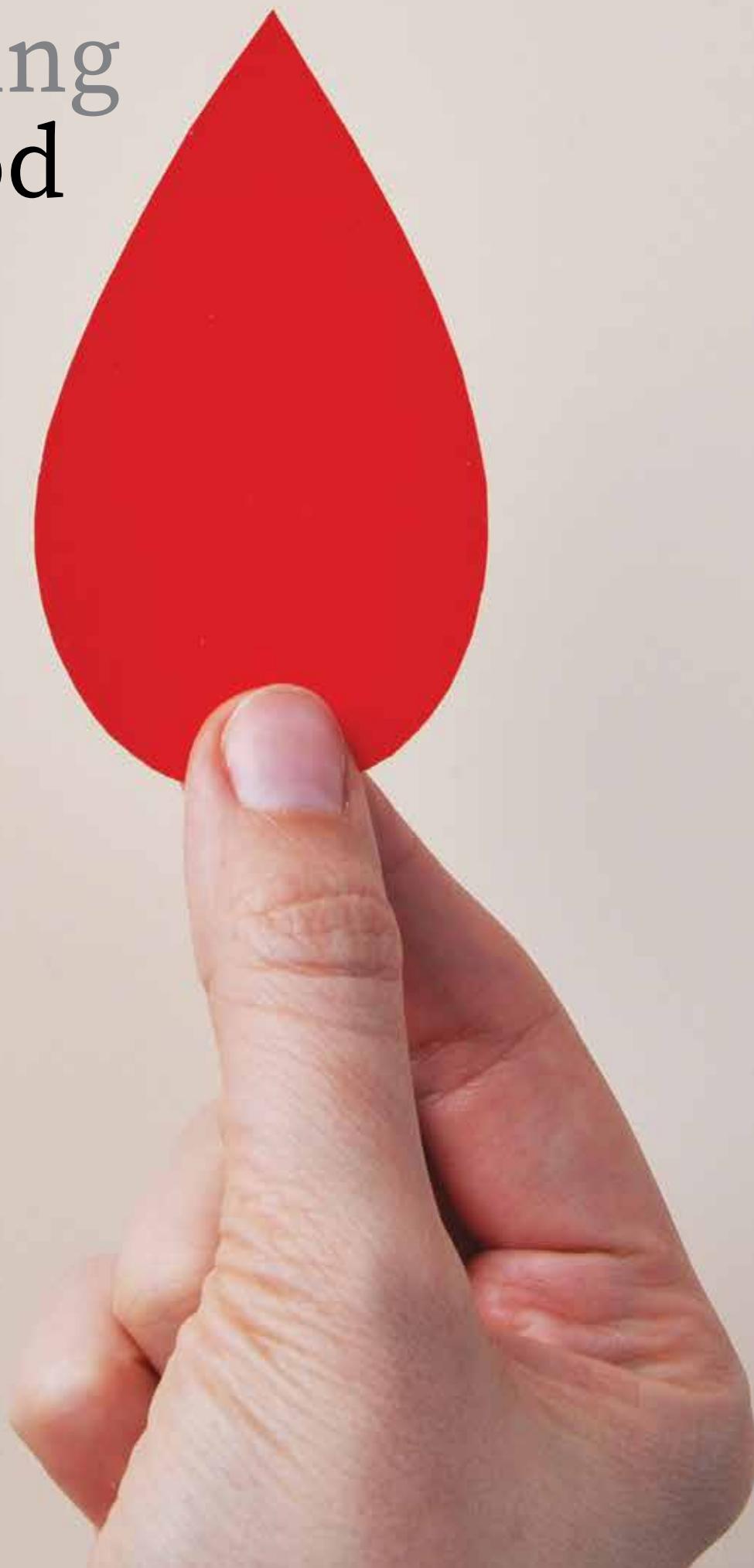


Giving Blood



How Long Do Blood Products Last?

Donated blood is separated into different products, including whole blood, red blood cells, plasma and platelets.

Each of these products has a different use and, more importantly for blood bank management, a different shelf life.

WHOLE BLOOD

Donated whole blood can treat patients with trauma and severe bleeding, cancer patients, patients with chronic illnesses or blood disorders, patients undergoing surgery and transplant patients. It is used for disease research, to develop new therapies and in diagnostic kits for infectious diseases, liver disease and blood cancer.

Depending on the type of anticoagulant used at the time of donation, whole blood usually lasts 21 to 35 days when properly refrigerated. Irradiated whole blood lasts about 28 days. In some specific emergencies, fresh whole blood is used immediately after collection, and its shelf life is only about 4 hours from the time it is prepared.

RED BLOOD CELLS

Red blood cells treat patients with anemia, blood loss due to trauma or chronic illnesses. Some surgeries require red blood cells, such as heart and organ transplants.



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Premature babies may need transfusions of red blood cells to help improve their oxygen levels.

Again, depending on the anticoagulants and additives used, donated red blood cells can last up to 42 days when properly stored. When treated with glycerol and frozen, they can last up to 10 years. Storage time, storage temperature and donor characteristics all

influence the quality of the red blood cells.

PLASMA

Donated plasma treats trauma and emergency patients, burn victims, cancer patients; in therapies such as immunoglobulin replacement therapy, blood clotting factors, Alpha-1 protease inhibitors; and as part of therapies for Kawasaki disease and

myasthenia gravis. Plasma contains essential proteins, clotting factors and antibodies that make it ideal for treating autoimmune disorders, nerve damage and bleeding disorders.

Donated plasma can be stored for about a year when frozen or for about 26 days in liquid form. After donation, plasma is usually frozen within 24 hours to preserve clotting factors. Once frozen plasma is

thawed, it must be used within 12 hours.

PLATELETS

Platelets help patients with blood clotting, cancer, traumatic injuries or those undergoing surgery. Cancer patients are the largest group of recipients. Once donated, platelets last only about five days, creating a nearly constant need for donations.

Blood Donations in Trauma Cases

Donating blood helps all manner of patients, but trauma patients and emergency cases are probably the most well known.

The ideal donation type to help trauma patients, the Red Cross says, are power red donations and AB Elite plasma donation.

POWER RED DONATIONS

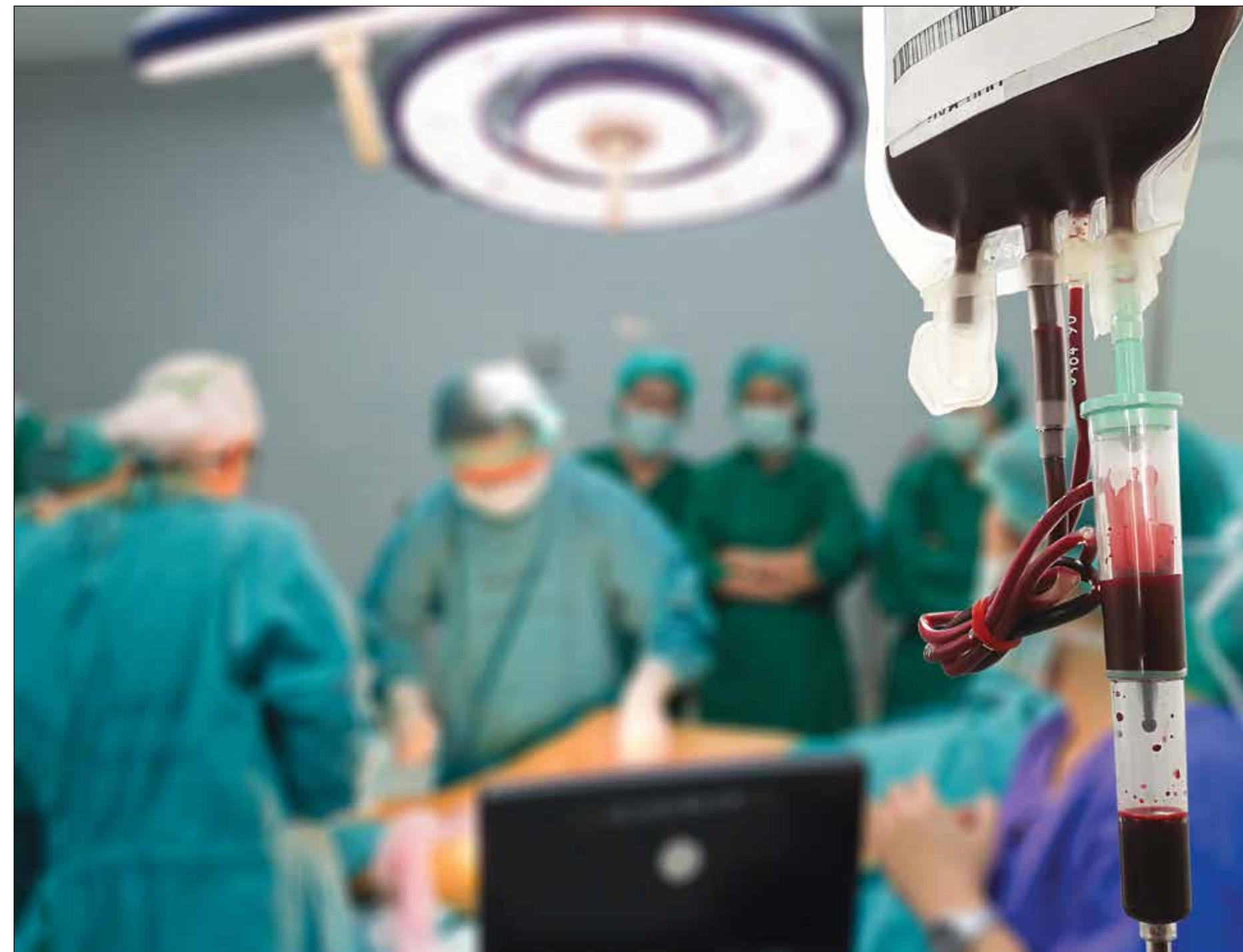
Power red donations work similarly to a whole blood donation, but a special machine allows the donor to give two units of red blood cells during one donation. Plasma and platelets are returned to the donor. Type O, A negative or B negative donors can give via power red donations.

Power red donors can make donations every 112 days, up to 3 times a year. Donors must be in good health and feeling well. Male donors must be at least 17 years old in most states, at least 5'1" tall and weight at least 130 pounds.

Their hemoglobin level must be at least 13.3 g/dL. Female donors must be at least 19 years old, at least 5'3" tall and weigh at least 150 pounds with the same minimum hemoglobin level.

AB ELITE PLASMA DONATIONS

These donations are



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plasma-only donations. During this process, blood is drawn from one arm and sent through a machine to collect the plasma. Red cells and platelets are returned to the donor, along with saline. Type AB donors are eligible to give these donations.

Type AB plasma is universal

and can be given to patients with any blood type. Only about 4% of the population has this blood type, and they can donate every 28 days, up to 13 times per year. These donations can take a little longer than a typical whole blood donation, but can have a profound impact for burn,

trauma and cancer patients.

The Red Cross says someone in the U.S. needs blood every two seconds, including about 25% of trauma patients every year. Around 3 to 5% of trauma patients need a massive transfusion of blood requiring 10 or more units. Summer brings a marked rise

in trauma cases needing blood transfusions as more people get out and about. Type O negative, also referred to as the universal blood type, is used in emergencies when a patient's blood type can't be identified quickly, and is in particular demand year-round.

The Role of Iron and Hemoglobin

Blood donors answer a series of questions and take some tests before being eligible to donate, including checking the donor's iron and hemoglobin levels. Here's why those levels are important.



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IRON

Iron is an essential mineral in the human body. The body can't produce it on its own and it must be obtained through diet and is found in meats, poultry, fish, beans, lentils, tofu, nuts, seeds and dark chocolate. Vitamin C helps the body absorb iron, so it's important to add plenty of that to your diet, too. Iron supports healthy muscles, organs and the immune system, and it's a critical part of hemoglobin. Some foods can decrease the amount of iron the body absorbs, including coffee or

tea, red wine, chocolate, high fiber foods, some medications and high calcium foods.

HEMOGLOBIN

Hemoglobin is a protein inside red blood cells that gives them their red color. Its main job is to pick up oxygen in the lungs and spread it throughout the body. After dropping off the oxygen, it binds to carbon dioxide and transports it back to the lungs to be exhaled. Low hemoglobin levels can indicate conditions such as iron deficient anemia.

Normal hemoglobin levels are different between males and females. For men, the normal range is 13.5g/dL to 17.5g/dL. For women, the normal range is 12g/dL-15.5g/dL.

TESTING

Hemoglobin levels are usually checked by a finger stick prior to blood donation. If levels are low — and some Black donors may have a normal range that varies by 0.7g/dL at the low end — the donor may be asked to wait to donate until levels return to normal.

AFTER DONATION

As soon as the donation is complete, your body begins to replace the lost fluid volume. In the coming weeks, it will replenish the red blood cells and other components lost to donation. Most of the plasma volume is replaced within 24 hours while red blood cells can take a few weeks. Lost iron is usually replenished over six to eight weeks. Help your body recover by drinking extra fluids, avoiding alcohol. Eat iron-rich foods and rest, especially if you feel dizzy or light-headed.

New Moms and Blood Donations

Postpartum hemorrhage is a leading cause of new maternal deaths in the U.S., affecting about 3 to 5% of women.

Blood donations can help stem this tide and are a critical treatment for this condition, especially if bleeding is severe or if first-line treatments have failed.

WHAT IS POSTPARTUM HEMORRHAGE?

Postpartum hemorrhage is severe bleeding after giving birth, usually occurring within 24 hours of childbirth, but it can happen up to 12 weeks after delivery. Women with PPH lose large amounts of blood quickly, causing a sharp drop in blood pressure and restricting blood flow to the heart, brain and other organs. This, in turn, causes hypovolemic shock, which can be deadly.

Symptoms of postpartum hemorrhage include a drop in blood pressure, feeling dizzy or faint and having blurred vision; increased heart rate or tachycardia; a decreased red blood cell count; pale or clammy skin; and pain and swelling in the vaginal or perineal area.

TREATING POSTPARTUM HEMORRHAGE

Health care providers usually



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treat postpartum hemorrhage as an emergency and will immediately try to stop the source of bleeding. This will include methods such as uterine massage to help the muscles of the uterus contract, medication such as oxytocin or methylergonovine to help the uterus contract, artery ligation,

compression sutures and blood transfusions.

WHAT HAPPENS DURING A BLOOD TRANSFUSION?

Health care providers will take a blood sample to find out the patient's blood type or use Type O if a transfusion is needed right away. They will

check the patient's weight and vital signs to determine how much blood is needed. A tube will be inserted into the patient's arm to receive a slow flow of blood that may increase if the transfusion is going well.

Red blood cell transfusions and whole blood transfusions take around two to four hours.

Plasma and platelet transfusions take about an hour, the Cleveland Clinic says. After the transfusion, health care professionals will monitor the patient for any possible reactions to the transfusion. They may recommend rest for the next 48 hours and the arm may be sore.

Blood Donations During War

Wars are major catalysts for innovations in health care. Treating patients through blood donation is no exception.

Here's a timeline of how blood donation was developed to help save lives during wartime.

1665: Dr. Richard Lower performs the first successful blood transfusion. He kept a dog alive using the blood of other dogs.

1818: Dr. James Blundell performs the first successful transfusion of human blood to a patient requiring treatment of postpartum hemorrhage.

1861-1865: Physicians during the American Civil War attempted blood transfusions.

In 1864, physicians wrote Army Medical Museum Curator Joseph Woodward to inquire about performing transfusions. The group of physicians and Woodward exchanged several letters discussing transfusions. At least five cases were attempted.

1900: Dr. Karl Landsteiner discovers the first three human blood groups, A, B and C. C is later changed to O. AB was added in 1902.

1916: The British establish the first blood depot during World War I. U.S. Army officer Oswald Robertson is credited with creating the blood depots. Robertson would eventually



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hold a school for blood transfusion, training teams from other medical units. Citrated blood became the method of choice for transfusion for most Allied forces, the University of Kansas Medical Center says.

1940: The U.S. establishes a nationwide program for blood collection. Charles R. Drew developed the Plasma for Britain program to collect blood for shipment to the British. By the end of World War II, the American Red Cross collected 13 million units of blood for the war effort.

1941: Victims of the Japanese attack on Pearl Harbor

are treated for shock with albumin. When injected into the blood stream, albumin absorbs liquid from the surrounding tissues, preventing blood vessels from collapsing.

1941: Drew heads up the Red Cross' National Blood Donor Service to collect blood for the U.S. military.

1948: The Red Cross begins the first nationwide blood program for civilians.

1950: The U.S. enters the Korean War and the American Red Cross becomes the collecting agency for overseas airlift, building upon the civilian program in place. An

Armed Forces Blood Program and National Blood Program were established and remained in operation until the war's end.

1966: A frozen blood bank is established in a combat zone during the Vietnam War, improving the storage and transport of blood. Also during the Vietnam War, the U.S. used "walking blood banks," soldiers with compatible blood types to provide an instant blood supply for their wounded fellows.

1974: The U.S. government sets up a national blood policy, supporting standardized

practices and an end to paid donations.

1991: A ban on blood donation is placed for U.S. veterans of the Persian Gulf War over concerns about the parasitic disease *Leishmania tropica*. The ban was lifted in 1993.

1992: The first national testing laboratory to ensure safe Red Cross blood products opens in Massachusetts.

2001: More than 500,000 extra units of blood were donated in the wake of the Sept. 11, 2001, terrorist attacks. Of that, more than 200,000 units had to be discarded after it expired.

Who Plasma Donations Help

A little more than half of your blood volume is plasma, a yellowish liquid that is mostly water and transports blood cells, nutrients, hormones, proteins and waste products.

It helps to regulate body temperature and blood pressure and aids in blood clotting. The antibodies it contains can help fight infection.

HOW IS PLASMA FORMED?

Plasma forms when water in the body combines with ingested electrolytes. The proteins in plasma come from bone marrow, older blood cells, the liver and the spleen. Those proteins are albumin, which helps maintain the balance between the fluid inside cells and the plasma outside; fibrinogen, which helps form clots and repair tissues; globulins, which help fight infections and blood clotting; and other proteins.

HOW IS PLASMA DONATED?

Plasma can be removed from whole blood after a regular blood donation. Or the donor could give through a process called apheresis, where whole blood is removed from the body, a specific component is separated — such as plasma — and the remaining blood and other components



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are returned to the donor's body.

The Red Cross says the ideal blood type for plasma donations are AB+ and AB-. For plasma donations, type AB is a universal blood type and can be given to any patient. It's particularly critical in trauma cases since there may not be

time to test blood type prior to transfusion. The Red Cross calls these donors AB Elite donors and can schedule special donations for them online.

WHAT DO PLASMA DONATIONS TREAT?

Donated plasma can be given directly to patients who

need to replace blood volume due to trauma, burns or shock. It can be processed into therapies for a variety of conditions, including immune deficiencies, bleeding disorders and neurological conditions. The Red Cross says nearly 10,000 units of plasma are needed every day in the U.S.

People with liver disease or blood clotting conditions may require plasma transfusions to help their blood clot and stop excessive bleeding. Children and adults with cancer often use up their own natural clotting ability and will receive transfusions of fresh frozen plasma.

Keeping U.S. Blood Supplies Safe

More than 14 million units of blood are transfused annually in the U.S., the U.S. Centers for Disease Control says, and the Red Cross says an estimated 6.8 million people donate blood every year in the U.S.

There are more than 50 community blood centers and 90 hospital blood centers in the U.S., all working to keep donated blood supplies safe.

The CDC says the blood supply is safer than it has ever been, with infections from blood donations a rarity. Adverse reactions to blood transfusions are very rare, it says, largely because health care providers and blood banks ask a series of screening questions before blood donation. These questions include health history questions, travel questions and general health questions. The U.S. Food and Drug Administration says these screenings weed out about 90% of unsuitable donors. It

requires blood centers to maintain lists of unsuitable donors.

Once blood is donated, labs test the blood for type, infectious diseases and additional proteins or antibodies that may cause adverse reactions in recipients, whittling away at the causes of those events. Blood center test for infections



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such as hepatitis B and C, HIV, human T-lymphotropic virus types I and II, syphilis, West Nile virus, bacterial infections and more. America's Blood Centers and the Association for Blood Donor professionals say the risk of disease transmission is low. For example, only one in 1.6 million patients get HIV from a blood transfusion.

The FDA inspects all blood facilities at least every two years, with problem facilities inspected more often. The agency requires reporting of unexpected events in the manufacture of products from blood donations, including problems with testing, processing, packing, labeling, storage, holding or

distribution. Blood centers may be voluntarily accredited by other organizations, America's Blood Centers and the Association for Blood Donor Professionals say.

The CDC's Office of Blood, Organ and Other Tissue Safety (BOOTS) and National Healthcare Safety Network watches for adverse events after

transfusions to help prevent transfusion-related events through evidence-based interventions and recommendations. The CDC helps state and local health departments and hospitals with investigating reports of potential infectious disease transmission via donated blood products.