The journey of blood: from one life to another

Blood is vital for life. Despite ongoing efforts, it will still be many years before artificial blood substitutes can widely replace the donated human blood. A nation can meet all its need for blood if only 1% to 3% of its population donate.

Voluntary blood donors are the safest source of blood and WHO is advocating that all countries move to a system of regular voluntary blood donation to meet their needs. It is essential that every nation has a stable pool of healthy donors who donate blood regularly.

The journey of blood from the time it is donated to when it is transfused is a complex one as it needs to be tested, stored and transported prior to use. Transfusion services face the challenge of providing blood that is safe and adequate to meet the rising demand.

This photo story chronicles the journey of donated blood from the donor to the recipient.

RELATED LINKS

Fact sheet: blood donation and safety
http://www.who.int/mediacentre/factsheets/fs279/en/index.html

10 facts on blood transfusion
http://www.who.int/features/factfiles/blood_transfusion/en/index.html

World Blood Donor Day 2009
http://www.who.int/worldblooddonorday/en/index.html

WHO programme on blood transfusion safety
http://www.who.int/bloodsafety/en/index.html

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The main function of blood is to carry oxygen from the lungs to all parts of the body along with waste products, nutrients, hormones etc. It controls clotting, maintains the internal environment of our body and protects us against harmful organisms. Donated blood is used to replace blood lost in accidents, injuries and surgical operations and to treat diseases where a particular blood component is missing.

Canadians gather in the shape of a blood drop

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Your body has about 5 litres of blood, accounting for 7% of your body weight, but this amount varies with age and gender. Blood is made up of several components - cells (45%) and a fluid part, the plasma (55%). The cells are of three types - red blood cells that transport oxygen in the body, white blood cells that fight infection and platelets that help the blood to clot at times of injury.

Two tubes of anticoagulated blood showing cells and plasma

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Blood cannot be synthesized and its only source is blood donors. More than 81 million units of blood are donated annually all over the world but less than half of this in areas of the world where nearly 80% of people live. If only 1% to 3% of the population donate blood, it will be sufficient for a country's needs.

A woman gives blood while her children watch

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Ensuring safety of blood supplies has become essential following the HIV/AIDS epidemic. Donors' blood is tested to find the blood group type and screened for infections like HIV, hepatitis B and C and syphilis. If countries where malaria or Chagas disease is common, the blood may be tested for these too. A regular voluntary donor has been found to be a safer source of blood than those who donate for family or in lieu of payment.

Reagents used to find blood group types

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Blood is a living tissue. Once donated it has to be stored in special refrigerators prior to use. A variety of chemicals are used to prevent clotting of blood, non-toxic preservatives to maintain the cells and newer storage materials to increase the shelf life of blood and blood components. This way the donated blood can be stored and transported safely.

Special refrigerators to store donated blood

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The use of whole blood is avoided. Instead specific blood components needed for patients are provided. This way one unit of donated blood can be used to treat several patients. For example, red blood cells are given to patients suffering from severe anaemia arising from a variety of causes, including malaria in children.

Children suffering from severe anaemia

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Platelets are used to prevent bleeding in patients suffering from diseases that reduce the number of platelets or their function. White blood cells are given to patients having low neutrophil counts suffering from severe bacterial or fungal infection, especially those following bone marrow transplant or cancer therapy.

Bags of packed red cells and platelets for transfusion

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Modern technology allows the removal of only a particular blood component; the rest of the blood returns to the donor's body without affecting his or her health. Machines automatically collect and process blood to prepare in large numbers different blood cells by a procedure called cytapheresis.

A man donating blood that is undergoing cytapheresis

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Whole blood is used in conditions such as trauma due to accidents and surgical procedures, where there is excessive loss of blood. Newborns also sometimes need an exchange transfusion. Plasma and plasma products are used to treat a variety of conditions that include bleeding, fluid loss, infections and immunological disease.

A sick child receiving blood transfusion

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The blood you donate can save someone you may never meet. But you will always have the satisfaction of having given a gift of life, truly the most precious one.

Two children, one of which received blood transfusion