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Umbilical Cord Blood Banking

Umbilical cord blood (UCB), collected following delivery of a baby, was once regarded as biological waste. Cord blood has much value, however, as a source of primitive hematopoietic stem cells and progenitor cells. These types of stem cells are routinely used to treat patients with cancers such as leukemia or lymphoma, and other disorders of the blood and immune systems. UCB cells are an alternative source for bone marrow transplantation; they are also being evaluated as a possible treatment for Alzheimer's disease, heart disease, HIV, and multiple sclerosis.

Clinical trials with UCB are planned or ongoing for treating autism, stroke, pediatric brain injury, burns, sickle cell disease, osteoarthritis, and viral infections. A trial is underway now in China testing UCB in patients with spinal cord injury.

Cord blood is thought to have several advantages compared to bone marrow. Because the stem cells in cord blood are not fully mature, the tissue match between the donor and patient can be less exact. Also, the incidence of graft-versus-host disease is reduced with UCB.

It is important to note that UCB cells are primitive cells but not the same as embryonic stem cells; cord blood cells are partly programmed to become blood cells or perhaps a type of immune cell. But research has shown that UCB cells can be pushed toward other fates, including bone, heart and nerve cells; the field is very active with both animal research and human trials.

While there is much enthusiasm about UCB cells and the potential for their clinical use, much work is needed to test and validate them. Meanwhile, there are many claims being made for the utility of UCB cells. Some overly aggressive marketing by private blood banks has come under the scrutiny by the Federal Food and Drug Administration (FDA) regarding inflated claims being made for future UCB treatments.

Outside of therapies for leukemia, lymphoma, or certain immune system or genetic metabolic disorders, there are no other approved uses for UCB.

Nonetheless, many families opt to save the cord blood, banking it for its future potential as “biological insurance” in a private blood bank or by donating UCB to a public bank. The privately banked cells would be available as fully compatible and immune-safe in the event the donor or a close relative required a blood cell transplant. Private banking is expensive -- $2500 to $3000 for the first year and about $150 a year thereafter.

There are no fees involved in donating blood to a public bank. While there are also no certainties that a public donor would be able to find a compatible match if the need were to arise, there is great need for UCB donations. Each year, thousands of people who could benefit from an umbilical cord blood or bone marrow transplant first turn to a family member, although 70 percent of patients will not find a matching donor in their family.

Many medical professionals, therefore, urge families expecting a baby to consider donating the cord blood to a public bank. The policy of the American Academy of Pediatrics states that private storage of cord blood is “unwise" unless there is a family history of specific genetic diseases or there is a family member with a current or potential need to undergo a stem cell transplantation.

From the Academy: “Cord blood donation should be discouraged when cord blood stored in a bank is to be directed for later personal or family use, because most conditions that might be helped by cord blood stem cells already exist in the infant’s cord blood (i.e., premalignant changes in stem cells). Physicians should be aware of the unsubstantiated claims of private cord blood banks made to future parents that promise to insure infants or family members against serious illnesses in the future by use of the stem cells contained in cord blood.”

Therefore, a properly matched transplant of bone marrow or cord blood from an unrelated donor may be the best treatment option.

The American Society for Blood and Marrow Transplantation encourages public donation where possible, since the probability of using one's own cord blood is very small.

The American Congress of Obstetricians and Gynecologists (ACOG) cautions that many physicians, employees, and/or consultants of private blood banking companies may have conflicts of interest in recruiting patients because of their own financial gain. (The UCB business is robust; a single unit of cord blood (less than a pint) costs around $30,000.

ACOG urges parents to consider the poor odds that their newborn would ever need a UCB transplant, and questions long-term storage of umbilical cord blood: “There is no accurate estimate of an individual's likelihood of using an autologous unit of umbilical cord blood. One estimate is approximately 1 in 2,700 individuals, whereas others argue that the rate would be even lower.”

Private storage of one's own cord blood is not legal in Italy and France, and is discouraged in other European countries.

Resources:

Info on donating to a public bank:

New York Blood Center's National Cord Blood Program (NCBP): Public Donation vs. Private/Speculative Storage
http://www.nationalcordbloodprogram.org/donation/public_vs_private_donation.html
The NCBP was founded to investigate cord blood as a possible solution to a critical public health need: finding appropriate hematopoietic transplants for patients who have no matched bone marrow donors.

U.S. Health Resources and Services Administration: Donating Umbilical Cord Blood to a Public Bank
http://bloodcell.transplant.hrsa.gov/cord/options/donating/index.html

General Info:

American Academy of Pediatrics: Cord Blood Banking for Potential Future Transplantation from Pediatrics Vol. 119, No. 1 Jan. 1 2007 pp. 165-170.
http://pediatrics.aappublications.org/content/119/1/165.full

American Society for Blood and Marrow Transplantation (ASBMT)
http://asbmt.org/
330 North Wabash Ave., Suite 2000
Chicago, IL 60611
Phone: 847-427-0224
ASBMT is an international professional membership association of physicians, investigators and other healthcare professionals promoting blood and marrow transplantation and cellular therapy research, education, scholarly publication and clinical standards.

FDA: Cord Blood Banking - Information for Consumers
http://www.fda.gov/biologicsbloodvaccines/resourcesforyou/consumers/ucm236044.htm

Kids Health from Nemours: Cord-Blood Banking
http://kidshealth.org/parent/_cancer_center/treatment/cord_blood.html

National Marrow Donor Program
http://bethematch.org/Home.aspx
3001 Broadway Street, NE
Minneapolis, MN 55413
Phone: 612-627-5000 or 1-800-627-7692
Be The Match® connects patients with their donor match for a life-saving marrow or umbilical cord blood transplant.

Parent's Guide to Cord Blood Foundation
http://parentsguidecordblood.org/
23110 Georgia Ave.
Brookeville, MD 20833
A non-profit organization that offers info on donating cord blood and finding a center that accepts donations of cord blood.

U.S. Health Resources and Services Administration: Options for Umbilical Cord Blood Banking & Donation
http://bloodcell.transplant.hrsa.gov/CORD/Options/index.html

This publication is supported by the Administration for Community Living (ACL), U.S. Department of Health and Human Services (HHS) as part of a financial assistance award totaling $10,000,000 with 100 percent funding by ACL/HHS. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by ACL/HHS, or the U.S. Government.