Safety of Blood Transfusions

Because of illness or injury, some children need to receive transfusions of blood and blood products. This procedure may be frightening for parents and their children. Many parents are also concerned about the safety of transfusions. While blood supply in the United States is considered very safe, parents should know a few things about blood transfusions and the safety of blood products for children. Read on for more information from the American Academy of Pediatrics about blood and blood transfusions.

A quick lesson about blood

The blood in our bodies does many important things.

- Blood carries oxygen and nutrients to all of our body's tissues.
- Blood helps remove carbon dioxide and other wastes from our body.
- Blood helps fight against infections and heal wounds, and it provides all the substances that are necessary for it to clot.

Human blood is made up of several parts, and each part has a specific job.

- **Red blood cells** carry oxygen from the lungs to all tissues of the body and carry carbon dioxide from those tissues back to the lungs. When red blood cells are low, this is called *anemia*.
- **White blood cells** help the body prevent infections.
- **Platelets** control bleeding by starting the process by which blood clots.
- **Plasma** carries red and white blood cells and platelets throughout the body. Plasma is made up of water, nutrients, and proteins, including those that interact and combine to form clots.

Blood banks separate these parts from volunteer blood donations and have them available to transfuse separately when needed.

What are the different blood types?

There are many different types of blood. The 4 major blood types (A, B, AB, and O) are classified by the presence of certain sugars ("A" or "B" substance) on the surface of red blood cells.

Anyone can receive type O blood with the plasma removed. That is why people with type O blood are called "universal donors." People who have type AB blood can receive blood that is type A, B, or O. That is why they are called "universal recipients." When a transfusion is not an emergency, transfusion services try to provide people with blood matched to their type.

Blood Type	Description
A	"A" substance is present.
B	"B" substance is present.
AB	Both "A" and "B" substances are present.
O	Neither "A" or "B" substance is present.

The blood type as usually reported by a laboratory also contains information about the Rh factor. This has to do with another substance on the surface of red blood cells called "Rh" substance. The presence or absence of "Rh" substance classifies blood as positive or negative. For example, "O positive" blood is blood type O with Rh factor; "O negative" blood is blood type O without Rh factor.

It is important to know what type of blood a patient has because mixing different blood types can lead to serious medical problems. That is why blood is tested for its type and presence of Rh factor before a blood transfusion can take place.

Who needs blood transfusions?

One out of every 10 people admitted to a hospital needs a blood transfusion. A blood transfusion occurs when a patient receives a blood product (either red cells, platelets, or plasma) from another person (a donor).

Many types of patients may require blood transfusions. They include those

- With severe anemia
- With severe injuries such as those from a car crash
- With severe burns
- With cancer
- Who have undergone an organ or stem cell transplant
- Who have had heart surgery
- With hemoglobin disorders (eg, sickle cell disease, thalassemia)
- Whose platelets do not work well
- With life-threatening infections and few white blood cells
- Whose bone marrow does not work well

Are blood transfusions safe?

Stories in the news of people becoming infected with various diseases from contaminated blood may lead parents to fear and question the safety of blood transfusions. While cases of patients receiving contaminated blood have been documented, the risk of receiving such blood is actually very low. In the United States, all blood donors are volunteers who are carefully questioned about their health history, sexual practice, travel, and drug use. The blood products they donate are carefully checked for a wide variety of infections that could be spread through transfusions. Some of the infections tested for include

- Hepatitis B
- Hepatitis C
- Human immunodeficiency virus (HIV), the virus that causes acquired immunodeficiency syndrome (AIDS)
- Human T-lymphotropic virus (HTLV), a virus associated with a rare form of leukemia

- Syphilis
- West Nile virus

Other infectious agents—including malaria, babesiosis, Dengue virus, and Creutzfeldt-Jakob disease—cannot be directly tested for but are instead screened for through donor history. If a donor is considered to be at significant risk for having a transmissible infection, the donor is not accepted. If a unit of blood is found to be unsafe, it is destroyed. The donor is then contacted and not allowed to donate blood in the future.

However, the most common reactions to blood transfusions are allergic (ie, itching, hives, or—in its more severe form—trouble breathing or wheezing).For that reason, transfusion should occur only under a doctor's supervision and in a location where medical help is immediately available. This reaction occurs during or very soon after the transfusion. Be sure to tell your child's doctor or nurse if your child starts to get uncomfortable, complains of itching, or develops hives or trouble breathing during or very soon after a transfusion. These events can be treated with medicines by mouth or by vein through an IV tube. If they occur often, the medicines can be given before the transfusion to prevent or decrease frequency of allergic reactions.

What you should know before giving consent

All medical procedures have risks. As mentioned, the risks of receiving blood or blood products may include disease transmission and allergic reactions. Before your child receives a transfusion of blood or blood products, you will be asked to give your permission or consent. To do this, you need to have as much information as possible. Ask as many questions as you need, and make sure you understand

- Your child's condition and why a transfusion is needed
- Other treatments besides a transfusion, as well as their risks and benefits
- What will happen if you choose to refuse the transfusion

Also, keep in mind that in an emergency, you may have no time to discuss why your child needs a transfusion. The doctor who is treating your child may also not be able to predict all possible risks and cannot give you any guarantees.

Where can the blood come from?

If your child needs a blood transfusion, you may be able to choose where the blood comes from. See "Blood Transfusion Options" chart.

How are transfusions done?

If your child is old enough to understand, try to explain the procedure by going over what will happen.

1. Before the transfusion begins, a small amount of your child's blood will be tested to identify its type and to make sure it matches the donor. This is done by inserting a needle into a vein in your child's arm (this should only sting for a few seconds) and withdrawing the blood into a test tube to be used by the laboratory.
2. Next, a sterile, single-use plastic tube (catheter) or needle (butterfly) will be placed into a vein in your child's arm and taped in place.
3. The nurse will make sure the blood that is used is the correct blood for your child. You may be asked to identify your child.
4. A bag holding the blood or blood product will then be hung on a pole next to your child's hospital bed.
5. Finally, a plastic tube will be attached from the bag to the tube or needle in your child's arm. The transfusion begins when the contents of the bag start to flow.

Once the transfusion begins, your child should not feel any pain. If your child complains of pain or a burning sensation, becomes itchy, or feels anxious, let the nurse know. Because the blood has been refrigerated, your child may feel cold after a few minutes. Ask the nurse for a blanket if your child gets uncomfortably cold.

Blood Transfusion Options

Option	Description	Advantages	Disadvantages
Autologous transfusion	A patient donates his or her own blood before surgery to be used if needed.	No risk of disease transmission or allergic reactions.	Not suitable for children younger than 9 or 10 years. Cannot be used for emergency surgery because the donation must be planned in advance. May not be possible for patients with certain medical conditions. Small risk of bacterial contamination.
Blood recycling	Blood lost during surgery is collected, cleaned, and returned to the patient.	No risk of disease transmission or allergic reactions.	Cannot be used for emergency surgery because the recycling process must be planned in advance. May not be possible for patients with certain medical conditions. Small risk of bacterial contamination.
Directed donation	Patients choose their own blood donors. For example, parents can donate blood to their children.	Patients feel safer by selecting their own donors.	Blood types must be the same or compatible. Still has a risk of disease transmission and allergic reactions. Must be planned in advance. Some hospitals do not allow this type of donation. Small risk of bacterial contamination. Donor transfusion directed by a family member may not be a good choice for individuals who could later need a bone marrow transplant. Additional costs are not usually covered by insurance.
Random donor blood	Volunteer blood donors.	Readily available; screened for diseases.	Blood types must be the same or compatible. Small risk of disease transmission and allergic reactions.

Most transfusions take 2 to 4 hours. However, if your child requires more than 1 unit of blood or requires another blood product, the transfusion could last longer. When the transfusion is over, the nurse will remove the tube or needle from your child's arm and cover the vein with a bandage.

Remember

If your child needs to receive blood or blood products, talk with your child's doctor about any concerns or fears you have about the procedure.

If necessary, seek out a specialist in transfusion medicine (usually a clinical pathologist affiliated with a hospital blood bank) or hematologist (medical blood specialist). Learn all you can about your child's condition, and make sure you understand the benefits and risks of receiving blood or blood products.

From your doctor

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