

Editorial Note on Bone Marrow Transplantation

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EDITORIAL

A bone marrow transplant is a technique that uses healthy bone marrow stem cells to replace damaged or destroyed bone marrow. The soft, fatty tissue inside your bones that creates blood cells is known as bone marrow. In the bone marrow, stem cells are immature cells that give rise to a variety of blood cells. The transplantation of multipotent hematopoietic stem cells, usually taken from bone marrow, peripheral blood, or umbilical cord blood, is known as hematopoietic stem cell transplantation (HSCT). A bone marrow transplant, also known as a stem cell transplant, is a method of cancer treatment. If you have leukemia, multiple myeloma, or some forms of lymphoma, you may have one.

Stem cell transplants are also used to treat some blood disorders. Because the stem cells are extracted from the bone marrow, a stem cell transplant was previously known as a bone marrow transplant. Instead of bone marrow, stem cells are now frequently extracted from the circulation. As a result, they're now commonly referred to as stem cell transplants. Chemotherapy (chemo) with or without radiation will be given to the patient before the transplant to kill the defective blood-forming cells and marrow. After that, you will be given healthy cells (this is not surgery). An intravenous (IV) line, or tube, delivers the fresh cells to your bloodstream. It's the same as receiving blood or medication through an IV. The cells make their

way into your marrow, where they develop and begin to produce healthy red, white, and platelet cells.

As the procedure's success rate has risen, it's now being used to treat autoimmune disorders and genetic skeletal dysplasias, such as malignant infantile osteoporosis and mucopolysaccharidosis. The most prevalent source of stem cells for HSCT is peripheral blood stem cells. A method termed as apheresis is used to extract them from the blood. Blood is extracted from the donor with a sterile needle in one arm and sent through a machine that filters out white blood cells. The donor's red blood cells are returned. Bone marrow cells, unlike other organs, can be frozen for long periods of time without harming too many cells. Because the cells must be taken from the recipient months before the transplant procedure, this is a requirement with autologous HSCs.

Fresh HSCs are favored for allogeneic transplants to reduce cell loss that might occur during the freezing and thawing process. Because allogeneic cord blood is only available at the time of birthing, it is stored frozen at a cord blood bank. To cryopreserve HSCs, a preservative called dimethyl sulfoxide must be applied, and the cells must be cooled gently in a controlled-rate freezer to avoid osmotic cellular damage during the production of ice crystals. In a cryofreezer, which typically employs liquid nitrogen HSCs can be kept for years.

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