

## **Donating Umbilical Cord Blood** [1]

Donated umbilical cord blood can be used to treat people with life-threatening diseases, including leukemia, other types of cancer, and immune and genetic disorders. Cord blood transplantation is often an effective alternative for people in need of [bone marrow transplantation](#) [2] who cannot find a suitable tissue-matched donor, either within their own family or from unrelated donors on bone marrow registries.

### **The importance of umbilical cord blood**

The growth of a fetus while in the mother's womb requires nourishment and oxygen. These essential substances pass from the mother's blood to the fetus' blood through the placenta (a temporary organ that connects the mother and fetus) and are carried to the developing infant through the umbilical cord. The blood found within the umbilical cord is the baby's, not the mother's. Typically, after a baby is born, the umbilical cord is cut and thrown away, along with the placenta and several cupfuls of blood that may still be in the cord. However, researchers have discovered that umbilical cord blood is rich in hematopoietic stem cells, the immature blood-forming cells also found in blood and bone marrow. These stem cells have the ability to differentiate (change) into red blood cells (cells that carry oxygen to all parts of the body), white blood cells (cells that help the body fight infections and diseases), or platelets (cells that help blood clot and prevent bleeding).

Bone marrow transplantation is a medical procedure in which diseased marrow (a spongy, fatty tissue inside larger bones) is replaced by healthier bone marrow from the patient or from a volunteer donor. Cord blood transplants may have several advantages over other types of bone marrow transplants. Cord blood is stored and readily available for patients who need a life-saving transplant as soon as possible; bone marrow donation, on the other hand, can take some time, and patients must wait for the donor to have the bone marrow harvested or blood stem cells collected. Clinical studies also suggest that patients receiving a cord blood transplant are less likely to have significant side effects.

### **Who can donate umbilical cord blood**

The following are some general guidelines for cord blood donation, recommended by the [National Marrow Donor Program](#) [3] (NMDP, a nonprofit organization that has a nationwide bone marrow and cord blood registry). These guidelines are intended to determine donor eligibility and

to protect the health and welfare of the person receiving the cord blood. Contact the cord blood bank that you choose to use for specific eligibility requirements.

Women must be at least 18 years old (16 years old in some states) and healthy. Healthy means that a person feels well and can perform normal activities.

Those who cannot donate include:

- Women who are at higher risk for or who have HIV/AIDS
- Women who have a history of cancer (except cured local skin cancer or early-stage cervical cancer)
- Women who have had malaria within the last three years or who have had a full course of antimalaria treatment within the past six months
- Women who have a positive test for hepatitis C antibody or hepatitis B surface antigen
- Women who have had an organ or tissue transplant
- Women who have gotten tattoos or body piercing within the last year.

All other medical conditions and medications you are presently taking must be evaluated by the cord blood bank. Mothers who are expecting twins may not be able to donate, since there are typically not enough stem cells recovered from the umbilical cord that are useful in transplantation.

### **How to become an umbilical cord blood donor**

Donating cord blood requires some advance preparation. Before the 34th week of pregnancy, you should check to find out if your hospital works with a specific cord blood bank and contact that bank. The NMDP lists [hospitals that participate with cord banks in its network](#) [4]. If your hospital does not have an official relationship with a cord blood bank, contact a cord blood bank in your area to ask if it can help you donate. AABB (formerly known as American Academy of Blood Banks) provides a [list of accredited cord blood banks](#) [5].

A cord blood bank will require you to provide consent before cord blood can be donated and stored. In addition, you will need to complete a health history questionnaire, and you will be asked to give a small sample of blood that will be tested for the presence of infectious disease.

### **The urgent need for minority donations**

Because a successful transplant depends on the donor's cord blood matching the recipient's, there is a better chance of finding a matched donor within the same racial and ethnic group. People from minority populations continue to be underrepresented in donor registries and, therefore, have less chance of finding a matched donor, compared with white people. Although the likelihood of finding a match for people with Hispanic, American Indian, Alaska Native, Asian, Native Hawaiian, black/African American, and multi-race backgrounds has increased dramatically over the last several years, there are still many people who are unable to find a match because of these less common tissue traits.

### **Public versus private use**

You can choose to donate cord blood to a public cord blood bank or store it for private use. Private storage of umbilical cord blood reserves your baby's cord blood for use within your own family, whereas public storage makes cord blood available for any person in need.

The American Academy of Pediatrics (AAP) has issued recommendations that discourage private storage of umbilical cord blood unless an older child in the same family has a health condition that could benefit from transplantation because the likelihood that a child will need his or her own cord blood for future use is estimated to be one in 1,000 to one in 200,000. In addition, the child's own cord blood cannot be used to treat genetic disorders present at birth since the cord blood itself could be affected by the same genetic trait. It is best to discuss with your doctor your personal reasons for wanting to store or donate your baby's umbilical cord blood.

Donating cord blood to a public cord blood bank is free of charge, while private storage of a cord blood unit is associated with significant fees. Initial fees for private cord banks may range from \$500 to \$2,000, in addition to annual storage fees of approximately \$100 per year. Learn more about the [AAP recommendations](#) [6] regarding public and private storage.

### **Collection of umbilical cord blood**

Donating umbilical cord blood poses no health risk to either the mother or the baby, and it is a painless procedure that does not change the birth process. Public cord blood banks take care of the costs of processing and storing your baby's cord blood, so donation is free of charge.

After the baby's birth, the umbilical cord is clamped and cut. Approximately three to five fluid ounces of blood is drained from the umbilical cord and placenta and placed into a collection bag or vial, called a unit. If there is not enough blood collected to yield a sufficient amount of blood-forming cells that can be used in transplant, the cord blood unit will not be stored. Instead, the cord blood unit will be used in medical research (if you have consented for this use). The entire process of umbilical cord blood collection takes approximately five minutes. However, cord blood will not be collected if a delivery becomes complicated since the focus will remain on the health and welfare of the mother and baby.

### **Umbilical cord blood storage**

Shortly after the cord blood has been collected, the cord blood unit is taken to a laboratory for processing, testing, and storing. It is tested for the presence of infectious diseases. In addition, the "tissue-type" of the cells is determined. This information is used to match the cord blood unit with patients who need it. The test is called human leukocyte antigen (HLA) typing. HLAs are proteins that are found on the surfaces of all cells in the body, especially on white blood cells of the immune system. It is the special combination of HLA proteins that make each person's tissue trait unique. The HLA type of the cord blood unit is listed on the donor registry, and doctors can access this information when they are looking for an HLA match for a patient in need of transplantation. All personal information is kept confidential. Cord blood banks will contact you to inform you of test results that are important for your health and welfare and that of your baby.

After all screening tests have been completed, the cord blood unit is stored in a bag, labeled with HLA type, and placed in a freezer. Cord blood can be stored for a long period of time in this

environment, and clinical studies have shown that, even after 10 years, sufficient amounts of cells necessary for transplant are still present in the cord blood unit. Research to learn more about cord blood stored beyond 10 years is ongoing.

### **More Information**

[Understanding Bone Marrow and Stem Cell Transplantation](#) [2]

[Side Effects of Bone Marrow and Stem Cell Transplantation](#) [7]

[Donating Bone Marrow](#) [8]

### **Additional Resources**

[Blood & Marrow Transplant Information Network](#) [9]

[New York Blood Center: National Cord Blood Program](#) [10]

[U.S. Department of Health and Human Services: Bone Marrow and Cord Blood Donation and Transplantation](#) [11]

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### **Links:**

[1] <http://www.cancer.net/navigating-cancer-care/diagnosing-cancer/tests-and-procedures/donating-umbilical-cord-blood>

[2] <http://www.cancer.net/node/24717>

[3] <http://www.marlow.org/>

[4] [http://www.marlow.org/HELP/Donate\\_Cord\\_Blood\\_Share\\_Life/How\\_to\\_Donate\\_Cord\\_Blood/CB\\_Participating\\_Hospitals/nmdp](http://www.marlow.org/HELP/Donate_Cord_Blood_Share_Life/How_to_Donate_Cord_Blood/CB_Participating_Hospitals/nmdp)

[5] <http://www.aabb.org/sa/facilities/celltherapy/Pages/CordBloodAccrFac.aspx>

[6] <http://www.aap.org/advocacy/releases/jan07cordbloodfaq.htm>

[7] <http://www.cancer.net/node/24674>

[8] <http://www.cancer.net/node/42>

[9] <http://www.bmtinfonet.org/>

[10] <http://www.nationalcordbloodprogram.org/>

[11] <http://bloodcell.transplant.hrsa.gov/>