RECEIVING A BLOOD TRANSFUSION:
WHAT EVERY PATIENT SHOULD KNOW

How many Americans need blood each year?

Over four million Americans receive blood transfusions each year. Blood is used to save the lives of patients who need surgery or other medical treatment, for accident victims and for patients with cancer, hemophilia and other serious diseases.

Why would my doctor recommend that I receive blood?

You may need to receive blood in order to stabilize your condition or to save your life. The amount of blood that is given to you is a decision your physician will make based on your particular needs. Details about why you may need blood will be best explained by your doctor.

What steps are taken to make sure that the blood patients receive is safe?

There are many safeguards on our national blood supply to ensure safe blood for patients. First, blood is donated by volunteer donors. Before giving blood, donors must answer questions about their health and risk factors for disease, and only a person with a clean bill of health can give blood. Blood from each accepted donor goes through extensive testing. In addition to tests for blood type, nine separate screening tests are run for evidence of infection with hepatitis, HIV, HTLV and syphilis. Finally, a carefully identified blood sample is tested against blood from the patient who will receive it, a process called crossmatch.

What are the risks of receiving blood?

If a blood transfusion is indicated during a surgical procedure or other medical treatment, the risks of NOT receiving blood far outweigh the risks of transfusion. Some patients may experience minor changes in the body's immune system after a transfusion, causing mild symptoms, such as fever, chills or hives, which typically require little or no treatment. A small number of patients may also react to donated blood by developing antibodies (immune reactions).

The transmission of disease and the destruction of red blood cells occur only very rarely, and seldom threaten life. The potential risk of contracting AIDS from a blood transfusion has received a great deal of attention. But it is important to know that all donated blood in the United States is tested for the AIDS virus, reducing the risk to a negligible level. When you consider the risks of transfusion, it may be helpful to know that many common activities carry far greater risks - for example, smoking cigarettes, driving a car or being pregnant.

What can I do to make sure that a safe supply of blood will be available should I, my friends, family or members of my community need it?

It is very important that healthy Americans donate blood. This will guarantee that a safe and adequate blood supply is available for patient care. Millions of lives are saved each year because of the availability of donated blood.

Do I have choices other than receiving blood from the community blood supply?

Yes, you may have other choices. Autologous blood transfusion refers to procedures in which you may serve as your own blood donor. In preoperative autologous donation, your blood may be collected and stored before a scheduled surgery if blood use may be required. In intraoperative and postoperative autologous transfusions, blood lost during surgery is saved and returned to the patient. Directed

donations can also be arranged in some cases from a person (usually a friend or relative) whom you select.

How can I find out more about blood?

Ask your doctor for more information about your medical treatment and the possible use of blood.

BLOOD TRANSFUSIONS

Why is blood transfused?

Transfusions are given to replace blood lost during surgery, to replace blood lost because of accidents and to replace blood lost due to internal bleeding caused by conditions such as stomach ulcers. Transfusions are used in the treatment of cancers such as leukemia and to treat different types of anemia such as sickle cell disease and thalassemia.

Is there a charge for receiving blood?

All blood centers and hospitals charge a processing fee to cover service costs such as donor recruitment; collecting, testing, packaging, storing and distributing the blood; and administrative and staff costs. In the hospital, there are charges for matching and administering a blood transfusion. Most health insurance policies cover these fees.

Are there any risks in receiving a transfusion?

As with any medical procedure, blood transfusions carry some risk. There is a remote chance of receiving blood of the wrong type. In addition, several infectious diseases can be transmitted by blood transfusions. Among the viruses that may be transmitted by blood are: human immunodeficiency virus (HIV), the virus that causes AIDS; human T-cell lymphotropic virus (HTLV-I); several hepatitis viruses; and cytomegalovirus (CMV).

What steps are taken to reduce the risks involved in receiving a transfusion?

Steps to ensure maximum transfusion safety involve both donor and recipient. Donors are screened very carefully using a detailed questionnaire for health problems or circumstances that increase risk of transmitting infection. After blood is drawn, it is tested for numerous viruses and other potentially harmful disease agents, and positive or doubtful units are discarded. Donor blood is tested for ABO, Rh and the presence of possibly dangerous blood group antibodies. After the recipient's blood is tested for ABO, Rh and the presence of blood group antibodies, donor units are selected that lack antigens that might react with any antibodies present in the recipient. Additional checks are then performed to compare the specific donor unit selected with the patient's blood.

What steps are taken to reduce the risk of acquiring hepatitis from transfusions?

First of all, donors are questioned extensively about possible exposure to hepatitis and behaviors that put them at increased risk for hepatitis. Individuals who are found to have an exposure or a risk factor are deferred from donation. In addition, several tests are used to detect the presence of hepatitis B and C. Since the 1970's, all donor blood has been tested for direct evidence of the hepatitis B virus. Since 1986, all donated blood has been screened for indirect evidence of hepatitis B, using a test for one of the antibodies to hepatitis B (antibody to hepatitis B core antigen). A test for antibody to hepatitis C virus is also in place. Hepatitis A is very rarely transmitted through blood transfusion.

What is cytomegalovirus (CMV)?

CMV is a common virus that causes a mild to unnoticeable infection in healthy people. About half of the adult population in the United States has been infected with CMV. The virus can be transmitted by blood transfusion. Although it is not a problem for most transfusion recipients, it can cause serious disease in patients whose immune systems function poorly, such as premature infants and patients who have undergone tissue or organ transplantation. These patients frequently are given blood that has been screened or processed in such a way as to reduce the risk of CMV transmission.

What is human T-cell lymphotropic virus?

Human T-cell lymphotropic virus, type I (or HTLV-I) is considered a leukemia virus; it differs from the virus that causes AIDS (HIV). HTLV-I is found particularly in Japanese people and in people living in the Caribbean area. HTLV-I can, on occasion, cause leukemia and a paralytic disease of the nervous system, but it takes many years to do so.

Are tests done to detect venereal disease?

Yes. Blood is tested for evidence of syphilis infection.

What other donor screening for infectious diseases is done?

Donors who are at risk of transmitting malaria are screened by medical history and rejected as blood donors. As a result, very few recipients of blood transfusions in the United States develop malaria. Similarly, individuals known to be harboring other infectious diseases are deferred or rejected as blood donors.

How have tests performed on donated blood affected the supply?

Blood and components are tested to eliminate units that may carry HTLV-I, -II, HIV, hepatitis B and hepatitis C, as well as those that are positive for syphilis. Approximately 1.9 percent of whole blood units donated are discarded due to positive tests. False positives may occur due to the sensitivity of the testing procedure. This means that some units of blood are discarded, although the donor does not have a viral infection. It is very important that units that are true positives not be used for transfusion. Until more research is done to perfect testing procedures that will detect only true positives, blood banks and donor centers will continue to take precautions to ensure the safest blood supply possible; this will include not using blood with a false-positive test result.

Has there been any progress in developing blood substitutes?

Blood substitutes with the ability to carry oxygen have been used in animals and to a limited extent in humans. Most blood substitutes have not been proven totally safe or completely effective. These substitutes do not provide clotting factors or white cells to fight infection. Most blood substitutes under development remain highly experimental, and none has been licensed for use in the United States. Research into substitutes is continuing, however.

BLOOD SAFETY / CURRENT ISSUES

The American Association of Blood Banks (AABB), through its 2200 institutional and more than 8500 individual members, is committed to ensuring a safe and adequate blood supply for the American people. AABB continually takes steps to enhance safety by evaluating new technology as it becomes available.

The AABB assesses and, when the specific technology is deemed effective and feasible, promotes implementation of new technology at the blood bank level through its *Standards for Blood Banks and Transfusion Services*. As a result of AABB's development of a multi-layer safety system, which includes donor screening, donor deferral and testing, transmission of transfusion-transmitted diseases has diminished steadily over the years.

Standards

The AABB has systems in place that ensure continual review and refinement of its voluntary standards. A standing committee is assigned to review and update the entire publication AABB *Standards for Blood Banks and Transfusion Services* every 18 months. Interim standards may be issued to reflect new technologies, methods, or criteria for donor selection if it is determined, based upon available data, that they will enhance the safety of the blood supply during the intervening periods.

Systems for ensuring the safety of the blood supply are generally described as having five layers, which work together to screen out infectious agents. Every blood collection center follows essentially the same requirements, all of which are specifically set forth in the AABB Standards. AABB Standards (for which member compliance is voluntary) are based upon established best practices and in accordance with FDA regulations and guidelines.

Layer 1: Blood Donor Screening

Efforts are made to recruit volunteer blood donors only from the safest and most suitable donors. For example, blood is collected from universities and workplaces, but not from prisons. Blood for transfusion is collected from volunteer blood donors. Improper donor incentives and coercion, which could alter the truthfulness of some donors, are prohibited.

Layer 2: Individual Screening

Each individual blood donor is required to read information about blood safety and is encouraged to leave, without explanation, if he or she recognizes that giving blood would be inappropriate. Potential donors are also asked a series of questions about their health and lifestyle (including direct questions on sexual behavior designed to identify high-risk activities) and undergo a miniphysical before being allowed to donate. The questions and examinations are designed to prevent individuals who are at high risk for HIV, hepatitis and other infectious diseases from donating blood. This process is continually refined in order to ensure that blood is drawn from the most appropriate individuals.

Layer 3: Laboratory Testing

The third layer involves testing collected blood for possible infectious diseases. Eight laboratory tests for different infectious diseases are currently conducted on each unit of donated blood. All results must be negative for a blood unit to be labeled and released. Tests for hepatitis B and syphilis were in place before 1985. Since 1985, the following tests have been implemented: HIV-1 and -2, HIV antigen, HTLV-1 and -2, two tests for hepatitis B and a test for hepatitis C. Nucleic Acid Amplification Testing (NAT) employs a new form of testing technology that directly detects the genetic material of viruses like hepatitis C and HIV. The use of NAT has not yet been approved by the FDA for donor screening in the US. Because of the promise that this technology holds for even further improving the safety of the blood supply, many blood collecting facilities are pursing implementation of NAT under the FDA's Investigational New Drug (IND) application process.

Layer 4: Confidential Exclusion

Blood donors may be offered a confidential opportunity to exclude their blood from use in transfusion by attaching stickers to the paperwork identifying the collected unit for use or withdrawal. If a donor knows of any reason why his or her blood should not be used for transfusion, he or she places the sticker indicating that the unit should not be transfused on the label. This is done to ensure that no pressure is exerted on the donor to give blood.

Layer 5: Donor Record Checks

Every donation is checked against existing records. If a donor was indefinitely deferred, the collected unit is withdrawn from circulation and potential use. This process acts as a barrier to prevent the release of any blood from a donor who was previously judged to be indefinitely unacceptable.