A Day in the Life of a New Acute Leukemia Patient

WHEN YOU ARE REFERRED TO PRINCESS MARGARET CANCER CENTRE’S LEUKEMIA PROGRAM by your family doctor, an emergency physician, internist or hematologist, your day revolves around a number of steps and procedures known as the Rapid Assessment Clinic (RAC). We recognize that the need to visit the Princess Margaret can be stressful for both patients and their families. To help reduce some of this stress, we have developed the RAC program so patients can rapidly receive state-of-the-art care.

What is RAC?
The clinic is for the rapid assessment of new or suspected diagnoses of adult acute leukemia. It aims to rapidly provide a diagnosis, often within 24-48 hours from time of referral. It not only provides clinical monitoring, care and therapy planning for newly diagnosed patients, but it also importantly provides education, resources, and support for patients and their family and caregivers.

What is the purpose of RAC?
Nearly half of all leukemia patients in Ontario are assessed at Princess Margaret. By ensuring timely assessments and rapid diagnosis for new patients, we can enhance your care and support.

Who ensures my rapid assessment?
Your assessments are done through a coordinated team effort by many health practitioners. You will likely first see a nurse practitioner (NP), a hematology resident, or leukemia fellow who will do the initial assessment, coordinate the initial testing to make a diagnosis, discuss your case and potential treatment options. Our program is supported by 3 specialized oncology registered nurses (RN) and it is overseen by 6 staff physicians (hematologists) who are experts in the treatment of leukemia. We are also supported by 8 specialized pathologists (hematopathologists) who will review your lab material, including bone marrow biopsies.

What is the process?
If you are a new outpatient, or an inpatient arriving through an ambulance, the steps are outlined in the schema outlined above. This process outlines what you expect from your oncology team once you are referred and first seen at the Leukemia Program at Princess Margaret. As you can see, it is a complex series of tests and discussions. But, we will make this process as smooth as possible for you. To learn more information about the Rapid Assessment Program, please contact our Nurse Practitioner Alix Duck by e-mail: Alix.Duck@uhn.ca.
ALL or acute lymphoblastic leukemia is a type of blood cancer affecting lymphoblasts. Lymphoblasts are cancerous white blood cells that acquire defects or mutations preventing them from maturing into normal infection-fighting B-lymphocytes, T-lymphocytes or natural killer cells. The majority of ALL cases affect B-lymphocytes (B-ALL) and about 15% of cases affect T-lymphocytes (T-ALL). Rarely, natural killer cells are impacted.

What are the symptoms of ALL?
The body develops more white blood cells than other type of cells but they do not function well. As a result the early symptoms include like the flu such as fever or night sweats, weakness, fatigue, pain in bones, or loss of appetite resulting to weight loss. Bruising or easy bleeding may be observed, having many infections, painless lump in the neck, underarm, stomach or groin are also early signs of ALL.

How is ALL diagnosed?
Diagnosis is done by testing patients’ blood and bone marrow samples. Complete blood cell count, blood chemistry, and visually checking a smear of blood or bone marrow biopsy under the microscope to look for abnormal cells or immature cells called blasts help to initially determine ALL. Cell samples are also looked further under the microscope to see changes in the chromosomes such as if part of a chromosome is moved to another chromosome. A specific type of chromosome change seen in ALL is the occurrence of the Philadelphia chromosome.

How is ALL treated?
The standard treatment for ALL includes oral, intravenous, and intramuscular chemotherapy. The outcomes for adults with ALL has improved dramatically in the last several years by incorporating chemotherapy protocols initially developed for children. These protocols involve several phases and last for a few years. In the first phase, patients are given chemotherapy to kill the leukemia cells and put the cancer into remission. This phase is called induction therapy. The next phases include killing any remaining leukemia cells that could regrow and cause relapse. Patients with the Philadelphia chromosome receive a pill that can effectively target this specific defect or mutation.

More information on ALL can be viewed from the Leukemia and Lymphoma Society (LLS) or the National Cancer Institute (NCI):
https://www.lls.org/leukemia/acute-lymphoblastic-leukemia
http://www.cancer.gov/types/leukemia

Red arrows identify two of many similar looking acute lymphoblastic leukemia cells. These are relatively large cells with large nuclei and very little cytoplasm. Yellow arrow identifies a rare cell that is destined to become a red blood cell. **Caption by Dr. Mark Minden.**

Image courtesy of Dr. Anna Porwit, UHN.
Dr. Steven Chan recently joined the Leukemia Program as a clinician and research scientist with a focus on finding new treatments for acute myeloid leukemia (AML). AML is a cancer of the bone marrow cells leading to the abnormal production of white blood cells, red blood cells, and platelets. AML patients frequently succumb to uncontrolled infections that healthy individuals can easily fight off. Although significant progress has been made in recent years to fight this disease, much work remains to be done to improve treatment outcomes.

Dr. Chan received his medical and research training at Stanford University in California where he earned his MD and PhD degrees. His recent research led to the discovery that a fraction of AML patients with a mutation in a gene called isocitrate dehydrogenase (IDH) are particularly sensitive of a new drug known as venetoclax (ABT-199). This drug is currently being tested in clinical trials for the treatment of a number of cancers, including AML, chronic lymphocytic leukemia (CLL), non-Hodgkin’s lymphoma, and multiple myeloma, among others.

His research program at Princess Margaret Cancer Centre will focus on two main goals. “The first is to discover how genetic mutations in AML lead to unique weaknesses that can be targeted by either new drugs or existing ones used for other indications. This research will hopefully allow physicians design better drug combinations that are tailored to the specific mutations found in the leukemia cells of an individual patient,” said Dr. Chan. “At Princess Margaret Cancer Centre, we believe that this form of personalized medicine will someday improve efficacy of cancer treatments while minimizing their side effects.”

The second focus of Dr. Chan’s research is finding the differences in metabolism between normal and leukemia cells and how these differences contribute to the development of AML in humans. This research will potentially lead to the development of new ways to eliminate leukemia cells by attacking the way they process and utilize nutrients.

The Leukemia Program at Princess Margaret Cancer Centre is dedicated to not only providing our patients with the best currently available therapies but also developing transformative therapies with the goal of cure for leukemia through innovative research like that of Dr. Chan’s.
Outreach Program

Many patients live within a significant distance from Princess Margaret Cancer Centre, and travelling to the hospital after you finish your treatment is always challenging. The good news is the Leukemia Program has started to make travelling less taxing by helping you receive your quality care closer to home while maintaining contact with your primary care physician at Princess Margaret.

Where do you get your treatment?

Once diagnosed with leukemia at your hospital or at Princess Margaret, some patients receive initial chemotherapy treatment known as “induction chemotherapy”. This treatment is provided here at the Princess Margaret. Once your blood counts have recovered, you and your Princess Margaret hematologist will decide the next step of treatment and discuss whether the Outreach Program is right for you based on the status of your leukemia, your residential distance to the hospital, and other treatment-related conditions. If the Outreach program is suited for your needs, follow-up clinic visits to assess your health status in between consolidation chemotherapy treatments can occur in partner hospitals. Services done in close collaboration with our partners include blood specimen collection and testing, other medical treatments, if needed, such as blood transfusion, supportive care, hydration, or treatment for febrile neutropenia, and central line care. The Outreach Program can also provide similar services for some of our patients not receiving induction or consolidation chemotherapy.

Who are the partner hospitals?

Currently, we have a formal Shared Care partnership with the Royal Victoria Hospital (North Simcoe Muskoka) and Southlake Regional Health Centre (York Region and South Simcoe), and are partnering with other hospitals with limited access to shared online health data. Scarborough General, Juravinski and Lakeridge are some of the local hospitals which are assisting with follow up care after consolidation.

How do you participate?

As part of your treatment process, the Leukemia Outreach Coordinator will work with you on your ongoing care plan during your treatment. If you qualify, you will provide consent to share your health information with a partner health centre. Your treatment will be done collaboratively with Princess Margaret and the partner hospital closer to your home.

Do you want to know more information about the program?

If you wish to be assessed for the program, please ask your specialized oncology nurse, or inpatient nurse about getting you in touch with the Leukemia Outreach Coordinator.

Image: From “Providing better care – together” brochure from Cancer Care Ontario.

Acute Leukemia Shared-Care Model

| Diagnosis of Acute Leukemia at Cancer Centre or Hospital |
| Treatment with Induction Chemotherapy at Princess Margaret Cancer Centre (In-Patient) |
| Clinic Visit Decision on next steps for treatment at Princess Margaret |
| Post-Induction/Consolidation Chemotherapy (1 to 3 Cycles) at Princess Margaret Cancer Centre (Out-Patient) |
| Follow-up Clinic Visits* for assessment at Partner Cancer Centre in between Consolidation Treatments |
| Clinic Visit Decision on next steps for treatment at Princess Margaret |
| Remission and Follow-up Care at Princess Margaret |
| Remission and Follow-up Care* at Partner Cancer Centre |
| Primary Care Follow-up |

Services include:
- Blood specimen collection and testing
- Medical treatment (e.g. blood transfusion, hydration and febrile neutropenia)
- Supportive Care

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