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Cancer Center

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## 1. Why does my child need a bone marrow transplant?

Sometimes the bone marrow — the spongy tissue found inside the bones — does not make the correct amounts of blood cells that your child's body needs. Or, there may be a problem with the cells that it does make. This happens with certain cancers and also with certain noncancerous blood disorders. A bone marrow transplant can replace your child's bone marrow with healthy stem cells.

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## 2. What are stem cells?

Stem cells are immature cells that give rise to more mature cells throughout our lives. Blood-forming stem cells mature to become functioning red blood cells, white blood cells, and platelets. Because the bone marrow needs to produce many cells every day, there are large numbers of blood-forming stem cells in the bone marrow.

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### 3. What if my child doesn't have a matched donor for a transplant?

MSK Kids has exceptional experience in bone marrow transplantation from unmatched donors. We work hard to offer something to every child who needs a bone marrow transplant.

Cord blood transplants can be a good option for kids without a closely matched donor. Another option is a transplant where some of the immune cells from the donor have been removed to prevent them from recognizing the recipient's body as different.

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### 4. How do I find a donor for an allogeneic transplant?

If your child's doctor tells you that your child needs an allogeneic transplant, finding a donor will be an important step. At MSK Kids, we begin helping you find a source of stem cells as soon as we know your child needs a transplant — whether it is a sibling, another relative, someone who is not related to your child, or through cord blood.

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### 5. What is a T-cell-depleted transplant?

Graft-versus-host disease (GVHD) is a possible complication of bone marrow transplantation that occurs when immune cells called T cells from a donor attack tissues of the recipient, causing inflammation and other symptoms that can sometimes be very serious. To reduce this risk, some children take medications after the transplant. Others receive a "T-cell-depleted" transplant where the T cells that cause GVHD are removed before the child receives the stem cells. MSK doctors created and refined this approach. Today it is used to treat patients all around the world.

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### 6. Why is chemotherapy or radiation therapy used before the transplant?

In most cases, [chemotherapy](#) or [radiation](#) therapy is needed before the transplant to help your child's body accept the new healthy stem cells. In children with cancer, it is also important to destroy any cancer cells remaining in the body. During an autologous transplant, the child receives chemotherapy to destroy any remaining non-bone marrow cancer cells before their own blood stem cells are given back. For children with certain immunodeficiencies, intensive chemotherapy and radiation are not needed before the transplant.

With one of the most experienced transplant teams in the world, MSK Kids will customize your child's treatment before the transplant, using the approach with the fewest side effects while maintaining the therapy's effectiveness. We are one of the leading centers investigating antibody-based conditioning approaches, which would allow us to do bone marrow transplants without chemotherapy or radiation. This would significantly lower short- and long-term side effects for the patient.

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### 7. How are the stem cells collected?

Doctors collect, or "harvest," blood-forming stem cells from the bone marrow or blood. Bone marrow stem cells are usually removed from the donor's hip bones during a minimally invasive procedure in the operating room while the donor is asleep under anesthesia.

Peripheral blood stem cells are removed from the bloodstream during a process called apheresis. A few days before the procedure, donors receive a medication to encourage stem cells to move into the bloodstream. The blood is collected from the donor's veins and a machine separates the stem cells from other blood cells. The remaining blood is then returned to the donor. The stem cells collected during the procedure are either used immediately or

frozen and stored until they are needed.

Cord blood is collected from the umbilical cord and placenta of healthy newborns. It is donated by the baby's parents at birth and stored in a special facility until it is needed.

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## 8. How does my child receive the stem cells?

This is the easy part. The stem cells are infused into your child's bloodstream the same way they would be during a blood transfusion (intravenously, through a vein). The stem cells know just where to go. They make their way to the bone marrow spaces in large bones, where they begin producing normal blood cells within just a few weeks.

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## 9. What happens after the transplant?

We'll keep your child safe and protected in the hospital as his or her new marrow begins to produce normal blood cells. For two to four weeks after the transplant, before the new bone marrow starts working, your child's risk of infection and bleeding is very high. During these first few weeks, we'll monitor your child carefully and give medicines and blood transfusions to help prevent infection. Your child will be isolated in the hospital during this period, but a parent is welcome to stay with him or her at all times. When enough healthy red blood cells, white blood cells, and platelets have been made, your child can go home. This usually happens about four to eight weeks after the transplant.

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## 10. How will we know if the transplant is a success?

Early after the transplant, while your child is still in the hospital, we will check their blood each day to see if it is growing new, healthy cells. When we see new blood cells being made, we will check to make sure that these cells are from the healthy donor and that they are fixing the problem at hand. We will also monitor your child closely for any complications.

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## 11. Will my child have to miss school during the transplant process?

Your child's immune system will be fragile for a while after the transplant. Because of the high risk of infection from exposure to other students, children who receive a transplant will not be able to return to school right away. The good news is that MSK Kids has a special New York City Department of Education program called the Hospital Schools program. Whether your child is staying with us during the transplant or needs to come in on an outpatient basis, our full-time teachers provide instruction for students in all grades, from pre-K through high school. They work closely with your child's school or home instructors to maintain your child's studies throughout the entire transplant process.

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## 12. How long will my child receive care after the transplant?

MSK Kids has a dedicated team to care for your child right after transplant, as well as during the eventual transition back to a normal, healthy life. Once your child is fully recovered, we offer survivorship programs that provide care for a lifetime to ensure your child remains healthy into adulthood.

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