Patient Education

Your Inpatient Autologous Stem Cell Transplant

Information for Patients and Caregivers

Read this guide to learn:

- What an autologous stem cell transplant is
- How to prepare for your hospital stay
- What to expect during your stem cell transplant
- What to expect during your recovery
- Important phone numbers and contact information
- Where you can find more information

The Leukemia/Bone Marrow Transplant Program of BC

Important Phone Numbers:

The Leukemia/BMT Inpatient Unit:
24 hour care
15th & 16th Floor
Jim Pattison Pavilion, VGH

604 – 875 - 4343

Hematology Apheresis Unit (HAU):
6th Floor Leon Blackmore Pavilion, VGH
Monday to Friday 7:00 am – 7:00 pm
Weekends & Holidays Closed

604 - 875 - 4626

The Leukemia/BMT Daycare Unit:
6th Floor Leon Blackmore Pavilion, VGH
Monday to Friday 7:00 am – 7:30pm
Weekends 8:00 am – 6:00 pm
Holidays 7:00 am – 7:30 pm
Leukemia/BMT Daycare closes every night. For issues after hours please call the Leukemia/BMT Inpatient Unit.

604 - 875 - 4073

If you do not have a scheduled appointment, please call the unit and speak to a Triage Nurse prior to showing up to the Leukemia/BMT Daycare Unit.

Call Us Immediately If You Have:

- Fever: a temperature of 38°C or higher
- Flu-like symptoms, chills or shaking
- Yellow or green mucus when you cough
- Shortness of breath, trouble breathing, or a bad cough
- Diarrhea, nausea or vomiting that doesn’t stop
- Impaired speech, memory loss, confusion
- New bad bruising and/or bleeding
- Difficulty taking your pills
- New pain or a bad headache
- Concerns about your Central Venous Catheter (CVC) line
- Dizziness, unsteadiness when walking or have fallen down
- Rash, blisters, allergic reactions

In Case of Emergency – Call 911

If you are having severe chest pain, can’t breathe, or require urgent medical care – **You or your caregiver should call 911**. An ambulance will take you to the closest hospital. Tell the staff you are a Leukemia/BMT patient and to contact our Doctor on call. These symptoms cannot be managed over the phone.

Table of Contents

About this Booklet

This booklet has been developed to help you and your family prepare for an autologous stem cell transplant. We hope reading this will help you feel less anxious about your transplant as you learn about what to expect each step of the way.

We welcome your feedback on how we can improve this booklet for other patients and families.

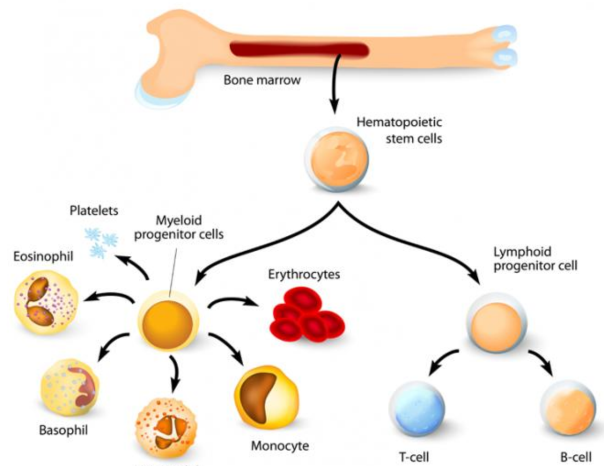
The amount of information available on stem cell transplants can be overwhelming. We know you will not be able to remember everything we tell you. This booklet provides written information to go along with the teaching you will receive from us, your healthcare team.

Read each section of this booklet when you are ready. You may think of questions to ask us as you read through it; we encourage you to write them down. Bring your questions and this booklet with you to your appointments.

At the end of the booklet there is a section on common medical terms.

What Are Stem Cells?

Development of Blood Cells in the Bone Marrow



Stem cells are the body's primary cells. All your body's cells, tissues, organs and bones are made from stem cells.

Stem cells that develop into blood cells are found in your bone marrow. Bone marrow is the spongy tissue found inside your bones. It is where your blood cells are made.

Blood stem cells create lots of different types of blood cells, including white blood cells, red blood cells and platelets.

You will notice that we talk a lot about blood cells (also referred to as "blood counts") through your treatment. It is helpful to grow familiar with them and what they do.

Types of Blood Cells

(all levels are x 10^9/L)

White Blood Cells:

- White blood cells help your body fight infection. They are part of your immune system. Normal white blood cell levels are 4 – 11.
- You are at greater risk for infection when your white blood cell count is low.
- Neutrophils are a type of white blood cell that fights bacterial infections. Normal levels are 2 – 8.
- Lymphocytes are a type of white blood cell that fights viral infections.

Red Blood Cells and Hemoglobin:

- Hemoglobin (inside red blood cells) carries oxygen from your lungs to other parts of your body. Normal hemoglobin levels are 120 – 170.
- You may feel tired and more easily short of breath when your hemoglobin is low.
- When your hemoglobin falls to 70 or lower, you will usually receive a blood transfusion.

Platelets:

- Platelets help to clot your blood. Normal platelet levels are 150 – 400.
- You will bleed and bruise more easily when your platelets are low.
- When your platelets fall to 10 or lower, you will usually receive a platelet transfusion.

What Is an Autologous Stem Cell Transplant?

In some cancers and blood diseases, one of the best treatment options is high doses of chemotherapy and sometimes radiation therapy. This treatment, known as conditioning therapy, is given before a stem cell transplant and:

- Provides intensive treatment to destroy cancer cells in patients with blood cancers.
- Destroys damaged stem cells in patients with diseases such as aplastic anemia.

High dose chemotherapy (and for some patients radiation treatment) can kill more cancer cells than less intense chemotherapy. However, this treatment also severely damages your bone marrow and causes it to stop making blood cells. To rebuild your damaged bone marrow after high dose chemotherapy, your collected stem cells are given to you as an intravenous (IV) infusion, similar to a blood transfusion.

This infusion of stem cells is called an autologous stem cell transplant. An **autologous stem cell transplant** uses healthy stem cells from your own body to replace your diseased or damaged bone marrow.

Your stem cells will enter your blood and find their way back to your bone marrow. They will allow your bone marrow to grow back and start making blood cells again.

The infusion of stem cells is called a stem cell “rescue,” since it is rescuing your normal bone marrow from dying. Without autologous stem cell transplants, we cannot give our patients high dose chemotherapy.

What’s an “allogeneic” stem cell transplant? What’s the difference?

A stem cell transplant is a procedure that:

- Allows Doctors to give very high-dose treatment for certain diseases; and/or
- Replaces diseased or ineffective stem cells with healthy new stem cells.

An autologous transplant uses a person’s own stem cells.

An allogeneic transplant uses stem cells from a donor. The recovery period is considerably longer for allogeneic transplants than autologous transplants.

Your Healthcare Team:

Your healthcare team is specially trained to care for patients receiving stem cell transplants.

You and your family are very important members of this team. You know best about your body, your health and your needs. Your healthcare team counts on you to let them know how you are doing.

The healthcare team also includes:

- *Doctors*
- *Nurses*
- *Pharmacists*
- *Social Workers*
- *Dietitians*
- *Physiotherapists*
- *Occupational Therapists*
- *Administrative clerks*

Before, during, and after your transplant, you will meet different members of your healthcare team. Our Doctors rotate through different areas of the program, and you may or may not see your Hematologist (Transplant Doctor) during your treatment. They are kept up to date on your progress. The whole healthcare team works together to care for you.

Please see *Resources and Support* and *Symptom Management Through Treatment* booklets for more information about your healthcare team and what they do.

We always welcome your comments and questions. Talk to us.

Steps to Transplant

This is a brief overview of the steps you will take through your stem cell transplant.

Step 1 Preparing for Transplant	You will meet with different members of your healthcare team who will help you prepare for your treatment. You will have tests to ensure it is safe for you to have a transplant.
Step 2 Mobilizing your Stem Cells	“Mobilizing” your cells means moving your stem cells from your bone marrow into your blood. You will receive injections and sometimes other drugs to mobilize your stem cells.
Step 3 Collecting your Stem Cells	Your stem cells will be collected over 1-2 days using an apheresis machine. This machine safely and painlessly collects stem cells from your blood and then returns the rest of your blood back to you.
Step 4 Tunneled Catheter Insertion	A Central Venous Catheter (CVC) will be inserted in your chest to help make your treatment more comfortable.
Step 5 Admission to Hospital	You will be admitted to the Leukemia/BMT inpatient unit on the 15^{th} or 16^{th} floor of VGH.
Step 6 Chemotherapy Treatment	You will be given chemotherapy and sometimes radiation. This is called your “conditioning treatment.”
Step 7 Stem Cell Transplant	Your stem cells will be given to you through your Central Venous Catheter (CVC), similar to a blood transfusion.
Step 8 Low Blood Counts	Chemotherapy will cause your blood counts to fall to very low levels for 2 - 3 weeks. You will generally feel weak and unwell from low blood counts and other side effects of chemotherapy.
Step 9 Blood Count Recovery (“Engraftment”)	Engraftment is when your blood cells return to normal levels. Your tunneled catheter will be removed once engraftment happens.
Step 10 Follow-up Visits in the Daycare Outpatient Unit	After being cleared for discharge from hospital, you will be followed-up as an outpatient in the Leukemia/BMT Daycare Clinic for 1-2 weeks.
Step 11 Managing at Home	Your Central Venous Catheter (CVC) line will be removed and you will finish your Leukemia/BMT Daycare visits. It will take time to resume a normal life. You will have follow- up visits with your Hematologist/Oncologist who will continue to monitor your blood counts.

Getting Ready for Your Transplant:

It is helpful to start thinking of the practical physical and emotional preparations before your transplant.

What Must I Do Before My Transplant?

1. **Choose a 24-Hour Caregiver**
   You will need a 24-+hour live-in caregiver for a few weeks once you are discharged from hospital. You can have more than one caregiver. Your family and friends can share the caregiver role. Your Social Worker can assist caregivers with navigating leave from work benefits and requesting visa application letters. For more information on caregiver roles and support, please see the *Resources and Support* booklet.

2. **Plan Where You Will Stay Before and After Discharge**
   You may not be admitted on your expected admission date; it depends on bed availability. You will need to be within a 45-minute drive from Vancouver General Hospital while waiting to be admitted, as well as for 1-2 weeks after. Please see *Resources and Support* booklet for recommendations and important things to consider when booking accommodations. To plan for unpredictable schedule changes, we recommend booking accommodations with a flexible cancellation policy. **Caregivers also need a place to stay** while supporting you in hospital.

3. **Register for Fair Pharmacare**
   You can register for BC Fair PharmaCare by searching "BC Fair PharmaCare" on your internet browser. Click on the government www2.gov.bc.ca website. Click the square blue box "Register online for Fair PharmaCare". This helps cover the cost of medications.

4. **Arrange for Care of Any Dependents and/or Pets**
   Let your Nurse Navigator and Social Worker know if there are any concerns regarding people dependent on you for their care.

5. **Have a Digital Celsius Thermometer**
   You can purchase one from your local pharmacy (if you do not already have one). You will use it regularly to monitor your temperature through your treatment and recovery.

6. **Inform Your Doctor**
   If you have seen a Doctor in a separate facility or health care program, ensure your Hematologist (Transplant Doctor) is aware. They are not always informed of all your previous medical records.

7. **Get Your Flu Shot & COVID-19 Vaccine**
   During the influenza season (usually October to April), we strongly suggest you and your family receive the flu shot and COVID-19 vaccine. It is free at any local clinic and offered at most pharmacies. While not 100% effective, it is the best way to prevent complications caused by the flu before, during, and after your transplant. Ask your Hematologist (Transplant Doctor) or Nurse Navigator if you are eligible.

What are other suggestions to prepare for transplant?

1. Proper nutrition is very important during treatment and transplant to help heal and repair damaged cells, to help produce healthy new marrow cells, and to minimize complications related to poor nutrition. If you are having trouble eating enough calories, we can refer you to a dietician prior to your autologous stem cell transplant. Ask your Nurse Navigator for more information.
2. Being physically active is important to build strength and energy prior to treatment and transplant. Follow a regular exercise routine as best you can. Try gentle exercises like walking 30 minutes every day. Yoga can strengthen muscles and help you relax.
3. Connect with a support program. We strongly recommend our patients use the excellent support services offered by BC Cancer, Canadian Cancer Society, and Leukemia & Lymphoma Society. Please see the *Resources and Support* booklet.

Step 1: Preparing for Your Transplant

Consultation with Hematologist

3-6 months before stem cell transplant (you may have received this booklet during this appointment). Vancouver General Hospital, Leon Blackmore Pavilion 6th Floor.

Your Hematologist (Transplant Doctor) will review your health history, do a physical assessment & discuss the stem cell transplant process with you and your family. They may ask for additional tests before deciding that a stem cell transplant is safe for you. They will give you instructions and details if this is the case.

> Please note, a medical consent will be completed during this appointment. **If English is not your first language, an interpreter will be needed for informed consent.** Family members are not able to provide interpretation for medical consents.

Phone call with BMT Nurse Navigators

Initial phone call: *1-2 weeks after Hematologist consultation*

Follow-up phone call: *5-8 weeks before stem cell transplant*

A few weeks after you meet with your Hematologist (Transplant Doctor), you will receive a phone call from one of our Nurse Navigators. They will give you your stem cell collection dates and your transplant date so you can begin to plan accordingly. Please note these dates can change.

Our Nurse Navigators arrange all the planning, testing and appointments needed in preparation for your stem cell transplant. 5 to 8 weeks before your transplant date, they will complete a 30-45 min phone call discussing the details of your transplant and the the tests and appointments you will need.

Please tell your Nurse Navigator if you live out of town and if you use any mobility aids, raised toilet seats, bedrails, or other assistive devices. They will help you connect with our physiotherapy team to arrange for this type of equipment during your transplant.

Pre Transplant Tests

Approximately 4 weeks before your ideal admission date

Tests must be done to check how well your heart, lungs and kidneys are working before the transplant. Whenever possible, we try our best to book tests and consultations on the same day. You may not need all of these tests, and your Doctor may order extra testing not listed below. More information on these tests can be found under Common Medical Terms on page 39.

These tests can include:

- Blood tests (bloodwork)
- Heart tests: Electrocardiogram (ECG), Radionucleotide Ventriculogram (RVG)
- Lung tests: Pulmonary Function Test (PFT), Chest x-ray
- Kidney tests: 24-hour urine collection
- Lumbar Puncture
- Bone Marrow Biopsy

Pre Transplant Consultations

Approximately 2 weeks before your stem cell collection,

To help you prepare for your transplant, you will meet with members of your healthcare team for personalized teaching in-person or via phone. Your Doctor may refer you for other consultations, depending on the results of certain tests (e.g., cardio-oncologists).

a) **Apheresis Nurse:** You will meet with a Nurse who will check your veins and teach you about the stem cell collection process. Checking your veins is important because the apheresis machine needs a certain amount of blood flow in order to work properly. If your arm veins are suitable, we will use them to collect your stem cells.

b) **Social Worker:** You will meet with a Social Worker to discuss how having a transplant can affect your family, coping, living arrangements, employment, finances and other practical matters. They can talk with you regarding general steps in creating a will, advance care plan, power of attorney, and temporary substitute decision maker.

c) **Dietitian:** If you have had problems with appetite or weight loss in the past, you will meet with a dietitian. They will discuss how you can prepare for your transplant and manage side effects through your diet and food choices.

d) **Thrombosis Clinic:** This appointment may be needed if you have had blood clots in your past, or if you are currently using a blood thinner (e.g., Apixaban®, Dalteparin®, Enoxaparin®, etc.). The thrombosis clinic Doctor and Nurse will teach you how to manage your blood thinner throughout your treatment.

Step 2: Mobilizing Your Stem Cells

Approximately 1-2 weeks before your ideal admission date

Your healthy stem cells must be collected from your blood before we can give you high dose chemotherapy. Since stem cells live in your bone marrow, we will give you a medication to move these stem cells into your bloodstream. This is a type of medication called G-CSF (granulocyte-colony stimulating factor). Moving your stem cells from your bone marrow into your bloodstream is called "**Mobilization**."

What Should I Tell My Doctor Before Starting G-CSF?

Other drugs may interact with G-CSF. Tell your Doctor if you are taking any other medications, even if you only take them sometimes. This includes over-the-counter drugs, naturopath/herbal remedies, vitamins, teas, etc.

How is G-CSF Given?

G-CSF is an injection under the skin using a small needle. You may feel slight stinging at the injection site while it is being given. Any pain or redness you notice after the injection should go away soon. If you see a "bump" at the injection site, please do not rub it. The bump will often go away within a few hours.

How Many G-CSF Injections Will I Need?

You will need 4 days of G-SCF injections. Bloodwork will be taken on the 4th day of G-CSF injection. You may need to wait or return for your bloodwork results. The Apheresis staff will let you know if you do.

Where Will I Receive My G-CSF Injections?

A Nurse will administer your G-CSF in the Hematology Apheresis Unit (HAU) or the Leukemia/BMT Daycare at Vancouver General Hospital, Leon Blackmore Pavilion, 6th floor.

G-CSF works best when given at the same time every day. Your injection appointments will be between the hours of 4:00 pm and 6:00 pm. This timing ensures you will have the most stem cells at the time of your stem cell collection.

What Are the Side Effects of G-CSF?

Generally, G-CSF is well tolerated. Some people may experience:

- *Bone pain, especially in the lower back, hips or leg bones.*
- *Headache*
- *Fatigue (feeling tired)*
- *Flu-like symptoms, such as muscles soreness, aches, and a low fever.*

If you feel uncomfortable or have any concerns with side effects from G-CSF, please contact your Nurse Navigator or the Hematology Apheresis Unit. During the G-CSF mobilization you can take Tylenol for discomfort or low fever (less than 38°C).

Contact us immediately after mobilization treatment and at any time if you have:

- *Shortness of breath that starts suddenly*
- *Blood in your urine*
- *Fever of 38°C or higher*
- *Chills or shakes*
- *Yellow or green mucous after you cough*

These symptoms may mean a possible infection or side effect from the mobilization therapy and should be treated as an emergency.

How Much Does G-CSF Cost?

G-CSF is a very expensive prescription medication and is not paid for by the Vancouver General Hospital or BC Cancer for the autologous transplant patient. The cost of G-CSF depends on the dose required; one course of treatment is between $2,000.00 and $3,000.00. We help you find ways to manage this cost.

Managing the Cost of G-CSF

1. You may be registered for BC Fair PharmaCare. If you have not already been registered, you can register by searching “BC Fair PharmaCare” on your internet browser. Click on the government website www2.gov.bc.ca. Click the square blue box “Register online for Fair PharmaCare”.
2. Contact Fair PharmaCare *(1-800-662-7100)* to clarify your benefit plan and medication coverage. If you have already reached your deductible amount with Fair PharmaCare in the present calendar year, the cost of your G-CSF may be greatly reduced.
3. If your income has reduced since your diagnosis (more than a 10% change in income in the last 2 years), you may be eligible for an income review and reduced deductible through Fair Pharmacare. Contact them for details.
4. Ensure you have your extended health benefits identification number and information to provide when asked for this. If you have any extended health benefits through a family member or partner, ensure you also have the identification number and information available.
5. Depending on your extended health plan and your Fair PharmaCare deductible, you may need to pay for some of this cost “out-of-pocket.” Your Nurse Navigator will register you with a program that will contact you about your G-CSF coverage. They will help cover some of your out-of-pocket cost.
6. Your Nurse Navigator will be your contact person regarding any G-CSF drug coverage issues.

Step 3: Collecting Your Stem Cells

Approximately 1-2 weeks before your ideal admission date:
Leon Blackmore Pavilion 6th Floor, Vancouver General Hospital

Your stem cells are collected by a process called apheresis (“a-fur-REE-sis”) in the Hematology Apheresis Unit (HAU). During this procedure, your blood will be circulated through an apheresis machine; it will separate and collect your stem cells. The remaining blood is then returned back to you.

- Your Apheresis Nurse will connect you to an apheresis machine by an intravenous (IV) line in each arm.
- Your blood will be drawn into the machine through one IV line.
- The machine will collect the stem cells from your blood. The rest of your blood is returned back to your body through the other IV line.
- If your veins are too small to be used, a central intravenous line will be inserted prior to collection. The apheresis process will use two different “ports” on the Central Venous Catheter (CVC).
- You will be directly connected to the apheresis machine for 4-6 hours. You may want to bring headphones and music to listen to as you will have limited use of your arms (because of the two IV lines).

Are There Any Side Effects to Stem Cell Collection?

During the collection, you may feel:

- **Light-headed or dizzy:** This is due to your blood going through the machine.
- **Tingling** to your lips, fingers, toes, or **cramping** in your hands and feet. This is caused by a drop in calcium levels in your blood and by the anticoagulant used to prevent your blood from clotting in the apheresis machine. Calcium can be added to your intravenous (IV) and these symptoms should fade.

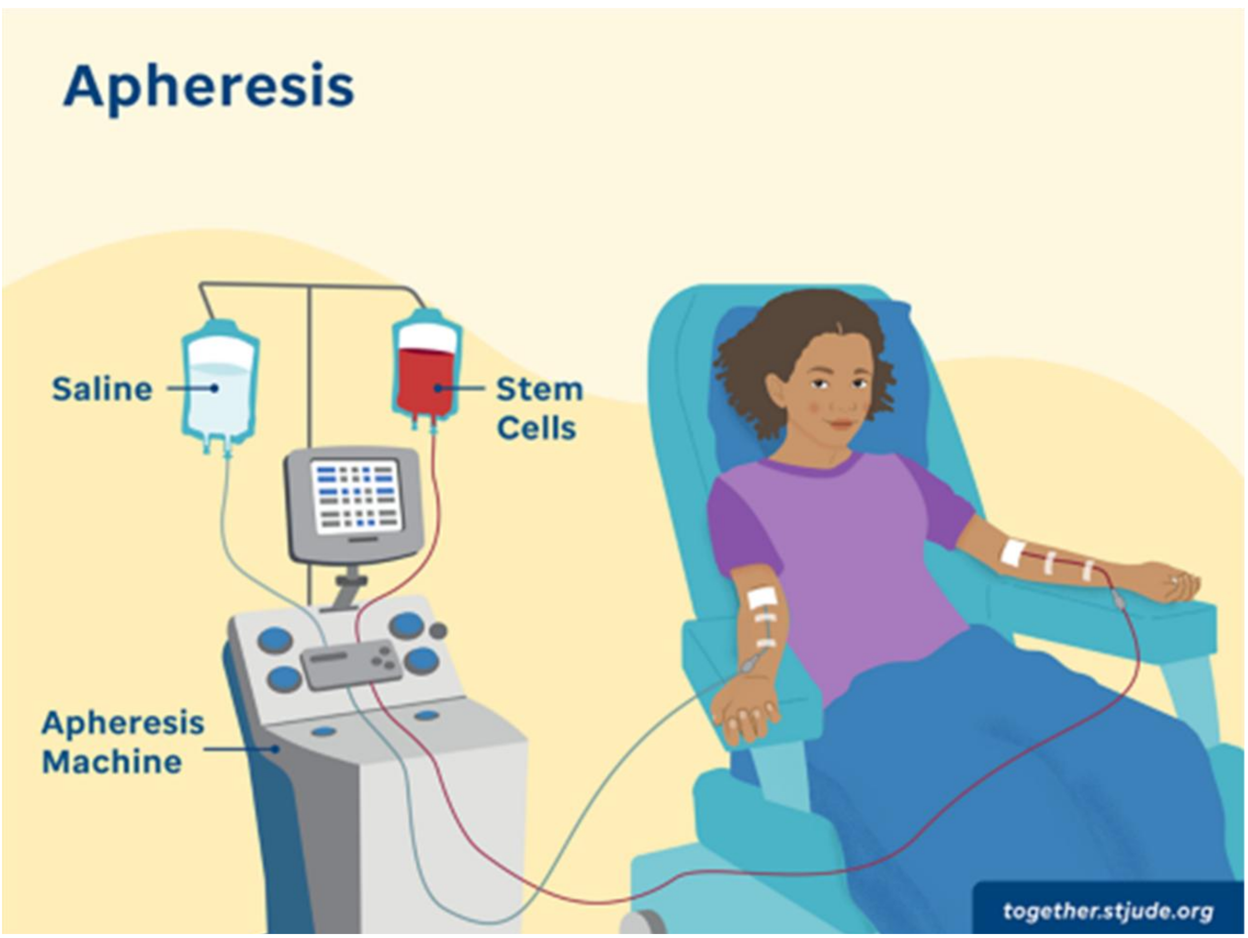
What Happens After the Stem Cells Are Collected?

At the end of the day, the bag of stem cells that has been collected is sent to a lab where the stem cells are counted. If more cells are needed, you will be asked to come back to the Hematology Apheresis Unit the next day to have the process repeated. This is normal and there is no need for concern.

Your cells are then frozen so they can be used later. A preservative called DMSO is added to protect your cells.

Most people only require G-CSF to mobilize their stem cells for collection. Occasionally, some people may need extra mobilization medications if not enough stem cells can be collected. Your Doctor will discuss this option with you if this is the case.

You will receive more information on how to prepare for your collection day during your first Apheresis visit.



Together by St. Jude, Aug 2022

Step 4: Central Venous Catheter Insertion

Approximately 1-2 days before your ideal admission date:
Vancouver General Hospital, Jim Pattison Pavilion, Radiology Unit Ground Floor

Before your transplant, you will need a **C**entral **V**enous **C**atheter (**CVC)** inserted. It is a flexible tube that is put into a large vein in your neck. The other end sits outside of your chest. Having a Central Venous Catheter may sound scary, but it will make your stem cell transplant experience much more comfortable as it can be used to draw blood tests.

There are two Central Venous Catheters we use. **You will have one of the following:**

- **Trifusion® Line**
    - Inserted before stem cell collection for people with small veins.
    - Used for stem cell collection, transplant and recovery.
- **Hickman® Line**
    - Inserted a few days prior to transplant.
    - Only used for transplant and recovery, not stem cell collection.
    - Most patients have a Hickman® line.

What will my Trifusion® line or Hickman® line be used for?

- Giving intravenous (IV) high-dose chemotherapy.
- Giving IV fluids to help keep you hydrated.
- Drawing blood for tests.
- Giving back your stem cells on the transplant day.
- Giving medications.
- Giving blood transfusions, if needed.

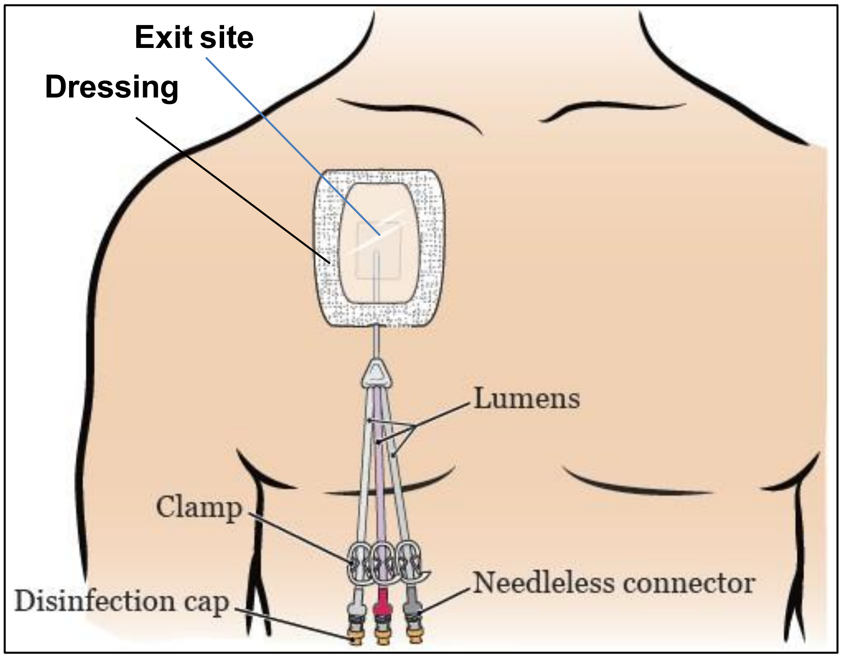
All These Names for the Same Thing!

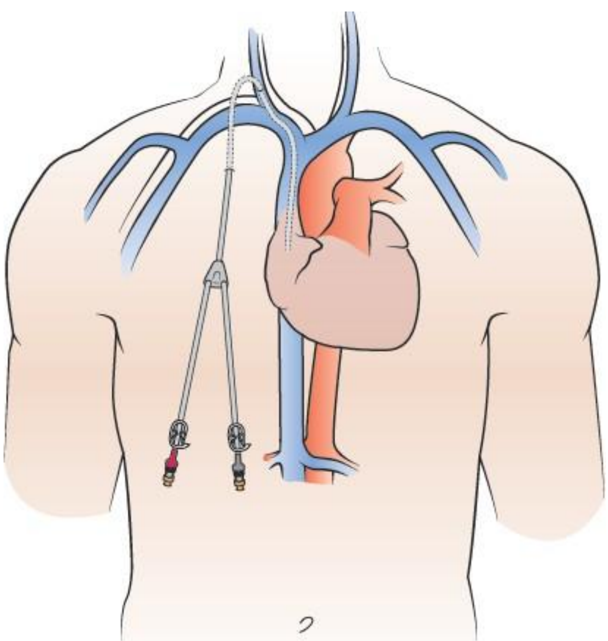
Although there are slight differences between them, all these terms refer to the same
Central Venous Catheter line:

- Central venous catheter (CVC)
- Central line
- Hickman® line or Trifusion® line
- Tunneled catheter
- Intravenous "IV line"
- Your line

Pictures of Central Venous Catheters

A Hickman® line with three lumens. A Trifusion® line is very similar in appearance. A white or clear dressing covers the "exit site" to protect it from infection





The white plastic catheter enters your bloodstream through a neck vein. The tip of the catheter sits above the heart (not in it).

This picture shows two lumens; most people will have three.

Please refer to *All About Your Tunneled Catheter* booklet for more information. **You will not have to flush your line, change caps, or change your own dressing as mentioned in the booklet.**

Step 5: Admission to Hospital

15th or 16th floor, Leukemia/BMT Inpatient Unit, Jim Pattison Pavilion, VGH

I've been given an ideal admission date. What does this mean?

Your ideal admission date is the date we aim to admit you to hospital. We cannot guarantee that a hospital bed on our unit will be available on this date. We make every effort to admit you as close to your ideal admission date as possible; please see more information on this subject in *The Leukemia/BMT Inpatient Unit* booklet.

Note: Patients receiving radiation (TBI) treatment will be admitted on their ideal admission date. These radiation treatments have been pre-scheduled and cannot be adjusted.

What should I have ready while I am waiting to be admitted?

From your ideal admission date onwards, have your hospital bag packed and be ready to come to the hospital as soon as you are contacted by our unit Patient Care Coordinator (PCC).

Due to the unpredictability of our unit, we are only able to hold your bed for a limited amount of time. For this reason, it is very important that you come to the hospital right away when you are contacted by our Nurse. Otherwise, your bed may be offered to another patient. You will rarely be called to be admitted after 3:00 pm.

What will happen when I am admitted?

When you arrive at the hospital, please check in at the front desk on the 15th floor (T15A). It will take time for our team to help you settle in, do our assessments and ensure all preparations have been done for you to start treatment the next day.

- You will be assigned a shared room with one other patient or a private room. Private rooms are for patients requiring additional isolation precautions or other circumstances.
- Your Nurse will orient you to the unitd, take your bloodwork, complete admission forms and perform a physical assessment.
- A Doctor will discuss the transplant process and treatment with you, perform a physical assessment and go over any consent forms needed.
- More information can be found in the *Leukemia/BMT Inpatient Unit* booklet.

Step 6: Chemotherapy Treatment

15th or 16th floor, Leukemia/BMT Inpatient Unit, Jim Pattison Pavilion, VGH

What is conditioning treatment?

Your treatment will start the day after admission. The treatments you are given in the days before your stem cell transplant is called "**conditioning treatment."** This can be chemotherapy only or both chemotherapy and radiation therapy.

What chemotherapy drugs will I receive?

Different diseases require different types of chemotherapy before transplant. Ask your Nurse Navigator, Doctor or healthcare team on the unit what type of chemotherapy you will be receiving.

Why do I need chemo (and maybe radiation) before a stem cell transplant?

Conditioning treatment is used to:

- Destroy cancer cells in patients with blood cancers
- Destroy damaged stem cells in patients with blood diseases

What are the types of conditioning treatment?

1. **Chemotherapy:** All patients receive chemotherapy conditioning. When you are admitted, your healthcare team will teach you about the chemotherapy you will be receiving, what days you will receive them and what to expect with each drug.

2. **Total Body Irradiation (TBI):** <u>Some patients</u> will also receive total body irradiation therapy, depending on their diagnosis. For more information on TBI, please see the handout *Understanding Total Body Irradiation.*

> See the *Symptom Management Through Treatment* guide for more information on treatment side effects and how to manage them.

How Does Chemotherapy Work?

Chemotherapy is a drug treatment that uses strong medications to kill cancer cells. It targets rapidly dividing cancer cells.

Chemotherapy also attacks fast growing healthy cells. The cells in 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 an upset stomach, hair loss and your blood counts to become very low.

Hazardous Safety

Chemotherapy is a hazardous medication, meaning it is harmful to cells. It takes 48 hours for chemotherapy to slowly leave your body through your urine and stool. Small amounts of the drug can also be found in blood, vomit, semen, and vaginal fluids.

Your body fluids are **hazardous every day chemotherapy is given and for 48 hours** from when the last dose finishes. Melphalan is an exception and you are only hazardous for 24 hours after this drug is given.

During the 48-Hours That You Are Hazardous:

- Casual contact such as hugging, kissing, and sharing a bed is still safe.
- Wash your hands well with regular soap and water after any contact with body fluids.
- Cover the toilet with a blue pad and then flush twice. Replace with a new blue pad every few days.
- Urine, bowel movements and toilet paper can be flushed down the toilet.
- Vomit, vomit bags, baby wipes and the soft paper towels used as toilet paper “the white roll” go into the red hazardous bins.
- If you are using a commode at the bedside: toilet paper and wipes go into the red hazardous bins.
- Family members who come in contact with your body fluids (e.g., emptying and measuring urine) need to wear blue gloves to protect themselves.
- Clothing and bedding that is soiled with a significant amount of body fluids should be handled with disposable gloves. Place them in a separate plastic laundry bag and wash them in a separate load from other laundry.

Step 7: Stem Cell Transplant Day

Day 0
15th or 16th floor, Leukemia/BMT Inpatient Unit, Jim Pattison Pavilion, VGH

Your stem cell transplant occurs once your conditioning therapy has completed.

What Will Happen on My Stem Cell Transplant Day?

- You will receive medications before your transplant. These medications help your body tolerate the DMSO preservative. DMSO was added to the bag of stem cells to protect them while they were frozen.
- When we are ready to start the transplant, your frozen stem cells will be thawed (unfrozen) in a warm water bath.
- Once your stem cells are thawed, the bag will be connected to your Central Venous Catheter (CVC) line and given back to you like a blood transfusion.
- A Nurse will be by your side during the reinfusion of your stem cells. A Doctor will be on the unit.
- It is a good idea to eat a lighter lunch to avoid feeling nauseated.

While your stem cells are being given to you (during your transplant):

- You will be sitting up comfortably in a hospital bed. We recommend bringing a caregiver to support you throughout your transplant day.
- You may feel nervous or excited or both; this is normal. You are safe and we are here to support you and answer any questions you may have.
- When you are ready to start the transplant, the bag of stem cells will be connected to your Central Venous Catheter (CVC) line and given back to you like a blood transfusion.
- You may have an odd taste in your mouth like canned corn or garlic. This is from the DMSO preservative in the bag of stem cells. We will give you a hard candy to suck on through the transplant to help get rid of this odd taste.
- You may feel a tickle or tightness in your throat or chest. This is normal and you will feel better if you breathe deeply and cough.
- You may feel nauseated (feeling of having to throw up).
- You may feel cold. This feeling is caused by the thawed stem cells.
- You may feel warm and flushed during the infusion. This is related to the DMSO and is expected.
- Some people have an allergic reaction to the DMSO preservative. Your Nurse and Doctor are ready if this happens and will give you medications to quickly stop the allergic reaction.

After your stem cells have been given back (after the transplant):

- You will feel sleepy from the pre-medication that was given.
- Your urine may be pink for up to 24 hours after the transplant.
- The canned corn taste from the DMSO may stay on your breath for 24 hours after the transplant.

Step 8: Low Blood Counts

Days 4 – 20
15th or 16th floor, Leukemia/BMT Inpatient Unit, Jim Pattison Pavilion, Vancouver General Hospital

Waiting for blood count recovery usually takes 2 - 3 weeks. The chemotherapy you received causes your blood counts (white blood cells, platelets, red blood cells) to drop to a very low level. When your blood counts are at their lowest level, you will feel the most unwell from the side effects.

What will happen while I am waiting for engraftment?

While your white blood cells and other blood counts are low, you will be closely monitored. Some things to expect include:

- **Tests:** You will have daily blood tests and other tests as needed (i.e., CT scans, chest x-rays, etc.) to monitor your progress and watch for infection.
- **Managing side effects from chemotherapy (and radiation)**: You will be given medications to help you manage side effects. Our healthcare team will also teach you about different things you can do to manage these side effects. See the next page for possible chemotherapy side effects.
- **Blood and Platelet transfusions:** Many people need blood and platelet transfusions when their blood counts drop to lower levels.
- **Stay physically active:** Keep moving after your transplant. Staying active is a very important way to prevent lung infections and limit the amount of muscle lost. Even when you are feeling unwell, try to stay out of bed as much as possible. Sit up for meals and walk around the unit as much as you can each day. Follow recommendations from your physiotherapist.
- **Teaching:** Learning about your medications and how to manage the side effects of transplant is important as you look ahead to being discharged. Your healthcare team is here to support you and answer any questions you may have.

What are the possible side effects from high-dose chemotherapy

Different people react differently to the stem cell transplant process. Do not feel discouraged if you meet someone who has had a different experience than you.

Short-term side effects (in the first 1-2 weeks after):

- Low white blood count – this increases your risk of infection
- Low platelet count
- Fever, chills and infections
- Nausea and vomiting
- Fatigue (feeling tired)
- Hair loss
- Loss of appetite (do not feel like eating)
- Changes to taste
- Mouth sores and sore throat – this can make it hard for you to eat or drink
- Abdominal cramping and diarrhea (frequent, runny stool)

Symptom Management Through Treatment booklet offers advice on how to manage the side effects you may be experiencing.

Later side effects (last longer than 2 weeks):

- Fatigue
- Shortness of breath with physical activity – this will improve with gradual increases in simple exercise such as walking
- Taste changes
- Nausea, diarrhea

Long-term side effects (last longer than 1 month):

- Fatigue
- Changes in your memory and concentration (also called “chemo brain”)
- Infertility (not being able to have children)
- Low hormone levels (thyroid hormone, testosterone, estrogen)

Step 9: Blood Count Recovery (Engraftment)

The medical term for when your blood cells begin to recover after transplant is '**engraftment**'. Engraftment is when your stem cells begin to making healthy new blood cells in your bone marrow. Engraftment usually begins 10-12 days after your stem cell transplant day. Your blood counts will recover in 2 - 3 weeks.

What happens when my blood counts recover?

As your blood counts return to more normal levels, you will notice the side effects and symptoms from the chemotherapy (and radiation) will improve. You will be discharged from hospital when the Doctor feels it is safe for you. This usually happens 2-3 weeks after chemotherapy when your blood counts are closer to normal.

Before you are discharged:

- 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.

How will I feel after my blood counts have recovered?

Even after your blood counts recover, you will still feel tired. Feeling tired can persist for a few months after the transplant. The best way to fight fatigue and low energy is to slowly increase the amount of activity you do every day.

You may also have other symptoms, such as:

- nausea and sometimes vomiting
- diarrhea
- poor appetite
- changes in taste
- hard time sleeping

These symptoms are common and will improve slowly. You can get medications that may help settle uncomfortable symptoms. You may need to keep taking medications to control your symptoms (such as nausea) until your symptoms get better.

Step 10: Follow-up Visits in L/BMT Daycare Unit

Leukemia/BMT Daycare Unit, 6th floor Leon Blackmore Pavilion, Vancouver General Hospital

Once you have been cleared for discharge from the hospital, you will continue to be seen as an outpatient in the Leukemia/BMT Daycare Unit for a week or two after transplant. Your appointments will be a couple of times a week. If you are experiencing side effects or complications, your appointments will be more frequent.

What will happen during each visit at the L/BMT Daycare Unit:

Each visit will vary in length, depending on what your blood tests and symptoms are that day. A typical visit lasts 2-4 hours. What you can expect:

- Blood tests taken from your Central Venous Catheter (CVC).
- Your healthcare team to do an assessment.
- Close monitoring for fever, infection, and other complications.
- IV fluids and medications for treating symptoms as needed (i.e., antibiotics, anti-nausea).
- Arrangements for extra tests as needed (e.g., X-ray, CT Scan, Ultrasound).

What should I bring to each visit at the L/BMT Daycare Unit?

- Your ID card with your name and medical record number (we will give you this).
- A list of the current medications you are taking.
- Any medications you may need to take throughout the day.
- <u>One</u> family member or friend. You will not be able to drive or take public transportation while you are still recovering from your transplant.
- Snacks, drinks, and a reusable water bottle. Bring your own hot water in a thermos. There is no hot water available.
- Things to occupy your time, although you may prefer to rest or watch TV.

What should I do every day?

- Check your temperature twice a day. Check it more often if you are feeling unwell. **Call us immediately** if you have a temperature of 38°C or higher.
- Your caregiver can help prepare your meals, keep track of how much you are drinking, take your temperature, and anything else you need help with.
- Write down questions you have and bring them to your next appointment. If you are unsure about a symptom you are having or have an issue that needs attention, contact us. A Nurse can help manage your question over the phone or contact the Doctor for further instructions

How will my Central Venous Catheter (CVC) line be removed?

Your Doctor will remove your line when your blood counts have recovered around 4 weeks after your stem cell transplant. Removing a Hickman® line is a safe and short procedure done on the Daycare unit. Trifusion® lines are removed in a similar safe and short procedure in the Radiology department.

Step 11: Managing at Home after Transplant

Generally, it takes 3-6 months for you to return to a normal lifestyle. Adjusting to life after your stem cell transplant can feel like a slow recovery. You may still have good days and bad days. It will take time for you to step back into your regular routine. Be patient with yourself as you adjust and recover.

See the following pages for more information on:

- *Coping emotionally through your treatment*
- *Helping your family cope*
- *Returning to work*
- *Choosing a caregiver*
- *Caregiver responsibilities*
- *Fear of recurrence*
- *Advance care planning*

Coping Emotionally Through Your Treatment

Undergoing cancer treatment can affect every part of your life, including your body, feelings, relationships, self-image and sexuality. Some patients say the emotional impact of treatment can be harder to manage than the physical changes.

Your emotions can change from day to day, or minute to minute. Your emotions may also change because of the step of the treatment process you are in.

<u>Some of your feelings may include:</u>

- Hope, anxiety, helplessness, uncertainty, impatience, and isolation.
- Feeling out of control and overwhelmed.
- Fear of sickness, death, or the unknown.

All of these feelings are normal.

Here are some things you can try that other patients have found helpful:

- Share your feelings with those you are close to, such as your family and friends.
- Ask your healthcare team questions so you will know what to expect.
- Talk to someone who has been through treatment. Connect with one of the many peer support programs available through community cancer centres.
- Manage your energy before, during, and after transplant by eating well and being active. Take a 10-15 minute walk each day to boost your mood and energy.
- Distract yourself by focusing on or doing an activity you enjoy. This will give you a break from your thoughts and feelings. Try reading, meditation, listening to music/audiobook/podcast, watching a favourite TV show or movie, painting, sketching, knitting, or spending time with family and friends.
- Set realistic, small goals. When you feel overwhelmed or you think what lies ahead will be too long or tiring, try taking it one day, or even one hour at a time. This helps you focus on the present.

Scan the QR code: ***Coping with Cancer*** video

Your Family

Family members are also affected by a stem cell transplant, especially your caregiver. Your family members may share the same feelings and worries that you do. For those from out of town, there can be the added stress of being away from familiar surroundings and the support of friends, neighbours and family. Role changes are common, and family members may need to take on more responsibilities. Financial or legal problems are also common concerns.

Here are some things to try:

- As a family, try to openly share your feelings and work together to solve your problems. Connect with one of our Social Workers for help.
- Prepare family members, such as children and grandchildren, by talking with them and giving them information suited to their age and level of understanding. For resources on speaking to children about your diagnosis and transplant, connect with a Social Worker.
- Get enough sleep, eat well, be active, or find time to do things you enjoy.
- Let extended family members know how they can best help you. Family and friends want to be there for you. They need to know what is most helpful. Practical things include help with car rides, meals, childcare/pet care, household chores and daily activities.
- Take care of any financial or legal problems such as Power of Attorney, wills, sick benefits and disability pensions. It is a good idea to work on these in advance. A Social Worker can help guide you.
- Connect with a Social Worker or search “talking to my family” and/or “caregivers” on the BC Cancer website www.bcancer.bc.ca for more support and information.

If you have any concerns about your family members coping with your diagnosis or transplant, please connect with a Social Worker

Choosing a Caregiver

When do I need a caregiver?

- It is strongly recommended to have a caregiver when you are receiving treatment as an outpatient.
- There may be times where a caregiver is medically required. This means you need at least one family member or friend who can provide you with physical and emotional support.
- Social Workers can assist caregivers who are planning to take time off work, to explore potential financial benefits and request the supporting documentation needed.

How do I choose my caregiver?

- Caregivers can be family, friends, or hired professionals **please note that caregivers cannot be provided by hospitals, health authorities, or the Leukemia/BMT Program.*
- Caregivers should be someone 19 years or older, who you are comfortable around, is comfortable around you, who knows you well, and is able to help you through your treatment.
- For us to best care for you, your caregiver must be able to communicate with the healthcare team. Translation and interpretation services can be provided.

How many caregivers do I need?

- You need at least one identified caregiver for the duration of your treatment. We understand this can be challenging from a practical and emotional lens for the caregiver. Therefore, rotating caregivers is also an option.
- If one primary caregiver is identified, we suggest arranging visits from family and friends to ensure caregiving tasks do not fall entirely on one person.
- Having rotating caregivers allows each caregiver to rest, relax and have time away from the hospital, and prevent burnout. *For more information on caregiver burnout please connect with one of our Social Workers.*

Caregiver Responsibilities

Caregiver duties and responsibilities depend on what your loved one needs. You can help by:

- Coordinating services, such as transportation to and from the clinic.
- Attending appointments, taking notes, asking questions, keeping track of the patient's schedule.
- Providing emotional support.
- Providing support at home:
  - *Reminding the patient to take oral medications.*
  - *Identifying changes in the patient's condition to the clinical team.*
  - *Calling the BMT triage nursing line or obtaining urgent medical care, if needed.*
- Maintaining the home environment (e.g., household cleaning, pet care, laundry).
- Activities of daily living (e.g., grocery shopping, preparing food, picking up prescriptions).
- Serving as a communication link with other family members and friends.

Resources for Caregivers

- Go to **www.bloodcancers.ca** Search "Caring for a loved one with a blood cancer" or "Learning to be a caregiver" or "Taking care of yourself". Click on the result that matches the title.
- Go to **www.cancer.ca** Search "caregiver". Click on any of the results you feel apply to your situation.

If you are experiencing caregiver burnout. Please connect with one of our Social Workers.

Returning to Work

Returning to work is a common source of stress for people after their transplant. When you feel ready to return to work, it is best to do it slowly and over time and in consultation with your Doctor.

Going back to work helps to get you back into a more "normal" routine. You may still be thinking about your transplant experience and will need to balance your work schedule with your post-transplant medical visits. You may also be dealing with side effects, such as:

- *Low energy*
- *Feeling anxious or worried about returning to work*
- *Troubling thoughts about family, relationship issues, financial concerns*

These side effects can affect your ability to concentrate.

Here are some tips to help you return to work:

- Talk to your Doctor about your return-to-work plans, so you get medical support and guidance. Your Doctor can give you advice on when you can consider returning to work. They can also give you and/or your workplace information on what needs to be considered regarding your physical needs.
- Be patient with yourself. It is important to pay attention to your body. Each person is different and each person's return to work plan will look different. It is important to accept this.
- Forcing yourself to move ahead before you are ready may result in needing to take even more time off from work.
- Before you return to work, make a plan. Consider if you want to share information about your illness with your coworkers. How much and how you share this information is fully up to you. Do not feel that your coworkers need to know everything. You have a right to keep your personal situation private.
- If you receive disability benefits through employee benefits, please connect with your disability case manager to discuss your return-to-work plan.
- BC Cancer's Vocational Rehabilitation Program can help you with the return to work/school process, find new work or new training, explore how to discuss health concerns with those at work/school and more. *1-800-663-333 Ext. 672194.*

Fear of Relapse

Many patients are concerned about their cancer coming back, “relapse”, or not being controlled. This is a very common fear. The risk of relapse is different for each person. It depends on many factors, such as your type of cancer, the treatment you received, and how long it has been since your last treatment.

If you have a fear of your cancer coming back, here are some things you can try:

- **Go to all your medical follow-up appointments.** At these visits, your Doctor will look for side effects from treatment and check if your cancer has come back.
- **Ask Your Doctor.** Talk directly about the chances of the cancer coming back. Knowing what to expect after cancer treatment can help you and your family make plans, lifestyle changes, and important decisions.
- **Plan Ahead.** Make sure your family and loved ones know your wishes if you can’t speak for yourself. Putting one’s legal affairs in order does not mean expecting the worst. Dealing with these issues early on in your treatment will give you the peace of mind to focus on getting better. Talk to your Social Worker about a will. See page 37 for more information on advance care planning.
- **Be Informed.** Learn about your cancer. Know what symptoms of relapse to look out for. Having more knowledge may give you a greater sense of control over your life.
- **Share Your Feelings.** People often find when they share strong feelings like fear, anger or sadness, it is easier to let go of them. Some people talk to friends or family, other cancer survivors or a counsellor.

There are programs in your community that offer support for those living with cancer, see *Resources and Support* booklet for more information. If you prefer not to talk to others, you can still sort out your feelings by thinking about them or writing them down. If you are having a hard time, talk to your Doctor, Nurse or Social Worker.

Focus On Wellness

Try to be hopeful. Sometimes this means looking for the good even during a bad time. Try to use your energy to focus on wellness and doing things that make you happy. Remember you are never alone. There are people to help and support you. Some of them are in your home and community; others are at your hospital, cancer centre or place of worship.

Common Questions after Transplant

These are general guidelines as you prepare to return to a more normal routine; your Doctor can discuss any concerns you may have.

Am I safe?	Less than 6 months after transplant	6 months to one year after transplant	One year or more after transplant
Taking probiotics	No	No	Ok
Eating raw/undercooked seafood (e.g., sushi), unpasteurized milk/cheese, etc.	**No** less than 3 months after transplant. **Ok** 3-6 months after transplant.	Ok	Ok
Work and School	No	Ok	Ok
Traveling	No	Ok	Ok
Hot Tubs	No	Ok	Ok
Swimming (Never swim with an IV catheter)	No	Ok	Ok
Gardening, mowing the lawn, raking leaves	No	Ok. Wear gloves and a mask	Ok
Having plants in the home	Ok. Do not water or handle plants.	Ok	Ok
Kneading/baking bread with yeast	Ok	Ok	Ok
Carpentry or woodworking	No	Ok	Ok
Construction or renovations	No	Ok	Ok
Flu Shot	Ok 3 months after transplant.	Ok	Ok
Bringing new pets to your home	No	Ok	Ok
Cats, dogs, fish, birds	Do not sleep in same bed, do not clean up litter or waste	Do not clean up litter or waste	Ok
Please check with your Doctor if you are not off medications or chemotherapy which suppress your immune system at 6 months to one year after transplant, or one year or more after transplant.			

Information adapted from Adult Allogeneic Transplant Manual (©2017). Seattle Cancer Care Alliance.

Your Doctor will discuss your re-vaccination schedule in a follow-up appointment.

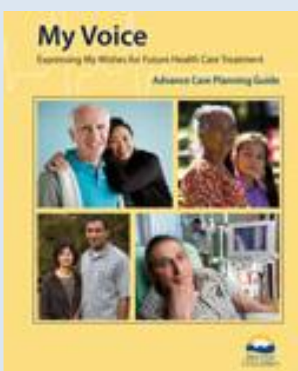
How Do I Start Advance Care Planning?

Advance care planning involves having conversations with your loved ones and healthcare team to make sure they know what your wishes are if you become unable to speak for yourself. Go to www.vch.ca and search “advance care planning”. Select “Advance care planning”.

Why Should I Think About Advance Care Planning?

The chance of you facing any life-threatening situations during treatment depends on a lot of factors, such as your type of cancer, your treatment, and your general health. No matter what your age or health, we feel it is important to recommend advance care planning. Research shows it can: improve your quality of life, improve the chance your care wishes will be fulfilled, and bring peace of mind to you and your loved ones.

Use the workbook, *My Voice: Expressing My Wishes for Future Health Care* to guide you and write down your options.



Online: Go to www2.gov.bc.ca search “advance care planning”. Click on “Advance Care Planning”. Scroll down and you will see links to the booklet available in pdf format.

Common Medical Terms:

Anemia: A condition in which the blood has too few red blood cells, or not enough hemoglobin in these cells.

Antibiotics: Medications used to fight bacterial infections.

Apheresis: A painless procedure where blood is run through a machine that removes the stem cells and then returns remaining cells back to the bloodstream.

Autologous Transplantation: A transplant in which the stem cells infused come from the individual receiving it.

Allogeneic Transplantation: A transplant where stem cells are donated to a patient from another matched person.

Biopsy: Removal of small piece of tissue for microscopic examination.

Blood Tests: You will have many blood tests before and throughout your treatment. Blood tests tell us about your blood cells levels (white blood cells, hemoglobin, platelets). They can also tell us about your general health, how well your organs are working (i.e., kidneys, liver, pancreas), electrolyte imbalances (i.e. potassium, magnesium) and if you have any possible infections.

Bone Marrow: Spongy tissue inside the bones where the blood cells are produced.

Bone Marrow Biopsy: In this procedure, a needle is used to remove a small amount of liquid bone marrow tissue and bone fragment (biopsy) from the pelvic bone. Doctors use these samples to diagnose and monitor blood and marrow diseases and cancers.

Bone Marrow Transplant: Bone marrow transplants are procedures to replace damaged or destroyed bone marrow with healthy bone marrow stem cells. They require operating rooms and anesthesia to collect bone marrow from the hip bone. More commonly, stem cells are collected from blood veins in the arm (see Peripheral Blood Stem Cell).

Chemotherapy: Anticancer drugs or combination of drugs designed to kill cancer cells.

Chest X-Ray: This is a picture of the organs, bones and tissue inside your chest. It takes about 30 minutes to complete.

DMSO (dimethyl sulfoxide): A drug used to protect frozen stem cells.

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.

Engraftment: The process in which reinfused stem cells begin to grow in the bone marrow and make new blood cells.

G-CSF: A medication given by needle injection that tells the bone marrow to make more neutrophils and move them into the bloodstream.

Hematologic: Relating to blood and blood forming tissues. A Hematologist is a Doctor that treats diseases and disorders related to the blood.

Infusion: The introduction of a liquid into the body through a vein.

Intravenous (IV): A therapy that delivers a liquid substances directly into a vein.

Infection: The invasion and spread of harmful organisms (bacteria, viruses, fungus, parasites) that are not normally present in your body.

Leukemia/BMT: Leukemia/Bone Marrow Transplant Program of BC, formed in 1981.

Lumbar Puncture: In this procedure, a needle is used to remove a small amount of cerebrospinal fluid (CSF) from between the lower back bones (vertebrae). CSF is the fluid that surrounds and cushions the brain and spinal cord and can sometimes contain cancer cells. Chemotherapy may be administered into the fluid around the spinal cord kill cancer cells in the CSF and prevent relapse.

Mobilization: Using a medication to move stem cells from the bone marrow into the bloodstream. This is used to prepare for apheresis.

Neutrophils: A type of white blood cell that protects you from infections. They are the first cells to arrive when you have a bacterial infection.

Peripheral Blood Stem Cell: A stem cell that has left the bone marrow and is circulating in the blood stream.

PET Scan (Positron Emission Tomography): A PET scan uses a form of radioactive contrast to create 3D colour images to see how your body's cells are working. It is often combined with a CT scan to provide a more complete picture of the location and growth of any diseased cells.

Platelets: Cells that are needed for blood to clot.

Pulmonary Function Test (PFT): A test to check your lung health. A clip will be placed on your nose and you will be asked to breathe in and out of a mouthpiece.

Red Blood Cells: Cells that carry oxygen from the lungs to the rest of your body.

Reinfusion: The return of your stem cells to your bloodstream.

Remission: Complete or partial disappearance of symptoms of a disease in response to treatment.

Radionucleotide Ventriculogram Scan (RVG or MUGA): A nuclear medicine scan used to look at how well your heart is pumping. A series of images of the heart are taken after injections of radioactive solution are given in your arm. The scan takes about 90 minutes.

Stem cells: Basic cells in the bone marrow that can become almost any type of cell in the body, including blood cells, muscle cells, organ cells, etc.

Stem cell collection: The process of taking stem cells out of the blood; see apheresis.

White Blood cells (WBC): The blood cells that fight infection. Also see neutrophils.

Where Can I Get More Information?

Suggested readings:

- Chemotherapy and Other Drug Therapies (Canadian Cancer Society)
- Coping When You Have Cancer (Canadian Cancer Society)
- Eating Well When You Have Cancer (Canadian Cancer Society)
- Sex, Intimacy and Cancer (Canadian Cancer Society)
- High-dose Therapy & Autologous Stem Cell Transplantation (Myeloma Canada)

Find booklets, videos and more information at:

Myeloma Canada: 1-888-798-5771
www.myeloma.ca

The Leukemia & Lymphoma Society of Canada: 1-833-222-4884
www.bloodcancers.ca
Click “I have a blood cancer”

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

The Canadian Cancer Society: 1-888-939-3333
www.cancer.ca
Click “Living with cancer”

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

Please note: the information contained in this manual is not intended to replace the advice of your healthcare team. Use this as a reference and education guide. Consult your healthcare team if you have any questions or concerns. Creator and author: Amy Healy 06/2019. Authors: Sally Moore 08/2026, Patsy Vanee 03/2026, Mona Walia 06/2025, Rebecca St. Jean 02/2026. Co-Authors: Anna Millington 02/2025, Annabel Francis 02/2025, Nikki Stiver 02/2025, Tanisha Bors 02/2025, Nogol Salehi 02/2025, Gretchen Olund 02/2025, Amy Chen 02/2025, Prachi Sony 02/2025, Matthew Bentley, 03/2025, Katie Lacaria 04/2025 Formator: Mimi Gee 04/2025

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