This guide is intended for patients in need of an unrelated volunteer stem cell donation.
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OneMatch Stem Cell and Marrow Network

The OneMatch Stem Cell and Marrow Network helps patients who need a unrelated stem cell transplant. If your transplant team has not found a suitable matched donor for you within your family, also known as a related donor, they will ask Canadian Blood Services’ OneMatch Stem Cell and Marrow Network to conduct a search for an unrelated donor on your behalf. This guide will help you to understand the role of OneMatch in conducting the search and coordinating the collection of stem cells from an unrelated volunteer stem cell donor. It is intended to offer additional support but not intended to replace the advice given to you by your Transplant team. While you may still be coming to terms with your diagnosis, be assured that OneMatch is continually working on your behalf to find an unrelated volunteer stem cell donor.

You can count on OneMatch to:

- Conduct a comprehensive search of volunteer donors worldwide based on the donor selection requirements provided by your transplant team
- Provide the expertise that your health care team may rely on to assist in identifying the best match for you
- Coordinate the collection of stem cells once a suitable unrelated donor is selected by your Transplant team.

What is the OneMatch Stem Cell and Marrow Network?

The OneMatch Stem Cell and Marrow Network is a Canadian Blood Services program dedicated to recruiting and finding healthy, committed volunteer unrelated donors for patients in need of stem cell transplants. OneMatch staff coordinates searches in Canada and around the world with other international registries towards a single goal – helping patients get the stem cells they need.
The decision to begin or end a search for an unrelated donor, as well as choosing a suitable donor, and receiving a transplant, rests entirely with your Transplant team. OneMatch’s role is to coordinate the search and subsequent collection from an unrelated volunteer donor based on the direction of the Transplant team.

**How does OneMatch work?**

OneMatch maintains a growing network of more than 390,000 Canadians who have made the decision to be a committed volunteer stem cell donor for any patient in need of a transplant, anywhere in the world. These volunteer donors must meet a variety of eligibility requirements and undergo a comprehensive health assessment. This ensures the donation process will be safe for the donor as well as the patient who receives the donor’s stem cells.

OneMatch operates according to Canadian regulations and standards as well as international standards established by the World Marrow Donor Association (WMDA). The WMDA is the international organization that promotes the ethical, technical, medical and financial aspects of stem cell transplantation. As part of the international network, OneMatch has access to over 28 million donors in over 53 countries, as well as over 685,000 umbilical cord blood units and 52 cord blood registries, from 36 countries.
UNDERSTANDING STEM CELL TRANSPLANTATION

What are stem cells?

Stem cells, specifically blood stem cells, are found in bone marrow, peripheral circulating blood and umbilical cord blood. These blood cells are immature cells which can become:

- Red blood cells - cells that carry oxygen
- White blood cells – cells that fight infection
- Platelets – cells that help control bleeding.

Our bodies are constantly manufacturing these cells in order to sustain life. Without these healthy cells, the consequences can be life-threatening.

What is Bone Marrow?

Bone marrow is the soft tissue inside bones that produces these blood forming stem cells. When disease affects marrow, such that the bone marrow cannot produce the stem cells or produces diseased cells, a stem cell transplant may be your best treatment option.

How does a stem cell transplant work?

A stem cell transplant replaces the patient’s unhealthy stem cells with the donor’s healthy stem cells. As stated above, there are three sources of stem cells used in transplant.

- Bone marrow
- Peripheral (circulating) blood
- Umbilical cord blood.

The choice of the type of stem cell donation will be a medical decision and will be made by your transplant physician and the transplant team.
Some things your transplant team will take into consideration when deciding on what type of transplant you will receive include:

- Whether a genetically matched donor is available
- Your body size
- Your disease status
- Your diagnosis
- Your age
- The urgency of the transplant.

**UNDERSTANDING THE DONOR SEARCH**

The search begins when your transplant team forwards a search request to OneMatch. The transplant centre physician is the only person who can request the search to begin and is the only person who can cancel a search.

Within one business day of receiving the request, OneMatch forwards a preliminary search report of possible matches to the transplant team. This report lists any potential Canadian and international donors who might be a match to you. The transplant team, using their clinical experience and in some cases, the assistance of the OneMatch team, will consider those potential unrelated donors who may be suitable matches. These potential donors are contacted for further health assessment and to provide DNA samples for additional testing. It is important to remember that each patient not only needs a matched donor, but also a well-informed, committed and healthy donor. On average, it can take up to six months to complete the necessary testing and health assessment screening to confirm the best matched donor.

The search is repeated continuously, so that any newly added donors may be identified. The search process continues until a donor is found and makes a stem cell donation or until the transplant team makes a decision to cancel the search request.

**Please note that it is not the responsibility of you or your family to find your donor.** Your transplant team, working with OneMatch, is responsible for locating a matched, committed donor for you.
How are donors matched to patients?

Stem cell matches are determined according to DNA markers called Human Leukocyte Antigens (HLA).

These antigens are found on the white cells in your blood and are inherited from both your mother and father. This is why a sibling can represent the best potential match. However, due to the random distribution of these antigens, most patients have approximately a 25 per cent chance of a sibling match; the rest rely on a volunteer donor from outside their family.

HLA antigens differ from person to person, and some antigens appear more frequently in certain populations and certain ethnicities. When a donor and patient have matching antigens, the donor is considered a candidate. Your transplant centre team may use up to 12 HLA antigens to determine donor/patient compatibility.

If more than one donor is found to be an HLA match, your transplant physician may consider other factors to determine the best match. Some of these factors may include the age, gender, or blood type of the donor.

![Diagram of HLA typing](image-url)
**Will OneMatch test my relatives to see if one of them is a match for me?**

Your transplant team is responsible for identifying any potential matches within your family and arranging for testing. In most cases, family testing focuses on your siblings. If you have questions about the possibility of a relative being your donor, we encourage you to have a discussion with your transplant team.

**Note:** Anyone joining OneMatch is making a commitment to be available for all patients in need. Once part of the network, their HLA typing will be included in searches for all patients, both in Canada and abroad.

**How is a volunteer unrelated donor found?**

Once your transplant centre team identifies potential volunteer unrelated donors who require further testing, the potential donors needs to be contacted. This process can take time.

If your donor lives in Canada, he or she will be contacted by OneMatch. OneMatch will ensure that the potential donor is healthy and willing and able to proceed. If a donor is willing and meets the donation criteria, he or she will undergo a health assessment with a Canadian Blood Services OneMatch Registered Nurse. After the donor is considered eligible, arrangements are made to collect the required blood samples for further testing. Some of these samples are sent to your Transplant Centre where testing is done to determine the compatibility between you and the donor. Testing done at the transplant centre can take up to one month to be completed. This process is called verification typing.

If the potential donor is in another country, OneMatch contacts the appropriate international registry, who will then contact the donor,
ensuring that he or she is still healthy and willing to proceed. If the donor is eligible, the international registry will arrange for the collection of further blood samples to be shipped to your transplant centre. This testing can take several weeks or even months to complete depending on the availability of donors.

At the same time, other samples collected from Canadian donors will also be sent to a Canadian Blood Services’ testing laboratory for infectious disease testing. The infectious disease testing of international donors is managed by the international registry and the transplant centre and has to meet approved standards.

**Understanding the Donation Process**

Once the Transplant Centre team determines the most suitable donor for the patient, they make a formal request for a stem cell donation to OneMatch. The timeline for the donation as well as the method of donation; bone marrow, peripheral blood stem cell, or cord blood donation is determined by your transplant team.

While your health care team prepares you for the transplant, OneMatch contacts the donor if he or she lives in Canada, or the appropriate international registry, if the potential donor is in another country. Every registry has its own policies and procedures for preparing adult donors for the donation. In Canada a potential adult donor will go through a number of steps before making the actual donation. This is called the **work up** stage. This includes:

- A complete Health Screen Questionnaire by a Canadian Blood Services OneMatch Registered Nurse
- A review of the donation method requested by your doctors, including the associated risks involved with bone marrow or peripheral blood stem cell donation
- A physical exam, health history and overview of the donation process conducted by the stem cell collection physician. This
will be done at the nearest collection centre hospital to the donor

- Signing of the “Intent to Donate” document which states the person (donor) intends to donate stem cells

Your transplant team may choose to advise you that a suitable donor has been found only after all of these steps have been completed, therefore ensuring a donor is eligible and suitable to donate.

How are stem cells donated?

The donor will be asked to go to the nearest stem cell collection centre hospital and will be asked to undergo one of two types of donation procedures: a bone marrow donation or a peripheral blood stem cell donation. The determination of the procedure required will be made by your Transplant team.

**Bone Marrow Donation Procedure**
This is a day surgery procedure. The donor is given either a general or local anesthetic. A special needle is inserted into the iliac crest (hip bone) and the bone marrow is extracted. The amount of bone marrow collected ranges from 500 to 1,500 millilitres, depending on what your physician determines is required. The donor’s marrow will replenish itself within four to six weeks.

**Peripheral Blood Stem Cell Donation Procedure**
In this procedure, the donor will receive injections of granulocyte colony stimulating factor (G-CSF) for a minimum of four days before the donation. These injections cause the bone marrow to push the stem cells into the circulating blood. To collect these cells, the donor is connected to an apheresis machine. A needle is inserted into the arm (similar to when donating blood) and the blood is drawn through a tube into the machine using centrifugal
force. The stem cells are collected and the remaining blood cells are returned to the donor through another tube.

**Umbilical Cord Blood**

In some cases an umbilical cord blood transplant may be a third option. This is a decision that will be made by your transplant team. At birth, cord blood from the umbilical cord of a new born baby is collected. A needle is inserted to draw out the rich and immature blood stem cells which are processed, frozen and stored. The search for cord blood is conducted through OneMatch in the same manner as the search for an unrelated donor. The cord blood is HLA matched to the patient and once typing is confirmed or verified, it is released to the transplant team.

**How are donated stem cells delivered to me?**

Once the donation is complete, a stem cell courier who is trained in handling stem cell products will be on hand to carry the stem cells from the Collection Centre back to your Transplant Centre. OneMatch ensures travel plans and documents are in order to ensure safe travel in Canada and around the world. Umbilical cord blood units travel by medical couriers as the products must remain frozen.

**Do donors ever say no?**

The vast majority of people who register with the OneMatch Stem Cell and Marrow Network have a strong commitment to help all patients in need of an unrelated stem cell transplant. When they are asked to donate, they usually respond positively and enthusiastically. It may be a number of years between the time a person registers with OneMatch to the time he/she may be asked to donate. Thus many factors may have changed in the interim, for example, issues with his/her own health. As a result, there is a rare chance that some people may decline to donate. Usually, this is identified early in the search process, when several potential donors may be under consideration.
When donors first join the Network, Canadian Blood Services works hard to ensure they are educated, informed and committed for the long-term. If a person is ever contacted as a potential donor, OneMatch works closely with the individual to make certain he or she is not only healthy but that the commitment is fully understood. Potential donors who reach this stage are also informed of the significant implications to the patient should they change their mind about donating. Although OneMatch works hard to ensure that the donor fully understands the possible impact to the patient, should they withdraw or decline the donation, OneMatch cannot force or compel a person to proceed with the donation. While a donor can decline to donate at any point leading up to the procedure, it is highly unusual for this to occur. Statistics show that OneMatch’s rate of donor availability is very high.

Does OneMatch find a stem cell match for every patient?

Unfortunately, even with millions of potential donors listed on registries around the world, as well as many public cord blood units, it may not be possible to find a stem cell match for all patients. If a donor is not found, it may be that you have an unusual genetic marker/antigen, or the combination of antigens is uncommon. In this case, your transplant team may consider other options for you and will discuss these options with you.

Will I ever get to meet my donor?

The privacy of both the stem cell donor and recipient must be respected. For this reason, there are restrictions regarding the direct communication and exchange of identifying information between donor and recipient for at least one year, post donation. After the year has passed, if both donor and recipient are in agreement, and verify in writing, direct communication may be permitted.

You should be aware that some transplant centres and international registries require a longer waiting period, and some registries and
transplant centres do not permit direct communication between donor and recipient under any circumstances. To determine if you would be able to have contact with your donor, please have a discussion with your transplant team.

While OneMatch has restrictions in place for the exchange of information between donor and recipient during the first year after transplant, OneMatch will facilitate the exchange of cards and letters that do not contain any identifying information. If you are interested in this option, please advise your transplant team.

**How can my friends and family help?**

The search for an unrelated donor will likely inspire your friends and family to consider registering with OneMatch. Although statistically unlikely that extended family and friends will be a match for you, by registering with OneMatch they have the ability to help another patient, like you, who is relying on someone they do not know to be the one match for them. This is why it is important for your family and friends, who may wish to register as a stem cell donor, to understand that they are also registering for all patients in need.

Anyone interested in registering with OneMatch must meet the following criteria:

- Be between the ages of 17 and 35 years old
- Be in good general health
- Be willing to donate for all patients in need anywhere in the world
- Have Canadian health care coverage.

There are two ways to register with OneMatch. The quickest way is to visit www.onematch.ca and register online. Canadian Blood Services also hosts awareness events across the country. A list of upcoming events can be found on-line at www.blood.ca.
Another important way to help patients is by giving blood. Many patients in need of a stem cell transplant are also in need of blood and blood products. Anyone interested in donating blood can call Canadian Blood Services’ at 1 888 2 DONATE (1-888-236-6283) to book an appointment at an upcoming clinic in their area.

Why do you have to be 35 years of age or younger to donate?

The national and international transplant community has defined an ‘optimal donor’ as young – between the age of 17 and 35. Stem cells from younger donors can offer patients a possible better outcome by reducing post-transplant complications. Younger donors will remain on the stem cell Network longer, thereby leading to fewer registrants needing to be recruited. Currently only 31% of the Network’s composition contains potential donors 17 to 35 years.

What if I still have questions?

Should you or your immediate family have any questions or concerns about the search process for a volunteer unrelated donor, how to register as a potential donor with OneMatch and engage your community, or anything else related to a stem cell transplant, please call The OneMatch Stem Cell and Marrow Network at 1-888-2-DONATE or email OneMatch at onematch@blood.ca.
Other resources that may help

Aplastic Anemia and Myelodysplasia Association of Canada - www.aamac.ca

Blood & Marrow Transplant Information Network - www.bmtnews.org

Canadian Blood and Marrow Transplant Group - http://www.cbmtg.org/

Leukemia and Lymphoma Society of Canada - www.lls.org

Saskatchewan Stem Cell Transplant Advocacy Group - www.stemsask.ca

Katelyn Bedard Bone Marrow Association - www.givemarrow.net

Special thank you to Saskatchewan Stem Cell Transplant Advocacy Group and Aplastic Anemia and Myelodysplasia Association of Canada (AAMAC) for patient group input in the writing of this booklet.
QUESTIONS YOU MAY WANT TO CONSIDER WHEN MEETING WITH YOUR TRANSPLANT TEAM

When meeting with your Transplant team for consultation, you may want to make a list of questions to ask. For example:

1. Do I have common antigen (genetic or HLA) markers that might make it easier to find a match?

2. What family members will you test as possible donors for me?

3. Given my typing what are the possibilities of finding a match donor?

4. Is cord blood transplant an option for me?

5. Is a reduced intensity transplant an option?  
   A reduced-intensity transplant is a bone marrow transplant (also called a BMT) or cord blood transplant that uses less intense treatment to prepare for transplant than a standard transplant does. While a standard transplant uses the pre-transplant treatment to destroy most of the disease cells, a reduced-intensity transplant relies on the donor’s immune cells to fight disease.

6. Would consideration be given to a mis-match transplant?

7. When do you recommend a transplant?

8. Are there other treatments that might be options for me?

9. Do you know of any clinical trials that I might be eligible for?

10. What resources does the Transplant Centre offer for transplant patients and caregivers?
Sign up to save a life.