Stem Cell Transplants

The procedure can put certain blood cancers into remission and may lead to a cure.

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A stem cell transplant, commonly known as a bone marrow transplant, replaces blood-forming stem cells. The procedure can be a lifesaving option for people with certain blood cancers that don't respond to other types of treatment. A successful transplant can put cancer into remission and may lead to a cure.

Hematopoietic stem cells are precursor cells that give rise to all the cells that make up the blood, including oxygen-carrying red blood cells, platelets and immune system white blood cells. This process occurs in the bone marrow, the spongy tissue inside certain bones.

The transplant procedure usually involves strong chemotherapy and sometimes total body radiation—known as conditioning therapy—that wipes out existing stem cells and blood cells and makes room for healthy new ones.

In some cases, a patient's healthy stem cells are collected before conditioning therapy, frozen and returned to the body afterward; this is known as an autologous transplant. In other cases, the stem cells come from a donor; this is called an allogeneic transplant. Donor stem cells often produce white blood cells that can fight cancer better than the recipient's original immune cells. The likelihood of complications is lower if the donor is a close genetic match, preferably a sibling. A compatible donor may also be found through a registry.

Stem cells may be obtained from bone marrow withdrawn from the hip bone, harvested from the blood (using drugs that move the cells from the bone marrow into the bloodstream) or collected from umbilical cord blood from newborns.

Risks of Stem Cell Transplants

After conditioning therapy, the new stem cells are administered via IV infusion. These cells migrate to the bone marrow—a process known as engraftment—where they produce new blood cells and reconstitute the immune system. It can take several months for blood cell counts to return to normal.

A stem cell transplant is an intensive medical procedure. The conditioning therapy kills off the recipient's protective immune cells, leaving them prone to infections. Patients may need transfusions of red blood cells and platelets until the new stem cells can produce enough on their

own. The conditioning regimen can also cause other side effects, including nausea and vomiting, hair loss and mouth sores; the procedure may also lead to infertility.

One potentially serious complication of an allogeneic transplant is graft-versus-host disease (GVHD), which occurs when the new immune cells produced by donor stem cells recognize the recipient's body as "foreign" and attack healthy tissues. Steroids, other immunosuppressive medications and certain targeted therapies can be used to prevent and manage GVHD.
