It may be following an accident, during surgery or to treat an illness: 1000 donations per day are needed. The fact that they are irreplaceable and perishable makes them all the more precious.

The transfusion route

Blood types

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This is why hospitals test all recipients’ blood before each transfusion. If the patient is losing too much blood and there is no time to test his or her blood type, blood that is compatible with every type, O negative, is transfused.

What is blood?

Blood is the fluid that flows through the body’s veins and arteries. It is made up of plasma, a yellow liquid composed of 90% water in which three types of cells are suspended: red blood cells, white blood cells and platelets.

Plasma carries not only blood cells, but also nutrients from digestion. It also collects waste, transporting it to the liver, kidneys, lungs and intestines, where it is eliminated. In addition, it is involved in the body’s defense system, bleeding control and tissue perfusion.

Red blood cells carry oxygen from the lungs to the various organs and carbon dioxide from the organs to the lungs, where it is expelled. They contain hemoglobin, a protein containing iron that gives blood its red color.

White blood cells protect the body from infections. They are said to be white because they form a whitish paste when they are separated from the other blood cells.

Platelets prevent blood loss and contribute to wound healing: when a blood vessel is severed, they adhere to the damaged area to form a plug that stops bleeding.

If you are over 18 and meet the eligibility criteria, then you too can save lives!

To find out where to give or for more information on the eligibility criteria, visit Héma-Québec’s Web site (www.hema-quebec.qc.ca) or contact Donor Services at 1-800-847-2525.

You can also save lives by recruiting donors and volunteering at a blood drive. To become a volunteer, visit the “Get Involved” section of Héma-Québec’s Web site.
The steps between donation and transfusion

Collection
Collecting one blood bag (450 ml) takes about ten minutes, but the entire donation process usually takes an hour.

All the equipment used comprises single-use, sterile material. There is therefore no danger of contracting a disease when giving blood.

In addition to the blood bag, samples are collected for analysis.

The amount of blood collected is minimal compared to the total blood volume, equivalent to approximately 1/120th of an average-sized person’s blood volume. The body quickly replenishes the blood collected: plasma is regenerated in less than 24 hours and the other blood components in less than eight weeks. You can therefore give blood every 56 days.

Transport
After the collection, the blood bags and their samples are packed in temperature-controlled boxes and sent to one of Héma-Québec’s two facilities, located in Montreal and Quebec City.

Arrival of blood at Héma-Québec
When the blood bags arrive at Héma-Québec, a race against the clock begins. Blood is perishable; it is therefore crucial to proceed efficiently, while complying with extremely strict transformation standards and procedures.

The contents of each box are carefully inspected. Each blood bag must be linked to a donor questionnaire and accompanied by five sample tubes. A unique barcode affixed to each bag is recorded by an optical scanner. At any time, any given donation can be identified and traced.

Transformation of the blood donation
Sample analysis and blood donation transformation take place simultaneously. When patients are transfused, they do not receive whole blood; rather, they are given one or several of the components (resulting from its transformation) they need.

It may be red blood cells, plasma or platelets. There is also a fourth component: cryoprecipitate, which is obtained by freezing and thawing the plasma.

Before extracting the desired components, white blood cells (also called leukocytes) are filtered out to reduce the risk of a transfusion reaction.

Héma-Québec uses two transformation methods, depending on the components it wants to obtain. Each relies on centrifugation, which consists in spinning the blood bags at very high speeds until the components are separated into well-defined layers in the bag.

The first method is used to extract red blood cells and plasma from the blood bag. Through centrifugal force, red blood cells are deposited at the bottom of the bag, while plasma remains at the top. The bag is then placed in an extractor, which separates the plasma and red blood cells into two separate bags. The plasma is frozen, while the red blood cells are enriched with a nutrient solution that helps with their preservation, and then refrigerated.

The second method further automates the transformation steps. It is used to prepare platelets. A first centrifugation of the blood bag yields red blood cells, plasma and a leuko-platelet layer (platelets and leukocytes remaining after the first filtration)—all in separate bags. Then, before being refrigerated, the red blood cells are enriched with a nutrient solution that helps with their preservation, and the plasma is frozen. The bag containing the leuko-platelet layer undergoes an additional step. To obtain the quantity of platelets required for a transfusion, five leuko-platelet layers must be combined with one plasma, all from the same blood type. This mixture is then filtered to eliminate the remaining leukocytes. The result is a platelet concentrate that is ready to be transfused.

Once a product is deemed compliant, it is duly labeled and stored, ready for shipment to hospitals. The short shelf life of blood products is a constant challenge for Héma-Québec.

What are the different products used for?
Each year, Héma-Québec delivers more than half a million blood products to Quebec hospitals. The blood components used vary depending on the patient.

**RED BLOOD CELLS**
- Used against certain cancers, such as leukemia.
- Often prescribed after chemotherapy treatment used against certain cancers.
- Effective in treating diseases.
- Used against serious burn victims and stopping hemorrhages.

**PLATELETS**
- Often prescribed to treat certain blood coagulation diseases.
- Used against certain cancers, such as leukemia.

**CRYOPRECIPITATE**
- Used against certain cancers, such as leukemia.
- Used against certain blood coagulation diseases.

**PLASMA AND CRYOPRECIPITATE**
- Used against certain cancers, such as leukemia.
- Used against serious burn victims and stopping hemorrhages.

**IN THE FREEZER**
- 1 year

**IN THE FRIDGE**
- 42 days

**AT ROOM TEMPERATURE**
- 5 days
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This is why hospitals test all recipients’ blood before each transfusion. If the patient is losing too much blood and there is no time to test his or her blood type, blood that is compatible with every type, O negative, is transfused.

Every 80 seconds, someone in Québec needs blood...

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Donors

RECIPIENTS

AB+
AB−
A+
A−
B+
B−
O+
O−

Where does the blood used for transfusions come from?

In Québec, those who give blood do so voluntarily by going to one of the many mobile blood drives organized throughout the province or one of the GLOBULE Blood Donor Centres. Hospitals’ blood supply therefore depends on the generosity of those who want to share the gift of health.

Who can make a donation?

Donor and recipient safety is a constant concern for Héma-Québec. Only those who meet strict criteria can give blood. It is also important to have eaten and to have drunk lots of fluids prior to donating.

All donation candidates must present an identification card and fill out a questionnaire on their health and certain aspects of their personal life. Following this, a nurse takes their blood pressure, pulse, temperature and checks their iron levels. If everything is as it should be, they may proceed to give blood.

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