Allogeneic Stem Cell Transplant: A Guide for Patients & Caregivers
# Table of Contents

## Welcome & Overview
- The Importance of Communication ........................................... 4
- How to Use This Guide ............................................................ 5
- We Value Your Feedback ........................................................ 5
- Let’s Begin With . . . Bone Marrow Basics ................................ 6
- Understanding Your Allogeneic Stem Cell Transplant .................. 7

## Preparing for Your Transplant
- Have Your Initial Consultation Visit ....................................... 10
- Make Preparations .................................................................... 10
- Your Transplant Team .............................................................. 12
- The Role of Your Caregiver ...................................................... 14
- Coping With Separation From Children .................................... 16
- Have Your Pretransplant Evaluation ....................................... 17
- Donor Screening ...................................................................... 19
- Peripheral Blood Stem Cell Harvesting .................................... 19
- Bone Marrow Harvesting ......................................................... 20
- The Next Step: Have Your Preadmission Appointment .............. 20
- Preparing for Your Hospital Admission ................................... 21

## What to Expect While You Are in the Hospital
- Day of Admission ..................................................................... 23
- When You Are Admitted ........................................................... 24

## The 5 Phases of Transplant ......................................................... 28

### Phase 1: Conditioning
- Radiation Therapy .................................................................... 29
- Side Effects From Conditioning ............................................... 30
- Transplant Day ......................................................................... 36

### Phase 2: Transplant Day to Engraftment
- Risk of Infection ....................................................................... 38

### Phase 3: Engraftment to Day of Discharge
- Possible Early Complications ................................................... 40
- Preparing for Discharge ............................................................ 43

### Phase 4: Early Convalescence
- Before Going Home .................................................................. 44
- Going Home .............................................................................. 44
- Preventing Infection ................................................................. 45
- Resuming Your Activities ......................................................... 52
- Sexual Health .......................................................................... 54
- Drinking Alcohol and Using Tobacco ....................................... 56
- Follow-up Care ......................................................................... 56
- Common Medications to Avoid .............................................. 57

### Phase 5: Late Convalescence
- Long-term Complications ......................................................... 59
Caregivers’ Guide for Bone Marrow/Stem Cell Transplant

Glossary

Additional Resources

- Caring for Your Central Venous Catheter  
  - How to Put on Your Sterile Gloves  
  - Map for Dressing Change: CVC
- Common Medications Containing Aspirin and Other Nonsteroidal Anti-inflammatory Drugs (NSAIDs)
- Frequently Asked Questions about Blood Transfusions
- Hair Loss and Your Cancer Treatment
- Hand Hygiene and Preventing Infection
- Instructions for Interventional Radiology Procedures
- Low-Microbial Diet
- MedicAlert® Foundation Brochure
- Sexual Activity During Cancer Treatment: Information for Men
- Sexual Activity During Cancer Treatment: Information for Women
- Sexual Health and Intimacy
- Total Body Irradiation
Welcome & Overview

We would like to welcome you to the Adult Stem Cell Transplant program at Memorial Sloan Kettering (MSK). We know that this is a challenging and potentially overwhelming time for you and your family and we want to assure you that we are here to help you throughout this process.

This guide is designed to help you and your family understand what to expect throughout your transplant journey. The information in this guide will complement, but is not meant to replace, the information that your healthcare team will review with you in person. While we want to inform you of some of the challenges that may lie ahead over the course of your recovery, we cannot predict what will happen in any given case. We need to inform you of potential issues, but this does not mean that you will experience all or any of these issues. Therefore, we ask that you not compare yourself to other people you may know or have heard of that have had a stem cell transplant. Each patient is unique.

Allogeneic stem cell transplants have been done for many decades, with significant improvements over that time. However, it remains a complex procedure that requires a commitment not only on the part of the healthcare team, but just as importantly, on the part of the patient and their family/caregiver. Preparing for your hospital admission, as well as the time you spend in the hospital, are only the first parts of your journey. All allogeneic transplant patients are required to stay within 1 hour of MSK until it is about 3 months from the day of the transplant. If you live a distance farther than 1 hour from the hospital, we can make arrangements for local housing. While overall recovery time varies from person to person, you should plan on allowing about 1 year for full recovery. All of these points will all be discussed in more detail in this guide.

There are many phases as you go through this process and we are fortunate to have a large, integrated healthcare team that will care for you as you go through each phase. We understand that patients can experience many emotional and psychological changes during the transplant process. Our healthcare team includes many professionals, such as social workers, chaplains, psychiatrists, and members of our integrative medicine department, that are available to support and help you and your family cope with these changes.

The importance of communication

Throughout your transplant journey, it’s very important that you communicate clearly with your healthcare team and your caregiver about how you are feeling. If anything is bothering you, even if it seems minor, tell a member of your healthcare team. This is true for how you are feeling physically, as well as how you are feeling emotionally. It is very important not to let things “brew,” otherwise minor issues can become more of a problem. The more information
you communicate to your healthcare team, the more they’ll be able to help you. There is usually something that they can do to make you feel more comfortable. Below are some of the ways you can communicate with your healthcare team:

- If you are an outpatient, call your doctor’s office Monday to Friday, 9:00 AM to 5:00 PM. Your doctor’s office assistant can give your message to the appropriate person (i.e., doctor, nurse, clinical nurse coordinator, social worker). **If you have an urgent issue and it is after office hours, you should still call your doctor’s office number.** The call will be answered by our hospital answering service, and you should ask for the hematology fellow on call.

- Use the MyMSK patient portal system. You can use MyMSK to ask questions about your appointment schedule, request a prescription refill, or request patient education information. **It should never be used to communicate any symptoms to your healthcare team.** We will give you more information about this system at your initial consult visit.

- While you are an inpatient, your healthcare team will see you at least once a day, and you will be seeing your primary nurse throughout the day. Talk with them about any issues during this time.

### How to use this guide

You should read this entire guide at least once, as well as the additional materials included at the back of the guide. We have tried to make this guide inclusive, so there is a lot of information to read and understand. You may find it easier to read through it in sections rather than trying to read through the entire guide at one time. We encourage you to refer to this guide as your treatment progresses.

We recommend that you highlight or write notes as you go through this guide on anything that you don’t understand or have a question about. There is no such thing as a “silly” question, so please do not hesitate to ask about anything that is on your mind.

### Glossary

We’ve done our best to limit the number of medical terms in this guide. However, there are some words that we need you to understand. With this in mind, we’ve included a glossary of useful terms at the back of this guide.

### We Value Your Feedback

We are always trying to improve the information we give to our patients, their families, and their friends. After you’ve read this guide, you may think of ways it
Let’s begin with . . . bone marrow basics

Your stem cells divide and change into the different types of blood cells in your body.

What is bone marrow? What are stem cells?

Bone marrow is a substance found in the spaces in the center of the larger bones in your body—your hip, breastbone, and pelvis.

Bone marrow contains a large number of hematopoietic stem cells (referred to as stem cells). Stem cells are immature cells that produce all of the blood cells in your body—the white blood cells that fight infection, red blood cells that carry oxygen, and platelets that help control bleeding. Your stem cells are constantly dividing and changing into these different types of blood cells in your body, replacing older blood cells. A very small number of stem cells circulate in your bloodstream.
You’ll hear your transplant referred to as a “bone marrow transplant” or a “stem cell transplant.” Either term is correct and refers to whether the stem cells are taken from the bone marrow, or if they are collected from the blood. This will be explained further on the next page and when we discuss the role of your donor.

Understanding your allogeneic stem cell transplant

An allogeneic stem cell transplant is being recommended for you because your doctors feel that a transplant is the best treatment for your specific disease. When you have an allogeneic stem cell transplant, stem cells are harvested (collected) from a donor. “Allogeneic” means that the stem cells come from someone else. The 3 general sources of stem cells that can be used in an allogeneic stem cell transplant are bone marrow stem cells, peripheral blood stem cells, and umbilical cord blood stem cells.

**Bone marrow stem cells** can be collected from a donor’s bone marrow through a procedure called bone marrow harvesting. The procedure is done in the operating room while the donor is asleep. The donor usually goes home the same day of the procedure.

**Peripheral blood stem cells** are collected from a donor’s bloodstream. To increase the amount of stem cells in the bloodstream, the donor will receive injections of a medication that stimulates the body to make more stem cells than usual. The stem cells escape from the bone marrow into the bloodstream, where they can be collected easily.

**Umbilical cord blood stem cells** are collected from the blood of the umbilical cord and placenta of a newborn baby at the time the baby is delivered. They are taken to a cord blood bank and stored frozen until needed for a transplant.

Your donor

A test called “tissue typing” is done to determine who is the most appropriate donor for you. For a hematopoietic stem cell transplant, the tissue typing is based on your human leukocyte antigens (HLA). These are markers that are found on the surface of your white blood cells.

A person with a close HLA match is most often a brother or sister. Family members can have a test to see what tissue type they have. There is a 25% chance that a sibling will be a match. Your doctor will determine if someone is a close enough match to be your donor.

People who aren’t related to each other can have a close match. If you don’t have a family member with a matching tissue type, we have a team of search
coordinators who will look for an unrelated adult volunteer donor or umbilical cord blood units. The National Marrow Donor Program® has millions of people registered who have been typed for this purpose. However, searching for a donor can take weeks or even months to complete. Sometimes, umbilical cord blood can be used if the transplant is urgent, since it is more readily available. If you will need stem cells from someone who is not related to you, your doctor will discuss this with you.

Conditioning

Before your transplant, you will receive treatment to prepare your body for the transplant, even if your disease is in remission. This is called conditioning and will consist of chemotherapy, radiation therapy, or both. The treatment will aim to:

- Kill any remaining cancer cells in your body.
- Make room in the marrow spaces for the new stem cells.
- Suppress your immune system in order for you to be able to accept the donor’s stem cells.

Myeloablative and nonmyeloablative transplants

There are 2 types of conditioning before an allogeneic transplant. One is called myeloablative. In this approach, you will receive high doses of chemotherapy with or without radiation. These treatments aim to kill your cancer but will also kill (myeloablate) all of the stem cells in your bone marrow. The donor stem cells will then replace the ones killed by the treatment. This form of treatment is very intense and may not be suitable for all patients.

A nonmyeloablative transplant involves a less intense treatment regimen. Lower doses of chemotherapy are given with or without lower doses of radiation. Medications are also given to suppress the immune system. The goal of this approach is to suppress your immune system enough to allow the donor stem cells to take over and produce a new immune system that will fight the cancer. Your doctor will consider many factors when choosing which type of transplant is best for you. These include your disease, other treatments you have received, and your overall health. Your doctor will explain these factors in detail with you.

Transplant infusion

When it is time for your transplant, the donor’s stem cells will be infused into your body through a central venous catheter (CVC). This is a thin tube inserted into your upper chest. The stem cells may be transfused from a bag, like a blood
transfusion, or pushed from a large syringe into your CVC. This will take place in your hospital room.

**Engraftment**

Almost immediately after the stem cells are infused into your body, they will travel through your bloodstream to your bone marrow. They will begin to divide and create healthy new blood cells. **Engraftment** is when your body accepts the transplant and your blood cell counts start to recover.

The time to engraftment usually takes about 10 days but can be longer, depending on the source of your stem cells. Platelets and red blood cells usually take a little longer to recover than white blood cells.

While you are waiting for engraftment, you may need to have blood and platelet transfusions. You’ll be given injections of growth factor, which is a medication that will speed up the production of white blood cells in your body.

You will be very vulnerable to infection during this time. You will need to take precautions, including avoiding sources of infection, washing your hands regularly, and eating a low-microbial diet. When you are admitted to the hospital, you will be given some medications to help protect you from certain infections. You will be closely monitored for any signs of infection and will be treated with antibiotics if we suspect you have an infection.
Preparing for Your Transplant

Have your initial consultation visit

At your initial consultation visit, you’ll meet with your doctor and other members of your healthcare team. Your doctor will take a complete medical and surgical history, do a physical exam, and discuss what he or she thinks is the best treatment plan for you. This plan will be presented at a weekly conference with other transplant doctors to ensure that there is agreement on what the best plan is for your specific situation.

Make preparations

During this time, you’ll make practical, physical, and emotional preparations for your transplant. Here is a list of things that will happen and things that you may need to do during this phase:

Learn about your transplant — The information your healthcare team will go over with you is meant to inform you, not frighten you. Make a note of anything that you don’t understand about your transplant, anything in this guide that isn’t clear, and any other questions you have.

Contact your insurance company — It’s a good idea to contact your insurance company before your transplant and see if there is a dedicated case manager for you.

Choose a caregiver — Identify a family member or friend to act as your caregiver. Make sure this person understands what the role entails. Give your caregiver a copy of this guide and ask him or her to read it at least once.

Fill out a Health Care Proxy form — A health care proxy is a legal document that identifies the person who will speak for you if you are unable to communicate for yourself. This person is known as your health care agent. This person may be different from your caregiver. You can get more information about this from your social worker or any other member of your healthcare team.

Meet with a social worker — Your social worker will explain the psychological, emotional, and financial support services offered by the social work team.
Arrange for disability/leave of absence from work — If you are working, make arrangements to go on disability or take a leave of absence. You should expect to be away from work for about 6 months, though this can vary depending on your transplant course.

Think about accommodations — As we mentioned earlier, you will need to stay somewhere that is located within 1 hour of MSK for the first 100 days after your transplant. Your social worker can help you arrange this, if needed.

Make decisions about your fertility — If fertility (the ability to have children naturally) is a concern for you, speak with your healthcare team about your options. Ask for an appointment with a fertility specialist to discuss how your treatment may affect your ability to have children in the future and the steps you may be able to take to preserve your fertility.

For men:

Men can preserve their fertility by sperm banking. This involves collecting, freezing, and storing sperm. Generally, 3 collections are needed. There are sperm banks throughout the U.S. where you can do this. For more information, ask your nurse for the resources below, or you can find them on our website, www.mskcc.org/pe.

Sperm Banking
www.mskcc.org/cancer-care/patient-education/resources/sperm-banking

Cancer and Fertility: Information for Men

For women:

There are options for women to preserve their fertility. This involves taking hormones for about 10-14 days and collecting eggs. The eggs may be fertilized with sperm to create embryos. The embryos or eggs are then frozen and stored. Because of the extra time this takes, you must talk with your doctor about this as soon as possible. For more information, ask your nurse for the resources below, or you can find them on our website, www.mskcc.org/pe.

Fertility Preservation: Options for Women Who Are Starting Cancer Treatment

Selected Fertility Centers
If necessary, arrange for childcare and pet care — If you have concerns about talking with your children about your transplant, your social worker can help guide you.

Make decisions about your hair — The chemotherapy that kills cancer cells also kills the cells that make your hair. Most people will lose their hair during their transplant. Think about whether you’d like to cut your hair. Visit a wig store if you decide to wear a wig.

Have your pretransplant evaluation — You’ll undergo a series of medical tests. Your clinical nurse coordinator will review which tests are needed and your doctor’s office assistant will work with you to schedule these tests at a time that is convenient for you (as best as possible).

Meet with a dietitian — If you will have particular nutritional needs, you will meet with a dietitian to review special dietary requirements and safe food handling.

Meet with a pharmacist — Your pharmacist will go over all the medications you will be taking before and after your transplant.

Your transplant team

A team of healthcare professionals will care for you throughout your treatment. You will meet many members of your healthcare team as you progress on your transplant journey. Some members, such as your doctor’s office assistant, laboratory staff, or our service coordinator, you may not have an opportunity to meet, but know that they are all working on your behalf. Here is a list of the team members and their roles.

An attending doctor will be in charge of your care throughout your treatment. Even though one specific doctor will be your primary outpatient doctor, different doctors may care you for while you are in the hospital.

A fellow is a doctor who has completed general training and is receiving additional training in cancer care.

A nurse practitioner (NP) is a nurse who has a master’s or doctoral degree. An NP is licensed to examine you, provide medical treatments, and prescribe medications.

A physician assistant (PA) is a medical professional who has graduated from an accredited PA educational program and is nationally certified and licensed by the state to practice medicine under physician supervision. PAs are licensed to examine you, provide medical treatments, and prescribe medications.
A **BMT clinical nurse coordinator** is a nurse who will communicate and work with you, your caregiver, and your team of doctors to organize and schedule all the testing, procedures, and consultations with other professionals needed before your transplant. Your clinical nurse coordinator will educate you about your specific treatment plan.

**Nursing staff** will be working with you when you are seen at outpatient visits, as well as while you are in the hospital. They are registered nurses specially trained in the care of stem cell transplant patients. Each outpatient nurse works with 1 or 2 attending doctors and will meet you at the time of your initial consultation visit. Your outpatient nurse will see you at many of your outpatient visits after discharge and will follow you along your transplant journey. When you are admitted, you will have a team of primary nurses that will care for you during your hospital stay. The inpatient nurses work 12-hour shifts and try to maintain consistency with who will be working with you. Both the inpatient and outpatient nurses work closely with your healthcare team to manage any symptoms and can help you with any questions or concerns you may have.

A **nursing assistant/patient care technician** provides basic care and support under the direction and supervision of a registered nurse.

A **hospitalist** is a doctor who sees patients only while they are in the hospital. At MSK, there is a hospitalist on duty all night.

A **clinical pharmacist** who specializes in the care of patients having stem cell transplants will review your medications with you and your caregiver, teach you how to take them properly, and inform you of any side effects they may cause.

A **social worker** will help you, your family, and your friends manage the stress that comes with the transplant process. Social workers understand the issues faced by transplant patients and are available to listen, offer counseling, and refer you or your family members to other resources and services, as needed.

A **transplant service coordinator** will work with you and your insurance company to determine your transplant benefits. This person is experienced in the insurance issues faced by transplant patients. Each insurance company has its own policies and requirements. When your insurance company requires authorization, your transplant service coordinator will assist with that process.

**Physician office assistants** provide administrative support to your attending doctors and their nurses. You may speak with them when you submit information, are scheduling an appointment, or have questions for your healthcare team.

**Session assistants** work in the outpatient areas and monitor the flow of patients in and out of the clinic. They ensure that patients have all of their necessary tests, scans, and treatments the medical team orders either completed
or scheduled. Session assistants also manage patients’ medical records and coordinate their future appointments.

An unrelated donor search coordinator works with staff at the National Marrow Donor Program to find a donor for patients who do not have a suitable donor in their family. He or she updates your doctor frequently with the results of the search.

A research study assistant (RSA) works with your healthcare team and will speak with you and explain some of the research studies at MSK that you may be able to participate in. These studies do not include anything that is related to your particular treatment, and mostly concern collecting samples or data.

Patient representatives are liaisons between patients and families and the hospital staff. They are here to protect patients’ rights and help explain hospital policies and procedures to patients and their families. Patient representatives can help patients with any concerns about their care and help facilitate communication to ensure a better doctor/patient relationship.

A dietitian is a food and nutrition expert who will assess your nutritional status, manage your treatment-related side effects, and provide dietary consultation to you and your caregiver.

A physical therapist (PT) will see you in the early part of your hospitalization and will work with you to help you maintain your strength and stamina during your recovery.

A room service associate will orient you to room service. He or she will make sure that you receive the appropriate menus, as well as deliver your meals.

A case manager will see you during your hospital admission, give required updates to your insurance company, and help you arrange home care as needed.

**The role of your caregiver**

An important step in preparing for your transplant is choosing your caregiver, who will be an important part of your healthcare team. This person is usually a family member or a close friend. Your caregiver will be responsible for some of the medical, practical, and emotional support you need during your transplant. This person needs to be available 24 hours a day, 7 days a week once you are discharged.

Some of your caregiver’s responsibilities will include:

**Medical support**
• Noticing any changes in your condition.

• Telling your healthcare team about any new symptoms you may have or changes in your condition.

• Calling for medical help in an emergency.

Practical support

• Dealing with financial and insurance issues.

• Keeping family members and friends up to date about your condition.

• Managing the number of visitors you have and keeping you away from anyone who is sick.

Emotional support

• Paying close attention to your moods and feelings.

• Communicating with you and listening to you.

• Understanding your needs and your decisions.

If there isn’t 1 single person who can act as your caregiver, then it may be possible for you to have different caregivers scheduled during different times. It is best to limit the number of caregivers to 2 or 3 individuals, if possible.

It is important for your caregiver to maintain a positive attitude, calm demeanor, and flexible approach, while also providing you with the support and encouragement you need. It's important for you to understand that the caregiver role is challenging and that your caregiver may at times feel overwhelmed by the responsibilities.

Take time now to think about who you would like to be your caregiver. It should be somebody you trust and who can take the time to care for you. Your caregiver should be someone who can offer you the practical and emotional support you need.

Resources for caregivers

Caregivers can experience financial, physical, emotional, and spiritual distress. Resources and support are available to help manage the multiple responsibilities that come with caring for a transplant patient. For support resources and information, contact your transplant social worker. We have included a useful
Coping with separation from children

Separation from your children will be difficult for you and your family. We know from past experience that patients with children experience a range of feelings and reactions related to this separation.

We strongly recommend that you talk to one of our social workers about being separated from your children. Have your caregiver tell any member of your healthcare team that you’d like to speak with a social worker and they will make sure to arrange it. They will listen to your concerns and help you develop a plan to maintain strong ties to your children while you are undergoing treatment.

Here are some things that other patients have done to remain in contact with their children during their transplant.

- Use a computer or tablet and programs like Skype, Google Talk/Hangouts, or FaceTime to talk to your children regularly. Set up a time that you talk to them each day, such as when they get home from school and before they go to bed. Get into a routine of using the computer to see them and talk to them.

- Paint or create other crafts to send home. Craft supplies can be provided to you by the Patient Recreation Center. Ask a member of your healthcare team to arrange for the Patient Recreation Center to bring supplies to you.

- Use your cell phone or a tape recorder to make an audio recording of yourself as you read your children’s favorite stories. Upload these recordings to the web, give them to your caregiver, or e-mail them to your children. They can read along with these stories while listening to your voice.

- Keep copies of your children’s favorite stories with you in your hospital room. At night, you can use Skype to read along with them before they go to sleep.

- Ask your children to decorate your hospital room with pictures; your caregiver can bring them to you and you can show them hanging on the wall over Skype.
• Give your child a special coloring book or journal for times when they miss you, or when feelings are difficult. Your caregiver can bring the colorings to you. You can talk to your child about them over Skype or on the phone.

We understand that nothing will replace physical contact between you and your children, but we strongly encourage you to use all available technology to maintain a strong bond with them while you are away.

For more assistance related to maintaining your relationship with your children, contact your social worker.

**Have your pretransplant evaluation**

Before you become a transplant candidate, your overall physical condition needs to be evaluated. You will need to make several trips to MSK to undergo tests. We often refer to this as the “work-up” or “restaging” period. During the work-up, you will need to have some, but not necessarily all, of the following tests:

- **Chest x-ray** — This is done to ensure your lungs are clear and there is no evidence of infection or other problems.

- **Blood tests** — These are done to evaluate your kidney and liver function and to assess your blood counts and hemoglobin level. Your past exposure to certain viruses is also checked.

- **Urine test** — This is done to determine if there are any abnormalities in your urine.

- **Electrocardiogram (EKG) and Echocardiogram (echo)** — This is done to give your healthcare team information about your heart.

- **Pulmonary function tests (PFTs)** — These are breathing tests that measure your lung function.

- **Computed tomography (CT) scan** — This is an x-ray that provides images of soft tissue and bone. Some scans use contrast dye that you drink or have injected into your body. Tell your doctor if you have a known allergy to contrast dye, seafood, or iodine. If you have an allergy, you may need to be given medications to prevent a reaction to the dye before your scan.

- **Positron emission tomography (PET) scan** — This is a scan that is used to look at certain types of cancer, as well as your organs and how they function in your body.
• **Dental exam** — You must have a full dental exam before your transplant. Any cavities, loose fillings, or gum disease should be taken care of before your transplant. This can be done by your own dentist or by our dentist here at MSK. If you see your own dentist, please ask him or her to provide a note saying that you have no dental problems. If there are issues, please ask your dentist to contact your doctor’s office to discuss them. Your dental exam can be done up to 3 months before you are admitted to the hospital for your transplant.

• **Bone marrow aspiration and biopsy** — A bone marrow aspirate is a small sample of bone marrow, usually taken from the back of your hip. Your hip will be numbed, a needle will be inserted into the bone marrow, and a small amount of bone marrow liquid will be taken out. A bone marrow biopsy may be performed at the same time. This biopsy involves collecting a tiny piece of bone for examination. This is done to evaluate how well your bone marrow is producing cells and to check for any sign of cancer in the marrow.

• **Lumbar puncture (spinal tap)** — This lets us check for abnormal cells in your cerebrospinal fluid (CSF). This is the fluid that surrounds your brain and spinal cord. A small needle will be inserted through your back and a small amount of CSF will be collected. A lumbar puncture is only done for certain types of leukemia and lymphoma. Sometimes, chemotherapy is injected into the spinal fluid to prevent the cancer from spreading there or to treat it if it is already there.

• **Skeletal survey** — This involves taking multiple x-rays of the major bones in your body to check for any signs of disease. It is generally done for patients with multiple myeloma. It can take a few hours to complete.

• **Consultation with a radiation oncologist** — If you are having radiation therapy as part of your conditioning, you will meet with your radiation oncologist to go over your treatment plan. You may also have a CT scan, PET scan, or both, at this visit to plan your treatment. You will also have a treatment planning session called a simulation. During this session, several x-rays are taken along with measurements of your chest. These are used to make lead shields. Your lungs are very sensitive to radiation and the shields will be used to protect them during some of the treatments.

These tests are usually done in the 30 days before your transplant (Day −30 onwards), but sometimes the pretransplant evaluation can take longer. Your clinical nurse coordinator will work with you and your caregiver to schedule the tests.

The results of the tests will be used to plan your treatment and make sure that it is safe to start your treatment.
Your doctor or nurse will explain any other tests that you may need.

**Donor screening**

At the time you are having your pretransplant evaluation, your donor will be going through the screening process. If your donor is related to you, they will be screened at MSK. If your donor is unrelated, they will be screened at the local donor center.

**Mobilization**

In an allogeneic transplant, your donor’s stem cells are first harvested (“collected”) from his or her body.

Mobilization is the process of increasing the number of stem cells produced by the bone marrow and released into the bloodstream.

Normally, stem cells live in the bone marrow, although a small amount circulates in the bloodstream. To increase the amount of stem cells in your donor’s bloodstream, he or she will be given injections of a medication called filgrastim (Neupogen®), which is a granulocyte colony-stimulating factor (GCSF). GCSF stimulates the body to make more stem cells than usual and releases the stem cells into the bloodstream. This process is called mobilization.

In most cases, filgrastim injections are self-administered, meaning that your donor will be taught how to inject him or herself with the medication at home. He or she will be given filgrastim in prefilled syringes, which will be kept in the refrigerator. Your donor will give him or herself injections daily for 5 to 6 days.

**Peripheral blood stem cell harvesting**

Peripheral blood stem cell (PBSC) harvesting is the process of collecting and separating whole blood into its major components (red blood cells, white blood cells, platelets, and plasma) then removing stem cells from the other white blood cells.

In general, the donor’s stem cells are collected 1 to 2 days before the transplant. Occasionally, donor stem cells are collected at an earlier time and frozen until needed.

For a related donor, the harvesting procedure is done in the Blood Donor Room at MSK. Your donor will typically have 2 harvesting sessions for 2 days in a row. Each session will last 3 to 4 hours.
During the procedure, your donor will be lying in a bed or sitting in a reclining chair. He or she will be connected to a machine either by an intravenous (IV) needle in each arm, or by a catheter that has been inserted into his or her chest (if his or her arm veins are too small). Blood will be withdrawn through the needles in their arms or the catheter and circulated through a machine that collects the stem cells. The rest of the blood will be returned to your donor through the needles or catheter. Once collected, your donor’s cells will be brought to our cell processing lab and prepared for you to receive them the following day.

**Bone marrow harvesting**

In certain cases, stem cells may be collected from the donor’s bone marrow rather than peripheral blood. This is called bone marrow harvesting. In this situation, mobilization is not needed.

Bone marrow harvesting is done in the operating room while the donor is under general anesthesia. Usually, the bone marrow is taken from the back hip bones. This procedure is done in 1 day, and in most cases, the donor goes home that same day. Although the donor does not feel anything during the procedure, he or she may have some soreness for a few days following the harvest.

**The Next Step: Have Your Preadmission Appointment**

When the date of your transplant has been determined and your pretransplant evaluation has been done, you will have your preadmission appointment. This appointment is usually 1 to 2 weeks before you are admitted to the hospital. At this appointment:

- Your doctor will review your specific treatment plan with you.
- Your doctor will go over the consent forms and you will sign consent for your transplant (if this has not been done at a previous visit).
- You will meet with your transplant nurse coordinator, who will give you a calendar outlining your treatment plan, review information, and answer any questions you may have.
- You will meet with your clinical pharmacist again to review the medications you will take during and after your transplant.
- You may be asked to sign a consent form for transfusion (if you have not already), as you may need blood or platelet transfusions when your blood counts are low after your transplant. For more information about blood
transfusions, read the resource *Frequently Asked Questions About Blood Transfusion*, located at the back of this guide.

Between your preadmission appointment and when you're admitted to the hospital, it is very important to call your transplant doctor's office if you have any of the following:

- Signs of a cold, such as:
  - Runny nose
  - Congestion
  - Cough
  - Temperature of 100.4° or higher
- Nausea
- Vomiting
- Diarrhea
- Toothache
- Open wound
- Any other new problem, even if it seems minor

Your doctor will decide whether your admission for SCT should be delayed. It could be very dangerous to start your chemotherapy for transplant while you have an infection, even just a cold. This is because your immune system will not be able to fight the infection.

**Preparing for Your Hospital Admission**

You are welcome to bring the following items with you to the hospital on your admission day:

- Pajamas, sweat pants, shorts
- Button down or zipper shirts
- Slippers
- Sneakers, socks with traction, or both
• Hat or scarf

• Blanket and pillow from home (brightly colored to distinguish it from hospital linens)

• Photos, posters, or other reminders of home

• Cell phone and charger

• Baby wipes

• Puzzles, books, magazines

• Notebook and pens and pencils

• A little bit of money

• Radio, iPod, or CD player

• Laptop or tablet (e.g., iPad)

**Do not bring the following items with you to the hospital on your admission day:**

• Your medications (both prescription and over-the-counter)

• Things that will clutter up your room

• Flowers or plants
What to Expect While You Are in the Hospital

Day of Admission

Having your central venous catheter inserted

For your transplant, you will need to have a central venous catheter (CVC) inserted into your upper chest wall. A CVC is a tube that is inserted into a large vein in the upper chest area. On the outside of your body, the catheter divides into 2 or 3 smaller tubes called lumens.

A CVC allows your healthcare team to transfuse your stem cells, draw your blood, and give you fluids, electrolytes, blood transfusions, chemotherapy, and other medications without having to keep sticking you with a needle. Having a CVC will make your treatment much more comfortable. Most of the time, your CVC is taken out at discharge.

You will have your CVC placed in MSK’s Interventional Radiology department at the main hospital. This procedure is done under monitored sedation. You will most likely have your CVC placed on the day you are admitted to the hospital. Occasionally, a CVC may need to be inserted a few days before hospital admission. Your transplant nurse coordinator will discuss the details of having your CVC placed. For more information, please read the resource Instructions for Interventional Radiology Procedures, located at the back of this guide.

After your procedure

After your CVC has been inserted, you will be monitored until you are fully awake. You will then be taken to the inpatient stem cell transplant unit, if it is being placed on the day of your admission. The inpatient nursing staff will care for your CVC while you are in the hospital.

If your CVC is inserted a few days before you are admitted to the hospital, you will be discharged once you are fully awake. You must have a caregiver accompany you if you are going home after your CVC is placed. In this situation, your nurse will teach you and your caregiver how to change the dressing using sterile technique to keep it free from germs. Your nurse will give you the necessary supplies, but it is unlikely that you would need to change the dressing before your admission.

Keep your CVC secure at all times to avoid pulling it. You can tape the lumens of your CVC to your skin, tuck them into a bra if you wear one, or secure them to your clothing. Ask your nurse about the best way to secure your CVC. You can
find detailed instructions on how to care for your CVC in the resource *Caring for Your Central Venous Catheter*, which is included at the back of this guide.

**When You Are Admitted**

There are two transplant units: M8 and M14. You will be followed by the same healthcare team whichever floor you are on. Nursing staff on each unit are specially trained in the care of transplant patients, and all the same guidelines are followed. Sometimes, you may be admitted to one unit, but later be moved to our other transplant floor, if patient needs require this. We try to avoid moving patients as much possible, but sometimes it is necessary.

Upon admission, your inpatient healthcare team will take a complete medical history, review your current medications, and do a physical exam. Your inpatient healthcare team is made up of an attending and a combination of a fellow, NP/PA, primary nurse, and pharmacy specialist. Bring a list of all prescription and nonprescription medications you are taking, along with dosages and frequency. This should include patches, creams, vitamins, nutritional supplements, herbal products, and over-the-counter medications. As mentioned earlier, you do not need to bring your medications with you.

Your primary nursing team will care for you throughout your hospital stay. Nurses typically work 12-hour shifts. The shift changes happen at 7:00 AM and 7:00 PM every day. During this time, bed-side patient handoff (report) will be performed between your nurses so that the nurse taking over your care will be updated with specific information about your condition.

**During your hospital stay**

- You will be placed in protective isolation in the hospital to prevent you from getting an infection. Anyone entering your room must perform hand hygiene and wear a mask and gloves. For more information on hand hygiene, see “Visitors” section on page 25 or *Hand Hygiene and Preventing Infections* at the end of this resource. Sometimes, you may need additional isolation precautions. A card telling your visitors about the type of isolation and what is required will be placed on the door to your room. Even though you are on isolation, you may have visitors 24 hours a day, every day, but we recommend that no more than 2 visitors be in your room at any one time. Children 7 years or older may visit as long as they follow our isolation procedures. More information about visitors is discussed below.

- You will be in a private room that has a bathroom for your use only. The room has a TV with cable channels and Wi-Fi access.
• You will be connected to an IV pole with electronic pumps during most of your hospital stay.

• Your vital signs will be taken every 4 hours, around the clock.

• Your urine will be measured daily during your hospital stay. It is important that we know how much urine you are making.

Testing/evaluation

Before 6:00 AM every day, you will be weighed and your blood will be drawn. Your blood will be checked to see how your white blood cells, red blood cells, and platelets are recovering. Other blood tests will be done as needed to check your kidney and liver function, monitor for infections, check the level of chemotherapy or other medications in your blood, and help evaluate your overall condition.

The day you are admitted to the hospital, every Monday, and right before you are discharged, your nurse will take a nasal and rectal swab for testing. This is to see if you have any bacteria that may cause an infection. If you do, your healthcare team will instruct you about additional necessary isolation precautions.

If you are at risk of falls, someone will be available to help you go to the bathroom. Your treatment team will tell you more about how to prevent falls.

Visitors

• Family and friends are welcome to visit you. One caregiver can stay overnight with you. However, anyone who has symptoms of an illness (e.g., cough, rash, fever, diarrhea) or who feels they may be coming down with an illness should not come visit you. This is also true for people who could have recently been exposed to someone with an infectious illness.

• All visitors should be able to follow infection control precautions, such as washing their hands, wearing a mask, and reporting symptoms of an illness. We consider age 7 to be a reasonable age to be able to follow these requirements.

• Your caregiver and any visitors must perform hand hygiene before each visitor enters your room using the guidelines below:

  o To wash your hands with soap and water, wet your hands, apply soap, rub them together thoroughly for 15 seconds, then rinse. Dry your hands with a disposable towel, and use that same towel to turn off the faucet.
If you’re using an alcohol-based hand sanitizer, be sure to cover all of your hands with it, rubbing them together until they’re dry.

• You must clean your hands using the hand hygiene guidelines described above prior to eating and after using the bathroom.

• All visitors must follow the isolation instructions that are posted on your door. Your visitors must remove their mask, gloves, and gown before leaving your room.

• Visitors and caregivers must use the visitor’s restroom in the hallway and not the restroom in your room. This is to minimize the spread of bacteria in your room.

• Please tell family and friends not to bring or send fresh-cut flowers or live plants to you. They are not allowed in your room.

Exercise

Even though you will feel tired after your chemotherapy and your transplant, you should still try to remain active and get out of bed every day. It is important to be safe, so ask for help when getting up.

We encourage you to walk around the unit. If your neutrophil count is high enough, you can walk in the hallway before 7:30 AM and after 12:00 PM. You must wear a mask and gloves while you are walking around the unit. Some patients will need to wear a gown when walking in the hallway. Your nursing team will tell you what precautions you will need to take. You should not leave the floor for walking or exercise. A physical therapist will evaluate you early during your hospitalization and prescribe an exercise program suitable for you.

Communication

Each room has a call bell system that is monitored 24 hours and day, 7 days a week by unit assistants. If you need something, please tell your unit assistant exactly what you need so we can direct the appropriate team member to help you. Your unit assistant will be able to call the team member directly using a personal voice communicator. It looks like a phone that goes around the neck.

Diet

Your diet will be planned by your healthcare team. You will be given a menu and instructions on how to order your meals. Room service will deliver your meals to you.
Generally, all patients are recommended to follow a low-microbial diet. Your dietitian will discuss this with you. For more information, read the resource *Low-Microbial Diet*, located at the back of this guide. Special meal plans for patients who keep Kosher, have diabetes, or follow other specialty diets can be requested. A dietician is available on both transplant floors for consultations.

**Showering**

You will be expected to shower daily. You will be assisted with or observed during your shower. A patient care technician will be in your room when you are showering. He or she will arrange a time for you to shower.

**Mouth care**

It is important that you practice good mouth care. Your nurse will go over this with you.
The 5 Phases of Transplant

While each person’s transplant is different, below is a table that outlines what we consider the 5 phases of a stem cell transplant. We will go over each phase in more detail in the following pages. The time frames given are not exact, and some effects may occur over several phases of your transplant journey.

<table>
<thead>
<tr>
<th>Description</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase 1:</strong> Conditioning</td>
<td>Day of hospital admission to Day 0 (transplant day)</td>
</tr>
<tr>
<td>• You will receive chemotherapy with or without radiation therapy, which will kill any cancer cells that are left. This will make room for new stem cells and suppress your immune system so you don’t reject the donor cells.</td>
<td><em>Start date varies depending on which conditioning regimen you will receive</em></td>
</tr>
<tr>
<td>• Phase 1 will be finished when you receive the infusion of stem cells.</td>
<td></td>
</tr>
<tr>
<td><strong>Phase 2:</strong> Transplant Day to Engraftment</td>
<td>Day 0 to engraftment (blood count recovery)</td>
</tr>
<tr>
<td>• You will feel the effects of your conditioning regimen.</td>
<td><em>Usually between Day +10 and Day +30</em></td>
</tr>
<tr>
<td>• Your white blood cell, red blood cell, and platelet counts will be low.</td>
<td></td>
</tr>
<tr>
<td>• You may have diarrhea, nausea/vomiting, and/or mouth sores.</td>
<td></td>
</tr>
<tr>
<td>• Your risk of developing infection will be high.</td>
<td></td>
</tr>
<tr>
<td>• You may need to have blood transfusions.</td>
<td></td>
</tr>
<tr>
<td><strong>Phase 3:</strong> Engraftment to Day of Discharge</td>
<td>Blood count recovery until discharge</td>
</tr>
<tr>
<td>• Your blood counts will recover and gradually increase.</td>
<td></td>
</tr>
<tr>
<td>• You will begin the healing process.</td>
<td></td>
</tr>
<tr>
<td><strong>Phase 4:</strong> Early Convalescence</td>
<td>Discharge to 1 year after transplant (or longer)</td>
</tr>
<tr>
<td>• Your blood counts will be recovering, but your immune system will still not be working properly.</td>
<td></td>
</tr>
<tr>
<td>• You will still be at risk of developing infection.</td>
<td></td>
</tr>
<tr>
<td>• You will remain on certain medications to prevent infection.</td>
<td></td>
</tr>
<tr>
<td>• You will continue to be monitored closely by your transplant team.</td>
<td></td>
</tr>
<tr>
<td><strong>Phase 5:</strong> Late Convalescence</td>
<td>1 year after transplant and onward</td>
</tr>
<tr>
<td>• Your immune system will be almost fully recovered, and you will return to your normal activities.</td>
<td></td>
</tr>
<tr>
<td>• There will still be a chance that you could develop late complications, such as organ dysfunction or recurrence of the original disease.</td>
<td></td>
</tr>
<tr>
<td>• You will begin receiving vaccinations you may have had as a child.</td>
<td></td>
</tr>
</tbody>
</table>
Phase 1: Conditioning

Conditioning is another name for the therapy given to prepare you for your transplant. Conditioning is usually a combination of 2 or more chemotherapy medications or chemotherapy and radiation therapy. The particular conditioning you will receive is based on a number of factors and is discussed with you at your outpatient visits prior to admission.

Conditioning starts on a negative-numbered day (e.g., Day -7). Depending on your treatment plan, the number of days of conditioning will vary. Your stem cell transplant always takes place on Day 0. Every day after your transplant is referred to as a positive-numbered day (e.g., Day +1, Day +2, etc).

<table>
<thead>
<tr>
<th>Day -10 to Day -1</th>
<th>Day 0</th>
<th>Day +1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditioning (chemotherapy and possible radiation therapy)</td>
<td>Stem cell infusion (transplant)</td>
<td>Start of supportive care</td>
</tr>
</tbody>
</table>

Before you receive your chemotherapy, a number of safety checks will be done to make sure everything is correct. Once all the safety checks have been completed, your nurse will give you IV fluids (to keep you hydrated), antinausea medication, and the chemotherapy medication through your catheter.

Radiation Therapy

The radiation therapy given before a transplant is usually total body irradiation (TBI). With TBI, small doses of radiation will be delivered to your whole body. If your transplant doctor recommends radiation as part of your conditioning, you will have a consultation with a radiation oncologist before you are admitted to the hospital. This doctor will explain the process and make certain measurements of your body to be sure the radiation is given safely and effectively. He or she is also responsible for prescribing the appropriate amount of radiation.

These doses are given 1 to 3 times a day and are given over 1 to 4 days. Having radiation therapy is like having an x-ray. The treatment does not hurt.

Each treatment will take 10 to 30 minutes. If you are male and have leukemia or lymphoma, you may have a boost, or an additional radiation treatment to your testes. This is done to destroy cancer cells that may be hidden there.

You may also need a boost to other parts of your body. The treatment depends on the disease you have. Your transplant doctor and radiation oncologist will explain the details of your treatment plan.
Things to remember

- Do not wear any jewelry during your treatments. The metal may change the radiation dose to that area.

- Stop using any creams, lotions, deodorants, or oils (even ChapStick® or lip balm) 2 days before you start radiation therapy. Do not use them at all while you are getting radiation. You can use Aquaphor®, but do not apply it for 4 hours before your treatment.

- Family members can go with you when you have your treatments. They must wait outside the treatment room, but they can see you on a video screen and talk to you.

- You and your clothes will not become radioactive during or after the treatments. You cannot pass the radiation to other people.

Your nurse will tell you more about how the radiation is given and what you will do during the treatments.

Side effects from conditioning

Conditioning should kill at least some, if not all, of the cancerous cells in your body and will prepare your bone marrow and immune system to receive your transplant. However, the side effects of these treatments are not to be taken lightly. These side effects may include the loss of your ability to fight infections, infertility, hair loss, fatigue, nausea and vomiting, diarrhea, mouth sores, or mouth tenderness.

Your healthcare team will help you understand and prepare for these side effects. Before you start treatment, make a list of questions that you would like to ask about these side effects. Talk through these questions with your caregiver and healthcare team.

Low white blood cell count (neutropenia)

Your treatment will damage your ability to fight infections and heal. It’s important that you understand why this happens, how to watch for danger signs, and how to avoid infections and injuries.

One side effect of treatment is called neutropenia. Neutropenia is a condition in which you have a lower than normal number of neutrophils (a type of white blood cell) in your bloodstream. Neutrophils play a crucial role in your immune system—they are one of the first types of cells that travel to the site of an
infection. Once they reach the site of an infection, they ingest and fight potentially harmful germs.

Because your treatment will kill your stem cells, you will temporarily lose your ability to make new neutrophils. Since your neutrophils are not being replaced, the number of neutrophils in your bloodstream will drop to a very low level, leaving you at high risk of infection. Your transplant team will watch for any signs of infection. You may be given an injected medication called Neupogen. This medication stimulates the growth of neutrophils to help you recover faster.

**Showering and bathing**

While you are neutropenic, keeping yourself clean is very important. You should shower or bathe daily using Hibiclens® skin cleanser. Hibiclens contains a fast-acting antiseptic called chlorhexidine gluconate (CHG) that kills germs that live on your skin and will reduce your risk of infection. It can work for up to 6 hours after using it.

**Instructions for using Hibiclens®**

- If you are washing your hair, shampoo and rinse thoroughly.
- Wash your face with regular soap.
- Rinse your body with warm water from the neck down.
- Apply Hibiclens® to a washcloth or directly to the skin being cleansed.
- Wash gently. Do not dilute the Hibiclens®.
- Rinse thoroughly with warm water and pat yourself dry.

**Important points to remember when using Hibiclens®**

- Do not use Hibiclens® if you are allergic to chlorhexidine.
- Do not use Hibiclens® on your face, ears, genital region, or on deep wounds.
- Do not use regular soap, lotion, powder, or deodorant after washing with Hibiclens®.

Wash carefully in your anal and genital areas using soap that can kill germs.

Your nurse will instruct you on guidelines for bathing and showering.
Mouth care

While you’re neutropenic, you will need to change the way you brush your teeth and care for your mouth. This will help to avoid infection and bleeding. Follow these guidelines to take good care of your mouth:

- You will be given a mouthwash to rinse your mouth before and after meals and at bedtime. The number of rinses may be increased to every 2 hours, depending on how your mouth feels.

- Use an ultra-soft toothbrush.

- You can use toothpaste that you buy in the store, but only the mouthwash that your nurse gives you. Most mouthwashes that you buy in the store contain alcohol, which could irritate and dry your mouth and throat.

- Do not use dental floss.

- Avoid licking your lips. It increases dryness and chapping.

- Apply a lip balm like Burt’s Bees®, ChapStick, or A&D ointment after you clean or rinse your mouth and every 2 to 4 hours as needed. This will help keep your lips moist.

- To avoid an infection in your mouth, your doctor may prescribe an oral antifungal antibiotic. Use it as instructed.

- If your mouth becomes sensitive, avoid hot, spicy, acidic, or coarse foods. You may prefer soft or liquid food served chilled or at room temperature.

- If you have pain in your mouth due to mouth sores, your doctor will prescribe medication for the pain.

Anemia

Your chemotherapy will cause you to have a very low red blood cell count, a condition known as anemia. Hemoglobin in red blood cells carries oxygen from the lungs to the tissues in all parts of the body. When your red blood cell count is low, your body can’t carry oxygen as well. Anemia can make you feel tired and weak. You may also feel dizzy, lightheaded, or have shortness of breath when changing positions quickly from lying to standing.

Some of the side effects of anemia include:

- Increased tiredness
• Weakness
• Rapid heartbeat
• Shortness of breath
• Headache
• Pale skin

If you have anemia, your doctor may prescribe a blood transfusion.

**Low platelet count (thrombocytopenia)**

In addition to losing your ability to make neutrophils and other types of white blood cells, you’ll also lose your ability to make platelets. Platelets clump together to help stop bleeding. After your treatment, the number of platelets in your bloodstream will drop, a condition called thrombocytopenia.

You will need to take special care to avoid cuts and strenuous activities that may cause bleeding. You need to take special care of your gums and mouth because it’s common for bleeding to happen there.

You will need to take these special precautions if the number of your platelets becomes very low:

• Avoid sharp objects, such as razors, scissors, and nail clippers. You should only shave using an electric razor/shaver and not with a razor that has a blade.

• Follow the guidelines on mouth care previously discussed.

• If you are straining to have bowel movements, ask your doctor or healthcare team for a stool softener or laxative.

Tell your doctor if you develop any symptoms of bleeding. Be on the lookout for:

• Easy bruising
• Faint, tiny, pin-point red dots on your torso, arms, or legs
• Vaginal spotting or heavy menstrual bleeding
• The appearance of broken blood vessels in the whites of your eyes
• Blood in your urine

• Headache that does not get better, blurred vision, or dizziness

• Coughing up blood, vomiting blood, or a nosebleed that doesn’t stop after a few minutes with applied pressure or ice

• Black stool or blood on the stool

**Nausea and vomiting**

Nausea and vomiting are common side effects of treatment. Chemotherapy acts on a specific part of your brain that may trigger nausea and vomiting. Nausea and vomiting can also be caused by stress or just the thought of having chemotherapy. The amount of nausea and vomiting you have will depend on the type of chemotherapy you will receive. Sometimes, you may experience nausea during your conditioning, or it may be delayed for several hours or days.

You will be given medication to prevent and control nausea prior to your conditioning. These medications work differently for each person. If the medication you are taking isn’t helping, tell your transplant team or doctor. You may need to try a different medication or take more than one kind of antinausea medication to feel better. Your healthcare team will work with you to prevent and treat nausea and vomiting.

**Diarrhea**

Diarrhea is frequent, loose, watery bowel movements. It can also cause stomach cramps, gas, and pain in the stomach or rectal area. Diarrhea can be caused by cancer treatments, medications, infection, stress, or other medical conditions. If you are having diarrhea, you can become dehydrated due to loss of body fluids and electrolytes. The nursing staff will monitor fluid losses that you may have from diarrhea. It is important that you always use the collection container in the toilet in order to collect your stool so that it can be measured.

**Constipation**

Constipation is the passage of dry, hard stool that occurs when materials move too slowly through the large intestine. The normal length of time between bowel movements varies for each person. If you are having fewer bowel movements than what is normal for you, or if you haven’t had a bowel movement for more than 2 days, you may be constipated.

There are many causes of constipation, including not drinking enough liquids or not eating enough fiber, a decrease in your activity, not moving around or walking enough, and side effects of chemotherapy, antinausea medications, and
pain medications. Medications are available to treat constipation. Tell your nurse or medical team if you haven’t had a bowel movement for more than 2 days.

**Mouth sores**

Some treatments affect the cells that line the mouth and digestive tract. This is known as mucositis. Mucositis can cause redness, swelling, tenderness, and sores on the lining of your mouth, tongue, and lips. You may experience some mouth and throat discomfort that can make it difficult to eat or swallow. Tell your nurse if you are having any of these symptoms so that they can be treated.

You may also experience discomfort in your salivary glands after radiation therapy. Your salivary glands are found on both sides of your neck and under your chin. These glands may become tender and swollen and you may produce less saliva. The swelling will decrease a few days after your conditioning. The decrease in saliva is usually temporary and improves after several months.

**Hair loss**

The chemotherapy that kills cancer cells also kills the cells that make your hair. Most patients will lose their hair during their transplant.

Losing your hair can be an unpleasant and upsetting experience. Like many patients, you can choose to cut your hair short before your transplant to take control of this process and to lessen the shock of losing your hair. Talk this through with your caregiver, friends, and family.

Before your transplant, it is also a good time to think about whether you would like to wear a wig. Modern wigs can look very natural and wearing one may make you feel more comfortable. A list of wig stores in New York is included in the resource *Hair Loss and Your Cancer Treatment*, located at the back of this guide. You can get one while you still have your hair, or bring a clipping of your hair, if you’d like your wig to match your natural hair color. Ask your doctor for a prescription for the wig, as some insurance companies will reimburse some of the cost of a wig.

**Skin changes**

Skin changes can be a side effect of conditioning. These changes include increased dryness, flaking, discoloration, and darkening. When you bathe, use a body soap that is labeled for “sensitive skin.” Discuss the use of products with your nurse. Use alcohol-free lotions, creams, or oils to help relieve the dryness.

Your skin may also be very sensitive to the sun and may burn very easily. Avoid bright sunlight; when outdoors, wear a sunscreen with an SPF of at least 30 and
protective clothing, such as long-sleeved shirts, long pants, and a hat. Skin is the most common site for cancer, and sun protection reduces the risk of skin cancers.

Your nurse will tell you how to manage skin reactions during your treatment. For more information, ask your doctor or nurse for the resource *Skin Care Guidelines for Patients Receiving Radiation Therapy*.

**Transplant day**

Now that the conditioning regimen is complete, it’s time for your stem cell infusion—your transplant.

On Day 0, your donor’s stem cells will be infused into your body. These stem cells will give you back the ability to make new blood cells and fight infections.

You will be given medications about 30 minutes before your transplant to help reduce any side effects that you may experience during the infusion. You will be closely monitored and your vital signs will be checked frequently during and after the infusion.

**Your stem cell infusion**

If the stem cells were obtained from a donor that is not related to you, they are immediately brought to MSK. Here, they are processed for an unmodified or a T cell-depleted stem cell transplant.

**Unmodified stem cell transplant**

In an unmodified stem cell transplant, the stem cells are given without first taking out the T cells (type of white blood cell that plays an important role in your new immune system). They are infused much like a blood transfusion over a few hours into your CVC. Red cells or plasma may need to be removed before you receive the stem cells if you and your donor are not the same blood type.

**T cell-depleted stem cell transplant**

In a T cell-depleted stem cell transplant, the T cells are removed from the stem cells before they are given to you. If you are going to have a T cell-depleted stem cell transplant, you will receive it after the T cells are removed in the laboratory. This takes 12 to 24 hours, so you will receive it the day after your donor has given the stem cells. The stem cells will be injected directly into your CVC from a large syringe. There are usually not any side effects from the infusion of T cell-depleted stem cells.
Umbilical cord blood stem cell transplant

On the day of your transplant, the umbilical cord blood will be thawed in our laboratory and brought to your room in a bag. If you are also getting partially matched T cell-depleted stem cells (haploidentical) from a family member, these will be given either on the same day as you receive the cord blood, or on the following day.

The cord blood will be given to you through your CVC. Sometimes, people experience nausea or get high blood pressure during an umbilical cord blood infusion. These issues will be treated as they occur.

Your doctor and nurse will discuss any questions or concerns you may have about the type of transplant you are going to receive.

Side effects

You may experience some side effects during and after your infusion. This is more common when the stem cells are collected ahead of time and stored frozen for some period of time. Side effects can include nausea, vomiting, a tickle in your throat, or a cough. Other side effects that can occur include low blood pressure, chills, and fever. It’s important that you communicate with your healthcare team during your transplant. If you do experience side effects, your healthcare team will treat your symptoms.

If the stem cells you received had been frozen and preserved, you may notice a strong, garlic-like taste in your mouth during and after your transplant. Your urine, sweat, and skin may also have a garlic-like smell. You may not notice the smell but those around you will. This smell is caused by the preservative used to store the stem cells and will gradually go away over 1 to 2 days. Your nurse will have lemons to use as a safe, natural air freshener during the infusion.

Additionally, if the stem cells you received have been frozen and preserved, your urine may look discolored, ranging from pink-tinged to bloody, for 24 hours after your transplant. This is your body’s way of getting rid of extra red blood cells that may be with the stem cells, but are not needed.
Phase 2: Transplant Day to Engraftment

Once you’ve had your transplant, you will enter a period of watching and waiting for your donor stem cells to begin producing healthy new blood cells, a process called engraftment. As engraftment occurs, the number of white blood cells, red blood cells, and platelets in your blood will begin to increase in number.

Some complications are possible after your transplant. Infection, bleeding, and anemia are some of the major ones that can occur while you are waiting for your blood counts to return to normal. In most cases, there are steps that you and your healthcare team can take to prevent, manage, and treat these complications.

Here is a list of things that will happen during this phase:

- **Testing** — You will undergo blood tests and other tests as needed to monitor your progress. You will have blood drawn every day.

- **You may continue to have side effects from the conditioning, as described earlier**. You will be given medication to minimize the side effects and increase your comfort.

- **Low-microbial diet** — Because you are neutropenic, you will eat a diet that contains a low number of potentially harmful microbes.

- **Transfusions** — You may need to receive a blood transfusion to boost the numbers of red blood cells and platelets in your bloodstream.

- **Recovery of your blood counts** — Over time, as the stem cells engraft and begin to produce new blood cells, your blood counts will improve.

- **Exercise** — You will try to remain physically active after your transplant by limiting the amount of time you spend in bed and walking a little each day. Follow the recommendations that your physical therapist gives you.

**Risk of infection**

You will be at risk for bacterial, fungal, and viral infections for several months after your transplant. They are a major risk in the early recovery period until your new bone marrow grows and makes white blood cells to fight infection. You will still be at risk for some infections while your immune system recovers during the first 2 years after your transplant.

Fever is one important sign of infection. If you develop a fever, you will have a chest x-ray and urine and blood tests. You will be given IV antibiotics to help your
body fight the infection. Nearly all patients develop fever during the first 2 weeks after their transplant. Most infections are treated successfully with antibiotics. Your doctors and nurses will try to prevent you from getting infections. You will likely be given medications that are used to treat infections, which can help prevent infections in patients who have had a transplant. You will receive antiviral medications to help prevent some viral infections you may have had in the past from coming back after your transplant. These viral infections can include cold sores, recurrence of genital herpes, and shingles.

Patients whose immune systems are not working well can get infections that would not occur in healthy people. These are called opportunistic infections. You may need medication to help protect you from these infections. You will be at risk for them until your white blood cell count and immune system return to normal.

**Bleeding**

Your platelet count will be low. Since platelets form blood clots, you will be at risk for bleeding. The mucous membranes of the nose, mouth, skin, and gastrointestinal tract are most commonly affected. You will have platelet transfusions if your count falls below 10,000 or if you have any bleeding.

**Anemia**

When your red blood cell count is low, you may experience weakness and fatigue. Your nurse will assist you with your daily activities if you need help. You will be given red blood cell transfusions as necessary. These and all other blood products will be irradiated to prevent harmful side effects.
Phase 3: Engraftment to Day of Discharge

Possible early complications

As we mentioned earlier, time frames given are not exact, and some of the side effects or complications that are reviewed here can occur in more than one phase of your transplant journey.

Organ complications

You may have complications in your kidneys, liver, lungs, or heart. These are not common, but they can be serious. You are at higher risk if you already have a medical condition in any of these organs. This is why we carefully evaluate your organ function before your transplant.

Kidneys

Your kidneys filter your blood and make urine to send waste products out of your body. The chemotherapy and radiation therapy you receive before your transplant can affect how well your kidneys work. This is temporary, but waste products may remain in your blood until your kidney function improves. It also means that your kidneys will have more trouble getting rid of some of the medications you are given.

Your nurses will keep records of the amount of fluids you get. This includes what you drink and what you get through your IV line. They will also write down how much urine you make. This will help your doctors to know if you are beginning to have problems with your kidneys. You will also have blood tests every day to tell your doctors how your kidneys are working. If necessary, your doctors will adjust the doses of some of the medications you are getting to decrease the risk of further injury to your kidneys.

Liver

In some people, small blood vessels in the liver are injured. This is called “sinusoidal obstruction syndrome” or “veno-occlusive disease.” If this happens it can cause your liver to become enlarged and may damage your liver cells. Fluid may fill your abdomen (belly). This usually begins within the first 3 weeks after a transplant. Everyone having a transplant will receive a medication during their transplant process to help reduce the risk of developing sinusoidal obstruction syndrome or veno-occlusive disease.

If you have any side effects to your liver, your doctor will discuss the treatment options with you in more detail.
Lungs

Infections that affect the lungs, including pneumonia, may cause breathing problems after a transplant. These problems most commonly develop in the first few weeks after a transplant and can be serious. Your healthcare team will watch you closely for any sign of pneumonia. Tell them if you notice any change in your breathing. Do not ignore a cough or shortness of breath. The treatment for pneumonia depends on what caused it.

To help prevent problems with your lungs, exercise them. This may help to keep them clear. Your nurse will show you how to do deep breathing. You can also use an incentive spirometer, which is an instrument to help you practice deep breathing. Even getting out of bed and doing breathing exercises helps.

Heart

Your heart pumps blood throughout your body. Certain chemotherapy medications may have side effects that damage the heart. Your doctors will watch your heart function carefully while you are in the hospital.

Graft versus host disease

Graft versus host disease (GVHD) occurs when the donor’s immune cells (T cells) start to attack your body’s organs and begin to damage them. There is a chance that GVHD will develop when the new stem cells begin to engraft. A close match of HLA or tissue type between you and your donor helps lower this risk, but does not eliminate it.

Risk factors for GVHD include your age and the gender of your donor. Anyone whose donor is not an identical twin receives some type of prevention for GVHD. This prevention includes either removing the T cells from the transplant (T cell depleted), or giving medications to prevent those T cells from causing GVHD. There are pros and cons to each method, and there are reasons that you would receive one or the other. Your doctor will discuss these with you before your transplant.

There are two kinds of GVHD: acute (early) and chronic (late and longer lasting). **Acute GVHD** usually develops within the first 100 days after a transplant, but can occur later. **Chronic GVHD** usually develops after 100 days, but rarely before the first 3 months after transplant. The symptoms of either may be mild to severe. You may develop acute, but not chronic GVHD. You may develop chronic GVHD without having had acute GVHD. Or, you may develop both. You may or may not have symptoms between the time that you develop acute and chronic GVHD.
Symptoms of acute GVHD include:

- A skin rash that appears on parts of the body or over the entire body
- Jaundice (yellow skin and eye color) and an enlarged liver
- Abnormal liver blood tests
- Loss of appetite
- Nausea and vomiting
- Mild to severe diarrhea

Symptoms of chronic GVHD include:

- Dark skin rash or dry or thickened skin
- Loss of appetite
- Weight loss
- Diarrhea
- Dry mouth
- Tightness and discomfort in the mouth
- Dry eyes
- Hair loss
- Decreased energy

GVHD may slow the growth of the bone marrow and recovery of the blood counts. This means it will take longer for your immune system to function properly and therefore you can be at an increased risk of infections. It may affect one or more parts of your body. If you have evidence of GVHD, your doctor will discuss the treatment plan with you.

Graft failure or rejection

Transplanted stem cells sometimes do not grow successfully inside the body. This is called graft failure. Graft rejection means that your immune system has rejected your new stem cells and your blood counts do not recover, or your blood
counts recover and then decline again. You will receive treatments before your transplant to prevent this from happening.

The risk of graft rejection lasts about 2 to 4 weeks after a transplant. Occasionally, graft failure can happen at a later time after a transplant. If this happens, one option may be to get more stem cells from your donor, if they are available. This is called a “boost.” Your doctor will discuss treatment options with you if this occurs.

**Preparing for discharge**

Once your blood counts have recovered, and if any side effects or complications you may have experienced have resolved, your inpatient team will begin working with you and your caregiver to prepare you for discharge. On average, people can be discharged about 3 weeks from their day of transplant. It may be a few days before that, or it may be longer than 3 weeks, depending on your stem cell source and your particular treatment plan.

To be discharged from the hospital, you must:

- Have no fever
- Have blood counts that are in a safe range (neutrophil count higher than 1,000)
- Be eating and tolerating some solid food
- Be drinking 1.5 to 2 liters of liquids a day
- Tolerating your oral medications
- Have a caregiver to assist you

Most of the time, your CVC will be removed right before you are discharged. Your transplant team will work with you before you are discharged to make plans for your follow-up care. You will be seen in the outpatient clinic within 1 week of your discharge.
Phase 4: Early Convalescence

This phase of your recovery extends over a long period of time—discharge to one year (or longer) after your transplant. It is important to remember that although your blood counts are coming back up to the normal range, your immune system is still very immature. You will still need to take preventive medications and follow precautions to keep yourself healthy and avoid infection.

Some complications, particularly those that affect the organs, may become evident during this phase, even if they were not a problem earlier in your course.

The time frames given here are general guidelines and may vary. Your transplant team may give you a more exact time frame.

Before going home

MedicAlert® jewelry

Before you leave the hospital, you will need to order a MedicAlert bracelet or necklace. Your transplant team will give you an order form and help you fill it out. Your bracelet or necklace should be engraved with the statements “Allogeneic stem cell transplant” and “Irradiated cellular blood components.” This will let paramedics or staff in any hospital know what to do if you are in an accident and cannot tell them yourself.

Discuss with your transplant team whether CMV-safe blood components are necessary for you after your transplant. If so, you will also need to have the statement “CMV-safe blood components only” engraved into your MedicAlert bracelet or necklace.

For more information on MedicAlert, go to: www.medicalert.org.

Going home

You may be very happy and feel ready to go home. However, it is common for people to have some worries and concerns as their discharge date draws near. At home, you and your family will need to manage your care. Feeling confident and comfortable doing this is a process that takes time. You can meet with your social worker during your follow-up appointments. He or she can help you get the services you need and can give you emotional support.

When you go home, you will need to adjust to living with your family again. You may find that the precautions you must take in the months ahead may add some stress to your life. People have told us that the key to managing this new stress is
to remain as calm and confident as you can. Regaining a sense of balance and comfort will come with time. You will not feel the same way you did before your illness. You may feel tired and weak. Your appetite may not be what it once was. You may have changes in your senses of taste and smell. It may take time for you to regain your strength and to be able to take part in the activities you enjoyed before your transplant.

**Preventing infection**

It usually takes 12 to 18 months for your immune system to recover from your transplant. We often tell people that the first year after transplant is like your first year of life as a newborn baby. During that time, you are at risk for infection. Your transplant team will be checking your blood cell counts to see how well your immune system is working. This will help them advise you about any changes to the guidelines you must follow.

Be aware of the symptoms of infection listed below. Call your doctor if you have:

- A temperature of 100.4° F (38.0° C) or higher. **Do not take acetaminophen (Tylenol®).**
  - You do not have to take your temperature daily. However, check it regularly if you do not feel well
- Flushed appearance of the skin, sweating, or shaking chills
- Coughing, sneezing, runny nose, shortness of breath, or chest discomfort
- Any redness, swelling, and/or pain in your throat, eyes, ears, skin, joints, or abdomen
- Blurred vision or other changes in your ability to see clearly
- Nausea, vomiting, or diarrhea
- Frequent urination, burning on urination, or both
- If you still have a CVC, and you develop a fever and/or chills, or you have any difficulty flushing it
- Irritation in your rectum, including burning and pain
- A rash
- Small blisters, similar to cold sores, around your mouth or on any other part of your body
You can catch viruses more easily until your immune system is back to normal. Also, viruses that you have had in the past can reactivate. One of these is the virus that causes chicken pox and shingles. If you are exposed to either of these illnesses, call your transplant doctor or nurse immediately. You will need to be assessed. The virus can also reactivate in patients who have already had chicken pox as a child. This often starts as pain in the skin with pimples or fluid-filled blisters. If you develop blisters, they can be tiny or as large as a pencil eraser. The blisters may be painful, itch, or burn. If you have any of these symptoms, call your doctor or nurse immediately so you can be treated.

Once your immune system has recovered, you will begin receiving your childhood vaccines. This usually starts about 1 year after your transplant; however, your transplant team will determine when the timing is right for you.

There are certain precautions you can take to decrease your chance of getting an infection. Below, we provide some guidelines for you to follow.

**Personal hygiene**

While you are recovering from your transplant, keeping yourself clean is very important and can help prevent infection. Follow the guidelines below.

- Shower or bathe daily. Use a mild soap such as Dove® or Caress®. Do not use Ivory® or a deodorant soap because they can dry out your skin. Be sure to wash your underarms and groin. Use a washcloth and towel that are only for your personal use.
  
  o If your skin is dry, avoid using very hot water. Apply baby oil or a skin moisturizer such as Eucerin® or CeraVe®. Put it on after you bathe, while your skin is still damp. Gently pat your skin dry with your towel. Do not use lotions containing alcohol. They will increase dryness.

- Hair usually starts to grow back about 3 months after the transplant. It is possible that your hair may grow back with a different texture. Although it is rare, hair loss can happen months or years after the transplant.

- Limit your time in direct sunlight. Your skin will be more sensitive and may burn more easily after your transplant. The medications you are taking may add to this. Whenever you are in the sun, protect your skin with a sunscreen that has an SPF of at least 30. Reapply it often. If you will be in direct sunlight for 20 minutes or longer, cover your skin with cotton clothing and a protective hat. Prolonged exposure to the sun may also reactivate cold sores (herpes simplex virus). Over stimulation of the skin by the sun can also cause GVHD of the skin.
• You can wear contact lenses but be sure that they are thoroughly cleaned before you put them in. Do not reuse cleaning solution. Be sure to discard cleaning solutions when they have expired. If your eyes are dry, use moisturizing drops.

• You can wear makeup. Purchase all new products after your transplant.

• New nails will grow and replace your old nails. This will happen gradually 3 to 4 months after your transplant. Do not get a manicure or pedicure in a nail salon while your immune system is still recovering. You can do this at home with your own equipment.

• If you still have a CVC, do not allow it to soak in water while you bathe.

• Do not get body piercings or tattoos after your transplant. These increase your risk of hepatitis and other infections. Discuss any concerns you may have with your primary attending.

Mouth care

Continue with mouth care as described earlier until your healthcare team tells you that you can start using an ultra soft toothbrush. You can brush your teeth with an ultra soft toothbrush if:

• Your absolute neutrophil count (ANC) is higher than 500 (sometimes called 0.5).

• Your platelet count is 20,000 (sometimes called 20) or higher.

Ask your doctor or dentist when you can floss and brush your teeth with a regular toothbrush.

If you wear dentures, you must keep them clean to prevent an infection. Soak them every day in any type of denture cleaner. Use the directions on the product. Then, rinse them thoroughly with tap water. Your dentures may need refitting after your transplant.

If any of your medications are mouth rinses, take out your dentures before rinsing or swishing the medication. This will help the medications work better and will prevent your mouth from becoming reinfected. Tell your doctor or nurse if you have pain or discomfort in your mouth.

Dryness of the mouth is another symptom you may have for 3 to 4 months or longer after your transplant. Do not use commercial, alcohol-based mouthwashes or hydrogen peroxide. They will dry and irritate your mouth. Instead, use a mild
salt-water rinse. Make it by mixing ½ teaspoon of salt and ½ teaspoon of baking soda in an 8-ounce glass of water. Your dentist may prescribe other rinses. Sucking on sugarless candy or lozenges may also be helpful.

Your salivary glands may not be as good at washing bacteria from your mouth after your transplant. This increases your risk of cavities. Use toothpaste with fluoride. You can also use a mouthwash with fluoride once your mouth has fully recovered and is no longer too dry. Allow the mouthwash to sit in your mouth for at least 1 minute, then spit it out; do not rinse.

Caring for your CVC

It is just as important to keep your CVC clean after you go home as it was while you were in the hospital. If you go home with a CVC, your nurse will teach you how to care for it at home and you will have a chance to practice with the nurse watching.

You can also review the resource *Caring for Your Central Venous Catheter*, located at the back of this guide.

Your home environment

Your home must be kept as free of dirt and dust as possible. However, you should not go to extremes. Do not repaint your walls or put down new carpets. In fact, you should not be around any renovations or construction until your transplant team approves. This includes those in process and those done within the past 3 months. Stay out of any musty area where mold may grow, such as a damp basement. You can use an air filtration system in your home, but it is not necessary.

**Do not use a humidifier.** Bacteria and mold grow easily in it. A pan of water placed near a heat source may help in the winter. **You must change the water every day.**

In general, try not to do any chores like dusting or vacuuming for the first 3 months after your transplant. Depending on your energy level, it is fine for you to cook, wash dishes, or iron. Your bathroom should be kept very clean (especially the tub and toilet). Use a disinfectant regularly.

Wash your eating utensils and linens carefully. They do not need to be washed separately from the rest of your household. Thoroughly wash all forks, spoons, and knives with hot water and dishwashing detergent or use the dishwasher. Wash towels twice a week and bed linens once a week. Use only your own towels and washcloths, not those of your family members.
Household plants can remain in your home. However, for the first few months after your transplant:

- Do not touch the soil from household plants unless you wear gloves and a mask.
- Do not touch the water in a vase of flowers. Someone else should change the water in the vases daily.

**Pets**

Animals can carry diseases. They may put you at greater risk for infection while your immune system is recovering. You can have a pet in your home and touch it, but it is best that you do not have close physical contact. Do not touch the animal’s saliva or feces. Be sure to protect yourself from bites or scratches. Do not handle or care for birds, lizards, snakes, turtles, hamsters, or other rodents while you are recovering. If you have an aquarium and you must clean it yourself, you must protect yourself by wearing gloves. If you have a cat or dog at home, follow the additional guidelines below until your doctor gives you other instructions.

- Be sure that your pet is up-to-date with immunizations and any booster shots.
- Have your veterinarian check your pet’s stool yearly for parasites.
- If you have a cat, get it tested each year for feline leukemia and toxoplasmosis.
- Have your pet treated for fleas. If your pet walks through wooded areas, have it screened for ticks every day during tick season (May to November). Discuss with your veterinarian the use of a flea and tick collar.
- Do not clean cat litter boxes or clean up after your dog. Have someone else do these things for you.
- Keep your pets indoors or on your own property whenever possible. This is to help prevent them from picking up diseases from other animals.
- Do not allow pets in your bed.

If you plan to get a pet after your transplant, it is best that you select a healthy dog or cat that is more than 1 year old. Have it spayed or neutered. Outside of your home, avoid close contact with animals in a farm or a petting zoo.
Family and visitors

You can have close physical contact with those in your immediate family. However, do not have close contact with someone who has a cold or any signs of being sick. Wear a mask if you must be in the same room with someone who is sick. Your family members and close friends should get a yearly flu shot.

You can have visitors, but limit them to small groups. Do not visit with anyone who has:

- A cold
- Chickenpox
- Recently been exposed to chickenpox
- Recently been exposed to herpes
- Recently been exposed to shingles
- Recently been exposed to any other type of virus or infection.
- Recently received a vaccine with a live virus such as varicella. There are very few of these, but if someone in your household needs one, his or her doctor should be told that you are immune suppressed and live in the same household.

Call your doctor immediately if you or any other family member is exposed to chickenpox, shingles, measles, or German measles (rubella).

Outside your home

Take regular walks outside, but avoid dirty areas and construction sites. Walking is an excellent way to regain your strength and endurance. However, during the first few months after your transplant, avoid the following places when they are crowded:

- Supermarkets
- Shopping malls
- Movie theaters
- Schools
• Restaurants

• Church/synagogue

You can go to these places at off-peak hours, when there are fewer people. Your doctor will tell you when some or all of these restrictions can be lifted.

You should avoid taking public transportation such as a train or bus for at least 3 months after your transplant. We understand you may need to take a taxi, car service, or other transportation such as Access-a-Ride to return for follow up visits. We recommended that you wear a mask and gloves when traveling by this means.

You can swim in the ocean after you regain your strength and are more active. Pay attention to alerts from the local health department. You can also swim in a private pool that isn’t crowded. Make sure that the pool is chlorinated. You cannot swim in lakes, rivers, or crowded pools until your immune system has recovered. **Do not swim if your CVC is still in place.**

### Bleeding

Platelets are blood cells that help form clots and control bleeding. When your platelet count is low, you are at risk for bleeding. Many patients are discharged with a low-platelet count. It can take weeks or months for your body to produce normal numbers of platelets. You may need to have platelet transfusions.

Signs of a low-platelet count include changes in the skin, bleeding, or both. Skin changes may include a lot of bruising or petechiae (pe-tea-key-eye). These are tiny, purplish-red spots on the skin that do not disappear when you press them. You may see them on your lower legs or inside ankles. If you see many petechiae, call your doctor. Other symptoms of a low-platelet count may include bleeding from your gums or nose.

If you have gone home with any of these symptoms and they increase in amount or frequency, call your doctor. If you have not had any of these symptoms and suddenly develop them, call your doctor. It may mean that there is a change in your platelet count. If you have an injury that causes bleeding, do not panic. Remain calm and follow the guidelines below for the type of injury:

- **Open wounds:** If you cut yourself, put a clean, dry gauze pad, towel, or cloth over the cut and press it firmly. Apply pressure until the bleeding stops. If the bleeding continues, elevate the wound. For example, raise your arm or prop up your feet. Apply ice to the wound and call your doctor.
• **Nosebleeds:** If you have a nosebleed, sit up and lean forward slightly. Do not tilt your head back. Squeeze the bridge of your nose firmly between your thumb and forefinger for at least 10 minutes without letting go. If the bleeding persists, continue to squeeze your nose. Apply a small bag of ice to the bridge of your nose until the bleeding stops. If the bleeding continues longer than 30 minutes, call your doctor.

• **Accidents:** If you are in an accident, you may need blood or blood products. They should be irradiated to 3,000 rads. Wear your MedicAlert jewelry at all times—it gives the doctor who will be treating you this information. This is to prevent transfused blood from causing GVHD. If you are admitted to another hospital, have the doctor call MSK immediately for guidelines on blood products.

If your platelet count is below 50,000, follow the guidelines below:

• Use an electric razor when shaving.

• Use a soft-bristle toothbrush or an oral irrigator such as a WaterPic® to prevent gum bleeding. Do not use dental floss.

• Do not take aspirin, products that have aspirin, and aspirin-like medications, such as such as ibuprofen (Advil®) or naproxen (Aleve®). For more information, see the section titled “Common Medications to Avoid.”

• Avoid blowing your nose forcefully.

• If you are constipated, call your doctor. You may need more fiber in your diet or a stool softener.

• Avoid activities or sports that can cause injury. If you have any questions or concerns about this, discuss it with your doctor.

**Resuming your activities**

**Daily activities**

The time it takes to recover after a transplant varies. Most people find that it takes about 3 months, while others may need more or less time. The time after your transplant is a time of cell recovery and growth. The cells in your mouth, stomach, intestine, hair, and muscles will all regrow. This requires calories and energy. You may feel more tired than you expected. Remember, this fatigue and weakness are not unusual. Each week, you should regain more of your strength. Around the third month after your transplant, your hair will start growing more quickly. You may feel well enough to start resuming your usual level of activity. From this point on, you will probably feel progressively better. For most people,
however, the first 2 to 3 months to 1 year after transplant remain a time of recovery.

Exercise

Most people find it takes time to regain their strength. It may be helpful to follow a regular exercise plan. When you begin to exercise, start with easy exercises. Your physical therapist can help you decide what type of exercise is right for you. As you feel ready, ask your doctor how to increase your exercise. Do not play contact sports or ski until your platelet count is over 100,000.

Hobbies

Some hobbies, such as woodworking, painting, and model building, use products that can be toxic. Always work in a room with plenty of fresh air. Keep the windows open. Use nontoxic paints and glue. If you have questions or concerns about resuming any of your hobbies, ask your doctor.

Returning to school or work

The earliest you can return to school or work is about 4 months from the time of your transplant. This time frame can vary from person to person and depends many factors. Some people may feel ready to return right away, while others feel concerned after being away for so long. It may help to begin slowly. For example, start with a schedule of half days or 3 days a week. Most people tell us that thinking about returning is almost harder than the actual event.

Making the transition back to your usual lifestyle can be difficult. Some patients have talked about feelings related to changes in their appearance. Hair loss, for example, is hard for many people. Others have trouble concentrating or maintaining their attention span. Many cannot keep up their former pace. Your transplant team is here to talk with you about going back to school or work. You can speak to a social worker, nurse, psychiatrist, or your doctor. We can work with you to find ways to ease your transition.

Traveling

For the first 3 months after your transplant, avoid traveling outside of the greater New York City area.

If you plan to travel by plane, speak with your transplant team. You must have a high enough platelet count to safely travel by plane.
If you plan to travel out of the country during the first 2 years after your transplant, talk with your transplant team. They may recommend that you see an expert in travel medicine to reduce your risk of infection while abroad, depending on your destination.
Sexual health

Before you go home, ask your doctor about resuming sexual activity. It is important for you and your partner to have answers to your questions. If new questions come up, you can discuss them during your follow-up visits.

Protecting yourself during sexual activity

Until your doctor tells you that your blood counts and immune system have recovered, follow these precautions:

- Avoid sex that involves penetration or contact with mucous membranes while your blood counts are low (a platelet count less than 50,000). This includes vaginal, oral, and anal sex or inserting fingers, vibrators, or other sex toys into your vagina or anus.

- Use latex condoms each time you have vaginal, oral, or anal sex.

- Use a barrier device (condoms or dental dams) any time your partner’s vaginal secretions or semen could enter your mouth.

- Abstain from any sexual activity that could expose your mouth to feces.

- Avoid sex that involves contact with mucous membranes if a genital infection is suspected or present in either you or your partner.

- Hugging, cuddling, gentle touching, and kissing skin are other ways you can be intimate with your partner during this time.

For additional information about being sexually active during and after treatment, ask your nurse for the following resources:

*Sexual Activity During Cancer Treatment: Information for Women*

*Sexual Activity During Cancer Treatment: Information for Men*

*Sexual Health and Intimacy*

The American Cancer Society publishes 2 well-written resources on sexuality following cancer treatment. They are available for free from your local American Cancer Society or on the ACS website at the links below:
Information for women

After your transplant, you may have:

- Fewer menstrual periods
- No menstrual periods
- Vaginal dryness and discomfort

Vaginal moisturizers are nonhormonal, over-the-counter products that help relieve vaginal dryness and discomfort. They are available in most drug stores or on the Internet. Examples are vitamin E liquid capsules, Replens®, Hyalo GYN®, and K-Y® Brand LIQUIBEADS™.

Vaginal lubricants usually come in a liquid or gel form. They are used to supplement a woman’s own lubrication and minimize dryness and pain during sexual activity. Use these lubricants to make sexual intercourse more comfortable and pleasurable. Examples are Astroglide®, K-Y® Jelly, and Pjur® Woman Bodyglide (a silicone-based lubricant). For more information, ask your nurse for the resource Vaginal Health, or go to: www.mskcc.org/cancer-care/patient-education/resources/vaginal-health.

Depending on your treatment, the function of your ovaries may change. This can result in decreased estrogen levels. Your doctor may recommend that you take estrogen supplements after your transplant.

If you need any help or support with these issues, contact the Female Sexual Medicine and Women’s Health Program at 646-888-5076.

Information for men

Some men experience decreased sexual desire after their transplant. This could have an impact on your relationship. However, as you regain your strength and increase your activities, this too will change.

Some men also experience erectile dysfunction (ED) after their transplant. ED can be treated with medication, including sildenafil citrate (Viagra®) or tadalafil (Cialis®). There are many other ways to treat ED. Your doctor can refer you to a specialist in our Male Sexual and Reproductive Medicine Program.
Drinking alcohol and using tobacco

After your transplant, your organs need time to recover. Alcohol can harm your liver and recovering bone marrow. This harm can be worse if you are taking medications that can affect your liver. Do not drink alcohol until your doctor tells you it is safe.

Never smoke:

- Cigarettes
- Cigars
- Marijuana
- Other tobacco products

Doing so can lead to a serious lung infection. It can also increase your risk of a second cancer. If you need help quitting, contact the MSK Tobacco Treatment Program at 212-610-0507, or go to: www.mskcc.org/cancer-care/counseling-support/tobacco-treatment

Follow-up care

Your follow-up visits will be scheduled before you are discharged. In general, you will be seen at least 1 to 2 times a week for the first 3 months after your transplant. After that, your appointments will be spaced further apart as long as you are doing well. Some patients find it helpful to bring a list of questions that may have come up since the last visit.

When you come to the clinic for your follow-up visits, always wear a surgical mask. Bring a list of all the medications you are taking and the dosages of each one. Make a list of any medications that need to be refilled. If you are going to run out of any medications before your follow-up visit, tell your doctor before your appointment. You will be given prescriptions during your visit to be filled either at MSK or your local pharmacy.

You will have blood tests to check your blood counts, electrolyte levels, and liver and kidney function. Bone marrow aspirations will be done every few months. They are usually done at 1, 3, 6, 12, and 24 months after transplant. If needed, your bone marrow may be checked more often or for a longer time after your transplant. Bone marrow tests tell us about the health and growth of your marrow.

If you had a transplant for acute leukemia, you may need to have lumbar punctures (spinal taps). This is especially true for patients who have had, or are at high risk for having, leukemia in the spinal fluid. A lumbar puncture allows
your doctor to give you more chemotherapy in your spinal fluid after your transplant. It can also be given through an Ommaya reservoir, if you have one.

You may need to have intravenous treatments, including antibiotics and blood transfusions. If so, your doctor or nurse will tell you how long and how often you will need them. These appointments will usually be scheduled at the same time as your follow-up visits.

At some point after your transplant, you may be referred to our survivorship nurse practitioner clinic. A survivorship nurse practitioner is part of the transplant team and works closely with your doctors and nurses to help with your recovery. This nurse practitioner will also communicate directly with your primary care provider so that information about your transplant is included in your overall healthcare.

**Dental care**

After you have recovered from your transplant, go to your local dentist for routine checks. If you need extensive dental work, you may wish to have your local dentist call a dentist at MSK at 212-639-7644 before treating you. Your transplant doctor will tell you when it’s safe to resume all dental care with your dentist.

Tell your doctor or dentist if you have:

- Taken the medications pamidromate (Aredia®) or zoledronic acid (Zometa®)
- Jaw tightness
- Toothaches
- Discoloration at your gum line or receding gums

**Common medications to avoid**

Do not take aspirin, any medications containing aspirin, and all other nonsteroidal anti-inflammatory drugs (NSAIDs) until your doctor gives you other instructions. For a list of these medications, ask your nurse for the resource *Common Medications Containing Aspirin and Other Nonsteroidal Anti-inflammatory Drugs (NSAIDs)* or go to: [www.mskcc.org/cancer-care/patient-education/resources/common-medications-containing-aspirin-and-other-nonsteroidal-anti-inflammatory-drugs-nsa](http://www.mskcc.org/cancer-care/patient-education/resources/common-medications-containing-aspirin-and-other-nonsteroidal-anti-inflammatory-drugs-nsa)

Check the label of any over-the-counter medications that you are thinking of taking to be sure that they do not contain ingredients you should avoid. If you are not sure about whether or not a specific medication is safe to take, ask your
transplant team. Do not take any herbal supplements or home remedies without talking to your transplant team first.
Phase 5: Late Convalescence

Long-term complications

As mentioned previously, there is a possibility of organ complications after transplant. We have discussed issues that may come up with your kidneys, liver, heart, and lungs.

Additionally, there may be other organ systems that may be impacted, such as your endocrine system. Your endocrine system makes hormones. It may not return to normal after your transplant. You will have blood work and exams to check your hormone levels.

Some people develop hypothyroidism, or an underactive thyroid, after radiation therapy, or just as a part of aging. You will have blood tests to check for this side effect. If you develop it, you will need to take medication to supplement what your thyroid cannot make itself.

We are concerned not only with your recovery after your transplant, but also with any complications that may develop long term, and of course, your overall health and well-being.

You will be followed in our survivorship clinic after your transplant and will be monitored closely for any late side effects you may experience. Some of the testing you had done as part of your pretransplant evaluation will be repeated, including an EKG, echocardiogram, and pulmonary function tests. We will monitor you for any thyroid dysfunction, evidence of a hormonal deficiency, and any sign of osteoporosis. Health issues such as thyroid dysfunction or bone loss can develop in any person, even if they have not had a transplant, but we want to monitor you closely and keep you well.

Other potential (uncommon) complications

Graft failure or rejection

Transplanted stem cells sometimes do not grow successfully inside the body. This is called graft failure. Graft rejection means that your immune system has rejected your new stem cells. You will receive treatments before your transplant to prevent this from happening.

The risk of graft rejection lasts about 2 to 4 weeks after a transplant. Occasionally, graft failure can happen at a later time after a transplant. If this happens, one option may be to get more stem cells from your donor, if they are available. This is called a “boost.” Your doctor will discuss treatment options with you if this occurs.
Relapse

A concern for many patients is that their cancer will return. Your risk is higher if you had your transplant when you were in an advanced stage of disease or you were not in remission. Your doctor will follow you closely to watch for any sign of relapse.

Continued follow-up care

Immunizations

After your transplant, you will lose the protection from the vaccines you received as a child. All transplant patients receive childhood vaccines once their immune system has recovered. This usually happens about 1 year after the transplant.

Once it is safe for you to receive vaccines, this will be coordinated by your transplant team. The vaccines can be given at MSK, or your NP can give your primary care doctor a list of the recommended vaccines. Please note, sometimes it is difficult for primary care doctors to get the vaccines, so you may need to receive them at MSK. You will receive only “killed” vaccines first, and if you respond to those, you will then receive “partially killed” vaccines, such as for measles and shingles.

Eye exams

You may develop cataracts if you received radiation therapy or high-dose steroids. If you develop any of the following symptoms, see an eye doctor:

- Vision that is cloudy, blurry, foggy, or filmy
- Changes in the way you see color
- Problems driving at night, such as glare from oncoming headlights
- Problems with glare during the day
- Double vision

You may only need a change in your eyeglass or contact lens prescription. Be sure to tell your optician or eye doctor what treatment you had. Try to wait until at least 3 months after your transplant before getting a new eyeglass or contact lens prescription, as your vision can change during the recovery process.
Glossary

This glossary explains terms that you may read in this guide, or hear from your healthcare team. If you hear a word or expression not listed here, don’t be afraid to ask your doctor or nurse.

**Absolute neutrophil count** - The percentage of polys and bands that are part of your total white blood count. If your ANC is less than 1,000 (or 1.0), you are at high risk for infection.

**Ablative therapy** *(ab-lay-tive)* - Treatment that removes or destroys the function of an organ or system. For example, high-dose chemotherapy and radiation before a stem cell transplant is considered ablative therapy because it wipes out your immune system.

**Afebrile** - Having no fever; normal temperature.

**Allogeneic stem cell transplant** – A type of transplant where stem cells are taken from a donor and given to a patient.

**Alopecia** *(al-o-pee-shuh)* – See hair loss.

**Ambulatory** - The ability to walk; not confined to bed.

**Anal** - Related to the anus.

**Analgesic** - A medication used to reduce pain.

**Anemia** *(uh-neem-ee-uh)* - Low red blood cell count, which can cause you to feel fatigued and have shortness of breath. Anemia can be caused by a variety of conditions and diseases.

**Anesthetic** - A medication or other substance that causes a loss of feeling or awareness. Local anesthetics cause a loss of feeling in 1 small area of the body. Regional anesthetics cause a loss of feeling in a part of the body, such as an arm or leg. General anesthetics cause a loss of feeling and a complete loss of awareness that feels like a very deep sleep.

**Antibiotic** – Medication used to kill organisms that cause disease. Since some cancer treatments can reduce your body’s ability to fight infection, antibiotics may be used to treat or prevent these infections.

**Antibody** - A protein produced by immune system cells and released into your blood. Antibodies defend against foreign substance such as bacteria. For example, if you get a tetanus vaccine, you will make a protein (antibody) which protects against tetanus, called a tetanus antibody. Each antibody works against a specific substance called an antigen.
**Anticoagulant** - Medication that reduces your blood’s ability to clot.

**Antiemetic (an-ti-eh-meh-tik)** - A medication that prevents or relieves nausea and vomiting.

**Antifungal** - A medication that kills fungi (organisms that cause infections). Patients undergoing treatment for cancer are especially vulnerable to fungal infections.

**Antigen (an-tuh-jen)** - A substance that causes your body’s immune system to react. This reaction often involves the production of antibodies. Cancer cells have certain antigens that can be found by laboratory tests. They are important in cancer diagnosis and in watching response to treatment.

**Antihistamine** - A medication used to relieve the symptoms of allergies, such as hives, stuffy nose, etc.

**Antimicrobial** - A substance that kills microorganisms such as bacteria or mold, or stops them from growing and causing disease.

**Antinausea** – See antiemetic.

**Apheresis** - A procedure in which blood is collected, part of the blood (such as platelets or white blood cells) is taken out, and the rest of the blood is returned to the donor. Also called pheresis.

**Aplastic anemia** – A disease in which the bone marrow is not able to make enough blood cells.

**Artery** - A vessel that carries oxygen-rich blood from your heart to your tissues. Blood is under pressure in arteries.

**Autologous** - Taken from an individual’s own tissues, cells, or DNA.

**Autologous stem cell transplant** – A type of transplant in which a person’s own stem cells are harvested, preserved, and returned to them.

**Axilla (ax-il-la)** - Your armpit.

**Bacteria (singular bacterium)** - Small germs that can cause infection.

**Benign** - Not malignant or cancerous.

**Biopsy (buy-op-see)** - The removal of a sample of tissue to see whether cancer cells are present and to determine an exact diagnosis. There are several kinds of biopsies.

**Blast cells** - Immature blood cells.
**Blood** - The body fluid that flows through all your vessels except the lymph vessels and performs a number of critical functions. Blood is composed of a liquid portion called plasma and 3 other components: red blood cells, white blood cells, and platelets.

**Blood chemistries** - Multiple chemical determinations of your blood content. These tests are helpful in assessing your kidney and liver function.

**Blood count** - A lab study to evaluate the amount of white blood cells, red blood cells, and platelets in your body.

**Blood culture** - A blood sample taken to find infection in the blood.

**Blood transfusion** - The infusion of red blood cells or platelets into your bloodstream to replace blood loss or to treat anemia.

**Blood typing and cross matching** - Making sure that the blood from a donor is compatible with yours before a blood transfusion. Blood cells contain factors that are not the same in all people. Before a transfusion can be given, blood samples from you and the donor are typed, or classified, according to which of these factors are present. The 4 principal red blood cell types or groups are A, B, AB, or O. Other factors such as Rh factor must also be checked.

**Bone marrow** - The spongy material in the center of bones where blood cells are made.

**Bone marrow aspiration and biopsy** - A procedure in which a needle is placed into the cavity of a bone, usually the hip or breast bone. A small amount of bone marrow is removed and examined under a microscope.

**Bowel** - Pertaining to your intestines.

**Bowel movement** - Movement of feces through the bowel and out the anus. Also called defecation.

**Brain scan** - An imaging method used to find anything abnormal in the brain, including brain cancer and cancer that has spread to the brain from other places in the body. A radioactive substance is injected into a vein and pictures are taken to find any abnormalities.

**Breastbone** - The long, flat bone that forms the center front of your chest wall. Your breastbone is attached to your collarbone and your first 7 ribs. Also called the sternum.

**Capillaries** - Tiny blood vessels located throughout the tissues of your body. They connect your arteries with your veins. Substances pass through them to nourish your cells.

**Cardiac** - Pertaining to your heart.
**Cardiomyopathy** - Damage to the heart muscle affecting the way the heart pumps blood through the body.

**CAT scan or computed axial tomography** - A series of detailed pictures of areas inside the body taken from different angles. The pictures are created by a computer linked to an x-ray machine. Also called computed tomography scan, computerized axial tomography scan, computerized tomography, and CT scan.

**Cataracts** - A clouding of the lens of the eye that can result from radiation therapy.

**Catheter (cath-eh-tur)** - A thin, flexible tube through which fluids enter or leave the body; e.g., a tube to drain urine.

**Central venous catheter** - A thin, flexible tube that is inserted into a vein in the upper arm, thigh, neck, or below the collarbone. It is guided (threaded) into a large vein near the heart called the vena cava or into the right atrium of the heart. It is used for taking blood samples and giving liquids, blood transfusions, chemotherapy, and other medications. It avoids the need for repeated needle sticks.

**Chemotherapy** - Medications used to destroy cancer cells. Chemotherapy is often used with surgery or radiation to treat cancer.

**Chimerism studies** - A test that shows how much of the blood is from the patient and how much is from the donor.

**Clinical trials** - Human research studies that test new drugs or treatments and compare them to current, standard treatments. Before a new treatment is used on people, it is studied in the lab. If the lab studies suggest the treatment works, it is tested with people. These human studies are called clinical trials. Your doctor may suggest a clinical trial. Participation is voluntary.

**Clot** - To change from a liquid form into a solid or semi-solid; for example, when blood clots, it changes from a liquid to a semi-solid, helping to stop bleeding.

**Colon** - Your large intestine.

**Complementary therapy** - Therapies used in addition to conventional therapy. Some complementary therapies may help relieve certain symptoms of cancer, relieve side effects of conventional cancer therapy, or improve a patient’s sense of well-being.

**Complete blood count (CBC)** - A blood test to measure the type and number of blood cells. The values are expressed in percentages.

**Constipation** - Difficulty having a bowel movement.

**Contagious** - An illness that can be spread from one person to another. Cancer is not contagious.
**Creatinine clearance** - A test that compares the level of creatinine in urine with the level of creatinine in the blood. Creatinine is a breakdown product of creatine, which is an important part of muscle. The test helps provide information on kidney function.

**Culture** - A procedure using a sample of blood, urine, throat secretions, or other biological material. It determines the specific germ (bacteria, fungus, or virus) responsible for an infection. Cultures also help determine which antibiotics may work best.

**Cytogenetics** - The process of analyzing the number and shape of cell chromosomes. The normal number of chromosomes is 46. Chromosomes may change when a patient develops cancer.

**Cytomegalovirus (CMV)** - A virus that can cause serious illness in people who have weak immune systems.

**Decongestant** - A medication that helps shrink mucous membranes and decrease the production of mucus.

**Dehydration** - Excessive loss of fluids from your body.

**Diagnosis** - Identifying a disease by its signs or symptoms and by using imaging procedures and laboratory findings.

**Diarrhea** - Frequent, loose, and watery stools.

**Dietitian** - A health professional with special training in nutrition who can help with dietary choices. Also called a nutritionist.

**Diuretic** - Substance that increases the elimination of water and salts (urine) from your body.

**Dizziness** - A sensation of instability and sometimes a feeling that you are about to fall.

**Donor leukocyte infusion** - A transfusion of whole blood or isolated lymphocytes that contain a calculated dose of T lymphocytes. This is sometimes given to treat a recurrence of a patient’s original disease or for the treatment of certain viral infections.

**Dose** - The amount of medication taken, or radiation given, at one time.

**Dysphagia** - Difficulty swallowing.

**Dyspnea** - Shortness of breath.
**Echocardiogram (ultrasound cardiography)** - A method of obtaining a graphic picture of the internal structure, position, and motion of your heart. It is done by using sound waves directed through your chest.

**Edema** - Build up of fluid within the tissues; swelling.

**Electrocardiogram (EKG)** - A method of evaluating your heart’s rhythm and muscle function by measuring electrical impulses.

**Electrolytes** - A general term for the many minerals needed to provide the proper setting for the cells of your body. Common electrolytes include calcium, sodium, potassium, and chloride.

**Emesis** - To vomit.

**Engraftment** - When stem cells infused into the body start to fix in place, grow, and make new blood cells.

**Epstein-Barr virus (EBV)** - The virus that causes mononucleosis (also called “mono” or “kissing disease”). In patients whose immune system is not normal, it can cause an EBV-associated lymphoma. Symptoms include fever and swollen lymph nodes.

**Esophagitis** - An inflammation of the esophagus.

**Esophagus** - A tube that carries swallowed food to your stomach.

**Excision** - Surgical removal of tissue.

**Expectorant** - Medication that makes mucus in your respiratory tract thinner and easier to cough out.

**Febrile** - Fever; elevated body temperature.

**Fertility preservation** - A type of procedure used to help preserve a person’s ability to have children. A fertility preservation procedure is done before a medical treatment that may cause infertility, such as radiation therapy or chemotherapy. Examples of fertility preservation procedures include sperm banking, egg freezing, in vitro fertilization with embryo freezing, and certain types of surgery for cervical and ovarian cancer.

**Filgrastim** - A medication used to increase the number of white blood cells in people who are receiving chemotherapy. Also called Neulasta® or pegfilgrastim.

**Fractionated radiation** - The total dose of a radiation treatment divided over several days.

**Fungi (singular fungus)** - A group of microorganisms larger than either bacteria or viruses. They can cause a serious infection when your immune system is compromised.
**Gamma globulin** - A protein component of blood plasma. It contains antibodies that are helpful against certain infections.

**Gastroenterologist (gas-tro-en-ter-ol-o-jist)** - A doctor who specializes in diseases of the digestive (gastrointestinal) tract.

**Gastrointestinal tract/GI tract** - The digestive tract. It is made up of the organs and structures that process and prepare food to be used for energy, such as your stomach, small intestine, and large intestine.

**GCSF (granulocyte colony-stimulating factor)** - Medications that stimulate the production of neutrophils (a type of white blood cell). These include filgrastim (Neupogen®), pegfilgrastim (Neulasta®), and plerixafor (Mozobil®).

**General anesthetic** - A medication that puts you to sleep to prevent pain during a surgery.

**Genital** - Refers to the genitalia (external and internal sex organs and glands).

**Gland** - See lymph node.

**Graft** - New stem cells that are growing.

**Graft versus host disease (GVHD)** – A reaction of donor cells (graft) against the patient’s (host) body; can be short-term (acute) or long-term (chronic).

**Groin** - The area of your body where the legs join the abdomen.

**Growth factors** - A naturally occurring protein that causes cells to grow and divide. Too much growth factor production by some cancer cells helps them grow quickly. Other growth factors help normal cells recover from the side effects of chemotherapy.

**Hair loss** - This often occurs as a result of chemotherapy or from radiation therapy to the head. In most cases, the hair grows back after treatment ends.

**Harvest** - The removal of bone marrow or peripheral blood stem cells to be used for a hematopoietic blood stem cell transplant (HCT).

**Hematocrit** - The percentage of the volume of whole blood that is made up of red blood cells.

**Hematologist (hem-uh-tahl-o-jist)** - A doctor who specializes in diseases of the blood and blood-forming tissues.

**Hematology** - The study of blood and blood-forming organs.
Hematology/oncology (HEME/ONC) - A branch of medical science that treats disorders of the blood, blood-forming tissues, and tumor cells.

Hematoma (hem-uh-to-ma) - A collection of blood outside a blood vessel caused by a leak or an injury; a bruise.

Hematuria - Blood in the urine. Urine may be pink, red, or brown (cola colored).

Hemoglobin - The substance in red blood cells that carries oxygen.

Hemorrhage - A term for loss of blood from injury to the blood vessels or by a lack of certain blood elements, such as platelets.

Hemorrhagic cystitis - Bleeding into the bladder that causes bloody urine. It can be caused by certain viruses, as well as certain chemotherapy medications such as ifosfamide or cyclophosphamide.

Heparin - A medication that decreases the ability of blood to clot. It is often used to prevent clotting in central line catheters.

Hepatitis - An inflammation of the liver usually resulting in jaundice.

Herpes simplex - A virus that usually produces fluid-filled blisters on the skin and mucus membranes.

Herpes zoster - A virus that causes shingles, which are painful skin eruptions.

Hives - Itching welts caused by an allergic reaction.

HLA (human leukocyte antigens) - Proteins (antigens) that appear on white blood cells, as well as cells of almost all other tissues. By typing for HL-A antigens, donors and recipients of white blood cells, platelets, and organs can be “matched.” This helps to make sure the transfused and transplanted cells will survive.

Hospitalist - A doctor who specializes in the care of hospitalized patients.

Host - The person into whom stem cells have been infused.

Hydration - A reference to the amount of water in the body. You may be dehydrated, well hydrated, or excessively hydrated (edematous).

Hyperglycemia - High blood sugar.

Hypertension - High blood pressure.

Hypocalcemia – Not enough calcium in the blood.
**Hypoglycemia** - Low blood sugar.

**Hypokalemia** - Not enough potassium in the blood.

**Hypotension** - Low blood pressure.

**Ileus** - Severe constipation.

**Iliac crest** - The top edge of your hip bone. Marrow is usually taken from it for a diagnosis of blood cell diseases.

**Immune reaction** - A reaction of normal tissues to substances recognized as “foreign” to the body.

**Immune system** - The system that defends the body against infection from bacteria and viruses. The immune system may also help the body fight some cancers.

**Immunity** - The state of your body’s defenses against an infection or possibly against a certain cancer.

**Immunizations** - Vaccines given to help your body resist disease.

**Immunosuppression (im-mune-no-suh-preh-shun)** - A state in which your immune system does not respond properly. This condition can be present at birth. It can also be caused by certain infections (such as human immunodeficiency virus or HIV), or by certain cancer therapies.

**Immunotherapy (im-mune-no-ther-uh-pee)** - Treatments that promote or support your immune system’s response to a disease such as cancer.

**Implantable port (such as Port-a-Cath®, Infuse-a-Port®, or Mediport®)** - A device that delivers fluids, medications, or blood directly into a vein. The entire device is implanted under the skin during surgery and can be used for an extended period of time.

**Incubation period** - The period between exposure to a germ and the first sign of illness (e.g., chicken pox, from 8 to 21 days).

**Indwelling catheter (such as Broviac® or Hickman®)** - A central line surgically placed (usually in the chest) and into a large vein in your neck. It is used to give medications, fluids, and blood products. May also be used to draw blood for testing.

**Infection** - Invasion of the body by disease-producing organisms.

**Infectious disease** - A disease caused by germs; one that can be passed from one person to another. Cancer is not an infectious disease.
**Infertility** - Not being able to produce children.

**Inflammation** - The triggering of local body defenses. It results in the outpouring of defensive cells ("polys") from the circulation system into the tissues. Frequently associated with pain and swelling.

**Informed consent** - A legal document that explains a course of treatment and the risks, benefits, and possible alternatives. The process by which patients agree to treatment. If you are under 18 years of age, your parents or legal guardian must also sign this form.

**Infusions** - The introduction of a fluid into a vein.

**Injections** - Injections may be given intramuscularly (into a muscle), intravenously (into a vein), subcutaneously (just under the skin), or intrathecally (into the spinal column space).

**Interstitial pneumonia** - Inflammation of the lung caused by a virus or due to damage from chemotherapy and/or radiation therapy.

**Intrathecal (IT)** - Within the spinal column. IT medication is given directly into the spinal column.

**Intravenous (IV)** - The administration of a medication or fluid directly into the vein.

**Investigational drugs** - Medications being studied by clinical investigation.

**Irradiated** - Treated with radiation.

**Irradiated blood products** - Blood products that have been exposed to a radiation source to inactivate the lymphocytes that could otherwise cause graft versus host disease.

**Jaundice** - A yellow color of the skin and white portion of the eyes. It is from a buildup of bilirubin, which is a broken down product of hemoglobin. It is a sign of liver disease or a blockage of the major bile ducts.

**Kidney** - The main organ involved in the filtering of certain bodily wastes. Also maintains the proper mineral and water balance.

**Laxative** - A substance that encourages bowel movements.

**Lesion (lee-zhun)** - A change in body tissue; sometimes used as another word for tumor.
**Leukapheresis** - The process of filtering white cells, leukocytes, or “polys” from the blood of the patient or a healthy donor. These cells may be given to you if you have a severe infection and a shortage of “polys.”

**Leukemia (loo-key-me-uh)** - Cancer of the blood or blood-forming organs. If you have leukemia, you may have a noticeable increase in white blood cells (leukocytes).

**Leukocytes** - White blood cells that play a major role in the body’s defense system. The cells are divided into granulocytes, lymphocytes, and monocytes.

**Leukocytosis (loo-ko-sigh-toe-sis)** - Having more than the usual number of white blood cells.

**Leukopenia** - Decrease in white blood cell count.

**Liver** - An organ in your body that performs many complex functions. These include processes related to digestion, production of certain proteins, and elimination of many of the body’s waste products.

**Local anesthetic** - A medication given by injection into a part of your body to prevent pain in the area without putting you to sleep.

**Long-term survivor** – A person who is 5 years from the last sign of disease and at least 2 years off therapy.

**Low microbial diet** - A diet designed to minimize bacteria, viruses, yeast, and molds in food and beverages.

**Lubricant** - An oily or slippery substance.

**Lumbar puncture (LP)/spinal tap** - A procedure in which a thin needle is placed in your spinal canal. It is done to remove a small amount of spinal fluid or to give medication through the central nervous system.

**Lumen** - A tube that forms part of a catheter. Many catheters exit the body and separate into several lumens.

**Lymph nodes/glands** - An important part of your body in the defense against infections.

**Lymphatic system** - The tissues and organs that make and store lymphocytes (cells that fight infection) and the channels that carry the lymph fluid. It includes the lymph nodes, spleen, thymus, and bone marrow. The lymphatic system is an important part of your body’s immune system. Invasive cancers sometimes enter your lymphatic vessels (channels) and spread to your lymph nodes.
**Lymphocytes** - A type of white blood cell that helps your body fight infection. There are 3 main types of lymphocytes: (1) T cells that help fight infections such as viruses and fungi; (2) B cells that make proteins called antibodies that help fight infection. For example, if you receive a vaccination against tetanus, you make a protein (antibody) against tetanus; (3) natural killer cells that help fight viruses and other germs. They are sometimes given to help fight cancer.

**Lymphocytosis (limf-o-sigh-toe-sis)** - Having too many lymphocytes.

**Lymphoma (lim-foam-uh)** - Cancer of the lymphatic system, a network of thin vessels and nodes throughout the body. Lymphoma involves a type of white blood cell called a lymphocyte. The 2 main types of lymphoma are Hodgkin’s disease and non-Hodgkin’s lymphoma. The treatment methods for these 2 types of lymphomas are very different.

**Magnetic resonance imaging (MRI)** - A method of taking pictures of the inside of the body. Instead of using x-rays, MRI uses a powerful magnet and transmits radio waves through the body. The images appear on a computer screen, as well as on film. Like x-rays, the procedure is painless. However, you may find it uncomfortable to be inside the MRI machine.

**Malignant tumor (muh-ling-nant)** - A mass of cancer cells that may invade surrounding tissues or spread to distant areas of the body.

**Metabolism** - A general term for the many chemical processes needed for your body to live.

**Metastasis (meh-tas-teh-sis)** - The spread of cancer cells to distant areas of the body by way of the lymph system or bloodstream.

**Microorganism** - A general name for any small living organism, such as bacteria, viruses, and fungi.

**Milliliter (mL)** - A unit of measure. One thousandths of a liter. There are 30 mL in 1 ounce, 15 mL in 1 tablespoon, and 5 mL in 1 teaspoon.

**Mobilization** - Taking medication to stimulate the growth of stem cells and move them into the bloodstream.

**Monoclonal antibodies** - Antibodies made in a laboratory to target substances called antigens. They can be attached to chemotherapy medications or radioactive substances. Monoclonal antibodies are being studied to see if they can seek out antigens unique to cancer cells and deliver treatment directly to the cancer. This would kill the cancer cells without harming healthy tissue. Monoclonal antibodies are also used in other ways, for example, to help find and classify cancer cells.
**Mucositis** - Inflammation of the mucous membrane (inside the mouth). It can cause painful mouth sores.

**Mucous membrane** - A lining of the internal surface of the body that produces mucus.

**Myeloma** - Cancer of blood plasma cells, a type of white blood cell.

**Narcotic** - A medication that relieves pain and can make you sleepy.

**Nephrologist (nef-rol-o-jist)** - A doctor who specializes in diseases of the kidneys.

**Neupogen®** - A brand of granulocyte colony-stimulating factor (GCSF)—a medication that stimulates the production of neutrophils (a type of white blood cell). Also called filgrastim.

**Neurology** - The branch of medical science that deals with the nervous system.

**Neutropenia** - A condition in which there is a lower than normal number of neutrophils (a type of white blood cell) in the body. While you are neutropenic, you will need to take precautions to prevent infection.

**Neutrophils (new-trow-fils)** - White blood cells that fight bacterial infection.

**Non-Hodgkin’s lymphoma** - Cancer of the lymphatic system. The difference between non-Hodgkin’s lymphoma and Hodgkin’s lymphoma is a type of cell called the Reed-Sternberg cell. This cell is only present in Hodgkin’s lymphoma. The treatment methods for Hodgkin’s and non-Hodgkin’s lymphomas are very different.

**NPO** - Abbreviation for “nothing by mouth.”

**Nuclear medicine scan** - A method for finding diseases of internal organs, such as the brain, liver, or bone. Small amounts of a radioactive substance (isotope) are injected into the bloodstream. The isotope collects in certain organs. A special camera is used to create an image of the organ and detect areas of disease.

**Nurse practitioner (NP)** - A registered nurse with a master’s or doctoral degree. Licensed nurse practitioners diagnose and manage illness and disease and can prescribe medication. They work closely with your doctor.

**Oncologist (on-call-o-jist)** - A doctor with special training in the diagnosis and treatment of cancer.

**Oncology (on-call-o-jee)** - The branch of medicine concerned with the diagnosis and treatment of cancer.
Ophthalmologist (of-thuh-mal-o-jist) - A medical doctor who specializes in diseases of the eye.

Orally - By mouth; e.g., a medication to be taken orally is one that is swallowed.

Organ - Several tissues grouped together to perform one or more functions in the body.

Osteoporosis - Brittle bones due to the loss of calcium.

Outpatient - A patient who visits a healthcare facility for diagnosis or treatment without spending the night.

Packed red blood cell transfusion (PRBC) - A transfusion of red blood cells without the serum.

Palate - The roof of the mouth.

Pancreas - A large gland in the upper part of your abdomen. It secretes enzymes (chemicals) into your intestines for the digestion of food. It makes insulin, which is secreted into your bloodstream.

Pancreatitis - Inflammation (swelling) of your pancreas.

Pancytopenia - The decrease of all blood cells (red, white, and platelets).

Parotid gland - Salivary glands located at the side of your face in front of each ear. These glands become large if you have mumps. Total body irradiation may cause painful swelling of these glands, which is temporary.

Pathology - The branch of medicine involved in making diagnoses from the examination of tissues.

Pedicure - A beauty treatment in which toenails are trimmed/shaped and often polished or painted.

PET scan - A scan used to look at the organs and the way they function in the body. A small amount of radioactive sugar is injected into a vein, and a scanner is used to make detailed, computerized pictures of areas inside the body where the glucose is used. Because cancer cells often use more glucose than normal cells, the pictures can be used to find cancer cells in the body. Also called a positron emission tomography scan.

Petechiae - Tiny, localized hemorrhages from small blood vessels just below the surface of the skin. They are often caused by a low platelet count. They clear up as the platelet count increases.

Pharyngitis - Inflammation of the throat; sore throat.
**Pharynx** - Your throat.

**Pheresis/apheresis** - A special method of collecting blood when only one part of the blood is needed.

**Phlebitis** - Inflammation of a vein. Signs include pain, swelling, and tenderness in an area. If a superficial vein is involved, the phlebitis can be felt as a cord-like thickening along the vein.

**Physician assistant (PA)** - A licensed medical professional who practices medicine under physician supervision. Physician assistants diagnose and manage illness and prescribe medications.

**Plasma** - The liquid portion of the blood in which blood cells are suspended. It contains many proteins and minerals necessary for normal body function.

**Platelet** - A part of the blood that helps repair (plug) holes in blood vessels after an injury. If you have a low platelet count, you are at risk for bleeding. Chemotherapy can cause a drop in the platelet count. This is called thrombocytopenia.

**Pneumonia** - Infection of the lung.

**Polys (neutrophils or granulocytes)** - The group of white cells that helps to resist bacterial infection. A “poly” count of less than 1,000 means that you have an increased risk of infection.

**Postop** - After surgery.

**Potassium** - An element found normally in your blood; it is important for heart and muscle function.

**Preop** - Before surgery.

**Prognosis (prog-no-sis)** - A prediction of the course of disease; the outlook for a cure. A prognosis is based on the average result in many cases. It may not accurately predict your outcome, since the course can vary from patient to patient.

**Prophylactic** - Treatment designed to prevent a disease or a complication that has not yet become clear.

**Protocol (pro-teh-call)** - A formal outline or plan, such as a description of what treatments you will receive and exactly when each should be given.

**Pulmonary** - Concerns or affects your lungs.

**Pulmonary fibrosis** - Thickened tissue in your lungs that causes coughing, difficulty breathing, and x-ray changes.
**Pulmonary function tests (PFTs)** - Special tests that are designed to evaluate the function of your lungs.

**Radiation oncologist** - A doctor who specializes in using radiation to treat cancer.

**Radiation recall** - Inflammation (swelling) of exposed skin and organs in areas of radiation therapy.

**Radiation therapy** - Treatment with high-energy x-rays to kill cancer cells or shrink tumors. The radiation can come from outside of the body (external radiation) or from radioactive materials placed directly in the tumor (internal or implant radiation). Radiation therapy can be used to reduce the size of a tumor before surgery or to destroy any remaining cancer cells after surgery. Or, in some cases, it may be the main treatment.

**Rectal** - By or having to do with the rectum. The rectum is the last several inches of your large intestine closest to your anus.

**Rectum** - The last part of your large intestine.

**Red blood cell** - A cell that carries oxygen to all parts of the body. Also called erythrocyte and RBC.

**Reinduction** - To start over, i.e., a new treatment or protocol.

**Rejection** - The body’s inability to accept transplanted stem cells.

**Relapse** - Return of cancer after a disease-free period.

**Remission** - When the signs and symptoms of cancer fully or partly disappear. The period during which a disease is under control. A remission may not be a cure.

**Renal** - Pertaining to your kidneys.

**Resistance** - Your ability to fight off and avoid disease.

**Respiration** - The process of breathing.

**Respiratory tract** - All parts of your body used for breathing.

**Scan** - A study using either x-rays or radioactive isotopes to create images of internal body organs.

**Sedative** - A medication given to make you drowsy or sleepy.
**Sedimentation rate (SED)** - The change in speed of the red blood cell count expressed in millimeters per hour. A SED rate that is over 25 or is increasing may indicate infection.

**Septicemia/sepsis** - A very serious bacterial or fungal blood infection. It usually spreads from another site of infection such as skin, bowel, or urinary tract. It can cause high fever, shaking chills, and heavy sweating. It is more likely to occur in patients with a very low white blood cell count.

**Shingles (herpes zoster)** - A viral infection of the nerve endings in the skin. It can cause blisters, crusting, and severe pain along the nerve. It is the same virus that causes chicken pox. Children who have not had chicken pox may get it from contact with someone who has shingles.

**Simulation** – A procedure that is done to plan radiation therapy; measurements and x-rays are taken and actual radiation treatment fields are determined.

**Sinuses** - Hollow spaces in the bones of your head.

**Spinal cord** - The cord or nerve tissue that runs through the center of your spinal column. It connects your brain to other parts of your body.

**Spleen** - An organ that filters your blood. It removes debris and old or dying cells from circulation. It also removes bacteria from the blood during the early stages of severe infection. It often becomes enlarged in those with leukemia and certain other diseases.

**Stem cells** - Primitive blood-forming cells in the bone marrow that give rise to white blood cells, red blood cells, and platelets.

**Sternum** - The long, flat bone that forms the center front of your chest wall. Your breastbone is attached to the collarbone and your first 7 ribs. Also called the breastbone.

**Stomatitis** - Mouth sores; this can be a side effect of some kinds of chemotherapy.

**Suppository (rectal or vaginal)** - A medication prepared for insertion into the anus or vagina, where it is generally absorbed into the bloodstream.

**Susceptible** - Tendency to develop a disease if exposed to it; not having immunity.

**Symptom** – The result of a change in the body or its function that indicates a potential problem or issue.

**T cell-depleted blood stem cell transplant** - A type of transplant in which T cells are removed in a laboratory after donor stem cells are obtained. This process reduces the likelihood of graft versus host disease that is caused by the donor's T cells.
**T cell or T lymphocyte** - A type of white blood cell or lymphocyte that plays a major role in the body’s defense against viral and fungal infections.

**Thrombocytopenia (throm-bo-sigh-toe-pee-en-e-uh)** - A decrease in the number of platelets in your blood.

**Thrombophlebitis** - An inflammation of a vein.

**Tinnitus** - Ringing in your ears.

**Tissue** - A collection of cells similar in structure and function.

**Tissue typing (human leukocyte antigen, HLA)** - A special test of white blood cells to check the genetic match between a donor and the patient.

**Total body irradiation (TBI)** - Radiation treatments given to the whole body.

**Total lymphoid irradiation (TLI)** - Radiation treatments given to the parts of the body where most of the lymphatic system is located.

**Toxicity** - A word used to describe the side effects caused by a medication.

**Toxins** - Poisonous substances; may be produced by germs.

**Trachea** - Your windpipe.

**Transfusion** - A procedure in which a person is given an infusion of whole blood or parts of blood, such as red blood cells or platelets. The blood may be donated by another person or it may have been taken from the patient earlier and stored until needed. Also called a blood transfusion.

**Transfusion reaction** - An allergic response to blood products. Symptoms include hives, chills, or headaches ranging from mild to severe.

**Tumor** - An abnormal lump or mass of tissue. Tumors can be benign (not cancerous) or malignant (cancerous).

**Ulcer** - A wearing away of normal tissues. It can be from corrosive chemicals (e.g., acids), infection, impaired circulation, or cancer. It can cause bleeding.

**Ultrasound** - An imaging method that uses sound waves to outline a part of your body. It can be done to any part of the body. A tumor or infection can be monitored this way.

**Unpasteurized** - Relating to perishable food that has not been pasteurized (heat-treated to kill potentially harmful microbes).

**Urinalysis** - The process by which your urine is examined for various factors.
Urinary tract - The organs that have to do with the production and elimination of urine, i.e., kidneys, bladder, ureters, and urethra.

Varicella - Chicken pox, an infection caused by a virus. Children with cancer may have a problem with this infection if they have not had it before.

Vein - A blood vessel carrying blood from your tissues towards your heart and lungs. Veins are used to draw blood samples and administer IV liquids because blood in veins is not under pressure.

Veno-occlusive disease (VOD) - Also referred to as sinusoidal obstruction syndrome (SOS); a disease caused by a blockage in the flow of blood in the liver. It results in weight gain, an enlarged liver, and yellowing of the skin. It can cause mild, moderate, or severe liver damage or death.

Vertigo - Dizziness, especially the feeling that your surroundings are swirling.

Virus - A small germ that may cause infection, such as measles, mumps, chicken pox, and the common cold.

White blood cells (WBC) – The cells in your blood that are most important in fighting infection. Examples are neutrophils, or “polys”, and lymphocytes, or “lymphs.”

X-ray - A form of radiation that can be used at low levels to produce an image of the body on film. It can be used at high levels to destroy cancer cells.

Zoster - varicella zoster - See shingles.
Additional Resources

- Caring for Your Central Venous Catheter
- Common Medications Containing Aspirin and Other Nonsteroidal Anti-inflammatory Drugs (NSAIDs)
- Frequently Asked Questions about Blood Transfusions
- Hair Loss and Your Cancer Treatment
- Hand Hygiene and Preventing Infection
- Instructions for Interventional Radiology Procedures
- Low-Microbial Diet
- MedicAlert® Foundation Brochure
- Sexual Activity During Cancer Treatment: Information for Men
- Sexual Activity During Cancer Treatment: Information for Women
- Sexual Health and Intimacy
- Total Body Irradiation
Caring for Your Central Venous Catheter

This information will teach you about the placement and care of your central venous catheter (CVC).

There are many different types of catheters (thin, flexible tubes) and your doctor will decide which kind is best for you.

All devices have 1 central catheter that enters your body. On the outside, the catheter may divide into 1, 2, or 3 lumens (see Figure 1). Each lumen has a clamp, a needleless connector, and a disinfection cap on the end.

A CVC can be used to take blood samples, as well as give:

- Fluids
- Chemotherapy and other medications
- Blood transfusions
- Intravenous (IV) nutrition

The advantages of having a catheter are:

- You won’t need as many needle sticks.
- It can stay in your body for as long as a few years and be removed when it is no longer needed.

Your nurse will teach you how to care for your catheter. You can have a caregiver, family member, or friend learn with you. You will learn how to use sterile technique to change your dressing. This will minimize your risk for infection. You will also learn how to change your needleless connectors and disinfection caps (SwabCaps®), as well as flush your catheter using a syringe with normal saline solution. You must flush your catheter to keep blood clots from forming inside of it. Once a week, you will change the needleless connectors, disinfection caps, and your dressing, as well as flush your catheter. You may want to mark your calendar to help you remember to do so. After you go home, use this information to help you remember the steps to care for your catheter.
Before Your Procedure

Ask about your medications

You may need to stop taking some of your medications before your procedure. Talk with your doctor about which medications are safe for you. We have included some common examples below.

- If you take medication to thin your blood, ask your doctor what to do. Some examples are aspirin, warfarin (Coumadin®), dalteparin (Fragmin®), heparin, tinzaparin (Innohep®), enoxaparin (Lovenox®), clopidogrel (Plavix®), cilostazol (Pletal®), prasugrel (Effient®), dabigatran (Pradaxa®), ribaroxaban (Xarelto®), apixaban (Eliquis®), and ticlodipine (Ticlid®). These medications can be used to treat blood clots or to prevent a heart attack or stroke.

- If you take insulin or other medications for diabetes, you may need to change the dose before your procedure. Ask the doctor who prescribes your diabetes medication what you should do the morning of your procedure.

- Please review the information in Common Medications Containing Aspirin and Other Nonsteroidal Anti-Inflammatory Drugs for examples of what not to take and what to take instead.

- Do not take vitamin E for 10 days before your procedure, or as directed by your doctor.

Arrange for someone to take you home

You must have someone 18 years or older take you home after your procedure. If you don’t have anyone, call one of the agencies below. They will provide someone to accompany you home, however there is usually a charge for this service and you will also need to provide transportation.

In New York:
  Partners in Care 888-735-8913
  Prime Care 212-944-0244

In New Jersey:
  Caring People 877-227-4649

Tell us if you’re sick

If you develop any illness (e.g., fever, cold, sore throat, or flu) before your procedure, please call a nurse in Interventional Radiology at 212-639-2236. A nurse is available Monday through Friday, 9:00 AM to 5:00 PM. After hours, during the weekend, and on holidays, call 212-639-2000 and ask for the Interventional Radiology fellow on call.

Note the time of your appointment

A staff member from the Interventional Radiology office will call you 2 business days before your procedure. He or she will tell you what time you should arrive at the hospital for your procedure. If you are scheduled for your procedure on a Monday, you will be called on the Thursday before. If you don’t receive a call by noon the business day before your procedure, please call 212-639-5051.

If you need to cancel your procedure for any reason, please call the doctor who scheduled it for you.
The Day of Your Procedure

Things to remember

- **Do not eat or drink anything after midnight the night before your procedure.** This includes water, gum, and hard candy.

- Take your medications the morning of your procedure as instructed by your doctor. Take them with a few sips of water.

- Do not apply cream or petroleum jelly (Vaseline®). You can use deodorant and light moisturizers.

- Do not wear eye makeup.

- Remove any jewelry, including body piercings.

- Leave all valuables, such as credit cards and jewelry, at home.

- If you wear contact lenses, if possible, wear your glasses instead. If you don’t have glasses, please bring a case for your contacts.

What to bring with you

- A list of the medications you take at home.

- Medications for breathing problems (such as inhalers), medications for chest pain, or both.

- A case for your glasses or contacts.

- Your Health Care Proxy form, if you have completed one.

- If you use a CPAP or BiPAP machine to sleep at night, please bring your machine with you, if possible. If you can’t bring your machine with you, we will give you one to use while you are in the hospital.

Where to go

- Memorial Hospital
  1275 York Avenue, New York, NY 10065

Parking at MSK is available in the garage on East 66th Street between York and First Avenues. To reach the garage, enter East 66th Street from York Avenue. The garage is located about a quarter of a block in from York Avenue, on the right-hand (north) side of the street. There is a pedestrian tunnel that you can walk through that connects the garage to the hospital. If you have questions about prices, call 212-639-2338.

There are also other garages located on East 69th Street between First and Second Avenues, East 67th Street between York and First Avenues, and East 65th Street between First and Second Avenues.

When you arrive at Memorial Hospital, take the M elevator to the 2nd floor. Enter through the glass doors and check in at the desk.
When you enter the building, check in at the reception desk and they will direct you to Interventional Radiology.

**What to expect**

Once you arrive at the hospital, doctors, nurses, and other staff members will ask you to state and spell your name and date of birth many times. This is for your safety. People with the same or similar names may be having procedures on the same day.

**During Your Procedure**

Two areas of your body will be numbed. A small incision (surgical cut) will be made at the base of your neck. A second small incision will be made on your chest, under your collarbone. The catheter will be inserted through the second incision, tunneled under your skin to the first incision, and threaded into your vein.

The incision at the base of your neck will be stitched closed. The stitches will be absorbed and will not need to be removed. Your catheter will be stitched to your skin at the point where it exits your body (exit site) so that it will stay in place (see Figure 1).

**After Your Procedure**

You may have some discomfort at your incision sites and along the CVC tunnel. Ask your nurse for medication to relieve your pain.

Your dressings need to be kept dry following your procedure. Your nurse will change your dressings 24 to 48 hours after your procedure. He or she will teach you how to do this.

Two days after your procedure, you can remove the dressing that covers the small incision at the base of your neck. You do not need to put a new dressing on this site. The strips of adhesive tape that cover this incision should be left in place until they start to peel off. This should happen about 3 to 5 days after your procedure.

Your catheter exit site will still need to be covered with a special dressing. This dressing prevents infection at this site. You will have stitches under your dressing. These stitches keep your catheter in place until the cuff on the catheter becomes anchored in the tunnel under your skin.

Your catheter will not interfere with your usual activities, such as household tasks, job responsibilities, and exercise. However, we suggest that you avoid contact sports, such as football and soccer, while your catheter is in place.

Prepare the following emergency kit and keep it with you at all times:

- 1 toothless clamp
- 1 dressing change kit
- Your doctor’s office and emergency telephone numbers

**Changing Your Dressing, Needleless Connectors, and Disinfection Caps**

- Do not change your dressing, needleless connectors, or disinfection caps in the bathroom after a shower. The steam from a shower can create a moist environment under your dressing and affect the adhesive. Make sure you change your dressing, needleless connectors, and disinfection caps on a clean, flat surface.
• You will see the folded *Map for Dressing Change: CVC* at the end of this resource. Use it to follow the step-by-step instructions for changing your dressing. This is when you will use sterile technique. You will not be able to touch the booklet then because that would break sterile technique. Open the map and spread it out where you can see it.

• You will use a Tegaderm CHG dressing to cover your exit site unless your doctor or nurse gives you another dressing to use. Change your dressing once a week, as long as it stays dry, intact, and clean. Change it on the day you change your needleless connectors and disinfection caps and flush your catheter. You may need to change it more often if it becomes moist, soiled, or peels away from the skin.

• If the gel pad on your Tegaderm CHG dressing becomes swollen, change your dressing. You can test the gel pad by applying pressure to it with your index (pointer) finger. If you see an indent, the gel pad is swollen and your dressing should be changed. This can happen if there is a lot of sweat under your dressing.

• If you have problems with your skin, such as irritability or sensitivity, your nurse may suggest a different type of dressing. In that case, you may need to change it more often than once a week. No matter which dressing you are using, always change it right away if it starts to come off or gets wet. Do not just put another dressing or more tape over it.

• For more information, you can watch *How to Change the Dressing, Needleless Connectors and Disinfection Caps on your Central Venous Catheter.*

### Changing Your Dressing

#### Supplies

- 1 dressing change kit
- An alternative dressing, if supplied by your nurse
- 1 needleless connector for each catheter lumen
- 1 disinfection cap for each lumen
- Extra alcohol pads
- Nonsterile gloves
- Paper tape
- A mirror that can stand up on a table (a makeup mirror works well)

#### Sterile procedure for changing your dressing

1. Prepare a clean area in which to work. **Remember not to change your dressing in the bathroom after a shower.**

2. Gather your supplies. **Wash your hands thoroughly with warm water and antibacterial soap or use hand sanitizer.**

3. Get into a comfortable position. Unpin the catheter from your clothing, if necessary. Open or remove your clothing to expose the catheter.

4. Check to make sure the catheter clamp(s) is (are) closed.

5. **Open the Map for Dressing Change: CVC instructions at the end of this resource and spread it out where you can see it.**
6. Open and remove the outer plastic packaging of the dressing change kit. Two masks will be right on top (see Figure 2). Put the mask on. If someone is helping you with your dressing, they will also need to wear a mask. **Do not touch anything else inside the kit.**

7. Put on the nonsterile gloves. Remove the old dressing by gently grasping an edge of the dressing and slowly peeling it off your skin toward the exit site of the catheter. As you peel the dressing back, place your thumb or forefinger on top of the dressing over the catheter to prevent tugging on the catheter. To make it easier to remove, wipe the area underneath the dressing with an alcohol pad as you pull the dressing away from your skin. Make sure the entire gel pad comes off with the dressing. Throw away the gloves and old dressing.

8. Without touching the area, inspect the exit site and the skin around it. It is easier to do this by looking in the mirror. Call your doctor or nurse after you complete the dressing change if you notice any signs of infection or irritation, such as:
   - Red or raw skin
   - Swelling
   - Any drainage from the exit site
   - Leakage around your catheter

9. Unwrap your dressing change kit by pulling back on the corners of the outer wrapping in the following manner:
   - Place the kit in front of you so that the top flap is facing you. Open the top flap away from you.
   - Open the first side flap.
   - Open the other side flap.
   - Open the bottom flap towards you.

   Make sure you don’t touch the inside of the outer wrapping. Take the paper drape out of the kit, touching only the edges. Unfold it and place it on your work area. This is called your sterile field.

   Open the package with the needleless connectors and drop them on your sterile field. If your nurse gave you an alternative dressing to use, drop them on the sterile field.

**Follow steps 10-21 on the Map for Dressing Change: CVC instructions at the end of this resource to complete the dressing change.**

You are now done with the sterile part of the dressing change. Keep your gloves and mask on to change the needleless connectors and disinfection caps.
Changing the Needleless Connectors and Disinfection Caps

21. You will change the needleless connector and disinfection cap on each lumen of your catheter. Make sure you have 3 alcohol pads for each lumen.

22. Check to make sure that the clamps on your lumens are closed before you change the needleless connectors and disinfection caps.

23. Even though your gloves are on, they will no longer be sterile if you touched your skin when you put on your dressing, so do not touch the inner part of the catheter tip or needleless connector. Using an alcohol pad, hold your catheter with your nondominant hand close to, but not touching, the needleless connector (see Figure 3).

24. Using your dominant hand, scrub the connection site for 15 seconds with another alcohol pad and allow it to dry for 15 seconds. Twist off the old needleless connector. Throw away the old needleless connector and alcohol pad.

25. Scrub the end of your catheter with a new alcohol pad for 15 seconds and allow it to dry for 15 seconds.

26. Pick up the new needleless connector with your dominant hand. If there is a cover in place over the new needleless connector, remove it and then twist the new needleless connector onto your catheter (see Figure 4).

27. If you won’t be flushing your catheter immediately, apply the disinfection cap to the end of the needleless connector.

28. Repeat steps 22-27 for the second and third lumens.

29. Remove your mask and sterile gloves. Throw them away.

Flushing Your Catheter

Flush the lumens with normal saline solution once a week, when your catheter is not in use. This is to keep the lines from becoming clogged. For more information, you can watch How to Flush Your Central Venous Catheter.

Supplies

- 1 prefilled, 10 mL syringe containing normal saline solution. You will need 1 syringe for each lumen
- Nonsterile gloves
- Alcohol pads
- 1 disinfection cap for each lumen
Steps to flushing your catheter

1. Gather your supplies.

2. Wash your hands thoroughly with warm water and antibacterial soap. Dry them with a clean towel or a paper towel. Put on a pair of nonsterile gloves.

3. To release the air bubbles in the syringe, gently tap the side of the syringe. Point the syringe up as you do this. Loosen but do not remove the cap on the syringe. Press the plunger on the syringe until the air is pushed out. Retighten the cap.

4. Pick up 1 lumen and unclamp it.

5. If you have a disinfection cap, remove it.

6. If you don’t have a disinfection cap, scrub the end of the needleless connector with an alcohol pad for 15 seconds and allow it to dry for 15 seconds.

7. Remove the cap from the syringe. Throw away the cap. Make sure that nothing touches the clean end of the needleless connector while you are doing this.

8. Carefully push the syringe into the needleless connector and twist it in a clockwise (to the right) direction until the connection feels secure. Try to inject the saline. If you can’t inject the saline, stop and check to be sure there are no twists or other blockages in the tubing. Try to inject the saline again. **If you still can’t inject the saline, do not use extra pressure to flush the line.** Remove the syringe, reclamp your catheter, and call your doctor or nurse.

9. Use the following push/pause method to flush your catheter:
   - Quickly inject \( \frac{1}{3} \) of the saline.
   - Pause.
   - Repeat.
   - Inject the last \( \frac{1}{3} \) of the saline. After the injection, clamp your catheter.

10. Untwist the syringe from the lumen and throw it away.

11. Attach a disinfection cap to the end of the needleless connector.

12. Repeat steps 3-11 for each lumen.

13. Reclamp the lumens.

14. Secure your catheter in a way that makes you feel comfortable. If you will pin your catheter to your clothing, prepare one 5-inch piece of paper tape. Fold down the edges of the tape (see Figure 5). Leave enough sticky tape so you can wrap it around all of the lumens. Avoid placing tape over the connection site. **Leave the catheter hanging loose only if you are sure it will not be pulled.**

15. Throw away your mask and gloves and wash your hands thoroughly.
Caring for Your CVC

- Do not submerge your catheter in water (e.g., a bathtub or swimming pool).
- Clamp the lumens when your catheter is not in use.
- Keep your catheter secure at all times to avoid pulling it. You can tape the lumens of your catheter to your skin, tuck them into a bra if you wear one, or pin them to your clothing. Ask your nurse about the best way to secure your catheter. Avoid placing tape over the connection site.
- If your catheter is leaking at any time, clamp it above the leak. Use the white catheter clamp on the catheter, if possible. If the white clamp is not available, use the clamp found in the emergency kit. Wipe the area that is leaking with an alcohol pad. Cover the site with tape. Call your doctor or nurse immediately. Catheters can often be repaired.

Guidelines for showering

While your catheter is in place, it is especially important to take good care of your skin to reduce your risk of infection. We recommend that you wash with Hibiclens® every day while your catheter is in place. It contains a fast-acting antiseptic called chlorhexidine gluconate (CHG) that kills germs that live on your skin and will reduce your risk of infection. Hibiclens can work for up to 6 hours after using it. You can purchase it from any local pharmacy or online. You will be sent home with a small bottle when you are discharged from the hospital. For more information, you can watch *Showering While You Have a Central Venous Catheter*.

Instructions for using Hibiclens

- If you are washing your hair, shampoo and rinse thoroughly.
- Wash your face with regular soap.
- Rinse your body with warm water from the neck down.
- Apply Hibiclens to a washcloth or directly to the skin being cleansed. Wash gently. Do not dilute the Hibiclens.
- Rinse thoroughly with warm water and pat yourself dry.

Important points to remember when using Hibiclens

- Do not use Hibiclens if you are allergic to chlorhexidine.
- Do not use Hibiclens on your face, ears, genital region, or on deep wounds.
- Do not use regular soap, lotion, powder, or deodorant after washing with Hibiclens.

You can shower with your catheter in place using a one-time-use waterproof cover that goes over your dressing. Each time you shower, cover the Tegaderm CHG dressing completely with a new waterproof cover to protect it from getting wet.

- To put on the waterproof cover, peel off the top and side strips. Place the top edge above your dressing. Smooth it down over your dressing. Do the same for the bottom part of your dressing, making sure that the bottom edge of the waterproof cover is below your dressing. Make sure the lumens of your catheter are tucked into the waterproof cover and completely covered.
- Do not let the tape on the waterproof cover touch the Tegaderm CHG dressing. It can lift your dressing when you remove the waterproof cover after showering.
- Dry the waterproof cover before removing it.
• Do not shower for longer than 15 minutes. Use warm water, not hot water. This will help prevent the waterproof cover from coming off.

• If your dressing gets wet, change it.

Call Your Doctor or Nurse Immediately if You:

• Have redness, swelling, or drainage around the area where the catheter exits your body

• Are unable to flush your catheter or if your needleless connector falls off

• Have a temperature of 100.4°F (38°C) or higher or chills

• Have a break or leak in your catheter

• Have an unexplained problem with your catheter

If you have any questions or concerns, please call Interventional Radiology at 212-639-2236. You can reach a staff member Monday through Friday from 9:00 AM to 5:00 PM. After 5:00 PM, during the weekend, and on holidays, please call 212-639-2000 and ask for the fellow on call for Interventional Radiology.
How to Put on Your Sterile Gloves

1. Open the package that contains the sterile gloves. Pull the edges of the package down to keep them flat.

2. Pick up 1 glove by the folded cuff.

3. Still holding just the cuff with 1 hand, slide your other hand into the glove, making sure the outside of the glove does not touch anything.

4. Slip the fingers on your gloved hand under the cuff of the other glove. Hold the glove up and do not let it touch anything.

5. Keep the thumb on your gloved hand pointing up so it is out of the way. Slide your other hand into the glove.

6. Pull the glove all the way up. Be careful not to touch anything, including your wrist.
10. **Wash your hands thoroughly with warm water and antibacterial soap.** Dry your hands thoroughly. Or you can use the hand sanitizer packet provided on the outside of the kit, as instructed by your nurse.

11. Take the package with the sterile gloves out of the tray. Be careful not to touch anything else in the tray. Put on the sterile gloves following How to Put on Your Sterile Gloves, touching only the inside of the sterile glove with your bare hand. Be careful not to touch anything except what is in the dressing change tray after your gloves are on. Move everything from inside the dressing change tray onto the sterile drape.

12. Open and remove all the alcohol prep pads from their wrappers. Put the alcohol pads back into the tray. Put the wrappers to the side or drop them in the trash.

13. Pick up the ChloraPrep® applicator with your dominant hand. Pinch the wings on the side together until you hear a click (see Figure 6). This will make the antiseptic soak into the applicator sponge. You must press very hard to make the click sound.

14. Using an alcohol pad, grasp the catheter with your nondominant hand, just above where it separates into lumens. (see Figure 7). Do not touch the catheter itself. Touch only the alcohol pad. Hold the catheter away from your chest.

15. Use your dominant hand to pick up the Chloraprep. Beginning at the exit site, scrub up and down and side to side with the Chloraprep to make a 2-inch box (see Figure 8). Discard the Chloraprep.

16. Allow the site to dry completely. This may take at least 30 seconds. Do not fan or blow on the site to speed up the drying. Hold the catheter away while it dries.

17. While holding the catheter with your nondominant hand, take another alcohol pad in your dominant hand. Place it around the catheter at the incision site and gently, without tugging, clean down the catheter toward the area where it separates into lumens. Discard the alcohol swab in your dominant hand. Continue holding the catheter in your nondominant hand.

18. Pick up a new alcohol pad with your dominant hand. Without tugging, clean down the lumen of the catheter (see Figure 9). Discard the alcohol pad. Repeat this step to clean each lumen.

19. Apply the No Sting Barrier Film to your skin in the shape of an open rectangle about the size of the Tegaderm CHG dressing. **Allow it to dry completely.** The No Sting Barrier Film will help the dressing stick to your skin. Discard the alcohol pad in your nondominant hand.

20. Peel the backing off the Tegaderm CHG (see Figure 10). Center the gel pad over the exit site and smooth down the dressing edge. Do not stretch the dressing when applying.

21. Grasp the round paper tab on the outside and peel the plastic off all the way around the dressing (see Figure 11). Peel the notched tape off of the paper tab. Apply the tape under the tubing and over the dressing edge to secure the catheter. You may press the outside of the dressing to make sure it is intact.

Continue the instructions in the booklet.
Common Medications Containing Aspirin and Other Nonsteroidal Anti-inflammatory Drugs (NSAIDs)

This information will help you identify medications that contain aspirin and other nonsteroidal anti-inflammatory drugs (NSAIDs). It’s important to stop these medications before many cancer treatments.

Aspirin, other NSAIDs (such as ibuprofen), and vitamin E can increase your risk of bleeding during cancer treatment. These medications affect your platelets, which are blood cells that clot to prevent bleeding.

Read the section “Examples of Medications” to see if your medications contain aspirin, other NSAIDs, or vitamin E.

If you take aspirin, medications that contain aspirin, other NSAIDs, or vitamin E, tell your doctor or nurse. They will tell you if you need to stop taking these medications before your treatment. You will also find instructions in the information about the treatment you’re having.

Before Your Surgery

If you’re having surgery, follow the instructions below.

- Stop taking medications that contain vitamin E 10 days before your surgery, or as directed by your doctor.
- Stop taking medications that contain aspirin 7 days before your surgery, or as directed by your doctor. If you take aspirin because you’ve had a problem with your heart or you’ve had a stroke, be sure to talk with your doctor.
before you stop taking it.

- Stop taking NSAIDs 48 hours before your surgery, or as directed by your doctor.

## Before Your Radiology Procedure

If you’re having a radiology procedure (including Interventional Radiology, Interventional Mammography, and General Radiology), follow the instructions below.

- Stop taking medications that contain vitamin E 10 days before your procedure, or as directed by your doctor.
- If your doctor tells you to stop taking aspirin, stop taking it 5 days before your procedure, or as directed by your doctor. If you take aspirin because you’ve had a problem with your heart or you’ve had a stroke, be sure to talk with your doctor before you stop taking it.
- Stop taking NSAIDs 24 hours before your procedure, or as directed by your doctor.

## Before and During Your Chemotherapy

Chemotherapy can lower your platelet count, which can increase your risk of bleeding. Whether you’re just starting chemotherapy or you’ve been getting it, talk with your doctor or nurse before taking aspirin or NSAIDs.

## Examples of Medications

Medications are often called by their brand name, which can make it hard to know their ingredients. To help you identify medications that contain aspirin, other NSAIDs, and vitamin E, please review the lists below.

These lists include the most common products, but there are others. Check with your healthcare provider if you aren’t sure. **Always be sure your doctor knows all of the medications you’re taking, both prescription and over-the-counter (not prescription).**
## Common Medications that Contain Aspirin

<table>
<thead>
<tr>
<th>Common Medication</th>
<th>Common Medication Details</th>
<th>Common Medication</th>
<th>Common Medication</th>
<th>Common Medication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggrenox®</td>
<td>Bufferin® (most formulations)</td>
<td>Fiorgren®</td>
<td>Momentum®</td>
<td>Soma® Compound Tablets</td>
</tr>
<tr>
<td>Alka Seltzer®</td>
<td>Buffets II®</td>
<td>Fiorinal® (most formulations)</td>
<td>Norgesic Forte® (most formulations)</td>
<td>Soma® Compound with Codeine Tablets</td>
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<tr>
<td>Anacin®</td>
<td>Buffex®</td>
<td>Fiortal®</td>
<td>Norwich® Aspirin</td>
<td>St. Joseph® Adult Chewable Aspirin</td>
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<tr>
<td>Arthritis Pain Formula</td>
<td>Cama® Arthritis Pain Reliever</td>
<td>Gelpirin®</td>
<td>PAC® Analgesic Tablets</td>
<td>Supac®</td>
</tr>
<tr>
<td>Arthritis Foundation Pain Reliever®</td>
<td>COPE®</td>
<td>Genprin®</td>
<td>Orphengesic®</td>
<td>Synalgos®-DC Capsules</td>
</tr>
<tr>
<td>ASA Enseals®</td>
<td>Dasin®</td>
<td>Gensan®</td>
<td>Painaid®</td>
<td>Tenol-Plus®</td>
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<tr>
<td>ASA Suppositories®</td>
<td>Easprin®</td>
<td>Heartline®</td>
<td>Panasal®</td>
<td>Trigesic®</td>
</tr>
<tr>
<td>Ascriptin® and Ascriptin A/D®</td>
<td>Ecotrín® (most formulations)</td>
<td>Headrin®</td>
<td>Percodan® Tablets</td>
<td>Talwin® Compound</td>
</tr>
<tr>
<td>Aspergum®</td>
<td>Empirin® Aspirin (most formulations)</td>
<td>Isollyl®</td>
<td>Persistin®</td>
<td>Vanquish® Analgesic Caplets</td>
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<tr>
<td>Asprimox®</td>
<td>Epromate®</td>
<td>Lanorinal®</td>
<td>Robaxisal® Tablets</td>
<td>Wesprin® Buffered</td>
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<tr>
<td>Axotal®</td>
<td>Equagesic Tablets</td>
<td>Lortab® ASA Tablets</td>
<td>Roxiprin®</td>
<td>Zee-Seltzer®</td>
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<tr>
<td>Azdone®</td>
<td>Equazine®</td>
<td>Magnaprin®</td>
<td>Saleto®</td>
<td>ZORprin®</td>
</tr>
<tr>
<td>Bayer® (most formulations)</td>
<td>Excedrin® Extra-Strength Analgesic Tablets and Caplets</td>
<td>Marnal®</td>
<td>Salocol®</td>
<td></td>
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<tr>
<td>BC® Powder and Cold formulations</td>
<td>Excedrin® Migraine</td>
<td>Micrainin®</td>
<td>Sodol®</td>
<td></td>
</tr>
</tbody>
</table>

**Common Medications Containing Aspirin and Other Nonsteroidal Anti-inflammatory Drugs (NSAIDs)**
### Common Medications that are NSAIDs that Don’t Contain Aspirin

<table>
<thead>
<tr>
<th>Advil®</th>
<th>Clinoril®</th>
<th>Indocin®</th>
<th>Motrin®</th>
<th>Ponstel®</th>
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<tbody>
<tr>
<td>Advil Migraine®</td>
<td>Daypro®</td>
<td>Ketoprofen</td>
<td>Nabumetone</td>
<td>Relafen®</td>
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<tr>
<td>Aleve®</td>
<td>Diclofenac</td>
<td>Ketorolac</td>
<td>Nalfon®</td>
<td>Saleto 200®</td>
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<td>Anaprox DS®</td>
<td>Etodolac®</td>
<td>Lodine®</td>
<td>Naproxen</td>
<td>Sulindac</td>
</tr>
<tr>
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<td>Feldene®</td>
<td>Meclofenamate</td>
<td>Naprosyn®</td>
<td>Toradol®</td>
</tr>
<tr>
<td>Arthrotec®</td>
<td>Fenoprofen</td>
<td>Mefenamic Acid</td>
<td>Nuprin®</td>
<td>Voltaren®</td>
</tr>
<tr>
<td>Bayer® Select Pain Relief Formula Caplets</td>
<td>Flurbiprofen</td>
<td>Meloxicam</td>
<td>Orudis®</td>
<td></td>
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<tr>
<td>Celebrex®</td>
<td>Genpril®</td>
<td>Menadol®</td>
<td>Oxaprozin</td>
<td></td>
</tr>
<tr>
<td>Celecoxib</td>
<td>Ibuprofen</td>
<td>Midol®</td>
<td>PediaCare Fever®</td>
<td></td>
</tr>
<tr>
<td>Children’s Motrin®</td>
<td>Indomethacin</td>
<td>Mobic®</td>
<td>Piroxicam</td>
<td></td>
</tr>
</tbody>
</table>

### Products that Contain Vitamin E

<table>
<thead>
<tr>
<th>Amino-Opt-E</th>
<th>Aquavit</th>
<th>E-400 IU</th>
<th>E complex-600</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquasol E</td>
<td>D’alpha E</td>
<td>E-1000 IU Softgels</td>
<td>Vita-Plus E</td>
</tr>
</tbody>
</table>

Most multivitamins contain vitamin E. If you take a multivitamin, be sure to check the label.

### About Acetaminophen

Acetaminophen (Tylenol®) is generally safe to take during your cancer treatment. It doesn’t affect platelets, so it won’t increase your chance of bleeding. However, talk with your doctor before taking acetaminophen if you’re getting chemotherapy.
Read the labels on all your medications

Acetaminophen is safe when used as directed, but there’s a limit to how much you can take in 1 day. It’s possible to take too much acetaminophen without knowing because it’s in many different medications.

Make sure to always read and follow the label on the product you’re taking. Acetaminophen is a very common ingredient found in over-the-counter and prescription medications. It’s often an ingredient in pain relievers, fever reducers, sleep aids, and cough, cold, and allergy medications.

The full name acetaminophen isn’t always written out. Look for the common abbreviations listed below, especially on prescription pain relievers.

Don’t take more than 1 medication that contains acetaminophen at a time without talking with a member of your healthcare team.
If you have any questions or concerns, talk with a member of your healthcare team. You can reach them Monday through Friday from 9:00 AM to 5:00 PM at ____________________. After 5:00 PM, during the weekend, and on holidays, please call____________________. If there’s no number listed, or you’re not sure, call 212-639-2000.

Common Medications Containing Aspirin and Other Nonsteroidal Anti-inflammatory Drugs (NSAIDs)

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PATIENT & CAREGIVER EDUCATION

Frequently Asked Questions About Blood Transfusions

This information answers frequently asked questions about having a blood transfusion.

Your doctor has recommended that you have a blood transfusion. Many people have questions about why they need a blood transfusion. Some people may worry about the risk of being infected with human immunodeficiency virus (HIV), hepatitis, or other viruses. The information below will help answer some of your questions.

What is my blood made up of?

Your blood is made up of plasma (fluid in your blood that holds all your blood cells) and 3 types of blood cells:

- Red blood cells that carry oxygen to your tissues.
- Platelets that help form clots and stop bleeding.
- White blood cells that fight infection.

Why do I need to have a blood transfusion?

You may need a transfusion because of the effect a disease, surgery, chemotherapy, or other treatments have on your blood.

You may need a transfusion of your red blood cells, white blood cells, or your platelets.

- You may need a transfusion of red blood cells if you had a lot of bleeding or if your red blood cell count is low (anemia).
- You may need a platelet transfusion if your platelet count is low.
• You can also have a white blood cell transfusion, but these are rare and done in very specific situations.

Does it hurt?

It doesn’t hurt to have a blood transfusion. The only pain you may feel is when the needle is placed into your vein. This pain will go away quickly.

If you have a central venous catheter (CVC), you can get red blood cells or platelets through it. This will not hurt.

If you have a Mediport®, it will be the same type of needle stick that you have for chemotherapy.

How can I be sure that the blood I receive is the same type as mine?

Your blood type is either A, B, AB, or O. It’s either Rh positive (+) or Rh negative (-).

Your blood type is checked with a test called a type and crossmatch. The results of this test are used to match your blood type with the blood in our blood bank. Your healthcare provider will check to make sure that the blood is the correct match for you before they give you the transfusion.

How long does it take for a type and crossmatch to be completed?

A type and crossmatch may take 2 to 4 hours to be processed in the blood bank. It may take longer if additional antibodies are found in your blood or if your immunotherapy medications affect your test results.

How long does it take to receive the transfusion?

One transfusion of red blood cells usually takes 2 to 4 hours. One transfusion of platelets takes 30 to 60 minutes.
Are there any risks associated with a blood transfusion?

Yes, blood transfusions have some risks. These risks include the very small chance of having an allergic reaction or getting an infection. Your healthcare provider will talk with you about these risks before you receive a transfusion.

How can I be sure the blood is safe?

After it’s donated, the blood is tested for:

- Syphilis
- Hepatitis B and C
- HIV
- A virus associated with a very rare form of leukemia
- West Nile virus
- *Trypanosome cruzi* (a parasite that causes Chagas disease)
- Zika virus
- Bacteria (platelets only)

If the donated blood tests show any of these infections, the blood is thrown away.

Can a friend or relative donate blood specifically for me?

Yes, friends and relatives can donate both red blood cells and platelets. These are called directed donations. These donations are tested in the same way as other donations. If the blood tests positive for any of the viruses listed above, the donor will be notified privately.

If the donor’s blood type isn’t the same as your blood type, the donation may be given to someone else who may need it.

Directed red blood cell donations are held for you for 25 days. Directed platelet
Donations are held for you for 4 days. After that, the donations may be given to someone else.

**Can I give blood for myself?**

Sometimes, we encourage people scheduled for surgery to donate their own blood. It’s stored and given back if and when you need it. This is called an autologous donation.

Ask your doctor if you can donate your own blood. If this is possible, arrangements will be made with the blood bank for you to begin banking your blood.

You can donate your own blood several times during the month before your surgery. For more information about autologous blood donations, read the resource *Being Your Own Blood Donor* ([www.mskcc.org/pe/autologous_blood_donation](http://www.mskcc.org/pe/autologous_blood_donation)).

**What if I don’t want a blood transfusion?**

It’s always your right to refuse a treatment. However, keep in mind that doctors recommend a transfusion only when they think it’s needed. A large amount of blood is lost during some types of surgery. If this blood is not replaced, you can die.

**Are there any substitutes for blood if I need a transfusion?**

There are no substitutes for blood. This is why we are so grateful to the many family members and friends who donate their blood.

**Is there anything to worry about during or after a blood transfusion?**

A blood transfusion can sometimes cause reactions. The most common symptoms are a temperature of 100.4° F (38° C), chills, and hives. These can be treated with medication. Transfusion reactions are rarely life-threatening. Your nurse will monitor you carefully while your blood transfusion is taking place.
Call Your Doctor if You Have:

- A temperature of 100.4° F (38° C) or higher
- Chills
- Redness and warmth in your face
- Hives, rash, or itching
- Trouble breathing or shortness of breath
- Lower back pain
- Nausea or vomiting
- Weakness or fainting
- Dark-colored urine (pee)

**If you have chest pain, call 911 right away.**

If you have any questions or concerns, talk with a member of your healthcare team. You can reach them Monday through Friday from 9:00 AM to 5:00 PM at ____________________. After 5:00 PM, during the weekend, and on holidays, please call____________________. If there’s no number listed, or you’re not sure, call 212-639-2000.
Hair Loss and Your Cancer Treatment

This information will help you understand hair loss during cancer treatment.

Commonly Asked Questions

What are the causes of hair loss?

Many people with cancer lose their hair because of chemotherapy, immunotherapy, endocrine therapy, or radiation to the head. However, there are other causes of hair loss. These include:

- Having a family history of hair loss
- Being low in certain vitamins
- Going through hormonal changes
- Having certain medical conditions (such as hypothyroidism)
- Having different hairstyles
- Taking certain medications
- Being stressed

If you’re starting to lose your hair, it’s important to see your dermatologist (skin doctor). They can help you figure out the reason for your hair loss and answer any questions you may have about your hair. Your dermatologist will ask about your history of hair loss and look at the areas where you’re losing your hair.

Why will I lose my hair during cancer treatment?

Cancer treatments, such as radiation and chemotherapy, attack fast-growing cancer cells. These treatments can also affect normal cells that grow fast, such as hair cells.
Chemotherapy can cause hair loss on your scalp, pubic area, arms, legs, eyebrows, and eyelashes. Radiation therapy to your head often causes hair loss on your scalp. Sometimes, depending on the dose of radiation to your head, your hair may grow back differently from how it looked before, or it may not grow back at all.

**When will I begin to lose my hair?**

You may start to see your hair thin or fall out 1 to 4 weeks after your first chemotherapy treatment and 4 weeks after you receive radiation therapy.

The amount of hair that falls out or thins depends on the type, dose, and timing of your treatments. The speed at which it falls out also varies from person to person. You may first notice hair on your pillow in the morning or see it when you shower or brush your hair.

Some people will experience hair thinning rather than hair loss. Hair thinning is when your hair feels and looks thinner in texture. Talk with your healthcare team about what to expect after your chemotherapy or radiation therapy.

**When will my hair grow back?**

Once your treatments have stopped, your hair should begin to grow back. Hair regrowth can take 3 to 5 months. When your hair grows back, it may have a different texture or color. In rare cases, your hair won’t grow back as fully as it did before.

There is a very small risk that your hair won’t grow back after radiation therapy to your head.

**Caring For Your Hair and Head**

Here are some ways you can care for your hair and head while you’re experiencing hair loss:

- Wash and condition your hair every 2 to 4 days. Use baby shampoo or other mild shampoo (such as Aveeno® or Vanicream™). You should also use a cream rinse or hair conditioner.
- Use shampoos and conditioners that have sunscreen to prevent sun damage to your scalp.
• Always rinse your hair well and pat it dry with a soft towel.
• Wash your hair after swimming in a pool.
• Don’t expose your scalp to the sun.
• Keep your head covered in the summer.
• In the winter, cover your head with a hat, scarf, turban, or wig to keep it warm. This can also help to catch falling hair.
• Sleep on a satin or silk pillowcase. These are smoother than other fabrics and can decrease hair tangles.
• Brush or comb your hair gently with a soft-bristle brush or comb. Start brushing or combing your hair at the ends and gently work your way up to your scalp. You can also comb through your hair with your fingers. Wet your fingers with water first.
• If your hair is long, you may want to have it cut short before you begin treatment.
• Tell your hairdresser that you’re receiving chemotherapy. They may be able to recommend gentle hair products.
• Try using Bumble and bumble™ Hair Powder to cover bald spots and thinning areas of your hair. You can buy it at Sephora® or online from various beauty supply websites.

Don’t use the following on your hair during treatment because they can be too harsh or pull on your hair:

• Hair spray, hair dye, bleach, or permanents (perms)
• Clips, barrettes, bobby pins, pony tail holders, or hair ties (scrunchies)
  ○ Don’t put your hair in braids, cornrows, or pony tails.
• Hair dryers, curlers, curling irons, or hair straighteners
• Rubber bathing or swimming caps
Wigs, Hairpieces, and Head Coverings

Wigs

If you want to wear a wig, try to get one before your hair falls out, because it will be easier to match your hair color and style. If you have already experienced hair loss, bring a photo of your usual hairstyle and, if you can, a lock of your hair. This will help you find a wig that looks like your hair did before your treatment started.

When shopping for a wig, you may want to shop around and compare prices.

A wig should fit properly, be comfortable, and be easy to care for. You may want to start wearing your wig as soon as your hair begins to thin. As your hair gets thinner, you may need to have your wig adjusted to make it fit better.

There are many types of wigs and hairpieces. Here is a list of the most common types:

**Custom-made wigs**

Custom-made wigs are made by hand and are usually the most expensive type of wig. These wigs are made using your specific head measurements. Getting a custom-made wig may require several visits to the wig store for it to be colored, cut, and cleaned. Custom-made wigs are usually made of human hair, but can be made of synthetic (not human) materials.

**Customized ready-made wigs**

Customized ready-made wigs can be made of human hair, synthetic blends, or a mixture of both. They are made in standard sizes, but can be altered to fit your head. These wigs can be styled and generally cost less than a custom-made wig.

**Ready-made or stock wigs**

Ready-made or stock wigs are usually made out of a stretchy material and come in 1 size. If you buy a ready-made wig, you can usually take it home the same day that you purchase it. Ready-made wigs are generally the least expensive type of wig.

**Hairpieces**

If you lose your hair in only 1 area, you may want to consider buying a hairpiece
rather than a wig. A hairpiece will blend into your own hair. It can be made in any size, color, or shape.

Head coverings
Scarves, turbans, and hats

- Scarves, turbans, and hats can help hold hair that is falling out and also hide a bald scalp.

- Scarves made from silk can easily slide off your head. You may want a scarf made of a cotton blend because they can be more comfortable.

- Turbans are sold in many drug stores and come in many different colors and textures.

- Hats worn with or without scarves can also be attractive and comfortable.

For more information about where to buy wigs and hairpieces, read our resource Where to Buy Wigs and Hairpieces (www.mskcc.org/pe/where_buy_wigs_hairpieces).

Financial Support

People who lose their hair from cancer treatment may have insurance coverage for a wig or hairpiece. In this case, your doctor should write a prescription with a diagnosis code showing that your hair loss is due to treatment for cancer. Check with your insurance company for details.

Additional resources for financial support include:

American Cancer Society (ACS)
www.cancer.org
Some American Cancer Society offices offer free wigs to people with cancer. For more information, go to your local American Cancer Society office or call 800-ACS-2345 (800-227-2345).

CancerCare
www.cancercare.org
CancerCare offers free wigs to people with cancer. Call 800-813-HOPE (800-813-4673) and ask to speak with a social worker.
The Look Good Feel Better Program

The Look Good Feel Better program is designed to help people cope with the effects that cancer treatment can have on their appearance. During weekly sessions, makeup artists teach makeup techniques, skin and nail care, and hair styling and head-covering options. To register for a class, call Look Good Feel Better at 800-395-LOOK (800-395-5665) or visit www.lookgoodfeelbetter.org.

Men can find information at www.lookgoodfeelbetter.org/programs/men.

Medications and Supplements for Hair Loss

Medications and supplements for hair loss can slow hair thinning and increase coverage of your scalp by growing new hair and enlarging existing hairs. Your doctor or nurse will write their recommendations for you in the space below.

If you have any questions or concerns, talk with a member of your healthcare team. You can reach them Monday through Friday from 9:00 AM to 5:00 PM at _______________________. After 5:00 PM, during the weekend, and on holidays, please call_____________________. If there’s no number listed, or you’re not sure, call 212-639-2000.

Hair Loss and Your Cancer Treatment

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Hand Hygiene and Preventing Infection

This information explains how to clean your hands with soap and water or an alcohol-based hand sanitizer.

Why is hand hygiene so important?

When germs get into your body, they can cause an infection. Everyone is at risk for an infection while in the hospital. Hand hygiene is the best way to prevent the spread of germs and infections. It only takes 15 to 20 seconds of washing your hands or using an alcohol-based hand sanitizer, such as Purell®, to kill the germs that cause infections. You can take action by cleaning your hands and asking your visitors to clean their hands.

When should I clean my hands with soap and water?

- After using the toilet, urinal, or bedside commode.
- If your hands look dirty.
- Before you eat or prepare food.
- If you have an infection with the germ Clostridium difficile (C. Diff) or norovirus.
- After vomiting or coughing up phlegm.
What is the correct way to clean my hands with soap and water?

1. Wet your hands with warm water. Use liquid soap, if possible. Apply a nickel- or quarter-sized amount of soap to your hands.

2. Rub your hands together until a lather forms. Rub the lather over the top of your hands, in between your fingers, and in the area around and under your fingernails.

3. Continue rubbing your hands for 15 to 20 seconds.

4. Rinse your hands well under warm running water.

5. Dry your hands with a paper towel.

6. Use a paper towel to turn off the faucet and to open the bathroom door, if needed.

When should I clean my hands with an alcohol-based hand sanitizer?

- If soap and water aren’t available.
- When you leave your hospital room and when you come back.
- Before eating (if you can’t get out of bed, you can use an individually packaged hand wipe).

What is the correct way to clean my hands with an alcohol-based hand sanitizer?

1. Put a nickel- or quarter-size amount of sanitizer in the palm of your hand.

2. Rub your hands together, and then rub the sanitizer over the top of your hands, in between your fingers, and in the area around and under your fingernails.

3. Continue rubbing until your hands are dry. If enough sanitizer was used to kill germs, it should take at least 15 seconds of rubbing before your hands feel dry. Don’t rinse your hands with water or dry them with a towel.
Where can I get more information about hand hygiene?

If you have any questions, talk with your doctor or nurse. You can also visit the following website for more information:

World Health Organization (WHO)
www.who.int/gpsc/5may/Hand_Hygiene_When_and_How_Leaflet.pdf

Call Your Doctor or Nurse if You Have:

- A fever (a temperature of 100.4°F (38°C) or higher)
- A temperature of 96.8°F (36°C) or lower
- New or worsening chills or sweating
- New or worsening redness around a wound
- New or increased drainage from a wound
- New or worsening shortness of breath or difficulty breathing
- A heartbeat that is faster than usual
- New or worsening cough
- New or worsening pain

If you have any questions or concerns, talk with a member of your healthcare team. You can reach them Monday through Friday from 9:00 AM to 5:00 PM at ____________________. After 5:00 PM, during the weekend, and on holidays, please call____________________. If there’s no number listed, or you’re not sure, call 212-639-2000.
PATIENT & CAREGIVER EDUCATION

Instructions for Interventional Radiology Procedures

This information will prepare you for your interventional radiology procedure at Memorial Sloan Kettering (MSK). Your doctor has referred you for a procedure called a(n) _______________________________.

Before Your Procedure

Ask about your medications

You may need to stop taking some of your medications before your procedure. Talk with your doctor about which medications are safe for you to stop taking. We have included some common examples below.

Anticoagulants (blood thinners)

If you take a blood thinner (medication that affects the way your blood clots), ask the doctor performing your procedure what to do. Their contact information is listed at the end of this resource. Whether they recommend you stop taking the medication depends on the reason you’re taking it.

Do not stop taking your blood thinner medication without talking with your doctor.

<table>
<thead>
<tr>
<th>Examples of Blood Thinners</th>
</tr>
</thead>
<tbody>
<tr>
<td>apixaban (Eliquis®)</td>
</tr>
<tr>
<td>aspirin</td>
</tr>
<tr>
<td>celecoxib (Celebrex®)</td>
</tr>
<tr>
<td>cilostazol</td>
</tr>
<tr>
<td>(Pletal®)</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>clopidogrel</td>
</tr>
<tr>
<td>(Plavix®)</td>
</tr>
<tr>
<td>dabigatran</td>
</tr>
<tr>
<td>(Pradaxa®)</td>
</tr>
</tbody>
</table>

Please read our resource *Common Medications Containing Aspirin and Other Nonsteroidal Anti-inflammatory Drugs (NSAIDs)* ([www.mskcc.org/pe/common_meds](http://www.mskcc.org/pe/common_meds)). It has important information about medications you’ll need to avoid before your procedure and what medications you can take instead.

**Medications for diabetes**

If you take insulin or other medications for diabetes, ask the doctor who prescribes the medication what you should do the morning of your procedure. You may need to change the dose before your procedure.

**Diuretics (water pills)**

If you take any diuretics (medications that make you urinate more often), ask the doctor performing your procedure what to do. You may need to stop taking them the day of your procedure. Diuretics are sometimes called water pills. Some examples are furosemide (Lasix®) and hydrochlorothiazide.

**Arrange for someone to take you home**

You must have someone 18 years or older take you home after your procedure. If you don’t have someone to do this, call one of the agencies below. They will send someone to go home with you. There’s usually a charge for this service, and you will need to provide transportation.

**Agencies in New York**

Partners in Care: 888-735-8913
Caring People: 877-227-4649

**Agencies in New Jersey**

Caring People: 877-227-4649

**Tell us if you’re sick**

If you develop any illness (fever, cold, sore throat, or the flu) before your procedure, call a nurse in Interventional Radiology at 212-639-2236. A nurse is available Monday through Friday from 9:00 AM to 5:00 PM. After 5:00 PM, during...
the weekend, and on holidays, call 212-639-2000 and ask for the Interventional Radiology fellow on call.

**Note the time of your appointment**

A staff member from Interventional Radiology will call you 2 business days before your procedure. If your procedure is scheduled on a Monday, you will be called on the Thursday before.

The staff member will tell you what time you should arrive at the hospital for your procedure. They will also tell you where to go for your procedure. If you don’t receive a call by noon the business day before your procedure, please call 212-639-5051.

If you need to cancel your procedure for any reason, please call the doctor who scheduled it for you.

---

**Instructions for eating and drinking before your surgery**

- Do not eat anything after midnight the night before your surgery. This includes hard candy and gum.
- Between midnight and up until 2 hours before your scheduled arrival time, you may drink a total of 12 ounces of water (see figure).
- Starting 2 hours before your scheduled arrival time, do not eat or drink anything. This includes water.

---

**The Day of Your Procedure**

**Things to remember**

- Take only the medications your doctor told you to take the morning of your procedure. Take them with a few sips of water.
- Do not apply cream or petroleum jelly (Vaseline®). You can use deodorant
and light moisturizers. Don’t wear eye makeup.

- Remove any jewelry, including body piercings.
- Leave all valuables, such as credit cards and jewelry, at home.
- If you wear contact lenses, wear your glasses instead, if possible. If you don’t have glasses, please bring a case for your contacts.

**What to bring with you**

- A list of the medications you take at home.
- Medications for breathing problems (such as inhalers), medications for chest pain, or both.
- A case for your glasses or contacts.
- Your Health Care Proxy form, if you have completed one.
- If you use a CPAP or BiPAP machine to sleep at night, please bring your machine with you, if possible. If you can’t bring your machine with you, we will give you one to use while you are in the hospital.

**What to expect**

Once you arrive at the hospital, doctors, nurses, and other staff members will ask you to state and spell your name and date of birth many times. This is for your safety. People with the same or similar names may be having procedures on the same day.

**Contact Information**

If you have any questions or concerns, please call Interventional Radiology at 212-639-2236. You can reach a staff member Monday through Friday from 9:00 AM to 5:00 PM. After 5:00 PM, during the weekend, and on holidays, please call 212-639-2000 and ask for the fellow on call for Interventional Radiology.
Low-Microbial Diet

This information will help you follow a low-microbial diet. Eating a low-microbial diet will lower your risk of getting sick while your immune system is weak, such as when you have leukopenia (a low number of white blood cells), after chemotherapy, radiation therapy, or a bone marrow or stem cell transplant.

The first section of this resource has information on how to keep your food safe. The second section explains what foods and drinks are safe to eat and drink while on a low-microbial diet. Don’t make any changes to this diet until you have talked to someone on your healthcare team. This includes your doctor, nurse, nurse practitioner, or dietitian.

People who had an allogeneic or autologous stem cell transplant should follow this diet for the first 100 days after their transplant. Please speak to your healthcare team about whether you need to keep following the diet after the 100-day period is over.

Food Safety Guidelines

About microbes

Microbes are tiny living things such as bacteria, viruses, yeast, and molds. They can get into food by infecting the animal the food comes from. Microbes can also get into food when it’s being processed or prepared. When microbes get into foods and you eat the foods without proper preparation, they can cause infections. People with leukopenia are at an especially high risk for infection.

Microbes can attach to foods and grow, but you can’t always see, smell, or taste them. They’re more likely to grow on:

- Milk and other dairy food items that aren’t refrigerated.
- Unpasteurized cheeses (such as Brie, blue cheese, and feta).
• Undercooked and raw eggs and foods that have raw eggs (such as cookie dough and Caesar salad dressing).

• Undercooked or raw meat, poultry, and seafood (including smoked seafood such as smoked salmon and trout).

• Certain fruits and vegetables (see the Fruits and Vegetables list in the “What to Eat on a Low-Microbial Diet” section).

• Unpasteurized or untreated juices (such as fresh-squeezed juices).

• Vegetable sprouts (such as raw alfalfa, soy bean, and radish sprouts).

Buying foods that are safe to eat

• Check containers for the expiration date. Buy and use food before that date.

• Don’t buy fruits and vegetables that have cuts, bruises, or mold.

• Don’t buy pre-cut fruits and vegetables at the grocery store. Buy whole produce and clean and cut it at home.

• Don’t buy canned foods if the can has dents or is swollen.

• Don’t buy food in jars if the jar is cracked or the lid isn’t tightly closed.

• Don’t buy packaged or boxed food that isn’t properly sealed.

• Buy only pasteurized dairy products, honey, and fruit and vegetable juices.

• Only buy eggs that are refrigerated. Open the carton to make sure no eggs are broken or cracked.

• Don’t buy foods from self-service bulk containers or bins.

• Don’t taste free samples.

• Don’t buy meats, cheeses, or salads from the deli counter or salad bar.

• Separate ready-to-eat and raw foods. Put raw meat, poultry, seafood, and other raw foods in plastic bags before they go into your shopping cart.

Pick up your milk and other cold and frozen foods at the end of your shopping trip. This decreases the time these items will spend outside of the refrigerator or freezer.

Transporting food safely
• After grocery shopping, go directly home and put your perishable food (food that can go bad quickly) into the refrigerator or freezer right away.

• Never leave perishable foods in a hot car.
  o If you need to make a stop after grocery shopping or if your trip from the grocery store to your home is long, place perishable foods in an insulated bag or cooler with ice or frozen gel packs.

Storing food safely

• Store food right after shopping.

• Put eggs and milk on a shelf inside the refrigerator. Don’t store them in the door. The inside of the refrigerator stays cooler than the door area.

• Never leave perishable food out of the refrigerator for more than 1 hour.

Keeping your kitchen clean

• Keep an area of your kitchen clean for preparing and eating food. This will help keep microbes from spreading.

• Use paper towels or a clean cloth to clean kitchen surfaces. Don’t use sponges.

• Use an antibacterial cleaning spray to clean surfaces. Look for products that have bleach or ammonia. Examples are Lysol® Food Surface Sanitizer and Clorox® Clean-Up Cleaner.

Using cutting boards and equipment

• Use thick plastic, marble, glass, or ceramic cutting boards. These materials are nonporous, meaning that food or liquid substances can’t absorb into them. Don’t use cutting boards made from wood or other porous surfaces that can absorb food and liquids.

• Throw out worn or hard-to-clean cutting boards.

• Wash cutting boards and knives with hot soapy water before using them to cut the next food.

• As an extra precaution, you can also wash your cutting boards with a kitchen sanitizer. Rinse off the sanitizer with hot water before using the cutting
board.

- Use separate cutting boards for fresh produce and for raw meat, fish, seafood, or poultry.
- Never place cooked food on a cutting board or plate that previously held raw food.

**Handling food safely**

- Wash your hands thoroughly with soap and warm water for 20 seconds:
  - Before preparing or eating food
  - After preparing raw poultry, meat, fish, or seafood
  - After handling garbage
- Thoroughly rinse fresh fruits and vegetables. Never use bleach or detergent to wash produce.
  - To properly wash produce, run under warm tap water and scrub skin with a clean vegetable brush.
  - Even if you plan to peel a fruit or vegetable, wash the skin and rind before cutting or peeling (for example, bananas, oranges, melons, and avocados).
- Separate and thoroughly wash all salad greens. Re-wash all produce even if it’s “pre-washed”.
- Thaw foods by using one of the following methods:
  - Put the food item in the refrigerator 1 day before cooking.
  - Use the defrost setting on a microwave. Cook right away.
- Keep your refrigerator at a temperature of 33°F to 40°F (0.6°C to 4.4°C). Keep your freezer at a temperature of 0°F (-17.8°C) or below.
- Don’t eat hamburgers and other meat products if the meat looks undercooked. Cook the meat until it’s grey and the juices run clear.
- Cook fish until it flakes and shellfish until it’s cooked-through and opaque.
- Cook egg whites and yolks until they’re firm.
- Use a food thermometer to check that all foods are cooked to the minimum
internal temperatures listed in the chart below. Check the temperature at the center of the thickest part of the food.

- Don’t share food with other people.
- Always remember: when in doubt, throw it out!

<table>
<thead>
<tr>
<th>Food</th>
<th>Safe Minimum Internal Temperatures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Egg and Egg Dishes</strong></td>
<td></td>
</tr>
<tr>
<td>Eggs</td>
<td>Cook until yolk and white are firm</td>
</tr>
<tr>
<td>Egg dishes</td>
<td>160° F (71° C)</td>
</tr>
<tr>
<td>Egg sauces</td>
<td>160° F (71° C)</td>
</tr>
<tr>
<td><strong>Ground Meat and Meat Mixtures</strong></td>
<td></td>
</tr>
<tr>
<td>Turkey and chicken</td>
<td>165° F (74° C)</td>
</tr>
<tr>
<td>Beef, hamburgers, veal, lamb, and pork</td>
<td>160° F (71° C)</td>
</tr>
<tr>
<td><strong>Fresh Beef, Veal, and Lamb</strong></td>
<td></td>
</tr>
<tr>
<td>Well done</td>
<td>170° F (77° C)</td>
</tr>
<tr>
<td><strong>Fresh Pork</strong></td>
<td></td>
</tr>
<tr>
<td>Well done</td>
<td>170° F (77° C)</td>
</tr>
<tr>
<td><strong>Ham</strong></td>
<td></td>
</tr>
<tr>
<td>Raw or fresh</td>
<td>160° F (71° C)</td>
</tr>
<tr>
<td>Precooked, cured ham</td>
<td>140° F (60° C)</td>
</tr>
<tr>
<td><strong>Poultry</strong></td>
<td></td>
</tr>
<tr>
<td>All products</td>
<td>165° F (74° C)</td>
</tr>
<tr>
<td><strong>Seafood (Fish and Shellfish)</strong></td>
<td></td>
</tr>
<tr>
<td>All (raw or fresh)</td>
<td>145° F (63° C)</td>
</tr>
</tbody>
</table>
Eating leftovers

- Refrigerate leftovers in shallow containers right after eating.
- Reheat the following leftovers to an internal temperature of at least 165°F (74°C) for at least 15 seconds:
  - Poultry
  - Stuffed meat, poultry, or fish
  - Ground meat
  - Pork, beef, veal, and lamb
  - Hard-boiled eggs
- When reheating leftovers in the microwave, stir, cover, and rotate the food so that it heats evenly.
- Sauces, soups, and gravies should be reheated by bringing them to a boil.
- Be sure to let the food cool so you don’t burn your mouth.
- Eat reheated leftovers within 1 hour of reheating.
- Don’t eat leftovers more than 2 days old.
- Don’t eat any food that has already been reheated once.

What to Eat on a Low-Microbial Diet

Breads, Grains, and Cereals

<table>
<thead>
<tr>
<th>What to eat</th>
<th>What to avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>All breads, rolls, bagels, English muffins, waffles, French toast, muffins, pancakes, and sweet rolls</td>
<td>Undercooked or raw brewer’s yeast</td>
</tr>
<tr>
<td>Potato chips, corn chips, tortilla chips, popcorn, and pretzels</td>
<td></td>
</tr>
<tr>
<td>Any cooked or ready-to-eat cereal purchased prepackaged from a store</td>
<td></td>
</tr>
<tr>
<td>Rice, pasta, and other cooked grains</td>
<td></td>
</tr>
</tbody>
</table>
### Milk and Dairy Products

<table>
<thead>
<tr>
<th>What to eat</th>
<th>What to avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>All <strong>pasteurized</strong> dairy products, including:</td>
<td>All <strong>unpasteurized</strong> dairy products, including:</td>
</tr>
<tr>
<td>- Commercially available milk and milk products (such as sour cream and whipped cream)</td>
<td>- Raw milk</td>
</tr>
<tr>
<td>- Yogurts, including those made with live cultures (such as Dannon®, Chobani®, and Stonyfield®)</td>
<td>- Homemade eggnog and yogurt</td>
</tr>
<tr>
<td>- Processed pre-packaged cheese slices and spreads, cream cheese, cottage cheese, and ricotta cheese</td>
<td>- Cheese made from <strong>unpasteurized</strong> milk, often including soft cheeses such as Brie, farmer's cheese, Camembert, Mexican-style cheese (such as queso blanco and queso fresco), goat cheese, and some mozzarella cheese. These are okay to eat if cooked until melted.</td>
</tr>
<tr>
<td>- Commercially packaged pasteurized cheese such as American, cheddar, mozzarella, Monterey jack, Swiss, and Parmesan</td>
<td>- Mold-ripened cheeses such as Roquefort, Stilton, Gorgonzola, and blue cheese</td>
</tr>
<tr>
<td>- Soft cheeses clearly labeled as “made from pasteurized milk,” including goat and feta</td>
<td>- Avoid eating the rind on cheeses, as it often contains mold (such as Brie)</td>
</tr>
<tr>
<td>- Prepackaged ice cream, frozen yogurt, sherbet, popsicles, ice cream bars, puddings, and fresh homemade milkshakes</td>
<td>Other dairy products:</td>
</tr>
<tr>
<td>- Commercially sterile, ready-to-feed, and liquid concentrate infant formulas</td>
<td>- Soft serve ice cream or yogurt</td>
</tr>
<tr>
<td></td>
<td>- Unrefrigerated, cream-filled pastry products</td>
</tr>
<tr>
<td></td>
<td>- Fermented dairy products (such as Kefir)</td>
</tr>
<tr>
<td></td>
<td>- Cheese sliced at the deli counter</td>
</tr>
<tr>
<td></td>
<td>- Cheeses that contain chili peppers or other uncooked vegetables</td>
</tr>
</tbody>
</table>

### Eggs

<table>
<thead>
<tr>
<th>What to eat</th>
<th>What to avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Well-cooked eggs (firm white and yolk) and pasteurized egg products (such as Egg Beaters®, powdered eggs, or liquid egg whites)</td>
<td>- Undercooked unpasteurized eggs and egg products</td>
</tr>
<tr>
<td>- Pasteurized eggs, like those served at MSK, may be eaten runny. One example is Davidson’s Safest Choice® Pasteurized Eggs, which are stamped with a red P. To see if they’re sold in your area, use the store locator at <a href="http://www.safeeggs.com/store-locator">www.safeeggs.com/store-locator</a></td>
<td>- Raw eggs and foods containing raw eggs (such as homemade Caesar dressing, freshly made mayonnaise and aioli, and raw cookie dough)</td>
</tr>
</tbody>
</table>
# Meat, Meat Substitutes, Poultry, and Seafood

<table>
<thead>
<tr>
<th><strong>What to eat</strong></th>
<th><strong>What to avoid</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Well-cooked meat and poultry (such as pork, beef, lamb, chicken, and turkey)</td>
<td>Undercooked or raw meats, poultry, and fish, including rare or medium-rare items</td>
</tr>
<tr>
<td>Thoroughly cooked fish and seafood (such as salmon, tilapia, cod, shrimp, lobster, crab, and canned tuna or salmon). Take extra caution with shellfish that’s in the shell (such as lobster) and be sure to cook it fully through until it’s opaque.</td>
<td>Uncooked or raw tempeh, miso products, and tofu</td>
</tr>
<tr>
<td>Cooked tofu or pasteurized or shelf-stable tofu</td>
<td>Freshly sliced deli meats and meats from street vendors</td>
</tr>
<tr>
<td>Cooked fermented products, including miso and tempeh</td>
<td>Raw or partially cooked fish and shellfish, including caviar, sashimi, sushi, and ceviche (“lemon-cooked” or cured fish)</td>
</tr>
<tr>
<td>Commercially prepared hot dogs and pre-sliced deli meats sold in a sealed package (such as salami, bologna, ham, and turkey) that are cooked until steaming hot. Throw away extras within 48 hours of opening.</td>
<td>Raw or cooked clams, mussels, and oysters</td>
</tr>
<tr>
<td>Well-cooked bacon and sausage</td>
<td>Smoked seafood, such as salmon or trout labeled as “Nova style,” “lox,” “kippered,” “smoked,” or “jerky” (unless cooked to 160° F or contained in a cooked dish or casserole)</td>
</tr>
<tr>
<td>Canned meats and commercially packaged beef or turkey jerky</td>
<td>Refrigerated pâtés and meat spreads</td>
</tr>
<tr>
<td>Canned and shelf-stable smoked fish</td>
<td>Hard-cured salami in natural wrap</td>
</tr>
</tbody>
</table>

# Fruits and Vegetables

<table>
<thead>
<tr>
<th><strong>What to eat</strong></th>
<th><strong>What to avoid</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Well-washed raw fruits and vegetables without cuts, bruises, or mold. Examples include apples, pears, peaches, peppers, salad greens, carrots, cucumbers, and tomatoes.</td>
<td>Unwashed raw or frozen fruits, vegetables, and herbs</td>
</tr>
<tr>
<td>Well-washed and peeled thick-skinned fruits and vegetables. Examples include citrus fruits, bananas, avocados, mangos, and melons.</td>
<td>Any raw or frozen “rough-textured” fruits and vegetables that can’t be thoroughly washed (such as strawberries, raspberries, blackberries, broccoli, and cauliflower). These are okay if cooked.</td>
</tr>
<tr>
<td>Cooked and canned fruits and vegetables</td>
<td>Pre-cut fresh fruits and vegetables (such as pre-cut melon)</td>
</tr>
<tr>
<td>Well-washed frozen fruits and vegetables</td>
<td>Unpasteurized and fresh-squeezed fruit and vegetable juices (unless prepared at home)</td>
</tr>
<tr>
<td>Pasteurized juices and frozen concentrates</td>
<td>Fresh fruit or vegetable salsa found in the</td>
</tr>
</tbody>
</table>
- Commercially packaged dried fruits
- Shelf-stable bottled salsa (refrigerate after opening)
- Fresh, well-washed herbs
- Dried herbs and spices

- grocery refrigerator case
- Vegetarian sushi, unless it’s homemade, because it may be prepared near raw fish
- All uncooked vegetable sprouts (alfalfa, bean, clover, and all others)
- Salads from delis or salad bars

## Drinks

<table>
<thead>
<tr>
<th>What to drink</th>
<th>What to avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Tap water and ice, if your water is from a city water supply or a municipal well serving a highly populated area</td>
<td>- Unpasteurized eggnog, apple cider and other unpasteurized fruit or vegetables juices</td>
</tr>
<tr>
<td>- Water from private wells or small community wells only if the well is tested daily for bacteria. If the well isn’t tested daily, boil the water before using it.</td>
<td>- Unpasteurized beer (such as microbrewery beers and those that aren’t shelf-stable) and wine. Talk with your doctor before consuming any alcoholic beverages.</td>
</tr>
<tr>
<td>- Commercially bottled distilled, spring, and natural waters</td>
<td>- Fountain soda and other fountain beverages</td>
</tr>
<tr>
<td>- Pasteurized fruit and vegetable juices</td>
<td>- Tea made with loose leaves, cold brewed tea, sun-tea, kombucha, and mate tea</td>
</tr>
<tr>
<td>- Bottled, canned, or powdered beverages</td>
<td>- Iced or cold brewed coffee or tea from restaurants or coffee shops</td>
</tr>
<tr>
<td>- Hot coffee</td>
<td>-</td>
</tr>
<tr>
<td>- Hot teas using commercially packaged tea bags</td>
<td>-</td>
</tr>
<tr>
<td>- Homemade iced tea and iced coffee made from hot brewed (boiling) tea or coffee, as long as you store it in the refrigerator and drink it within 2 days</td>
<td>-</td>
</tr>
<tr>
<td>- Pasteurized soy milk and other non-dairy milks (such as almond, rice, and coconut milk)</td>
<td>-</td>
</tr>
<tr>
<td>- Commercially made liquid nutritional supplements (such as Ensure® and Boost®)</td>
<td>-</td>
</tr>
</tbody>
</table>

## Nuts

<table>
<thead>
<tr>
<th>What to eat</th>
<th>What to avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Factory-packaged roasted nuts</td>
<td>- All nuts that are sold open and in bulk, as in some health food or specialty stores</td>
</tr>
<tr>
<td>- Factory-packaged raw almonds or hazelnuts (required by law to be pasteurized), or other raw nuts labeled as “pasteurized”</td>
<td>- Unpasteurized raw nuts</td>
</tr>
<tr>
<td></td>
<td>- Roasted nuts in the shell (such as pistachios or peanuts in the shell)</td>
</tr>
</tbody>
</table>
- Nuts in baked goods
- Commercially packaged nut butters (such as peanut, almond, and soybean)

- Freshly ground peanut butter or nut butters (not commercially packaged)

## Condiments and Miscellaneous

<table>
<thead>
<tr>
<th>What to eat</th>
<th>What to avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salt and sugar</td>
<td>Raw or unpasteurized honey and honeycomb</td>
</tr>
<tr>
<td>Jellies, syrup, and jams (refrigerate after opening)</td>
<td>Whole or fresh ground black pepper served tableside at restaurants</td>
</tr>
<tr>
<td>Pasteurized or flash pasteurized honey</td>
<td>Shared condiment containers at restaurants (ask for individual packets)</td>
</tr>
<tr>
<td>Packaged ground black pepper, herbs, and spices</td>
<td>Fresh salad dressings (stored in grocer’s refrigerated case) containing raw eggs or cheeses, such as Caesar salad dressing</td>
</tr>
<tr>
<td>Ketchup, mustard, BBQ sauce, and soy sauce (refrigerate after opening)</td>
<td>Herbal and nutritional supplement preparations</td>
</tr>
<tr>
<td>Pickles, pickle relish, and olives (refrigerate after opening)</td>
<td></td>
</tr>
<tr>
<td>Vinegar</td>
<td></td>
</tr>
<tr>
<td>Vegetable oils and shortening</td>
<td></td>
</tr>
<tr>
<td>Refrigerated margarine and butter</td>
<td></td>
</tr>
<tr>
<td>Commercially made, shelf-stable mayonnaise and salad dressings, including Caesar, blue cheese, and other cheese-based salad dressings (refrigerate after opening)</td>
<td></td>
</tr>
<tr>
<td>Cooked gravy and sauces</td>
<td></td>
</tr>
</tbody>
</table>

## Desserts

<table>
<thead>
<tr>
<th>What to eat</th>
<th>What to avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refrigerated, commercially made, and homemade cakes, pies, pastries, and pudding</td>
<td>Unrefrigerated, cream-filled pastry products (not shelf stable)</td>
</tr>
<tr>
<td>Refrigerated cream-filled pastries</td>
<td>Soft serve ice cream and frozen yogurt</td>
</tr>
<tr>
<td>Cookies, both homemade and commercially prepared</td>
<td>Ice cream scooped at a restaurant</td>
</tr>
<tr>
<td>Shelf-stable, cream-filled cupcakes and fruit pies</td>
<td></td>
</tr>
<tr>
<td>Packaged ice cream and frozen yogurt from the grocery store</td>
<td></td>
</tr>
<tr>
<td>Candy and gum</td>
<td></td>
</tr>
</tbody>
</table>
## Eating Outside the Home and Take-Out

<table>
<thead>
<tr>
<th>What to eat</th>
<th>What to avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>● All foods recommended in previous food groups must come directly off the grill or stove and not be served on steam tables or stored under heat lamps. Examples of foods that are safe to eat include freshly made pizza (not sliced or reheated); hamburger directly off a grill; just-cooked French fries; and whole, just-cooked rotisserie chicken moved directly from rotisserie to package by a gloved employee.</td>
<td>● Any food that isn’t freshly made to order</td>
</tr>
<tr>
<td>● Single-serving condiment packages (no pump serve containers)</td>
<td>● Unpasteurized fruit juices and dairy products (such as juices ordered from a juice bar)</td>
</tr>
<tr>
<td>● Hot black coffee or hot tea from a coffee shop, without mixing by staff or using shared, un-refrigerated milk containers.</td>
<td>● Raw fruits and vegetables and desserts with fresh fruit</td>
</tr>
<tr>
<td></td>
<td>● Deli meats and cheeses sliced at the deli counter</td>
</tr>
<tr>
<td></td>
<td>● Salad bars, buffets, smorgasbords, potlucks</td>
</tr>
<tr>
<td></td>
<td>● Sidewalk vendors</td>
</tr>
<tr>
<td></td>
<td>● Soft serve ice cream and yogurt</td>
</tr>
<tr>
<td></td>
<td>● Fast food (such as McDonalds® and Subway®)</td>
</tr>
<tr>
<td></td>
<td>● Reheated foods</td>
</tr>
</tbody>
</table>

### Eating out at restaurants

You can eat out while on a low-microbial diet **unless you had a stem cell transplant**. If you had a stem cell transplant, see the “Guidelines for people who had a bone marrow or stem cell transplant” section below.

It’s important to choose the restaurant carefully. Local health departments inspect restaurants to make sure that they’re clean, and that they follow safe food practices. You can find out how your local restaurants did on a recent health inspection by going to your local Department of Health (DOH) website. To find out about restaurants in New York City, go to the following website: [www1.nyc.gov/site/doh/services/restaurant-grades.page](http://www1.nyc.gov/site/doh/services/restaurant-grades.page)

You can also ask your local restaurants about their food safety training rules. When you go out to eat, follow the guidelines below.

- Order all foods to be fully cooked and meats to be well done.
- Don’t order foods that may have raw eggs (such as Caesar salad dressing, fresh mayonnaise or aioli, and hollandaise sauce).
- Ask the wait staff if you aren’t sure of the ingredients in your meal.
• Don’t eat foods from buffets and salad bars.

• Ask that your foods be cooked fresh and not served from steam tables or stored under heat lamps.

• Ask for single-serving condiments, such as ketchup and mustard packets. Open containers may be used by many customers.

• Don’t eat soft serve ice cream and soft serve frozen yogurt. The dispensers may contain bacteria if they’re not cleaned often.

• Always order a whole or personal pizza. Don’t order individual slices, since they’re often stored under heat lamps.

Guidelines for people who had a bone marrow or stem cell transplant
People who had an allogeneic or autologous stem cell transplant shouldn’t eat out at restaurants for the first 100 days after their transplant. Please speak to someone on your healthcare team if you have any questions or concerns about eating out before or after the 100-day period.

Avoid supplements
Don’t take supplements, homeopathic remedies, or herbal products (such as St. John’s wart, traditional Chinese medicines) unless discussed with your MSK medical team. Because there are no federal standards for these products in the United States, the way they’re processed and stored may pose a health risk. Microbes in these items can also cause an infection. Also, the products themselves could interfere with or change the activity of a prescription medication.

Safe drinking water
Never drink from lakes, rivers, streams, springs, or wells.

If you’re unsure if the tap water is safe, check with the local health department or boil or filter the water. Drink bottled water if you think the tap water may not be safe. Note that most water filtration devices will not make the water safe if the water supply hasn’t been chlorinated.

If you use well water that isn’t tested daily for bacteria, you must boil it. Bring the water to a rolling boil for 15 to 20 minutes. Store boiled water in the
refrigerator. Throw away any boiled water that you don’t use within 48 hours.

Resources

Use the resources below to find additional information about preventing foodborne illness and the safe handling, storage, and preparation of food.

Government websites with information and news about foodborne illnesses, recalls, and regulations:

- **United States Department of Agriculture (USDA) Food Safety and Inspection Service**
  www.fsis.usda.gov

- **U.S. Department of Health & Human Services Food Safety Information**
  www.foodsafety.gov

- **U.S. Food & Drug Administration (FDA)**
  www.fda.gov/ForConsumers/default.htm

- **Centers for Disease Control and Prevention Food Safety**
  www.cdc.gov/foodsafety/

**Fight BAC! Partnership for Food Safety Education**
A website with practical tips about how to keep food safe.
www.fightbac.org

**USDA “Ask Karen”**
A web-based question and answer system that allows visitors to read previously asked questions and submit new questions about foodborne illnesses and safe food handling, storage, and preparation.
www.fsis.usda.gov/wps/portal/informational/askkaren

**NYC Department of Health and Mental Hygiene Restaurant Inspection Information**
A website where you can search for New York City restaurant inspection results and grades.
www1.nyc.gov/site/doh/services/restaurant-grades.page
The Safe Food Information Line
Call this number to contact the U.S. FDA by phone.
888-723-3366

Nutrition services at MSK
Call this number to schedule an appointment with one of MSK’s registered dietitians or nutritionists.
212-639-7312

If you have any questions or concerns, talk with a member of your healthcare team. You can reach them Monday through Friday from 9:00 AM to 5:00 PM at ______________________. After 5:00 PM, during the weekend, and on holidays, please call_____________________. If there’s no number listed, or you’re not sure, call 212-639-2000.

Low-Microbial Diet
### INFO FOR PERSON WEARING THE ID

<table>
<thead>
<tr>
<th>FULL NAME</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE OF BIRTH</td>
<td>GENDER</td>
<td></td>
</tr>
<tr>
<td>PRIMARY ADDRESS</td>
<td>UNIT/APT #</td>
<td></td>
</tr>
<tr>
<td>CITY</td>
<td>STATE</td>
<td>ZIP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EMAIL ADDRESS</th>
<th>PHONE NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>☐ Home ☐ Cell ☐ Work</td>
</tr>
</tbody>
</table>

### SELECT YOUR MEDICAL ID

<table>
<thead>
<tr>
<th>MEDICAL ID NAME</th>
<th>SIZE</th>
<th>PRICE</th>
</tr>
</thead>
</table>

### SELECT AN ADD-ON SERVICE

<table>
<thead>
<tr>
<th>ADD-ON SERVICE</th>
<th>PRICE</th>
</tr>
</thead>
</table>

### ENGRAVING YOU WOULD LIKE

Engraving character limits vary. List most important items first.

| LINE 1 |   |   |
| LINE 2 |   |   |
| LINE 3 |   |   |
| LINE 4 |   |   |

Go online or call after enrollment to complete health and emergency contact information.

### CALCULATE PAYMENT

<table>
<thead>
<tr>
<th>ID PRICE</th>
<th>ADD-ON PRICE</th>
<th>$7.00</th>
<th>TOTAL</th>
</tr>
</thead>
</table>

### PAYMENT INFORMATION

- □ Check/MO  
- □ MasterCard  
- □ Visa  
- □ AMEX  
- □ Discover

<table>
<thead>
<tr>
<th>CREDIT CARD NUMBER</th>
<th>EXP DATE (MM/YY)</th>
</tr>
</thead>
</table>

| CREDIT CARD HOLDER’S NAME | |
|---------------------------| |
| CREDIT CARD HOLDER’S BILLING ADDRESS | |

**SIGNATURE FOR CARD AUTHORIZATION**

**SIGNATURE OF MEMBER**

By signing above you agree to our terms & conditions as shown online at www.medicalert.org/consent. A parent or guardian signature is required for members under 18.
My MedicAlert Services

When purchasing a MedicAlert medical ID you receive a suite of services designed to protect you in the event of an emergency. These services are connected to your medical ID for one-year.

Select from our three optional add-on services:

24/7 Emergency Response
First responders and medical professionals are trained to recognize MedicAlert IDs and call our 24/7 Emergency Response Center. We immediately connect them to your medical history, ensuring you receive quick treatment and proper medical care.

24/7 Family Notification
We will communicate with your loved ones to inform them of your emergency and location, ensuring you are quickly reunited with family/friends.

Emergency Health Record
We provide an electronic Emergency Health Record that you can maintain and access from anywhere, at any time. The information from your health record is communicated to first responders and health professionals during an emergency to speed your treatment and ensure quality care.

Physician Notification
We will contact your physician to notify them of your emergency. This service allows for your physician to communicate directly with the treating facility to understand your situation and the type of treatment provided; allowing for exceptional follow up care.

Contact Center Support
We provide live customer support agents to assist you with medical information updates, service upgrades, engraving recommendations, and medical ID purchases. Support is available Mon-Fri (6AM – 5PM PST).

Global Services
Our dedication to safeguarding your health in the event of an emergency expands beyond our borders into more than 50 countries, and translation services are available in 140 languages.

Advantage
PRICE: $29.99 for 1 year
Our premiere service plan which provides comprehensive protection. In additional to the My MedicAlert services, Advantage customers receive medical document storage and exclusive discounts.

Advantage service required if purchasing medical ID for DNR purposes.

Kid Smart
PRICE: $19.99 for 1 year
Our premiere service plan for kids (age 18 and under) which provides comprehensive protection. In additional to the My MedicAlert services, Kid Smart customers receive medical document storage and exclusive discounts.

In partnership with the Alzheimer’s Association, we have created this specialized program to provide 24/7 wandering protection and emergency response services for individuals living with Alzheimer’s or other related dementias who are at risk for wandering and becoming lost.
**Chain Bracelets**

### Classic Steel with Color - $27.99
- Red
- White
- Blue
- Black
- Green
- Pink
- Orange
- Purple
- Light Blue

Sizes available: 4” - 10” in ½” increments

### Classic
- Steel X-Sm ID - $27.99
- Steel Sm ID - $37.99
- Steel Lg ID - $39.99
- 10K Gold Sm ID - $169.99
- 10K Gold Lg ID - $189.99
- Sterling Silver Sm ID - $89.99
- Sterling Silver Lg ID - $99.99

Sizes available: 4” - 10” in ½” increments

### Classic Contrast
- Sm ID - $47.99
- Lg ID - $49.99

Sizes available: 4” - 10” in ½” increments

### Standard - $34.99
- Option 1
- Option 2
- Option 3

Sizes available: 4” - 10” in ½” increments

### Linking Hearts - $44.99

Sizes available: 4” - 10” in ½” increments

### Intrepid Titanium
- Sm Red - $49.99
- Sm Black - $49.99
- Lg Red - $59.99
- Lg Black - $59.99

Sizes available: 6.5-7” (for Sm only), 7.5-8”, 8.5-9” (for Lg only)

### Sweetheart - $27.99

Sizes available: 4” - 10” in ½” increments

**Note:** This ID has limited engraving space

### Sterling Silver Sweetheart - $89.99

Sizes available: 4” - 10” in ½” increments

**Note:** This ID has limited engraving space

### Special Sterling Silver Bar
- Sm - $99.99
- Lg - $149.99

Sizes available: 4” - 10” in ½” increments

### Executive Sterling Silver Bar
- Sm - $129.99
- Lg - $149.99

Sizes available: 4” - 10” in ½” increments

### Santa Rosa Elite Sterling Silver
- Sm - $99.99
- Lg - $119.99

Sizes available: 4” - 10” in ½” increments

### Cable Choice Sterling Silver - $159.99

Sizes available: 4” - 10” in ½” increments

---

**Beaded Bracelets**

### Crystal - $79.99
- Iridescent
- Rose
- Amethyst
- Onyx
- Green
- Blue

Sizes available: 7”, 8”

### Sparkle Embossed - $44.99
- Orange
- Pink
- Blue
- Black
- Red

Sizes available: 6”, 7”, 8”

### Sparkle - $37.99
- Orange
- Pink
- Blue
- Black
- Red

Sizes available: 6”, 7”, 8”

---

**Stretch Bands**

### Embossed
- Sm Steel - $37.99
- Lg Steel - $39.99
- Sm Gold Tone - $47.99
- Lg Gold Tone - $49.99

Sizes available: 5-6”, 6.5-7.5”, 8-9”

### Classic Contrast
- Sm - $47.99
- Lg - $49.99

Sizes available: 5-6”, 6.5-7.5”, 8-9”

---

**Charm Bracelets**

### Sweetheart Charm - $27.99

Sizes available: 4” - 10” in ½” increments

**Note:** This ID has limited engraving space

### Classic
- Sterling Silver - $89.99
- 10K Gold - $159.99

Sizes available: 4” - 10” in ½” increments

**Note:** This ID has limited engraving space

### Cable Chain with Toggle - $159.99

Sizes available: 4” - 10” in ½” increments

**Note:** This ID has limited engraving space
### SILICONE BANDS

**COMPETE - $34.99**
- Red
- Black
- White
- Yellow
- Violet
- Green
- Purple

One-size fits most. Trim to correct size.

**PLAY - $24.99**
- Red
- Black
- White
- Yellow
- Violet
- Green

Sizes available: 6", 6.75", 7.5"

### SPORTS BANDS

**REFLECTIVE - $34.99**
- Black
- Pink
- Yellow
- Blue

Sizes available: Small=5"-6", Medium=6.5"-8"

**CLASSIC ADULT - $34.99**
- Black
- Blue
- Purple
- Red
- Navy Blue
- Orange

Sizes available: Small=5"-6.5", Medium=6.5"-8", Large=8"-9.5"

**CLASSIC KID - $34.99**
- Black
- Pink
- Yellow
- Blue
- Navy Blue
- Red

Sizes available: Small=4"-5", Medium=5"-6", Large=6"-7.5"

### PARACORD BRACELETS

**VIBRANT - $29.99**
- Black
- Pink
- Blue
- Orange
- Purple

Sizes available: 5.5", 6", 6.5", 7", 7.5", 8", 8.5"

**TWO-TONE - $34.99**
- Grey/Black
- Red/Black
- Blue/Black

Sizes available: Sm.=5"-5.75", Med.=6"-6.75", Lg.=7.25"-8"

*NOTE: This ID has limited engraving space*

### SHOE TAGS

**STEEL - $24.99**

*NOTE: This ID has limited engraving space*

**SILICONE & STEEL - $24.99**

*NOTE: This ID has limited engraving space*

### NECKLACES

**CLASSIC BALL**
- Steel with red - $24.99
- Steel with black - $24.99
- Steel - $29.99
- Two-tone - $44.99

Comes on a 30” beaded chain.

**CLASSIC**
- Steel with red - $27.99
- Steel with black - $27.99
- Steel with purple - $27.99
- Steel - $34.99
- Sterling Silver - $79.99
- Two-tone - $49.99
- 10K gold - $169.99

Comes on a 26” or 30” curb chain.

**SWEETHEART**
- Steel on 26” or 30” curb chain - $34.99
- Sterling silver on 26” neck chain - $79.99

**STERLING SILVER FRENCH ELITE TEARDROP - $109.99**

Comes on a 24” sterling silver french rope chain.

**STERLING SILVER BOX ELITE - $119.99**

Comes on a 24” sterling silver rope edge chain.

### DOG TAGS

**STAINLESS STEEL - $24.99**
- Black
- Steel

Comes on a 30” beaded chain.

**ALUMINUM - $29.99**
- Blue
- Red
- Green
- Pink

Comes on a 30” beaded chain.

**TITANIUM - $59.99**
- Black
- Red

Comes on a 28” chain.
PATIENT & CAREGIVER EDUCATION

Sexual Activity During Cancer Treatment: Information for Men

This information provides guidance for men on sexual activity during cancer treatment.

Most men can be sexually active throughout their cancer treatment, but it’s important to do so safely. If you have any questions about the information below, speak with your doctor or nurse. If you have any concerns about how to follow these suggestions based on your religious observances, we advise you to speak with your religious leader.

Use Birth Control to Prevent Pregnancy

It’s important to prevent pregnancy while you’re getting cancer treatment. If you become pregnant with an egg that has been damaged by exposure to radiation, chemotherapy, or other anticancer medications, or if an embryo or fetus is exposed to these treatments during its development, you may have an increased risk for miscarriage or birth defects.

If your partner is a female who could become pregnant, use birth control (contraception) throughout your cancer treatment. Don’t rely on withdrawing before ejaculation (“pulling out”) or on avoiding sex during fertile times of her menstrual cycle (the “rhythm method”). These methods are not effective in preventing pregnancy.

Types of birth control

- If you have only 1 female partner, you could use condoms. You could also ask your partner to see the healthcare provider (HCP) who manages her gynecologic care to help her select a method of birth control that is best for her. Examples include birth control pills and intrauterine devices (IUDs).
- If your partner chooses not to use birth control, or if you have more than 1
partner, use a condom each time you have sex. Condoms not only prevent pregnancy, but they also protect you from sexually transmitted infections (STIs), including HIV. See the section “Barrier Devices” for information on buying and using condoms.

- A vasectomy is a permanent method of birth control for people who are sure that they don’t want any (more) children. This is a minor surgery that is done to block sperm from being released with your semen.

**Other considerations**

Continue to use birth control for a period after your treatment ends in order to prevent pregnancy.

- If you’re getting chemotherapy or radiation directed to an area near your testes, continue to use birth control for at least 1 year after your treatment ends. This allows time for damaged sperm to clear from your body.
- If you’re getting targeted or immunotherapy, the amount of time you should use birth control will vary based on the medication you’re taking. Ask your doctor or nurse how long you should continue to use birth control after treatment.

If you plan to have children after treatment, ask your doctor when it will be safe for you to start trying.

Some cancer treatments may affect your fertility (the ability to have a biological child). If you have questions about this, ask your doctor or nurse.

**Protect Yourself from Infection**

If you or your partner have sex with multiple partners, and you don’t use barrier protection (see the section “Barrier Devices”), you’re at risk for sexually transmitted infections (STIs), including HIV, if you do not use barrier protection. In addition, certain cancer treatments can cause low blood cell counts for long periods of time which may increase your risk of infection. Your doctor or nurse will tell you if this is a concern for you.

To prevent infection:

- Wash your hands and genitals before and after having vaginal, oral, or anal
To protect yourself from STIs (including HIV), consider using a condom each time you have vaginal, oral, or anal sex throughout your treatment.

- If you use sex toys, wash them with hot soapy water every time you use them.

- If you are expected to have very low blood cell counts for a long period of time, your doctor or nurse may recommend that you use a barrier device during sex, such as condoms or dental dams. See the section “Barrier Devices” for more information.

  - In some situations, your doctor may recommend for you to avoid sex that involves penetration or contact with mucous membranes while your blood counts are low. This includes vaginal, oral, and anal sex or inserting fingers, vibrators, or sex toys into your anus.

  - Hugging, cuddling, gentle touching, and kissing skin are other ways you can be intimate with your partner during this time.

- Some men develop yeast infections under the foreskin of the penis during treatment, especially if they're taking steroids or antibiotics. Symptoms include itching, irritation, and discharge from the penis. If you suspect you have a yeast infection, avoid sex and call your doctor or nurse.

If you had stem cell transplant, you are at an increased risk of infection for many months after your treatment. Until your doctor tells you that your immune system has recovered:

- Use a latex condom each time you have vaginal, oral, or anal sex.

- Use a condoms or dental dam any time your partner’s saliva, vaginal secretions, or semen could enter your mouth. See the section “Barrier Devices” for more information.

- Do not perform any sexual activity that could expose your mouth to feces.

**Consider Steps to Avoid Exposing Your Partner to Chemotherapy and Other Anticancer Medications**

We don’t know how much anticancer medication gets into a man’s semen or if
this poses any risk to a sexual partner. If this is a concern for you or your partner, you may want to use a condom whenever your semen could enter your partner’s vagina, mouth, or anus. This will prevent your partner, regardless age or sex, from being exposed to any medication that may be in your semen.

We don’t know how long these medications may be in semen, but you could use a condom each day you receive anticancer treatment and for 1 week afterward.

Make sure to use condoms throughout treatment if needed for birth control or to protect yourself from infection. See the section “Barrier Devices” for more information.

If your partner is pregnant during your treatment, we don’t know if the medications in your semen would pose any risk to the fetus. Scientific studies on animals suggest this is possible, so we recommend using a condom each time you have sex. See the section “Barrier Devices” for more information.

**Barrier Devices**

**Condoms**

- You can buy condoms at any drug store. We recommend latex condoms, but if you or your partner is allergic to latex, use polyurethane condoms.

- Spermicides do not provide any added protection.

- You can use lubricated condoms or use a separate water- or silicone-based lubricant.

- Before you use a condom, check the expiration date on the wrapper. Expired condoms are more likely to break.

- To use a condom correctly:

  1. Be careful when opening and handling the condom. Don’t use your teeth, scissors, or other sharp objects to open the wrapper. Don’t use the condom if it is torn, brittle, or stiff.

  2. Wait until your penis becomes firm before putting on the condom.

  3. While pinching the tip of the condom, unroll it over your penis as far as it will go. The extra space at the tip is needed to collect your semen.
4. Smooth out any air bubbles because they can cause the condom to break.

5. After you have ejaculated, but before your penis becomes soft, hold the base of the condom (where the ring is) and carefully pull your penis out of your partner so that nothing spills.

6. Carefully slide off the condom and throw it in the trash.

A condom can tear if it’s too tight or it can fall off if it’s too loose. If this happens while you’re having vaginal sex, your female partner may want to consider taking emergency contraception if she isn’t using another form of birth control. Emergency contraception includes levonorgestrel (Plan B®), also known as the “morning-after pill.”

**Dental dams**

- A dental dam is a thin, rectangular sheet of latex or silicone that covers the genitals of a woman receiving oral sex.

- You can buy these online, get them from the New York City Department of Health and Mental Hygiene, or make one out of a condom.

- If you want to make a dental dam out of a condom, cut off the tip and cut down the side of the tube to make a sheet.
  - You may want to avoid condoms with a spermicide or lubricant, as the taste may be unpleasant.

- To use a dental dam, have your female partner hold the sheet over her vulva or anus while you are giving her oral sex.

**Resources**

**Memorial Sloan Kettering (MSK) Male Sexual and Reproductive Medicine Program**
646-888-6024
Call for help with issues related to male sexual function.

**American Cancer Society**
*Sex and the Man with Cancer*
www.cancer.org
Call 1-800-ACS-2345 to request printed material.
If you have any questions or concerns, talk with a member of your healthcare team. You can reach them Monday through Friday from 9:00 AM to 5:00 PM at ____________________. After 5:00 PM, during the weekend, and on holidays, please call____________________. If there’s no number listed, or you’re not sure, call 212-639-2000.
Sexual Activity During Cancer Treatment: Information for Women

This information provides guidance for women on sexual activity during cancer treatment.

Most women can be sexually active throughout their cancer treatment, but it’s important to do so safely. If you have any questions about the information below, speak with your doctor or nurse. If you have any concerns about how to follow these suggestions based on your religious observances, we advise you to speak with your religious leader.

Use Birth Control to Prevent Pregnancy

It’s important to prevent pregnancy while you’re getting cancer treatment. If you become pregnant with an egg that has been damaged by exposure to radiation, chemotherapy, or other anticancer medications, or if an embryo or fetus is exposed to these treatments during its development, you may have an increased risk for miscarriage or birth defects. Becoming pregnant can also prevent you from receiving the best diagnostic tests and treatments for your cancer, as these may harm a fetus.

If there is any chance you could become pregnant, use birth control (contraception) throughout your cancer treatment. Don’t rely on your partner withdrawing before ejaculation (“pulling out”) or on avoiding sex during fertile times of your menstrual cycle (the “rhythm method”). These methods are not effective in preventing pregnancy.

It’s important to pick a birth control method that is effective and fits your lifestyle. Make an appointment with your healthcare provider (HCP), who manages your gynecologic care and speak with them about an option that’s best
for you.

No matter what method you choose, use your birth control as instructed or you may become pregnant. If you have any problems with your birth control, talk with your HCP to find another option.

**Types of birth control**

**Nonhormonal birth control**

The following forms of birth control don’t contain hormones and are safe for most women.

**Copper intrauterine device (IUD)**

A copper IUD is a small, T-shaped device your HCP places inside your uterus. It can stay in place for 10 years or it can be removed earlier. Copper IUDs may cause heavier blood flow during your monthly periods, so check with your oncologist (cancer doctor) to see if this is safe for you.

**Male condoms**

Male condoms can prevent pregnancy and protect you from sexually transmitted infections (STIs), including HIV. If this is your only form of birth control, have your partner use a condom each time you have vaginal sex. See the section “Barrier Devices” for information on buying and using condoms.

Female condoms are not effective in preventing pregnancy.

**Surgical sterilization**

Surgical sterilization is a permanent method of birth control for people who are sure that they don’t want any (more) children. One type of surgical sterilization is a tubal ligation (having your “tubes tied”) which permanently blocks your fallopian tubes. Another type is the placement of a device in your fallopian tubes to block them.

**Hormonal birth control**

These forms of birth control contain hormones, either a combination of estrogen and progestin, or progestin alone. Hormonal birth control is very effective in preventing pregnancy, but does not protect against STIs, including HIV.

Some medical conditions make it unsafe to use hormonal birth control, so they
aren’t right for everyone. Women who shouldn’t take hormonal birth control include those with a hormone-sensitive tumor (such as certain kinds of breast cancer), a personal or family history of blood clots, a history of migraines with aura, impaired liver function, and those who are 35 years of age or older and smoke. There are other medical conditions that also make it unsafe to use hormonal birth control, so talk with your oncologist and HCP to see if hormonal birth control is right for you and which type is best.

There are several different kinds of hormonal birth control.

**Birth control pill**
These pills are taken once a day. Skipping a day or more may increase your chance of becoming pregnant.

**Injectable contraception (Depo-Provera®)**
This is a shot your HCP gives you every 12 weeks.

**Implantable contraception (Implanon®, Explanon®)**
This is a small rod your HCP implants under the skin of your arm. It can stay in place for 3 years or be removed earlier.

**Intrauterine device (LNG IUD, Mirena®, Skyla®)**
This is a small, T-shaped device your HCP places inside your uterus. It releases the hormone progestin. The Skyla® IUD can stay in place for 3 years and the Mirena® IUD can stay in place for 5 years, but they can be removed earlier.

**Other considerations**
Continue to use birth control for a period after your treatment ends in order to prevent pregnancy.

- If you’re getting chemotherapy or radiation directed to an area near your ovaries, continue to use birth control for at least 1 year after your treatment ends. This allows time for damaged eggs to clear from your body.
- If you’re getting targeted or immunotherapy, the amount of time you should use birth control will vary based on the medication you’re taking. Ask your doctor or nurse how long you should continue to use birth control after treatment.
If you plan to have children after your treatment, ask your doctor when it will be safe for you to start trying. Depending on your situation, your doctor may recommend you wait more or less time.

Some cancer treatments may affect your fertility (the ability to become pregnant with a biological child). If you have questions about this, ask your doctor or nurse.

Protect Yourself from Infection

If you or your partner have sex with multiple partners, and you don’t use barrier devices (see the section “Barrier Devices”), you’re at risk for STIs, including HIV. In addition, certain cancer treatments can cause low blood cell counts for long periods of time, which may increase your risk of infection. Your doctor or nurse will tell you if this is a concern for you.

To prevent infection:

- Wash your hands and genitals before and after having vaginal, oral, or anal sex.

- To protect yourself from STIs (including HIV), consider using a condom each time you have vaginal, oral, or anal sex throughout your treatment, even if you’re using another form of birth control.
  - Your partner can use a condom, or you can use a female condom. The female condom is a polyurethane pouch placed inside your vagina before sex. Don’t use a male and female condom at the same time. Female condoms are not an effective form of birth control, so you should not rely on them to prevent pregnancy.

- If you use sex toys, wash them with hot soapy water every time you use them.

- If you’re expected to have very low blood cell counts for a long period of time, your doctor or nurse may recommend that you use a barrier device during sex, such as condoms or dental dams. See the section “Barrier Devices” for more information.
  - In some situations, your doctor may recommend for you to avoid sex that involves penetration or contact with mucous membranes while your blood counts are low. This includes vaginal, oral, and anal sex or...
inserting fingers, vibrators, or sex toys into your vagina or anus.

- Hugging, cuddling, gentle touching, and kissing skin are other ways you can be intimate with your partner during this time.

- Chemotherapy and radiation to the pelvis may cause your vagina to become dry and irritated. This may cause pain during vaginal sex and lead to infection. If you have vaginal discomfort, use a condom with a water-based lubricant. Ask your nurse for information on vaginal moisturizers and lubricants to help with vaginal dryness. You may also want to avoid vaginal sex until your tissues heal.

- Some women develop vaginal yeast infections during treatment, especially if they are taking steroids or antibiotics. Symptoms include vaginal itching, irritation, and white and lumpy discharge (like cottage cheese). If you think you have a yeast infection, avoid sexual activity and call your doctor or nurse.

If you had a stem cell transplant, you’re at an increased risk of infection for many months after your treatment. Until your doctor tells you that your immune system has recovered:

- Use a latex condom each time you have vaginal, oral, or anal sex.
- Use a condom or dental dam any time your partner’s saliva, vaginal secretions, or semen could enter your mouth. See the section “Barrier Devices” for more information.
- Do not perform any sexual activity that could expose your mouth to feces.

Consider Steps to Avoid Exposing Your Partner to Chemotherapy and Other Anticancer Medications

We don’t know how much anticancer medication gets into a woman’s vaginal fluids or if this poses any risk to a sexual partner. If this is a concern for you or your partner, you may want to use a barrier device whenever your partner may have contact with your vaginal fluids. You can use a condom for vaginal or anal sex and a dental dam when you’re receiving oral sex. This will prevent your partner, regardless of age or sex, from being exposed to any medication that may be in your vaginal fluids.
We don’t know how long these medications may be in vaginal fluids, but you could use barrier devices each day you receive anticancer treatment and for 1 week afterward.

Make sure to use condoms throughout your treatment if needed for birth control or to protect yourself from infection. See the section “Barrier Devices” for more information.

Barrier Devices

Condoms

- You can buy condoms at any drug store. We recommend latex condoms, but if you or your partner is allergic to latex, use polyurethane condoms.

- Spermicides don’t provide any added protection.

- You can use lubricated condoms or use a separate water- or silicone-based lubricant.

- Before you use a condom, check the expiration date on the wrapper. Expired condoms are more likely to break.

- To use a condom correctly (instructions for your male partner):

1. Be careful when opening and handling the condom. Don’t use your teeth, scissors, or other sharp objects to open the wrapper. Don’t use the condom if it is torn, brittle, or stiff.

2. Wait until your penis becomes firm before putting on the condom.

3. While pinching the tip of the condom, unroll it over your penis as far as it will go. The extra space at the tip is needed to collect your semen.

4. Smooth out any air bubbles because they can cause the condom to break.

5. After you have ejaculated, but before your penis becomes soft, hold the base of the condom (where the ring is) and carefully pull your penis out of your partner so that nothing spills.

6. Carefully slide off the condom and throw it in the trash.

- A condom can tear if it is too tight or it can fall off if it is too loose. If this happens while you are having vaginal sex, and you are of childbearing age,
consider taking emergency contraception if you’re not using another form of birth control. Emergency contraception includes levonorgestrel (Plan B®), also known as the “morning-after pill.”

**Dental dams**

- A dental dam is a thin, rectangular sheet of latex or silicone that covers the genitals of a woman receiving oral sex.
- You can buy these online, get them from the New York City Department of Health and Mental Hygiene, or make one out of a condom.
- If you want to make a dental dam out of a condom, cut off the tip and cut down the side of the tube to make a sheet.
  - You may want to avoid condoms with a spermicide or lubricant, as the taste may be unpleasant.
- To use a dental dam, hold the sheet over your vulva or anus while your partner is giving you oral sex.

**Resources**

**Memorial Sloan Kettering (MSK) Female Sexual Medicine and Women’s Health Program**  
646-888-5076  
Call for help with issues related to female sexual function.

**American Cancer Society**  
*Sex and the Woman with Cancer*  
[www.cancer.org](http://www.cancer.org)  
Call 1-800-227-2345 to request printed material.

**American Congress of Obstetricians and Gynecologists**  
[www.acog.org/patients](http://www.acog.org/patients)

**New York City Department of Health and Mental Hygiene**  
[www1.nyc.gov/nyc-resources/service/1428/condom-information](http://www1.nyc.gov/nyc-resources/service/1428/condom-information)  
Has information on getting and using male and female condoms.

**Planned Parenthood**
If you have any questions or concerns, talk with a member of your healthcare team. You can reach them Monday through Friday from 9:00 AM to 5:00 PM at _________________. After 5:00 PM, during the weekend, and on holidays, please call________________________. If there’s no number listed, or you’re not sure, call 212-639-2000.
PATIENT & CAREGIVER EDUCATION

Sexual Health and Intimacy

This information explains how to maintain sexual health and intimacy during cancer treatment.

It’s common for people to feel changes in their body during and after cancer treatment. There may be things you can see right away, like surgical scars, drainage tubes, and catheters (thin, flexible tubes). You may experience a loss of hair, a change in your weight, pain, or fatigue (feeling more tired or weak than usual).

These physical changes may affect how you feel about yourself or how you relate to your partner. They can affect your interest in sexual activity. They may also lessen your enjoyment and pleasure.

Here are some suggestions and resources to help you adjust and cope during this time.

Coping With Your Feelings

During and after your cancer treatment, you may feel different. The first step in coping is to talk about how you feel. Family and friends can help. Your nurse, doctor, and social worker can reassure, support, and guide you. Here are some ways you can cope during and after cancer treatment:

- Recognize the things that you enjoy about yourself or make you feel special. These may be related to your family, friends, personal interests, or work life.
- Spend time doing activities and being with people that you enjoy.
- If your faith is important, maintain your spiritual or religious practices.
- Choose clothes that make you feel good.
- Have your favorite clothes altered to fit better.
- Take part in the “Look Good Feel Better” program. See the section called
Maintain Physical Intimacy With Your Partner

- Talk with your partner about your physical relationship. Talk about what you think would help you feel close and give you both pleasure. Share your concerns so that you can find solutions together.
- Increase intimate and sensual touching. Hug, caress, cuddle, touch, and hold hands to feel closer to each other.
- Try being intimate at times when you have more energy.
- Being relaxed can help with sexual enjoyment. Select a time and place when you can relax and have privacy.
- If sex is difficult or uncomfortable:
  - Try different sexual positions. Some may be less tiring or more comfortable.
  - Vaginal moisturizers and lubricants can be helpful for women. For more information, ask your nurse for the resource Improving Your Vulvovaginal Health, or search for it on www.mskcc.org/pe
  - Medications to help with erections (getting hard for sex) can be helpful for men.

Special points related to sexual activity

- You should ask your healthcare provider if there are any safety measures you should use for different types of sexual activity (such as oral, anal, or vaginal sex).
- If there is any chance you or your partner can become pregnant, use birth control (contraception) during your cancer treatment. If you have any questions about birth control, or for help deciding the type of birth control that’s right for you, talk with your healthcare provider.
- Ask your healthcare provider how long you should use birth control after your treatment is over.
- Some cancer treatments may affect your fertility (the ability to become
pregnant with a biological child). If you have questions about this, ask your healthcare provider.

- Ask your healthcare provider if your blood cell counts are high enough for you to have safe sex.
  - Your white blood cell count should be high enough to prevent infection.
  - Your red blood cell count should be high enough to prevent bleeding.
- Use a condom to protect yourself from sexually transmitted infections (STIs), including HIV, especially if you have more than 1 partner.

For more information, ask your nurse for the resource *Sexual Activity During Cancer Treatment: Information for Women* or *Sexual Activity During Cancer Treatment: Information for Men*, or search for them on [www.mskcc.org/pe](http://www.mskcc.org/pe)

**Talk With Your Healthcare Provider if:**

- You have vaginal dryness or tightness that makes sexual activity painful. Simple solutions are available to help. You can also ask for a referral to our Female Sexual Medicine and Women’s Health Program. Call 646-888-5076 to make an appointment.
- You have difficulty getting or keeping an erection or have a low testosterone hormone level. Your healthcare provider can recommend medication that may help. You can also ask for a referral to our Male Sexual and Reproductive Medicine Program. Call 646-888-6024 to make an appointment.
- You have accidental leakage of urine or bowel movements (stool). This is called incontinence. Your healthcare provider can give you a referral to the Sillerman Center for Rehabilitation or call 646-888-1900 to make an appointment.
- You have any questions or concerns.
Female Sexual Medicine and Women’s Health Program
646-888-5076
Our Female Sexual Medicine and Women’s Health Program helps women who are dealing with cancer-related sexual health challenges, including premature menopause and fertility issues. For more information, or to make an appointment, please call 646-888-5076.

Male Sexual and Reproductive Medicine Program
646-888-6024
Our Male Sexual and Reproductive Medicine Program helps men who are dealing with cancer-related sexual health challenges, including erectile dysfunction. For more information, or to make an appointment, please call 646-888-6024.

Sillerman Center for Rehabilitation
646-888-1900
515 Madison Avenue (Entrance on East 53rd Street, between Park and Madison Avenues)
New York, NY 10022

Some types of cancer and treatments damage the pelvic muscles. This can cause back and pelvic pain and urinary or fecal incontinence. If you’re experiencing these problems, ask your doctor or nurse for a referral.

Counseling Center
646-888-0200
641 Lexington Avenue, 7th Floor (on East 54th Street between Third and Lexington Avenues)
New York, NY 10022

Many people find that counseling helps them. We provide counseling for individuals and couples to help you process any issues and work with you to solve problems. Your partner can attend these sessions with you, if you would like.
Look Good Feel Better Program
800-395-LOOK (800-395-5665)
Learn techniques to help you feel better about your appearance by taking a workshop or visiting the program online at www.lookgoodfeelbetter.org

External Resources

American Cancer Society (ACS)
www.cancer.org
800-ACS-2345 (800-227-2345)
The ACS has free booklets on cancer and sexual health called *Sex and the Man With Cancer* and *Sex and the Woman With Cancer*. You can search for them on www.cancer.org or call to request printed copies.

National Cancer Institute (NCI)
www.cancer.gov
Contact the NCI to learn more about sexual health and cancer.

If you have any questions or concerns, talk with a member of your healthcare team. You can reach them Monday through Friday from 9:00 AM to 5:00 PM at ____________________. After 5:00 PM, during the weekend, and on holidays, please call____________________. If there’s no number listed, or you’re not sure, call 212-639-2000.

Sexual Health and Intimacy

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Full Dose Total Body Irradiation

This information will help you prepare for full dose total body irradiation (TBI) at Memorial Sloan Kettering (MSK). It will help you know what to expect before, during, and after your treatment. It will also help you learn about side effects and how to care for yourself during your treatment.

Read through this resource before you start TBI. Use it as a reference in the days leading up to your treatments so that you can prepare as much as possible. Bring this resource to your simulation appointment and all future appointments with your radiation oncologist. You and your radiation therapy team will refer to it throughout your treatment.

About Radiation Therapy

Radiation therapy uses high-energy beams to treat cancer. You won’t see or feel the beams.

Radiation therapy works by damaging the cancer cells and making it hard for them to reproduce. Your body is then naturally able to get rid of the damaged cancer cells. Radiation therapy also affects normal cells. However, your normal cells are able to repair themselves in a way that cancer cells can’t.

About TBI

TBI is radiation therapy that’s given to your entire body. Many people have TBI before their stem cell transplant. TBI may be given for any or all of the following reasons:

- To destroy cancer cells in areas where chemotherapy can’t easily reach (such as your nervous system, bones, skin, or testes).
- To decrease the response of your immune system. If you’re having an allogeneic stem cell transplant (getting bone marrow or stem cells from a donor), your body may see the cells as foreign. If this happens, your immune
system will try to destroy them. Having TBI before your transplant can help keep this from happening.

- To create space for new bone marrow to grow (engraft).

You will be admitted to the hospital for your TBI treatment.

**Your Role on Your Radiation Therapy Team**

You will have a team of healthcare providers working together to provide the right care for you. You’re part of that team, and your role includes:

- Asking questions and talking about your concerns. We have included a list of possible questions at the end of this resource.
- Telling someone on your radiation therapy team when you have side effects.
- Telling your doctor or nurse if you’re in pain.
- Caring for yourself at home, including:
  - Quitting smoking, if you smoke. If you want to quit, call our Tobacco Treatment Program at 212-610-0507.
  - Following your healthcare team’s instructions to care for your skin.
  - Drinking liquids as instructed by your healthcare team.
  - Eating the foods suggested by your healthcare team.
  - Maintaining your weight.

**Your Simulation Appointment**

Before you start TBI, you will have a treatment planning procedure called a simulation. This is done to make sure that your treatment area is mapped out and you get the right dose of radiation. You will also have imaging scans and skin markings during this appointment.

On the day of your simulation appointment:

- Wear your hospital gown or comfortable clothes that are easy to take off.
- Don’t wear jewelry or metal objects (such as rings or hairpins).
- Don’t wear powders or lotions.
When you arrive for your appointment, a member of your radiation therapy team will check you in. You will be asked to state and spell your full name and birth date many times. This is for your safety. People with the same or a similar name may be having care on the same day as you.

Your radiation therapist will greet you. They will take a photograph of your face. This picture will be used to identify you throughout your treatment.

Your radiation therapist will then explain what to expect during your simulation. If you haven’t already signed a consent form, your radiation oncologist will review everything with you and ask for your signature.

**Simulation**

If you’re not wearing a hospital gown, you will change into one. The temperature in the room is usually cool. Tell your radiation therapists if you’re cold.

Your radiation therapists will help you lie down on the simulation table. Once your simulation starts, try not to move or speak, because these things may change your position. However, if you’re uncomfortable or need help, tell your radiation therapists.

During your simulation, the lights in the room will be turned on and off and you will see red laser lights on each wall. Your radiation therapists will use these laser lights as a guide to help position you on the table. Don’t look directly into the laser lights, because they may damage your eyes.

There will be an intercom (microphone and speaker) and a camera inside the simulation room. Your radiation therapists will walk in and out of the room during your simulation, but there will always be someone who can see and hear you. You will hear your radiation therapists speaking to each other as they work, and they will tell you what they’re doing.

To help pass the time during your simulation, your radiation therapists can play music for you.
Imaging scans
You will have a chest x-ray and a CT scan to map your treatment area and plan your treatment. The scans won’t be used for diagnosis or to find tumors.

- The chest x-ray will be done with a machine called a simulator. You will be standing up during the scan. It will take about 20 minutes.
- The CT scan will be done in a different room. You will be laying down during the scan. It will take about 10 minutes.

During your imaging scans, you will hear the x-ray and CT machines turn on and off. Even if the noise seems loud, your radiation therapists will be able to hear you if you talk to them.

Skin markings (tattoos)
Your radiation therapists will draw on your skin with a felt marker. You can wash off the felt markings after your simulation.

You will also get permanent skin markings called tattoos. The tattoo marks are no bigger than the head of a pin. You will get 2 tattoos: 1 on your upper back and 1 on your upper chest.

Your radiation therapists will use a sterile needle and a drop of ink to make each tattoo. Getting them will feel like a pinprick. The tattoos are permanent and won’t wash off. If you’re concerned about having tattoos as part of your radiation treatment, talk with your radiation oncologist.

After the tattoos are made, your radiation therapists will take several photographs of you in your simulation position. The photographs and tattoos will be used to position you correctly during each of your treatments.
Appointment scheduling
Your radiation oncologist will plan your exact treatment schedule. A member of your radiation therapy team can give you more information. You can write notes in the space below.

You will have a total of 11 treatments over 4 days. This means you will have 2 to 3 treatments each day.

__________________________________________
__________________________________________
__________________________________________
__________________________________________

Your TBI Treatments
A patient escort will bring you from your hospital room to your treatments.

- Wear your hospital gown or comfortable clothes. Don’t wear clothes with metal.
- You can keep your socks on, but you must take off your shoes or slippers.
- Don’t wear jewelry or metal objects (such as rings or hairpins). These may increase the radiation dose to that area.
- Don’t wear powders or lotions.

Before your first treatment, you will have a set-up procedure. Your set-up procedure and first treatment will take about 90 minutes. The rest of your treatments will take about 60 minutes.

Set-up procedure
If pain medication was helpful during your simulation, you may want to take it before this procedure.

You will stand in your treatment position for your set-up procedure. Special x-rays called beam films will be taken to make sure your position and the area being treated are correct. Beam films may also be taken before some of your other treatments. They aren’t used to see how your tumor responds to the treatment.
After your set-up procedure, you will have your TBI treatment.

**Positioning**

It’s important that you’re in the correct position during your TBI treatments. Your radiation therapists will help you.

- You will be positioned on a platform. You will stand over a seat that’s like a bicycle seat and place your hands on handles next to your hips (see Figure 1). Infants and very small children will be wrapped in a papoose board on a table.

![Figure 1. Treatment position for older children and adults](image)

- Lung blocks will be placed on a board that hangs in front of your chest. They won’t touch your body. The lung blocks will lower the amount of radiation that your lungs receive. Your lungs are very sensitive to radiation and can’t get the same dose as the rest of your body.

- A large Plexiglass® screen will be placed in the front of your body. The Plexiglass will make sure that the radiation is evenly distributed.
You will face the machine for the first half of your treatment and will be turned away from it for the second half.

**During your TBI treatments**

Once you’re in the correct position, your radiation therapists will leave the room, close the door, and start your treatment. You won’t see or feel the radiation, but you may hear the machine as it moves around you and is turned on and off.

You will be alone in the room during your treatment, but your radiation therapists will see you on a monitor and hear you through an intercom at all times. They will make sure you’re comfortable during your treatment.

Breathe normally during your treatment, but don’t move. However, if you’re uncomfortable or need help, tell your radiation therapists. They can turn off the machine and come in to see you at any time, if needed.

**Neither you nor your clothes will become radioactive during or after treatment. It’s safe for you to be around other people.**

**Boosts and compensation**

You may get extra doses of radiation to specific areas of your body.

- A boost is an extra dose of radiation given to an area that’s included in the TBI treatment area. You may have boosts as an outpatient before you’re admitted to the hospital for your regular TBI treatments.

- Compensation is an extra dose of radiation given to an area that wasn’t included in the TBI treatment area. You will have lung blocks that cover your lungs during your treatments. To compensate (make up) for this, you will get 2 doses to the chest wall without the lung blocks.
Your inpatient care team

Any concerns you have during treatment will be managed by your inpatient team. Your inpatient team will contact your radiation therapy team, if needed. Tell your inpatient team if you have:

- Chills
- Painful, peeling, blistering, moist or weepy skin
- Any new or unusual symptoms

Weekly visits during treatment

Your radiation oncologist and radiation nurse will see you each week to ask you about any side effects you’re having, talk with you about your concerns, and answer your questions. This visit will be before or after your treatments each ________________.

If you need to speak with your radiation oncologist or radiation nurse between these weekly visits, call your radiation oncologist’s office. You can also ask the support staff or your radiation therapists to contact them.

Vitamins and dietary supplements

Many people ask about taking vitamins during treatment. If you want to take a daily multivitamin, you can. Don’t take more than the recommended daily allowance of any vitamin. Don’t take any other vitamins or any supplements without talking to your doctor. This includes both nutritional and herbal supplements.

Side Effects of TBI

You may have side effects from TBI. The type and how severe they are depend on many things. These include the dose of radiation, the number of treatments, and your overall health.
Short-term side effects

The most common side effects happen days or weeks after your treatment and don’t last very long. These include:

- Headache
- Nausea and vomiting
- Diarrhea
- Fatigue
- Skin reactions
- Bone marrow suppression (low blood counts)

Some people also have swelling of their salivary glands. This causes pain in front of their ear and in their jaw. This is a less common side effect.

Long-term side effects

Some side effects can happen months or years after your treatment and last for a long time. These include:

- Becoming sterile (not able to have a biological child). Your sexual function and pleasure won’t be affected.
- Having lower amounts of thyroid hormones. Your doctor will check your thyroid hormone levels during your yearly check-ups. About half of people who have TBI will need thyroid supplements.

Other long-term side effects are rare but can happen. They include:

- Inflammation of the sac around your heart
- Inflammation of your lungs
- Cataracts
- New cancers
Managing side effects

Nausea, vomiting, and diarrhea

These side effects are worst during the first day of treatment. They usually start 1 to 2 hours after the first treatment. If you vomit, it usually happens less often as the treatment proceeds.

You may have diarrhea during the first few treatment days.

Tell your nurse if you have any symptoms. They may give you medication to help.

Skin and hair reactions

Your skin and hair in the treatment area may change. This is normal.

- After 2 to 3 weeks, your skin may become pink or tanned. Later in your treatment, your skin may become bright red or very dark.
- Your skin may feel dry, itchy, and look flaky.
- You may have a rash, especially in areas where your skin has been exposed to the sun. If this happens, tell your doctor or nurse. A rash can also be a sign of infection.
- You may lose some or all of the hair in the treatment area. The hair will usually grow back 3 to 6 months after you finish treatment.

Your skin will gradually heal after you finish treatment, but this often takes 3 to 4 weeks. Sometimes, skin reactions get worse during the week after you finish treatment. If this happens, call your radiation oncologist or nurse.

Your nurse will teach you how to care for your skin. They will apply special dressings (bandages) or creams, if needed. Follow the guidelines below to care for your skin during treatment. Keep following them until your skin gets better. These guidelines refer only to the skin in the treatment area.

Keep your skin clean

- Bathe or shower every day. Use warm water and a mild, unscented soap (such as Neutrogena®, Dove®, baby soap, Basis®, or Cetaphil®). Rinse your skin well and pat it dry with a soft towel.
- When washing, be gentle with the skin in the treatment area. Don’t use a
washboard, scrubbing cloth, or brush.

- The tattoo marks you got before your treatment are permanent and don’t wash off. If you got other markings during treatment (such as an outline of your treatment area with a purple felt-tipped marker), you can remove them with mineral oil when your radiation therapists say it’s okay.

- Don’t use alcohol or alcohol pads on the skin in the treatment area.

**Moisturize your skin often**

- Start using a moisturizer when you start TBI. This can help minimize skin reactions. You can use an over-the-counter (not prescription) moisturizer.

- Use a moisturizer that doesn’t have any fragrances or lanolin. Your nurse may suggest one for you.

- Don’t use more than 1 moisturizer at a time, unless your nurse tells you to use more.

- If you’re using a moisturizer, apply it to your entire body every night.

**Avoid irritating your skin in the treatment area**

- If your skin is itchy, don’t scratch it. Apply moisturizer. Ask your nurse for recommendations on how to relieve the itching. Your doctor or nurse may give you a prescription for medication to treat itchy skin.

- Wear loose-fitting cotton clothing and undergarments over the treatment area. Avoid underwire bras or tight clothing that will rub against your skin.

- Use only the moisturizers, creams, or lotions that you have discussed with your radiation oncologist or nurse.

- Don’t use makeup, perfume, powder, or aftershave on the skin in the treatment area.

- Don’t put tape on the skin in the treatment area.

- Don’t shave in the treatment area. If you must shave, use only an electric razor. Stop if your skin becomes irritated.

- Don’t let the skin in the treatment area come into contact with extreme hot or cold temperatures. This includes hot tubs, water bottles, heating pads,
and ice packs.

- If you don’t have any skin reactions, you can swim in a chlorinated pool. Shower right after you get out of the pool to rinse off the chlorine.

- Avoid tanning or burning your skin. If you’re going to be in the sun:
  - Use a PABA-free sunblock with an SPF of 30 or higher.
  - Wear loose-fitting clothing that covers as much of your skin as possible.

**Fatigue**

Fatigue is feeling tired or weak, not wanting to do things, not being able to concentrate, or feeling slowed down. You may develop fatigue after 2 to 3 weeks of treatment, and it can range from mild to severe. Fatigue will gradually go away after your treatment is done, but it can last for several months.

There are many reasons why you may develop fatigue, including:

- The effects of radiation on your body.
- Not having enough restful sleep at night.
- Not eating enough protein and calories.
- Having pain or other symptoms.
- Feeling anxious or depressed.
- Side effects of certain medications.

You may find that your fatigue is worse at certain times of the day. Below are suggestions to help you manage your fatigue.

**Ways to manage fatigue**

- If you’re working and are feeling well, keep doing so. However, working less may help you have more energy.

- Plan your daily activities. Think about the things you need to do or that are most important to you. Do these activities when you have the most energy.

- Plan time to rest or take short (10 to 15 minute) naps during the day, especially when you feel more tired. When you nap, try to sleep for less than 1 hour at a time.
• Try to sleep for 8 or more hours every night. This may be more sleep than you needed before you started radiation therapy.
  
  ○ Being active during the day can help you sleep better at night. For example, if you’re able to exercise, you can go for a walk, do yoga, or ride a bike.
  
  ○ Relaxing before going to bed can also help you sleep better at night. For example, you can read a book, work on a jigsaw puzzle, listen to music, or do calming hobbies.
  
  ○ You may also find it helpful to go to sleep earlier at night and get up later in the morning.

• Ask family and friends to help you with things like shopping, cooking, and cleaning. Check with your insurance company to see if they cover home care services.

• You may have more energy if you exercise. Ask your doctor if you can do light exercise, such as walking, stretching, or yoga.

• Eat foods and drink liquids that are high in protein and calories. For information about eating during your TBI, read the resource *Eating Well During and After Your Cancer Treatment* ([www.mskcc.org/pe/eating_cancer_treatment](http://www.mskcc.org/pe/eating_cancer_treatment)).

• Ask your radiation oncologist or nurse for help with any other side effects you have. Pain, nausea, diarrhea, trouble sleeping, or feeling depressed or anxious, can increase your fatigue.

**Sexual health**

You may have concerns about how cancer and your treatment may affect your sexuality. You aren’t radioactive. You can’t pass radiation to anyone else, so it’s safe to be in close contact with other people.

The American Cancer Society has excellent resources that discusses sexual health issues during treatment. The one for men is called *Sex and the Man with Cancer*. The one for women is called *Sex and the Woman with Cancer*. You can search for them at [www.cancer.org](http://www.cancer.org) or call 800-227-2345 for a copy.

MSK also has sexual health programs to help you address the impact of your disease and treatment on your sexual health. You can meet with a specialist
before, during, or after your treatment.

- **Female Sexual Medicine & Women's Health Program**: For more information or to make an appointment, call 646-888-5076.

- **Male Sexual & Reproductive Medicine Program**: For more information or to make an appointment, call 646-888-6024.

**Emotional health**

Cancer diagnosis and treatment can be a very stressful and overwhelming.

You may feel:

<table>
<thead>
<tr>
<th>Anxious</th>
<th>Angry</th>
<th>Nervous</th>
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<tbody>
<tr>
<td>Afraid</td>
<td>Depressed</td>
<td>Numb</td>
</tr>
<tr>
<td>Alone</td>
<td>Helpless</td>
<td>Worried</td>
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<tr>
<td>Ambivalent</td>
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All of these feelings are normal if you or someone you love has a serious illness.

You may also worry about telling your employer that you have cancer or about paying your medical bills. You may worry about how your family relationships may change, about the effect of cancer treatment on your body, or if you will continue to be sexually attractive. You may worry that the cancer will come back. We’re here to support you.

**Ways to cope with your feelings**

- Talk with other people. When people try to protect each other by hiding their feelings, they can feel very alone. Talking can help the people around you know what you’re thinking. It may help to talk about your feelings with someone you trust. You can talk with your spouse or partner, a close friend, family member, chaplain, nurse, social worker, or psychologist. You may also find it helpful to talk to someone who’s going through radiation therapy, or a cancer survivor or caregiver who has been through a similar treatment. Through our Patient and Caregiver Support Program, you have a chance to speak with former patients and caregivers. To learn more about this service, call 212-639-5007.

- Join a support group. Meeting other people with cancer will give you a
chance to talk about your feelings and listen to other people who have the same concerns. You will learn how others cope with their cancer and treatment. Your doctor, nurse, or social worker can tell you about the support groups you might be interested in.

- Try relaxation and meditation. You might try thinking of yourself in a favorite place while breathing slowly, paying attention to each breath, or listening to a soothing music or sound. For some people, praying is another form of meditation. These kinds of activities can help you feel relaxed and calm.

- Exercise. Many people find that light activity like walking, biking, yoga, or water aerobics helps them feel better. Talk with your doctor or nurse about types of exercise you can do.

We all have our own way of dealing with difficult situations. Generally, we use whatever has worked for us in the past. However, sometimes this isn’t enough. We encourage you to speak with your doctor, nurse, or social worker about your concerns.

**After Your Treatment**

Be sure to keep your follow-up appointments with your radiation oncologist. During these appointments, your radiation oncologist will evaluate your response to treatment. You may have blood tests, x-rays, and scans during these visits.

Before each follow-up appointment, write down your questions and concerns. Bring this and a list of all your medications to your appointment. If you’re running low on any medication you need, tell your radiation oncologist before you run out. You can also call your radiation oncologist or nurse at any time if you have any questions or concerns.
Contact Information

If you have any questions or concerns, talk with a member of your healthcare team. You can reach them Monday through Friday from 9:00 AM to 5:00 PM at the numbers listed below.

Radiation oncologist: _______________________
Phone number: ____________________________

Radiation nurse: ___________________________
Phone number: ____________________________

After 5:00 PM, during the weekend, and on holidays, call ____________ and ask for the radiation oncologist on call. If there’s no number listed, or you’re not sure, call 212-639-2000.

Resources

Many of the resources listed in this guide can be found on the Internet. If you don’t have a computer or if you don’t know how to use the Internet, check with your local public library or community center.

MSK support services

Counseling Center
646-888-0200
Many people find that counseling helps them. We provide counseling for individuals, couples, families, and groups, as well as medications to help if you feel anxious or depressed.

Female Sexual Medicine & Women’s Health Program
646-888-5076
This program helps female patients who are dealing with cancer-related sexual health challenges, including premature menopause and fertility issues.
Integrative Medicine Service
646-888-0800
MSK’s Integrative Medicine Service offers patients many services to complement traditional medical care. These include music therapy, mind/body therapies, dance and movement therapy, yoga, and touch therapy.

Male Sexual & Reproductive Medicine Program
646-888-6024
This program helps male patients who are dealing with cancer-related sexual health challenges, including erectile dysfunction.

Nutrition Services
212-639-7312
MSK’s Nutrition Service offers nutritional counseling with one of our certified dietitians. Your dietitian will review your current eating habits and give advice on what to eat during and after treatment.

Patient and Caregiver Support Program
212-639-5007
You may find it comforting to talk with a cancer survivor or caregiver who has been through a similar treatment. Through our Patient and Caregiver Support Program, we’re able to offer you a chance to talk with former patients and caregivers.

Resources for Life After Cancer (RLAC) Program
646-888-8106
At MSK, care doesn’t end after active treatment. The RLAC Program is for patients and their families who have finished treatment. This program has many services, including seminars, workshops, support groups, counseling on life after treatment, and help with insurance and employment issues.

Tobacco Treatment Program
212-610-0507
If you want to quit smoking, MSK has specialists who can help. Call for more information.
External resources

**American Cancer Society (ACS)**
www.cancer.org
800-ACS-2345 (800-227-2345)
Offers a variety of information and services, including Hope Lodge, a free place for patients and caregivers to stay during cancer treatment.

**American Society for Therapeutic Radiology and Oncology**
www.rtanswers.org
800-962-7876
A group of radiation oncology professionals that specializes in treating patients with radiation therapy. Provides detailed information on treating cancer with radiation and contact information for radiation oncologists in your area.

**CancerCare**
www.cancercare.org
800-813-HOPE (800-813-4673)
275 Seventh Avenue (Between West 25th & 26th Streets)
New York, NY 10001
Provides counseling, support groups, educational workshops, publications, and financial assistance.

**Cancer Support Community**
www.cancersupportcommunity.org
Provides support and education to people affected by cancer.

**National Cancer Institute (NCI) Cancer Information Service**
www.cancer.gov
800-4-CANCER (800-422-6237)
Provides education and support to people with cancer and their families. Publications are available online and in print.
Questions to Ask Your Doctor or Nurse

We recommend that you write down the questions to ask during your visit with your doctor or nurse. Write down the answers during your appointment so that you can review them again later.

What kind of radiation therapy will I get?

How many treatments will I get?

What side effects should I expect during radiation therapy?

Will these side effects go away after radiation therapy is finished?

What kind of late side effects should I expect after radiation treatment?

Full Dose Total Body Irradiation

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