SANBS
South African National Blood Service

NAVIGATION TO A SAFE BLOOD TRANSFUSION – PRACTICAL GUIDE

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Introduction

The average adult has approximately 70ml of blood per kilogram body weight; this amounts to about 4-6 litres of blood in the adult body. A blood transfusion is the infusion of whole blood or blood components into the bloodstream of the patient.

Blood transfusion can be lifesaving. It is used in resuscitations such as with massive blood loss due to trauma, to replace blood lost during surgery and in treatment of anaemia and / or thrombocytopenia. Patients may have one transfusion episode or many, depending on their disease (indication).

Nursing staff play a pivotal role in the transfusion of blood and blood products and the guidelines presented here aim to cover all aspects of safe transfusion of blood products along with the associated risks and management of transfusion reactions.

Introduction

SANBS background

SANBS was established in April 2001 with the merger of seven independent non-profit blood transfusion services from across the country. Chapter 8 of the National Health Act requires the Minister of Health to issue a license to a non-profit organisation for delivering a nationwide transfusion service.
This organisation will be regulated by the Minister of Health and must comply with the regulations of the Department of Health and the Standards for the Practice of Blood Transfusion in South Africa.

Our Purpose

Trusted to Save Lives.

Mission

To reliably provide trusted blood products and services to all patients at a world class level of cost and quality while innovating new treatments to enhance human healthcare.

Vision

To be a cornerstone of healthcare services in South Africa, through the gift of life.

Types of blood donation

In South Africa, blood is collected from voluntary, non-remunerated blood donors. All donations are tested using NAT (nucleic acid amplification testing) to detect genetic material of viruses. Donations are tested for HIV, Hepatitis B, Hepatitis C and Syphilis. Cold chain maintenance during the whole vein-to-vein process (from donor to recipient) is essential to ensure the quality, viability, potency and safety of blood products. There are four basic types of blood donations:

1. Whole blood donations

Whole blood donations are the most common and well-known form of blood donation. Each donated unit can be processed into red cells, platelets and plasma components. One donation can help save up to three lives.

2. Apheresis donations

Apheresis equipment collects and centrifuges whole blood, harvests the preferred component red cell concentrate/plasma/platelet and returns the other blood components to the donor. One specific component of blood is donated at a time: e.g. during platelet apheresis, platelets will be collected while plasma and red blood cells are returned to the donor. This process can take up to 2 hours.

Introduction

3. Autologous donations

Autologous donations entail the removal and storage of blood or blood components from a donor (patient), which is intended for subsequent transfusion back into that person during of after their planned surgery. The patient must be certified medically fit to donate by his physician and must meet all SANBS donation criteria / requirements. The patient may donate one unit approximately every seven days, with a maximum of three units, prior to their surgery/procedure.

4. Directed donations

The patient may request that a specific family member or friend donate blood or a blood component for use by the patient. Directed donations are usually made by parents for minor children, or by relatives of patients with rare blood types. The designated donor's samples will undergo complete testing for possible transfusion-transmittable infections and compatibility to the patient. This directed donation must be requested from the doctor treating the patient.

ABO and RH blood group systems

The ABO blood group system consists of the A, B, AB and O blood groups. Antigens on red blood cells determine your blood group. Antibodies to antigens lacking on the red cell will be present (without previous exposure to red cells) in the serum of individuals (see table below). Transfusion of incompatible blood will lead to an immunological antigen–antibody reaction and may result in severe intravascular haemolysis (breakdown) or clumping of red cells. Pre-transfusion testing, along with proper patient identification, prevents transfusion of ABO incompatible blood.

Introduction

Blood group	Antigens on the red cell	Antibodies in the serum
A	A	Anti-B
B	B	Anti-A
O	Neither A nor B	Anti-A, B
AB	A and B	No ABO Abs

	Givers								
Recievers	Type	O-	O+	B-	B+	A-	A+	AB-	AB+
	AB+	●	●	●	●	●	●	●	●
	AB-	●		●		●		●	
	A+	●	●			●	●		
	A-	●				●			
	B+	●	●	●	●				
	B-	●		●					
	O+	●	●						
	O-	●							

A person either has (Rh-positive) or lacks (Rh-negative) the D antigen (Rhesus factor) on their red cells. If an Rh-negative person is exposed to the D antigen it will result in the production of anti-RhD antibody. Exposure is usually through:

- Blood transfusion (patient with an Rh-negative blood group is transfused with Rh-positive blood), or
- Placental exposure during pregnancy (mother is Rh-negative and foetus has an Rh-positive blood group).

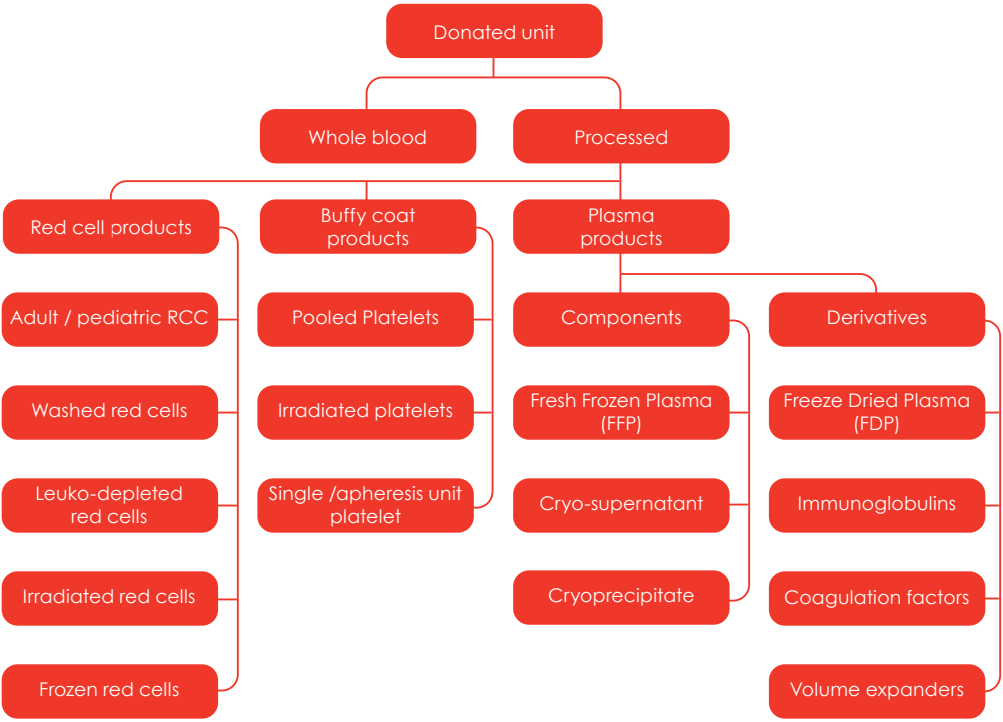
Production of anti-RhD antibody through exposure can result in:

- The destruction of RhD positive cells during future blood transfusions.
- Haemolytic disease of the newborn in future pregnancies. Anti-D injections are administered to Rh-negative mothers within 48 hours of giving birth to "mop up" any Rh-positive baby cells and thus prevent the mother's body from producing anti-RhD antibodies.

Introduction

Available blood products

Donated blood can be used as whole blood or processed into components. Pooled plasma can be sent for fractionation to produce plasma derivatives.



A clear clinical indication must exist for the transfusion and the choice of products. This must be noted in the patient's clinical notes. Component therapy enables the physician to replace / replenish specifically needed products and minimize the risk to the patient.

Introduction

Blood and blood products available from South African National Blood Service

Product	Storage	Administration	Indications
RCC	2–6 °C. Also unit waiting to be transfused.	Transfuse over 4-6 hours unless otherwise instructed by physician.	Restoring oxygen-carrying capacity and improving tissue oxygenation in: acute blood loss general or cardiac surgery obstetric haemorrhage decompensated chronic anaemia anaemia in acute coronary syndrome.
Leucocyte depleted RCC		Transfuse over 4–6 hours unless otherwise instructed by physician. Use appropriate blood administration set.	Patients suffering recurrent FHNTRs. Patients on chronic transfusion regimens. Intrauterine transfusions Infants <1 year old. Critically ill patients or patients scheduled for cardiac surgery. Potential stem cell and organ transplant patients. Patients at risk for CMV infection. Exchange transfusions in adults e.g. malaria. Intrauterine transfusions Infants receiving. exchange / large-volume transfusions.
Paediatric leucocyte depleted RCC			
Whole blood (WB)		Do not warm unless clinically indicated.	
Washed red cells		Use paediatric sets for paediatric patients. Transfuse within 6 hours.	Severe, recurrent, allergic transfusion reactions not prevented by antihistamines. Known IgA deficiency patients that formed anti-IgA antibodies. (Minuscule amounts of plasma containing IgA protein may cause an anaphylactic reaction). Patients with allergies to other plasma proteins.
Frozen, deglycerolised RCs	10 yrs, -65°C frozen		Due to high costs, this option is reserved for rare blood type donations only.
Pooled & single donor platelets	20-24°C Agitate continuously	Transfuse immediately on arrival in ward. Transfuse over 15–20 min.	Bleeding due to low platelet counts or defective platelet function. Bone-marrow failure (leukaemia or aplastic anaemia) Dilution thrombocytopenia (massive transfusions) Acute DIC (abruptio placenta) Congenital platelet defects.
FFP	-18°C Transfuse within 4 hours when thawed	Standard blood set. Over 20–30 minutes unless otherwise instructed by physician.	Inherited single factor deficiencies. Multiple coagulation-factor deficiencies (DIC, massive transfusions, liver disease) with active bleeding. Warfarin reversal in actively bleeding patients. Vit K deficiency associated with active bleeding. TTP (where cryo-poor is unavailable). Haemorrhagic disease of the newborn with IV Vit K.
Cryoprecipitate	-18°C	Standard blood administration set. Transfuse over 10-15 min.	Hypofibrinogenemia: acquired (DIC, massive blood loss) Congenital hereditary factor XIII deficiency.
Irradiated products (red cells and platelets)	2–6 °C	Transfuse within 24 hours after irradiated. Transfuse over 4–6 hours unless otherwise instructed by physician. Use appropriate blood administration set.	Transfusions from first-degree blood relatives Allogeneic bone-marrow or stem-cell transplant patients. Patients undergoing stem cell harvesting for re-infusion. Hodgkin's disease patients HLA matched platelets. Patients on purine analogue drugs. Congenital immunodeficiency states. Intrauterine transfusions. Exchange transfusions following intrauterine transfusions.

Introduction

Irradiated red cells should be transfused within 24 hours of irradiation as an exponential increase in extracellular potassium is noted after irradiation. Should more than 24 hours elapse before transfusing, consider having the product washed.

Washed products should be transfused within 24 hours of preparation to minimize the risk of bacterial infections.

Paediatric products (FFP, red cell concentrate and platelets) are available. This prevents wastage from ordering adult volumes. All paediatric red cell concentrates and platelets are leucodepleted. (As per South African Society of Anaesthesiologists (SASA) guidelines on volume transfused for paeds instead of units).

Legal and ethical aspects of transfusion

Blood transfusion is an integral part of modern medicine, often being a lifesaving intervention. All healthcare workers involved in the ordering and administration of blood products and in the monitoring of transfused patients must be aware of their legal obligations and ethical responsibilities.

Informed consent

The ethical principle of autonomy states that competent adults have the right to determine what will (and what will not) be done to their bodies. This includes the right to make decisions based on personal values, which may differ from societal norms.

Chapter 2 of the National Health Act (2003) stipulates that healthcare workers should take all possible measures to obtain and document informed consent prior to any intervention;

Chapter 8 stipulates that individuals have the right to participate in decisions regarding their health care. The National Patients' Rights Charter (2008) specifies informed consent and informed refusal as basic patient rights.

Information should be given on:

Indications (why a transfusion is needed)

Benefits of a transfusion

Risks associated with a transfusion

Available alternatives to a transfusion

Costs involved

Likelihood of success

Specific products to be transfused and reasons for specific products

The expected number of transfusion episodes

Obtaining informed consent for all blood transfusions is therefore mandatory, not optional. The use of a separate transfusion consent form is advised. (Check whether your hospital uses a separate consent form for blood transfusions).

Exceptions to obtaining informed consent from the patient:

- Emergencies, e.g. A patient in a coma where the treating doctor may decide on the patients' behalf (after considering all other options) to administer emergency treatment.
- Minors, where a parent or a legal guardian may give consent after completing the informed process.
- Mental illness, where the legal guardian may give consent if at the time of treatment the patient is incapable of doing so (incompetent).
- Where a court order is obtained to permit intervention / treatment of a patient.

Legal and ethical aspects of transfusion

Obtaining informed consent is the responsibility of the treating physician. Ideally, the doctor making the decision to transfuse should be the doctor administering the informed consent. The nurse's responsibility is to ensure that voluntary consent has been obtained from the patient prior to the transfusion.

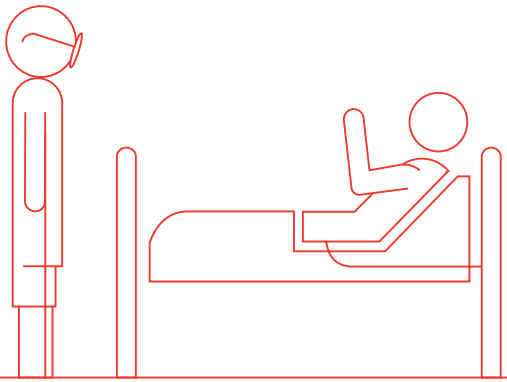
Informed consent must be a voluntary process. It should be administered in a language that the patient understands, at the patient's level of understanding. A translator should be used if necessary and the use of medical terminology should be avoided.

Patients who refuse a blood transfusion

(e.g. Jehovah's Witness)

Informed refusal of treatment is a basic patient right. Should a patient refuse the transfusion, there should be clear policies for managing this patient. The reasons for refusal should be stated and documented. All alternatives to a blood transfusion should be explored and explained to the patient.

Hospital liaison committees from the Jehovah's Witness Society can provide information to physicians regarding transfusion alternatives or arrange consultations with physicians who have experience in the management of a patient without the use of blood transfusions. These committees comprises ministers from this religious group with specialised training and exist in most large cities.



Legal and ethical aspects of transfusion

Documentation

All documents pertaining to the informed consent process should be kept in the patient's file indefinitely (these are legal documents) and must indicate the time and date of the proceedings. The following signatures should appear on the documentation:

- Physician.
- Patient / parent / guardian / mandated person.
- Witness to consent.
- Translator (if required). Specify the language used.
- **Nurses role:**
  - Sign as a witness if the process has been witnessed.
  - Translate (if you know the language).
  - Ensure Informed Consent is signed before the transfusion.
  - Document that consent has been obtained.

Pre-transfusion

Ordering of blood and blood products

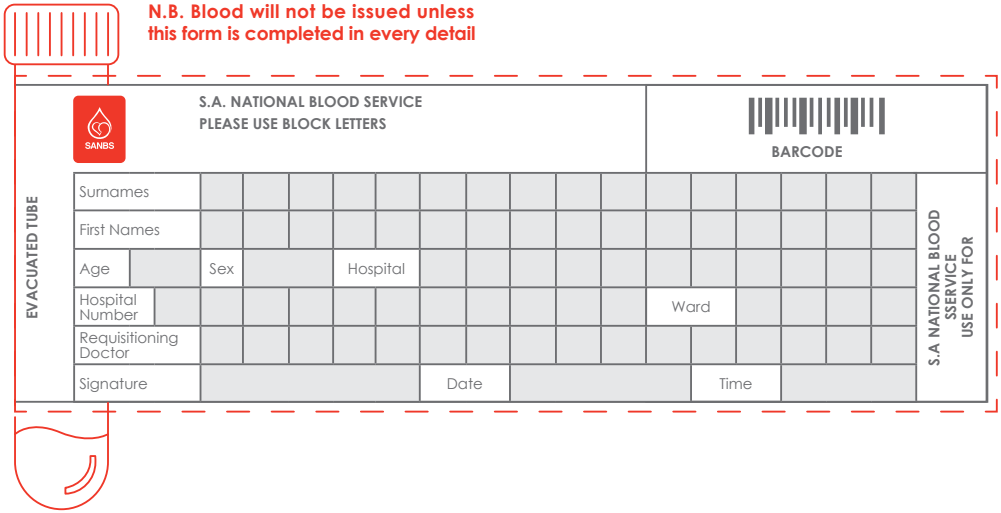
Always remember the three most important rules:

- Identify the patient according to your hospital protocol.
- Document all events prior, during and after transfusions.
- Communicate (doctor, patient, nursing staff and blood service provider).

Specimen collection

The doctor who orders blood is responsible for ensuring that the correct procedure is followed when taking the sample for pre-transfusion testing:

- Use only SANBS EDTA tubes.
- Do not use expired tubes.
- Identify the patient according to hospital protocol (see patient identification below).
- Complete the label on the specimen tube at the patient's bedside from the information on the patient's wristband.
- Ensure that the label with patient's details is securely affixed to the specimen tube.
- The tube must be ¾ full of the blood. Please contact the blood bank to enquire about minimum sample volume required for paediatric patients.
- Record the date and time the specimen was taken on the specimen label.
- Sign both the specimen and the "Request for Blood or Blood Components" form.



Pre-transfusion

Patient identification

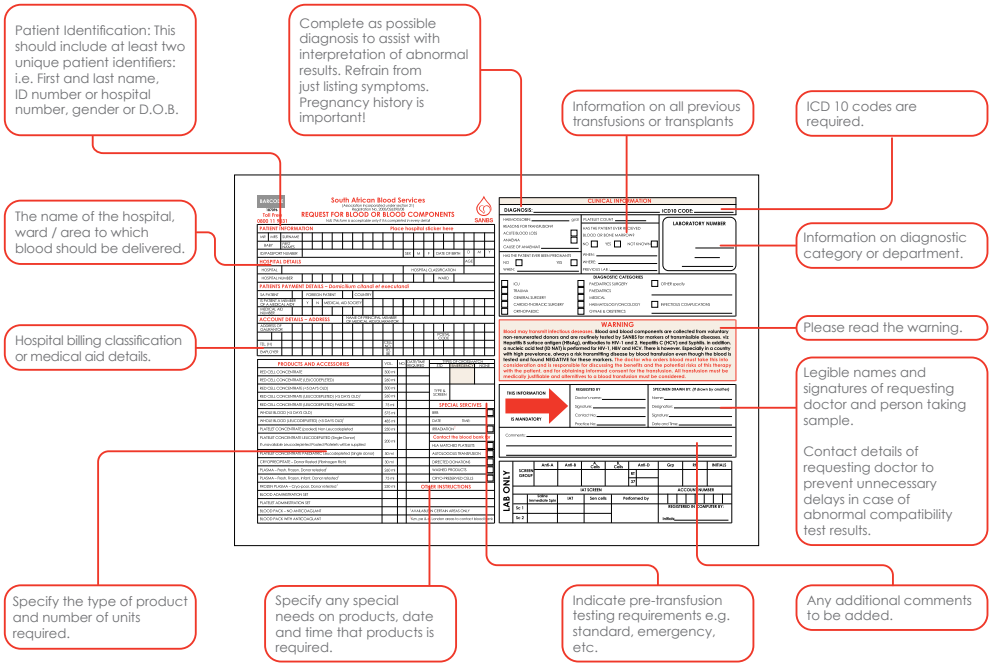
- Each patient must wear an identification wristband with a unique hospital number.
- Check that the doctor has obtained and documented informed consent.
- Ask your patient: "What is your name, surname and date of birth?"
- Check doctor's notes to confirm if a blood transfusion and what specific blood product has been prescribed.
- Check that all the patient's details, including hospital number, are identical on the doctors notes, the nursing notes and any other hospital records.
- Verify that all the patient's details are identical on their wristband and the hospital records and that the patient has verbally confirmed their name, surname and date of birth.

Requesting blood or blood products.

If any special services (see below) are required, the doctor must discuss his / her request with the blood bank prior to submitting the order, as some products are not stored at the blood bank and may need to be transported from the processing centre to the blood bank in time.

Incomplete or illegible request forms will not be accepted by the blood bank.

The request form must contain the following information:



Pre-transfusion

All details of the request must be noted in the patient's file to aid in preventing misdirected transfusions.

Pre-transfusion testing

SANBS laboratories perform two-phase compatibility testing as follows:

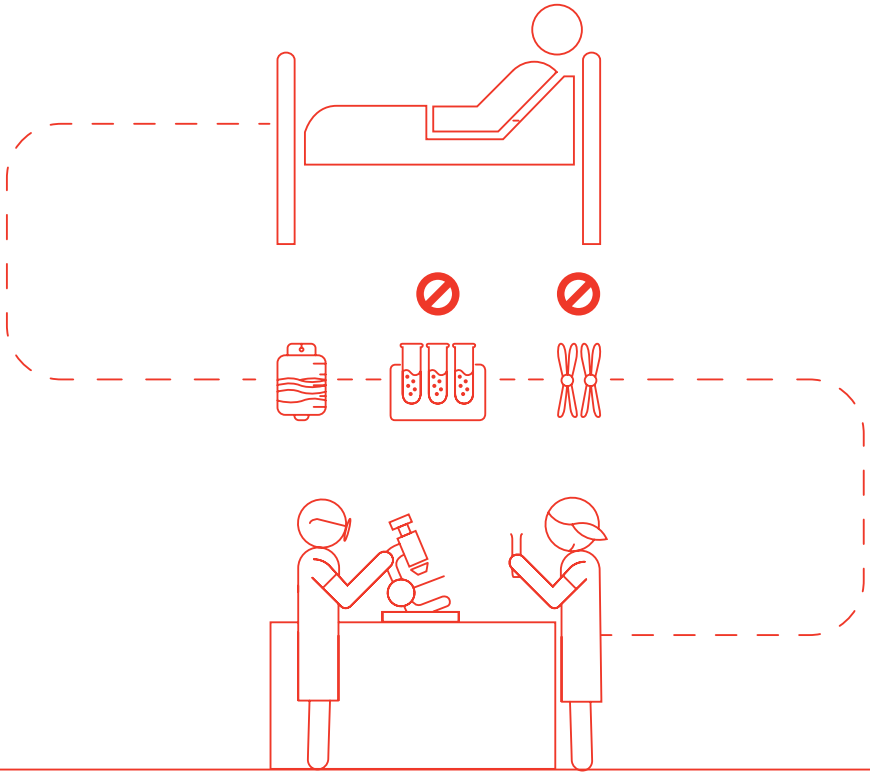
Phase 1:

- Using patient's sample, determine the ABO and Rhesus grouping.
- Using the patient's sample, do irregular antibodies screening.

Phase 2:

- Using the patient's sample, reconfirm the patient's ABO and Rh group.
- Reconfirm the ABO and Rh grouping of the donated unit.
- Using red cells from the donated unit and serum from the patient's sample, perform a compatibility test between the donor and patient.

! The use of uncross-matched blood exposes patients to a higher risk of transfusion reactions, as undetected antibodies may cause severe haemolytic reactions.



Pre-transfusion

Benefits and risks of pre-transfusion testing options

Type	Phase 1 ABO, Rh	Phase1 Irregular antibody (Ab screen)	Phase 2 Patient serum and donor RCs	Comments
None	✓	Not done prior to issuing unit	Not done prior to issuing unit	Only in dire emergencies issued within 5-10 minutes or emergency fridge blood. Risk of irregular antibodies and reactions - doctor's responsibility
Emergency	✓	Only 20°C Ab screen done	Done after issuing	20 - 30 minutes laboratory time. Risk of irregular antibodies and reactions - doctor's responsibility
Standard	✓	✓	✓	45min - 2hours laboratory time. Incompatibility due to irregular antibodies may delay issuing
Type & Screen	✓	✓	No compatibility testing done yet.	This option is not an order for blood. Compatibility testing (phase 2) is only done on written / telephonic request. Requesting doctor will be informed if irregular antibodies are present. Specimen kept for 72 hrs at Blood Bank

Times displayed in the above table indicate laboratory-testing time only and do not allow for delays in transportation of samples and products to and from the blood bank.

Pre-transfusion

Special requests, services and products.

Special services / products available include:

- Irradiated products.
- Washed products.
- Filtered products.
- HLA-matched platelet products.
- Autologous and directed programmes.
- Cryo-preserved cells.
- Blood on returnable basis.

For any special requests (e.g. washed, irradiated or filtered products), please notify the blood bank in advance. Please ensure that the specific requirements on storage / shelf-life / administration / documentation are adhered to when making use of the above services or products. Further detail is available from the blood bank or from the Clinical Guidelines for the use of Blood Products in South Africa, 4th Edition.

Blood on returnable basis (BRB)

Where available, the BRB system assists in blood conservation programmes. Blood is issued in a BRB hamper with two separately sealable compartments. Units are packed with eutectics (ice packs) and temperature-monitoring devices. Unused units may be returned to the blood bank for credit and re-issued to another patient if:

- The compartment's seal is unbroken.
- The cold chain has been maintained (temperature loggers).
- The BRB hamper is returned to the blood bank within 12 hours.

All units that were transfused must be meticulously recorded in the patient's file.

Emergency fridges

The Group O blood in the emergency blood fridge is indicated for use in dire emergencies only – when there is insufficient time to request crossmatched blood from the blood bank.

Care and maintenance

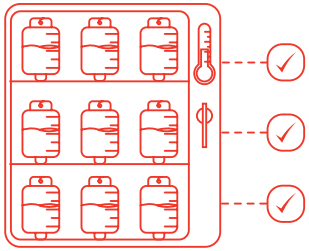
The hospital will designate staff (usually nurses) to monitor the stock levels and the checks (e.g. for temperature and alarm) that need to be done twice a day (once per shift).

Stock can be replenished on any day by requesting blood (on the appropriate documentation) from the blood bank. Requests should preferably be made one day in advance to ensure that blood bank can supply Group O blood on time.

Order blood when your stock is at 50% to prevent having an empty fridge when another emergency arises.

Daily checks include:

- Visual checks for colour changes and damage to the packs and the fridge.
- Units stored in group and expiry-date order.
- Units cabled tied onto the grid.
- Stock levels checked and stock ordered from blood bank.
- Correct storage temperature of between 2°C and 6°C.
- Only Anti-D Kit and emergency blood stock kept in fridge.
- Fridge is connected to an uninterrupted power supply.



Discrepancies must be reported to the blood bank immediately.

Power failure

In case of power failures, please inform the blood bank if the power is not restored within 10 minutes so that arrangements can be made to move the blood to alternative appropriate storage with a temperature of between 2°C and 6°C (e.g. cooler box or other fridge).

Alarms

The alarm button can be silenced by pushing the button, but will continue to sound again every 30 minutes until the causative factor has been atttended to. Switching the fridge off does not deactivate the alarm. Please inform the blood bank if a problem cannot be rectified.

Emergency fridges

Determination of the Rh type of the patient

Some emergency blood fridges stock only Group O-negative units and thus no RhD test is needed as Group O-negative units are compatible with all other blood groups.

There are emergency blood fridges which have Group O-positive and Group O-negative units and a RhD test must therefore be performed on the patient's blood specimen prior to selecting a unit for transfusion. Rh should be determined on all patients, so that O-positive patients can receive O-positive emergency blood, thus preserving the very scarce O-negative stock.

Selection of unit for transfusion

Rh-positive for Rh-positive patients.

Rh-negative for Rh-negative patients.

- If Rh test is in doubt or if patient is of childbearing age, use Rh-negative blood.

Check the unit prior to removal for clots, clumps, colour changes and damage.

Documentation

Record patient and blood pack details on "THE STOCK BLOOD / PLASMA INFUSION RECORD" form attached to the emergency unit it the fridge and return to blood bank as soon as possible. This is a legal requirement according to the National Health Act.

Transfusion

In terms of the Standards of Practice for Blood Transfusion in South Africa,

- Transfusions of blood, red cell components and other components shall be prescribed in the medical records of the recipient by the doctor in charge and administered under medical direction.
- The transfusionist shall be a medical practitioner or a registered professional nurse who is working under his delegated authority.
- The recipient shall be observed during the transfusion and for an appropriate time thereafter for possible adverse reactions.
- The patient shall be positively identified and this identity verified against that on the accompanying documents and the units to be transfused.

Essential transfusion knowledge

Warming and thawing of blood and blood products

Warming of blood is a much-debated issue and impacts on the safety of a transfusion. Incorrect heating (or storing) of blood may cause haemolysis of red blood cells and may lead to severe transfusion reactions or death.

Cold blood administered slowly (one unit over 4–6 hours) will not have any detrimental effects on the patient. Routine warming of blood is not recommended as it exposes patients to unnecessary risks.

Clinical indications for warming of blood:

- Massive transfusions when blood is administered at a rate of >50ml/kg/hr.
- Infant transfusions at a rate of >15ml/kg/hr.
- All neonatal transfusions.
- Transfusions to hypothermic patients.
- Transfusion of units that contains high-titre cold heamagglutinins.
- Transfusions administered via central lines.

Further safety, logistic and cost implications that need to be remembered:

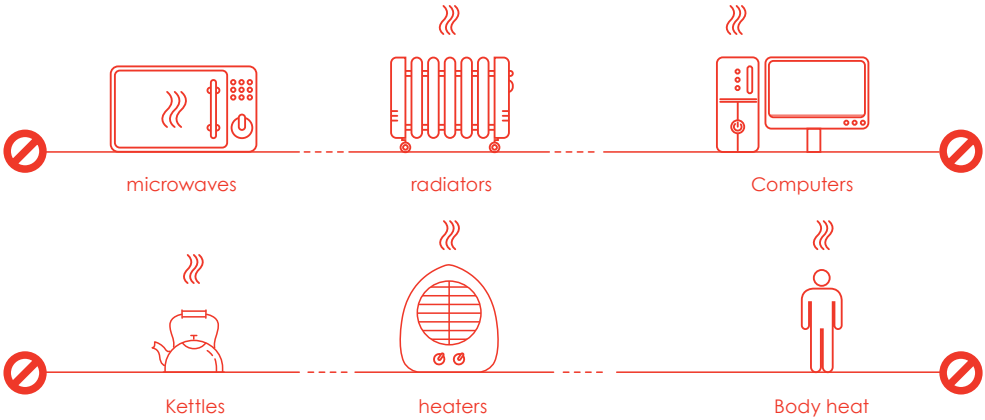
- Overheating the unit of blood above the warmer specifications may cause extensive haemolysis and/or possible death.
- Only approved warming methods / equipment may be used to warm blood. Blood warmers should be serviced and maintained properly. It is recommended that warmers be equipped with visible temperature-monitoring devices and audible alarms.
- Bacterial contamination of ports (and products) should be avoided at all times.

Transfusion

- The total time from removal from cold storage to completion of the transfusion may never exceed 6 hours for whole blood or red cell products.
- The temperature at which we thaw or heat must be monitored, controlled and of such a nature that the viability and quality of the product is not compromised.
- Physical damage to the blood product must be avoided.
- The logistic implications of choosing a method should include an evaluation of the human resources, equipment available and urgency of the transfusion.
- Platelets, plasma products and granulocyte products must never be warmed.

To avoid thawing of plasma in the ward, request the blood bank to thaw before issuing. This service may not always be available in smaller blood banks.

! never warm blood or thaw plasma using:



Venous access

Venous access should be obtained and maintained according to aseptic techniques stipulated in your facility's policies. Blood may be administered via peripheral or central lines according to the physician's instructions.

Large-bore needles (16–18G) are used when transfusing adults; paediatric transfusions are done with 22–27G needles. Avoid using needles <28G to transfuse products with a haematocrit >60%

Convert French to Gauge

French	Gauge
1,5	25
1,7	24
2	-23

Transfusion

Administration sets

Only sterile administration sets may be used to transfuse blood or blood products. Ensure that the appropriate set is chosen for the product that you will be transfusing. Never piggyback transfusion sets onto other lines.

Blood, platelet, plasma products and albumin

Blood, platelet, plasma products and albumin are administered via a normal / standard blood administration set fitted with a 170-micron mesh filter. Standard blood administration sets may be primed with the blood product or normal saline. The blood product should cover the total length of the filter membrane while priming the set and during the transfusion.

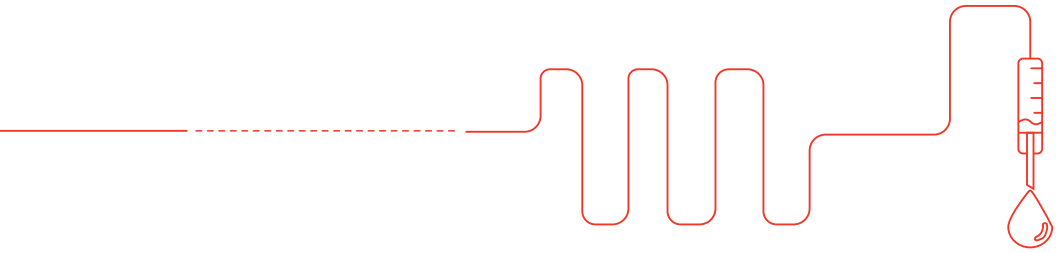
Paediatric administration sets

Paediatric transfusion sets are available at most hospitals. Blood banks do not issue paediatric transfusion sets. Use of paediatric sets will prevent unnecessary wastage of smaller volume products (due to bigger space of tubing and chambers) and they allow for accurate volume and flow-rate control.

When to change administration sets:

- If a reaction is suspected / confirmed, to prevent further infusion and harm to the patient.
- Between different blood products e.g. red cells and platelets.
- Between red cell transfusions of different ABO groups.
- Before infusing IV fluids such as Dextran, Ringers Lactate, etc.
- Every 10 -12 hours or after every 2 units to prevent bacterial growth and transfusion of haemolysed blood.
- When flow is hampered by debris in the filter.

Nothing except normal saline may be administered through the same line as blood products. (See Additives and drugs on page 26.)



Transfusion

Additives and drugs

No drugs or IV fluids may be added to the unit as these may react with the blood product or anticoagulant and preservatives in the unit. Fluids that may be given concurrently:

- Normal saline
- 4% albumin
- Plasma protein fractions
- ABO-compatible plasma

Pressure infusion devices

Pressure bags may be used when blood needs to be transfused rapidly, e. g. massively bleeding patient. Manufacturer's instructions must be followed to ensure correct use.

Infusion pumps

Before using infusion pumps to transfuse blood or blood products, confirm with the manufacturer if the device is registered for this purpose. Staff must be trained on the correct use of infusion pumps as red cell haemolysis may occur if the rate of transfusion does not take into account the lumen size of the needle / catheter (especially important in the paediatric setting).

Filters

Leucodepletion filters

Bedside filtration is not recommended because:

- Hospital staff are not technically trained. Technique and results will be less adequate.
- Temperature control is not as effective as in a laboratory.
- Units will be older, and white cell fragmentation will already have taken place.
- Especially for platelet products, the prevention of Febrile Non Haemolytic Transfusion Reaction (FNHTR) and alloimmunization will be less effective than with pre-storage leucodepletion.
- Patients on ACE inhibitors display increased hypotensive reactions to bedside filtered products in relation to products that were pre-storage filtered due to bradykinin activation.
- Quality control measures are not in place to monitor and regulate efficacy and processes.

Night time transfusions

- Transfusions should not be given at night unless the patient is actively bleeding or has some other urgent clinical need.
- Elective transfusions should be done during the day to reduce errors and improve safety for patients.

Transfusion

Leucodepleted blood must be requested from the blood bank if indicated. Bedside filters will **ONLY** be used in the event of leucodepleted blood not being available from the blood bank. Correct use of leucocyte reduction filters at the bedside is necessary to ensure their effectiveness. Staff need to verify which filter is indicated for which product (as per manufacturer's instructions).

Leucocyte reduction filters must **NEVER** be used for granulocyte transfusions.

Micro-aggregate filters

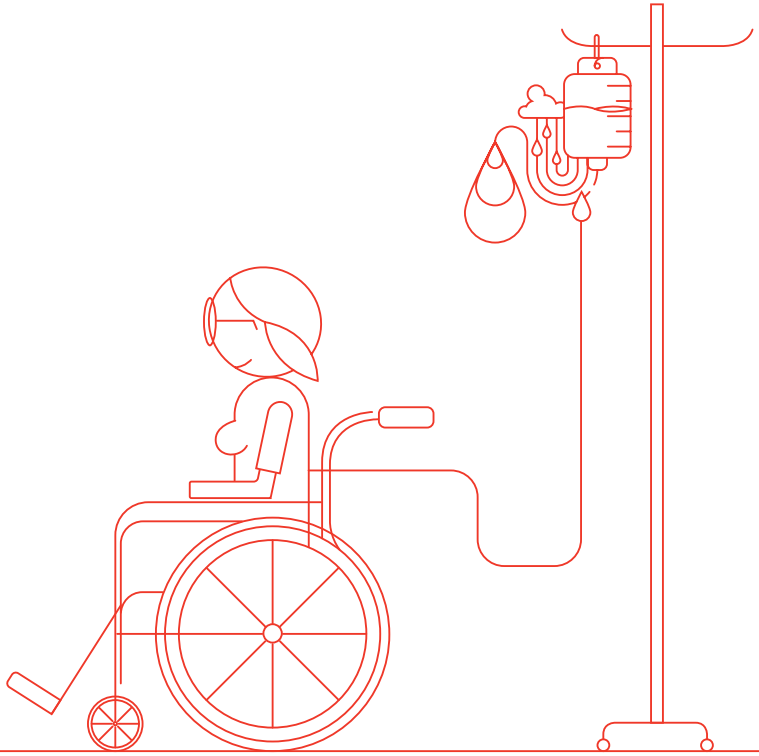
Micro-aggregate filters have a very small pore size (10-40 microns) to filter out microscopic debris in stored blood.

Current medical and nursing literature does not provide evidence in favour of micro-aggregate filter use over standard filter (170-260 microns) use for routine transfusions.

The routine use of micro-aggregate filters for neonatal transfusion is not warranted since no convincing studies exist to indicate efficacy, and the relatively fresh red cell products used for most neonatal transfusion contain minimal amounts of micro-aggregates.

Micro-aggregate filters have some intrinsic disadvantages. Of particular concern is the administration of platelet components through microaggregate filters. Micro-aggregate filters, diminishing the therapeutic value of the transfusion and thereby ultimately increasing the patient's transfusion requirements and donor exposure, trap transfused platelets.

Micro-aggregate filters must **NEVER** be used for granulocyte transfusions.



Pre-transfusion checks and observations

Receiving the unit from the blood bank

- All information must be read out aloud. Two qualified health care workers perform checks.
- Visually inspect the component / unit for any defects, leakage, abnormal colour, clots and expiry dates.
- Crosscheck the information (barcode, patient name, blood group) on the unit against the information on the issue / delivery note.
- Verify the ABO, Rh and information from previous transfusions again.
- Recheck the units / delivery note against the physician's order / prescription.
- Report any abnormalities to the treating physician and blood bank immediately. Return the units to the blood bank. Do not transfuse the units.
- Verify whether the patient is receiving autologous or directed units. These units must be transfused before allogeneic units.

Patient identification

Misdirected transfusions (and their often fatal consequences) are preventable through proper patient identification.

- Check patient's wristband and verbally ask the patient for their name, surname and date of birth.
- Check patient hospital records (nurses and doctors notes).
- Check doctor's orders.
- Cross check the patient's details on the unit and the blood form.
- Check the patient's details on the transfusion therapy card.
- Check previous transfusion records.

Pre-transfusion patient observations

In order to recognise a transfusion reaction you need to know what your patient's condition was before starting the transfusion.

- All Pre-transfusion observations must be recorded in the patient's file.
- Verbally enquire how your patient is feeling: e.g. headache, back pain,abdominal pain, dyspnoea, etc.
- Visually observe for signs and symptoms present in your patient: e.g. rigors, congested neck veins, dyspnoea, bleeding / oozing at wound / operation sites, etc.
- Record vital signs: BP, pulse, respiration rate, temperature, urine output, CVP reading.

Transfusing the patient

Commencing a transfusion

An intravenous infusion may only be changed to a blood or blood component transfusion by a registered nurse or a medical doctor on the written instruction and responsibility of a medical doctor after

- Proper verification of all unit-related and patient identifiers by two registered health care professionals was completed;
- ensuring the correct administration set for the specific component is used;
- checking the physician's prescription on rate of infusion, additional medication or special instructions;
- baseline observations were done and recorded in the patient's file; and
- ensuring that informed consent has been obtained and documented.

Remember to communicate with your patient for early recognition of symptoms of a transfusion reaction and prompt reporting.

Observing the patient

Baseline observations must be done prior to the transfusion. During a transfusion, patients should be observed

- every 15 minutes for the first half-hour of each unit (severe transfusion reactions are more likely to occur during the first 30 minutes of a unit),
- then half hourly or according to hospital policy. Observations include:
    - visual observation and verbal enquiry regarding the patient's wellbeing.
    - blood pressure, pulse, respiration, temperature, urine output.
    - CVP reading (if applicable).

The unconscious patient warrants extra observations. Often, a drop in blood pressure and oozing from a wound or venous access sites are the only signs of a haemolytic reaction.

Documentation

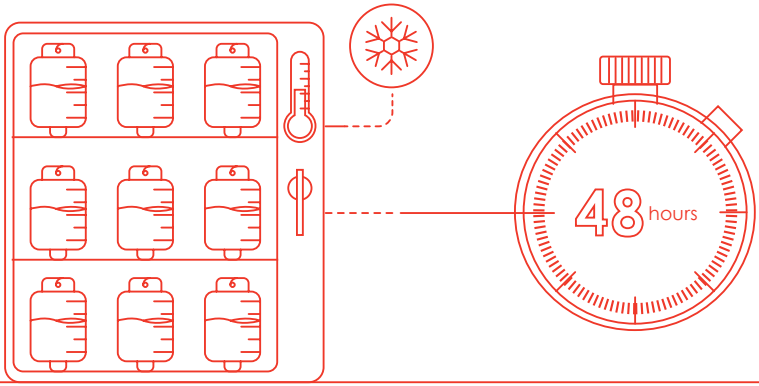
All documents pertaining to a transfusion are kept in a patient's file indefinitely. The following information must be documented:

- date of transfusion;
- type of product transfused;
- unit number;
- start and finish time of each unit;
- name of persons starting, discontinuing and checking each unit;
- units that was not transfused to the patient;
- any reactions that occurred during or after the transfusion.

Post-transfusing the patient

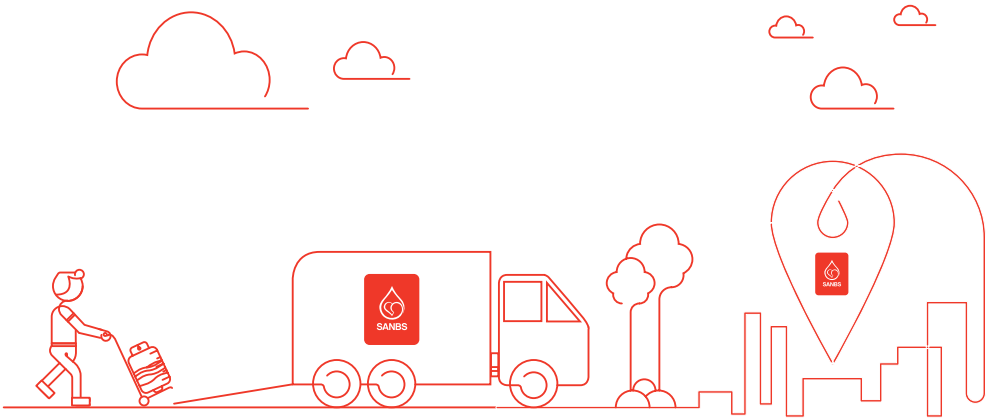
Flushing of lines

Do not flush adminitration sets. Normal saline can be used, especially in paediatric patients to ensure the benefit of the full prescribed dose. Take care not to flush under pressure, as this may dislodge debris from the filter.



Empty blood and blood product bags

Empty bags should be retained in the ward fridge for 48 hours. In case of delayed transfusion reactions, the bags should be sent to the blood bank (with the appropriate post-transfusion samples) to perform a transfusion reaction investigation. After 48 hours, the empty bags should be discarded according to the hospital's policy on discarding of medical waste.

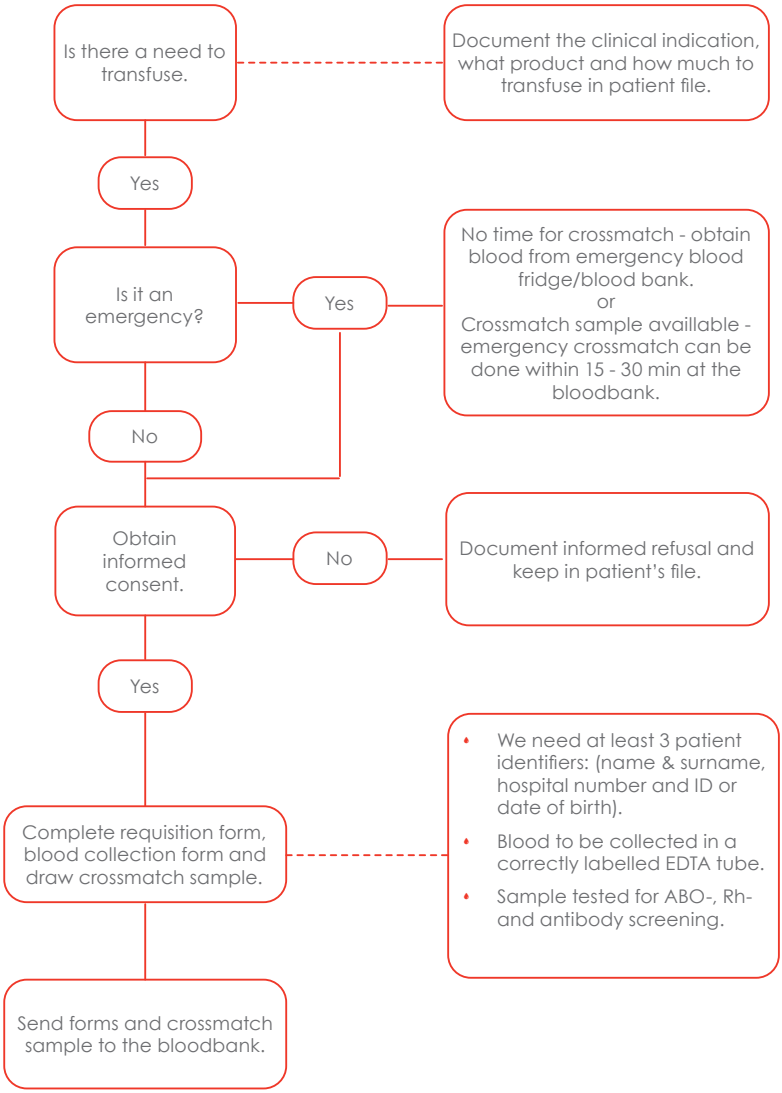


Disposal of unused units

Unused units are not to be discarded in the ward and must be returned to the blood bank with the reason why the product was not transfused. Complete traceability of every unit is essential and this requires full compliance with the Lookback programme.

Process charts

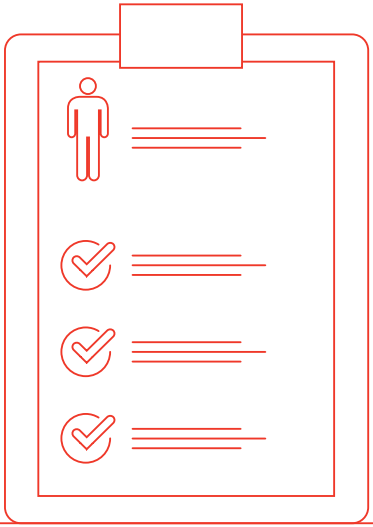
Prior to transfusion: ordering of blood



Process charts

Prior to transfusion: receiving the unit from the blood bank

1. All information must be read aloud by two health care professionals e.g. two nurses or one nurse and one doctor.
2. Check the donor's blood group with the patient's blood group on the delivery note and verify compatibility.
3. Compare expiry date on the unit and on the delivery note.
4. Cross-check the barcode on the pack with the blood issue form / delivery note.
5. Visually examine the component / pack for any defects, leakage, abnormal colour or clots.
6. Any discrepancy should be communicated to the doctor and the blood bank. The product should be returned to the blood bank.



The more checks in place, the safer the transfusion episode.

Process charts

Check patient's wristband and verbally ask the patient for their name, surname and date of birth.

Check patient hospital records (nurses and doctors notes).

Check doctor's orders.

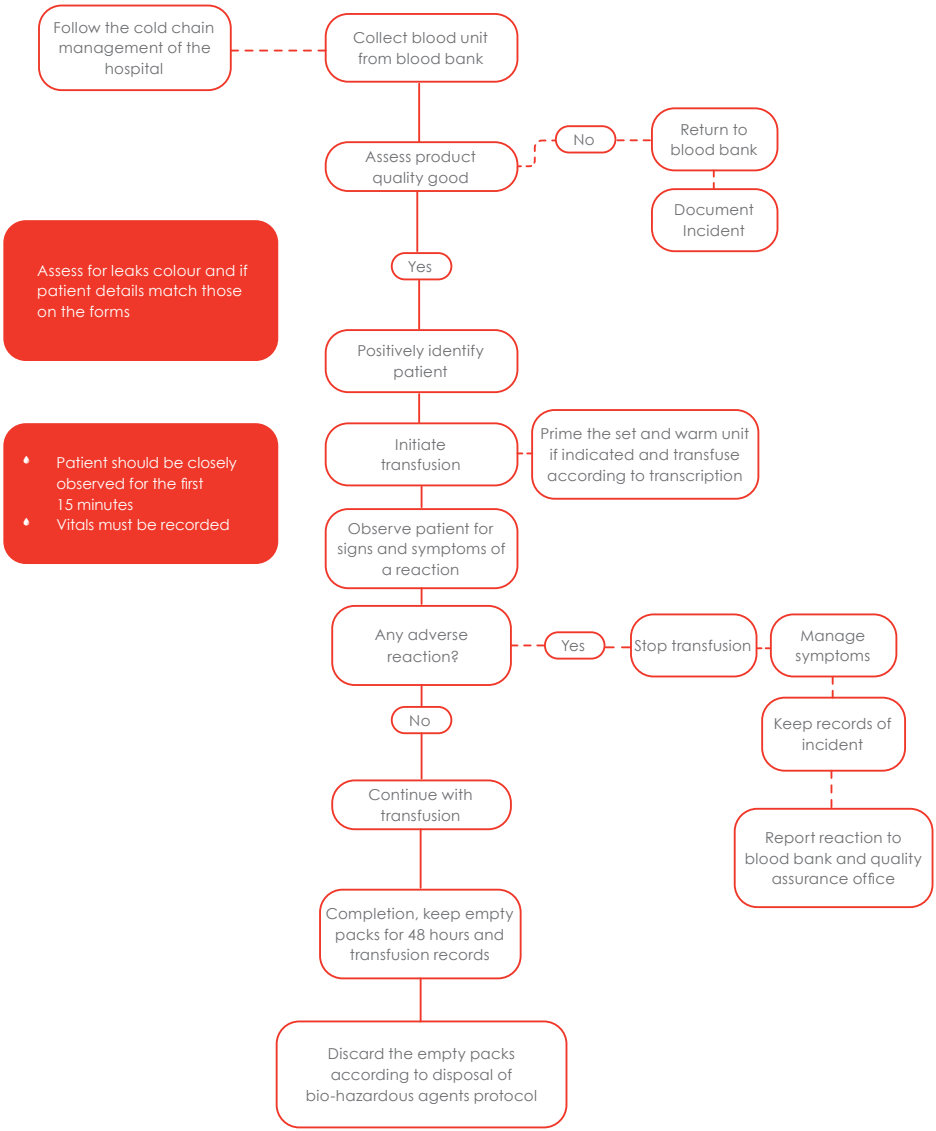
Cross check the patient's details on the unit and the blood form.

Check the patient's details on the transfusion therapy card.

Check previous transfusion records.

Process charts

Administration of blood



Transfusion reactions

Definition

According to the Clinical Guidelines for the use of Blood and Blood Products in South Africa, a transfusion reaction is defined as "any potentially adverse sign or symptom which occurs after the start of any transfusion of blood or blood products".

How to recognize a transfusion reaction

To recognise signs and symptoms developing (or a change in signs or symptoms), you need to know what signs or symptoms were present before the onset of the transfusion. Baseline observations are essential to enable early recognition of transfusion reactions.

Signs and symptoms are often non-specific and the frequency and type of reactions may vary with different blood products.

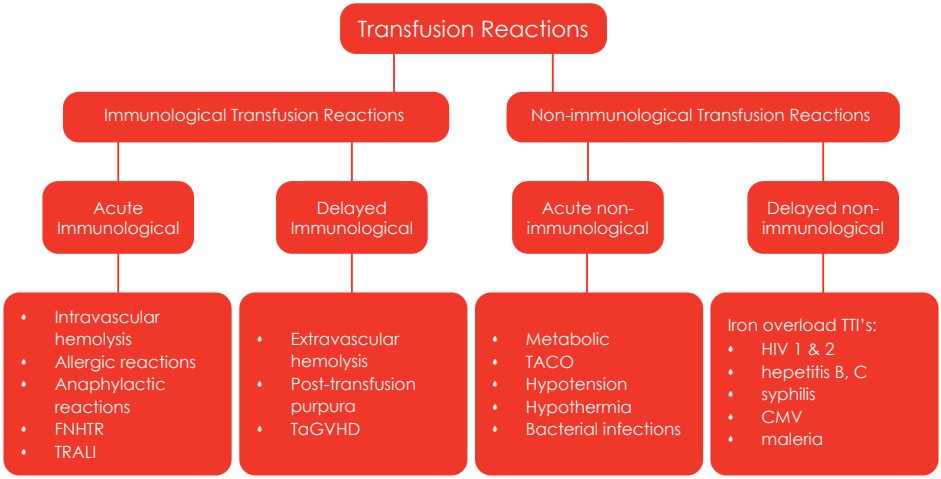
Signs and symptoms that may be suggestive of a transfusion reaction:

- chills
- nausea
- itching
- vomitting
- facial/tounge swelling
- headache
- rash
- oliguria
- pain
- rise or drop in blood pressure
- haematuria
- fever
- restlessness
- back pain
- flushing/rise in temperature
- chest pains
- rigors
- breathing difficulty
- wheezing/anxiety
- rise or drop in pulse

A high level of **suspicion** and **quick intervention** may be **lifesaving** to your patient.

Transfusion reactions

Types of transfusion reactions



Emergency management of transfusion reactions

Acute complications usually develop during or shortly after a transfusion (within 24 hours). These can range from mild to severe (life-threatening) and are managed accordingly.

Transfusion reactions

Category	Management
Category 1: Mild hypersensitivity reactions: • Allergic reactions. • Urticarial reactions.	• Stop the transfusion. • Administer antihistamine. • If symptoms improve, continue with transfusion. • If no improvement within 30 min OR worsening of symptoms, manage as category 2.
Category 2: Moderately severe reactions: • Febrile non-haemolytic reactions.	• Stop transfusion. • Replace the infusion set and maintain venous access with normal saline. • Notify the physician and the BB. • Send the unit and the samples to BB. • Symptomatic support. • If symptoms improve, continue the transfusion. • If no improvement, treat as category 3.

Category 3: Life-threatening reactions:
• Acute intravascular haemolysis.
• Bacterial contamination and septic shock.
• Transfusion-associated circulatory overload (TACO).
• Anaphylactic reactions.
• Transfusion-associated lung injury (TRALI).
	In addition to "category 2" management:
	• Normal saline infusion
	• Symptomatic support as per specific reaction:
	  ◦ Maintain airway (give O2).
	  ◦ Adrenaline.
	  ◦ IV corticosteroids.
	  ◦ Bronchodilators.
	  ◦ Diuretics.
	• Notify the BB and send suspect units, tubing and specimens ASAP.
	• Observe for haemoglobinuria

Emergency management of all acute transfusion reactions always include:

- Stop the transfusion.
- Contact the prescribing practitioner.
- Maintain venous access with normal saline through a separate infusion set.
- Maintain symptomatic support of the patient.
- Immediately contact the treating physician.
- Contact the blood bank ASAP.

Transfusion reactions

Further management of a transfusion reaction

Once the patient is stabilised:

- Complete the transfusion reaction form, supplying as much information as possible.
- Collect 1 EDTA sample (bloodbank crossmatch sample).
- Urine to be tested in the ward (indicated on the transfusion reaction form).
- Send the suspect unit and tubing with the samples and documentation to the blood bank as soon as possible.
- Record events in the patient's clinical file.
- Do not commence the transfusion with another unit before liaising with the transfusion service.
- Report all transfusion reactions to your hospital's transfusion discussion platform, the Quality Assurance office, and your local blood bank (to assist in planning for future transfusion needs of the patient).

Transfusion reactions

TRANSFUSION REACTION FORM

Important: Please read this pamphlet before commencing the transfusion

Responsibilities of the Doctor Transfusing a Patient with Blood or a Blood Component:

1. Discuss the benefits and the potential risks of blood transfusion and obtain informed consent from the patient. All transfusions must be medically justifiable and alternatives to a blood transfusion need to be considered.
2. Check that the certificate of compatibility on the container has been completed correctly.
3. Ensure that the patient is satisfactorily identified as the correct patient for whom the blood or blood component in each unit is intended.
4. Verify that a pre-transfusion compatibility test has been carried out and ensure that a record is kept thereof. In the case of extreme emergency, blood may be transfused without a pre-transfusion compatibility test provided that such a test is performed when possible, unless the doctor considers such a test impractical or unnecessary.
5. Inspect the container and the blood therein for any abnormalities before it is transfused, in order to ensure that the hermetic seal of the container is intact and shows no evidence of having been pierced. A container of blood shall not be entered/spiked by piercing the hermetic closure for preparing a suspension of packed red cells or removing a sample for testing or for any other purpose unless:
   - the entering/spiking of the container is carried out under conditions which conform with acceptable methods of asepsis;
   - the container of blood is kept at a temperature of 2 – 6°C from the time of entering/spiking until immediately prior to transfusion;
   - the transfusion is completed within 6 hours of the container being entered.
6. Check the expiry date on the unit of blood or blood component to ensure that it has not lapsed.
7. Ensure that each infused blood unit is retained at a storage temperature of 2 – 6°C for at least 48 hours after the completion of the transfusion.
8. In the event of a suspected transfusion reaction deliver a fully completed transfusion reaction form with the empty packs and administration set to the Blood Bank for the purpose of investigating the cause of an untoward reaction or death following the transfusion. (Refer to 8 below)
9. **Report promptly to the Blood Bank any untoward reaction, or death of the patient as an apparent result of the transfusion.**
10. Storage and transportation temperature:
    - Blood must be transported at (1 – 10°C).
    - Blood must be stored at 2 – 6°C until immediately before transfusion.
    - FFP must be transported and stored at less than -18°C (minus).
    - Blood and blood products must **NOT** be immersed in hot water or heated except by using an approved warming device, the temperature of which must not exceed 37°C.
    - Blood must be infused within 4 – 6 hours of warming.
    - Blood must not be frozen.
    - Platelets to be transported and stored at 20 – 24°C and continuously agitated until transfusion.

NB! All issued products must be transfused within 72 hours, if unused/not transfused, must be returned to the blood bank.

IN THE EVENT OF A TRANSFUSION REACTION

1. Stop the transfusion immediately
2. Keep the vein open with normal saline using a new administration set
3. Confirm if unit was intended for same patient
4. Contact the doctor in charge
5. Monitor temperature, pulse rate, BP, respiratory rate and urine output
6. Perform a dipstix on urine sample for haemoglobinuria
7. Contact the transfusion service for advice
8. Send to the Blood Bank as soon as possible:
   - This form fully completed
   - The suspect donor pack (and other previous blood or plasma packs, if any), the administration set and drip filter. (Do not empty the pack or remove drip set)
   - At least 5ml EDTA venous blood taken from the patient from a different site to the infusion, with precautions to avoid haemolysis and bacterial contamination

TRANSFUSION REACTION CATEGORIES	
REACTION	**SIGNS / SYMPTOMS**
ANAPHYLACTIC REACTIONS Severe, usually due to antibodies to IgA immunoglobulin, less frequently severe reactions to other plasma proteins.	Sudden onset. Symptoms include dyspnoea, hypotension/shock, facial and/or glottal oedema plus explosive GI symptoms. May lead to cardiac arrest/death.
ACUTE HAEMOLYTIC REACTION (AHTR) Caused by exposure of patient to incompatible donor red cells (usually ABO mismatched blood). Apparently similar reactions can result from incorrectly heated/stored/administered red cell products	Usually abrupt in onset and within 15 – 20 minutes after initiation of any red cell containing blood products. Fever, chills, nausea, vomiting, pain – flank back, chest, dyspnoea, hypotension, tachycardia, unexpected degree of anemia, renal failure, DIC.
BACTERIAL CONTAMINATION Caused by any contaminated blood product most frequently associated with platelet concentrates.	Usually rapid onset, about one hour post transfusion. Chills, fever, abdominal, cramps, vomiting or diarrhoea, renal failure, flushed dry skin, hypotension and shock.
FEBRILE NON HAEMOLYTIC TRANSFUSION REACTION Cause: Usually recipient leucocyte or platelet antibodies to transfused donor cells.	Onset usually with 1 – 2 hours after start of transfusion. Headache, myalgia, malaise, fever, chills, tachycardia and hypertension. Commonly found in multiparous or multi-transfused patients. Isolated fever > 38°C or, a rise of 1°C from the pre-transfusion value.
TRANSFUSION – RELATED ACUTE LUNG INJURY (TRALI) Severe, usually caused by leucoagglutinins in the plasma of the donor. Generally under-recognised and under reported.	No lung injury prior to the transfusion. Dyspnoea, hypotension, fever, bilateral pulmonary oedema usually occuring within 4 hours of a transfusion.
TRANSFUSION – ASSOCIATED CIRCULATORY OVERLOAD (TACO) This is usually due to rapid or massive transfusion of blood in patients with diminished cardiac reserve or chronic anaemia.	Dyspnoea, orthopnoea, cyanosis, tachycardia, increased blood pressure and plumonary oedema usually occurring within 4 hours of a transfusion.
DELAYED TRANSFUSION REACTION Extravascular Haemolytic Reaction: Caused by exposure to incompatible red cells in the presence of an atypical IgG antibody such as anti-Kell, anti-Duffy, etc. Severity variable ranging from mild to severe.	Signs and symptoms may appear within hours in a severe reaction (often anti-Kell) & is characterized by a drop in haemoglobin and jaundice. In some cases there may be additional complications, eg. renal failure and DIC. However most cases are mild and are only noticed 2 – 10 days after the transfusion with mild jaundice & anaemia. Often the reaction goes unnoticed if mild.
ALLERGIC REACTION Cause: Allergens to plasma proteins.	Usually mild. NO FEVER. Itching, hives, urticaria, erythema. Limited to muco-cutaneous symptoms only.

Transfusion reactions

ACCOUNT NUMBER	LAB NUMBER	HOSPITAL LABEL

PATIENT INFORMATION

NAME OF PATIENT:		AGE:
SURNAME:	OTHER INITIALS:	FEMALE ☐ MALE ☐
HOSPITAL NAME:	HOSPITAL NUMBER:	
DIAGNOSIS (BEFORE TRANSFUSION):		
INDICATION FOR TRANSFUSION:		
PRODUCTS TRANSFUSED:	UNIT/PACK NUMBERS:	
WAS THE BLOOD WARMED?	HOW?	
BRIEF MEDICAL HISTORY:		

REACTION DETAILS

DATE OF TRANSFUSION: D D M M Y Y Y Y	TIME:	VOLUME TRANSFUSED BEFORE ADVERSE REACTION:
ONSET OF REACTION: ☐ IMMEDIATE ☐ < 1 HR ☐ 1-2HRS ☐ < 1 HRS ☐ > 24 HRS		DATE:

CLINICAL SIGNS AND SYMPTOMS (Compulsory fields, please complete in full)

PRE-TRANSFUSION		POST-TRANSFUSION	
Temp:_____°C **Hb:**_____ **BP:**_____ **Pulse:**_____ **Sats:**_____		**Temp:**_____°C **Hb:**_____ **BP:**_____ **Pulse:**_____ **Sats:**_____	
RESTLESSNESS/ANXIETY		RESTLESSNESS/ANXIETY	
FLUSHING/SWEATING		FLUSHING/SWEATING	
FEVER		FEVER	
DIZZINESS		DIZZINESS	
NAUSEA/VOMITTING		NAUSEA/VOMITTING	
PRURITIS (ITCHING)		PRURITIS (ITCHING)	
URTICARIA (RASH)		URTICARIA (RASH)	
RIGORS (INVOLUNTARY SHAKING)		RIGORS (INVOLUNTARY SHAKING)	
HYPOTENSION (SBP DROP ≤ 30MM HG)		HYPOTENSION (SBP DROP ≤ 30MM HG)	
HYPERTENSION		HYPERTENSION	
BACK PAIN		BACK PAIN	
HEADACHE		HEADACHE	
DYSPNOEA (SHORTNESS OF BREATH)		DYSPNOEA (SHORTNESS OF BREATH)	
CHEST PAIN		CHEST PAIN	
CYANOSIS		CYANOSIS	
DECREASE IN OXYGEN SATURATION		DECREASE IN OXYGEN SATURATION	
TACHYCARDIA		TACHYCARDIA	
SHOCK		SHOCK	
WHEEZING		WHEEZING	
COLLAPSE		COLLAPSE	
JOINT/MUSCLE PAIN		JOINT/MUSCLE PAIN	
HAEMATURIA		HAEMATURIA	
FACIAL/TONGUE SWELLING		FACIAL/TONGUE SWELLING	
JAUNDICE		JAUNDICE	
OLIGURIA		OLIGURIA	
Other Symptoms:			

TREATING DOCTOR AND / OR NURSE IN CHARGE OF PATIENT

DOCTOR'S NAME:	CONTACT NO.:	SIGNATURE:
NURSE'S NAME:	WARD NO.:	DATE:
TREATMENT/MEDICATION GIVEN:		
CHEST X-RAY RESULTS:		
PATIENT OUTCOME: STABLE ☐ UNSTABLE ☐ DEMISED ☐		
IF DEMISED, STATE DATE AND TIME OF DEATH:		

Transfusion reactions

Clinical presentation and management of transfusion reactions

Reaction	Definition, clinical presentation and management
Acute transfusion reactions	Transfusion-related reactions that occur at any time during or up to 24 hours following a transfusion of blood or components. The most frequent reactions are fever, chills, pruritus or urticaria, which typically resolve promptly without specific treatment or complications
Haemolytic transfusion reactions	A reaction where there are clinical and laboratory signs of increased destruction of transfused red blood cells. Haemolysis can be intravascular or extravascular, and immediate (acute) or delayed.
Acute haemolytic transfusion reaction	Transfusion of incompatible red cells or incorrectly heated or stored red cell products causes rapid destruction of red blood cells immediately after or within 24 hours of a transfusion. Clinical and laboratory signs of haemolysis are present: increasing anaemia, haemoglobinuria, back pain, flank pain, abdominal pain, oozing at venous access sites / wounds and rise in LDH and positive DAT. Other symptoms include fever, chills, nausea, vomiting, hypotension, tachycardia, renal failure and DIC. Maintain renal function, monitor vital signs, administer saline, induce diuresis (Furosemide) and refer to haematologist or nephrologist.
Allergic transfusion reaction	This reaction is caused by allergies to plasma proteins. In some instances, infusion of antibodies from an atopic donor may also be involved. Usually mild with muco-cutaneous signs and symptoms: itching, hives, urticaria and erythema. Administer antihistamines. Commence transfusion with a new unit after liaising with the blood bank.
Anaphylactic transfusion reaction	Severe reactions due to antibodies to IgA immunoglobulins or other plasma proteins. Sudden onset with facial oedema, laryngeal symptoms (stridor, hoarseness, glottal oedema), respiratory symptoms (dyspnoea, bronchospasm), hypotension, shock, cardiac arrest and death. Explosive GIT symptoms often present. Administer adrenaline, steroids, oxygen and monitor patient. Plan future transfusions with appropriate products.

Transfusion reactions

Reaction	Definition, clinical presentation and management
Transfusion-associated dyspnoea	Respiratory distress within 24 hours of transfusion that does not meet the criteria of TRALI, TACO or severe allergic reaction (SAR) and is not explained by the patient's underlying condition. Symptomatic support is indicated.
Hypotensive transfusion reaction	A drop in systolic and / or diastolic pressure of >30mm Hg occurring within one hour of completing the transfusion, provided all other adverse reactions, as well as underlying conditions that could explain hypotension, have been excluded. Administer saline and maintain BP and IV volume.
Transfusion-associated circulatory overload	Caused by volume infusion that cannot be effectively processed / tolerated by the recipient due either to high rates or volumes of infusion or to underlying cardiac or pulmonary pathology. During transfusion, or within 6 hours (may be as long as 24 hours) after transfusion, the patient may present with acute respiratory distress (hypoxemia, dyspnoea, cyanosis), tachycardia, systolic hypertension, positive fluid balance (and increased BNP levels), congested neck veins and acute developing or worsening pulmonary oedema. Patients respond well to administration of diuretics.
Transfusion-related acute lung injury	Caused by leucoagglutinins in donor plasma. Within 4–6 hours of transfusion. Abrupt onset of fever, dyspnoea, hypotension and bilateral pulmonary oedema (in the absence of circulatory overload signs). Maintain blood pressure and cardiac output with fluid support. Ventilation support as needed. Avoid diuretic use.
Febrile nonhaemolytic transfusion reaction FNHTR	Caused by leucocyte or platelet antibodies (in recipient) to donor cells or passively transfused cytokines. Commonly found in multiparous and multi-transfused patients. Within 1–2 hours after transfusion started, the patient presents with fever, chills, headache, myalgia, malaise, tachycardia and hypertension. Isolated fever >39°C or a change of >1°C from pre-transfusion temperature, with or without rigors and chills, but without haemolysis or features of an allergic reaction. Administer antipyretics, maintain venous access and liaise with blood bank to exclude haemolytic reaction after posttransfusion investigation is completed.

Transfusion reactions

Reaction	Definition, clinical presentation and management
Bacterial contamination	Caused by transfusion of contaminated products. Rapid onset, usually around one hour after transfusion. Chills, fever, abdominal cramps, nausea, vomiting, flushed skin, hypotension, renal failure and shock. Supportive measures: Monitor vital signs, antibiotics, fluid and electrolyte support, steroids and vasopressor when indicated.
Delayed transfusion reactions	Transfusion-related reactions that occur after 24 hours following a transfusion of blood or components.
Delayed haemolytic transfusion reactions	Caused by exposing (often re-exposing) the recipient (with atypical IgG antibodies e.g. anti-Kell, anti-Duffy) to incompatible red cells. Most cases are mild and often unreported. Present within hours with severe Hb drop and jaundice (often anti-Kell) or 2–10 days post-transfusion with mild anaemia and jaundice. Renal failure or DIC may complicate the reaction. Severe reactions are treated according to patient's needs: haemodialysis for renal failure, transfusions for bleeding diathesis. Mild cases often do not need specific intervention.
Delayed serologic transfusion reaction	Demonstration of new, clinically significant alloantibodies (against red blood cells), 24 hours to 28 days after a transfusion, despite an adequate haemoglobin response to transfusion that is maintained. This is of importance for future transfusions.
Post-transfusion purpura	Caused by recipient alloantibodies against donor platelet antigens. Thrombocytopenia arising 5–12 days following transfusion of cellular blood components. Only 10% of patients present with haemorrhage. Usually presents with purpura, bruising and mucosal bleeding. Requires immediate referral and treatment with IV Gammaglobulins as the reaction may be lethal. Steroids andplasma exchange are additional options in treatment.
Transfusionassociated graft vs. host disease	The introduction of viable T-lymphocytes into a susceptible host may cause transfused lymphocytes to engraft, proliferate and destroy host cells and tissues. Within 10–30 days of transfusion, the patient presents with fever, maculopapular rash, liver dysfunction (or severe jaundice), diarrhoea, pancytopenia and bone-marrow hypoplasia. Immediate referral to specialist oncologist unit is necessary as this carries a very high mortality. The engrafted clone of lymphocytes is eradicated by chemotherapy.

Haemovigilance programme

Haemovigilance is a surveillance system that focuses on improvement of processes, procedures and prevention of the recurrence of transfusion-related reactions. This is achieved by the continuous collection and analysis of data on reactions related to the transfusion of blood products. Through analysis of data, risk is identified and corrective and preventive measures are developed and implemented. It is important to note that haemovigilance can contribute to transfusion safety only if there is a comprehensive quality system in place, based on principles of good manufacturing, laboratory and clinical (hospital) practice.

The success of the programme in contributing to safe blood supply depends on cooperation from all stakeholders and reporting of all possible transfusion reactions accurately and timeously.

Lookback programme

This programme traces any patient who received HIV- and hepatitis-negative blood from a donor whose subsequent donation is found positive for either infection (donor-initiated). The programme also investigates all reports of patients contracting infections via blood transfusions (recipient-initiated).

Patients are contacted through the hospital or their private physician and are offered further testing to determine whether an infection was transmitted via a transfusion.

Contacting the recipient is obligatory and may help prevent secondary spread to others through sexual contact. The doctor who ordered the blood transfusion is responsible for counselling and testing the recipient and for managing and treating the patient, or for referring the patient to a specialist, where appropriate. (Clinical Guidelines for the use of Blood and Blood Products in South Africa, 4th Edition). Nurses play an important part in tracing patients by checking the patient's details and by ensuring that the unit/s of blood transfused are correctly recorded in the patient's file.

Challenges faced by the Lookback programme:

- Incorrect hospital number has been written on the Blood Request Form.
- Patients supply incorrect contact information when booking in.
- Hospital file is untraceable in some provincial hospitals.
- Intensive follow-up is often required to get a response from the doctor or hospital so the case file can be closed.
- Many cases remain unresolved because there is no response from the hospital or attending doctor.

Since 2005 and the implementation of ID NAT testing, confirmed transmission of HIV/Hepatitis has been less than 3:12 00000 transfusions.

Self-quiz

1. Each and every donation is tested for viral markers.
    a) true
    b) false

2. Where can red blood cells be stored?
    a) ward fridge
    b) medication fridge if only for a short time
    c) blood bank fridge
    d) all of the above
    e) none of the above

3. When is an order for transfusion NOT required?
    a) when transfusing cryoprecipitate
    b) when transfusing albumin
    c) when the patient is a minor
    d) when the transfusion is very urgent
    e) all of the above
    f) none of the above

4. You are collecting a pre-transfusion blood sample from the patient. Which of the following instructions are correct?

    (i) The sample tube must be labelled before drawing the blood sample.
    (ii) The sample label must have at least the patient's name and another unique identifier.
    (iii) The sample label must be checked against the patient's chart not the armband as it might be wrong.
    (iv) When possible the patient should participate in the identification process.
    (v) The sample must be labelled in the presence of the patient.

    a) all are correct
    b) ii), (iv) and (v) are correct
    c) i) and (ii) are correct
    d) (iii) and (iv) are correct
    e) (i), (ii) and (v) are correct

Self-quiz

5. A 17-year-old female is admitted to Emergency after being hit by a car. She requires an immediate red blood cell transfusion for active bleeding before her blood group can be determined.

Which blood group is appropriate for this patient?

a) Group AB-positive
b) Group O-negative
c) Group O-positive
d) Group AB-negative
e) any blood group is appropriate in this urgent situation

6. Hlengiwe Ntombela is scheduled for a transfusion of red blood cells today. Before sending for the blood ensure the patient is ready by:

a) checking that IV access is ready and patent
b) verifying that Hlengiwe Ntombela has signed a consent for the blood transfusion
c) checking that the physician has written an order for the transfusion
d) all of the above
e) none of the above

7. The blood group of the patient is found on the unit.

a) true
b) false

8. Serious reactions such as acute Haemolytic transfusion reaction usually present more than 6 hours after the completion of the transfusion.

a) true
b) false

9. When administering a transfusion, the blood should initially be started slowly to…

a) detect transfusion reactions and intervene early before too much blood is transfused
b) prevent pain at the IV site
c) prevent fluid overload
d) allow the patient time to become less anxious

Self-quiz

10. You assess John Kruger after the first 15 minutes of his transfusion and notice a red rash appearing on his chest and upper arms. What do you do first?

    a) stop the transfusion and complete a patient assessment
    b) increase the rate of infusion so the transfusion will finish before the symptoms worsen
    c) slow the transfusion and reassess John in another 15 minutes
    d) check John's vital signs

11. A RCC brown in colour is safe to transfuse.

    a) true
    b) false

12. Platelets are stored at room temperature.

    a) true
    b) false

13. You began transfusing Mary Bloodworthy at 9:00. It is now 13:00 and Mary's unit of blood is ¾ transfused. What do you do?

    a) dilute the unit with saline to decrease the viscosity so that he blood will flow more easily
    b) restart Mary's IV and continue the transfusion
    c) stop the transfusion and document that Mary only received a partial unit
    d) continue the transfusion cautiously with more frequent assessments
    e) elevate the IV pole to increase the flow

14. Transfusion of ABO-incompatible blood may result in an acute haemolytic transfusion reaction.

    a) true
    b) false

15. Which patients should be pre-medicated with an antihistamine prior to transfusion?

    a) patients who have experienced a fever or rigors with a previous transfusion
    b) patients who have had prior allergic reactions from transfusion
    c) all patients should be pre-medicated to prevent uncomfortable reactions
    d) patients receiving platelets always require an antihistamine to prevent common allergic reactions
    e) all of the above
    f) none of the above

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