



MedStar Health *Institute for Quality and Safety*

MedStarBloodless.org

International Training Center for
Bloodless Medicine and Surgery

MedStar Franklin Square Medical Center
MedStar Georgetown University Hospital
MedStar Good Samaritan Hospital
MedStar Harbor Hospital
MedStar Montgomery Medical Center
MedStar National Rehabilitation Network
MedStar Southern Maryland Hospital Center
MedStar St. Mary's Hospital
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Patient Resource Packet

Knowledge and Compassion
Focused on You

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When patients are well informed, they are better able to participate in shared decision-making, which has been shown to boost patient outcomes and lead to higher patient and provider satisfaction.

The resources here are intended to help healthcare teams educate Bloodless Medicine and Surgery patients about their options for transfusion-free care. They use plain language to help patients understand what bloodless medicine and surgery is, as well as how it relates to their healthcare. The combination of print and digital media is designed to give patients of all literacy levels the information they need to make informed treatment decisions.

What is Bloodless Medicine and Surgery?

Bloodless Medicine and Surgery refers to medical care that does not use blood transfusions. A blood transfusion means giving donated blood or blood components to a patient through a narrow tube inserted into a vein in the arm. They're generally used to replace blood that's lost due to injury, illness or surgery. But many patients refuse transfusions. Jehovah's Witnesses refuse them for religious reasons. Others can't have them for medical reasons. And in some parts of the world, people don't have access to them at all.

To accommodate all of these patients, Bloodless Medicine and Surgery clinicians use many different techniques and three overall strategies to make transfusions unnecessary. The first strategy is to make sure the patient loses as little blood as possible throughout their care. The second strategy is to help the patient's body make the best use of the oxygen in the bloodstream. Oxygen is extremely important to how our vital organs work and heal. The third strategy is to screen patients for anemia—when a patient doesn't have enough red blood cells—and treat it before going any further.



Bloodless Medicine and Surgery is a safe and effective approach to medical care. And it turns out there are benefits to avoiding transfusions. Patients recover faster, have shorter hospital stays and experience fewer infections than patients who have transfusions. Research also shows that bloodless surgery patients have fewer heart attacks and strokes after surgery.

All in all, bloodless patients do just as well — and in many cases, better — than patients who receive transfusions. If you're considering a bloodless approach, it's very important to find experienced practitioners and discuss your treatment plan with them in detail.

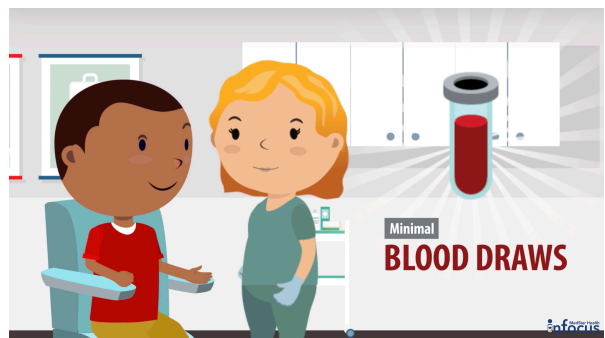
You may want to ask them how long they've been doing Bloodless Medicine and Surgery, how many patients they've treated, and what specific strategies they use. If you're not satisfied or comfortable with their answers, be ready to seek help elsewhere. Your care team should be able to answer all of your questions, help you every step of the way, and — just as important — treat your wishes with the utmost respect.

[View video reference](#)

How is Bloodless Medicine and Surgery Done?

Bloodless Medicine and Surgery involves using proven techniques and procedures to keep blood healthy and minimize blood loss during the course of your medical treatment. For example, if you're having surgery, your care team may use medication, IV iron or nutritional supplements beforehand to boost up the hemoglobin in your red blood cells.

Hemoglobin is important because it carries oxygen throughout your body. Boosting hemoglobin helps you better handle any blood loss later. If your care team needs to do blood tests before surgery, they'll take as little blood as possible, as few times as possible. During surgery, there are a number of techniques and procedures available, if they are acceptable to you. One of these is called hemodilution. Hemodilution is a process of temporarily drawing off some of your blood and replacing it with clear fluids during surgery. This lessens the impact of any blood loss. At the end of surgery, part or all of your blood is returned to you.



Other techniques during surgery include using: Anesthesia that safely lowers blood pressure to minimize bleeding; Special surgical instruments that dramatically reduce blood loss; A cell salvage machine, that collects lost blood, cleans it, and returns part or all of it to the patient; A hemoglobin monitor that tells us how healthy the patient's blood is without drawing a blood sample; And non-blood products that can stop bleeding.

After surgery, your care team may use: Medications to help your body make the best use of the oxygen in your blood; A hemoglobin monitor to avoid blood draws; and minimal blood draws if they need to do follow-up testing.

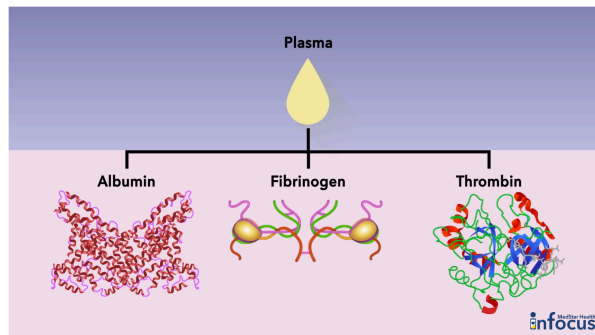
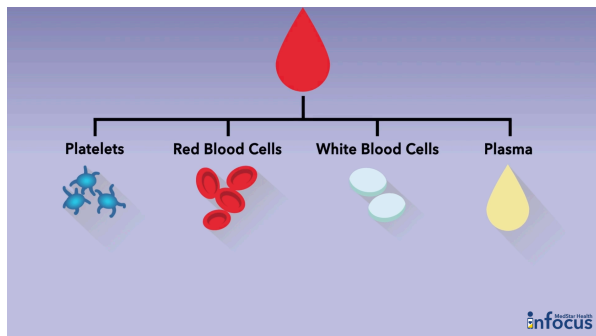


If you want to know more about how these tools and techniques work, you can ask your care team. If you are one of Jehovah's Witnesses, you can discuss them with a member of your local Hospital Liaison Committee. Depending on your preferences, your care team can use some of these techniques and not others. In this way, they can provide the highest quality, personalized medical care while at the same time avoiding the risks associated with transfusions.

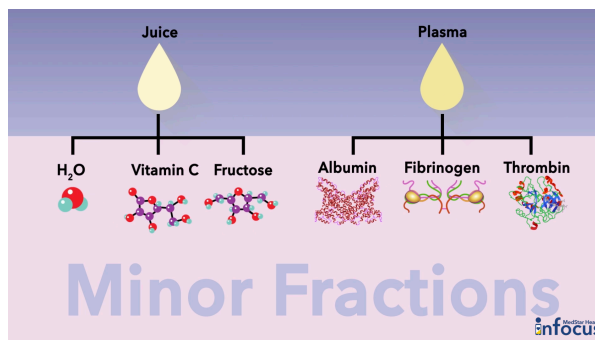
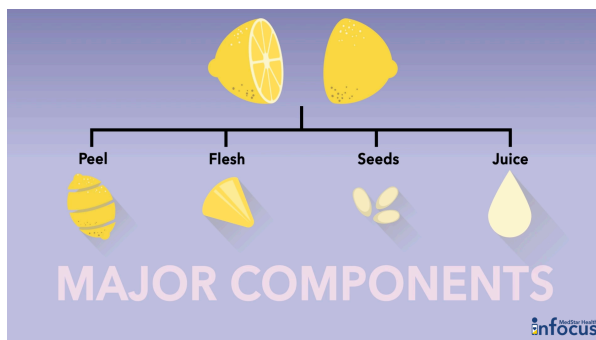
[View video reference](#)

Understanding Blood Components and Fractions

The blood in your body is called whole blood, and it has four major components: platelets, red blood cells, white blood cells and plasma. Substances taken out of these four components are called minor fractions. For example, plasma contains substances such as: albumin, fibrinogen, and thrombin. These substances are minor fractions of plasma.



To understand the difference between major components and minor fractions, it might help to use the example of a lemon. Like whole blood, a lemon can be broken down into four parts: the peel, flesh, seeds and juice. These are the lemon’s “major components.” But you can also take water, vitamin C, or fructose, which is a type of sugar, from the juice of the lemon. These smaller substances are like minor fractions.

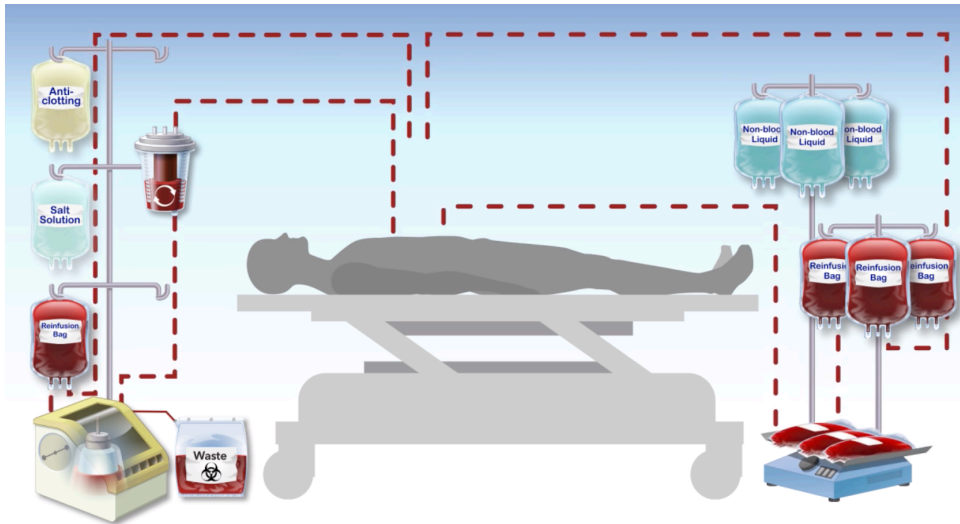


In the course of your medical treatment, your doctor may recommend using a product that contains one or more minor blood fractions. If you’re considering using a product with fractions, make sure to talk with your doctor about the potential risks and possible side effects associated with it, as well as what your other options may be. If you are one of Jehovah’s Witnesses, you can also speak with a member of your local Hospital Liaison Committee about the decisions you’re facing.

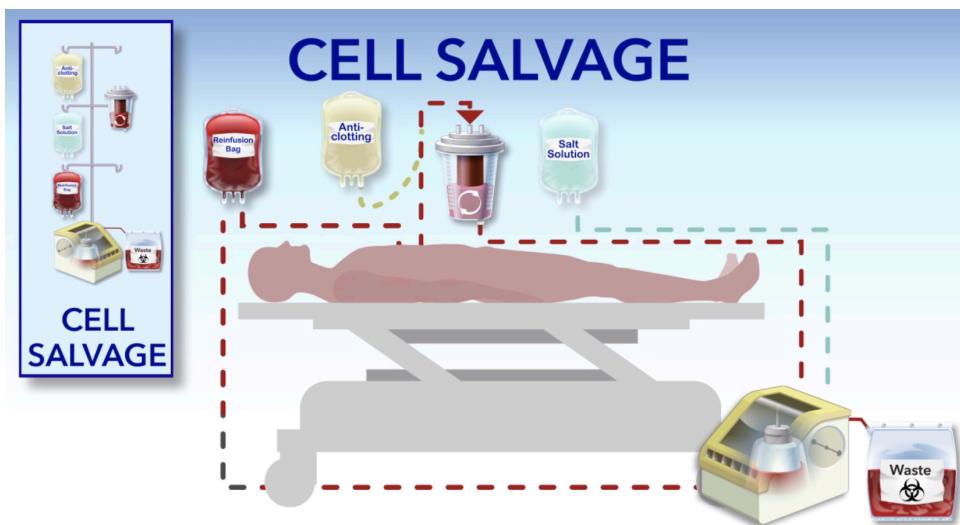
[View video reference](#)

Cell Salvage and Hemodilution

Cell Salvage and Hemodilution are two medical procedures that patients and their doctors may decide to use to avoid blood transfusions. Both procedures involve using the patient's own blood, and the surgical team makes every effort to ensure that the patient's blood never leaves the closed surgical system.

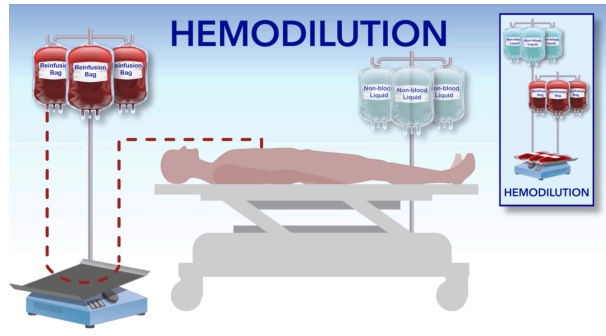
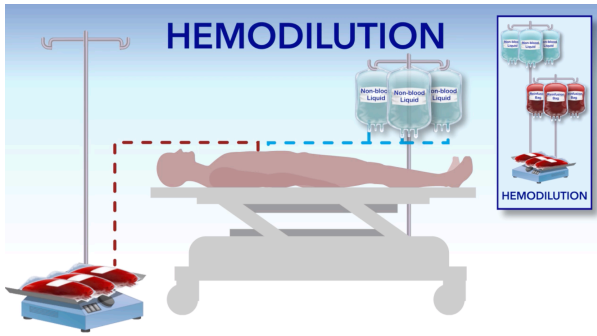


Cell Salvage is a way to recycle the patient's own blood, during or after surgery. During surgery, doctors gently suction the blood a patient loses. This blood is collected in a container called a reservoir, where blood thinning medicine is added so the blood doesn't clot. Next, the blood is cleaned with a salt solution. Then the red blood cells are separated from the rest of the blood and the blood thinner that was added earlier. Finally, the concentrated red blood cells are given back to the patient. Cell Salvage can also be done after surgery for a short period of time. If the patient loses blood through a wound drain, it can be collected, washed and given back to them.



CELL SALVAGE AND HEMODILUTION

Hemodilution is a procedure doctors use to reduce the number of red blood cells lost during surgery. It involves removing some of the patient's blood at the beginning of the operation, putting it on rockers to prevent clotting, and replacing it with non-blood liquid to maintain the right volume of blood. With this procedure, any blood a patient loses during surgery is diluted. That means the patient loses fewer red blood cells. At the end of surgery, the blood removed at the beginning is given back to the patient.

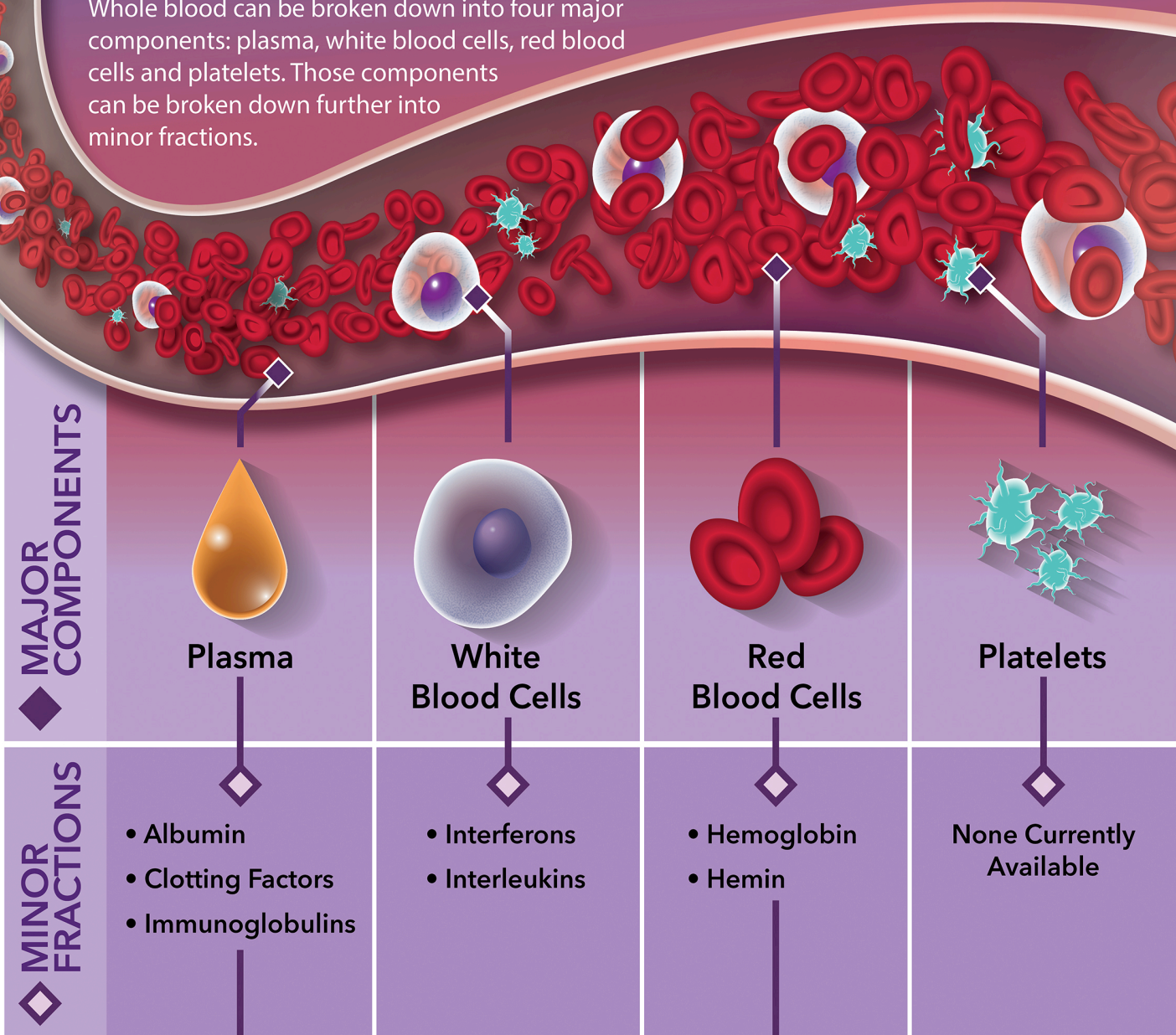


[View video reference](#)



WHOLE BLOOD

Whole blood can be broken down into four major components: plasma, white blood cells, red blood cells and platelets. Those components can be broken down further into minor fractions.



- PRODUCTS THAT CONTAIN PLASMA FRACTIONS**
- Erythropoietin
 - Streptokinase
 - Colony Stimulating Factors
 - Synthetic Interleukins
 - Synthetic Interferons
 - Cryoprecipitate
 - Prothrombin Complex Concentrate (PCC)
 - Tissue Adhesives/ Sealants
 - Platelet Gel (made with own platelets)

- PRODUCTS THAT CONTAIN RED BLOOD CELL FRACTIONS**
- Hemoglobin-Based Oxygen Carriers (not widely available)
 - Normosang
 - Panhematin

*Talk with your doctor about the potential risks and possible side effects of minor fractions, as well as what your other options may be.



Plasma Fractions



Albumin

Albumin is a protein made in the liver that flows through the body in plasma, which is the colorless fluid part of blood. Albumin helps keep blood volume in a normal range. It can be separated from plasma and used as a treatment to increase volume before or after surgery if needed. Products that may contain albumin: erythropoietin, streptokinase, colony stimulating factors and interleukins.

Clotting Factors

Clotting factors are a group of proteins that flow in blood plasma. They can be separated from plasma and used to help stop bleeding in patients who bleed easily. Products that contain clotting factors: cryoprecipitate (contains fibrinogen, von Willebrand factor, factor VIII, factor XIII), prothrombin complex concentrate (PCC).

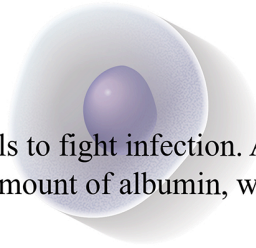
Immunoglobulins (or Immune Globulins)

Immunoglobulins are a special group of proteins found in blood plasma. Also called antibodies, they are separated from pooled plasma and used in medicine that helps fight viruses and bacteria. Example: RhoGam.

White Blood Cell Fractions

Interferons

Interferons are proteins made by white blood cells to fight infection. As medicine, interferons are often synthetic (man-made) and may contain a small amount of albumin, which is a plasma fraction.



Interleukins

Interleukins are proteins made by white blood cells to help cells communicate with each other. As medicine, interleukins are often synthetic (man-made) and may contain a small amount of albumin, which is a plasma fraction.

Red Blood Cell Fractions

Hemoglobin

Hemoglobin is a protein in red blood cells that carries oxygen. Hemoglobin can be separated from red blood cells to make Hemoglobin-Based Oxygen Carriers (HBOCs), which are blood substitutes. HBOCs are not currently widely available.



Hemin

Hemin is a salt that blocks the production of substances called porphyrins. Hemin can be separated from red blood cells and used to treat a condition called Porphyria..

Platelet Fractions

None Currently Available



*Talk with your doctor about the potential risks and possible side effects of minor fractions, as well as what your other options may be.

Hemodilution

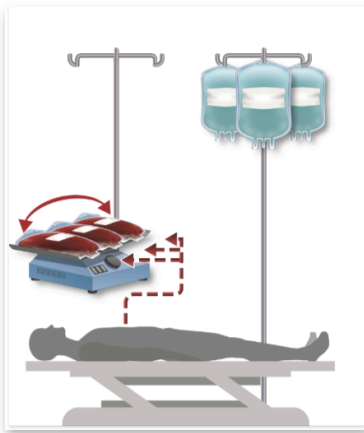
What is hemodilution?

Hemodilution is a procedure used during surgery to lessen the effect of blood loss by diluting the patient's blood. When a patient loses diluted blood, fewer red blood cells are lost than if the blood has a normal concentration.

A three-step process:

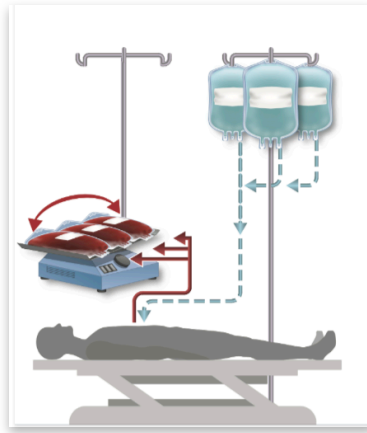
1. REMOVE

At the beginning of surgery, the team removes some of the patient's blood. The blood is placed on rockers to prevent clotting, and it is saved for later.



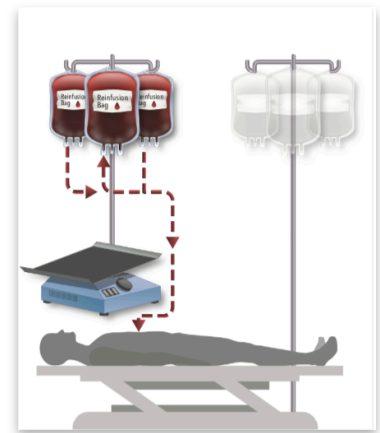
2. REPLACE

The team then replaces the removed blood with the non-blood liquid. This helps maintain the right amount of blood volume.



3. RETURN

At the end of surgery, the blood removed at the beginning of surgery is given back to the patient.



The surgical team makes every effort to maintain a closed surgical system. Talk with your care team if you have any concerns about the procedure or any other aspect of your medical care.