△ GENERAL INFORMATION

The ability to transfuse blood has been one of the important advances in surgery. It has made it possible to perform operations more safely. Some operations would not even be attempted without the availability and use of blood and its byproducts. Most of the time, however, blood is simply held in reserve in case it is truly needed.

Many patients who are told that they may—not *will*, just *may*—need a blood transfusion become anxious about the entire process and especially about how safe the transfusion may be.

BLOOD TRANSFUSION PROGRAMS IN THE UNITED STATES

Blood is considered a *drug*. For this reason, it comes under the regulation of the U.S. Food and Drug Administration (FDA) that imposes a number of requirements to safeguard the person donating the blood as well as the one receiving it. The American Association of Blood Banks is a voluntary, nonprofit organization that accredits blood banks. It has additional standard requirements.

In the United States, blood donations are obtained in several ways. There are large community blood centers, such as those run by the Red Cross and smaller hospital blood centers. A small amount of blood is imported. Around 14 million units of blood are donated each year by about 10 million donors.

Even though most blood is donated by volunteers and collected by agencies that are nonprofit, there is a considerable cost involved in collecting blood and then putting it through all the various steps before getting it to the patient. This cost is passed on to the patient.

The aims of this entire process are to ensure the safety of the donor and to obtain a high-quality blood component that is as safe as possible for the person who is to receive it. The steps include screening the donor, collecting the blood, testing it, getting it ready, and distributing it. Doing this involves at least the following:

DONOR SCREENING

Only volunteers are accepted as donors. For the safety of the person receiving donated blood, the donors are asked about the following:

- Their general health.
- Whether they are under the care of a physician.
- Whether there is anything wrong with their heart or lungs.
- Recent donations or major illness, unexplained weight loss, or unusual bleeding.
- Any bleeding disorder.
- Whether they are receiving growth hormones.
- Exposure to malaria and hepatitis or other liver diseases.
- Whether they are infected with acquired immunodeficiency syndrome (AIDS) or have symptoms of AIDS and other questions about sex-related diseases and behavior that might put them at risk for AIDS or hepatitis.

Sometimes, a family doctor's opinion may be that the donor is perfectly okay, but a number of conditions are not acceptable, according to FDA standards, and may cause a donor to be rejected.

PHYSICAL EXAMINATION AND LABORATORY TESTING

Screening of the donor includes the following:

- Blood count.
- Blood pressure, pulse, and respiration.
- A focused physical examination with special attention for any signs of illness, effects of drug abuse or alcohol, needle marks indicating intravenous drug abuse, AIDS or related diseases, and skin infection.
- Laboratory tests for two types of hepatitis, human immunodeficiency virus (HIV), and syphilis.

BLOOD COLLECTION

- Blood is collected in specially designed sterile containers that are licensed by the FDA and can be used only once.
- The skin over the donor's vein is examined with great care to be certain there is no skin disease in that area. The skin is washed with soap and water and then swabbed with an antiseptic solution.
- A one-time use sterile needle is used to puncture the vein to obtain the blood.
- The donation takes about 7 to 10 minutes.
- As the blood is being collected, a blood thinner *(anticoagulant)* is mixed with it to prevent it from clotting. Also, the blood is mixed with a special solution to keep it in the best possible condition until it is ready for use.

BLOOD TYPES

There are several different major blood types, and they are designated as A, B, O, and AB. They must be matched for all transfusions; otherwise, a serious reaction can result. In addition, a number of minor blood types may need to be taken into account.

In general, patients who get a blood transfusion do not necessarily receive the blood donated by their friends or relatives. They receive blood that best matches their own blood. There are some variations or exceptions to this as follows.

SPECIAL DONATIONS

Autologous Blood Transfusion

Individuals donate their *own* blood some days before the operation and expect to receive that blood during the operation. The rules for this practice are as follows:

- There is no age or weight restriction.
- Pregnant women are discouraged from doing it.
- The blood level of the donor must be high enough to begin with.
- A person can donate blood every 7 days for up to 3 donations before the operation.

Collecting blood from a patient so that it can be used later by that same patient can be harmful if the donor has any of the following:

- A blood infection *(bacteremia)*.
- Symptoms of coronary heart disease or disease of the heart valves.
- Recent seizures.

A person choosing to donate his or her own blood should be reasonably certain the blood will be needed. Such blood may be discarded if it does not meet FDA standards for transfusion to a person other than the donor.

Directed Donor Blood

Relatives and friends donate blood for the patient, believing that such blood is safer than blood from unknown donors. In fact, there is no evidence that this is true. Blood donated by friends or relatives must meet the same FDA requirements for routine blood donation because the blood will be used by others in the community if it is not used by the patient.

SAFETY OF A BLOOD TRANSFUSION

- The risk of developing hepatitis C (the more serious type of hepatitis) is one in 103,000 transfusions.
- The risk of developing HIV (that commonly leads to AIDS) is one in 490,000 transfusions.

So, although blood transfusion is very safe, it still is not risk free. It should be given after careful consideration of the patient's clinical situation and needs. Using these guidelines, the risks of a blood transfusion are far outweighed by the benefits that follow.