-CoV-2 infection including iron overload, endocrinopathies like diabetes, asplenia due to previous splenectomy, and coagulopathy.[1]

Some people with thalassemia are at a higher risk for severe COVID-19 infections than others. The Thalassemia International Federation has categorized "**highest risk**" and "**high risk**" thalassemia on the basis of age, disease, and comorbidity related factors.[2]

Persons with a diagnosis of thalassemia and any two of the following can be considered as high to highest risk:

- People over 50 years of age
- Transfusion dependent
- Non-transfused with hemoglobin values chronically below 70 g/L for the past two to three years
- People receiving iron chelation therapy
- Splenectomized persons or persons with asplenia
- Those with comorbidities including diabetes, pulmonary hypertension, endocrine, cardiac, or respiratory disease

Is COVID-19 immunization recommended for people with thalassemia?

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

- A multicentre, retrospective, cross-sectional study from Iran including adult TDT and NTDT patients described a death rate of 26.6% in patients with confirmed COVID infection by PCR and 25% in those with suspected COVID infection.[3]
- A systematic review identified seven publications with a total of 34 adult beta thalassemia patients (76.5% had TDT) with a death rate of 26.5%.[4]

While data specific to the safety and efficacy of COVID-19 vaccines in people with thalassemia is currently limited, there are data to suggest that the currently available COVID-19 vaccines have efficacy.[5] 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 thalassemia?

As thalassemia is considered to be a severe underlying medical condition, both adults and children with thalassemia were excluded from the COVID-19 vaccine clinical trials. Therefore, it is unknown if COVID-19 vaccines are as efficacious for patients with thalassemia as they were found to be for the clinical trial participants.

Many people with thalassemia have been splenectomised, which compromises immune function.[6] Chronic transfusion and iron overload are also thought to impair a person with thalassemia's immune response. As with most vaccines, there is a potential for blunted immune response in individuals who are immunocompromised due to their disease or treatment.[7,8] In one study, people with TDT produced protective antibodies comparable to healthy population following COVID-19 vaccination.[9] Therefore, it is possible that people with thalassemia may not respond as well to the vaccine as the general population, and should continue to follow local public health guidelines and adhere to precautionary procedures following vaccination for as long as SARS-CoV-2 continues to circulate at high rates in the community.

Currently, there are no serious warnings or precautions associated with the mRNA (COMIRNATY [Pfizer-BioNTech] or SPIKEVAX [Moderna]) vaccines in persons with thalassemia beyond those of the general population. If vaccination with the Janssen COVID-19 Vaccine (Janssen) 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.

Are there any specific contraindications or exceptions for people with thalassemia?

Individuals who have had a severe allergic reaction to an ingredient of one type of COVID-19 vaccine are still able to receive future doses of the other type of vaccine.[10] BCCDC has a list of the individual components and their purpose in the vaccines. For a complete list of components in the vaccine, consult the vaccine monographs found at: www.bccdc.ca/health-info/diseases-conditions/covid-19/covid-19-vaccine/vaccines-for-covid-19.

For individuals with a history of anaphylactic reaction to a previous dose of an mRNA COVID-19 vaccine, re-vaccination (i.e., administration of a subsequent dose in the series when indicated) may be offered with the same vaccine or the same mRNA platform if a risk assessment deems that the benefits outweigh the potential risks for the individual and if informed consent is provided. Prior to revaccination, consultation with an allergist or another appropriate physician (e.g., Medical Health Officer) is advised. If re-vaccination is going ahead, vaccine administration should be done in a controlled setting with expertise and equipment to manage anaphylaxis, with an extended period of observation of at least 30 minutes after re-vaccination.

Health Canada continues to monitor any adverse events following immunization through their post-authorization surveillance process.

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Thalassemia patients who have received gene therapy should be immunized in accordance with guidelines for patients who have received high-dose chemotherapy and autologous hematopoietic stem cell transplant.

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

COVID-19 vaccines can be given concomitantly with, or any time before or after any other live or inactivated vaccine.[11-14]

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

There are no specific timing considerations for the administration of the COVID-19 vaccine relative to treatment other than for patients who are receiving gene therapy. These patients should be immunized according to guidelines for autologous stem cell transplant recipients (e.g., two doses at least two weeks pre-treatment and more than three months post-treatment).

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