History of Blood

In ancient time humans must have realized the importance of blood. They must have observed that the loss of blood usually lead to death. The transfer of blood from one person to another is an ancient idea.

1492: The first reported blood transfusion occurred. The transfusion was done on Pope Innocent VII in Rome. His doctors advised to transfuse blood from three healthy individuals as a therapeutic measure for his illness. However the outcome of this blood transfusion was not successful and the Pope died soon after.

1628: William Harvey, an English physician discovered how blood circulated around the body, with the heart pumping blood into the body through the arteries, and the blood returning back to the heart through the veins.

1665: The first successful blood transfusion was recorded. Experiments were done by an English physician, Richard Lower, who transfused blood from one dog to another. Most of the dogs survived the transfusion.

1667: Richard Lower and Jean-Baptiste Denis reported successful transfusions from animals to humans. Animals used included sheep and lamb. However, due to the deaths that were reported, within ten years this practice became illegal and for the next 150 years no studies in blood transfusion were recorded.

1795: Syng Physick did the first successful blood transfusion from one human to another human in America, however he never published his studies.

1818: The first successful transfusion was recorded. It was performed by James Blundell, a British obstetrician, on a mother that suffered post-partum haemorrhage (sever bleeding after delivery). Blood from her husband was taken with a syringe and successfully injected into the patient. Between 1825 and 1830 he performed ten of these transfusions, with five of the patients showing clinical benefits.

During the transfusions that were performed in the following years, two problems were being encountered. The first was that frequently, blood clotted during the procedure, as no anticoagulants (a solution that inhibits blood to clot) were being used until the year 1914. The second problem was that about half of the transfused patients had severe reactions, some of which led to death.

1900: The breakthrough came when Karl Landsteiner, an Austrian scientist, discovered three human blood groups. These were the A, B and O blood groups. For this discovery he was

awarded the Nobel Prize for medicine in 1930.

1902: Two students who worked with Karl Landsteiner discovered the fourth human blood group, the AB. These two were A. van Decastello and A. Sturli. These four blood groups together are what we today know as the ABO blood group system.

1903: George Washington Crile started to use blood trasnfusion regularly in surgery. Later in 1909, he also adopted methods for cross-matching of blood. Than by 1914, he was able to state that 'the ideal treatment for surgical shock is the direct transfusion of blood'.

1912: Roger Lee defined the terms ‘Universal donor’ and ‘Universal recipient’. He demonstrated that group O blood could be transfused in patients having anyone of the four blood groups, while group AB patients could receive blood having anyone of the four blood groups.

1914: As mentioned earlier, several anticoagulants were being introduced.

1916: Francis Rous and J.R. Turner introduced a citrate-glucose solution, which was added to the collected blood. This allowed blood to be stored in containers and refrigerated for several days before being transfused. In the years to follow establishments where blood was collected and stored were being introduced.

1925: While Karl Landsteiner was working in New York he discovered two more blood group systems, the MN and the P blood group systems.

1926: The British Red Cross instituted the first human blood transfusion service in the world.

1932: The first hospital blood depot later named 'Blood Bank’, was introduced in a Leningrad Hospital, Russia.

1935: During this year, the International Society of Blood Transfusion (ISBT) was founded.

1936: The first vacuum blood bottle was marketed by Hyland.

1937: Originated the term 'Blood Bank' by Bernard Fantus, who established the first Blood Bank at the Cook County Hospital in Chicago, 5 years after Russia. In the following years Blood Banks spread throughout the United States.

1939: Although the discovery of the ABO blood group system reduced dramatically the number of deaths following blood transfusion, several other transfusion reactions (such as fever) were being observed. These were caused by other blood group systems, which yet had to be discovered. The most important of these systems was the Rhesus (RH) system. This discovery was made by Philip Levine and R.E. Stetson in 1939. They observed that after a mother gave birth to a stillborn child and subsequently transfused with her husband's blood, she suffered a severe reaction to the blood. Both the mother and the husband were group O. The two

scientists explained the presence of a new factor as being the cause; however no name was given to it.

1940: The name was given by Karl Landsteiner and Alex Weiner. They conducted a study in which they injected blood from the monkey 'Maccacus rhesus' into rabbits and guinea pigs. The blood from the rabbits and the guinea pigs was then collected, and the serum (the liquid in which red blood cells flow), which contained the anti-Rh factor (a protein that binds to the rhesus antigen), was mixed with red blood cells from a number of samples from individuals of a population of New York City. Red blood cells from 85% of this population agglutinated (clumped together) with this serum. This population was called Rhesus Positive (Rh Positive). The remaining 15% that did not have any agglutination were called Rhesus Negative (Rh Negative). Other important blood group systems were discovered during the following years.

Edwin Cohn, American scientist, developed a cold ethanol fractionation which is the process of breaking down plasma into components and products. Albumin, gamma globulin and fibrinogen were isolated and became available for clinical use. A technique for long-term preservation of blood plasma by separating the liquid red blood cells from the near solid plasma and freezing the two separately was also documented by Charles Drew an American physician during this year. Cryopreservation allowed blood to be preserved and reconstituted at a later date.

An Army Blood Transfusion Service (ABTS) and an equipment depot – the Army Blood Supply Depot (ABSD) were set up during this year. This decision was taken by the War Office in Britain were it was also decided to blood group every member of HM Forces and issue all medical units with the equipment required to run a donor session in the field in order to obtain blood where it was needed with the minimum delay.

1943: Acid citrate dextrose (ACD) solution, which reduces the volume of anticoagulant, permitting transfusions of greater volumes of blood and longer term blood storage, was introduced by J Loutit and PL Mollison, London during this year.

Paul Beeson, American physician, published the link between blood transfusion and the occurrence of jaundice some months later: a classic description of transfusion-transmitted hepatitis.

1950: The number of blood banks was increasing around the world. In the United States alone the number of hospital blood banks reached 1500. During this year one of the most important technical developments in blood banking was introduced by Carl Walter and W.P. Murphy Jr. They introduced the plastic bags for the collection of blood, which replaced the breakable glass bottles that were in use.

The scientific research that was done in the next fifty years revolutionized blood banking. New concepts and important techniques were developing, all of which moved blood banks

towards a system that took into consideration the safety of both blood donors and patients receiving their blood.

1954: A blood product named Cryoprecipitate was developed for those who suffered from haemophilia.

1960: The first therapeutic plasmapheresis procedure was reported by Alan Solomon and John L Fahey, American physicians.

1961: It was recognized that platelet concentrates reduces mortality from haemorrhage in cancer patients.

1965: A technique known as cryoprecipitation for concentrating factor VIII from blood plasma was identified by an American Physician Judith Graham Pool.

1967: Rh immune globulin was introduced to prevent Rh disease in the newborns of Rh-negative women.

1969: The feasibility of storing Platelets at room temperature was demonstrated by Scott Murphy and Frank H Gardner, American scientists, which revolutionized platelet transfusion therapy.

1970: Blood banks started collecting blood from volunteers. Careful donor selection and testing of blood for transfusion-transmitted diseases were introduced which reduced the number of cases of Hepatitis B contamination but a new virus – hepatitis (Hepatitis C was discovered).

1971: Started Hepatitis B surface antigen (HBsAG) testing on blood collected for transfusion.

1972: Apheresis started to be used to extract one cellular component while returning the rest of the blood to the donor.

1979: Due to the fact that blood banks were collecting blood from volunteers and to the increasing demand of blood, several blood banks were starting to suffer shortage in their blood supply and were not coping with the demand. Although this problem still exists today the discovery of a new anticoagulant preservative, CPDA-1, that extended the preservation of blood to 35 days, reduced the problem.

1981: The first cases of Acquired Immune Deficiency Syndrome (AIDS) were discovered.

1982: A paper was presented by Bruce Evatt an American physician, suspecting that AIDS is a blood born disease after the discovery of the syndrome amongst haemophiliacs.

1983: The shelf life of red blood cells increased to 42 days when a new additive, SAG-M was introduced.

1985: The first antibody test to detect HIV was quickly implemented by all blood banks to protect the patients from infections of this virus.

1987: Hepatitis B core antibody testing (anti-HBc) and alanine aminotransferase test (ALT) was introduced.

1989: Human T Lymphotropic Virus I antibody (anti-HTLV-I) testing was introduced.

1990: Testing for Hepatitis C was introduced. In the years to follow other testing was implemented and the techniques by which the testing was done improved, minimizing the risks of diseases transmitted through blood transfusions.

1992: April European school of Transfusion was founded (ESTM) which is a non-profit association under Italian law. ESTM has high lightened the need for an increased harmonization in the teaching of Transfusion Medicine throughout Europe and even worldwide.

1993: The first edition of the 'Guidelines for the Medical Assessment of Blood donors' was published.

1996: HIV antigen testing introduced. Variant Creutzfeldt-Jakob Disease (vCJD) identified. The clinical, epidemiological, neuropathological and experimental data all point to variant CJD being caused by the same strain of prion as Bovine Spongiform Encephalopathy (BSE). This is a different strain of prion from those seen in sporadic CJD.

1998: EBA was founded on the 21st September of this year were any national blood service based on voluntary and unpaid blood donation in a European country can be a member.
The EMEA issued a CPMP Position Statment on New Variant Creutzfeldt-Jakob Disease (CJD) and Plasma-Derived Medicinal Products.

1999: Nucleic acid amplification technology (NAT) testing is introduced. Nat Testing detects viruses in their early stages, ensuring blood transfusion is even safer.

2003: The EMEA issued a CPMP Position Statement on Creutzfeldt-Jakob Disease (CJD) and Plasma-Derived and Urine-Derived Medicinal Products.
European blood directive (Directive 2002/98/EC) a new era of blood regulation(Transfusion Medicine 2004 pg257).

2004: Commission Directive 2004/33/EC was issued to implement directive 2002/98/EC.

2005: Scientific Committee on Newly Identified and Emerging Health Risks (SCENIHR) issued an updated opinion on The Safety of Human Blood and Organs with Regard to West Nile Virus.

2006: The EMEA issued a Concept Paper on the Revision of the Note for Guidance in Plasma-Derived Medicinal Products.

2009: The EBA announced its 10th Anniversary Symposium, Safe Blood for Europe, which was held in Brussels. During the EBA Board Meeting which was held in May, the EBA finalized a Position Paper on Competition in the European Blood Market.
In September of the same year, the EBA was asked by the European Commission (EC) for data on the measures that were taken by Blood Establishments to reduce the possible impact of the Influenza A/H1N1 on the European Blood Supply. This information was gathered from amongst EBA members. A Planning Document on Pandemic Flu was offered by EBA which is a great example of how a Blood Organization could prepare itself in cases of a pandemic outbreak.
A Position Paper which supports Voluntary Non-Remunerated Blood Donation was agreed by the EBA board members during its meeting.

2010: The European ME Alliance (EMEA) is calling on Europe's health ministers to initiate an immediate Europe-wide prohibition of blood donation from people who have been diagnosed with myalgic encephalomyelitis (ME/CFS).
This year's EBA Board meeting which was held in Valletta, Malta, has voted and issued a Position Paper which supports the universal use of the ISBT 128 labelling, coding and identification of blood, blood components, tissues and cells.

2011: WHO issued a blood safety fact sheet which describes the global situation about blood donation and transfusion.

Today, the experiments and methods that were used in the past may seem to be crude; however it is thanks to these researchers, that we have reached the safe standards that we have today. The only thing that never changed throughout the years is the importance of blood.

About Blood Menu

About Blood (video below)

Vein to Vein

Acquired Components

Haemoglobin Level

History of Blood

Glossary

Articles & Research