Bone Marrow Transplantation: What All Conditions Can Be Treated With It?

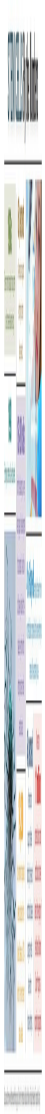
What is a bone marrow transplant?

Bone marrow transplant (BMT), also known as stem cell transplant, is a special treatment for patients with certain types of cancers or other diseases. A bone marrow transplant involves the extraction of cells that are normally present in the bone marrow (stem cells), their filtration, and insertion into the patient. The stem cells may come from the patient or from a donor, the selection of which depends on the condition that the patient is suffering from. The healthy stem cells travel to the bone marrow where they produce new blood cells and promote the growth of healthy marrow.

Everything You Need to Know About Bone Marrow Transplants- Types, Procedure, Recovery

Learn More_

What is the need for a bone marrow transplant?



A bone marrow transplant helps treat many forms of diseases and cancers. Additionally, a specialist sometimes recommends it after chemotherapy or radiation therapy in some cancer patients. Due to the high doses of chemotherapy or radiation used for the treatment of specific types of cancers, a person's bone marrow may get permanently damaged, thus requiring a bone marrow transplant. Sometimes, a bone marrow transplant is needed because it is destroyed as a result of a disease. A bone marrow transplant can be used to:

- Replace damaged or non-functional bone marrow with healthy functioning bone marrow for conditions such as leukemia, aplastic anemia, and sickle cell anemia
- Rejuvenate a new immune system to fight existing leukemia or other cancers that chemotherapy or radiation fail to treat completely

- Replace bone marrow and restore its normal functioning after high doses of chemotherapy or radiation during cancer treatment

- Replace a bone marrow with a genetically healthy and functional bone marrow to prevent damage due to genetic diseases such as Hurler's syndrome and adrenoleukodystrophy

Check out Top Hospitals for Bone Marrow Transplant

Explore

What are different types of bone marrow transplant?

Depending on the type of the donor and the condition that the patient has, bone marrow transplants are of different types:

- **Autologous bone marrow transplant:** In an autologous transplant, the patient is himself or herself the donor. The specialists extract stem cells from the patient by bone marrow harvest or apheresis (a procedure of collecting peripheral blood stem cells). The cells are frozen. The specialist thaws and injects the stem cells back into the patient in a short procedure as the requirement arises. This type of transplant is often known as the rescue therapy.

- **Allogeneic bone marrow transplant:** Allogeneic transplant involves the use of stem cells from a donor. The donor should be a close genetic match. Stem cells are taken either by bone marrow harvest or apheresis from a genetically-matching donor. A donor for allogeneic BMT can be a parent or an unrelated donor found through national bone

marrow registries.

- **Umbilical cord blood transplant:** In this BMT, stem cells are taken from the umbilical cord immediately after the delivery of an infant. These specialists test, type, count and freeze the stem cells until the date of transplant.

How does a bone marrow transplant work?

The following key steps are involved in a bone marrow transplant:

- **Collecting stem cells:** A doctor inserts a thin tube called a transplant catheter in a large vein in the donor. The doctor will collect the stem cells from this tube and give medications and chemotherapy through this tube.
- **Transplant treatment:** The specialist gives high doses of chemotherapy or radiation therapy to the patient. It takes about 5 to 7 days.
- **Stem cell transfusion:** The healthcare team puts the stem cells in the patient through the transplant catheter. Each infusion takes about 30 minutes to 1 hour.
- **Recovery:** Medications and antibiotics are given to the patient. The specialists also advice blood transfusion sometimes. The recovery period is about two to four weeks.

What are the conditions that can be treated with a bone marrow transplant?

Acute myelogenous leukemia (AML)

AML is a fast-growing blood cancer. In this disease, the body makes unhealthy stem cells that don’t develop properly. It also prevents the marrow from making normal red blood cells, white blood cells, and platelets. The most common type of BMT for this type of leukemia is an allogeneic transplant. The process involves replacement of unhealthy cells by healthy blood-forming cells donated by someone else.

Acute lymphoblastic leukemia (ALL)

It is also a type of blood cancer, where the body makes abnormal lymphocytes, a type of blood cell in the bone marrow. The type of BMT used for ALL patients in the allogeneic transplant.

Chronic lymphocytic leukemia (CLL)

This is a type of blood cancer where the body makes too many abnormal white blood cells. These cells don't work properly and do not allow the marrow to produce other healthy blood cells. An allogeneic form of BMT helps treat CLL.

Chronic myelogenous leukemia (CML)

This is a chromosomal abnormality where bone marrow makes too many white blood cells. An allogeneic bone marrow transplant helps treat CML.

Non-Hodgkin's lymphoma (NHL)

It is a certain type of cancer where the body makes unhealthy lymphocytes. The specialists prefer autologous transplant more commonly for the treatment of NHL. In this, the specialist collects and stores patient's own blood-forming cells and injects them after chemotherapy or radiation.

Hodgkin's Lymphoma

It is a rare lymphatic system cancer that causes the lymph cells to reproduce abnormally. It leads to tumors and making the body less capable of fighting the infections. Autologous transplant is a common treatment for Hodgkin's lymphoma.

Severe aplastic anemia (SAA)

It is a condition where the bone marrow does not produce enough blood cells for the body. An allogeneic transplant helps treat SAA. The specialist derives healthy cells from someone else to treat the patient. These healthy cells can come from a family member, unrelated donor, or umbilical cord blood.

Severe combined immunodeficiency (SCID)

This is a group of inherited immune system disorders. In these disorders, some parts of the immune system are missing or do not function well. SCID also uses the allogeneic type of bone marrow transplant.

Wiskott-Aldrich syndrome (WAS)

It is an inherited immune system disorder where the immune system does not work properly. Allogeneic transplant helps treat WAS.

Sickle cell disease (SCD)

Abnormal hemoglobin levels are one of the characteristics of SCD. The red blood cells in the body become stiff and sickle-shaped, causing blockage of blood flow in small veins. This can

lead to the damage of the lungs, brain, kidneys, and other organs. Allogeneic transplant helps treat sickle cell disease.

Krabbe disease

Globoid-cell leukodystrophy (GLD) is the other name for Krabbe disease. This disease affects the body's metabolism as the body is missing an important protein to break down fat-based substances in the body. Allogeneic transplant helps treat Krabbe disease.

Hurler syndrome (MPS-IH)

This is also a metabolic disorder where the body is lacking an important protein to break down the sugary substances in the body. Allogeneic transplant helps treat Hurler’s Syndrome.

Adrenoleukodystrophy (ALD)

This is an inherited metabolism disorder where the body is missing a protein required to break down fat-based substances. An allogeneic transplant helps treat ALD.

Myelodysplastic syndromes and myeloproliferative disorders (MDS)

These are a group of disorders that affect the bone marrow and the blood. In these disorders, the stem cells in the bone marrow slow down or even stop making red blood cells, white blood cells, and platelets. Allogeneic transplant is the most common type of transplant for MDS.

Multiple myelomas (MM)

This is a cancer of plasma cells that help to fight the infections. In MM, the unhealthy plasma cells are not able to fight the infections in the body properly. Both autologous and allogeneic types of transplants can help treat multiple myeloma, however, autologous BMT is more common.

Looking for a Treatment Plan for Bone Marrow Transplant

Get the Best Quote

Choosing the Type of Bone Marrow Transplant

Talking with your doctor is very important to understand and make important health decisions. Your doctor will recommend an autologous or allogeneic transplant depending on the disease you have, condition and health of your bone marrow, and your age and general health. For example, in case of cancer or a disease in your own bone marrow, your doctor will probably recommend an allogeneic transplant.

Choice of a transplant is a complicated decision. You will need advice from a doctor who has a specialization in bone marrow transplants or hematology. You and your donor may need to visit a stem cell transplant center. There you will meet and talk with a transplant specialist and undergo examination and tests. Before considering a bone marrow transplant, you should also consider non-medical factors such as who will care for you during your treatment, how long you will be away from job and responsibilities, and whether your insurance covers the cost of a bone marrow transplant.