

How a baby helped save his big brother's life

The stem cells in Joseph Kim's umbilical cord blood were retrieved by doctors and infused into his then-five-year-old brother who was suffering from a rare bone marrow disease

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When Coquitlam toddler Joseph Kim gets a little older, he'll hear all about how his heroic birth -- and especially the contents of his umbilical cord -- helped save his older brother Daniel's life.

No one has to ask Daniel how Joseph helped him as he teetered on life's edge.

"In Grade 1, the teacher asked the kids who their heroes were and many of them picked supernatural cartoon characters. Not Daniel. He said his brother Joseph was his hero because he saved his life," says father Richard Kim.

When Joseph was born about 18 months ago, doctors at B.C. Children's Hospital took the extremely rare step of retrieving the stem cells in his umbilical cord blood and infusing them into his then-five-year-old brother, who was suffering from severe aplastic anemia, a rare disease in which the bone marrow does not produce blood cells of all types.

Daniel, now a thriving seven-year-old, was the first B.C. child to get an umbilical cord blood transplant for severe aplastic anemia, which affects only about four children each year in B.C.

BC Children's Hospital did its first cord blood transplant on a leukemia patient in 1992, and since then, 16 more children have received cord blood transplants, most of them in the past few years since research is continually yielding new indications for such transplants.

Daniel was visiting his grandparents in Korea when he became ill with what was initially diagnosed as merely severe flu symptoms. Eventually, he was admitted to hospital in Seoul and a bone marrow aspiration test confirmed he had acquired severe aplastic anemia. The condition could have been treated with a bone marrow transplant, but doctors in that country did not do that procedure, opting instead for blood transfusions which did not help. While in hospital there, he also developed potentially fatal appendicitis, for which he was operated on, according to his father, Richard Kim. After nearly four months, he was cleared to fly home to



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Rita Richardson, a supervisor at Children's Hospital, lifts a stem cell product cassette from a liquid nitrogen tank.

see doctors at BC Children's Hospital.

Dr. David Dix, a hematology oncologist at Children's, recalls getting a frantic e-mail from Richard Kim.

"He was in a state of distress about how his son was languishing in the hospital in Korea. When we finally saw Daniel, he was really unwell. He had iron overload from the blood transfusions he had been given and he was malnourished and his blood counts were negligible. We put him on immunosuppressive therapy [for his disordered immune system] but we were discouraged to find he didn't respond for three months.

"I made a note that his mother was pregnant, but I didn't count on an umbilical cord blood transplant at that point because there is only a 25-per-cent chance of a match. Then we started a search for a bone marrow transplant donor, but we couldn't find any matches," he said.

When Joseph was born, Daniel's family and medical team were thrilled to learn that he was a 100-per-cent match. Then doctors had to debate whether to proceed with a cord blood transplant immediately or wait until Joseph was a few months old, when his bone marrow might instead be harvested.

"The standard therapy is bone marrow transplantation," explains Dix.

"We hadn't done a cord blood transplant for this [condition] at the hospital before this but we knew of a case elsewhere so we made a decision to go ahead since it was too risky for Daniel to wait any longer. He responded incredibly well. We were thrilled at how everything turned out," said Dix.

Richard Kim, (who asked that no photos be taken of his sons to protect their privacy) says it took about two months for the cord blood transplant to show it was working. "We were advised it would be six to eight weeks to see results and then, at about nine weeks, the blood counts showed great improvement. Throughout that time, Daniel was in isolation to protect him from any infections. We had people here and in Korea praying for us and Daniel came through it. It's like a miracle that he reacted so well."

Kim says Daniel is now "a regular boy who loves to play outdoor sports -- soccer, baseball, basketball.

"He's healthy now. He and his brother have a typical relationship with the typical sibling fights. Joseph loves to get involved in anything his older brother is doing. They love to play with toy cars and trains and after Daniel has them all set up, Joseph will come along and crash them and wipe them all out," he added.

Members of the Kim family are so grateful for the successful intervention that they will be sharing their story of survival at a public education forum on Sunday at the Jewish Community Centre, Norman Rothstein Theatre.

Michael O'Connor, a stem cell researcher at the Terry Fox Laboratory at the B.C. Cancer Research Centre, is the keynote scientific speaker at the event called Stem Cells: Hope or Hype. It is sponsored by the Vancouver chapter of the Canadian Technion Society, an

organization that supports the Technion-Israel Institute of Technology, one of the world's leading academic stem cell research centres.

O'Connor's talk will be followed by a panel discussion and debate about the religious and ethical perspectives regarding stem cells from a more controversial source, embryonic cells. The panel will be moderated by broadcaster Dr. Art Hister and panelists include Dr. Saad Bahr, a University of B.C. family medicine resident who is also a founding member of the Islamic Society of B.C.; Rev. Dr. Philip Crowell, director of spiritual care at B.C. Women's and Children's Hospitals; and Rabbi Andrew Rosenblatt, an orthodox rabbi who also has a graduate degree in science.

Tickets for the event, which starts at 7:30 p.m., are \$18 and can be purchased at the JCC front desk or by calling 604-277-4415.

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A PRIMER ON STEM CELLS

Stem cells are like the master cells of the body from which all other cells are created. Stem cell therapy is the replacement of diseased, dysfunctional cells in those patients requiring a repopulation or regeneration of stem cells.

Stem cells divide to form new and different cells with specific functions in the blood, brain and bone, for example.

They are increasingly being touted for their potential to regenerate organs and tissues throughout the body in a wide range of diseases. Currently, stem cell transplants are most frequently used to rebuild the blood and immune systems of patients whose bone marrow is damaged or destroyed from cancer and its treatment or from immune and bone marrow system disorders.

The sources of stem cells are:

Embryonic: Plucked from human embryos at four to five days old. Used only in research, often from donated aborted or frozen surplus embryos that would otherwise be discarded. The practice is mired in ethical concerns, but this year, scientists announced they had found a way around the controversy by extracting stem cells from human embryos without destroying a budding life in the process.

Adult, or mature, stem cells: Found in circulating blood and in bone marrow of children and adults, in placentas and in umbilical cords. Adult stem cells may not be as versatile as embryonic ones since they don't multiply as much and are not as easily manipulated to

produce all cell types. As well, mature stem cells may not be as pure as embryonic.

Stem cells from cord blood are often used for treatment of children, rather than adults, since the cords hold a limited amount of blood. There is no public umbilical cord blood bank in B.C., so it is typically discarded as medical waste unless parents of newborns expressly save and store it in a private facility, of which there are now about 10 in Canada.

- B.C. Children's Hospital has a small cryopreservation facility to store limited amounts of umbilical cord blood from sibling donors or from patients themselves. The tanks also contain bone marrow stem cells.

- B.C. is home to the first private cord blood bank -- Lifebank Corp. in Burnaby -- which provides collection and storage of umbilical cord stem cells for a fee. Lifebank now has more than 7,000 samples in its liquid nitrogen stainless steel tanks. In the 11 years since the service began, no samples have had to be withdrawn for medical reasons by parents who are storing the stem cells from their newborns' umbilical cords. But the act of collecting and storing the cells is like a type of medical insurance, according to Lifebank president Ernest Stacey.

- It has been estimated that there is only a one in 20,000 chance a child would ever require a cord blood transplant. Various federal health agencies are now studying the feasibility of a national public stem cell bank. The provinces have asked the Canadian Blood Services agency to draw up a business plan. A report is expected to be presented to health ministers early this summer.

Sources: National Marrow Donor Program (U.S.A.), Mayo Clinic, Lifebank, Public Health Agency of Canada