Understanding Inpatient Induction Chemotherapy:

Daunorubicin and Cytarabine

Information for Patients and Families

LEUKEMIA/BONE MARROW TRANSPLANT PROGRAM
BC

Read this resource to learn:

- What is acute myeloid leukemia?
- What can I expect during treatment?
- What side effects could I experience?
- How can I prepare for discharge from the hospital?
- What happens next?
- Where can I get more information?

What is Acute Myeloid Leukemia?

Leukemia is a cancer of the blood and bone marrow. Bone marrow is the spongy, soft centre of bones where stem cells are formed. Stem cells are able to develop into any kind of cell in your body.

Some stem cells grow to become different types of blood cells:

White Blood Cells – These cells help the body fight germs and prevent infections.

Red Blood Cells – These cells carry oxygen from your lungs to all parts of your body.

Platelets – These blood cells help the body form clots to prevent and stop bleeding.

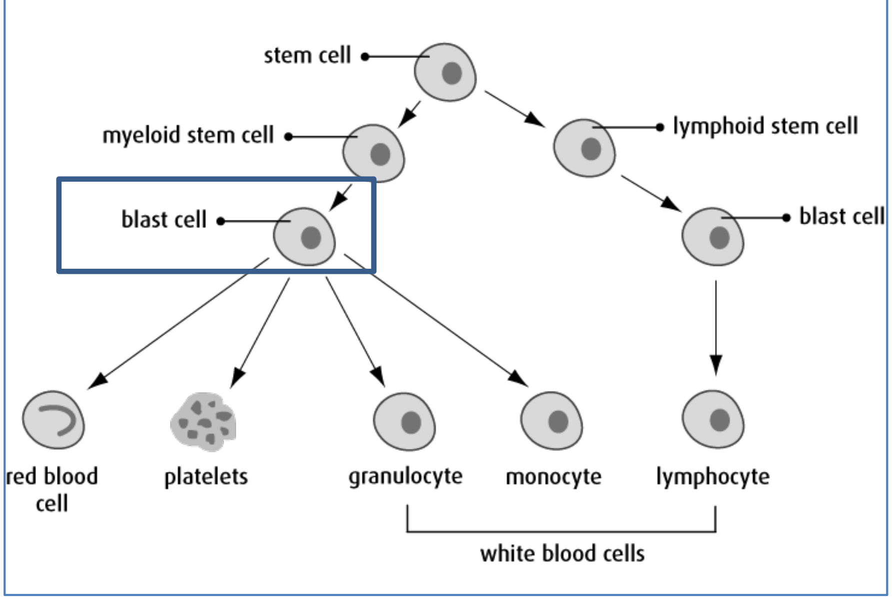
See the "**Understanding your Counts"** handout for more information on blood cells.

Cancer is the uncontrolled growth of cells in your body. In acute myeloid leukemia (AML), your bone marrow starts making too many "blast" cells. This can happen when the normal genes or DNA in your cells become damaged or mutated.

Blast cells are "immature" (not fully formed) blood cells that are normally found in small numbers in your body. When your bone marrow starts making too many blasts cells, they become "leukemic" or "cancer" cells that may spill into your bloodstream.

Too many blast cells can crowd out all the other normal cells in your blood. Fewer normal cells can lead to serious health problems.

Acute Myeloid Leukemia is the uncontrolled growth of "blast" cells.



Normal Development of Blood Cells in Bone Marrow:

HICKMAN LINE: A flexible plastic tube placed in a neck vein. The other end sits outside your chest. We use it to give intravenous ("IV") treatment and to take blood samples from you. It will make your treatment more comfortable because we won't have to use needles most of the time when drawing bloodwork.

ELECTROCARDIOGRAM (ECG): A heart test to check your heart's electrical activity. Electrode stickers are placed on your chest to measure your heart's rhythm.

RADIONUCLIDE VENTRICULOGRAM (RVG or "MUGA"): A special type of x-ray used to look at how well your heart is pumping.

CHEST X-RAY: A picture of the organs, bones and tissue inside your chest.

Before Treatment Starts:

- A bone marrow biopsy test is done to confirm you have leukemia diagnosis and what type of leukemia you have.

- A "Hickman" intravenous line will be inserted so we can safely give you treatment. You may also hear this called "your line," "tunnelled catheter" or a "CVC" (central venous catheter).

- You will have many different tests to check how your organs are working before we give you chemotherapy treatment. These tests include:
    - Blood tests: you will have bloodwork drawn every day while you're in hospital
    - Heart tests: RVG and ECG
    - Lung test: chest x-ray
    - Other tests your doctor orders as needed

- Each patient's case is slightly different. In some cases, the leukemia can quickly cause serious harm. In these cases, chemotherapy needs to start as soon as possible, even before all tests are done.

- People with leukemia sometimes need a stem cell transplant as a part of their treatment. Generally, your physicians do not know if you need a stem cell transplant when you are diagnosed. To plan ahead in case a stem cell transplant is needed, we will ask for more information on your siblings and family background.

What Can I Expect through Treatment?

After the necessary tests and procedures have been performed, you will start treatment. The day you start chemotherapy is called "Day 1."

Days 1 - 7:

- You will be given intravenous (IV) chemotherapy 7 days in a row.
- Your "blood counts" (white blood cells, hemoglobin and platelets) will start to be lowered by chemotherapy.
- You may start to notice some side effects from the chemotherapy.

Days 8 – 24:

- Your last dose of chemotherapy will finish on the 8th day.
- Blood "counts" (hemoglobin, white blood cells, platelets) will continue to be low.
- Side effects from chemotherapy feel the worst during this time, especially when your white blood cells are close to zero.
- Day 15: sometimes a bone marrow biopsy is done to check if the chemotherapy has worked. See page 6 for details.
- As your blood counts slowly start to go up, you will start to feel better.

Days 21 - 24 or later

- You will be discharged from the inpatient unit when your doctor feels it is safe.
- You will have a bone marrow biopsy to check if there is any remaining leukemia in your body. This is often done as an outpatient in our day unit.
- You are safe to be monitored and receive more chemotherapy treatment as an outpatient at Vancouver General Hospital.

Every Day in Hospital You Will Have:

- Assessments and support from your whole health care team
- Blood work taken
- Medications to treat you and help you cope with side effects
- Close monitoring for fever, infection and other complications
- Intravenous (IV) fluids
- Blood and platelet transfusions as needed
- Extra tests and consultations with specialist doctors as needed

How Does Chemotherapy Work?

Chemotherapy is a drug treatment that uses strong medications to kill cancer cells. It targets cells that grow and divide quickly, as cancer cells do.

Chemotherapy also attacks fast growing healthy cells. The cells that line your stomach, hair, skin and bone marrow are examples of cells that grow quickly.

You will start to feel unwell and experience chemotherapy side effects as your healthy cells are damaged. This is why chemotherapy can cause upset stomach, hair loss and lowers your “blood counts.”

Cytotoxic Safety (“CYTO” = cell “TOXIC” = harmful)

Chemotherapy is a cytotoxic medication, meaning it is harmful to cells. After receiving chemotherapy, you are **cytotoxic for 48 hours** from the last time the drug was given.

Your last dose of chemotherapy finishes on Day 8. This means you are cytotoxic Days 1 to 10.

Cytotoxic drugs slowly leave your body through your urine and poo. Small amounts can also be found in blood, vomit, semen, vaginal fluids and breast milk. While the risk is low, please follow these steps to keep you and your family safe while you are cytotoxic:

While you are Cytotoxic:

- Casual contact such as hugging, kissing and sharing a bed is safe.
- After using the toilet: Cover the toilet with a blue pad, and then flush twice. Replace the blue pad every few days.
- Pee, poo and toilet paper can be flushed down the toilet. Wash your hands with soap and water after.
- Vomit, vomit bags, baby wipes and the soft paper towels used as toilet paper (“the white roll”) go into the red cytotoxic bins.
- If you’re using a commode at the bedside: toilet paper and wipes go into the red cytotoxic bins.
- Family members who come in contact with your body fluids (i.e. emptying and measuring pee) need to wear blue gloves to protect themselves. They then need to wash their hands with soap & water.

Days 1-7: What to Expect

- You will receive "anti-nausea" pills each day of chemotherapy. They help prevent you feeling upset to your stomach. Please ask for more if you need them.
- The 2 chemotherapy medications you will receive:

1. **Daunorubicin** ("don-oh-REW-bis-sin")
    - Red solution given intravenously (IV)
    - Given 3 days in a row over 30 minutes.
    - Turns your pee red for a short time.
2. **Cytarabine** ("sye-TARE-ah-been")
    - Clear solution given intravenously (IV)
    - Given continuously for 7 days in a row over 24 hours.

We call the first day you begin chemotherapy "day 1." The second day is called "day 2." We continue naming days like this until you have fully recovered from your chemotherapy. This usually takes 21-28 days.

The chart below shows what chemotherapy you will receive on which day. **Any changes in medications or schedule are approved by your doctor and pharmacist.

Day	**Anti-Nausea Pills**	**Daunorubicin** over 20-30 minutes	**Cytarabine** over 24 hours
1	Dex & Ond	✓	✓
2	Dex & Ond	✓	✓
3	Dex & Ond	✓	✓
4	Ond		✓
5	Ond		✓
6	Ond		✓
7	Ond		✓
8			Cytarabine finishes

Dex = Dexamethasone 8mg pill   Ond = Ondansetron 8mg pill

Days 8-28 or later: What to Expect

After you finish your 7 days of chemotherapy, you need to stay in hospital for close monitoring. When your white cell count is low, any kind of infection can quickly make you very sick.

At first, as chemotherapy kills the leukemia cells and some of your healthy cells, you will see your "blood counts" lower. Side effects from chemotherapy often feel the worst during this time, especially when your white blood cells are close to zero.

Day 15 Bone Marrow Biopsy

You may have a bone marrow biopsy roughly 2 weeks after you start treatment. This is done as an "early look" to check if your leukemia cells have been killed by the chemotherapy.

If there is a still a significant number of leukemia cells and you are well, your doctor will talk with you about having a second cycle of chemotherapy while you are in hospital. A plan will be made to have the same or different chemotherapy medications. Your doctor will discuss the best option with you.

As your bone marrow recovers and your blood counts start to increase back to normal, you will start to feel better. This usually happens 3-4 weeks after chemotherapy. Your health care team will discuss your discharge from hospital at this point.

What Side Effects Can I Expect?

Different people react differently to medications, so side effects vary between patients. Some of the most common side effects are listed on the following pages.

There are a lot of things you can do to help yourself feel better. Reading about what to expect and what you can do to cope can reduce anxiety and will help you feel more comfortable. Always tell your health care team about any side effects you notice.

Potential side effects you may experience:

- Fatigue
- Appetite changes
- Hair loss
- Fever and Infection
- Nausea and vomiting
- Diarrhea
- Skin changes
- Sore mouth
- Increased risk of bruising and bleeding

Refer to the booklet *“**Supporting You through Treatment**”* for the care and management of any potential side effects you may experience. Not all the side effects mentioned will apply to you. More information on this booklet is on page 12.

When will the Side Effects Stop?

As your blood counts grow back to more normal levels, your side effects will improve. It takes roughly 3-4 weeks for side effects to pass, but sometimes can continue longer.

Always tell your nurse or doctor about any side effects or symptoms you notice, as minor as they may seem. Sometimes we will “watch” or monitor them. Sometimes we may need to

How Can I Prepare for Discharge from Hospital?

You will be discharged from hospital when the doctor feels it is safe for you. This usually happens 3-4 weeks after chemotherapy when your blood counts are closer to normal.

During your treatment, the best way to help yourself is by:

- Always tell your nurse and doctor about symptoms you have.
- Eat calories and protein as you are able. They contain the nutrients your body needs to heal. We know this is a challenge. Our dietitians will help you make the best food choices when your appetite is low or your mouth is sore.
- Keep your strength and stay active. Sit out of bed for meals and walk around the unit or in your room as you are able. Our physiotherapists and occupational therapists will help you stay as active as possible.
- Learn how to care for your Hickman Line as you will have it in place when you are discharged. You will be taught safety tips and how to change your own dressing.

Before you are discharged, we consider:

- Your blood cell counts have reached a safe level. Your blood counts do not have to be normal for you to be discharged.
- You are well enough to be monitored as an outpatient.
- You are able to eat and drink enough to maintain your weight.
- You have enough strength and mobility to attend regular clinic visits.
- You are able to take your medications in pill form.

You will need to stay in the Vancouver area for 3-6 months after you are discharged. More chemotherapy treatments are needed to prevent the leukemia from returning. These treatments are usually done in our outpatient “Daycare Clinic”. We understand how difficult this is for our patients and their families, especially those who do not live in Vancouver. Our social workers will meet with you to discuss how treatment may affect your family, living arrangements, finances and other practical matters.

What Happens Next?

After being discharged from hospital, you will have another bone marrow biopsy. This will be done to find out if you are in remission from leukemia.

What is Remission?

Remission is a sign your cancer is under control. This is determined by performing the bone marrow exam at approximately day 28 following treatment (or at the time of blood count recovery). A remission doesn't mean that you are cured or you can stop treatment completely.

With AML, some cancer cells can be left behind even when you are in remission. This is the reason why patients go on to receive "consolidation chemotherapy" and/or possibly a stem cell transplant. Your doctor will keep seeing you and checking blood work long after your treatment is done to make sure that you stay cancer-free.

If you are in remission from leukemia, your doctor will talk with you about "consolidation chemotherapy." If you are not in remission at this time, your doctor will talk with you about other treatment options.

What is Consolidation Chemotherapy?

Consolidation chemotherapy is the next step in treating leukemia. The goal of this treatment is to kill any remaining leukemia cells and prevent the leukemia from coming back. If it is not given, there is a high risk the leukemia will return.

Most patients will get consolidation chemotherapy as an outpatient in our "Daycare Clinic". This means you will not stay overnight in hospital for treatment. The Daycare clinic is on the 6th floor of the Leon Blackmore Pavilion at Vancouver General Hospital.

Each time you go through the 3-4 week long treatment and recovery of chemotherapy, this is called a **Cycle of Chemotherapy**.

Where Can I Get More Information?

Ask a member of your health care team for any of the materials listed below. You will find them on the T15 pamphlet display near the public washrooms or in the patient library on the Daycare Unit (room 631 of Leon Blackmore Pavilion 6th floor).

- "Acute Myeloid Leukemia" or "The AML Guide" (Leukemia/Lymphoma Society)
- Supporting You Through Treatment (Leukemia/BMT Program of BC)
- Resources and Support (Leukemia/BMT Program of BC)
- Coping When You Have Cancer (Canadian Cancer Society)
- Eating Well When You Have Cancer (Canadian Cancer Society)
- Questions to Ask When You Have Cancer (Canadian Cancer Society)
- Sex, Intimacy and Cancer (Canadian Cancer Society)

If you have questions or concerns about your treatment or coping with your leukemia diagnosis, let your health care team know.

Find these booklets, videos and more information at:

The Leukemia Bone Marrow Transplant Program of BC:
www.leukemiabmtprogram.org/

The Leukemia & Lymphoma Society of Canada: 1-833-222-4884
www.llscanada.org/
Click Patients & Caregivers → Free Information Booklets

BC Cancer: 1-800-663-3333
www.bccancer.bc.ca/

The Canadian Cancer Society: 1-888-939-3333
www.cancer.ca
Click Support and Services → Publications

Please note that the information contained in this manual is not intended to replace the advice of your health care team. Use this as a reference and education guide. Consult your health care team if you have any questions or concerns. Author: Amy Healy 06/2019

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