

## Your baby's blood can save your life

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Grafting your own skin for serious burns or your own vein for heart bypass stems from age-old insight that what's yours can heal you. Cavemen discovered how saliva could salve their wounds. Such knowledge is behind a new way to cure cancers and blood diseases with blood from your own umbilical cord. But in this medical innovation, the definition of "what's yours" is expanded from you as individual to you as member of a family. Simply put, doctors have found a way to use a newborn's umbilical cord blood potentially to save in the future not only its life but also its ailing siblings, parents, even grandparents.

The procedure is called umbilical cord blood transfusion, in which basic cells are injected into a patient's bloodstream to turn into red or white blood corpuscles and platelets. From there, the fresh red cells carry oxygen, the white cells produce antibodies, while the platelets aid in blood clotting. Marching through vital organs, the microscopic army treats leukemia, bone disease, and immune and metabolic disorders. It also rejuvenates a patient right after chemotherapy or radiation.

Poets must write odes to life for umbilical cord blood cells. For, these hematopoietic stem cells (HSCs) are the building blocks to restorative blood and immune systems, the master cells that morph or help make various cell types, of which humans have 260. Wondrous HSCs regenerate and thus can have indefinite life span; they constantly renew blood by producing billions of new cells each day. Their closest "kin" are the bone marrow and the early embryo. But transplanting umbilical cord blood is as easy as a transfusion. By contrast, bone marrow transplant is painfully invasive, while embryonic cloning is controversial for having to kill the fetus to harvest its HSCs.

There are other sources of HSCs: peripheral blood in adults, skin and fat, cartilage and muscle, liver and retina. But extracting, still experimental and expensive, yields too little. Taking out umbilical cord blood can be done cheaply and painlessly in three minutes. Upon delivery the baby's umbilical cord is clamped, then cut from it. A sterile bag then gathers about 100 ml of blood from the other end. The sample is then rushed to a cord blood facility for testing and processing. Plasma is drained out and, if the blood contains at least 100 million nucleated cells, the sample is blast-frozen with liquid nitrogen to minus-104 degrees for storage in a blood bank. The donor can withdraw her blood for personal or family.

Research in bone marrow and umbilical cord blood (UCB) began about the same time in the '60s. Bone marrow transplants followed soon afterwards. Only in Oct. 1988 did scientists attempt in France the first UCB transfusion, and it was an instant success. The patient, a five-year-old boy, was afflicted with Fanconi anemia, which leads to bone marrow failure and thus discarded the previous technology. There have been more than 6,000 UCB transplants since then. In June 2004 a Singapore firm called CordLife, pioneering in UCB research and storage in Asia, performed the continent's first transplant – using UCB from a sibling. The infant girl-donor gave blood to her three-year-old brother who had been diagnosed with leukemia from birth and had been given less than a year to live. The patient is now in nursery school. Five months after the Singapore transplant, Korean doctors transfused UCB from a stranger-donor to a 37-year-old woman paralyzed for the past two decades by a spinal injury. In three weeks she was able to walk with crutches, but true success will be determined after three to five years. CordLife introduced UCB extraction and banking in the Philippines last year, along with the first UCB transplant at St. Luke's Medical Center on a nine-year-old girl with a Japanese donor.

Doctors worldwide cheer that UCB transplant is the most promising cure today for debilitating diseases. Researches have shown its success in 72 ailments. (Useful websites: [www.bioexchange.com/news/stemcells.cfm](http://www.bioexchange.com/news/stemcells.cfm) or [www.parentsguidecordblood.com](http://www.parentsguidecordblood.com).) More than that, the possibility of finding matches, compared to bone marrow donation, is infinitely better. Like the Singaporean boy whose parents were deluged with hundreds of volunteers when they appealed for help on television, patients have only a 1:20,000 chance for a perfect match. This is because the six definitive human leukocyte antigens (HLAs), or proteins present in the surface of body cells of both donor and recipient, must be exactly alike. Each person inherits three HLAs from each parent, and has a good chance of one sibling out of five to be a match. But that's it.

With umbilical cord blood donation, statistics improve. A recipient needs only three of the donor's HLAs to match - and the transplant may proceed, although with chances of rejection and failure. Among five siblings, a donor can find three potential recipients. More than that, both parents are likely to match, as well as one from each set of grandparents. It's one of the wonders of life: via the umbilical cord, mothers sustain prenatal babies; its blood content in the future may also save her life and that of her loved ones.

Because of such statistics, CordLife sells UCB banking like insurance policies. "One hopes he will never need it, but one never knows when he'll need it," Joey S. Salindong, Philippine country manager, says of CordLife's lay-away plan. From the start of the year, about a hundred Filipinos have signed up their children or grandchildren for UCB banking. The deal costs a little over a thousand dollars for UCB extraction, testing and processing, plus a little over a hundred a year for banking. To date, however, a banked blood sample can be used for only one medical application. But widespread research promises to develop multiple application per sample – as well as inroads in cures for more and more diseases, like Alzheimer's, Parkinson's, heart conditions, even substitute for insulin shots against that treacherous diabetes. It is for this reason, Salindong chuckles, that among his clients are ageing millionaires who, not taking any chances, are having UCB samples taken not only from one but all potential grand-offspring.

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