

○ **Dr. Yigal Dror – 2 years**

Focus: Inherited marrow failure syndromes (IMFSs), a collection of conditions whereby individuals are unable to make enough blood cells.

This study aims to better define the clinical characteristics of IMFSs and the risk factors for complications by investigating clinical, laboratory and genetic factors. This information will enhance ability to diagnose, provide a basis for the creation of a screening / monitoring program for complications and identify signs for early involvement.

The study will also help researchers understand why a portion of patients with IMFSs develop severe complications, while others remain stable for many years, or even for life.

○ **Dr. Lillian Sung – 1 year**

Focus: Occurrence of life threatening infection among child patients with acute myeloid leukemia (AML).

There is a wide range in the rate and outcome of infection, even among children receiving identical chemotherapy treatments. Dr. Sung therefore is looking at variations in specific genes involved in immunity that could contribute to the rate and outcome of infections in children.

From this information, the aim is to be able to predict and administer targeted therapy to children with the greatest risk.

○ **Dr. Michel Duval – 2 years**

Focus: Effects of maintaining a higher hemoglobin level on Neutropenia - a low number of white blood cells - duration after bone marrow transplantation (BMT).

Prolonged neutropenia is found to result in a 2- to 5-fold increased risk of death after stem cell transplantation, and is associated with a higher risk of bacterial and fungal infections, and an increase in transplant-related mortality. Thus Dr. Duval proposes to determine in a randomized trial whether a higher hemoglobin level in children after BMT will accelerate white blood cell count recovery.

○ **Dr. Rod Rassekh – 2 years**

Focus: To identify patients at risk of an adverse drug reaction (ADR) - a major cause of childhood morbidity and mortality - by looking at common genetic variations.

Identifying patients who have had an ADR, this project will look at genetic variations between ADR and non-ADR patients. Potential genes that confer a risk of an ADR to a particular medication will be identified, with the goal of

using this method as a routine tool for doctors to safely select medications and doses for individual patients.

Note: This project has allowed pediatric oncologists to anticipate adverse drugs that may be targeted, prompting future investigations at other centres. It is possible that the Canadian pediatric oncology centres, through the C¹⁷ Research Network, will take the world lead in the understanding of adverse drug events in childhood cancers.

○ **Dr. Donald Mabbott – 2 years**

Focus: Aim to reduce the negative impact of radiation on children treated for brain tumours, and improve their quality of life.

With recent advances in medical treatment, many children diagnosed with brain tumours are now cured. Unfortunately, those who are treated with radiation to the brain can experience brain injury, learning problems, and experience difficulties obtaining employment as adults.

To understand the relationship between brain injury from radiation and its effect on thinking skills, researchers will obtain MRI images of the brain and tests of thinking ability in healthy children and children with brain tumours. Findings of this study will help identify children at risk of difficulties, in order to develop rehabilitation programs to help children learn after they have been treated with radiation and identify medical treatment to avoid injury while maintaining positive effects.

○ **Dr. Conrad Fernandez – \$2 years**

Focus: Quality of Life comparison between patients with varying treatments for Wilm's Tumour, a form of kidney cancer in children.

The most common kidney cancer in children, Wilm's Tumour, can be effectively treated by intensive chemotherapy or bone marrow transplantation (BMT). Presently, however, it is not known which is the best treatment for high-risk relapse.

A study will be done to compare these two treatments. Researchers plan to measure quality of life at four time points during treatment and follow-up of participants of the COG study. If the treatments are the same in terms of cure, finding out if one treatment is better in terms of quality of life and ascertaining what aspects of quality of life are most affected by the treatment can help health care providers work to reduce side effects.

○ **Dr. Jacqueline Halton – 2 years**

Focus: Bone death in children with Acute Lymphoblastic Leukemia, or ALL.

ALL is the most common form of childhood cancer. With improved outcomes, an increased number of survivors are at risk for long-term side effects of treatment, including osteonecrosis (ON) or bone death. Causing pain

and poor quality of life, ON affects joints and can require replacement of affected joints.

MRI is a sensitive imaging tool that can detect ON at even its earliest stages. This study will use MRI imaging to determine risk factors for ON, to provide the basis for future intervention and prevention guidelines, including possible earlier detection. The study will evaluate a) the pattern and severity of ON among children receiving treatment for leukemia, and b) the relative contribution of the various risk factors for ON among these children. This study is currently in the early stages of development.

○ **Dr. Paul Steinbok – 2 years**

Focus: Thalamic Brain Tumours in the era of magnetic resonance imaging (MRI).

This study will collect salient information about outcomes of children with thalamic tumours (cancer of the thalamus, or brain stem) who were diagnosed and treated at the 12 pediatric neurosurgical centres across Canada over the last 20 years.

Through chart review and tumour specimens, researchers will evaluate the tumour location, magnetic resonance images, pattern of tumour extension and effects of treatment on patient outcome.

The aim is to gather information to widen our understanding of thalamic tumours, to improve patient and physician education and knowledge, including potential barriers to successful treatment, and guide therapies toward improved outcomes.

In the latter part of the study researchers aim to perform genetic analysis of tumour samples to study the molecular-genetic changes underlying the development of the tumours. This study is in the early stages of development.