



## Cord Blood Banking

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### **What is cord blood?**

Cord blood is the blood from the baby that is left in the **umbilical cord** and **placenta** after birth. It contains special **cells** called **hematopoietic stem cells** that can be used to treat some types of diseases.

### **What are hematopoietic stem cells?**

Most cells can make copies only of themselves. For example, a skin cell only can make another skin cell. Hematopoietic stem cells, however, can mature into different types of blood cells in the body. Hematopoietic stem cells also are found in blood and **bone marrow** in adults and children.

### **How can hematopoietic stem cells be used to treat disease?**

Hematopoietic stem cells can be used to treat more than 70 types of diseases, including diseases of the **immune system**, **genetic disorders**, **neurologic disorders**, and some forms of cancer, including leukemia and lymphoma. For some of these diseases, stem cells are the primary treatment. For others, treatment with stem cells may be used when other treatments have not worked or in experimental research programs.

### **What are the advantages of using cord blood to treat disease?**

Using the stem cells in cord blood to treat a disease has the following benefits compared with using those in bone marrow:

- Stem cells from cord blood can be given to more people than those from bone marrow. More matches are possible when a cord blood transplant is used than when a bone marrow transplant is used. In addition, the stem cells in cord blood are less likely to cause **rejection** than those in bone marrow.
- It is harder to collect bone marrow than it is to collect cord blood. Collecting bone marrow poses some risks and can be painful for the donor.

- Cord blood can be frozen and stored. It is ready for anyone who needs it. Bone marrow must be used soon after it is collected.
- Stem cells in cord blood can be used to strengthen the immune system during cancer treatments. Bone marrow stem cells do not have this capability.

### What are the disadvantages of using cord blood to treat disease?

A disadvantage of cord blood is that it does not contain many stem cells. Units from several donors can be combined to increase the number of stem cells if a transplant is needed for an adult.

### What is an autologous transplant?

In an **autologous transplant**, the cord blood collected at birth is used by that same child. This type of transplant is rare for the following reasons:

- A child's stem cells cannot be used to treat genetic diseases in that child. All of the stem cells have the same **genes** that cause the disease.
- A child's own stem cells cannot be used to treat that child's leukemia, a cancer of the blood.

### What is an allogenic transplant?

In an **allogenic transplant**, another person's stem cells are used to treat a child's disease. This kind of transplant is more likely to be done than an autologous transplant. In an allogenic transplant, the donor can be a relative or be unrelated to the child. For an allogenic transplant to work, there has to be a good match between donor and recipient. A donor is a good match when certain things about his or her cells and the recipient's cells are alike. If the match is not good, the recipient's immune system may reject the donated cells. If the cells are rejected, the transplant does not work.

### How is cord blood stored?

Cord blood is kept in one of two types of banks: public or private. They differ in important ways that may affect your choice.

### What are public cord blood banks?

Public cord blood banks store cord blood for allogenic transplants. They do not charge to store cord blood. The stem cells in the donated cord blood can be used by anyone who matches. Some public banks will store cord blood for **directed donation** if you have a family member who has a disease that could potentially be treated with stem cells.

Donors to public banks must be screened for blood or immune system disorders or other problems. With a cord blood donation, the mother's blood is tested for genetic disorders and infections, and the cord blood also is tested after it is collected. Once it arrives at the blood bank, the cord blood is "typed." It is tracked by a computer so that it can be found quickly for any person who matches when needed.

### What are private cord blood banks?

Private or family banks store cord blood for autologous use or directed donation for a family member. Private banks charge a yearly fee for storage. Blood stored in a private bank must meet the same standards as blood stored in a public bank. If you have a family member with a disorder that may potentially be treated with stem cells, some private banks will store the cord blood free of charge.

### What steps need to be done before cord blood is collected?

Certain steps must be done beforehand:

- The bank must be notified and a collection kit must be obtained in advance (usually 6 weeks or more) of your due date. Some hospitals have collection kits on hand, whereas others do not.
- A family medical history must be provided and the mother's blood must be tested.
- Consent must be given before labor begins.

If you choose a private bank, you will sign a contract and pay a fee before the baby is born.

### How is cord blood collected?

Cord blood is collected by your obstetrician or the staff at the hospital where you give birth. Not all hospitals offer this service. Some charge a separate fee that may or may not be covered by insurance.

The process used to collect cord blood is simple and painless. After the baby is born, the umbilical cord is cut and clamped. Blood is drawn from the cord with a needle that has a bag attached. The process takes about 10 minutes.

### What problems can occur during cord blood collection?

Sometimes, not enough cord blood can be collected. This problem can occur if the baby is preterm or if it is decided to delay clamping of the umbilical cord. It also can happen for no apparent reason. If an emergency occurs during delivery, priority is given to caring for you and your baby over collecting cord blood.

## What else should I think about when deciding whether to donate or store cord blood?

Think about the following points when making your choice:

- Donating cord blood to a public bank adds to the supply and can potentially help others. Donating to a public bank is especially important for ethnic minorities, who are not well represented in cord blood banks. Public cord blood donation increases the chance of all groups finding a match.
- Only certain hospitals collect cord blood for storage in public banks.
- Storing a child's stem cells in a private bank as "insurance" against future disease is not recommended.
- If you already have a child with a medical condition that may be helped by a cord blood transplant, donating a biological sibling's cord blood for directed donation is encouraged.
- If you decide to store cord blood in a private bank, you should find out the total cost, including charges for collecting and processing the cord blood and the annual storage fees.

## Glossary

**Allogenic Transplant:** A transplant in which the donated tissue, organ, or cells come from another person. The donor may be a family member or unrelated to the recipient.

**Autologous Transplant:** A transplant in which the recipient uses his or her own cells or tissue (such as bone marrow).

**Bone Marrow:** The spongy tissue in bone cavities that produces new blood cells.

**Cells:** The smallest units of a structure in the body; the building blocks for all parts of the body.

**Directed Donation:** A donation of an organ or cells that is directed to a specific individual or group, such as a family member.

**Genes:** Segments of DNA that contain instructions for the development of a person's physical traits and control of the processes in the body. They are the basic units of heredity and can be passed down from parent to offspring.

**Genetic Disorders:** Disorders caused by a change in genes or chromosomes.

**Hematopoietic Stem Cells:** A type of blood cell that can mature into other types of blood cells.

**Immune System:** The body's natural defense system against foreign substances and invading organisms, such as bacteria that cause disease.

**Neurologic Disorders:** Diseases that affect the brain, spinal cord, or nerves.

**Placenta:** Tissue that provides nourishment to and takes waste away from the fetus.

**Rejection:** An immune response in which the body recognizes transplanted cells or tissues as foreign and attacks them.

**Umbilical Cord:** A cordlike structure containing blood vessels that connects the fetus to the placenta.

## If you have further questions, contact your obstetrician–gynecologist.

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