



Life Blood Issue 7

Dear Life Blood Reader

Welcome to the seventh edition of Life Blood. 2008 is a special year for the WPBTS as it is the year in which we celebrate our 70th anniversary.

Since its inception in 1938, the Service has grown to become a centre of excellence within the blood transfusion industry in Africa. It is also accredited by the South African National Accreditation Systems (SANAS) and today collects more than 130 000 units of blood which is used to save the lives of more than 390 000 people each year.

We would especially like to take this opportunity to thank all stakeholders in the transfusion value chain from donors to recipients and all those in between for your support and contributions.

The WPBTS has recently appointed Dr Juanita Makan as the new Medical Officer. We would like to congratulate her and wish her well in her new capacity.

In this issue we've included a brief history of the WPBTS; clinical guidelines for the management of massive transfusion; information on the irradiation of blood products; an overview of the apheresis platelet donation unit; a look at the responsibilities of doctors who transfuse blood and provide an overview of the blood group analyzer.

Feel free to comment. You can contact the Medical Officer on 021 5076329, the Marketing Officer on 021 5076326 or e-mail us on marketing@wpbts.org.za

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History of the WPBTS 1938-1969

1938

The first meeting of the Cape Peninsula Blood Transfusion Service took place at Groote Schuur Hospital on 24 October 1938. Two hundred blood donors enrolled within the first three months and the first 30 transfusions took place in November 1938.

In the 1930's transfusion practice was in its most basic development phase. Hospitals would request a donation and when a suitable donor was found, they would report to the hospital. The blood would be transfused directly from the donor to the recipient with only a screen separating them.

1942 - 1949

The Service obtained its own building in the Cape Town city centre where three donors could be accommodated. Blood was collected in Horlicks milk bottles as these proved the most suitable. The blood was delivered to government laboratories for crossmatching.

Government laboratories assisted the Service with the development of suitable storage techniques and serum processing. The first blood bank was established in 1939 and was able to provide blood serum and whole blood to military hospitals for the duration of the Second World War, as well as continuing to provide in the requirements of civilian institutions as well. By October 1943, there were 1 394 active donors providing blood for an average of 182 transfusions a month. In 1949 the Service acquired its first mobile unit and began to recruit donors in the countryside. It also changed its name to the Western Province Blood Transfusion Service, a registered non profit and welfare organisation.

1955

The first blood bank outside the Cape Peninsula opened in George followed by Paarl, Worcester and Beaufort West. The increased demand for blood led to the procurement of a second mobile unit.

1959

The head office expanded its premises, allowing it to accommodate 15 donors, and making it possible for the organisation to provide a comprehensive service for the technical aspects of blood transfusion. It also housed the largest single unit blood bank in the country at the time. In addition to donor grouping and cross-matching; serological, biochemistry and plasma aspirating laboratories were housed in the same building.

1960

The official opening of the WPBTS's new premises in the Broadway Industries Centre, Heerengracht, Foreshore, Cape Town.

1961

For the year ending June 1961 the service had collected donations from approximately 50 000 donors and mobile units from 352 clinics.

1967- 1969

The official opening of the WPBTS's new premises on the 4th floor Medipark, Hertzog Boulevard, Cape Town on 18th July 1967. The Service moved to new premises that allowed the organisation to collect and distribute almost 7 000 pints of blood per month and employed 160 staff members. The Service was closely involved with the first heart transplant which took place in 1967 and new lightweight mobile equipment was introduced, allowing standard vehicles to be used as mobile units.

The next Life Blood e-zine will include the following chapter in WPBTS's history from 1970 to 2000.



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Clinical Guidelines for the Management of Massive Transfusion

The replacement of the equivalent of the total blood volume in 24 hours with red blood cells and crystalloid and/or colloid solutions is defined as massive transfusion. Massive transfusion can also be defined as transfusion of 50% of total blood volume within 3 hours.

In massive transfusion, when blood loss is being replaced by red cell concentrates (packed cells), it may be necessary for red cell transfusions to be supplemented with fresh frozen plasma (FFP), cryoprecipitate and platelet concentrates. Whenever possible, the haemostatic profile of the patient should be monitored and the above components transfused only if there is a specific haemostatic defect.

Massively transfused patients manifest a profound haemostatic disorder as demonstrated by prolonged PT, APTT and thrombocytopenia less than $50 \times 10^9/\mu\text{L}$, which is, in part, due to haemodilution. Increases in PT or APTT greater than 1.5 to 1.8 times control values are associated with decreases in some coagulation factors, particularly fibrinogen, FV and FVIII, and should be treated with FFP, especially if there is active bleeding.

Although FFP contains fibrinogen, the amount provided in FFP is usually insufficient to maintain adequate levels and cryoprecipitate should be given early in the course of massive haemorrhage, along with FFP. In general, FFP and cryoprecipitate should be considered when more than 50% of blood volume has been replaced, and it is mandatory when more than 120%-150% of the blood volume has been replaced with red cell concentrate, crystalloid and/or colloid.

For more useful information visit the websites set out below:

http://www.bcshguidelines.com/pdf/bloodloss_2006.pdf

<http://www.ncbi.nlm.nih.gov/pubmed/17572415>

The Irradiation of Blood and Blood Products

The WPBTS has procured a Gammacell 1000 Elite blood irradiator which is located at the Red Cross Children's Hospital Blood Bank.

It will primarily be used within the Service for the irradiation of designated units from blood relatives. However this service is available to all hospitals for the irradiation of blood and is available all hours.

Requests for the irradiation of blood products can be made by indication on the crossmatch laboratory request form or telephonically via the blood bank nearest to you. Transportation will be provided to and from your nearest blood bank and the Red Cross Children's Hospital at no extra cost.

To obtain more information you can contact the Red Cross Blood Bank on telephone 021 6891118 or 021 6899273.

Clinical indications for the gamma irradiation of blood products

Transfusion-associated graft-versus-host disease (TA-GVHD) is a potential complication of the transfusion of any blood component containing viable T-lymphocytes. Under certain conditions these cells engraft and proliferate in the recipient. Cellular interaction between donor T lymphocytes and recipient cells leads to cellular damage (particularly the skin, thymus, gastro-intestinal tract, liver, spleen and bone marrow) leading to clinical consequences which are often fatal. The risks of TA-GVHD are highest in immune deficient or immune suppressed recipients; while in immunocompetent individuals, sharing an HLA haplotype with the donor is a major risk factor.



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Gamma-irradiation is currently the only recommended method for the prevention of TA-GVHD and when indicated all blood products containing significant numbers of white cells (whole blood, red cell concentrates and platelets) should be irradiated.

Indications for usage

- All transfusions from blood relatives.
- All HLA selected platelet concentrates.
- Intra-uterine transfusion (IUT).
- Exchange transfusion (ET) following IUT.
- Recommended for all exchange transfusions provided this does not lead to undue delay of the ET.
- Congenital immunodeficiency states (In some centres all blood for neonates is irradiated to avoid missing a congenital immunodeficiency).
- All recipients of allogeneic bone marrow transplants (BMT) or peripheral blood stem cell transplants from the time of initiation of conditioning chemo/radiotherapy. This continues while patient is on GVHD prophylaxis or lymphocytes $> 1 \times 10^9/L$.
- Patients undergoing stem cell harvesting for later autologous re-infusion.
- All patients with Hodgkins Disease.
- Patients treated with purine analogue drugs.

Storage and expiry

Blood may be irradiated at any time up to 14 days after collection and thereafter stored for a further 14 days after irradiation. Therefore, after irradiation whole blood and red cell concentrates have an expiration date of 28 days for 12 year olds and older; 14 days for those younger than 12 years; and 24 hours for neonatal exchange transfusions OR the original expiry of the unit, whichever is sooner. The expiration date of platelets that have been irradiated does not change from the original expiry. Where there is a particular risk from hyperkalaemia (IUT, ET), it is recommended that red cells (usually whole blood in these cases) be transfused within 24 hours of irradiation.

Red cell concentrates, platelets and / or granulocyte concentrates must be irradiated whereas it is not necessary to irradiate fresh frozen plasma, cryoprecipitate or fractionated plasma products if transfused to the above patient.



Overview of the Gammacell 1000 Elite Irradiator

The effective irradiation of blood and blood products by the Gammacell 1000 Elite Blood irradiator is achieved by the utilisation of multiple microprocessor-based control systems to ensure each sample receives the required dose. This process is fast as it only takes 3 minutes to process a single unit.

Beta and gamma irradiation is emitted by the decay of unstable atoms of caesium-137.

Tariff list

The blood irradiation tariff has been revised for state and private hospitals which have resulted in a decrease in price. To access the pricelists click on links below.

[State Pricelist](#) | [Private Pricelist](#)



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Apheresis Platelet Donation Unit



Overview of the Apheresis Platelet Donation Unit

The apheresis department collects approximately 3500 apheresis platelet units per annum. Upon receipt of an order from the blood banks a suitable apheresis platelet donor is contacted. The platelet donation process takes a maximum of 100 minutes. During this time the donor rests comfortably, watches television and enjoys the refreshments being offered. Platelet donations are made utilising the latest technology on the Haemonetics MCS plus and Cobe TRIMA apheresis collection machines. A platelet yield is calculated on each unit as part of quality assurance.

The advantages of utilising single donor platelet transfusions:

- The complete dose is derived from 1 donor with a minimum yield of $2,4 \times 10^{11}$ platelets and a volume of 200 - 300ml.
- Leukoreduction occurs during the apheresis procedure; therefore recommended for patients who experience febrile reactions as a result of sensitisation to leukocyte antigens.
- Reduced donor exposure and therefore reduced risk of alloimmunisation to HLA antigens.
- Recommended for patients who are on long term therapy eg. leukaemia.

Responsibilities of Doctors who Transfuse Blood

The responsibility of the practitioner who orders and transfuses blood encompasses the following:

- Transfusing blood only when it is medically indicated.
- Warning patients of the potential risks inherent in blood transfusion.
- Obtaining and documenting informed consent.
- Correctly identifying the patient, and units of blood to be transfused.
- Ensuring that appropriate compatibility tests have been performed.
- Ensuring that the blood has been correctly handled prior to and during transfusion.
- Ensuring that the blood has not passed its expiry date.
- Permitting responsible persons to administer blood to the patient.
- Transfusing blood at the proper rate.
- Observing and monitoring the patient at the commencement of, and during the transfusion.
- Effectively managing any untoward transfusion reaction.
- Reporting of untoward reactions or death.
- Tracing, counselling and testing recipients of blood transfusions identified through the transfusion transmissible infection "lookback" programme.



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The Crossmatch Laboratory Request Form Requires the Doctor and the Phlebotomist to Sign

In order to minimise the unnecessary delay in the distribution of requested blood kindly ensure the crossmatch laboratory request form is filled in completely. The minimum information required on the request form is the patient's name, folder number, diagnosis, doctors' name and signature. Incomplete forms will be returned as the WPBTS is not allowed to accept these.

Blood Group Analyzer



Olympus PK7300 Analyzer

The Olympus PK7300 can process up to 300 samples per hour. Tests are performed on micro plates. It is easy to operate and provides all the features required for laboratory accreditations thus enabling good laboratory practice conformance.

The Blood Grouping Laboratory has been furnished with an additional Olympus PK7300 Analyzer to assist with the increased workload as well as being utilised as a back-up machine. Tests performed are ABO typing, RH typing, irregular antibody screen, syphilis and titre, phenotyping for C, E, c, e, Kell as well as antenatal tests. Phenotyping is done on all samples on two separate donations. Testing is performed on EDTA samples which are bar-coded with a unique serial number. Any discrepancies on the system are repeated manually and updated. However, repeatedly discrepant samples are referred to the Reference laboratory for further investigation. All new donors are tested twice. All donors who are found syphilis reactive i.e. TPHA reactive are confirmed manually. These donors are either resigned or deferred for 6 months depending on the titre.
