BLOOD TRANSFUSION

This information brochure is designed to help you prepare for possible transfusion by explaining what transfusion medicine is and what to expect.

Introduction

Blood transfusion involves taking blood from one person and giving it later to another or the same person. Blood transfusions are needed to replace blood lost in accidents and from surgery, as well as to treat conditions such as anemia. Hospitals rely on a bank of blood donated by community volunteers, to enable them to save lives. Blood carries oxygen and nutrients to all the organs of the body. It also takes away waste products. Blood is essential to life; if your organs do not receive oxygen and nutrients, they can shut down.

When should it be done?

Blood transfusions are used to treat a number of medical conditions, to replace large blood loss during surgery, and for emergency treatment. Many people lose blood during major operations. Most of those amounts can be replaced with intravenous fluids, which your body replaces with new blood cells over a few weeks. A blood transfusion is required if you lose a large amount of blood. Blood transfusions are only needed for a minority of people having surgery. To reduce your need for a blood transfusion, ask your doctor for advice about boosting your iron levels either before or after your surgery as well as the possibility of collecting blood during surgery.

Anemia occurs when the level of healthy red blood cells (RBCs) in the body becomes too low. This can lead to health problems because RBCs contain **hemoglobin**, which carries oxygen to the body's tissues. Anemia can cause a variety of problems, including fatigue and stress on bodily organs. Anemia can be caused by many things, but the three main mechanisms that produce it are:

- excessive destruction of red blood cells
- blood loss
- inadequate production of red blood cells

Among many other causes, anemia can result from inherited disorders, nutritional problems (such as an iron or vitamin deficiency), infections, some kinds of cancer, or exposure to a drug or toxin. Treatment is usually directed towards the cause and may not require blood transfusion.

Need for blood transfusion depends on a number of factors, including your health, medical history, blood type and seriousness of the condition. Your anesthesiologist will explain to you the risks and benefits of having a blood transfusion. As a patient, you have the right to refuse a blood transfusion.

What are my options if I need a blood transfusion?

If your doctor thinks you need blood, you have several options depending on time and health factors. You may need to check with your insurance company regarding its payment policy related to blood transfusion or any other related treatments.

AUTOLOGOUS TRANSFUSION:

It is possible for adults and some children to use their own blood for a transfusion. This is called autologous transfusion. It was widely used in orthopedic surgery, such as scoliosis surgery, hip and knee replacements. Your blood is collected before the operation and then given back during or after surgery. This technique is less popular now because it can be costly (check with insurance) to collect blood in advance to store, and if surgery is cancelled, or if the person cannot have the operation, the blood has to be destroyed.

DURING SURGERY:

Before some operations begin, your doctor may be able to remove some of your blood and replace it with other fluids. This is called Acute Normovolemic Hemodilution or ANH. After surgery, the blood that was removed may be returned to you. In addition, the surgeon may be able to recycle your blood during surgery. Blood that normally is lost and discarded may be collected, processed and returned to you.

AFTER SURGERY:

Sometimes blood that is lost after surgery may be collected, filtered and returned to you. It is becoming more common in orthopedic surgery, such as knee and hip replacements.

DESIGNATED DONATION:

Although the blood supply is safe, some people prefer to receive blood from people they know ("designated donors"). This blood has been found to be no safer than the community donor blood.

How is it performed?

Blood transfusions are most commonly administered using a small plastic tube called a cannula, which is inserted into a vein in your arm, or sometimes using a larger tube inserted into a vein in the neck or chest (central line). This is connected to a drip, and the blood runs through the drip into your arm. Blood for transfusions is stored in small plastic bags. Each bag or unit holds about a pint (350ml or 15 fluid ounces) of blood, and each unit is usually given over a period of one to two hours or faster if needed. Medical staff will monitor your blood pressure, body temperature and pulse throughout the transfusion, and ask you how you feel (if you are not under general anesthesia).

How does it work?

Although blood is made of the same basic elements, not all blood is alike. In fact, there are 8 common red blood cell types, which are determined by the presence or absence of certain substances on red cells.

The 8 blood types are:	O positive	O negative
	A positive	A negative
	B positive	B negative
	AB positive	AB negative

Before a transfusion is given, the blood of the donor and recipient must be tested against each other to ensure they are compatible. This is more specific than simply using blood from the same blood group and is called cross-matching. A sample of your blood is taken and matched with a suitable donor. Before you receive the transfusion itself, hospital staff will also make careful identification checks of your full name, date of birth, and the details on your wristband. You will be asked to state your name. Most of the blood transfused is collected from community volunteers who donate many times, and who donate their blood free of charge. Each time a person volunteers to donate blood, that person is questioned about their health and behavior in private before blood is collected and some donors are asked not to donate. Then the blood is tested in a laboratory for most of the infectious diseases that can be transmitted by blood transfusion.

These include tests for

HIV,

hepatitis B,

hepatitis C,

human T-lymphotropic virus (HTLV),

West Nile virus, and

Syphilis.

If any of the tests are positive, the blood is discarded.

What are transfusions used for?

Blood transfusions are an important part of medical treatment. They are needed sometimes for many different procedures, including:

general surgery,

cardiothoracic surgery (heart and chest),

orthopedics (bone and bone diseases),

hematology (blood diseases),

emergency surgery to replace blood loss from major accidents,

intensive care treatment,

renal surgery,

treatment of newborn babies and children,

Some treatments involved with pregnancy and childbirth.

Blood transfusions using whole blood are no longer common in modern surgery, except in cases of massive blood loss. Instead, blood is usually separated into its three main components; red blood cells, plasma, and platelets. Each of these components is used for different reasons.

Red Blood Cells

Red blood cells carry oxygen to the tissues of the body using a substance called hemoglobin. Red blood cells may be stored under refrigeration for a maximum of 42 days.

Platelets

Platelets are a component of the blood that helps it to clot and stop bleeding. If the number of platelets in your blood is low, you may bruise easily and bleed heavily, from even minor cuts or bruises. As an example, people with leukemia, people who have had high doses of chemotherapy, and those who have had a bone marrow transplant commonly have low platelet counts and may need to have platelet transfusions. Platelets are stored at room temperature and may be kept for five days.

Plasma

Plasma is the fluid in the blood that carries the red cells, white cells and platelets. It also contains proteins and protective antibodies. Plasma transfusions may be given during cardiac surgery, to reverse anti-coagulant treatment, and to bleeding women following childbirth. Plasma helps the blood to clot, and is sometimes given after massive transfusions, or to people with conditions such as liver disease to replace low levels of clotting proteins. Fresh frozen plasma is kept in a frozen state for up to one year. When needed it is thawed and then given to a patient.

Risks

Blood transfusions need to use blood from a donor that is compatible with the recipient. The process of matching blood groups is carried out with great care, so that you receive blood that is as similar to your own as possible. There are, however, uncommon instances when a reaction might occur. Blood donations are carefully monitored and controlled:

- the health of all donors is checked before giving blood,
- every donor is tested for certain infections every time they give blood.

Few people experience slight side effects following a blood transfusion, including a rise in temperature, skin rash, backache or headache. If you have these symptoms, or feel anything unusual, tell your doctor immediately. If you have had a transfusion reaction in the past, please let your doctor know.. These so called minor symptoms are usually relieved with medicine. Of the major side effects, transfusion related acute lung injury (TRALI) is one that concerns your physician. It is defined as an acute lung injury that is related to a blood transfusion; specifically, it occurs within the first six hours following a transfusion. The cause of TRALI is

currently not fully understood. Recipient, donor, and blood product risk factors may have important roles in the occurrence of TRALI.