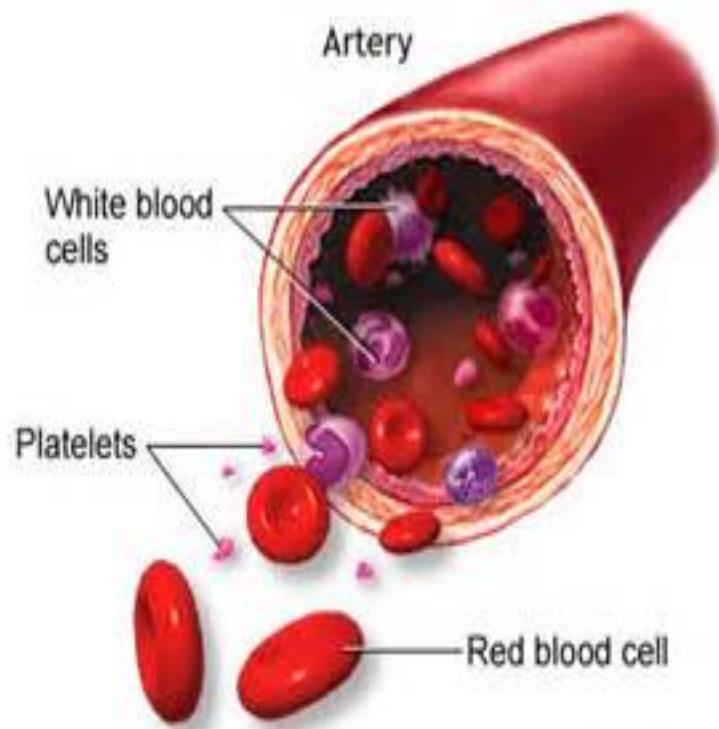
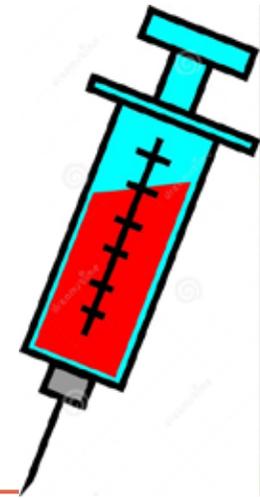
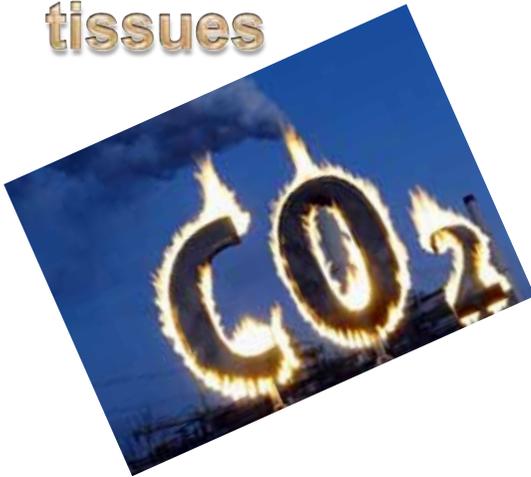

- **Petchey Academy
Blood Presentation**

BLOOD

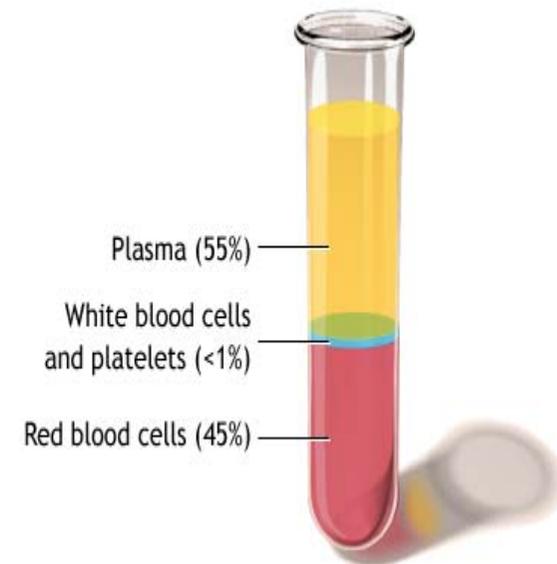


What Is Blood?

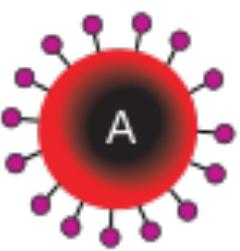
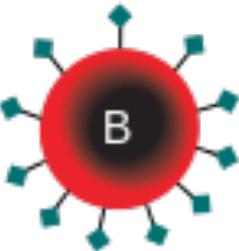
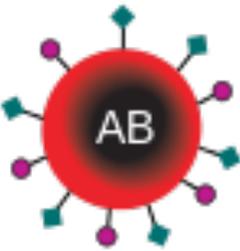
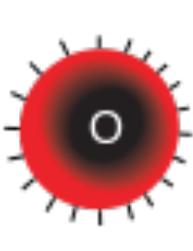
- **Blood mixture** of individual components which are red cells, white cells, platelets and plasma.
- **It circulates in the veins, arteries**
- **It carries oxygen and glucose to tissues .**
- **It carries carbon dioxide away from the tissues**



We cant live without it!!!

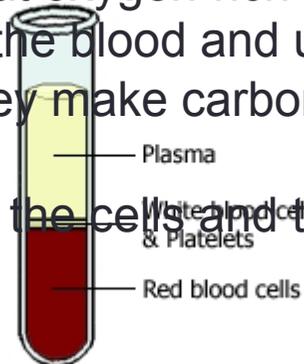


Blood groups

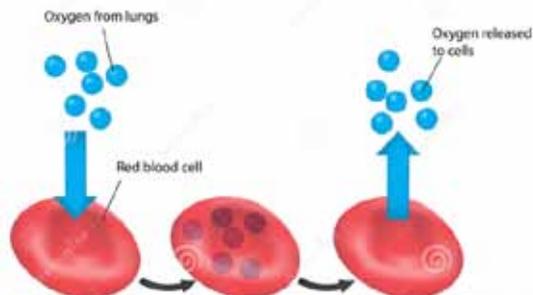
	Group A	Group B	Group AB	Group O
Red blood cell type	 <p>A</p>	 <p>B</p>	 <p>AB</p>	 <p>O</p>
Antibodies in Plasma	 <p>Anti-B</p>	 <p>Anti-A</p>	None	 <p>Anti-A and Anti-B</p>
Antigens in Red Blood Cell	 <p>A antigen</p>	 <p>B antigen</p>	 <p>A and B antigens</p>	None

Red blood cell

- Red blood cells have the important job of carrying oxygen.
- Your body needs this steady supply of blood to keep it working right.
- Blood delivers oxygen to all the body's cells.
- To stay alive, a person needs healthy, living cells.
- Without oxygen, these cells would die.
- If that oxygen-rich blood doesn't circulate as it should, a person could die.
- the left side of your heart sends that oxygen-rich blood out to the body.
- The body takes the oxygen out of the blood and uses it in your body's cells.
- When the cells use the oxygen, they make carbon dioxide and other stuff that gets carried away by the blood.
- It's like the blood delivers lunch to the cells and then has to pick up the trash.



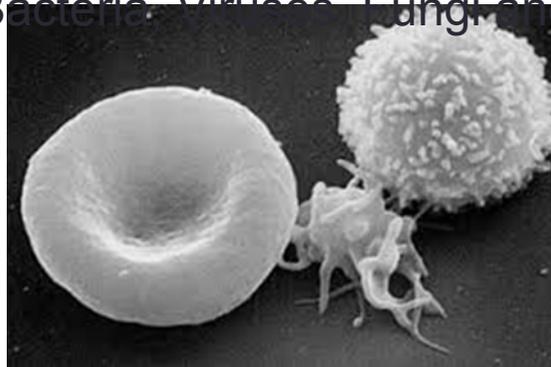
Oxygen Transport



[http://kidshealth.org/kid/word/r/
word_red_blood_cells.html?
tracking=K_RelatedArticle](http://kidshealth.org/kid/word/r/word_red_blood_cells.html?tracking=K_RelatedArticle)

White blood cell

- White blood cells are part of the germ-fighting immune system.
- They are like little warriors floating around in your blood waiting to attack invaders, like viruses and bacteria.
- You have several types of white blood cells and each has its own special role in fighting off the different kinds of germs that make people sick.
- For example they fight: Bacteria, Viruses, Fungi and Protozoa.



[http://kidshealth.org/kid/word/r/
word_red_blood_cells.html?
tracking=KRelatedArticle](http://kidshealth.org/kid/word/r/word_red_blood_cells.html?tracking=KRelatedArticle)

<http://kidshealth.org/kid/htbw/heart.html#>

Creutzfeldt-Jakob disease.

Creutzfeldt-Jakob disease is a rare but deadly illness that causes worsening, gradual brain damage.

It is usually caused by eating meat infected with **bovine spongiform encephalopathy (BSE, or "mad cow disease")**, and can be passed on through a blood transfusion, but this almost never happens.

In the UK, about 2.1 million units of blood components are transfused each year, and until today there have only been four cases of CJD linked to transfusions.

As a safety action, to reduce the risk of transmitting CJD, those who have received a transfusion since 1980 are not currently able to give blood.

BLOOD TRANSFUSION



What is a blood transfusion?

It is a medical procedure which is when a person donates blood of the same type (A, B, AB, O) to a patient who has lost too much blood.

You may need it if:

- **You have lost too much blood during surgery, childbirth or a dangerous accident.**
- **To treat anaemia which hasn't worked with other procedures.**
- **To treat genetic conditions like thalassaemia or sickle cell anaemia.**

You can say no to a transfusion, but you need to know what will happen if you choose this action. Some treatments or operations can't be done safely without a transfusion being given.

A person can almost never get a viral infection from a transfusion, as the blood services use strict testing processes.

It is estimated that:

- **the risk of getting hepatitis B is about 1 in 1.3 million**
- **the risk of getting hepatitis C is about 1 in 28 million**
- **the risk of getting HIV is about 1 in 6.5 million**

Furthermore, there hasn't been a recorded case of someone getting a viral infection from a transfusion since 2005.

Blood Safety

Blood donors are carefully chosen and tested to see if the blood they donate is as safe as possible. This is to prevent the travel of infection from donor to patient, or to check if the blood type of the donor matches that of the patient.

Blood is mainly tested for **Hepatitis B, Hepatitis C, HIV/AIDS, Syphilis** or **HTLV – a rare but dangerous virus, which causes Leukaemia which is fatal in some people.**

Getting an infection from a blood transfusion is unlikely.

You must be correctly identified to make sure you get the right blood transfusion, and wear an identification band with your correct details. You will be asked for your name and date of birth, and the details on your band will be checked before each bag of blood is given.

You will be monitored closely during your transfusion.

Separating the components

When a donor has given blood, special equipment is used to separate it into different components, including:

red blood cells – they transport oxygen around the body and are used to treat anaemia.

platelets – these help to stop the bleeding when a person is cut or injured; platelet transfusions can be used to prevent excessive bleeding in people with low platelet counts.

plasma – a liquid that makes up most of the volume of blood; plasma contains many nutrients needed by the body's cells, as well as proteins that help the blood to clot if a patient is bleeding.

white blood cells – these are used to fight infection.



WHY IS IT
NECESSARY?



**There are several different types of blood transfusion.
Whether you need one depends on a number of factors.**

These include:

- your health
- your medical history
- the type of operation you're having
- the seriousness of your condition

An average-sized adult has about five litres of blood in total. Small amounts of blood loss (up to 1.5 litres) can be replaced with a salt solution, which your body replaces with new red blood cells over the following weeks.

Red blood cell transfusion

The main reason for this transfusion is to treat **anaemia**, which occurs when the body doesn't have enough red blood cells, which means the body's tissues and cells aren't getting enough oxygen.

It can develop as a result of severe blood loss. It can also be caused by:

- **health conditions where red blood cells are produced slowly** –
e.g. in anaemia due to lack nutrients (usually treated without a blood transfusion), and some types of cancer, such as **acute myeloid leukaemia** and **lymphoma**
- **health conditions that disrupt the normal cell production** –
e.g. **sickle cell anaemia** and **thalassaemia**
- **conditions or factors that lead to red blood cells being destroyed** –
e.g. in infections such as malaria, the use of certain medicines, toxins like alcohol or lead poisoning, or because of the immune system mistakenly attacking healthy red blood cells

If you're told that you might need a blood transfusion, you should ask why it's necessary and whether there are alternative treatments.

Platelet Transfusion

A platelet transfusion is used to treat people who don't have enough platelet cells in their blood, (**thrombocytopenia**).

If you have this condition, you're at risk of excessive bleeding, either through a small accident, cut or graze, or as a result of surgery or dental work.

Causes of thrombocytopenia that may require treatment with a platelet transfusion include:

- cancers like **leukaemia** or **lymphoma**
- chemotherapy or bone marrow transplants which reduces the production of platelets.
- chronic liver disease or cirrhosis (scarring of the liver, which has many causes, including alcohol abuse)
- sepsis or severe infection which can cause abnormal clotting and low platelets

Plasma and Granulocyte Transplants

Plasma is the fluid in the blood containing proteins that help the blood to clot. This transfusion may be needed if there's severe bleeding, such as after surgery, trauma or childbirth. It may also be needed in conditions (such as liver disease) that affect the production of clotting proteins.

Granulocytes are a type of white blood cell that help to fight infection. Granulocyte transfusions are uncommon, but may be needed if there's a severe infection that's not responding to antibiotics after chemotherapy or bone marrow transplantation.

Surgical Operations

Surgeons always try to carry out surgery to decrease blood loss. In recent years, this has become easier, due to the use of laparoscopic surgery, where only small cuts are made in the body.

However, some types of surgical operations and procedures have a higher risk of blood loss; therefore, a blood transfusion is more likely to be needed.

It 's possible to use a procedure called **intra-operative cell salvage**. It collects your blood that's lost during the surgery, and it can be returned back to you. Ask your doctor or nurse if intra-operative cell salvage is appropriate for the type of surgery you're having.

It's no longer possible to routinely collect your own blood in advance of your surgery.



HOW IS IT
PERFORMED?

If you're going to receive a blood transfusion as part of a planned course of treatment, the doctor, nurse or midwife planning your transfusion will usually ask for your permission for the procedure.

When asking for permission, they should explain why a blood transfusion is needed and if there are any alternatives and the potential risks or complications associated with the transfusion.

There may be events when it's not possible to obtain consent before a transfusion – for example, if someone is unconscious after a major accident.



How blood is given?

A sample of your blood will be taken before the transfusion to check that the blood you receive is compatible with your own blood.

You'll be asked to state your full name and date of birth, and the details on your I.D. band will be checked before each bag of blood is given.

Blood is usually given through a tiny plastic tube called a cannula, which is inserted into a vein in your arm. It is connected to a drip and the blood runs through the drip into your arm. Depending on severity, each unit of blood can take 30 mins – 4 hrs.

Depending on the situation and the type of other treatment needed, some patients may have a larger tube inserted into a vein in their chest.

Alternatively, a peripherally inserted central catheter (PICC line) may be inserted in the crook of the arm.

A unit of blood usually takes two to three hours to give. A unit can be given quicker for more severe cases. A unit of platelets or plasma is given in 30-60 minutes.



During the Transfusion



You may be uncomfortable when the tube is put into the vein, but you shouldn't feel anything during the transfusion.

You'll be seen at regular breaks, but if you start to feel sick during or shortly after your transfusion, you should tell a member of staff immediately.

Some people may have a temperature, chills or a rash. These reactions are usually mild and easily treated with paracetamol or by slowing down the blood transfusion.

Severe reactions to blood are rare. If they occur, staff are trained to recognise and treat them. If you have any concerns, discuss them with your doctor, nurse or midwife.



RISKS

Having an allergic reaction to the donated blood is a rare risk of a blood transfusion.

An allergic reaction is caused by the body's immune system reacting to proteins or other substances in the donated blood. The symptoms of the reaction are usually mild and occur during or shortly after the transfusion.

Symptoms can include:

- **a severe skin rash**
- **swollen hands arms feet, ankles or legs**
- **dizziness**
- **headaches**

- **fever of 38°C or above**
- **chills**
- **shivering**
- **shortness of breath**
- **swollen lips or eyelids**

These types of reactions can usually be controlled by slowing down/stopping the transfusion and treating the symptoms with antihistamines and, in some cases, paracetamol.

Anaphylaxis is a more worse and possibly life-threatening allergic reaction to antibodies or other substances in the blood.

The symptoms of anaphylaxis may occur as soon as the blood transfusion begins. They include:

- **severe shortness of breath**
- **feeling like you will pass out**
- **a rash/swelling of the lips or eyelids**

It is usually treated by an injection of adrenaline:

a hormone made by the adrenal glands that increases rates of blood circulation, breathing, and carbohydrate metabolism and prepares muscles for exertion.

Fluid Overload

Too much blood can be transfused into the body in too quickly for the body to properly cope with it. This is a fluid overload. It's more common in people who are old or frail, and in lighter people.

The excess fluid can cause heart failure. The lungs also become filled with fluid, which can result in shortness of breath. Older patients and people with serious health conditions like heart disease, are at greater risk of this problem.

It is treated by giving a medicine to remove excess fluid from the body called diuretic, and by reducing the speed of the transfusion in the future.

Lung Injury

A rare but very serious risk associated with blood transfusions is transfusion-related acute lung injury (TRALI). It occurs more often with platelets and plasma than with red cells.

TRALI is a condition in which a person's lungs suddenly become very inflamed within six hours of the transfusion. The high levels of inflammation cause the lungs to become starved of oxygen. In some cases, the patient can die.

Most experts believe that some type of abnormal immune response causes the inflammation associated with TRALI.

Treatment for TRALI requires using a ventilator to provide the body with oxygen until the inflammation of the lungs subsides.

Haemolytic Reactions

A **haemolytic transfusion reaction** is when the immune system reacts to the donated blood and attacks the blood cells.

HTRs can happen during or soon after transfusion, or they can be slowed down, happening a few days or even a week later. They can cause symptoms like other transfusion reactions, but the urine may turn darker, because of.

HTRs are rare. They may be caused by:

- a rare antibody that couldn't be found whilst checking the blood.
- in delayed reactions, a new antibody can develop after transfusion, which can break down the transfused blood
- in very rare cases, the wrong blood is given to a patient; this is why great care is taken to check the correct details on the sample tube, and why the patient and the blood units are checked before the transfusion.

Bacterial Infections

Despite every effort being made to keep donated blood clean, bacteria can rarely develop in donated blood. Platelet donations are more likely to become contaminated, because they need to be stored at room temperature.

If a person receives contaminated blood, they may show signs of blood poisoning, including:

- fever
- chills
- a fast heartbeat
- hyperventilating
- cold, damp skin
- changes in mental states, such as confusion

Sepsis is usually treated with injections of antibiotics.