

# Cord Blood Banking is Not Insurance for the Future



By *Lila Abassi* — October 13, 2017



Umbilical cord blood banking [1]

When the Internet finds out a woman is pregnant, prospective moms can expect to be bombarded with countless email advertisements for everything baby. That is because most businesses recognize that the pregnant woman is a proverbial cash cow. Pregnant moms, who are already stressed about their developing fetus' vulnerability and want to do best by their children, become the perfect target for those seeking to capitalize on fear.

One such example is cord blood banking. What exactly is it? During the 1980s, it was discovered that the umbilical cord was a rich supply of potentially life-saving hematopoietic stem cells. These cells are similar to those found in bone marrow and capable of differentiating into many different cell types. The cells can be used in a number of hematologic, genetic, immunologic, metabolic and malignant disorders. Storing cord blood can serve as a type of "insurance" in case babies suffer from any of the aforementioned illnesses later in life. This sounds pretty great, but what exactly is a stem cell and how exactly is storing cord blood potentially bad?

A stem cell must have three basic properties: 1) The ability to regenerate themselves so that when they divide, they create identical daughter cells that maintain the cell line's population, 2) The ability to differentiate; they can develop specialized form and function, for example, becoming liver tissue rather than cardiac tissue). Stem cells, which can turn into virtually any cell in the body, are called "pluripotent," while cells that have some pre-destiny are called "multipotent." 3) Stem cells can replenish tissue cells that have been damaged or destroyed (I.e. the gut, skin, and blood need constant renewal from a stem cell source).

The [umbilical cord](#) [2], which was once considered a waste product of birth, is anything but. Unlike embryonic stem cells, which are subject to restrictions and regulations for legal and ethical reasons, cells obtained in the post-natal period don't come with that baggage. The [advantage](#) [3] of

obtaining umbilical cord stem cells eliminates the need to find a tissue-matched donor. Cord blood cells are called "autologous" stem cells – they come from the same person (allogeneic is tissue from a related or unrelated donor). If cord blood stem cells are used in other individuals there is a much lower risk of transplant rejection versus bone marrow. And it could eliminate the need for a painful bone marrow procedure.

**Disadvantages** <sup>[3]</sup>of cord blood are that a minimum of 50-200 mL of blood is needed for collection. Any amount less than that is discarded as insufficient. But in most cases, there simply isn't enough blood. Only **8-12 percent** <sup>[4]</sup> of cord blood units have sufficient stem cells for transplant for an individual weighing 80 kilograms.

Additionally, it is unlikely that an individual will need his or her own cord blood later in life, between 1 in 400 and 1 in 200,000. In fact, there are certain instances in which the use of one's own umbilical cord blood is not useful, such as in cases when there is a genetic defect in the cell. For example, autologous cord blood stem cells cannot be used to treat malignant cancers such as leukemia because the genetic mutations for cancer already exist in the DNA of the cord blood cells. Using one's own stem cells would effectively result in "contaminating" oneself with the same genetic flaw.

It is not known how long frozen banked cord blood samples will remain viable. Available data put this at about 15 years, so whether it will be of use over the person's lifetime is unknown. Between the price associated with cord blood banking and its **small potential for use** <sup>[5]</sup>, this process is not cost-effective. There is an initial **cost** <sup>[6]</sup> of up to \$3,000 with an annual storage fee of up to \$175.

Cord blood banking is an unregulated market; there are no quality control measures to determine whether a given sample can be used for transplant purposes. Some accreditation exists among banks but it is variable and inconsistent.

The following is the **position** <sup>[7]</sup> of the American Academy of Pediatrics (AAP):

1. Cord blood donation should be discouraged when the stored blood is intended 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 (ie, 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. Although not standard of care, directed cord blood banking should be encouraged when there is knowledge of a full sibling in the family with a medical condition (malignant or genetic) that could potentially benefit from cord blood transplantation.
2. Cord blood donation should be encouraged when the cord blood is stored in a bank for public use. Parents should recognize that genetic (eg, chromosomal abnormalities) and infectious disease testing is performed on the cord blood and that if abnormalities are identified, they will be notified. Parents should also be informed that the cord blood banked in a public program may no longer be accessible for future private use.

3. Because there are no scientific data at the present time to support autologous cord blood banking, the difficulty of making an accurate estimate of the need for autologous transplantation, and the ready availability of allogeneic transplantation, private storage of cord blood as “biological insurance” should be discouraged.

The following are the [recommendations](#) <sup>[8]</sup> of the American College of Obstetrics and Gynecologists:

- Umbilical cord blood collection should not compromise obstetric or neonatal care or alter routine practice for the timing of umbilical cord clamping.
- If a patient requests information on umbilical cord blood banking, balanced and accurate information regarding the advantages and disadvantages of public and private umbilical cord blood banking should be provided.
- The current indications for cord blood transplant are limited to select genetic, hematologic, and malignant disorders.
- Patients should be aware that in certain instances, use of one’s own stem cells is contraindicated. Most conditions potentially treated by a patient’s own umbilical cord blood already exist in his or her own cells and, therefore, the stored blood cannot be used to treat the same individual.
- Counseling should include the information that the chance a child or family member developing a condition that could be treated with an autologous transfusion of umbilical blood is rare.
- The routine storage of umbilical cord blood as “biologic insurance” against future disease is not recommended.
- Directed cord blood banking is available through private and public umbilical cord blood banks for any pregnant patient who has a family member with a disease potentially treated by hematopoietic stem cell transplant.
- Some states have passed legislation requiring physicians to inform their patients about umbilical cord blood banking options. Obstetrician-gynecologists and other obstetric care providers should consult their state medical associations for more information regarding state laws.
- As a variety of circumstances may arise during the process of labor and delivery that may preclude adequate collection, it is important to obtain well-documented informed consent that various medical circumstances of the mother or the neonate may prevent umbilical cord blood collection.
- Physicians or other professionals who recruit pregnant women and their families for for-profit umbilical cord blood banking should disclose any financial interests or other potential conflicts of interest.

Based on what has been presented thus far, it would appear then that storing cord blood as

"biological insurance" is not recommended. Parents should be very [wary](#) [9] of those companies promising anything resembling words like "healing" and "cures." While legitimate, well-designed randomized clinical trials are being conducted, parents need to be aware of the shadowy market of "stem cell therapies."

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[1] [https://c1.staticflickr.com/1/196/441273018\\_3c76e89b24\\_b.jpg](https://c1.staticflickr.com/1/196/441273018_3c76e89b24_b.jpg)

[2] [http://file:///home/chronos/u-6f642da7bc4f9a76964c4631240a0d333d9e8749/Downloads/116.full%20\(1\).pdf](http://file:///home/chronos/u-6f642da7bc4f9a76964c4631240a0d333d9e8749/Downloads/116.full%20(1).pdf)

[3] <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3753204/>

[4] <https://www.acog.org/-/media/Committee-Opinions/Committee-on-Genetics/co648.pdf>

[5] <http://www.sciencedirect.com/science/article/pii/S1083879107005745>

[6] [https://www.babycenter.com/0\\_storing-cord-blood-in-a-private-bank\\_1369773.bc](https://www.babycenter.com/0_storing-cord-blood-in-a-private-bank_1369773.bc)

[7] <http://pediatrics.aappublications.org/content/119/1/165>

[8] <https://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Genetics/Umbilical-Cord-Blood-Banking>

[9] <https://parentsguidecordblood.org/en/news/umbilical-cord-blood-stem-cell-scams-theyre-pulling-your-cord>