

PATHCHAT

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Transfusion Medicine:

Blood safety: The right blood product to the right patient at the right time



This is the first of a series of current updates on transfusion medicine.

The decision to transfuse a blood product by the clinician requires an evaluation of the risk benefit ratio for the individual patient and documented informed consent.

In order to minimise risk, the local blood service conforms to international standards for donor selection and the testing of donations. However, bedside practices also contribute significantly to adverse events. Haemovigilance programmes (local and international) that formally monitor and report on adverse events reveal incorrect patient identification as a leading cause of morbidity in transfusion medicine.

Three important pillars underpin blood safety

- 1. Donor selection:** Voluntary non-remunerated individuals are subject to a written questionnaire that interrogates for any medical condition or behavioural pattern that may identify a risk for HIV or other transfusion-transmissible infections. The process also gives the donor an opportunity to self-exclude from donating.
- 2. Testing of the donor and the unit:** The following marker status is routinely established:
 - Serology for hepatitis B surface antigen; hepatitis C antibody; antibody to HIV1 and 2, and syphilis
 - Nucleic acid (PCR) testing for HIV, HBV and HCV

The unit of blood will only be released from quarantine once testing is complete and tests negative for all markers. Nevertheless, risk of disease transmission still exists due to window period donations.

In the event of a positive test for any of the markers, the donor is notified, counselled and deferred from any further donations. The **look-back programme** run by South African National Blood Service (SANBS) will trace recipients of previous negative donations from such a donor, taking into account the positive test marker and the window period of the virus.

NB: Since the implementation of nucleic acid testing in October 2005, there has been no documented case of HIV.

- 3. Clinician:** Prior to transfusion and provided that the patient is haemodynamically stable:
 - The necessary clinical and laboratory evaluation to determine mechanism of cytopaenias and bleeding should be performed. Input from a haematologist is important with regard to review of peripheral blood smear, guiding investigation of coagulopathies, etc.
 - Consider pharmacological interventions like haematinic replacement or prohaemostatic agents (cyclokapron or DDAVP).
 - Assess for blood conserving processes, for example, acute normovolaemic haemodilution, or cell salvage and pre-operative autologous donation in patients for elective surgery with anticipated significant blood loss.

If elective transfusion is inevitable:

- Choose the correct product and establish the goals of transfusion.
- Obtain and document informed consent.
- Correctly identify patient and label crossmatch sample at bedside.

Prior to transfusion and at the patient's bedside, at least two medical persons (doctor and a registered nurse, or two registered nurses) must do the following:

- Identify the patient.
- Verify details on the unit – patient details, blood group, expiry date.
- Recheck the order by the prescribing doctor and record any previous blood group.
- Inspect the unit for leaks, abnormal aggregates and colour – any abnormalities will preclude transfusion.

Establishing transfusion and monitoring:

- Apply a strict aseptic technique with cannulation as blood is a biomaterial with a propensity for bacterial contamination.
- During the course of the transfusion, regularly inspect the site for inflammation.
- Monitor baseline pulse, blood pressure, respiratory rate and temperature (CVP, urine output in more ill patients). Thereafter, every 15 minutes for duration of transfusion, together with general verbal and visual assessment of clinical condition.
- Close supervision with a slow rate of transfusion 2 ml per minute, especially in the first 30 minutes, is required.

The rate of transfusion depends on the clinical indication, generally 2 to 5 ml per minute. Red cell products must be completed with six hours of entry. Platelets can be given over 15 to 20 minutes.

Adverse reactions

In the event of any reaction (change in blood pressure, temperature, chest or back pain, or skin reactions):

- **Stop transfusion immediately.**
- Change drip set and keep vein open with normal saline.
- Record vital parameters and initiate further specific management, for example, for anaphylaxis.
- Repeat all bedside checks with regard to patient identification and blood unit verification.
- Contact the transfusion service and complete documentation. This is a legal requirement.
- Submit the following samples for analysis: repeat cross-match, LFTs, blood cultures if bacterial contamination is suspected, urine sample, the unit of blood together with administration set. Further transfusion will depend on the outcome of the investigation.

Remember the following:

- Use standard blood recipient set for red cell products.
- Use platelet-giving set for platelet products (filter with smaller surface area to reduce loss).

- Do not use bedside leucodepletion filters on units that have already been leucodepleted in the blood bank. This results in unnecessary cost and loss of up to 10% of red cells.
- The use of microaggregate filters is also not indicated, considering the current processing technology.
- Where multiple paediatric red cell units are required for a single patient, notify the blood bank for limited donor exposure programme (LDEP).
- Use only approved blood-warming devices if there is a valid indication (massive transfusion > 50 ml per kg per hour, exchange transfusion in the neonate, high titer cold agglutinin reactive above 30 degrees).
- Do not add medication or other fluids to blood products.
- Normal saline, 4% albumin, plasma protein fractions and ABO-compatible plasma are the only fluids that may be given through the side arm of the red cell administration set.
- Platelet products must never be stored in the fridge prior to transfusion.
- All empty bags must be retained for a minimum of 48 hours in the fridge as per regulations.

References:

- South African standards for practice of blood transfusion. Clinical guidelines for use of blood products in South Africa. 4th edition.*
- Leucocyte depletion of blood components – guidelines of Blood Transfusion Services of South Africa.*
- South African Medical Journal (SAMJ). May 2006, 96:5.*
- The Specialist Forum. April 2002. Eliminating blood transfusions – the path towards bloodless surgery p. 32–40.*
- Transfusion. 2004. Overview of blood conservation, 44:1S-3S.*

Useful websites:

- www.sanbs.org.za (official website of the SANBS)
- www.bcsghguidelines.com (Blood transfusion taskforce of the British Committee for Standards in Haematology: list of guidelines)

