INTRODUCTION & OVERVIEW OF THALASSEMIA

Thalassemia is a heterogeneous group of hemoglobin production disorders that is primarily found in the Mediterranean, Asian, Indian, and Middle Eastern regions. These regions account for 95% of all thalassemia births in the world. The epidemiology of thalassemia, however, is rapidly evolving due to migration patterns. More recent migration movements to Canada have challenged health professionals throughout the country in providing equitable access to quality services for the prevention and treatment of hemoglobin disorders in general and thalassemia in particular. Thalassemia is a relatively rare congenital blood disorder, which has life-long implications for patients and families. The care of patients with thalassemia is most adequately delivered by comprehensive care centers staffed by professionals experienced in the treatment of the disease and its complications.

The following Consensus Statement on The Care of Patients with Thalassemia in Canada is a revision of the guidelines for the Clinical Care of patients with Thalassemia in Canada written in 2009. This revision is meant primarily for healthcare professionals involved in the care of affected patients and is to provide members of the thalassemia treating the team with relevant information, which should improve health care delivery and patient outcomes. This statement is developed by a Canadian team and intended primarily for application in the Canadian context. Every patient with Thalassemia regardless of location in Canada should have access to optimal management guidance and monitoring. The statement is not intended to offer the full and comprehensive review of thalassemia management, however; it was intended to serve as guidance on delivering services and the way they need to be structured and delivered in Canada. The document will describe the key members and the goal and function of the comprehensive care team in a Thalassemia program. It will provide principles, recommendations, and interventions with a summary of Thalassemia management and its complications.

α-Thalassemia:

α -thalassemia is caused by the reduced or absent production of α -globin chains. Each individual has typically four α-globin genes.

- Hb Bart's hydrops fetalis: all four α -globin genes are deleted resulting in severe intrauterine anemia and death. In the modern era, some patients are surviving to term with intrauterine transfusions and thus need life-long transfusion support for survival after birth with alpha thalassemia major.
- Hb H disease is due to mutations (deletional or non-deletional) in three α-globin genes resulting in moderate hemolytic anemia. Only one α -globin gene is intact. Some patients may need transfusion support and have a thalassemia intermedia phenotype.
- α-thalassemia minor is due to deletions or mutations of two α -globin genes resulting in mild microcytic anemia. Finally, silent carriers have one α-globin gene deletion or mutation and are clinically asymptomatic.

β-Thalassemia:

β-thalassemia is a genetic disease of hemoglobin production. It is caused by a decreased or absent β-globin chain production, which results in a relative excess of free α-globin chains, and in premature destruction of red blood cells. Each individual has typically two β-globin genes. This disease is common in people from the Mediterranean, Middle East, and South East Asia. It is inherited in an autosomal recessive pattern.

- β-thalassemia major (BTM) is a term that refers to a clinically severe phenotype, which is due to the absence of β-globin chain production as a result of homozygous or compound heterozygous β-thalassemia mutations. Severe anemia, ineffective erythropoiesis, and compensatory erythroid marrow hyperplasia necessitate regular red blood cell transfusions, beginning in infancy. Patients with thalassemia major are at risk for impaired growth and development and decreased survival. This is due primarily to consequences of severe anemia, ineffective erythropoiesis, and compensatory erythroid marrow hyperplasia.

- β-thalassemia intermedia (BTI) or Non-transfusion Dependent Thalassemia (NTDT) refer to a clinically moderate phenotype, which is due to genotypes such as compound heterozygous states for milder β-globin mutations, thalassemic hemoglobin variants (e.g., HbE) or alternative thalassemic mutations (e.g., δβ). These patients may need occasional transfusional support. Circumstances may change through life requiring long term transfusion support. β-thalassemia trait/carrier refers to a clinically mild phenotype with only one mutated gene resulting in mildly low hemoglobin levels and clinically asymptomatic individuals. NTDT is used now to describe patients with that thalassemia that requires occasional blood transfusions.