Blood Book
Australian Blood Administration Handbook

First edition, March 2020

Australian Red Cross Lifeblood

Disclaimer

The material in this publication has been carefully prepared by the authors and may be used as a guide. However, it is not tailored to any particular patient's circumstances, and is not a substitute for expert opinion in the making of any decisions relating to the clinical indications for blood components and products, procedures for their administration, and for management of any reactions or adverse events.

It is the intent of the authors to provide evidence-based best practice where this exists, including; the Australian Red Cross Lifeblood Blood Component Information and the Patient Blood Management Guidelines, the Australian and New Zealand Society of Blood Transfusion and Australian College of Nursing 2019 Guidelines for the Administration of Blood Products.

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Readers are encouraged to seek information and advice regarding local practices in their own institutions.

For more information, visit **transfusion.com.au**

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Australian governments fund Australian Red Cross Lifeblood to provide blood, blood products and services to the Australian community.

Contents

Blood Book
Australian Blood Administration Handbook

The Blood Book has been developed to assist Australian health professionals in safe bedside transfusion practice.

For additional information refer to national standards and guidelines, local health service, institution or hospital policies and procedures, and specific product information.

Lifeblood collects blood from unpaid voluntary Australian donors which is transformed into life-giving blood components and products.

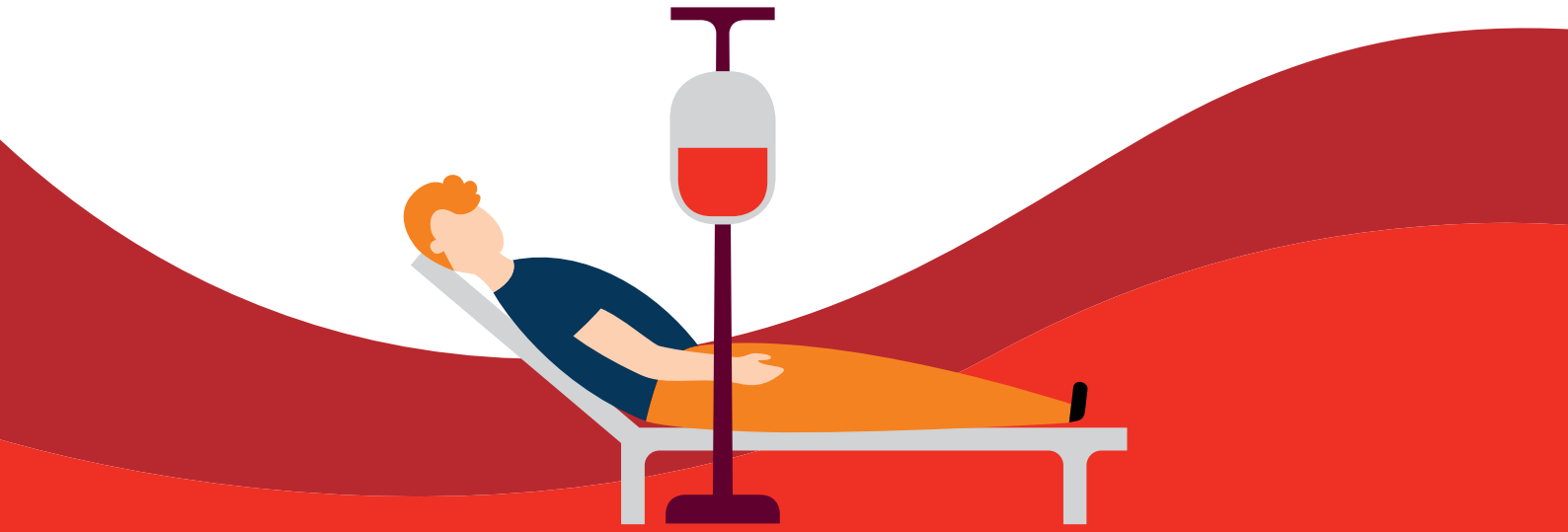
All health providers play a vital role in ensuring that blood reaches patients when and where required, is safely and appropriately administered, and wastage is minimised.

Transfusion is only one aspect of managing the patient's blood. The decision to transfuse blood must be based on individual needs and consideration of patient blood management (PBM) strategies.

PBM incorporates proactive treatment tailored to suit individual patients, using a multidisciplinary team approach to conserve a patient's own blood.

A range of information, clinician resources and the Patient Blood Management Guidelines are available on the National Blood Authority website at blood.gov.au

Australian governments fully fund Australian Red Cross Lifeblood to supply safe, high-quality blood and blood products to meet the clinical needs of Australians.



Term definitions

Blood component	Specifically used in reference to red cells, platelets, fresh frozen plasma (FFP), cryoprecipitate, cryodepleted plasma, and whole blood.
Blood product	Plasma derivative or plasma-derived proteins fractionated from large pools of human plasma under pharmaceutical conditions; for example, coagulation factors, albumin and immunoglobulins.
Must	Indicates a strongly recommended practice where compliance would be expected.
Should	Indicates a recommended practice where compliance would be expected but alternative practices may be acceptable.
May	Indicates a practice that is permitted within the context of Australian guidelines.
Unit	A measure of dosage, generally referring to a single pack.
Pack	A bag full of a particular blood component.
Blood administration set	The IV giving set/IV administration line used to administer fresh blood components.
Administration set	The IV giving set/IV administration line used to administer blood products.


A
B
O+

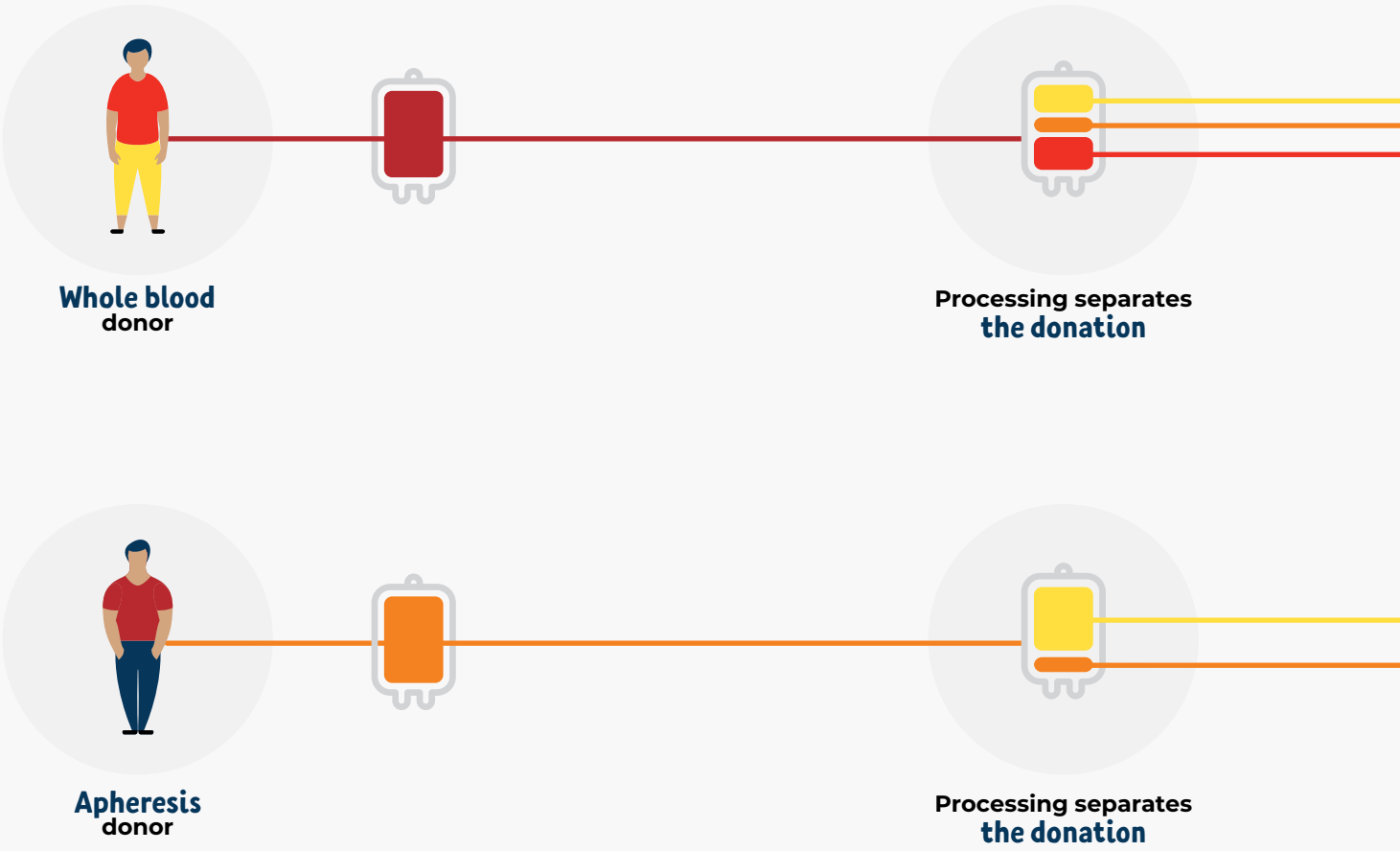
Component therapy

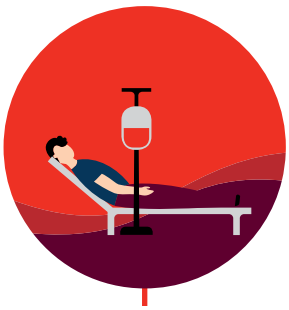
Component therapy

Your patient may require a transfusion of fresh components. These are collected by either whole blood donation or an apheresis donation of plasma and platelets.

Each component serves a specific clinical purpose and patients may receive more than one of these components, depending on their clinical requirements.

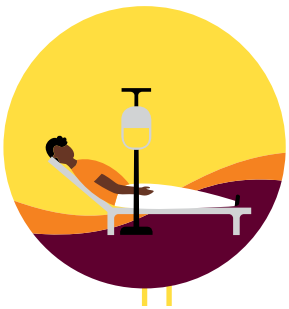
Your patient is receiving a living component that requires unique care. Safe transfusion starts with you.





A patient has a
red cell transfusion
to improve oxygen-carrying capacity

A patient has a
platelet transfusion
to prevent or stop bleeding



A patient has a
plasma transfusion
to replace clotting factors or proteins

Red cells

Pooled platelets
(From up to four donors)

Whole blood derived plasma components
FFP, cryoprecipitate, cryodepleted plasma

Apheresis platelets

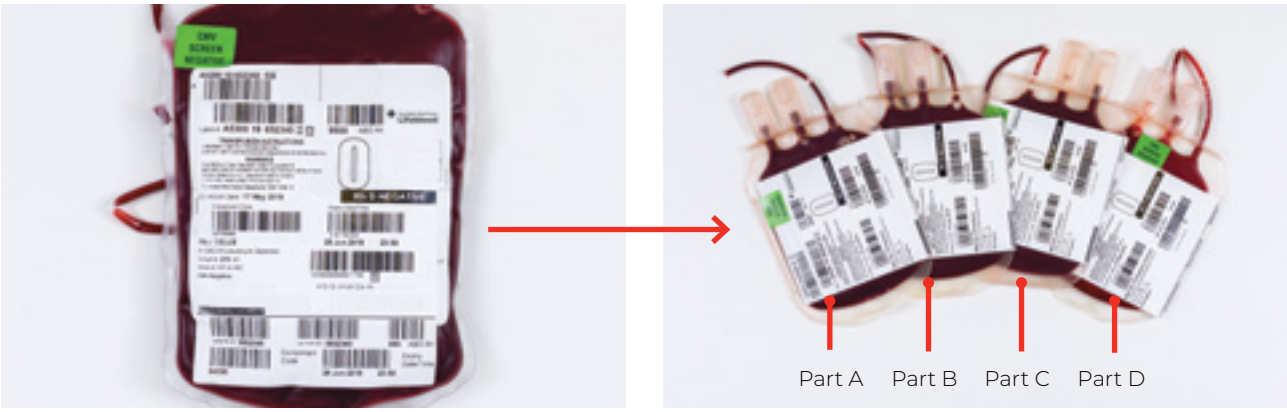
Apheresis plasma components
FFP, cryoprecipitate, cryodepleted plasma

Component therapy

Red cells

Red cell transfusions improve oxygen-carrying capacity by increasing the red cell count. Conditions that may need a red cell transfusion are anaemia caused by chemotherapy treatment, blood loss due to trauma/surgery, and inherited or acquired haematological disorders.

Types of red cell packs



Red cells

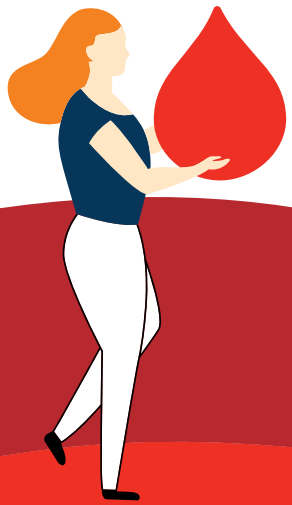
A standard red cell pack is made from one whole blood donation.

Generally, one unit will increase an average-sized (70 kg) adult's haemoglobin by approximately 10 g/L.

Paediatric red cells

A red cell pack can be divided into four smaller volume packs by Lifeblood for children, neonates and small infants to prevent multiple donor exposures and reduce blood wastage. Paediatric red cell packs are labelled Part A, B, C and D.

Fresh red cells (< 5 days old) may be indicated for neonatal and paediatric patients. See the *Patient Blood Management Guidelines: Module 6 – Neonatal and Paediatrics* for more information.



Storage

Red cells must be stored in a monitored blood refrigerator or validated shipper. Never store blood in a domestic or ward refrigerator.

To ensure integrity of the component, minimise the amount of time blood components are outside of temperature-controlled storage. Each pack should be completed prior to the labelled expiry or within four hours of removal from temperature-controlled storage, whichever is sooner.

Red cell 30-minute rule

If you have a delay in starting the transfusion remember:

< 30 minutes out of controlled storage

The pack can be returned to the Transfusion Service Provider or remote blood refrigerator. Complete the return date and time in registers.

> 30 minutes out of controlled storage

Still wanting to transfuse the patient?

The pack may be kept at the patient's bedside but transfusion must be completed within four hours from the time of removal from storage.

Not wanting to transfuse the patient?

Return the pack to the Transfusion Service Provider clearly indicating that it has been out of controlled storage for more than 30 minutes. Ensure the fate of the pack is recorded in local registers where applicable.

Red cell compatibility

Patient ABO type	Best option	OK to use	Never use
Unknown	O RhD neg	-	A, B, AB
O	O	-	A, B, AB
A	A	O	B, AB
B	B	O	A, AB
AB	AB	O, A, B	-
Patient RhD type	**Best option**	**OK to use**	**Never use***
RhD neg	RhD neg	-	RhD pos
RhD pos	RhD pos	RhD neg	-

**RhD positive red cells may be given to RhD negative males and females without child-bearing potential, but have a risk of developing anti-D antibodies. A woman of child-bearing age who is RhD negative may receive RhD positive red cells in an emergency situation but a haematologist should be consulted in regards to RhD immunoglobulin/anti-D treatment.*

A general principle is that red cell components of identical ABO group and RhD type as the patient should be used for transfusion. A current transfusion specimen is required for compatibility testing. This can be called a group and screen, group and save, or a type and screen.

The blood group of the patient and the pack should be identical. If the blood group of the red cell pack and the patient are not identical, the Transfusion Service Provider must make a specific comment indicating that it is compatible or the most suitable available.

RhD negative red cells can be given to RhD positive patients. In critical bleeding, with insufficient time to undertake full compatibility testing, group O RhD negative red cells may be used for all patients.

Component therapy

Platelets

Platelets prevent or stop bleeding by forming a plug that is held in place by clotting proteins. Patients may require platelet transfusions if they have a low platelet count or non-functioning platelets.

This could occur due to high-dose chemotherapy, bone marrow transplantation, major surgery while on platelet-inhibiting drugs, liver disease requiring surgery, severe trauma, or leukaemia and bone marrow cancers.

Types of platelet packs

Platelets (pooled and apheresis)

Platelets from four whole blood donors are collected and pooled (combined) into one pack to make a single dose (one unit).

Platelets are also collected by apheresis from a single donor. Sometimes one donor provides enough platelets to make two or three units. These units have the same donation number but are labelled Part A, B and C.

Pooled and apheresis units contain the same number of platelets. One unit will increase an average-sized adult's (70 kg) platelet count by $20x10^9/L$.

Paediatric platelets (apheresis only)

One apheresis pack can also be divided into three smaller volume paediatric packs. They have the same donation number and will be labelled with either the capital letter A, B or C and also be labelled a, b, and c.

Storage

Platelets are kept at room temperature (20–24°C). Do not refrigerate platelets, as refrigeration can affect platelet reactivity.

Before issue, platelets are stored on a single-layer rocker with continuous agitation to ensure optimal gas transport and to minimise platelet aggregation (clumping). Due to the storage at room temperature, platelets are susceptible to bacterial growth.

Transfusion of platelets should occur as soon as possible after issue from the Transfusion Service Provider.

Screening for bacterial contamination

Platelets are susceptible to bacterial growth due to being stored at room temperature.

Platelets from Lifeblood in Australia are tested for bacterial contamination. Screening detects many of the contaminated packs, however, a negative result does not exclude the possibility of contamination.

Platelets are issued as 'negative to date'; the cultures continue to be incubated over their full shelf life.

Preliminary positive results initiates a recall of packs and prompt medical review of patients if already transfused. Additional communication is provided as soon as further results are available.

Platelet compatibility

Patient ABO type	Best option	OK to use	Avoid
Unknown	O or A neg	-	B, AB
O	O	A	B, AB
A	A	B, O	AB
B	B	A, O	AB
AB	AB *(not routinely available)*	A, B	O

ABO identical and RhD compatible platelets are usually preferred. ABO non-identical platelets may be issued to patients by the Transfusion Service Provider when ABO identical platelets are unavailable.

In some circumstances, the need for special requirements such as Human Leucocyte Antigen (HLA) or Human Platelet Antigen (HPA) matching may be more important than providing the same ABO group.

If the blood group of the platelet pack and the patient are not identical, the Transfusion Service Provider must make a specific comment to indicate that it is compatible, or the most suitable available.

Platelets do not express Rh antigens but some Rh antigens are present in a pack of platelets.

RhD negative platelets can be given to RhD positive patients. RhD negative patients, especially women of child-bearing potential, where possible, should receive RhD negative platelets.

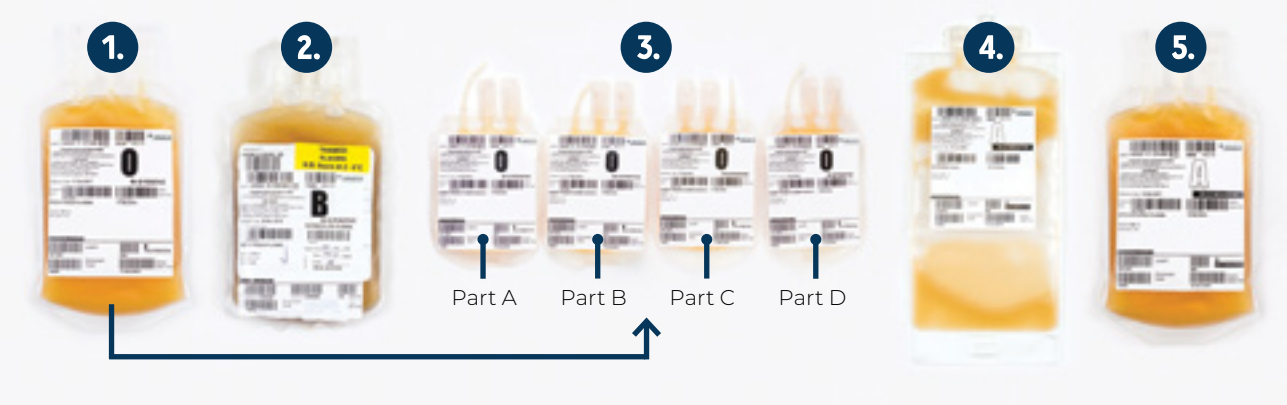
If RhD positive platelets are given to RhD negative patients, the use of RhD immunoglobulin (anti-D) may be required – consult the treating medical officer or haematologist.

Component therapy

Plasma components

Plasma is the liquid part of blood and contains antibodies, clotting proteins and albumin. It is processed to make fresh frozen plasma (FFP), cryoprecipitate, and cryodepleted plasma.

Types of plasma components



1. Fresh frozen plasma

Patients may require a fresh frozen plasma (FFP) transfusion to replace clotting factors. This may be due to massive transfusion, invasive surgery, acute disseminated intravascular coagulation (DIC), or some anticoagulants.

FFP can be derived from either a collection of whole blood or apheresis plasma. These are equivalent components. Apheresis donations may be divided into two or three packs. These units have the same donation number but are labelled Part A, B and C.

2. Extended life plasma

Some Transfusion Service Providers may thaw and keep FFP in a monitored blood fridge for up to five days. This is to enable the issuing of thawed plasma in time-critical situations and is now called extended life plasma (ELP). A label must be attached to the ELP showing the change in component name, new component code, thawing date and time, expiry date andtime and the identity (initials) of person who re-labelled the pack.

3. Paediatric fresh frozen plasma

Plasma derived from a single pack of whole blood is divided into four packs of smaller but equal volume. This reduces the donor exposure for small paediatric transfusions and minimises wastage. All units have the same donation number and are labelled Part A, B, C and D.

4. Cryoprecipitate

Patients may require cryoprecipitate transfusions to treat low fibrinogen caused by critical bleeding or DIC. One unit of apheresis cryoprecipitate is equivalent to approximately two whole blood derived units of cryoprecipitate.

5. Cryodepleted plasma

Cryodepleted plasma is the plasma remaining after cryoprecipitate has been removed from FFP. Cryodepleted plasma can be a substitute in some situations for warfarin reversal and during plasma exchange used to treat thrombotic thrombocytopenic purpura.

Storage

Plasma components are stored at -25°C or below for up to 12 months. Once thawed, FFP and ELP are stored in a blood fridge. Once thawed, cryoprecipitate should be maintained at room temperature between 20–24°C (do not refrigerate).

Transfusion of thawed plasma components should be started as soon as possible after issue from the Transfusion Service Provider.

Expiry dates of plasma

Plasma components have two expiry dates – one from the time of freezing and the other from the time of thawing. Some Transfusion Service Providers will place an updated expiry label over or in addition to the expiry date from freezing. Check the updated expiry date and time on the pack label and patient compatibility label carefully prior to administration and always ensure that the shortest expiry has not been breached.

Thawing devices

Specialised warming equipment is used for thawing plasma components. Thawing should only be performed by the Transfusion Service Provider and typically takes around 30 minutes.

Plasma compatibility

Patient ABO type	Best option	OK to use	Avoid
Unknown	AB	A	B
O	O	A, B, AB	-
A	A	AB	B
B	B	AB	A
AB	AB	-	A, B

Plasma components should be compatible with the patient's ABO group. If the blood group of the plasma pack and the patient are not identical, the Transfusion Service Provider must make a specific comment to indicate that it is compatible, or the most suitable available.

Group AB plasma may be used for all patient ABO groups and may be transfused without regard to RhD type.

In an emergency, adult patients may receive group A plasma if AB plasma is unavailable or in short supply as per local health service policies.

Low titre products

Plasma components that have low titre anti-A and/or anti-B pose a lower risk of causing clinically significant haemolysis when transfusing ABO incompatible plasma components. Where Lifeblood testing indicates a low titre of anti-A and/or anti-B, the clinical plasma components have a modifier, "Low anti-A/B", printed on the plasma pack label to enable selection of the components. The modifier will not be applied to group AB components as these donations do not have anti-A or anti-B.

Component therapy

Special requirements

In some circumstances, patients require additional testing or modifications to blood components. The treating physician is responsible for prescribing and documenting a patient's special requirements.

Always remember to check national guidelines and your local health service policy about which patient groups have special requirements.

Always notify the Transfusion Service Provider as soon as possible, as some special components are difficult to source.

1. Leucocyte depletion

All red cells and platelets issued by Lifeblood in Australia are leucocyte (white cell) depleted. This process removes ≥ 99% of the leucocytes, reducing the risk of transmission of cytomegalovirus (CMV), febrile non-haemolytic transfusion reactions, and HLA alloimmunisation.

2. Cytomegalovirus (CMV) seronegative

CMV is a common virus carried by white cells. CMV infections may lead to severe or fatal disease in immunosuppressed patients. CMV negative components are usually only needed for certain patient groups and neonates. Some donors have never been exposed to CMV and are seronegative. Selected donations are tested for CMV antibodies and are labelled CMV negative.

3. Irradiation

Irradiation kills any residual T-lymphocytes in red cell or platelet components. All platelets issued by Lifeblood in Australia are irradiated. Irradiation prevents transfusion-associated graft-versus-host disease (TA-GVHD).

Irradiation increases damage to the red cells and reduces shelf life and is only used in some patients such as: premature and small neonates, neonates who require exchange transfusions or who have had intrauterine transfusions, bone marrow or stem cell transplant recipients, patients receiving certain immune-suppressing drugs, and patients with some congenital immunodeficiencies.

A radiation sticker on the component has the word "not" in the red area prior to irradiation. Once the pack has been irradiated, the red area turns black. The component label also denotes that it has been irradiated.

Washed red cells

This is a special requirement needed by patients who have repeated transfusion reactions.

Washing of red cells removes unwanted plasma proteins, including antibodies. The plasma proteins can cause allergic reactions and/or the development of red cell antibodies. Washing also removes white blood cells and platelets. Washing will reduce the shelf life of the product.

IgA deficient

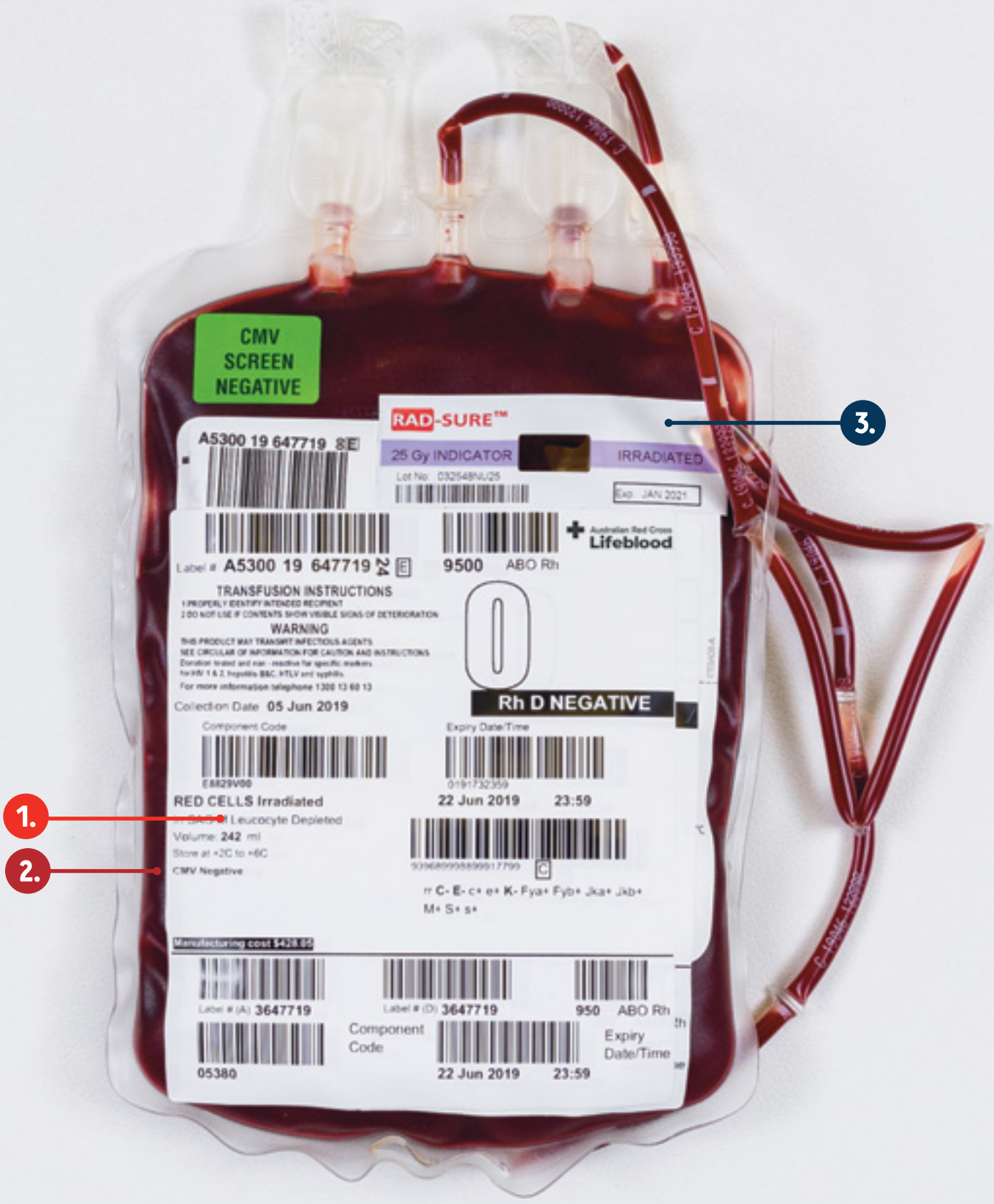
Immunoglobulin A (IgA) deficient components are used in consultation with a haematologist or immunologist for IgA deficient patients with a history or risk of anaphylactic transfusion reactions. Red cells are washed to provide IgA deficient product. IgA deficient platelet and plasma components are sourced from IgA deficient donors.

Human leucocyte antigen matched

HLA-matched platelet transfusions are sometimes required for patients with HLA alloimmunisation (antibodies) causing refractoriness (suboptimal increase in platelet count) to random donor platelets. HLA-matched platelets need to be ordered in advance.

Human platelet antigen matched

HPA-matched platelet transfusions are sometimes required for patients with fetomaternal alloimune thrombocytopenia or post-transfusion purpura. HPA platelets need to be ordered in advance.


CMV SCREEN NEGATIVE
RAD-SURE™
25 Gy INDICATOR
IRRADIATED
A5300 19 647719
Label # A5300 19 647719
9500 ABO Rh
Lifeblood
TRANSFUSION INSTRUCTIONS
WARNING
O
Rh D NEGATIVE
Collection Date 05 Jun 2019
Component Code
Expiry Date/Time
E8829V00
22 Jun 2019 23:59
RED CELLS Irradiated
Leucocyte Depleted
Volume: 242 ml
Store at +2C to +6C
CMV Negative
r' C- E- c+ e+ K- Fya+ Fyb+ Jka+ Jkb+ M+ S+ s+
Manufacturing cost $428.85
Label # (A) 3647719
Label # (D) 3647719
950 ABO Rh
05380
Component Code
Expiry Date/Time
22 Jun 2019 23:59
1.
2.
3.

Component administration

Component administration

Preparation for transfusion

Organise yourself and your patient for a safe transfusion. Preparing for the unexpected may minimise adverse outcomes for the patient.

Blood transfusions should be administered in an environment where any problems can be dealt with quickly and appropriately.

The preparation process

Ensure staff and equipment are available and transfusion is occurring in a safe clinical area

Check resuscitation equipment is available and in working order, and that emergency medical support is readily available.

Ensure all transfusion equipment is:

- approved for its intended use in blood component transfusion
- in date and has been checked
- used following the manufacturer's recommendations and specifications for use, and
- used in keeping with local health service policy.

See pages 19–21 for detailed equipment information.

Ensure informed consent discussion has occurred and has been documented

All blood transfusions must have a valid informed consent. It can be provided by the patient, parent or legal guardian, or follow the emergency medical procedure consent protocols. A dialogue about reasons for transfusion and expectations of clinical outcomes must take place between the clinician and the patient or guardian. Any information provided should be in line with the patient or guardian's literacy level and in a way they can understand.

Consent must be documented in the patient's medical record and/or on a transfusion-specific consent form in accordance with local health service policy.

Refer to your local health service policy regarding consent processes for blood transfusion, including inability to obtain consent and for patients who refuse. All elements of the consent process should be aligned to local, state or territory and national requirements.

Ensure prescription is complete and valid

The treating physician is responsible for completing the prescription and documenting any special requirements. If the precription is incomplete, obtain this from the prescribing physician.

Ensure IV access is patent and appropriate to use

If uncertain, consult with your senior nurse or medical officer.

Ensure correct patient ID band is attached to the patient

Ask the patient (if conscious and competent) to state and spell their first and family names in full, state their date of birth (DOB), and ensure the information is identical on the identification band.

Ensure the patient understands procedure and possible adverse events

The person administering the component should ensure the patient understands the transfusion procedure, including symptoms of possible transfusion reactions.

Record baseline observations

Within the 60 minutes before commencement of each pack, record patient temperature, pulse, respirations, blood pressure and general patient status including any pre-existing rashes.

Administer premedication if ordered

If any premedication has been ordered, ensure it has been administered at the appropriate time prior to commencing transfusion.

Ensure circumstances are appropriate to proceed

If uncertain, consult with your senior nurse or medical officer.

Transfusion equipment

Blood administration sets

Approved blood administration sets must be used for all blood components. Blood administration sets must incorporate a 170–200 micron filter to remove clots and debris.

A syringe may be used for paediatric transfusions provided the component is drawn into the syringe via a 170–200 micron filter.

Blood component packs should be mixed thoroughly by gentle inversion prior to administration.

Blood component or 0.9% sodium chloride solution (normal saline) must be used to prime the blood administration line following the manufacturer's recommendations.

Blood administration sets must be changed when transfusion is completed, or every 12 hours and in accordance with the manufacturer's recommendation.

Multiple packs of the same component type can be administered through the same administration set.

Blood administration sets should not be 'piggy-backed' into other lines. It is acceptable to attach the set to extension tubing on an IV cannula.

Compatible IV solutions

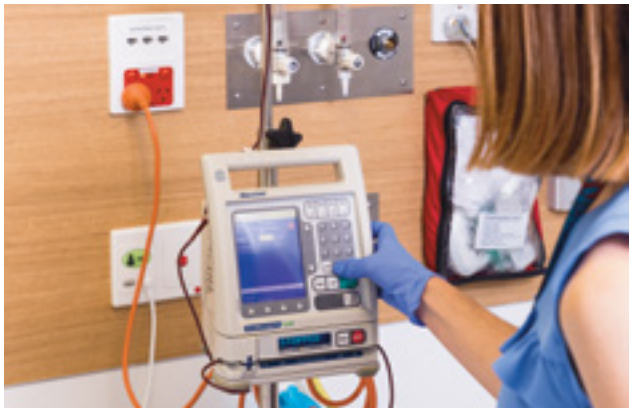
Red cells

- ✓ 0.9% sodium chloride solution (normal saline), albumin 4% or ABO compatible plasma.
- ✓ Current formulation of GELOFUSINE® (available in Australia) as stated in the product information.
- ✗ Electrolyte and colloid solutions containing any calcium (e.g. Hartmann's solution or lactated Ringer's solution). These solutions should not be administered with blood components collected in an anticoagulant containing citrate as they may cause clotting in the infusion line.
- ✗ 5% glucose (dextrose) in water or hypotonic sodium solutions may cause red cells to haemolyse.

Platelets and plasma components

- ✓ 0.9% sodium chloride solution (normal saline).
- ✗ Electrolyte and colloid solutions containing any calcium (e.g. Hartmann's solution or lactated Ringer's solution). These solutions should not be administered with blood components collected in an anticoagulant containing citrate as they may cause clotting in the infusion line.

Transfusion equipment *continued*



Pumps

Pumps are commonly used when free flow via gravity is unreliable or where controlled flow rates are required e.g. paediatric transfusion.

The pump line must incorporate an approved blood administration filter.

The device and its settings must be included as part of the standard checking procedure and throughout the transfusion.

The pump settings and volume being delivered must be monitored hourly throughout the administration process.

Any adverse reactions/outcomes as a result of pump use must be notified to the appropriate authority in accordance with local health service policy.

Syringe drivers

Syringe drivers may be useful for small volume transfusions e.g. neonatal transfusion.

If a syringe driver is used, the configuration must ensure that blood components pass through an approved blood administration filter.

Aseptic technique must always be maintained and the syringe must be labelled with correct patient details to ensure proper patient identification, and time of preparation for optimum product viability.

Blood component warmers

Most patients can receive blood components at the temperature provided from the Transfusion Service Provider. Indications for using blood warmers include:

- patients with clinically significant cold agglutinins
- large-volume rapid transfusions
- exchange transfusions
- plasma exchange for therapeutic apheresis in adults
- intrauterine transfusions (at the discretion of the feto-maternal specialist)
- trauma situations in which core-rewarming measures are indicated, and
- the patient rewarming phase during cardiopulmonary bypass surgical procedures.

When using blood warmers, ensure the following:

- Blood warmer administration sets must incorporate an approved blood administration filter.
- Blood administration sets used with warmers must be primed prior to use.
- Only approved blood warming devices should be used - improvised devices must never be used.
- The operating temperature of the blood warmer must be recorded on the patient's infusion record.

Rapid infusion devices

Rapid infusion devices are used to warm and administer blood rapidly (e.g. during critical bleeding/massive transfusion).

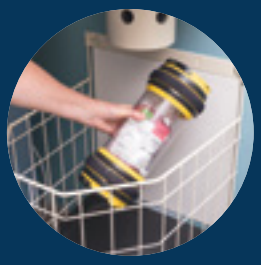
These devices must be operated strictly according to the manufacturer's instructions and local health service policy.

Blood component collection

Appropriate checking procedures when collecting blood components reduces the risk of transfusion of the wrong component to the wrong patient.

How and where does collection occur?

Your Transfusion Service Provider



Pneumatic tube

Shipper

Remote blood fridge

The collection process

Collection should only take place when you are ready to begin the transfusion.

Always remember to:

- Collect one pack at a time (except in an emergency) to avoid wastage and reduce the risk of wrong transfusion.
- Take documented patient details and product type to collect pack.
- Ensure all patient details, including first name, family name, DOB, and medical record number, match the details on the pack.
- Ensure that you have collected the prescribed component.
- Ensure the pack is within expiry date and time and check for any visible leaks at ports and seams, and that there is no evidence of haemolysis, unusual discolouration, cloudiness or visible clots.
- Ensure the attached compatibility label has the same donation number as the component label.
- Ensure all documentation for the removal/ collection of the blood component has been completed.
- If any discrepancies arise, do not proceed and contact the Transfusion Service Provider.

Component administration

Patient, prescription and pack check

This is the last step of the transfusion process to ensure the right component is transfused to the right patient.

Overview

Each individual undertaking the administration of blood components should have an understanding of their roles and responsibilities.

Two staff members must independently perform uninterrupted checks at the patient's side immediately prior to transfusion.

If there is any interruption or a delay, the checking process must be repeated.

Prior to administration, both clinicians must compare, confirm and be individually satisfied that this is the right pack for the right patient.

One of the two people involved in the checking process must spike and hang the blood component immediately after checking.

Patient identification

Where possible, involve the patient in the identification checks by asking them to state and spell their first and family names in full, state their DOB, ensure the information is identical on the identification band.

If the patient is not able to participate, ask a parent, guardian or carer to verify the patient's identity.

If the patient's identity cannot be confirmed, follow local health service policy.

For the purpose of checking identity, sometimes neonates are known as 'baby of' until they have been given a legal name. In the event that the neonatal patient's identification details change, a new identification band must be attached to the patient.

Inspect the pack

Ensure the pack and component is suitable for transfusion:

- within expiry date and time
- no visible leaks at ports and seams
- no evidence of haemolysis, unusual discolouration or cloudiness, and
- no visible clots.

Note: MRN as a patient identifier

Where provided, the MRN should be considered as a third patient identifier and must be consistent on the documentation and patient identification band. In some circumstances, the MRN may not be available on a compatibility label as a third patient identifier; for example, when pretransfusion testing is requested as an outpatient before admission, or when the MRN is not provided to a private pathology transfusion service by a health service. When MRN is not present on the compatibility label, refer to your local health service policy for guidance.

1.

Check:
Patient and pack labels

Patient and compatibility label

Make sure the patient's identification band details are identical to information on the compatibility label attached to the pack. These include:

- patient first and family name
- patient DOB, and
- patient medical record number (MRN) (*see Note*).

Compatibility and component labels

Compare the compatibility label attached to pack with the component label attached to the pack:

- donor identification numbers are identical, and
- ABO blood group is compatible.

2.

Check:
Patient and prescription

Compare all patient identifiers and ensure they are identical on identification band and prescription, including:

- patient first and family name
- patient DOB, and
- patient medical record number.

3.

Check:
Prescription and pack labels

Compare all patient identifiers and ensure they are identical on prescription and compatibility label including:

- patient first and family name
- patient DOB, and
- patient medical record number (*see Note*).

Compare blood component type and ensure it is the same as that on prescription.

Ensure that any special requirements have been met.

Blood component administration

Timely and safe transfusion reduces the waste of a precious resource and ensures the patient receives the desired outcome.

Always maintain aseptic technique. Adverse transfusion reactions can occur, so it is vital to be aware of potential adverse transfusion reactions and their clinical presentations.

One of the two people involved in the checking process must spike and hang the blood component immediately after checking.

Time of infusion

Start administering the component as soon as possible after leaving controlled temperature storage. Start each pack slowly, where possible and clinically appropriate.

The rate of infusion can be increased after 15 minutes, to the maximum infusion rate defined in accordance with the prescription, provided there are no signs or symptoms of an adverse reaction. Confirm blood component specific infusion rates with the prescription. For stable patients, start slowly and usually administer:

- **Red cells:** 2–3 hours per pack
- **Platelets:** 30 minutes per pack
- **Fresh frozen plasma:** 30 minutes per pack
- **Cryoprecipitate:** 30–60 minutes per dose

The transfusion must be completed within four hours and/or prior to component expiry (whichever is sooner). If the transfusion is likely to take over four hours, consult the senior nurse or medical officer.

Observations

Frequent visual observations during transfusion is essential to identify signs of reactions or adverse events.

The patient must be observed closely for the first 15 minutes of each pack and at least hourly throughout the transfusion. The need for more frequent vital signs will depend on the patient's clinical status, location and local health service policy.

Temperature, pulse, respirations and blood pressure must be recorded prior to transfusion, 15 minutes after commencement, and on completion of each pack (or as otherwise stipulated by the local health service policy).

Report any reactions and/or adverse events to hospital incident management systems.

Identification and management of transfusion reactions

It is important to **recognise**, **respond** to, and **report** adverse events. Speed is essential because of the possible life-threatening nature of acute transfusion reactions.

The most common immediate signs of a transfusion reaction are fever, chills and urticaria. During the early stages of a reaction, it may be difficult to ascertain the cause. The most serious reactions include:

- acute and delayed haemolytic transfusion reactions
- septic/febrile reaction due to bacterial contamination of blood packs
- anaphylaxis
- transfusion-related acute lung injury (TRALI), and
- transfusion-associated circulatory overload (TACO).

Management of suspected transfusion reactions

The following is meant as a guide only.
Always know and follow your local health service policy.

1. Stop the transfusion immediately.
2. Check vital signs, provide emergency care and seek urgent medical advice e.g. Medical Emergency Team (MET), if required.
3. Maintain current IV access but do not flush existing administration line (use a new administration line if required).
4. Repeat all clerical and identity checks of the patient and blood product.
5. Notify the medical officer and Transfusion Service Provider.
6. Continue to monitor and record temperature, pulse, respirations and blood pressure as well as colour and volume of any urine passed (looking for evidence of haemoglobinuria).
7. After the transfusion is terminated (except for some types of mild reactions), send freshly collected blood and urine samples, blood component and blood administration line (connected, clamped and sealed for safe transport) as required by the Transfusion Service Provider.

For more specific acute transfusion reactions see Appendix 1: Acute Transfusion Reactions on page 54.

Administration of medications during a transfusion

Local health services must have a policy regarding administration of medications during transfusion. Medication must not be added to the blood component or blood administration line.

Medication may interact with the anticoagulant, additive solutions, or the blood component contained in the pack.

A break in integrity of the infusion line may increase the risk of bacterial contamination of the component.

Be aware that medications can cause an adverse reaction and it will be difficult to distinguish between medication or transfusion as the cause of an adverse event.

Analgesia and blood

The following exception has been shown to not adversely affect red cell transfusions.

Co-administration of morphine, pethidine and or ketamine diluted only in 0.9% sodium chloride solution (normal saline) for patient-controlled analgesia or by continuous side arm infusion incorporating a non-reflux valve.

Follow local health service policy regarding the co-administration of patient-controlled analgesia and red cells.

If continous IV medication needs to be administered:

- use another lumen of a multi-lumen central venous access device if available, or
- use or insert another IV cannula for continuous drug administration required.

If IV medication needs to be administered intermittently:

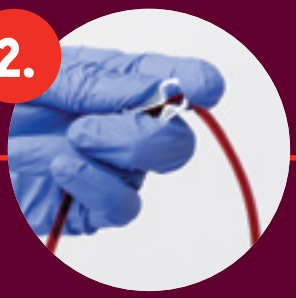
1. Stop the transfusion.
2. Ensure the line is clamped above injection port.
3. Flush the line with 0.9% sodium chloride solution (normal saline) using the injection port closest to the patient (to clear blood from IV port and tubing).
4. Administer the medication.
5. Flush the line again with 0.9% sodium chloride solution (normal saline).
6. Unclamp the line and restart the transfusion.

Ensure that this procedure does not result in the transfusion exceeding four hours.

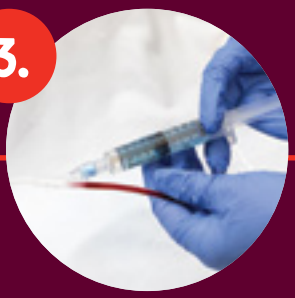
Intermittent administration of IV medication

1. 

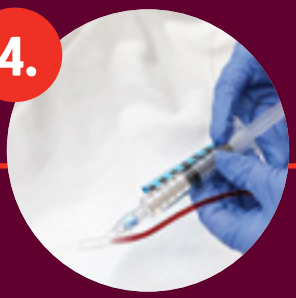
Stop the transfusion

2. 

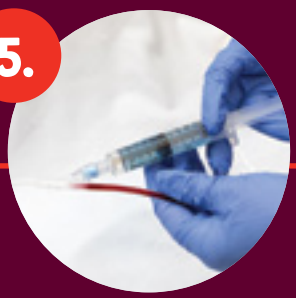
Clamp the line above the closest injection port to the patient

3. 

Flush the line with 0.9% sodium chloride (normal saline)

4. 

Administer the medication

5. 

Flush the line again with 0.9% sodium chloride (normal saline)

6. 

Unclamp the line and restart transfusion

⚠ Always remember:

Ensure that administering medication does not result in the transfusion exceeding four hours.

Post-transfusion processes

Good documentation of transfusion allows for easy and accurate review of records when required. Adverse reactions may occur after the transfusion has been completed so it is important to involve the patient in post-transfusion education.

Completing the transfusion

Consider a minimum volume flush to clear the blood administration line, ensuring the patient receives the entire component. Exercise caution in at-risk patients, i.e. neonates, infants and patients who are at risk of circulatory overload.

Monitor the patient as required post-transfusion.

Document outcomes, start and finish times, blood donation number, and any adverse events.

If the transfusion is completed uneventfully, discard the empty pack in accordance with the local health service policy for disposal of clinical/ biological waste.

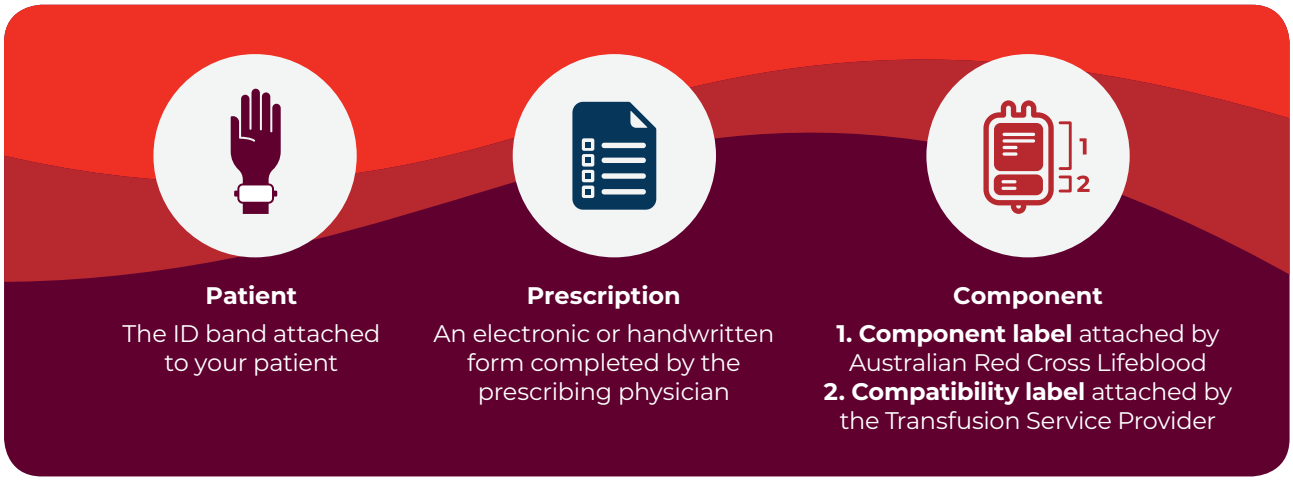
If there is any suspicion of a transfusion reaction, the Transfusion Service Provider must be informed of the clinical details. If the component has already been discarded, do not retrieve from waste.

For patients undertaking a transfusion at a day treatment centre, local health services should have a policy in place regarding the appropriate amount of time the patient needs to be observed after the transfusion. The patient should be aware who to contact if there are issues following the transfusion.

Component administration

Blood component administration checklist

Familiarise yourself



Patient
The ID band attached to your patient

Prescription
An electronic or handwritten form completed by the prescribing physician

Component
1. Component label attached by Australian Red Cross Lifeblood
2. Compatibility label attached by the Transfusion Service Provider

Remember

You must verify the patient's identity at each stage of the administration process. Ask the patient (if conscious and competent) to state and spell their first and family names in full, state their DOB, and ensure the information is identical on the identification band.

Ensure each outcome is OK before proceeding

1 Preparation for transfusion	Outcome	If 'NO' complete the following action
Staff and equipment are available	☐ OK ☐ NO	Ensure these are sufficient and transfusion is being performed in a clinical area
Informed consent discussion has occurred and is documented	☐ OK ☐ NO	Confirm that the patient understands the procedure and consent has been obtained
Prescription is valid	☐ OK ☐ NO	Obtain valid prescription
IV access is patent	☐ OK ☐ NO	Ensure IV access is patent and sufficient
Patient ID band is attached and correct – ask the patient or carer if possible	☐ OK ☐ NO	Ensure correct patient ID band is attached
Record baseline observations in the 60 minutes before transfusion	☐ OK ☐ NO	Observe and record temperature, pulse, respirations, blood pressure, and any rashes
Administer premedication if ordered	☐ OK ☐ NO	Administer premedication
Appropriate to transfuse the patient at this time	☐ OK ☐ NO	Consult senior nurse/medical officer

Ensure each outcome is OK before proceeding

2 Blood component collection	Outcome	If 'NO' complete the following action
Collect pack only when ready to start transfusion	☐ OK ☐ NO	Leave pack in appropriate storage until ready to start transfusion
Documented patient identification, component type and special requirements details are present	☐ OK ☐ NO	Take documented patient identification, component type and special requirements details to collect pack
Collect the prescribed blood component	☐ OK ☐ NO	Obtain the prescribed blood component from Transfusion Service Provider/blood fridge/ pneumatic tube
Check special requirements (if any) on the prescription have been met	☐ OK ☐ NO	Do not proceed and contact Transfusion Service Provider
Check documented patient details and compatibility label attached to pack are identical	☐ OK ☐ NO	Do not proceed and contact Transfusion Service Provider

3 Patient, prescription and pack check	Outcome	If 'NO' complete the following action
Inspect pack for: • Leaks or splits • Clots, discolouration, cloudiness • Expiry date and time	☐ OK ☐ NO	Do not proceed and contact Transfusion Service Provider **Note:** Fresh frozen plasma (FFP) and cryoprecipitate will have two expiry dates; one when frozen and another date once thawed. Use the date that expires first.
Identical patient, component and compatibility labels: • Patient first and family names • Patient DOB • Patient MRN/URN • ABO blood group compatibility • Blood donation number	☐ OK ☐ NO	Involve the patient, if possible. If any discrepancies arise, do not proceed and contact Transfusion Service Provider or senior nurse or medical officer.
Identical patient and prescription: • Patient first and family names • Patient DOB • Patient MRN/URN	☐ OK ☐ NO	Do not proceed and contact Transfusion Service Provider or senior nurse or medical officer
Identical prescription, component and compatibility labels: • Patient first and family names • Patient DOB • Patient MRN/URN • Component type • Special requirements met (if any)	☐ OK ☐ NO	Do not proceed and contact Transfusion Service Provider or senior nurse or medical officer
All above checks were performed uninterrupted by two independent checkers and have been documented. Both must compare and confirm this is the right pack for the right patient.	☐ OK ☐ NO	Do not proceed and perform all above checks again and document

4 Blood component administration	Outcome	If 'NO' complete the following action
Blood component administration to be started by a person who has completed all checks	☐ OK ☐ NO	Do not proceed and perform all checks before starting administration
Start component as soon as possible and within 30 minutes of leaving controlled temperature storage	☐ OK ☐ NO	If transfusion is proceeding, the component should be completed within four hours of being removed from approved storage. If transfusion is not proceeding, contact Transfusion Service Provider.
Patient vital signs monitored throughout the transfusion	☐ OK ☐ NO	Monitor and record patient temperature, pulse, respirations, blood pressure, and any rashes. Recognise, respond to and report any adverse events.
Administer component as per prescription specific infusion rates	☐ OK ☐ NO	Confirm blood component specific infusion rates with prescriber. For stable patients start slowly and usually administer: • Red cells: 2–3 hours per pack • Platelets: 30 minutes per pack • FFP: 30 minutes per pack • Cryoprecipitate: 30–60 minutes per dose
Transfusion completed within four hours and/or prior to component expiry	☐ OK ☐ NO	Consult senior nurse/medical officer if transfusion likely to take over four hours

5 Post-transfusion processes	Outcome	If 'NO' complete the following action
Ensure patient has received all the prescribed component	☐ OK ☐ NO	Consider clearing IV line with minimum volume of 0.9% sodium chloride solution (normal saline). Exercise caution in at-risk patients, i.e. neonates, infants, patients at risk of circulatory overload.
Monitor patient as required post-transfusion	☐ OK ☐ NO	Monitor patient according to local protocols and clinical indications post-transfusion
Dispose of blood component pack safely if transfusion uneventful	☐ OK ☐ NO	Dispose of blood component pack as per local health service protocols
Complete documentation: • Start and finish dates and times • Blood donation number • Transfusion observations and outcomes in patient records (electronic/paper)	☐ OK ☐ NO	Complete all relevant documentation

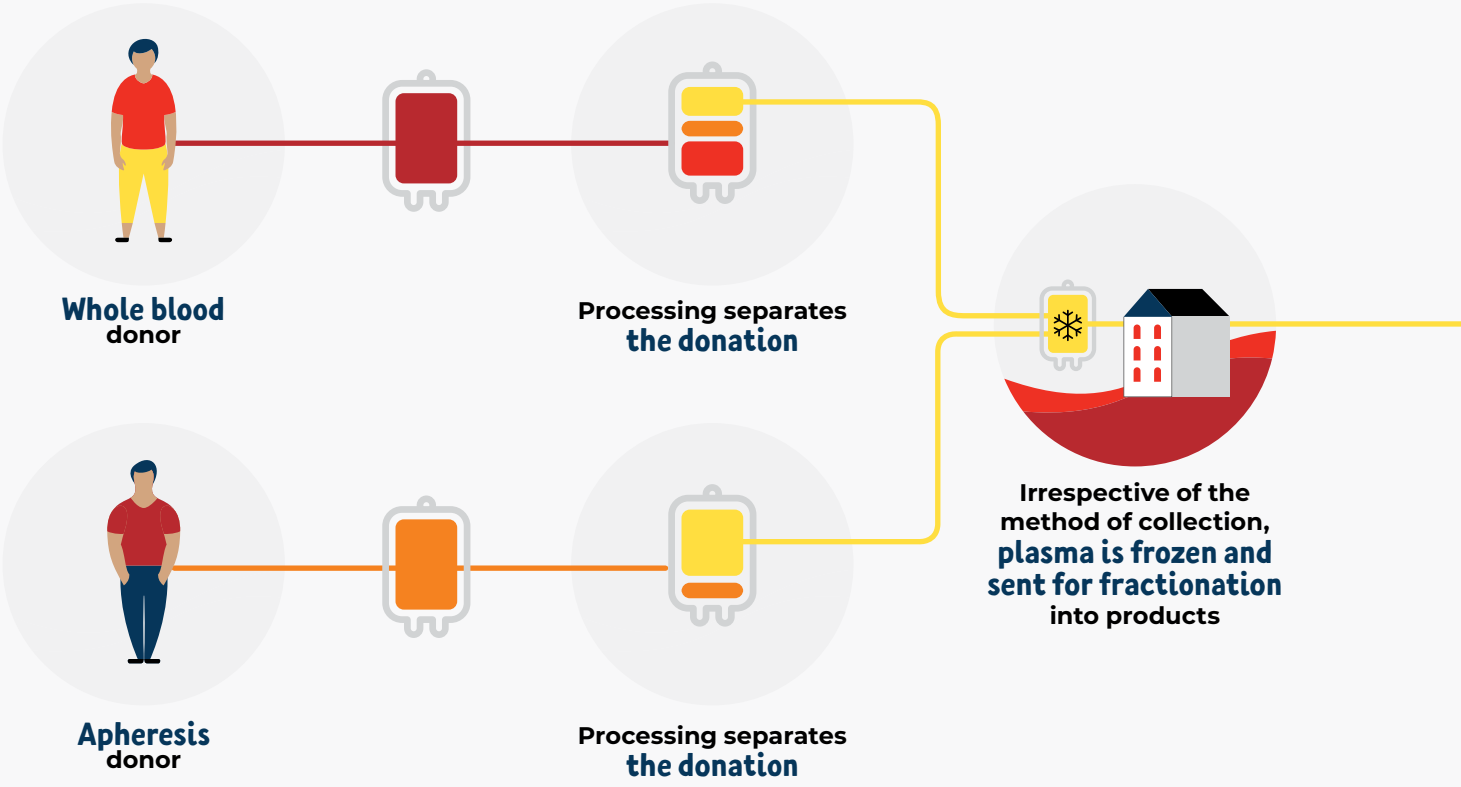
Product therapy and administration

Product therapy

Your patient may require one or more of the available fractionated plasma products, depending on their clinical requirements.

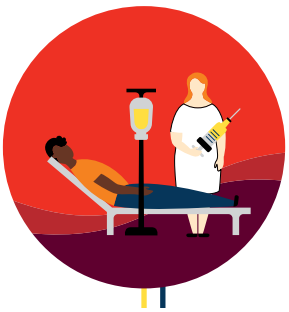
Plasma products are not interchangeable. Each manufacturer has slightly different formulations, may use different stabilisers, and are available in different concentrations. Patients must receive the specific named product at the specified concentration and route of administration (intramuscular, intravenous and subcutaneous).

Your patient is receiving a blood product made from donated plasma. Safe infusion starts with you.



A patient is given
immunoglobulins
to treat either immune deficiencies, autoimmune conditions, or treat or prevent specific conditions

A patient is given
albumin
to maintain the balance of fluid



A patient is given
clotting factors
to prevent or treat bleeding or clotting from specific deficiencies

Immunoglobulins

Albumin

Plasma-derived clotting factors

Recombinant clotting factors

Plasma derived vs recombinant clotting factors

Clotting factors can be made from two sources: pooled donor plasma which is then manufactured by fractionation like other plasma products; or by genetically engineered cell lines, which are called recombinant products.

Product therapy and administration

Immunoglobulins

Immunoglobulins are products that contain human antibodies made from donor plasma. The plasma is pooled and processed by 'fractionation'.

Immunoglobulins treat patients with a range of immune deficiencies, autoimmune conditions and can treat and prevent specific conditions.

Types of normal immunoglobulins

Normal immunoglobulins are solutions of human plasma proteins with broad spectrums of antibody activity. They treat patients with a range of immune deficiencies and autoimmune conditions. The following types are available:

Intravenous immunoglobulins (IVIg)

The current IVIg product made from Australian donated plasma is **Intragam 10** (shown above). Imported IVIg products can be found on the National Blood Authority website.

Subcutaneous immunoglobulins (SCIg)

The current SCIg product made from Australian donated plasma is **Evogam 16%** (shown above). Imported SCIg products can be found on the National Blood Authority website.

Normal immunoglobulin-VF

Used for public health disease control activities to treat susceptible contacts of an indicated infectious disease (hepatitis A, measles, poliomyelitis or rubella). Normal Immunoglobulin-VF is for intramuscular use only.

Types of specific immunoglobulins

Specific immunoglobulins have high levels of specific antibodies and are used to treat or prevent specific conditions. The following products are available:

CMV Immunoglobulin-VF

Used to prevent and treat CMV infection following bone marrow and renal transplants. CMV Immunoglobulin-VF must be administered intravenously only.

Hepatitis B Immunoglobulin-VF

Used to prevent hepatitis B infection in people who have been exposed to hepatitis B virus and have not been vaccinated. Hepatitis B Immunoglobulin-VF is available in 100 IU or 400 IU and is an intramuscular solution. It should not be administered intravenously.

Tetanus Immunoglobulin-VF

Tetanus Immunoglobulin-VF is available for intravenous injection and intramuscular injection. The IV solution is used for the treatment of clinical tetanus. The IM solution is used for passive protection of individuals who have sustained a tetanus-prone injury and it has been over 10 years (or unknown) since last vaccination.

RhD immunoglobulin-VF (anti-D)

Used for prevention of haemolytic disease of the newborn (HDN). RhD immunoglobulin is only given to an RhD negative woman. Two dose sizes are available of RhD Immunoglobulin VF: 250 IU and 625 IU for intramuscular use only.

Rhophylac® (anti-D)

Used for prevention of haemolytic disease of the newborn (HDN). RhD immunoglobulin is only given to an RhD negative woman. It is used for the infrequent occasions when intravenous administration of RhD immunoglobulin is required.

Zoster Immunoglobulin-VF

It is used to prevent varicella zoster virus in immunocompromised patients, pregnant women and neonates. Zoster Immunoglobulin-VF is available as a 200 IU vial and is an intramuscular solution. It should not be administered intravenously.

Administration from glass bottles

Administration from glass bottles requires a vented system. A vented system can be in the form of a vented spike adapter, a side air vent in an IV line or an airway needle. Always follow your local health service policy.

Administration of immunoglobulins

All immunoglobulins

The following is general guidance only and should be used in conjunction with the *Blood Product Administration Checklist* (see page 49).

Preparation

- Products are not interchangeble. Check the following details match the prescription exactly:
  - product and brand name
  - method of administration (IV, IM or SC)
  - concentration, and
  - dosage.
- Always check the product information (PI) leaflet for specific administration information prior to use.
- Always follow your local health service policy.

On completion

- Product batch numbers must be documented in the patient's medical record and in the transfusion/blood register for traceability. Some products have a peel off label with the batch number making documentation easy. The provider may also attach peel off label(s).
- Contact the provider for advice regarding return of any unused vials.
- Used vials/bottles must be discarded in medical waste and are not suitable for recycling.

Subcutaneous immunoglobulins (SCIg)

SCIg is infused by patients or their carers at home to avoid visits to hospital for treatment, though the infusions need to be more frequent than IVIg.

Hospital-based SCIg programs must provide the patients with education and training to ensure they have safe injection techniques, are able to use the equipment, manage adverse events as well as transport, store and safely dispose of product.

The most common adverse reaction is swelling at the infusion site. This usually lasts 12 to 24 hours after the infusion and becomes less common after the first two months of therapy.

Know your local health service policy for managing and reporting adverse events due to SCIg.

RhD Immunoglobulin-VF (anti-D)

- Take any standard antenatal blood tests before the administration of anti-D.
- Following a sensitising event, administer as soon as possible but preferably within 72 hours.
- Women must receive the right dose according to their gestation, and single or multiple pregnancy status in line with Australian guidelines.

Rhophylac® (anti-D)

- As an IV immunoglobulin, this may cause a reaction in the woman, so consider availability of staff and resources to respond to any reactions.

Intravenous immunoglobulins (IVIg)

- Check previous treatment history with patient or guardian.
- Correct reversible risk factors for adverse reactions (such as dehydration) before the infusion is given.
- Infusion rates vary between products and between concentrations. If the administration line is primed with 0.9% sodium chloride solution (normal saline) rather than the product, consider this volume in timing of rate increases.
- Infusion rates for paediatric patients should be calculated and prescribed by the treating doctor. If the product is drawn into a syringe and administered via a syringe pump, it must be completed within four hours and appropriately labelled. Follow your local health service policy for labelling of injectable medicines, fluids and lines.
- Close observation is required, the patient's general status should be monitored regularly throughout the infusion. A common approach is to take temperature, pulse, respiratory rate and blood pressure:
  - as a baseline prior to commencing
  - prior to each rate increase
  - hourly once maximum rate is achieved
  - if the patient experiences new or increased symptoms, and
  - on completion.
- Reactions tend to be related to the rate of the infusion and often resolve with stopping or slowing the infusion. A medical review may be required before restarting the infusion.
  - For minor reactions (headaches are most common) the infusion can often be restarted cautiously at a slower rate after the patient has clinically improved.
  - Severe reactions are uncommon but can occur at any time. Symptoms and signs may include: dyspnoea, wheezing, chest tightness, coughing, changes in blood pressure, tachycardia, flushing, fever, rigors, urticaria, headache, vomiting, nausea, abdominal and/or back pain.
- Patients should be observed for at least 20 minutes post-infusion. Refer to product information, local health service policy and consult the treating doctor. Consider extended monitoring after completion of the infusion for patients who have:
  - not had IVIg before
  - switched from another product
  - had a long interval since the last infusion
  - had a significant deterioration in health, and/or
  - had a reaction to a previous infusion.
- On completion of an infusion, consider a minimum volume flush to clear the administration line ensuring patient receives the entire product.


KEEP OUT OF REACH OF CHILDREN
Albumex® 20
Albumex® 20
Human Albumin
(200 g/L)
Solution for
Intravenous Infusion
AUST R 31820
2g in 10mL
Australian Red Cross
Lifeblood
CSL Behring
Albumex® 20
Human Albumin 20%
(200 g/L)

Product therapy and administration

Albumin

Albumin is the dominant protein in blood that helps to maintain the balance of fluid and carries important chemicals around the body. It is produced from pooled and fractionated human plasma.

Types of albumin

Albumin is made in two concentrations: Albumex® 4 (40 g/L) and Albumex® 20 (200 g/L) in a range of bottle volumes in Australia. Care should be taken to ensure that the correct concentration of product is used. Administration of Albumex® 20 instead of Albumex® 4 in error could result in severe circulatory overload or sudden cardiac failure in the patient.

Albumin is usually clear, yellow, amber or green in colour. Green discolouration is normal and safe to use.

Albumex® 4

Albumex® 4 is used to treat patients with severe hypoalbuminaemia (albumin < 25 g/L) with shock, therapeutic plasmapheresis and in cardiothoracic surgery.

Albumex® 20

Albumex® 20 is given to critically ill patients with extremely low albumin such as in burns, paracentesis of ascites and haemodialysis.

Administration of albumin

All albumin products

The following is general guidance only and should be used in conjunction with the *Blood Product Administration Checklist* (see page 49).

Preparation

- Products are not interchangeble. Check the following details match the prescription exactly:
  - product name
  - concentration, and
  - dosage.
- Always check the product information (PI) leaflet for specific administration information prior to use.
- Always follow your local health service policy.

Administration

- Albumex® bottles must only be accessed once using an aseptic technique.

On completion

- Product batch numbers must be documented in the patient's medical record and in the transfusion/blood register for traceability. Some products have a peel off label with the batch number making documentation easy. The provider may also attach peel off label(s).
- Contact the provider for advice regarding return of any unused vials.
- Used vials/bottles must be discarded in medical waste and are not suitable for recycling.

Albumex® 4

- Monitor the rate and volume of infusion, accurate fluid balance documentation is important.
- The patient's clinical condition will dictate the frequency and means of observation.
- If Albumex® 4 is drawn into a syringe and administered via a syringe pump, it must be appropriately labelled and completed within four hours.

Albumex® 20

- The rate of administration is based on the patient's status and clinical indication. The product information includes specific recommended rates of administration for Albumex® 20.
- Monitor the rate and volume of infusion, accurate fluid balance documentation is important.
- The patient's clinical condition will dictate the frequency and means of observation.
- It is recommended by the manufacturer that blood pressure is also monitored during administration of Albumex® 20.
- If Albumex® 20 is drawn into a syringe and administered via a syringe pump it must be appropriately labelled and completed within four hours.

Administration from glass bottles

Administration from glass bottles requires a vented system. A vented system can be in the form of a vented spike adapter, a side air vent in an IV line or an airway needle. Always follow your local health service policy.


KEEP OUT OF REACH OF CHILDREN
Albumex® 20
Human Albumin 20% (200 g/L)
Solution for Intravenous Infusion
20g in 100mL
Australian Red Cross
Lifeblood
CSL Behring

Product therapy and administration

Clotting factors

Clotting factors (also known as coagulation factors or proteins) are used to prevent or treat bleeding or clotting from specific deficiencies. Products can contain either a single or a combination of clotting factors (which are numbered by Roman numerals).

Clotting factor products can be made in two ways: manufactured from pooled donor plasma by fractionation or by genetically engineered cell lines (called recombinant products). Generally recombinant products are preferred.

Types of plasma-derived clotting factors (in Australia 2019)

Product	Clotting factor(s)	Indication
MonoFIX-VF®	Factor IX, anti-haemophilic factor	Haemophilia B i.e. Factor IX deficiency
Prothrombinex®-VF	II, IX and X	Warfarin reversal as per Australian Warfarin Reversal Consensus Guidelines
Biostate®	VIII and von Willebrand factor in a 1:2.4 ratio	von Willebrand disorder Haemophilia A i.e. Factor VIII deficiency
Thrombotrol-VF®	Antithrombin III	Antithrombin deficiency
FEIBA®	Activated prothrombin complex concentrate	Bleeding in patients with Factor VIII deficiency and inhibitors
Factor XI™	XI	Factor XI deficiency
Fibrogammin®	XIII	Factor XIII deficiency
RiaSTAP®	Fibrinogen	Congenital fibrinogen deficiency
Ceprotin®	Protein C	Congenital protein C deficiency
Berinert®	C1 esterase inhibitor concentrate	Congenital C1 esterase inhibitor deficiency

Most common types of recombinant clotting factors (in Australia 2019)

Product	Clotting factor(s)	Indication
BeneFIX® **Rixubis®** **Alprolix®**	Factor IX, anti-haemophilic factor	Haemophilia B i.e. Factor IX deficiency
Advate® **Xyntha®** **Adynovate®** **Eloctate®**	VIII	Haemophilia A i.e. Factor VIII deficiency
NovoSeven®	VIIa	Bleeding in patients with Factor VII deficiency, and with Factor VIII or Factor IX deficiency with inhibitors; Glanzman's Thromabasthenia
NovoThirteen®	XIII	Factor XIII deficiency

There are a large range of recombinant products available, with only the most common listed above. For the full list of products currently available in Australia, see the National Blood Authority website.

Administration of clotting factors

All clotting factor products

The following is general guidance only and should be used in conjunction with the *Blood Product Administration Checklist* (see page 49).

Preparation

- Products are not interchangeable. Check the following details match the prescription exactly:
  - clotting factor required
  - product type and brand name
  - number of units
- Check previous treatment history with patient/carer (i.e. current product type and brand used for treatment/prophylaxis of bleeds).
- Always check the product information (PI) leaflet for specific administration information prior to use.
- Always follow your local health service policy.

Administration

- Follow the manufacturer's instructions to reconstitute and filter the product prior to use. Do not shake vial/syringe once mixed with diluent, and ensure the product is fully dissolved. If foaming occurs, let the product settle before drawing up. Failure to reconstitute correctly may result in vacuum loss or incomplete dissolution of the product. If vacuum is lost, follow the product information and contact your provider.
- Check if the product is to be administered IV as a bolus dose or via continuous infusion pump and administer accordingly.
  - IV bolus doses are administered under constant visual observation.
  - Continuous infusion should only be ordered in consultation with a recognised haemophilia treatment centre. Use of a pump is recommended to ensure constant delivery of accurate rates. Administration line should be primed with clotting product. Product should be administered at the rate as specified by prescriber. Must be appropriately labelled and completed within the prescribed time. Must not be interrupted to maintain factor levels.
- Follow the local health service policy for user-applied labelling of injectable medicines, fluids and lines.

On completion

- Product batch numbers must be documented in the patient's medical record and in the transfusion/blood register for traceability. Some products have a peel off label with the batch number making documentation easy. The provider may also attach peel off label(s).
- Contact the provider for advice regarding return of any unused vials.
- Used vials/bottles must be discarded in medical waste and are not suitable for recycling.

Factor IX

Patients with Factor IX inhibitors may be at an increased risk of anaphylaxis upon subsequent challenge with Factor IX. Patients should be observed closely for signs and symptoms of acute hypersensitivity reactions, particularly during the early phases of initial exposure to product.

Biostate

Doses should specify the active entity required, i.e. the amount of Factor VIII units or the amount of von Willebrand Factor units the patient requires. If unsure, clarify the prescribed dose.

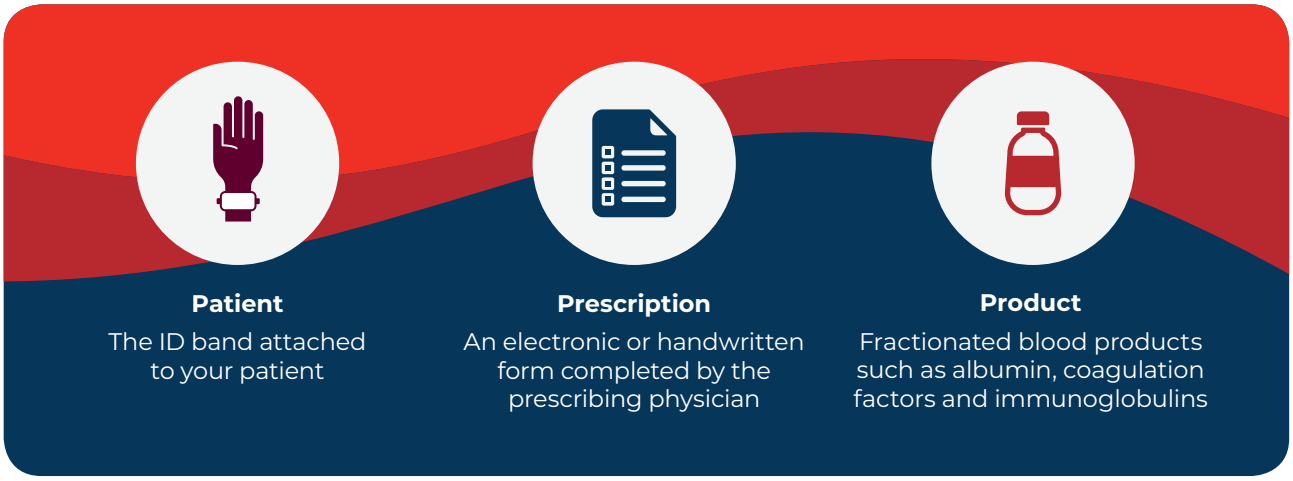
Administration from glass bottles

Administration from glass bottles requires a vented system. A vented system can be in the form of a vented spike adapter, a side air vent in an IV line or an airway needle. Always follow your local health service policy.

Product therapy and administration

Blood product administration checklist

Familiarise yourself



Remember

You must verify the patient's identity at each stage of the administration process. Ask the patient (if conscious and competent) to state and spell their first and family names in full, state their DOB, and ensure the information is identical on the identification band.

Products are not interchangeable. Patients must receive the **specific named product** at the **specified concentration** and **route of administration**. Always check individual product information.

Ensure each outcome is OK before proceeding

1 Preparation for administration	Outcome	If 'NO' complete the following action
Staff and equipment are available	☐ OK ☐ NO	Ensure these are sufficient and administration is being performed in a clinical area
Informed consent discussion has occurred and is documented	☐ OK ☐ NO	Confirm that the patient understands the procedure and consent has been obtained
Prescription is valid	☐ OK ☐ NO	Obtain valid prescription
IV access is patent where applicable	☐ OK ☐ NO	Ensure IV access is patent and sufficient
Patient ID band is attached and correct – ask the patient or carer if possible	☐ OK ☐ NO	Ensure correct patient ID band is attached
Baseline observations recorded for administration of IVIg and albumin	☐ OK ☐ NO	Observe and record temperature, pulse, respirations, blood pressure, and any rashes
Administer premedication if ordered	☐ OK ☐ NO	Administer premedication
Appropriate to administer product at this time	☐ OK ☐ NO	Consult senior nurse/medical officer

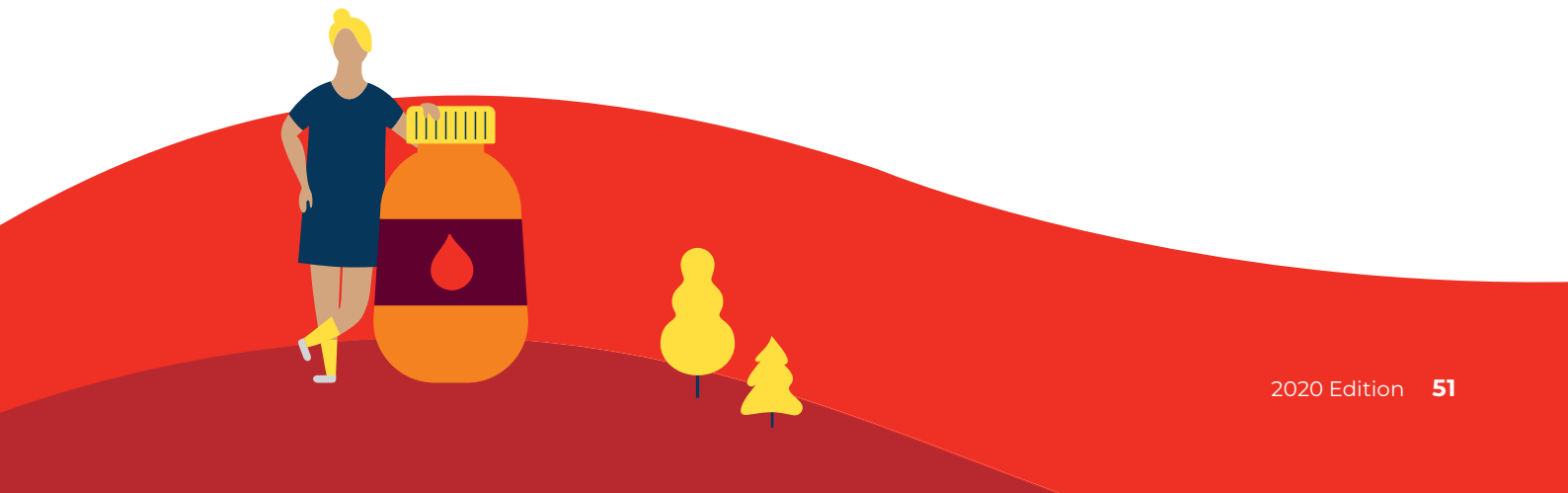
Ensure each outcome is OK before proceeding

2 Blood product collection	Outcome	If 'NO' complete the following action
Documented patient identification and product details are present	☐ OK ☐ NO	Take documented patient identification and product details to collect product
Collect the prescribed blood product	☐ OK ☐ NO	Obtain the prescribed blood product from Transfusion Service Provider/blood fridge/ pneumatic tube
Removal from storage is documented and products are traceable	☐ OK ☐ NO	Document removal from storage in the register or electronic system, including time, patient name, product and batch number
Product is at appropriate temperature	☐ OK ☐ NO	Allow product to reach room temperature before administration

3 Patient, prescription and product check	Outcome	If 'NO' complete the following action
Inspect product for: • Tampering • Sediments, discolouration, cloudiness • Expiry date and time	☐ OK ☐ NO	Do not proceed and contact Transfusion Service Provider
Identical patient and prescription check: • Patient first and family names • Patient DOB • Patient MRN/URN	☐ OK ☐ NO	Involve the patient if possible. If any discrepancies arise, do not proceed and contact Transfusion Service Provider or senior nurse or medical officer.
Identical prescription and product check: • Product type, brand, strength and dose If dispensed for a named patient, check: • Patient first and family names • Patient DOB • Patient MRN/URN	☐ OK ☐ NO	Products are not interchangeable. Patient must receive specified brand name and strength product. If there is a discrepancy, do not proceed and contact your Transfusion Service Provider or senior nurse or medical officer.
Reconstitution if applicable: • Read and follow the product information • Use equipment and diluent provided • Use filters provided • Ensure product is fully dissolved	☐ OK ☐ NO	Read product information for reconstitution advice
All above checks were performed uninterrupted by two independent checkers and have been documented. Both must compare and confirm this is the right pack for the right patient.	☐ OK ☐ NO	Do not proceed and perform all above checks again and document

4 Blood product administration	Outcome	If 'NO' complete the following action
Blood product administration to be started by a person who has completed all checks	☐ OK ☐ NO	Do not proceed and perform all checks before starting administration
Patient vital signs monitored as per product information	☐ OK ☐ NO	Monitor and record patient temperature, pulse, respirations, blood pressure, and any rashes. Recognise, respond to and report any adverse events.
Administer product correctly as per prescription/product specific infusion rates, route using aseptic technique	☐ OK ☐ NO	Confirm blood product specific infusion rates with prescription and product information. Check correct route is being used – IV bolus, IV infusion, subcutaneous or IM. Start IVIg infusions slowly and increase the rate as prescribed and tolerated by the patient.

5 Post-administration processes	Outcome	If 'NO' complete the following action
Ensure patient has received all the prescribed product	☐ OK ☐ NO	For IV infusions, consider clearing IV line with minimum volume of 0.9% sodium chloride solution (normal saline). Exercise caution in at-risk patients, i.e. neonates, infants, patients at risk of circulatory overload.
Monitor patient as required post-infusion	☐ OK ☐ NO	Monitor patient according to local protocols and clinical indications post-infusion
Dispose of blood product safely if infusion uneventful	☐ OK ☐ NO	Dispose of product as per local health service protocols. Place completed bottles/vials in medical waste bin. Do not recycle glass bottles.
Complete documentation: • Start and finish dates and times • Batch number • Observations and outcomes in patient records (electronic/paper)	☐ OK ☐ NO	Complete all relevant documentation



Appendices

Appendix 1

Acute transfusion reactions

It is important to **recognise**, **respond** to, and **report** adverse events. Speed is essential because of the possible life-threatening nature of acute transfusion reactions.

If you suspect a transfusion reaction:

1. 

Stop transfusion and activate emergency procedures if required

2. 
Check vital signs

3. 
Maintain current IV access, but do not flush existing administration line

4. 
Repeat all clerical and identity checks

5. 
Notify medical staff and Transfusion Service Provider

6. 
Collect blood and urine samples, save blood pack and IV line for culture if required

7. 
Commence specific clinical management

8. 
Document reaction in patient's medical records and complete an incident report as per your local health service policy

Key symptom

Fever

Signs and symptoms	Investigations	Causes and clinical management
≥ 38°C and rise ≥ 1°C from baseline within 4 hours of starting transfusion No other symptoms (but may have chills or rigors).	No investigation required.	**Mild febrile non-haemolytic transfusion reaction** • Exclude other serious or severe reactions. • Give antipyretic. • If reaction subsides and product still viable, **restart transfusion slowly.** • If no improvement or worsening of symptoms, **stop transfusion and do not restart**, and investigate for a severe febrile reaction.
≥ 38°C and rise ≥ 1°C from baseline within 15 minutes of starting transfusion With other symptoms such as chills, rigors, hypotension, shock, tachycardia, anxiety, dyspnoea, back/chest pain, haemoglobinura/oliguria, bleeding from IV sites, disseminated intravascular coagulation, nausea, vomiting. **or** **≥ 39°C** ⚠ **Potentially life-threatening**	**Sepsis work-up** Gram stain on blood product bag; blood cultures on both patient and products. **Incompatible blood work-up** Group, screen and DAT on pre and post-transfusion samples. **Haemolysis work-up** FBC, LDH, bilirubin, haptoglobin, electrolytes, creatinine, urinalysis. **DIC work-up** Disseminated intravascular coagulation (DIC) may complicate a severe reaction – perform aPTT, PT, fibrinogen, D-Dimer (or FDP).	**Severe febrile non-haemolytic transfusion reaction** • **Do not restart transfusion.** • Investigate to exclude other serious or severe reactions with sepsis and incompatible blood work-ups. Consider haemolysis and DIC work-ups. **Transfusion-transmitted bacterial infection** • **Do not restart transfusion.** • Start broad-spectrum IV antibiotics, IV fluids and inotropes to provide cardiovascular support and maintain urine output. • Ask your Transfusion Service Provider to notify Lifeblood to ensure quarantine and testing of components from same donation. **Acute haemolytic transfusion reaction** • **Do not restart transfusion.** • IV fluids and inotropes to maintain blood pressure and urine output. • Induced diuresis may be needed. • For further transfusions, consider consultation with a haematologist.

Key symptom

Dyspnoea

Signs and symptoms	Investigations	Causes and clinical management
Within 15 minutes of starting transfusion but may be later Hypotension, fever, with/without tachycardia. ⚠ **Potentially life-threatening**	**Sepsis work-up** Gram stain on blood product bag; blood cultures on both patient and products. **Incompatible blood work-up** Group, screen and DAT on pre and post-transfusion samples. **Haemolysis work-up** FBC, LDH, bilirubin, haptoglobin, electrolytes, creatinine, urinalysis. **DIC work-up** Disseminated intravascular coagulation (DIC) may complicate a severe reaction – perform aPTT, PT, fibrinogen, D-Dimer (or FDP). **Anaphylaxis work-up** Check haptoglobin, tryptase and IgA levels. Test for anti-IgA if IgA deficient.	**Transfusion-transmitted bacterial infection** • **Do not restart transfusion.** • Start broad-spectrum IV antibiotics, IV fluids and inotropes to provide cardiovascular support and maintain urine output. • Ask your Transfusion Service Provider to notify Lifeblood to ensure quarantine and testing of components from same donation. **Acute haemolytic transfusion reaction** • **Do not restart transfusion.** • IV fluids and inotropes to maintain blood pressure and urine output. • Induced diuresis may be needed. • For further transfusions consider consultation with a haematologist. **Anaphylaxis** • **Do not restart transfusion.** • Implement basic life support. Maintain airway and blood pressure. Adrenaline, IV fluids, oxygen and other resuscitation as indicated. • To prevent recurrence, consider corticosteroid and antihistamine premedication. If IgA-deficiency with anti-IgA present, consider IgA-deficient or washed red cells. • For further transfusions, consider consultation with a haematologist.
1–2 hours following transfusion Typically with **hypertension**, also cyanosis, orthopnea, increased venous pressure/ jugular venous distension, tachycardia, pulmonary oedema, elevated BNP, cardiomegaly. ⚠ **Potentially life-threatening**	Assess chest X-ray for pulmonary oedema. Elevated BNP/N-terminal pro-BNP levels are more common in this reaction.	**Transfusion associated circulatory overload** • **Do not restart transfusion.** • Give oxygen, diuretics and sit patient upright. • For future transfusions in susceptible patients (i.e. paediatric or elderly patients, severely anaemic or CHD): infuse slowly and consider diuretic.
Within 6 hours following transfusion (usually within 1–2 hours) Typically with **hypotension**, also bilateral pulmonary oedema, severe hypoxemia, cyanosis, fever, bilateral interstitial and alveolar infiltrates (pulmonary oedema), without elevated pulmonary pressures. No evidence of circulatory overload or pre-existing lung injury. ⚠ **Potentially life-threatening**	Assess chest X-ray for pulmonary infiltrates. Normal BNP/N-terminal pro-BNP levels are more common in this reaction. HLA/HNA typing and antibodies. Transfusion-related acute lung injury is a clinical diagnosis – investigations to exclude other reactions.	**Transfusion-related acute lung injury** • **Do not restart transfusion.** • Provide cardiovascular and airway support; give oxygen and ventilation as necessary; diuretics are not beneficial and may worsen this reaction. • Notify Lifeblood to ensure quarantine and testing of components from the same donation.

Key symptom

Urticaria or rash

Signs and symptoms	Investigations	Causes and clinical management
Over less than 2/3 of the body 2–3 hours into transfusion Localised urticaria (hives), pruritus with no other symptoms/signs.	No investigation required.	**Minor allergic reaction** · Give antihistamine. · If reaction subsides and product still viable, **restart transfusion slowly.** · If no improvement or worsening of symptoms, **stop transfusion and do not restart**, and manage as a severe allergic reaction (see below). · Consider premedication with antihistamine for future transfusions if recurrent minor allergic reactions occur.
Over more than 2/3 of the body early in transfusion Localised urticaria (hives), pruritus with no other symptoms/signs.	No investigation required.	**Severe allergic reaction** · **Do not restart transfusion.** · Give antihistamine and corticosteroid as required. · If recurrent severe allergic reactions occur, consider premedication with antihistamine or transfusing with plasma-depleted or washed red cells.
Over more than 2/3 of the body, within 45 minutes of starting transfusion (majority within 5 minutes) With other symptoms such as: · dyspnoea, upper or lower airway obstruction (hoarseness, stridor, wheezing, chest pain, anxiety) · severe hypotension, bronchospasm, cyanosis · GI symptoms (nausea, vomiting). ⚠ **Potentially life-threatening**	**Anaphylaxis work-up** Check haptoglobin, tryptase and IgA levels. Test for anti-IgA if IgA deficient.	**Anaphylaxis** · **Do not restart transfusion.** · Implement basic life support. Maintain airway and blood pressure. Adrenaline, IV fluids, oxygen and other resuscitation as indicated. · To prevent recurrence, consider corticosteroid and antihistamine premedication. If IgA-deficiency with anti-IgA present, consider IgA-deficient or washed red cells. · For further transfusions, consider consultation with a haematologist.

Appendix 2

Additional resources

For our full range of resources for health professionals visit **transfusion.com.au**

iTransfuse App

The iTransfuse App is the transfusion bedside support tool for clinicians. The app includes interactive versions of the administration checklists, blood compatibility, acute transfusion reactions resources, and a detailed explanation of fresh blood component labelling.

Find the app at
iTransfuseApp.com.au

Blood Component Administration Checklist

A quick reference checklist for the administration of fresh blood components such as red cells, platelets and plasma components.

Blood Product Administration Checklist

A quick reference checklist for the administration of blood products such as immunoglobulins, albumin and clotting factors.

Pack Check

Pack Check: Educator Guide assists educators in the face-to-face teaching of how to check a blood component prior to transfusion. It is suitable for teaching registered and enrolled nurses, midwives and medical students.

Pack Check: Student Guide has been designed to assist in learning how to check a blood component pack prior to transfusion. It is designed for registered and enrolled nurses and medical students.

Blood Component Information (BCI)

This resource includes a description of the blood collection process, method of manufacture, critical manufacturing steps, clinical indications for use, and administration methods. The BCI is considered an extension of blood component labels as the space on these labels is very limited.

Acute transfusion reactions resources

A quick reference poster and card covering the signs and symptoms of common transfusion reactions and how to manage them.

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