PP 82. A Brief History of Apheresis Platelet Collection at the Western Province Blood Transfusion Service

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Background
The earliest attempts at direct modification of blood were carried out experimentally in France in the early years of this century. The first blood cell separator arose from the belief of Dr Edwin Cohn of Harvard University that various components of human blood could be stored more effectively if the components were first separated from whole blood. The American medical technologist, Herb Cullis, invented the apheresis machine in 1972.

The Western Province Blood Transfusion Service (WPBTS) acquired its first apheresis processor, the Haemonetics Model 30, in 1975. The apheresis unit operated in a small area with only two staff members and produced single donor platelet (SDP) units and apheresis granulocyte collections, and performed therapeutic procedures. Random donor platelet (RDP) unit production was stopped for about two decades so the unit had to supply all platelet products for the Service. The apheresis unit has since grown to a facility housing ten apheresis machines with six staff members and produces over 3900 SDP products per year.

The aim of the project is to document how the apheresis unit at WPBTS has expanded since its inception in 1975 and to record the changes in apheresis technology and processes over the past 41 years in this facility.

Method
This is a retrospective review of platelet apheresis collection performed at the Cell Separation Unit of WPBTS between 1975 and 2016. Comparison of equipment, staff complement, procedures, product quality and changing technologies will be done by review of documentation, literature searches and anecdotal accounts from staff members.

Results
- SDP supply has increased from 85 units per month in 1976 (when RDP production had ceased) to 325 units per month in 2016.
- The use of apheresis equipment in chronological order has been the Haemonetics Model 30 (1975), Haemonetics Model V50 (1983), Fenwal CS-3000 (1985), Cobe Spectra (1994), MCS 3P (1996), Gambro Trima (2001), now known as the Terumo BCT Trima Accel, and MCS Plus (2003).
- Apheresis procedures initially required venepuncture of both the donor's arms, but single arm procedures were possible from 2004.
- Expiry time of SDP products has increased from 24 hours to five days.
- The donor pool has tripled since the 1970s.
- Testing of SDP units included ABO and Rh, antibody titre, syphilis and HBsAG (Australia antigen). Routine HIV testing was introduced in 1985 and Hepatitis C testing in 1992.
- Equipment and technology changes have decreased procedure duration (from 210 minutes to an average of 90 minutes), increased donor comfort and improved ease of use for staff members.
- Other advancements include changes in platelet product splitting thresholds, production of infant SDP units, and the supply of HLA matched platelet products on request since 2008.
- Future endeavours include consideration of pathogen inactivation procedures.

Conclusion
The WPBTS Cell Separation Unit has advanced in size and production of SDP since its inception in 1975, while maintaining an adequate donor pool and ensuring patients in the Western Cape are provided with the safest platelet products possible.