Rx: Health Care FYI #14

Subject: *Cord Blood Stem Cells are Saving Lives*
From: *Rep. Tim Murphy (PA-18)*

The problem: More than 30,000 people are diagnosed annually with leukemia or other blood, metabolic, or immune system disorders, and ***tens of thousands*** die every year waiting for bone marrow transplants.[1] Cord blood (stem cells from the blood contained in umbilical cord and placenta) has been proven to be a successful alternative for those waiting for bone marrow transplants.

The benefits of cord blood stem cells:

- Cord blood donated to a public Cord Blood Bank is an alternate stem cell source that avoids the ethical dilemma in harvesting embryonic stem cells, which requires killing embryos.
- Umbilical cord blood stem cells trigger little immune response in the recipient as opposed to embryonic stem cells which have a tendency to form tumors when injected into animals or human beings.
- Cord blood can be used as an alternative to bone marrow transplantation and to treat more than 70 diseases including Leukemia and Sickle Cell Anemia.[2]
- Cord blood does not have to match as closely as bone marrow, so most (>90%) children will be able to find a donor within 1-2 weeks.[3]
- Cord blood poses fewer risks than bone marrow transplants. Early studies show that the immune cells in cord blood from unrelated donors are less likely than those in bone marrow to attack the patient's own tissues (graft vs. host disease). Cord blood is also less likely to transmit viruses. [4]
- Cord blood works for adults. Two studies confirm improved survival rates among adults who received cord blood transplants for leukemia.[5]
- Cord blood collection is easy and risk-free. Cord blood collected from the delivered placenta or umbilical cord does not interfere with the care of the mother or newborn baby, posing no risk to mother or baby.
- Cord blood is available immediately. Cord blood stems cells are frozen and stored at public and private cord blood banks. When a suitable cord blood unit is found, it is guaranteed to be dispatched to a patient within one week or 24 hours in an emergency.
- Studies have shown certain cord blood stem cells have the capacity to change into other cell types, which give them the potential to help regenerate organs and treat many fatal, terminal and debilitating conditions, including spinal cord injury, Parkinson's, diabetes and heart disease.[6] Researchers have turned cord blood stem cells into neural stem cells, nerve cells, liver/pancreas precursors, skeletal muscle, fat cells, bone cells and blood vessels.[7]

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[1] Government Accountability Office. Bone Marrow Transplants. Despite Recruitment Successes National Program may be underutilized. October 2002.
[2] National Cord Blood Program. DIAGNOSES IN PATIENTS TRANSPLANTED WITH NCBP UNITS. December 2004.
[3] Cord Blood. Duke Comprehensive Cancer Center. 2004.
[4] National Cord Blood Program. What are the advantages of Cord Blood. New York Blood Center. 2004.
[5] Laughlin, M. Outcomes after Transplantation of Cord Blood or Bone Marrow from Unrelated Donors in Adults with Leukemia**.:** Rocha, V. Transplants of Umbilical-Cord Blood or Bone Marrow from Unrelated Donors in Adults with Acute Leukemia. New England Journal of Medicine. 2004.
[6] Kögler G *et al.*, "A new human somatic stem cell from placental cord blood with intrinsic pluripotent differentiation potential", *J. Experimental Medicine* 200, 123-135, 19 July 2004.
[7] Missy. Ekern. BioE First to Clone and Commercialize Multipotent Stem Cell Lines Derived from Human Umbilical Cord Blood. 2005.

Cord blood stem cells save lives:

- Neurological Diseases: Cord blood from unrelated donors was used to treat Krabbe's disease which produces progressive neurologic deterioration and death in early childhood. Most of the children were cured and achieved age-appropriate cognitive development.[8]
- Spinal Cord Injuries: Hwang Mi-soon, who was paralyzed for 19 years, took her first steps after receiving transplanted cord blood stem cells.[9]
- Sickle Cell Anemia: Keone Penn, 16 year old African-American received a cord blood stem cell transplant for sickle-cell anemia five years ago is now cured.
- Acute Leukemia (cancer):
    - Gayle Serls, received a cord blood transplant and has since seen both children graduate and celebrated her own 50th birthday.
    - Katherine Sutter, at 5 months old, received a cord blood transplant and is now cured.
- ALD (Adrenoleukodystrophy), an inherited disorder in which a protein that normally helps metabolize very long-chain fatty acids that leads progressive brian damage and death: Spencer Barsch, 2 year old, received a cord blood transplant and stopped cerebral changes from ALD.
- Osteoporosis: Anthony Dones, at 5 months old, received a cord blood transplant and is recovering.
- Diamond Blackfan Anemia, a disorder where no red blood cells are made, requiring monthly transfusions: Heidi Tweten received a cord blood stem cell transplant in her 20's is now off anti-rejection medications for six years with normal blood counts and has since graduated from nursing school, got married, and adopted a baby boy.[10]
- Hurler's Syndrome, a disorder that affects a child's central nervous system and organs leading to mental retardation and possible death: Cord blood treatments for 20 children had an 85 percent success rate in treating the disease.[11]

The federal government's role:

- In August 2001, President Bush stated that the federal government would continue to support research (committing $250 million) involving stem cells from other sources, such as "umbilical cord placenta, adult and animal stem cells which do not involve the same moral dilemma."
- In FY2004, the Consolidated Appropriations Act, 2004 (P.L. 108-199) provided $10,000,000 to establish a National Cord Blood Stem Cell Bank within the Health Resources and Services Administration (HRSA).
- The FY2005 Consolidated Appropriations Act (P.L. 108-447) provides $9,941,000 for the National Cord Blood Stem Cell Bank Program in HRSA.

Recommendations:

- Educate the public on the benefits of cord blood stem cell donations. With 4 million annual births in this country, an increase in cord blood donations will help provide cord blood for every patient who needs one.
- Fund the $45,000,000 for the Stem Cell Therapeutic and Research Act of 2005 to reauthorize the National Bone Marrow Registry to create a National Cord Blood Stem Cell Inventory and Outcomes Database to increase the coordination and distribution of cord blood transplants to donors.
- Support research efforts for cord blood stem cells, particularly research to change cord blood stem cells into other cell types to treat diseases and regenerate tissues and organs.

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[8] Escolar, Maria. Transplantation of Umbilical-Cord Blood in Babies with Infantile Krabbe's Disease. The New England Journal of Medicine. May 2005.
[9] Gyu. Kim. Tye. Korea Times. Korean Scientists Succeed in Stem Cell Therapy. November 2004.
[10] National Cord Blood Program. Patient Stories. New York Blood Center. 2004.
[11] Staba. Susan. Et.al. Cord-Blood Transplants from Unrelated Donors in Patients with Hurler's Syndrome. The New England Journal of Medicine. May 2004.