

## **[Track 2: What Is a Transplant?]**

**Narrator:** Transplants using stem cells from the blood, bone marrow or umbilical cord blood can be an effective treatment for people with blood cancers such as leukemia, lymphoma, and multiple myeloma—as well as a variety of genetic and immune system disorders. Transplant outcomes have improved because of advances in clinical practice, including more precisely matched donors and patients, improvements in ability to manage complications and better understanding of optimal timing for transplant. As outcomes improve and donor and cord blood registries grow, more patients are able to receive transplants.

There are several types of transplants, and the process can be complex. First, it's important to understand your blood and immune system. The diagram in the booklet that accompanies this program should be helpful.

Be The Match, formerly known as the National Marrow Donor Program, has provided the following definitions. Marrow is the soft tissue inside bones that produces blood-forming cells. Blood-forming cells are immature cells that can grow into red blood cells, white blood cells or platelets. Red blood cells carry oxygen throughout the body. White blood cells help fight infection. Platelets help control bleeding. Healthy marrow and blood cells are needed to live. When disease affects marrow so that it cannot function properly, a marrow or cord blood transplant could be your best treatment option.

A bone marrow or cord blood transplant replaces your unhealthy blood forming cells with healthy ones. The new cells may come either from yourself (an autologous transplant) or from a matched donor or cord blood unit (an allogeneic transplant).

There are three sources of blood-forming cells used in transplants:

- Bone marrow
- Peripheral (circulating) blood (also called peripheral blood stem cell or PBSC)
- Umbilical cord blood collected after a baby is born

If you need a transplant, your Doctor will choose the type—determined by the source of the stem cells—and cell source—marrow, PBSC or cord blood—that is right for you based on your disease and other health factors. Most transplant procedures are successful, and most people receiving them benefit greatly. Long-term survival rates depend on many factors, the most important of which are the type and stage of your cancer. As with most cancer therapies, transplants have some side effects which must be managed.

Since both blood and marrow are good sources of stem cells for transplantation, the terms "stem cell transplantation" and "hematopoietic stem cell transplantation" have replaced "bone marrow transplantation" as the general term. When you hear the abbreviation "BMT," that now refers to "blood and marrow transplantation" rather than "bone marrow transplant."

The types of transplants are autologous, allogeneic, and syngeneic. An autologous transplant uses a patient's own stem cells. The stem cells are collected from the bone marrow or blood and

frozen. The thawed cells are then returned to the patient after high doses of chemotherapy and/or radiation therapy have destroyed the cancer cells and the patient's immune system.

With an allogeneic transplant, stem cells are donated by someone else, a related or unrelated donor. The related donor is generally a brother or sister, since each brother and sister with the same parents has a 25% chance of matching, as they carry the antigens of both parents. An unrelated donor is a person who is not a relative, but their stem cells are a close match to the patient's cells. If the patient and the donor are identical twins, the transplant is called a syngeneic transplant.

Both autologous and standard allogeneic transplants use high dose chemotherapy, radiation, or both in the conditioning process, the treatment used to prepare a patient for transplant. Some people have health problems that prevent them from having standard autologous transplants, or, for health reasons, they could not tolerate myeloablative – also called full intensity - allogeneic transplants. For these people, a reduced-intensity or non-myeloablative transplant, could be an option. Chemotherapy and radiation used in reduced-intensity transplants weakens, but does not destroy, the patient's immune cells. The reduced-intensity transplant relies on the donor's immune cells to fight disease by building a new immune system for the recipient. At first, recipients have both their own and donor stem cells in their bone marrow. The hope is that over time, donor cells totally replace the recipient's diseased marrow.

There are two additional points that should be mentioned here: One – it's not unusual these days for “maintenance therapy” or “maintenance treatment” to be recommended after blood and

marrow transplant for some diseases. Findings from a number of clinical trials seem to tell us that, in some cases, maintenance therapy improves overall survival. Maintenance therapy may not be needed by every transplant recipient, but it's important to know it could be offered. The second point relates to clinical trials. Even though the outcomes of blood and marrow transplant have improved a great deal over the 50 years or so they've been used, continuing clinical research is needed to optimize transplant outcomes. Talk with your transplant doctor or other team members about whether a clinical trial could be an option for you.

Questions you may be asking right now are, "Who can have a transplant?" and, "Should I have one?"

There are several factors your Doctor and other healthcare team members consider before recommending a transplant as part of your treatment. These factors include:

- Your age and general health
- The possibility that the cancer or disease is treatable with a transplant
- The type of transplant best for you
- The availability of cells—either yours or cells from a donor
- Whether there is a caregiver available to help take care of you during and after the transplant
- Insurance and financial resources, especially if an allogeneic transplant may be recommended.

**Narrator:** There is obviously so much to learn about transplants. It's impossible to expect to learn everything from any one source. The resource booklet that comes with this program has excellent sources of information, and we encourage you to use the Cancer Survival Toolbox basic skill of "Finding Information" to help you learn more. It may also be useful to listen to the other basic skills programs on "Communicating," "Problem-solving," "Decision-Making," and "Standing up for Your Rights," as these are all important tools for anyone considering a transplant.