Donating Bone Marrow

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Listen to the Cancer.Net Podcast: Donating Bone Marrow [1], adapted from this content.

Key Messages:

- A bone marrow or stem cell transplant offers many people with a bone marrow disease the best chance of recovery.
- About 30% of people who need a bone marrow transplant have a family member who can donate. The remaining 70% do not have a matched donor in the family.
- The National Marrow Donor program has a registry for potential donors. They also provide recommendations for keeping both donors and recipients safe.
- The process for donating stem cells is much easier and painless than in the past.

A bone marrow transplant is a medical procedure used to replace diseased bone marrow with healthy bone marrow. However, it is usually the blood stem cells that are transplanted, not the actual bone marrow. So, this procedure is more commonly called a stem cell transplant.

A person may need a stem cell transplant for diseases of the bone marrow. These can include leukemia, lymphoma, myeloma, and aplastic anemia. People with some types of genetic and immune system disorders may also need a stem cell transplant. For many patients, a stem cell transplant offers the best chance of survival and a possible cure. Donating bone marrow or stem cells can save someone's life. Huge improvements in the donation process of have made it as easy and painless as giving blood.

The importance of bone marrow

Bone marrow is the soft, spongy material found in large bones. Bone marrow makes than more 20 billion new blood cells every day. Bone marrow stem cells are essential because they mature into red blood cells, white blood cells, or platelets. Red blood cells carry oxygen to all parts of the body. White blood cells help the body fight infections and diseases. And, platelets help blood clot and control bleeding. In patients with bone marrow disease and certain types of cancer, these functions do not work well. This is why patients with such conditions

may need a stem cell transplant.

An allogeneic transplantation, also known as an ALLO transplant, uses stem cells from a donor. Learn more about the types and process of bone marrow transplantation [2].

Tissue typing for an ALLO transplant

Before a person receives an ALLO transplant, the health care team must find a matching donor. Human leukocyte antigens (HLA) are specific proteins on the surface of white blood cells and other cells. The combination of these proteins make each person's tissue type unique. HLA typing is a special blood test that identifies these proteins. A successful bone marrow transplant requires the donation of near-perfect, HLA-matched bone marrow. HLA-matched bone marrow/blood stem cells are less likely to cause graft-versus-host disease (GVHD). In GVHD, the immune cells in the transplanted bone marrow recognize the recipient's body as foreign and attack it. Learn more about GVHD [3].

Finding Donors

About 30% of patients who need a bone marrow transplant can find an HLA-matched donor in their immediate family. A person?s brothers and sisters are more likely to have HLA-matched bone marrow. This is why a person?s health care team usually tests brothers and sisters first. Parents and children may be a match, but the chances are low. For the remaining 70% of patients, doctors try to find HLA-matched bone marrow from the worldwide pool of volunteer donors.

The National Marrow Donor Program [4] (NMDP) is a nonprofit organization that helps doctors locate matching donors. The NMDP registers people who would be willing to donate bone marrow. They also record the HLA tissue type of each donor into a comprehensive, confidential database, called a registry. The NMDP is the largest registry. Other registries that specialize in finding donors for specific ethnic groups also exist. When searching for a donor, doctors examine every registry in the world.

HLA tissue types are inherited, meaning passed from parent to child. A person has a better chance of finding a bone marrow match from the same racial and ethnic group. People belonging to minority populations are under-represented in the donor registry. Increasing donations from specific minority populations gives more people a chance to find a matched donor. These populations include American Indian, Alaskan Native, Asian, black, Hispanic, Native Hawaiian or Pacific Islander. In addition, registries need donors from multiple racial or ethnic backgrounds.

Who can donate bone marrow

The following are some general guidelines recommended by the NMDP for bone marrow donation. These guidelines protect the health and safety of the donor and the recipient. Donors should contact their local NMDP center for specific details and discuss donations with their health care team.

- Potential donors must be healthy and between the ages of 18 and 60.
- If matched with a person needing a transplant, each donor must pass a medical examination. Donors must also be infection-free before donating bone marrow.
- Most people taking medications can still donate bone marrow. They need to be healthy and have any medical condition under control when they donate. Acceptable medications include birth control pills; thyroid medication; antihistamines; antibiotics; prescription eye drops; and topical medications, such as skin creams. Antianxiety and antidepressant drugs are also acceptable as long as the person's medical condition is under control. Talk with your doctor if you have any concerns about the medications you are taking.
- People who cannot donate bone marrow include pregnant women, users of intravenous drugs that are not

prescribed by a doctor, people who have had a positive blood test for hepatitis B or hepatitis C. Also, those with specific medical conditions, such as most types of cancer or certain heart conditions, cannot donate.
- People with Lyme disease, malaria, or recent tattoos or piercings should wait at least a year before donating bone marrow.

How to register as a bone marrow donor

Registering to become a bone marrow donor is easy. Locate a donor center by visiting the National Marrow Donor Program's website [4]. You can also call the organization's toll-free number at 800-MARROW2 (627-7692). If you can?t find a donor center in your area, you can register online. NMDP will mail you a tissue-typing kit with instructions on how to register.

Donor centers may charge a nominal fee ranging from $50 to $100, which is tax deductible. In some cases, there is no cost to the donor. Any additional costs are usually the responsibility of the patient receiving the bone marrow transplant.

When donors register, they need to fill out a short medical questionnaire. They also need to sign a consent form stating that they understand what it means to participate in the registry. Either a small sample of blood, about 1 tablespoon, or cells from inside the cheek using a cotton swab is taken. The sample is analyzed to find out the donor's HLA type. This confidential information is recorded in a national database. This database can be accessed by doctors from across the country when patients need a transplant.

When a match is made, the NMDP contacts the donor. A new sample of blood is taken and sent to the patient's transplant center to confirm the HLA match. Once the match is confirmed, a counselor from the NMDP calls the donor to schedule an appointment. During the appointment, NMDP will discuss the risks, benefits, and procedure involved in bone marrow donation. After agreeing to the procedure, the donor is given a medical exam to protect his or her health and the health of the bone marrow recipient.

Donors are under no obligation after registration. They can ask to have their name removed from the registry at any time. People who become part of a bone marrow registry should contact the registry if their contact information changes.

The donation process

Today, most donors have a peripheral blood stem cell (PBSC) collection. For five days before PBSC collection, a donor receives injections of a white blood cell growth hormone called G-CSF (Neupogen). These injections last 5 minutes. On the fifth day, a needle is placed in each of the donor's arms. The person?s blood is circulated through a machine that collects the stem cells. Then, the rest of the blood is returned to the donor. This collection takes about three hours and may be repeated on a second donation day. There is very little blood loss. Side effects may include headaches, bone soreness, and the discomfort of needles in the arms during the process.

Although less common, a donor may receive a bone marrow harvest. During this procedure, doctors take bone marrow from the donor's hip bone during surgery. Anesthesia, which is medication to block the awareness of pain, is given during this procedure. Donors usually go home the same day and can return to normal activity within one week. Common side effects of this type of bone marrow donation can include nausea, headache, and fatigue. These side effects are most often related to the anesthesia. Donors may also experience bruising or discomfort in the lower back.

It is important to note that most donors have minimal side effects. The body replaces lost bone marrow within four to six weeks. A member of the health care team contacts the donor for several months after donation to make sure he or she has fully recovered.

More Information

Understanding Bone Marrow and Stem Cell Transplantation [2]

Side Effects of Bone Marrow and Stem Cell Transplantation [3]

Additional Resources

ExploreBMT [5]

Blood and Marrow Transplant Information Network [6]

U.S. Department of Health and Human Services: Bone Marrow and Cord Blood Donation and Transplantation [7]

The Bone Marrow Foundation [8]

Links:
[1] http://www.cancer.net/sites/cancer.net/files/Donating_Bone_Marrow.mp3
[2] http://www.cancer.net/node/24717
[3] http://www.cancer.net/node/24674
[4] http://bethematch.org/
[5] http://www.explorebmt.org/
[6] http://www.bmtinfonet.org/
[7] http://bloodcell.transplant.hrsa.gov/
[8] http://www.bonemarrow.org/