



# *Blood Transfusion Information for Patients*

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## *Introduction*

Blood transfusions are an important part of healthcare. In 2007 in Saskatchewan, more than 33,000 units of red blood cells and over 53,000 blood products were given to people who needed them! Receiving blood in Canada is very safe and there is little risk of complications from transfusions. While most people who are hospitalized won't need a blood transfusion, your doctor feels that it is important for you to be informed about blood transfusions and blood products.

This booklet will explain:

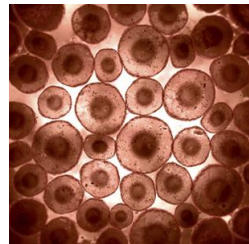
- What a **blood transfusion** is.
- The **benefits** and **risks** associated with blood transfusions.
- Possible **alternatives** to having a blood transfusion.

If your doctor recommends a blood transfusion as part of your medical treatment, you (or your family) will be asked to give consent. It is very important that you understand what you are agreeing to. If you have any questions, concerns, or need clarification on some of the information found in this booklet, ask your doctor.

## *What is blood?*

Although it seems to be a simple fluid, blood is complicated. The fluid portion is called **plasma**. Three major types of cells float within the plasma:

1. **Red Blood Cells** – The first type of blood cell is called the red blood cell. These cells are red and give blood its characteristic colour. Red blood cells carry oxygen from the lungs to all the other parts of the body.
2. **White Blood Cells** – The second type of blood cell is the white blood cell. There are several types of white blood cells. They are important in fighting infections.



3. **Platelets** – The third type of blood cell is the platelet. Platelets are the smallest of the blood cells. When injuries occur to the blood vessels, platelets act to “plug the hole” in the blood vessel and stop the bleeding.

The plasma also contains three types of proteins, including:

1. **Albumin** is the most common type of protein in the plasma. It is made by the liver. It carries nutrients and hormones around the body.
2. **Immunoglobulins** (also known as antibodies) are proteins that recognize foreign organisms that have invaded the body. They destroy these “germs”.
3. **Clotting Factors** are a group of proteins that help stop bleeding when we are injured.

## *What is a blood transfusion?*

Whole blood is separated into its different parts (plasma and cells) shortly after it is collected from donors at Canadian Blood Services. A transfusion could include:

- **Red Blood Cells**
- **Plasma**
- **Platelets**
- **Blood Fractionation Products** (which are processed from the plasma)

This way, you only receive what you need! When people talk about “blood transfusions” they mean transfusions of red blood cells. However, in reality red blood cells account for only 40% of what is in blood – the rest is plasma and platelets.

Doses of red blood cells, plasma and platelets for transfusion are packaged in special bags made out of polyvinyl chloride (PVC). Each dose is referred to as a **unit**. Red blood cell, plasma and platelet transfusions are given through a needle placed into a vein in the patient's arm.

## *When would I receive a blood transfusion?*

Red blood cell transfusions are usually given to patients who don't have enough of their own red blood cells. They may have lost blood during surgery or in an accident. Some people have diseases that cause their bodies to destroy their own red blood cells. If you have lost a large number of red blood cells, you won't be able to carry enough oxygen from your lungs to the rest of your body. A transfusion of red blood cells will restore your body's ability to carry oxygen.

Platelet transfusions are usually given when patients are at risk of bleeding. This may be because they have either reduced numbers of platelets in their blood or reduced platelet function.

Plasma transfusions are given when patients require albumin, clotting factors or immunoglobulins.



## *What are blood products?*

Your doctor may recommend that you receive a blood product. This may be in addition to, or instead of, a blood transfusion. Blood products are medications that are made from human blood. Blood products are also called fractionation or plasma products. Blood products commonly prescribed for patients in the hospital include:

- **Cryoprecipitate** is a plasma concentrate that contains clotting factors.
- **Albumin** is a protein made by the liver and is transfused to patients with burns or low blood pressure.
- **Intravenous Immune Globulin (IVIG)** is a solution that contains high levels of immunoglobulin (antibodies). Like albumin, this product is made from blood. It is given to people who don't have enough antibodies of their own to prevent infections and to patients who have low immunity. There are many other reasons that your doctor may order IVIG for you. Like albumin, IVIG is specially treated to fight off any disease-causing viruses.
- **Rh Immune Globulin**, also called WinRho<sup>®</sup>, is a solution containing high levels of a special antibody. It may be given

to pregnant Rh Negative women in their 28<sup>th</sup> week of pregnancy and after they have given birth. It is typically given as an intramuscular (into the muscle) injection. WinRho® may also be given intravenously (by a needle placed into a vein) in selected immune disorders.

- **Clotting Factors.** There are some other special immunoglobulin solutions that are used to prevent people from developing a disease after they have been exposed to it. These medications are derived from blood, and are used to prevent diseases such as Hepatitis B and chicken pox. They may be given intramuscular or through a needle placed in a vein.

People whose bodies do not produce normal amounts of specific clotting factors may be prone to bleeding. This condition is known as **hemophilia**. For hemophiliacs, medications are available which replace the missing clotting factors and stop the bleeding. These medications may be either:

- **Plasma derived** medications are made from blood.
- **Recombinant** medications are made in a laboratory and do not contain any blood. Some of these medications may also be given rarely to people who are not hemophiliacs in an attempt to control heavy bleeding.

### *Are there other products that I might receive?*

Your doctor may order a product for you called Pentastarch (examples are Voluven® or Pentaspan® ). This product is a clear liquid that is infused through a needle placed in a vein, just like a blood transfusion. Pentastarch is a man-made liquid that is not derived from blood.

## *What happens if I need a blood transfusion or a blood product?*

If your doctor prescribes a blood transfusion or blood products for you, he or she will explain the benefits and risks of the transfusion or blood product, and ask you to consent to the treatment. These risks and benefits will differ depending on what product you are to receive, and on your illness or condition. If you have any questions or there is anything that you don't understand, you should ask your doctor.



Prior to receiving a transfusion, a sample of your blood will be sent to the Transfusion Laboratory. Your ABO and Rh blood group will be **determined and double-checked**. Your blood will also be screened for the presence of atypical antibodies. Most people don't have these antibodies. However, if you have been transfused before or you are female and have been pregnant your body may have produced those antibodies. If you do have them, the Medical Laboratory Technologists working in Transfusion Medicine will identify them and carefully search for blood components that are compatible with your blood and can be safely transfused to you.

Once a unit of red blood cells, plasma or platelets has been selected for you, it will be labeled with your name and hospital number. When your doctor requests that it be given to you, your nurse will administer the unit through a needle placed in your vein. It usually takes between 30 minutes to a few hours to give blood components.

While you are being transfused, your nurse will observe you closely, in case you develop a side effect. Most side effects are mild; some are



treated with medications like Tylenol® or antihistamines such as Benadryl®. Reactions to transfusion can occur anytime during the transfusion or up to 4 to 6 hours after the transfusion. Symptoms may include headaches, fever, chills, nausea, vomiting, dizziness, hives or itchy skin. **If you have any change from how you felt before the transfusion, notify the nursing staff immediately.**

## *Where does the blood transfusion or blood product come from?*

Canadian Blood Services (CBS) look after the collection, testing, processing and storage of blood donations. Blood components (red blood cells, plasma, platelets and cryoprecipitate) are donated by people across Canada. Every donation is tested by CBS for transmissible diseases. It is **not** released for use until it has been tested.

Blood products such as **albumin, intravenous immune globulin** and **clotting factors** are produced by pharmaceutical companies under stringent conditions to ensure the highest quality and safest product.

Health Canada regulates and licenses all products manufactured for Canadian use.

## *What are the risks of being transfused?*

Receiving blood or blood products in Canada is very safe. Serious complications are rare. Some of these rare, but serious, complications are:

- **Developing serious infection from bacteria in the transfusion.**
- **Having a serious allergic reaction (called anaphylaxis).**
- **Having a severe hemolytic reaction. This is where the donor red blood cells are destroyed.**
- **Being infected with a virus such as HIV or Hepatitis.**

It is more common to experience mild side effects from the transfusion, such as an itchy rash, fever or chills. Most people who receive a transfusion don't experience any side effects at all.



Many people are concerned about being infected with a disease like HIV or Hepatitis through a blood transfusion. **This is extremely rare.** For example, the risk of receiving red blood cells infected with HIV is 1 in 4.7 million.

Virus	Risk
HIV	1 in 4.7 million
Hepatitis B	1 in 82,000
Hepatitis C	1 in 3.1 million

**Source:** Callum JL and Pinkerton PH. *Bloody Easy 2: Blood Transfusions, Blood Alternatives and Transfusion Reactions: a Guide to Transfusion Medicine, 2<sup>nd</sup> Ed.* Sunnybrook and Women's College Health Sciences Centre, Toronto, ON, 2006; 32.

The risk of receiving an infected red blood cell is much lower than the risk of being killed in an automobile accident.

Event	Risk
Fatal car accident	1 in 11,000
Fatal fall	1 in 14,000

**Source:** Statistics Canada. *Mortality – Summary list of causes, 2004.* Available at: [www.statcan.ca](http://www.statcan.ca)

**Canada's blood supply is one of the safest in the world!**

## *Are there any alternatives to having a blood transfusion?*

If you require elective surgery (your surgery is scheduled well in advance), your surgeon and family doctor will work together to ensure that you are as healthy as possible. The stronger that you are going into surgery, the less likely it is that you will need a blood transfusion.

If you are found to be anemic (you have low numbers of red blood cells in your body), your doctor may give you iron pills to “build up your blood”. People who are anemic going into surgery are more likely to need red blood cell transfusions than people who are not anemic. If you are very anemic, your doctor may also give you a medication called erythropoietin to stimulate your body to produce new red blood cells. It takes several weeks for these medications to have their effect.

Before your surgery, if your surgeon tells you to stop medications such as Aspirin®, Plavix®, Ibuprofen (Advil®), Warfarin (Coumadin®) or any other drugs, it is important for you to stop taking them. These drugs can affect platelet function.

If you have any questions about how medications affect the function of your platelets, please ask your physician.

Other means of conserving blood are **Acute Normovolemic Hemodilution (ANH)** and **Intraoperative Cell Salvage**.

**ANH** is performed by the anesthesiologist in the operating room while the patient is unconscious. If necessary, the anesthesiologist can remove whole blood from the patient, and replace it with saline (a salt solution). This is called hemodilution because the saline dilutes the patient's blood. The blood that was removed is stored in the operating room with the patient. If the patient bleeds, the anesthesiologist returns their own blood back to him or her. Usually, you need to be a healthy person to undergo this procedure. Discuss any questions you have with your surgeon or anesthesiologist.

**Intraoperative cell salvage** is another means of giving the patient's own blood back to them at the time of surgery. In this process, blood that is lost by the patient during surgery is collected, filtered and returned to the patient. Up to 80% of blood lost can be recovered. This procedure is not

appropriate for everyone. For example, patients undergoing surgery for cancer may not be able to undergo this procedure. Intraoperative cell salvage also has some specific risks to the patient associated with it. If you wish to consider intraoperative cell salvage, it is very important to discuss this therapy with your surgeon.

It is important to discuss your feelings about blood transfusion with your surgeon and your family doctor. If you have more questions about alternatives to transfusion, or you have religious or other objections to blood transfusion, your doctor may refer you to a specialist with expertise in transfusion medicine.

## *Does artificial blood exist?*

No. Most often when people think about artificial blood, they imagine something that doesn't contain any blood, but still carries oxygen throughout the body. Scientists haven't yet been able to design a product like that.

There are products called blood substitutes but they are **NOT** licensed for clinical use (not licensed to be given to patients) in either Canada or the United States.

## *Can I donate my own blood?*

This is called an **autologous blood donation** (donation for yourself). Your physician **must** make arrangements with Canadian Blood Services in 4 to 6 weeks in advance of your surgery date in order for you to make your own blood donation. This blood is marked only for your use. **It will not be used by any other patient if you do not require a transfusion.** Using autologous blood can eliminate the risk of transmissible disease or antibody production to donor blood. If you require more blood than you donated, you may have to receive blood from other donors. Please discuss this with your doctor.



## *Can I donate for a family member or friend?*

This is called a **directed donation** (donation for a specific person). Currently in Saskatchewan, parents who are eligible may provide their blood for their children. This must be arranged through your physician and Canadian Blood Services and is not available in emergency situations. Usually these donations occur 4-6 weeks before a pre-booked surgery. Directed donations, like autologous donations, are only used for the specific patient. They can not be given to others.



## *How will I know if I received a transfusion?*

You will receive notification when you are discharged from the hospital. It may be a letter or card that states that while you were in the hospital you received red blood cells and/ or a plasma component. This letter or card helps the hospitals and Canadian Blood Services track where, when and what blood products you received. **Please retain this document for your personal health information.**

## *I never knew that blood was so important!*

### **How do I become a blood donor?**

If you would like to donate blood, please contact Canadian Blood Services at **1-888-2-DONATE** (1-888-236-6283).

### **I would love to help, but I can't donate blood!**

Even if you can't donate blood you can still help by donating your time and enthusiasm! Volunteers are essential to the success of Canadian Blood Services. Volunteers greet donors and assist them through the donation process, offer refreshment and thanks after donation, recruit donors, coordinate blood clinics in their communities and much more!

To become a volunteer, contact Canadian Blood Services at **1-888-2-DONATE** (1-888-236-6283).



## ***Contact Information***

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*Notes or Questions to Ask My Physician*

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