The Time Line of the History of Transfusion Medicine

By Leo J. McCarthy, M.D.

With Artwork by the IU School of Medicine Pathology PMEG
Leo J. McCarthy, M.D.
Biography

Leo J. McCarthy, M.D. an expert on the history of blood transfusion, and Professor Emeritus of Pathology and Laboratory Medicine, Medicine and Pediatrics continues research and lectures on transfusion. In 1991, Dr. McCarthy became a Fellow in the Royal College of Physicians of Ireland, which was established in 1654, and in 1994 he became a Fellow in the Royal College of Physicians of Edinburgh.

Dr. McCarthy created and endowed the Annual McCarthy Lecture in Transfusion Medicine in 1997 at Indiana University School of Medicine, where he, also, established an accredited fellowship in Transfusion Medicine in collaboration with the Indiana Blood Center. At the 1997 Indiana Association of Blood Banks he received the Victor H. Muller Award to acknowledge his contributions to transfusion medicine, blood banking and transfusion services.

In 2000 he became an alumnus member the Alpha Omega Alpha (AOA) Medical Honor Society Nebraska Chapter

He was honored in 2001 with the IUPUI campus-wide Glenn W. Irwin, Jr., M.D. Excellence Recognition Award. In 2002 he received John Elliott Memorial Award that recognizes an individual for outstanding service to the American Association of Blood Banks, an international, not-for-profit association dedicated to the advancement of science and the practice of transfusion medicine. One year later in recognition of his mastery of and passion for transfusion medicine, he became a Sagamore of the Wabash, Indiana’s highest honor awarded by the Governor.

Abbreviated Curriculum Vitae: http://www.medlib.iupui.edu/hom/exhibits/mccarthy,cv.pdf (Requires Acrobat Reader)

Dr. McCarthy, the formerly director of Transfusion Medicine for Indiana University School of Medicine for three decades, now produces scholarly works on the history of transfusion. Dr. McCarthy has created two unique, graphic visions of blood transfusion throughout history.
The Indiana University School of Medicine Libraries are pleased to present this original graphic of the time line on the history of transfusion.
Transfusion Time Line

The transfusion time line highlights many of the discoveries, inventions, observations, and practices, which, since ancient times, have led to remarkable progress and resulted in the effective treatments that are now taken for granted. The 20th Century has witnessed the most progress in the enumerable transfusion practices, activities and safety.
“The only thing new in the world is the history you don't know”
Harry Truman

“History must repeat itself because we pay such little attention to it the first time”
Blackie Sherrod

- Ancients “loss of blood with loss of life”
- 2500 BC: Egyptians... leeches for blood “letting”
- 450 AD: Hippocrates... “Father of Medicine” embraced humoral theory
- Galen 131-201 AD... balance of humors
- 76-100 AD: Pliny the Elder... drinking gladiators blood
- 1492: Pope Innocent VIII died after drinking blood?
- 1500's: animal - human transfusions?
- 1553: Michael Servetus... blood through lungs
1628: William Harvey - *De Mortu Cordis*

1637: Christopher Wren and Robert Boyle...
1st successful IV

1665: Richard Lower...
1st transfusion in animals

1667: 1st human transfusion of lamb's blood to du Mauroy by Jean Denis (physician to Louis XIV)
Arthur Coga in England

1670: Francesco Folli... concept of transfusion?

1771: Hewson...
observed blood flow during "cupping",
identified fibrinogen.

1818: James Blundell saved woman by transfusion
"Father of Modern Blood Transfusion"

1667: English and French courts forbids transfusions
150 years, until 1818
1840: Lane... transfused hemophilia patient

1853: Alexander Wood... hypodermic needle

1863: Avelin... pump for transfusion

1885: Halstead transfused sister with his own blood

1864: Only successful Civil War transfusion

1873: Sir Thomas Smith... defibrinated blood

1880: Bull transfused saline

1899: Shattuck... agglutination of various species with human blood

1898: Crile... direct transfusion, artery to vein by cannula
1900: Landsteiner... ABO groups

1901: Von Behring... Antibody for Antitoxin

1902: Decastello & Sturla... AB group

1905: Carrel... arterial anastomosis

1907: Hektoen... compatibility testing

1915: Weil... storage with citrated blood

Vincent... 1st transfusion in WWI

Lewisohn... minimized amount of citrate

1916: Rous and Turner... stored RBC's in citrate-glucose 26 days.

1917: Robertson... worlds first blood bank WWI

1918-1919: Hirschfeld... blood group frequencies differ in population
1922: Geoffrey Keynes... Blood Transfusion

1923: Florence Selbert... pyrogens from heat stable bacteria
1923: Patek and Taylor... AHG to hemophiliacs
1924: Moschowitz... TTP
1927: Landsteiner and Levine... M and N system
1926: Trauck... J-way stopcock
1930's: Culbertson... centrifuge for agglutination

1933: Ochlecker... "Biological test", inject 50ml
1935: DeBakey... direct transfusion by continuous flow
Flosdorf and Mudd... plasma lyoplization
Marriott and Kekwick... transfusion "slow drip"
1936-39: Doran-Jorda... 1st mass blood drawing, 13,000
1945: Coombs, Race, Mourant... AHG
Diamond... exchange transfusion

1940's: Fisher, Race... RH
1940: Cohn... cold fractionation... albumin
Landsteiner - Wiener... Rhesus antigen
1941: Ravdin... albumin at Pearl Harbor
1943: Louilt and Mollison... ACD
Beeson... 1st case TA hepatitis
1945: Coombs, Race, Mourant... AHG
Diamond... exchange transfusion

1939: Culberson... 1st Blood Bank in Indiana at IU
1939: Levine... intra-blood group reactions
Mazzini... Cardiollpin Test
1964: Teraski... lymphocytotoxicity test

1964: Pool... cryoprecipitate

1965: Dausett... HLA

1968: Latham... discontinuous flow
Klebanoff... intraoperative salvage

1970: E. D. Thomas... 1st bone marrow transplant

1970: Judson... continuous flow centrifuge (IBN/NCI)

1970: Blumberg... Australia Antigen... HBV
1975: Milstein... monoclonal antibodies
1977: Bukowski and King... P.E for TTP
1982: 1st case of TA-HIV
1985: Lin... Epo gene
1988: 1st cord transplant prepared at IU
1990: HCV identified
1990's: Cloning... A, B, O, H, Kell, Rh genes

"What has been accomplished does not die, but too often, alas, the personality of those who have handed the torch from one generation another soon fades into oblivion."

- Harvey Cushing

Growth of Transfusion Medicine as speciality
Brief Introduction to the History of Transfusion Medicine Tree

The origins of blood transfusion are lost in the myths of antiquity, but certainly the existence of the A and B antigens in nature provide the basis for crucial serologic testing. Leaching was known to the ancient Egyptians in 3000 BC, and was mentioned in the ancient Sanskrit in 1500 BC as noted by Alexander the Great. It was Galen (131 AD - ca 201 AD http://www.nlm.nih.gov/hmd/greek/greek_galen.html), the physician to Emperor Marcus Aurelius, who popularized the concept of blood circulation, which was subsequently disproven by William Harvey, 1628 AD http://www.zephyrus.co.uk/williamharvey.html. Galen popularized the humoral theory, which, also, was embraced by Hippocrates (470 BC-410 BC) but probably originated with Empedocles or Pythagoras. Subsequently blood letting by cupping, phlegms, and barber-surgeons attempted to release “bad blood” (bad humors) and thus reestablish the correct humoral balance, which was equated with good health.

The World Wars created an extraordinary demand for blood transfusion, and the Allied Forces were aided by a well-organized blood supply. Drs. Edwin Cohn and Charles Drew revolutionized the procurement and distribution of plasma and blood respectively.

The technique of drawing and safely transfusing blood had given rise to establishing blood centers, hospital transfusion services, solid organ transplantation, bone marrow transplantation, frozen blood, paternity testing, plasma fractionalization, ameliorating Hemolytic Disease of the Newborn (RH disease), autosalvage, component therapy, viral testing (hepatitis B and C, HIV), apheresis, and effective therapies for hemophilia, etc. Therefore from its humble, obscure roots of origins, the tree of transfusion medicine continues to grow and blossom increasing applications with relevance to modern medicine.
Return to:

- The Medical Libraries Website: http://www.medlib.iupui.edu
- The Leo J McCarthy MD Online Exhibit with History of Transfusion Medicine Tree: http://www.medlib.iupui.edu/hom/exhibits/tree.html
- The Special Collections & History of Medicine of the IU School of Medicine Libraries: http://www.medlib.iupui.edu/hom/