



PATIENT & CAREGIVER EDUCATION

Human Leukocyte Antigen (HLA) Typing and Stem Cell Collection: Information for Donors

This information will help you understand your human leukocyte (LUKE-oh-site) antigen (HLA) typing and stem cell harvesting (collection). You're getting this information because you're being tested to see if you're a potential stem cell donor. For the rest of this resource, our use of the word "you" and "your" refers to you or your child.

Donating stem cells is a 3-step process.

1. **HLA typing.** This is done to see if your stem cells are a good match for the recipient (the patient).
2. **Health screening.** If your HLA type matches the patient's, you will have a health screening to make sure you're healthy enough to donate stem cells.
3. **Stem cell harvesting.** This is the procedure to collect some of your stem cells.

HLA Typing

About HLA markers

HLA markers are proteins that are found on most cells in your body (see Figure 1). There are many HLA markers, and different people can have different patterns of the markers. HLA markers are inherited (passed from a mother and father to their child), so your close family members (siblings, parents, and children) are most likely to have a pattern of HLA markers that's like yours.

HLA markers are a way for your immune system to tell which cells belong in your body and which ones don't. Your immune system knows which pattern of HLA markers is normal for your body. If it finds a cell that has a different pattern of markers, it will attack and kill the cell. This is why it's important that your HLA markers are as similar to the patient's as possible.

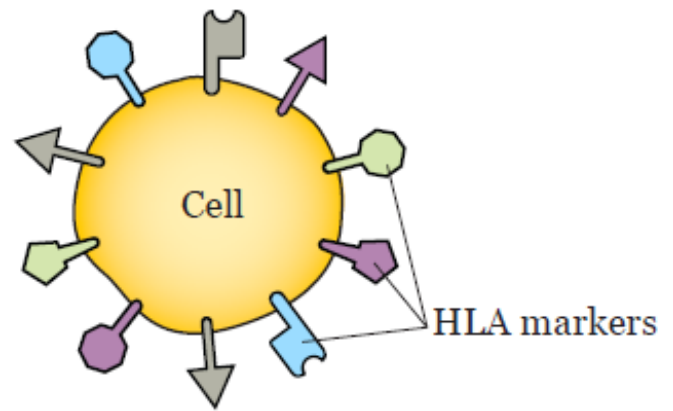


Figure 1. HLA markers

About HLA typing

Your HLA type can be tested in 2 ways:

- A blood test
- A swab of your cheek

If you will be doing your HLA typing using a cheek swab sample, read the resource *Instructions for Collecting and Shipping HLA Samples Using Cheek Swabs* (www.mskcc.org/pe/instructions_hla_samples).

Results of your HLA typing

After MSK receives your HLA test sample, it usually takes about 1 to 2 weeks for your results to come back. If your results show that your pattern of HLA markers is like the patient's, this means you're a potential donor. We will contact you to tell you and to ask if we can tell the patient. We won't tell the patient that you're a potential donor unless you give permission.

If you want to check on the status of your results, please call the following number:

- If the patient is age 18 or older, call the Adult Stem Cell Transplant Related Donor Office at 212-639-5394.
- If the patient is younger than 18, call the Pediatric Stem Cell Transplant

Health Screening

If you're willing to move forward with the donation process, you will need to have some tests to make sure you're healthy enough to donate. These tests usually include a health screening, a physical exam, and blood tests. Sometimes we may ask for copies of your medical records. The office will contact you about scheduling an appointment for this testing. You won't need to pay for the appointment or tests.

Once we're sure that you're healthy enough to donate, we will ask for your permission to share any relevant health information with the patient and the patient's healthcare team. We won't share any of your information without your permission.

Stem Cell Harvesting

Stem cells are immature cells that make all of the blood cells in your body: the white blood cells that fight infection, red blood cells that carry oxygen, and platelets that stop you from bleeding. Most of your stem cells are found in your bone marrow. Bone marrow is a substance in the spaces in the center of the larger bones in your body. There are also some stem cells circulating in your blood.

There are 2 ways that your stem cells can be harvested:

- Peripheral blood stem cell (PBSC) harvesting
- Bone marrow harvesting

Each method is described below. Once we've found out if you're a potential donor, a doctor, nurse practitioner (NP), or nurse will discuss these methods with you in more detail.

Peripheral blood stem cell harvesting

PBSC harvesting is the procedure used to collect stem cells from your blood.

Peripheral blood is the blood that circulates in your blood vessels. It includes every type of blood cell.

Before your procedure

Stem cell mobilization and growth factor injections

Before we can collect stem cells from your blood, you will need to take a medication called a growth factor. The growth factor medication will cause your body to make more stem cells than usual. It also causes the stem cells to move into your bloodstream, where they can be collected more easily. This process is called mobilization.

Growth factor medications include filgrastim (Neupogen®) and plerixafor (Mozobil®). Both of these medications are given by injection into your upper arms or thighs. You will take either filgrastim alone or both filgrastim and plerixafor.

You can be taught to do the injections yourself, have a family member give them to you, or you can discuss other arrangements with your doctor, NP, or nurse. The injections of filgrastim will be daily for 5 to 6 days. If you're also taking plerixafor, those injections will be daily for 1 to 2 days.

Common side effects of these medications include bone pain in your breast bone, arms, legs, and lower back. They can also cause headaches and flu-like symptoms. Either regular or extra strength acetaminophen (Tylenol®) can help relieve these side effects. If acetaminophen doesn't help, contact your doctor's office. Your doctor or NP may need to prescribe something stronger.

Tunneled catheter placement

Before we collect your stem cells, a NP or nurse from our donor room will check your veins to make sure they're healthy enough for the procedure. If your veins aren't healthy enough, you will have a tunneled catheter put into a large vein near your collarbone. A tunneled catheter is a type of central venous catheter (CVC). It will be used during your procedure and will be removed once your collection is complete. Your nurse will teach you how to care for it and will give you written information.

What to eat

As your stem cells are collected, your blood calcium levels may drop. We recommend that you eat dairy products and other foods that are rich in calcium (such as cheese, milk, ice cream, dark leafy greens, fortified cereals, or enriched grains). This will help to raise the calcium levels in your blood.

During your procedure

Your PBSC harvesting will take place in the Blood Donor Room at Memorial Sloan Kettering (MSK). The address is:

Blood Donor Room at MSK
1250 First Avenue (between East 67th and 68th Streets)
New York, NY 10065

You will have appointments 2 days in a row. Each appointment usually takes 3 to 4 hours.

The harvesting is done while you're on a bed or a recliner chair. You will be connected to a machine by IV tubes in your arms or your tunneled catheter. Blood will be drawn through the tubes and sent through the machine. The machine will collect your stem cells and the rest of your blood will be returned to you.

After your procedure

Most people can return to their regular activities the day of or the day after their donation. We will follow up with you after your procedure to see how you're feeling.

Bone marrow harvesting

Bone marrow harvesting is the procedure used to collect stem cells from your bone marrow. Bone marrow can be removed from different sites on your body, such as your breastbone and the front and back of your hips. These are called harvest sites. The most common harvest site is the back of your hips. You will get general anesthesia (medication to make you sleep) for your procedure.

Before your procedure

- You may need to give a unit (about a pint) of blood 2 weeks before your procedure. If needed, this blood will be given back to you in the recovery room. It will help your bone marrow recover.
- You will need to plan for someone to take you home after your procedure. This is because you will probably be sleepy from the anesthesia.

Instructions for eating and drinking

To get ready for the anesthesia, you will need to follow special instructions the night before and morning of your procedure.

- Starting at midnight the night before your procedure, stop eating.
- Between midnight the night before your procedure and 2 hours before your scheduled arrival time, you may only drink up to 12 ounces of water.
- Starting 2 hours before your scheduled arrival time, stop drinking liquids. From this time on, don't eat or drink anything.

During your procedure

Your bone marrow harvesting procedure will be done in the operating room. Since the harvest site is usually the back of your hip bones, you will probably be lying on your stomach. Once you're asleep, your doctor will put a needle through your skin and into your bone to take out the marrow.

The amount of bone marrow that will be removed depends on the patient's weight and illness. Your weight and size may also limit how much bone marrow you can donate.

Your body will replace the bone marrow in 2 to 3 months after the procedure.

After your procedure

When you wake up, you will be in the Post Anesthesia Care Unit (PACU). You may have some pain or soreness at your harvest sites. You will get pain medication to help with any discomfort. You will also get a prescription for pain medication to take at home, if needed.

Most people go home the same day as their bone marrow harvesting procedure. You should be back to feeling normal in about 1 to 2 days. You will get pain medication and specific instructions on how to care for yourself at home.

You won't be able to do any strenuous exercise (such as running, jogging, or aerobics) or play any contact sports (such as football, soccer, or basketball) for 1 week after your procedure.

It's important to eat a well-balanced diet high in iron for 2 months after your procedure. For more information, read the resource *Iron in Your Diet* (www.mskcc.org/pe/iron_diet).

We will follow up with you after your procedure to see how you're feeling.

Additional Resources

- *Allogeneic Donor Peripheral Blood Stem Cell Harvesting* (www.mskcc.org/pe/allogeneic_pbsc_harvesting)
- *About Bone Marrow Harvesting* (www.mskcc.org/pe/bone_marrow_harvesting)

If you have any questions, contact a member of your healthcare team directly. If you're a patient at MSK and you need to reach a provider after 5:00 PM, 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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