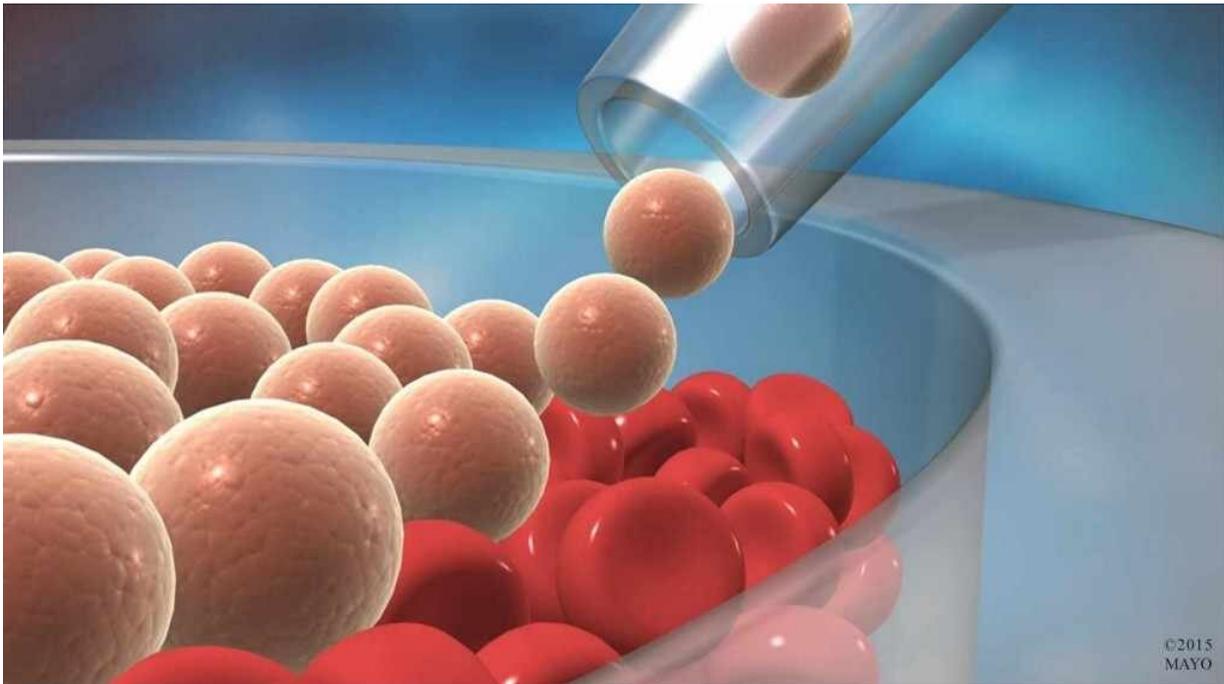


Five key medical advances related to bone marrow transplantation

October 11 2022, by Heather Carlson Kehren



Credit: Mayo Clinic

In the six decades since blood and marrow transplantation was used to treat patients with blood cancers, this once experimental treatment has become a vital cancer-fighting tool. Mayo Clinic in Rochester, Minnesota, is celebrating the 10,000th blood and marrow transplant used in the treatment of blood cancers and related disorders.

Mayo Clinic performed its first bone marrow transplant in 1963. Today, hundreds of people receive blood and marrow transplants every year at Mayo Clinic in Arizona, Florida and Minnesota.

This latest milestone is a time for reflection on the impact this treatment has had on the lives of many patients and families. But it is also important to continuously strive to improve the therapy to make it safer and more effective by incorporating new research and other promising developments, says William Hogan, M.B., B.Ch., director of Mayo Clinic's Blood and Marrow Transplant Program in Minnesota.

"It was only with the major contributions of many patients, nurses, researchers and providers over many decades that blood and marrow transplants have been developed into an effective treatment for so many," Dr. Hogan says. "It is awe-inspiring to reflect on the impact of this therapy on so many patients over the past 60 years. We look forward to an era of rapid innovation and providing even better patient-centric therapies for a range of devastating diseases."

Here are five of the most promising advances in blood and [marrow transplantation](#), including new ways of treating blood cancers:

1. Use of mismatched donors

Blood and marrow transplantation infuses healthy blood-forming stem cells into the body to replace bone marrow that has an underlying malignancy or defect that makes it unable to function normally. It is one of the first forms of regenerative medicine. The [stem cells](#) can come from a person's own cells—known as an autologous transplant, and this is an effective strategy for many [blood cancers](#), such as lymphoma and multiple myeloma. However, if the bone marrow is already compromised by certain cancers or is failing for other reasons, then a transplant from a donor called an allogenic transplant may be more

appropriate. Fully matched donors, such as an identical twin sibling, were the safest option initially. But thanks to recent advances, less well-matched donors, such as half-matched family members, are often considered.

2. Reduced-intensity conditioning

Many cancers affect [older people](#), but blood and marrow transplants were previously limited to young people. Older people not healthy enough for a blood or marrow transplant now have more options thanks to an approach that provides lower doses of chemotherapy and radiation before a transplant.

3. CAR-T cell therapy

Chimeric antigen receptor-T cell (CAR-T cell) therapy is a newer form of cell therapy used to fight cancer. The procedure involves taking the T cells from a person and reengineering them to recognize and destroy cancer cells. This immunotherapy treatment has been especially helpful in treating blood disorders, such as leukemia, lymphoma and multiple myeloma, and is rapidly expanding to other cancers.

4. Biomarkers to recognize serious complications early

Researchers have discovered metabolic markers that can predict an individual's risk for developing severe graft-versus-host disease—a serious complication of blood and marrow transplants in which the donor's immune cells start to attack the recipient's healthy tissues. This allows prompt personalized treatment.

5. Using bone marrow transplants to treat other

conditions

Mayo Clinic researchers are examining whether stem cell transplants can treat other conditions, such as multiple sclerosis.

While these advances are heartening, the need for more [bone marrow](#) donors—especially from people from diverse racial and ethnic backgrounds—remains strong. The key is encouraging more people to register to become a donor at [Bethematch.org](#).

Provided by Mayo Clinic

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