Memorial Sloan Kettering Cancer Center

PATIENT & CAREGIVER EDUCATION

Autologous Peripheral Blood Stem Cell Harvesting

This information explains what to expect before, during, and after your procedure for harvesting peripheral (peh-RIH-feh-rul) blood stem cells at Memorial Sloan Kettering (MSK).

About Autologous Peripheral Blood Stem Cell Harvesting

Peripheral blood stem cell harvesting is a procedure to harvest (collect) some of the stem cells in your blood. Stem cells are immature cells that make all the blood cells in your body. This includes:

- White blood cells that help your body fight infections and other diseases.
- Red blood cells that carry oxygen from your lungs to the rest of your body.
- Platelets that stop you from bleeding and help your wounds heal.

Autologous (aw-TAH-luh-gus) means your own stem cells

will be harvested, stored, and put back (transplanted) into your body in a peripheral blood stem cell transplant. Your stem cells will grow and mature into new blood cells that will replace your cells that were killed during treatment. Peripheral blood is the blood that circulates (flows) in your blood vessels.

Before Your Procedure

Stem cell mobilization and granulocyte colony-stimulating factor (GCSF) injections

Only a small number of your stem cells naturally circulate in your bloodstream. To raise the number of stem cells in your bloodstream, you'll get injections (shots) of a medication called granulocyte (GRAN-yoo-loh-SITE) colony-stimulating factor, or GCSF.

GCSF helps your body make more stem cells than usual. It also helps the stem cells move into your bloodstream, where they're easier to harvest. This process is called mobilization. Examples of GCSF medications include filgrastim (Neupogen®), pegfilgrastim (Neulasta®), and plerixafor (Mozobil®). Your nurse will talk with you about which injections you'll need.

You'll need an injection every day for about 1 to 2 weeks. Your nurse will tell you when you'll start and stop the injections. You can talk with your nurse about

making plans to get the injections, such as coming into the clinic. Or, if you want to do the injections yourself, your nurse will show you how to do it. They'll also give you the resource *How to Give Yourself an Injection of Filgrastim (Neupogen®) or Pegfilgrastim (Neulasta®) Using a Prefilled Syringe* (www.mskcc.org/pe/injection_filgrastim_pegfilgrastim) to help you remember what to do.

Common side effects of GCSF include:

- Bone pain in your sternum (breastbone), arms, legs, and lower back
- Headaches
- Flu-like symptoms, such as:
  - Chills
  - Muscle or body aches
  - Cough
  - Sore throat
  - Runny nose
  - Vomiting (throwing up)
  - Diarrhea (loose or watery poop)
  - Fatigue (feeling very tired and weak)
- Nausea (feeling like you're going to throw up)

- A fever of 99 to 100 °F (37.2 to 37.8 °C)

You can take regular or extra strength acetaminophen (Tylenol®) as needed. Don’t take nonsteroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen (Advil® and Motrin®) and naproxen (Aleve®). These medications can cause bleeding.

If acetaminophen doesn’t help, tell your healthcare provider. They’ll prescribe something stronger.

Tunneled catheter placement

Before your stem cells are harvested, a nurse will check the veins in your arms to see if they’re healthy enough for the procedure. If they’re not healthy enough (for example, if they’re too small), you’ll have a tunneled catheter (a thin, flexible tube) put into a large vein near your collarbone. A tunneled catheter is a type of central venous catheter (CVC).

After your tunneled catheter is placed, your nurse will teach you how to care for it. They’ll also give you the resource *About Your Tunneled Catheter* (www.mskcc.org/pe/about_tunneled_catheter) to help you remember what to do.

Your nurse will tell you when your tunneled catheter can be removed. It may stay in place for weeks or months,

depending on your care plan. During this time, your nurse will use the 2 access ports attached to your catheter to take samples of your blood, to draw blood during your harvesting procedure, and to give you intravenous (IV) fluids and medications during your stem cell transplant.

What to eat and drink

As your stem cells are harvested, your blood calcium level (the amount of calcium in your blood) may drop. So, the day before and the day of your harvesting procedure, we suggest you eat dairy products and other foods that have a lot of calcium in them. Examples include Greek yogurt, almonds, dark leafy vegetables, and tofu. This will help raise your blood calcium level.

It’s also important to drink enough liquids leading up to your harvesting procedure. This will make it easier for the nurse to place the intravenous (IV) lines for your procedure.

You can tell if you’re drinking enough liquids by checking the color of your urine (pee). If it’s straw-colored or lighter, you’re drinking enough. If it’s darker, you need to drink more.

The Day of Your Procedure

Where to go

Your harvesting procedure will be at one of the following locations:

- Blood Donor Room
  Arnold and Marie Schwartz Cancer Research Building
  1250 First Avenue (between 67th and 68th Streets)
  New York, NY 10065
  212-639-7643
- Apheresis Unit on the 12th floor
  David H. Koch Center for Cancer Care at Memorial Sloan Kettering
  530 East 74th Street (between York Avenue and the East River)
  New York, NY 10021
  646-608-3142

You'll have 2 to 4 appointments for harvesting sessions. Each session usually takes 4 to 5 hours. If you're asked to take filgrastim, you'll need to take your dose on these days before each appointment.

The exact number of sessions you have depends on the number of stem cells harvested in each session. Your healthcare provider will tell you each day if you need to come back for another harvesting session.

What to expect

You'll lie on a bed or sit in a recliner chair during each harvesting session. A nurse will connect you to a machine. They'll connect you either by an intravenous (IV) line (thin, flexible tube) that's put into a vein in each of your arms or by your tunneled catheter.

The machine will draw blood from one of your IV lines or tunneled catheter access ports. The blood will pass through the machine and the machine will separate out and collect your stem cells. The machine will return the rest of your blood to you through your other IV line or tunneled catheter access port.

You can watch TV, read, or use your smartphone or tablet during your procedure. If you feel cold, you can ask for blankets to keep you warm.

As your stem cells are harvested, you may have muscle cramps, twitching, or feel tingling (a slight stinging or poking feeling) around your lips and fingertips. These are signs your blood calcium level is low. If you have any of these things, tell a nurse. They'll give you Tums®, which are a quick and easy source of calcium. They may also give you a medication that has calcium through your IV line or tunneled catheter.

After Your Procedure

Once you finish the procedure, if you had IV lines in your arms, your nurse will take them out and cover the sites with bandages to prevent bleeding. Leave the bandages in place for at least 3 hours, but not more than 5 hours. If there’s bleeding when you take the bandages off, apply gentle but firm pressure on the sites for 3 to 5 minutes. Call your healthcare provider if the bleeding doesn’t stop.

If your tunneled catheter was used, your nurse will flush and recap it.

After a harvesting session, you may have bruising at the IV sites. You may also feel tired. Ask your healthcare provider when you can go back to doing your regular activities. Most people can right away.

Once your stem cells are harvested, they’ll be brought to our stem cell laboratory, where they’ll be frozen and stored safely until your transplant day. Your care team will tell you how long your stem cells will be frozen and stored. It may be weeks or months, depending on your care plan.

When to Call Your Healthcare Provider

Call your healthcare provider if you have any of the following:

- A fever of 100.4 °F (38 °C) or higher
- Flu-like symptoms
- Any redness, bleeding, drainage, swelling, or pain around your tunneled catheter site or at the IV sites
- Numbness or tingling in your lips, hands, or feet
- A lot of pain on the left side of your body
- A bad headache and any neurological (nerve) changes, such as:
  - Changes in vision
  - Changes in short-term or long-term memory
  - Changes in mobility (your ability to move)
  - A hard time speaking
  - Any other concerning symptoms

If you have any questions, contact a member of your care team directly. If you're a patient at MSK and you need to reach a provider after 5 p.m., during the weekend, or on a holiday, call 212-639-2000.

For more resources, visit www.mskcc.org/pe to search our virtual library.

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