Storage of cord blood attracts private-sector interest

Janis Hass

In brief

Storage of cord blood from their babies can cost parents several hundred dollars, and some private companies are already offering the service. Janis Hass reports that some Canadian specialists question the value of the banks.

Inside 4 storage facilities across Canada, thousands of samples of umbilical-cord blood sit undisturbed in liquid nitrogen freezers, cryopreserved at –196 degrees C. Outside of these frigid and inert environments, however, the debate about the collection, storage and use of this precious source of stem cells is hot and dynamic.

Since the University of Alberta created Canada's first — and only free — umbilical-cord blood bank in 1996, 3 similar banks have opened their doors to paying customers, thus adding another chapter to the constant controversy surrounding the issue of public vs. private health care. Does Canada need these private banks? Do they provide "biological insurance," as they tout in their promotional literature? Or is it all a "waste of money," as some specialists in bone-marrow transplantation contend?

There's little doubt that a substance once considered medical waste is now a source of potentially life-saving material. Umbilical cord blood is rich in the hematopoietic stem cells that can help to restore bone marrow damaged by the radiation and chemotherapy used to treat cancers such as leukemia. Stem-cell transplants have also being used to treat several disorders affecting blood and the immune system. There are 3 sources of stem cells: umbilical cord and adult peripheral blood, and bone marrow.

Stem cells provided by cord blood offer several advantages over bone marrow. For transplants, finding a bone-marrow donor match can be time consuming and frustrating, the procedure can be painful for the donor, and 40% of the time the search is unsuccessful. Meanwhile, cord blood can be extracted relatively simply and quickly after birth and it presents a lower risk of graft-versus-host disease.

In the future, these stem cells may be used in gene therapy and to treat other cancers, but defining how great that potential is depends on the source of information. Dr. Michael Virro, an obstetrician/gynecologist who has invested in Cells for Life Ltd., a private bank for storing cord blood located in Markham, Ont., is optimistic about the blood's potential. "They've used it for breast cancer treatment and I've even heard [about its use in the treatment of] rheumatoid arthritis. . . . So the uses are expanding almost every week."

A brochure provided by the company provides a list of 17 "diseases that have been successfully treated with stem cells cryopreserved from umbilical-cord blood."

Pediatric hematologist Fred Saunders, director of the Bone Marrow Transplant Group at Sick Children's Hospital in Toronto, is more cautious. "We consider the use of cord-blood stem cells 'investigational.' It is not standard therapy, and it should be [used] under investigative protocols. These brochures are misleading because they make it sound like it is standard therapy, and it is not."

The major issue concerning Saunders and others is that the private cord-blood banks are unregulated and unaccredited in Canada. The Canadian Pediatric Bone Marrow Transplant Group is calling for their accreditation, and although standards covering the banks and stem-cell transplantation already exist in draft form, a Health Canada official says it may take 2 more years before they become law.

Until such a system is in place, Saunders would hesitate to use stored stem cells from the private banks. "When there are standards and inspections of these places, then I will use them. I don't care where [the blood] came from or whether someone made a buck from it, but I want to be reassured that this is a viable product."

At the moment, the private cord-blood banks say they are following standard guidelines used by Canada's blood banks.

The private banks say they are designed to provide customers with "biological insurance" against life-threatening disease, but Dr. Jeff Davis, a pediatric oncologist at the Children's and Women's Health Centre of British Columbia, thinks this type of private storage is a waste of money. "If you had a baby, and you said, 'I want the cord blood stored now,' and then your baby develops leukemia when he's 1 year old, would a physician like me be willing to use that cord blood?

Photo courtesy of Dr. John Akabutu

Unprocessed cord blood sample

"No way, because it probably [is diseased] too. I mean, it's the same blood — it's the baby's blood."

Davis contends that too many unanswered questions remain, particularly about the length of time the blood can be stored. "I do not know if we have actually done a transplant with bone marrow that has been stored for more than 10 years."

At Cells for Life, Virro believes that cryopreserved stem cells have an unlimited shelf life. "I do know that they have thawed out samples after 15 years and they still looked very good, so I think [the storage time] is unlimited at this point."

The Canadian Pediatric Bone Marrow Transplant Group recommends that stem cells be stored for a maximum of 5 years. Dr. John Akabutu, director of the public cord blood bank at the University of Alberta, says the shelf life of these frozen cells is "hotly disputed." At his bank, cells are currently discarded after 5 years.

Dr. Barbara Cruickshank, medical director of the Cord Blood Program at the Toronto Hospital and an assistant professor of reproductive sciences at the University of Toronto, says setting a time limit is an arbitrary decision. "It depends. People are storing them in different ways. Certainly we have long experience in storing embryos and sperm and the general guidelines don't limit it to 5 years."

What's it cost?

Her Toronto program is a private bank that charges fees to recover costs but is not designed to turn a profit. Still, storing the cord blood does not come cheap. Cruickshank's program charges $500 for registration and processing, and an annual storage fee of $100. Cells for Life charges $525 plus $100 annually, while Vancouver's Lifebank Cryogenics Corporation charges $850 for registration and processing and $125 annually. In the US, Viacord Inc. Charges US$1500, and annual storage fees of US$95.

So, is the private storage of umbilical cord blood a once-in-a-lifetime opportunity for parents to bank a valuable resource that may be a potential lifesaver for family members? Or is it simply an opportunity for entrepreneurs to profit from parents' fears about cancer and the difficulty of trying to find an appropriate bone-marrow donor?

Administrators at the private banks say they're simply offering the public another option. "We're not saying it is going to cure anything — we're simply letting people know what it has been proven [useful] for so they can make the decision themselves," says Virro. "Nobody is holding a gun to anybody's head."

"We have coined the term 'biological insurance,' " adds Ernest Stacey, president of Lifebank Cryogenics. "I'm not sure that's preying on anyone's fear, but it's a realistic term. It's an opportunity and it is not misleading because we're telling people up front. We're not deceiving anyone — we're saying 'here it is and yes, it may work or no, it may not work. And there's no guarantee.' "

Cruickshank agrees that storage of the cells is "speculative" but believes it is important for the public to have the storage option. More than 2000 samples have been stored by the Toronto Cord Blood Program during its first 2 years.

At the University of Alberta, Akabutu believes that the best solution for Canada is a national program with an online registry, but he lacks the funding to provide it. At present, his program relies on private donations. "These banks are very expensive to start with and the chances of using a cord-blood sample from a small hospital are remote. So it would be quite a horrendous waste of money to have too many small blood banks across Canada."

At the moment, he says, there are only 5 government-funded cord-blood banks in the US to serve a population of 270 million people, and "that tells you something. The public bank is what makes sense."

He says a national bank would represent the country's genetic diversity. "I do not see why you would need to store blood [privately] that may never be used and will likely be tossed when it could have been used by someone [had it been in a public bank]."

Akabutu is working with Canadian Blood Services to establish a national cord-blood registry of unrelated donors. However, without the public funding and political will needed to make the registry possible, the options physicians and parents have in the future will remain the same as the ones they have today.

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