

Blood Transfusion: Answering Your Questions



This brochure is intended for persons who will need a transfusion of blood or blood products and those who are receiving transfusions on a regular basis.

FOR MORE INFORMATION PHONE: (802) 847-5121 | (800) 991-2799

IS IT SAFE TO RECEIVE BLOOD

Receiving blood is safer today than ever. In some cases, it may be the only way to save your life. While it is true that at one time, receiving blood was not as safe, nowadays a very rigorous process is used to select donors and cutting-edge technology is used to test blood so that harmful diseases and viruses can be detected more accurately in donors' blood.

All of these precautions have led to a significantly lower risk of viral disease transmission; as a result, bacterial contamination and other non-infectious complications of transfusion are now considered to be more prevalent risks.

Other common transfusion reactions such as itching, hives, fever, or chills can occur in 1%- 10% of transfused patients, but are considered minor and are not usually life-threatening (see further descriptions below). However, an evaluation by a physician is still recommended whenever any reaction occurs.

Current Estimated Transfusion Risks

<u>Complication</u>	<u>Risk per Unit Transfused</u>
Acute lung injury	1 in 1,000 to 200,000
Circulatory overload	1 in 2,000 to 6,000
Severe allergic reaction	1 in 2,000 to 30,000
Delayed hemolytic reaction	1 in 5,000 to 110,000
ABO incompatible hemolysis	1 in 13,000 to 200,000
Bacterial infection	
with platelets	1 in 33,000 to 75,000
with red cells	1 in 30,000 to 5,000,000
Hepatitis B virus infection	1 in 205,000
Hepatitis A virus infection	1 in 1,000,000
Hepatitis C virus infection	<1 in 1,935,000
HIV-1 (AIDS virus) infection	1 in 2,135,000

WHAT ARE OTHER RISK OF BLOOD TRANSFUSIONS?

Allergic reactions

Blood may cause an allergic reaction in the receiver. Approximately 1% to 10% of receivers have such a reaction, which may be hives or other skin reactions. These are easily treated with medication (antihistamines).

Fever

Like any foreign substance administered to a patient, blood can cause fever, with or without chills. Approximately 1% to 10% of transfusions cause this reaction, which also is easily treated with different medications. Very rarely, fever may be due to the infusion of a blood product that is contaminated with bacteria. In such cases, the medical team will treat the problem.

Other reactions

Certain patients may develop antibodies following a transfusion. This complication, called all immunization, has no symptoms and does not put the patient's life in danger. However, special attention will be paid to the patient during subsequent transfusions.

Another potential reaction following a transfusion is circulatory overload, which can occur in the elderly or in patients with cardiac disorders. If blood transfusions have caused severe reactions in the past, please share this information with your medical team.

HOW CAN A PATIENT ENSURE A SAFE BLOOD TRANSFUSION?

Receive a blood transfusion only when it is needed

Although the risks of major complications from transfusions are very low, they can and do occur when over 15 million units of blood and blood components are transfused annually in the U.S. Therefore, a patient should receive transfusions only when necessary and when alternatives to improving their medical condition are believed to be less effective.

Confirm accuracy of patient identification

Preventable fatal transfusion reactions are almost always caused by errors in labeling or patient identification. The wristband is a very important piece of patient identification. Review the wristband to confirm proper spelling of name and date of birth. When a nurse or phlebotomist draws a blood sample, confirm that the tubes are labeled at the patient's bedside. The labels should have complete and accurate patient information (no missing letters or numbers), the date and time when the sample was drawn, and the initials or designated code of the person drawing the blood sample.

Similarly, confirmation should be made that the right blood is going to the right patient. Before a transfusion is started, the nurse should read the information on the unit of blood out loud to another person at the bedside. The information on the unit should be the same as that of the patient who is to receive the blood (the name, medical record number, and date of birth should match).

WHAT IS BLOOD?

Blood contains different components: solid components – such as red blood cells, white blood cells and platelets – and plasma, the liquid in which the solid components are suspended. Each of these may be made into separate blood products. Depending on a person's health status, he or she may need to receive one of the most commonly transfused blood products – red blood cells, platelets or plasma.

Blood is essential for the human body to function properly. It transports oxygen, nutrients and other substances for fighting disease to the cells, which need them to stay alive. Blood components are formed in the bone marrow. In an average adult, the volume of blood is between five and six liters.

Red Blood Cells

Red blood cells transport oxygen. Each drop of blood contains approximately five million red blood cells. Red blood cells are used for patients who have lost blood due to trauma or during a major surgical operation, or who suffer from disorders that reduce the number of their own red blood cells, such as chronic anemia.

Red blood cells are stored for 42 days at a temperature of 2 to 6 degrees Celsius. In exceptional circumstances, they can be frozen and then stored for up to ten years.

Platelets

The blood cells referred to as platelets are smaller than red blood cells. They aid in blood clotting and wound healing. The main role of platelets is to speed clotting when there is bleeding. They are used especially in cases of massive bleeding, where there is a decrease in the number of platelets in the blood, or when platelet dysfunction is noted.

Platelets can be stored for five days from the day they are collected and up to seven days with additional testing, at a temperature of 20 to 24 degrees Celsius.

Plasma

Plasma is the clear liquid part of the blood that contains the red blood cells, white blood cells and platelets. It also contains many proteins including factors necessary to form a clot. On average, plasma makes up 55% of whole blood by volume. Plasma is most often administered to patients who have serious clotting factor deficiencies or in order to replace an important loss of blood.

Plasma is generally kept frozen and only thawed when needed.



WHERE DOES THE BLOOD USED FOR TRANSFUSIONS COME FROM?

All the blood products mentioned in this brochure come either from volunteer donors in the New England region through the American Red Cross or from persons elsewhere in the U.S. through other accredited and FDA-licensed blood collection centers.

Not just anyone can be a donor! Donors are volunteers who are selected carefully before each donation. They are not paid for their donation. Apart from doing good, no other compensation is offered.

Before each donation, donors must provide personal identification and fill out a donor form that contains questions about their health status and risk factors they may have related to certain diseases. Donors are then questioned about their health status and any high-risk activities that they may have engaged in. The tip of the donor's finger is pricked to ensure that the hemoglobin level is up to the standard of a blood donor. Only people who meet these rigorous criteria can donate their blood.

Finally, each donation is drawn using new, sterile and disposable material (needle, bag, etc.) which is used one time only.

HOW IS THE BLOOD I AM RECEIVING TESTED?

All blood collected is carefully analyzed. It is screened for Hepatitis B, Hepatitis C, HIV, West Nile Virus, HTLV, Zika, and syphilis. The tests are carried out before the blood can be used. If the results of one of these screening tests are inconclusive or positive, the blood must be disposed of. Additional required tests are performed as they become available and found to improve the safety of blood transfusions.

The blood is also analyzed to determine which blood group it belongs to and whether it is Rh-positive or Rh-negative. Before any transfusion, a recent sample of the patient's blood is cross-matched with the donated blood to make sure that they are compatible.

HOW ARE BLOOD PRODUCTS TRANSFUSED?

All blood products are administered by intravenous infusion, using tubing equipment with a filter. The rate of transfusion varies according to the blood product used, but must be completed within 4 hours of starting. Usually the transfusion is started slowly for the first 15-20 minutes to ensure there are no major reactions before increasing the transfusion rate.

WHAT ARE THE ADVANTAGES OF BLOOD PRODUCT TRANSFUSION?

In the U.S., well over 15 million blood products are transfused every year. Blood transfusion may be required in the care of premature babies, during cardiac surgery, for organ transplants, during treatments for cancer and anemia, and for resuscitation following traumatic injury. The transfusion of blood or blood products have resulted in significant advances in the treatment of these patients. Thanks to blood transfusion, major surgical operations and medical treatments can be carried out.

ARE THERE ALTERNATIVES TO TRANSFUSION?

Options other than transfusion may be considered for certain surgeries. The decision to use either transfusion or another type of treatment must be discussed with your doctor.

Autologous blood donations

Autologous blood donation refers to patients who pre-donate their own blood and have it stored while they are awaiting surgery that is likely to require blood transfusions. To do this, you must ask your doctor whether it is advisable for you to store your own blood for a possible transfusion given the surgery and your own health status.

Recuperation of blood during the operation

In certain surgical operations, it is possible to retrieve lost blood during the operation and transfuse it immediately back to the patient. You should discuss this with your doctor, since it is not possible for all surgical operations.

USE OF DRUGS

In very specific circumstances, drugs may reduce or eliminate the need for blood. Once again, your doctor is the best person to give you information about this.

If you have other questions about blood transfusion, do not hesitate to discuss them with your doctor.

The information provided in this document is for educational purposes only and does not supersede existing hospital and clinic policies, procedures, or clinical judgment.

SELECTED INTERNET SITES*:

National Library of Medicine: <http://www.nlm.nih.gov/medlineplus/healthtopics.html>

AABB (American Association of Blood Banks): www.aabb.org

American Red Cross – Northern New England Region: www.newenglandblood.org

America's Blood Centers: www.americasblood.org

UpToDate Patient Information: www.patients.uptodate.com

*Inclusion of websites do not represent an endorsement of the content at the websites or a guarantee of the accuracy of the information contained within. However, these sites are generally viewed as reliable Internet sources.

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