IBMS
History Committee
- Health for Heroes

Major Lawrence Bruce Robertson

The man who introduced a new syringe-cannula technique, which allowed direct donor to patient transfusion.

Effective Blood Transfusion

Throughout the 20th century, milestones in the advancement of blood transfusion were synchronised with the onset of military conflict around the world. Beginning with the new knowledge of matching different blood groups and the use of an anticoagulant that facilitated indirect transfusion.

Prior to the First World War

In 1901 Landsteiner discovered the ABO blood groups. Transfusion was only possible using defibrinated blood. In 1914 Moss instigated direct donor to patient techniques, using paraffin wax coated tubing and bottles. This was always dependent on a ready supply of donors close to the battlefield.

Anticoagulants Facilitated Indirect Transfusion

In Belgium in 1914 Adolph Huston demonstrated that Sodium citrate, in tolerable quantities, could anticoagulate blood for transfusion. the following year Luis Agote in Argentina and Richard Lewisjohn in the USA, verified its use for this purpose.

Institute of Biomedical Science

Blood Transfusion

Outbreak of World War I

Between 1916 –1917 Canadian Army Major Lawrence Bruce Robertson, introduced a new syringe-cannula technique for performing direct donor to patient transfusion of unmatched blood saving the lives of many casualties.

Blood transfusion was favoured by the American and the Canadian surgeons arriving at the Western Front. Capt. Oswald H. Robertson MORC USA in 1918 established the first bank of stored whole blood. Blood that tested negative for syphilis, could be given quickly and safely in forward medical units.

The beneficial effect in combating blood loss in major trauma was soon recognised and adopted by British and French surgeons.

The Spanish Civil War 1937-1939

Gave rise to a fresh approach to blood transfusion, hastened by the threat of large numbers of civilian and military casualties. With a major initiative to increase the number of blood donors and to establish large-scale blood banks to ensure supplies.

Canadian Norman Bethune, whose WW1 experience taught him the importance of helping the wounded quickly. He set up a blood bank close to the front lines and organised a mobile blood-transfusion service, the first of its kind.

Jorda added glucose to the citrate anticoagulant for blood collection improving the viability of transfused red cells which increased the benefits of transfusion.

The subsequent publication of the effectiveness of transfusion, by army surgeons, resulted in its introduction to civilian medical practice.

Onset of World War II

Prior organisation was haphazard in UK with a few exceptions e.g. Lane in London. 1938 the War Department decided how blood transfusion support would be provided to military hospitals in war. 1939 established of the Army Blood Transfusion Service and opened the Army Blood Supply Depot (ABSD) Commanded by Colonel LEH Whitby l/RAMC, the first military transfusion service in the world.

Whitby recognised that blood is a perishable commodity, as potentially lethal as it is life saving and had to be handled through special channels by competent trained personnel.

Acid Citrate Dextrose (ACD) Solution

This was introduced in 1943 by J.F. Loutit and Patrick L. Mollison. It reduced the volume of anticoagulant, allowing greater volume of blood to be given and permitting longer term storage.

ABTS Organisation

The Army Blood Transfusion Service was organised on three levels:

- The ABSD, producing all wet and dried products, crystalloids, grouping sera, blood collecting and administering blood equipment. Provided training in all areas
- Base Transfusion Units, which were chiefly concerned with distribution. In each theatre of operations, five were deployed
- Field Transfusion Units, which worked in forward areas

Freeze Dried Plasma

Early years research at the Lister Institute UK developed techniques for storage of plasma for transfusion, stable in hot climates.

- A massive demand for plasma supplies to treat military and civilian casualties
- Freeze-drying plants were established at the ABSD
- 1944, Edwin Cohn described the ethanol separation and purification of plasma

The War Legacy

During the period September 1939 to May 1945 the Plasma and Blood Bank balance was 756,046 units. Due to the care and competence with which the British handled blood

- Accidents where kept to a minimum
- No single case of incorrectly typed blood recorded

Led to the establishment of the National Blood Transfusion Service in all regions plus Plasma Product plants at Elstree and Chelsea.

Late 50's Introduction of Plastics

- Avoidance of breakage and waste
- Integral blood taking set
- Disposable blood giving sets
- Start of safe component production