

Celebrating 50 years of Bone Marrow (Stem Cell) Transplants

Timeline for Development of Bone Marrow Transplant Procedures

Bone marrow (stem cell) transplants are now routinely carried out worldwide to treat people with life-threatening blood disorders including various cancers. Procedures are now refined to the point where a wide variety of donor categories are utilized. Bone marrow transplants were initially attempted only when the donor and the recipient were related.

Early-mid 1900s	First attempts to treat patients with serious blood disorders by using bone marrow. These early treatments are not successful, probably at least in part because they are administered orally.
1956	<i>First successful bone marrow transplant</i> between two humans (a leukemia patient and his identical twin) is performed by Dr. E. Donnall Thomas at a hospital in New York.
1957/58	Canada's first bone marrow transplant is performed on a leukemia patient in Regina, Saskatchewan. The donor is the patient's sister. The patient survives for only a few days.
1958	Jean Dausset identifies human leukocyte antigens (HLAs), which help the immune system to recognize what is part of the body and what is not. HLA compatibility between donor and recipient is necessary for transplants to be successful.
1960	Researchers discover that bone marrow contains at least two kinds of stem cells: blood or haematopoietic stem cells that form all the types of blood cells in the body, and stromal cells that form bone, cartilage, fat, and connective tissue.
1968	<i>First successful bone marrow transplant</i> using a related donor who is a sibling but not a twin is performed by Dr. Robert Good to treat a patient with severe hereditary immuno-deficiency.
1970	<i>First successful bone marrow transplant</i> using a related donor who is not a twin or a sibling is performed in Seattle.
1973	<i>First successful bone marrow transplant</i> using an unrelated donor is performed on a patient with Severe Combined Immuno-Deficiency (SCID) in New York.
1979	<i>First successful bone marrow transplant for leukemia</i> using an unrelated donor is performed at the Fred Hutchinson Cancer Research Center in Seattle. The donor is one of the laboratory staff who proves to be a good match.
1980	Jean Dausset is one of three co-winners of Nobel Prize for his discovery of HLA and its role in immune reactions.
1988	A 36-year-old family physician in Ontario becomes Canada's first successful bone marrow transplant recipient using an unrelated donor.
1988	The Register of Bone Marrow Donors Worldwide is established.
1990	Dr. E. Donnall Thomas is awarded the Nobel Prize for his work in bone marrow transplantation.
1998	Bone marrow (stem cell) transplant services are started in Saskatchewan with a half-time physician. From 1998 – 2000, approximately ten autologous transplants are carried out annually.
2002	Two full-time transplant hematologists are recruited to the Provincial Blood and Marrow Transplant Program. Initially, approximately 48 transplants (including both autologous and allogeneic) are performed each year.
2005	Insufficient resources and inadequate infrastructure begin to restrict stem cell transplants in Saskatchewan. Transplant numbers drop to about 30 autologous patients per year. Patients requiring allogeneic transplants are sent out of province.
2008	The number of donors and cord blood units registered on the Bone Marrow Donors Worldwide database passes 12 million.
2008 and beyond	Bone marrow infusions are being used for induction of specific tolerance in organ transplantation. Indications are that stem cell therapies offer huge potential for treating a variety of diseases such as Alzheimer's, Parkinson's, motor neuron diseases and diabetes, as well as for repairing organ damage in heart attack victims.