

Flippin' Blood

Second Edition, June 2012



A **BloodSafe** flip chart to help make transfusion straightforward



THIS IS A QUICK REFERENCE GUIDE ONLY

Please use your health service policies and procedures, relevant national and local standards, guidelines and specific product information for further guidance.

Flippin' Blood contains most, but not all transfused products. The range of products available in different states/territories and between hospitals may vary.

The first edition of this publication was prepared by Ms Trudi Verrall and Dr Kathryn Robinson, in conjunction with Mr Ken Davis and other members of the South Australian Department of Health funded BloodSafe Program. It was reviewed by Dr Ben Saxon, Dr Erica Wood and other members of the Australian Red Cross Blood Service Transfusion Medicine Team.

This second edition was updated by Mr Russell Hunt, Dr Beverleigh Quested and Dr Kathryn Robinson to reflect changes in products and in accordance with the second edition of the *Guidelines for the Administration of Blood Products* (Australian and New Zealand Society of Blood Transfusion and Royal College of Nursing Australia, 2011). Refer to these guidelines for further information including a glossary.

The members of the BloodSafe Program would like to thank staff from hospitals and transfusion service providers for their valuable feedback, with special thanks to Dr Erica Wood, Dr Ellen Maxwell, Ms Madaleine Gallagher-Swann, Ms Jo Perillo, Ms Linley Bielby, Ms Lisa Stevenson and Mr Ken Davis for reviewing the second edition.

© BloodSafe Program, June 2012

ISBN 978-0-9775576-2-2



DISCLAIMER

Whilst the material in this flip chart has been carefully prepared by the authors, it is not tailored to any particular patient's circumstances. It may be used as a guide and is not a substitute for expert opinion in the making of any decisions in relation to the clinical indications for blood products, procedures for their administration and for management of any adverse reactions. It is the intent of the authors to provide evidence-based best practice where this exists. Readers are encouraged to seek information and advice regarding local practices in their own institutions.

The authors of the flip chart do not make any express or implied representation or warranty in relation to the completeness, accuracy, suitability or currency of the information contained in the flip chart. The authors are not liable in contract, tort (including negligence) or otherwise, for any direct, indirect, special or consequential loss or damages in connection with this flip chart, its use, its contents or any products or services referred to herein. It is intended that this document will be updated periodically.

Updated information related to blood products in Australia is available at www.transfusion.com.au

BASICS

- 4 Summary of Changes to *Flippin' Blood*, Second Edition
- 6 General Transfusion Practices and Equipment
- 14 Pre-administration Identity Checks of Patient and Blood Product
- 16 Product Types for Patients with Special Requirements

BAGS

- 20 Red Cells
- 24 Platelets
- 28 Fresh Frozen Plasma (FFP), Extended Life Plasma and Cryodepleted Plasma
- 32 Cryoprecipitate (Cryo)

BOTTLES

- 38 General Information on Recombinant and Fractionated Products including Rh(D) Immunoglobulin (Anti-D)
- 40 Intravenous Immunoglobulin – INTRAGAM® P 6%
- 44 Intravenous Immunoglobulin – KIOVIG 10%
- 48 Intravenous Immunoglobulin – OCTAGAM® 5% and OCTAGAM® 10%
- 52 Human Albumin – ALBUMEX® 4 and ALBUMEX® 20
- 54 Human Prothrombin Complex Concentrate – PROTHROMBINEX®-VF
- 56 Coagulation Factor VIII – Recombinant and Plasma-derived
- 58 Coagulation Factor IX – Recombinant and Plasma-derived

REACTIONS AND RESOURCES

- 62 Management of Suspected Transfusion Reactions
- 66 Useful Resources

Summary of changes to *Flippin' Blood*, Second Edition

Although many of the significant changes from the first edition of *Flippin' Blood* are highlighted below, this list does NOT include all changes made to this second edition.

The following changes to *Flippin' Blood*, Second Edition reflect changes to the Australian and New Zealand Society of Blood Transfusion and the Royal College of Nursing Australia, *Guidelines for the Administration of Blood Products*, Second Edition (2011), Sydney, Australia (www.anzsb.org.au/publications). For a detailed list of changes and their rationale refer to pages 7–9 of that document.

- Updated information on the process of informed consent and the decision to transfuse.
- The duration before changing the blood administration set has been increased from 8 to 12 hours, however as individual product information varies between administration sets, the manufacturer's guidelines must be followed.
- A change to the number of units recommended to be transfused per blood administration set which was previously 2–4 red cells, depending on urgency. The current edition does not limit the number of units as long as flow is maintained and the manufacturer's recommendations are followed.
- Changes to the use of bedside leucocyte depletion filters due to the introduction of universal pre-storage leucocyte depletion at the Australian Red Cross Blood Service.
- Updated information on patient identification requirements in line with national guidelines including the current Australian Commission on Safety and Quality in Health Care Standards (see 'Resources' on page 67).

- Updated guidance related to bedside checking procedures.
- Updated information on typical infusion rates for blood products.
- Updated information on the '4 hour rule'. Blood components SHOULD be infused within four hours of leaving controlled storage. In certain clinical situations such as transfusion of neonates, where a slow infusion rate is indicated, transfusion MUST be completed within four hours of commencement and no longer than four-and-a-half (4½) hours following release of the product from controlled storage. This exception to standard practice must be documented in health service policy/procedure. For more information see pages 8 and 9 of *Guidelines for the Administration of Blood Products*, Second Edition (2011).
- More extensive directions about the frequency of patient monitoring during transfusion, with the recommendation that the observations of temperature, pulse, respiratory rate (TPR) and blood pressure (BP) be recorded at 15 minutes after commencement (with the exception that continuous visual observation in specialist areas with transfusion expertise may suffice). Patients should still be under close observation for up to 30 minutes after commencement of transfusion.
- Updated reaction management section.

Other changes to *Flippin' Blood*, Second Edition reflect changes to product availability, transfusion practice, and national guidelines and include:

- Updated information to reflect the range of blood products currently available in Australia.

- Additional information related to fractionated blood products including intramuscular immunoglobulins such as Rh(D) immunoglobulin (Anti-D).
- Updated information related to specific product types for patients with special requirements.
- Deletion of information related to specific models of pumps as this should be verified and detailed in health service policies/procedures.
- Updated 'Resources' pages.
- Use of the International Organization for Standardization hazard severity panels (ISO-3864-2:2004 [E]):



DANGER indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.



WARNING indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



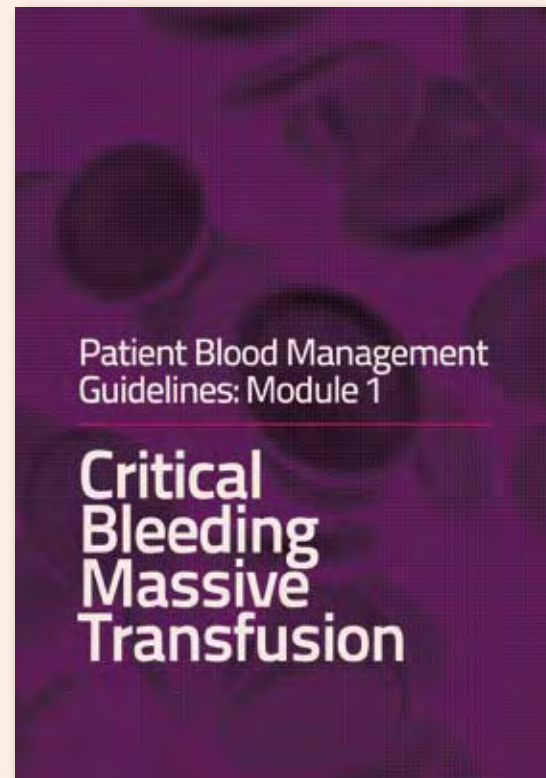
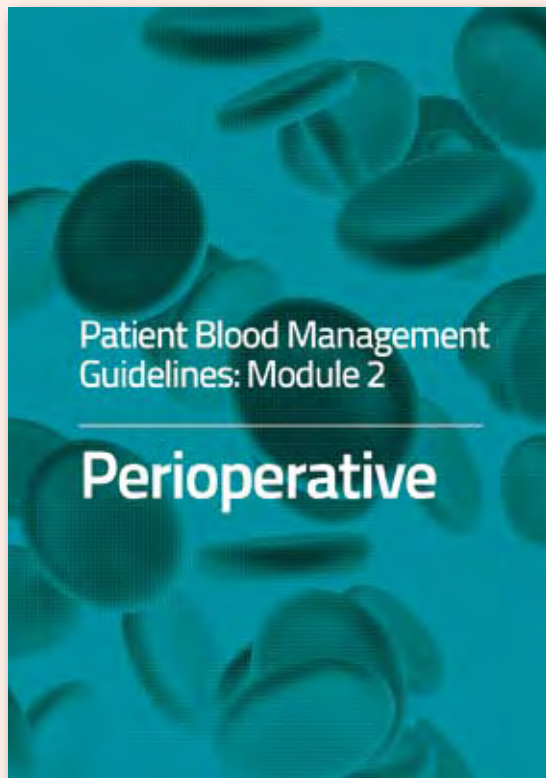
CAUTION indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

BASICS

Flippin' Blood, Second Edition, June 2012

- 6 General Transfusion Practices and Equipment**
- 14 Pre-administration Identity Checks of Patient and Blood Product**
- 16 Specific Product Types for Patients with Special Requirements**

Examples: General Transfusion Practices and Equipment



DECISION TO TRANSFUSE

National Patient Blood Management Guidelines are available covering different patient groups/settings. For the full guideline and quick reference guide of each module, as well as updates on the progress of other modules (Medical, Critical Care, Obstetric, Paediatric and Neonatal), see www.nba.gov.au/guidelines



STANDARD PRECAUTIONS

Standard Precautions must be used when administering/ disposing of blood products (this includes gloves and eye protection).

DECISION TO TRANSFUSE

- The decision to transfuse, and the consideration of other blood management strategies, must be based on a thorough clinical assessment of the patient and his or her individual needs.
- The indication for transfusion, or other blood management strategies chosen, must be documented in the patient's medical record.
- The NHMRC/ASBT *Clinical Practice Guidelines on the Use of Blood Components* (2001) have been updated as national *Patient Blood Management Guidelines* with sequential release of six modules (covering different settings/patient groups) from 2011 onwards (see 'Resources' on page 67).

CONSENT FOR BLOOD PRODUCTS

- All elements of the consent process should reflect prevailing local, state, territory or national requirements.
- Refer to your health service policy regarding consent processes for blood products, including inability to obtain consent and patient refusal.
- Consideration of the patient's language and cognitive ability should influence the verbal or written information provided.
- A range of written information for the Australian context, including in languages other than English, and specific information for parents and children, is available (see 'Resources' on page 67) in addition to those produced by individual health services.
- Consent must be documented by the prescriber in the patient's medical record in accordance with health service policy.

REFUSAL OF BLOOD PRODUCTS

- Refusal of blood products whether for religious or personal reasons must be documented in the patient's medical record in accordance with health service policy.
- Where a patient refuses consent to transfusion of specific blood products, both those not to be administered and alternatives acceptable for administration should be clearly documented.
- The medical record should contain clear documentation that the patient is aware that the planned procedure/treatment may entail a higher risk in the event of bleeding complications; in extreme situations, where there are no alternatives to medical transfusion, death may result.
- A checklist may be helpful in major surgery as this may often involve multiple disciplines (eg. the surgeon, anaesthetist and haematologist).

PRECAUTIONS FOR BLOOD PRODUCTS

- Ensure circumstances/situation is appropriate to proceed, including availability of trained staff.
- Close observation is required and the patient's general status should be assessed as suitable to commence, then monitored regularly throughout the infusion.
- Check resuscitation equipment, including oxygen and adrenaline are available and in working order, and emergency medical support is readily available.

STANDARD PRECAUTIONS

- Standard Precautions must be used when administering/disposing of blood products (including gloves and eye protection).

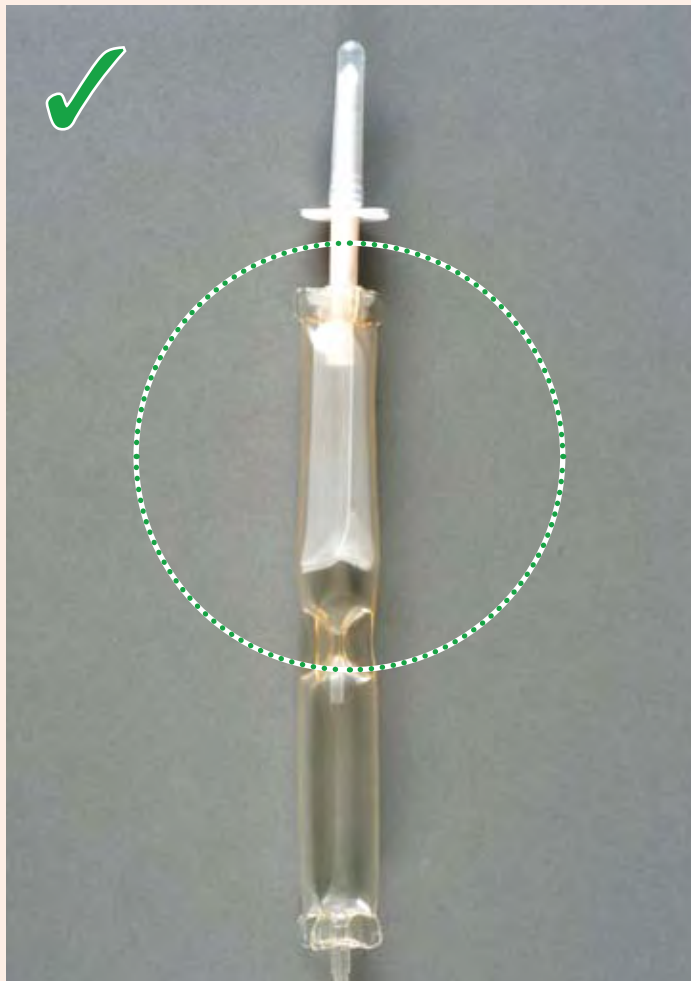
PREMEDICATION

- Any premedication prescribed for the patient should be administered at a suitable time before the infusion commences to allow for effectiveness.

✓ BLOOD ADMINISTRATION SETS

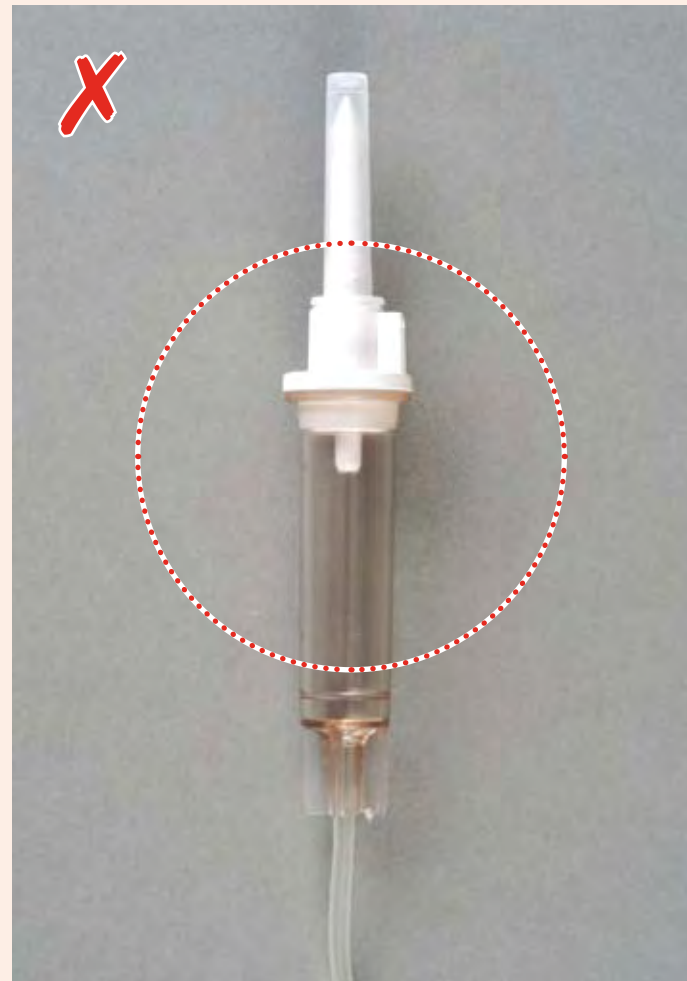
For fresh blood components such as red cells, platelets, fresh frozen plasma/cryodepleted plasma/extended life plasma and cryoprecipitate, always use an administration set approved and manufactured for this purpose (incorporating 170–200 micron filter) to remove clots and clumps of debris.

Refer to individual product information for other products such as fractionated and recombinant products.



✗ ADMINISTRATION SETS WITHOUT AN APPROVED BLOOD FILTER

IV lines without an approved blood filter (170–200 micron) are NOT suitable for the administration of fresh blood components such as red cells, platelets, fresh frozen plasma/extended life plasma/cryodepleted plasma and cryoprecipitate. These products must ONLY be infused in conjunction with a blood filter.



RAPID INFUSION DEVICES

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


BLOOD ADMINISTRATION SETS

- Blood components must be transfused using an administration set (blood 'giving set') approved and manufactured for this purpose which incorporates a standard filter (recommended pore size of 170–200 microns) to remove clots and debris.
- These MUST be used when administering blood components such as red cells, platelets, fresh frozen plasma (FFP)/cryodepleted plasma/extended life plasma and cryoprecipitate. Refer to individual product information for other products such as fractionated and recombinant products.
- When blood components are being administered by syringe to small infants or neonates, the blood must be drawn into the syringe via an approved blood filter (170–200 micron).
- Platelets must be transfused through a new blood administration set unless administered in the setting of critical bleeding/massive transfusion when platelets, plasma and cryoprecipitate may need to be transfused through the same administration set. However platelets must not be transfused through a blood administration set which has been used for red cells, as red cell debris may trap the platelets. Red cells may follow platelets through the same blood administration set, but not precede platelets.
- Blood transfusion sets must not be 'piggy-backed' into other lines.
- FLUSHING BLOOD LINES with a small amount of 0.9% Sodium Chloride solution (Normal Saline) between red cell packs is not evidence-based and may be unnecessary (however it may be required to maintain IV access if the next red cell pack is not readily available). On completion of the transfusion episode, blood administration sets may be flushed with 0.9% Sodium Chloride solution (Normal Saline) using the minimum volume to clear line and ensure patient receives entire product. Exercise caution in neonates/paediatric patients or others at risk of fluid overload – refer to health service/unit policy.

- Change blood administration set every 12 hours if continuing to transfuse, OR with new IV fluids, with platelets or on completion of transfusion, whichever comes first.
- Any number of red cell packs may be transfused during a 12-hour period provided the flow rate remains adequate. However specific manufacturer's recommendations defining the maximum number of packs per blood administration set must not be exceeded.

LEUCOCYTE DEPLETION FILTERS

- All red cells and platelets issued by the Australian Red Cross Blood Service are leucocyte depleted and therefore additional bedside leucocyte depletion filters are not required. However, all blood components still require administration through an approved blood administration set incorporating a filter (170–200 micron) to remove clots and clumps of debris.
- In rare cases when blood components have been collected within a local health service (eg. autologous units or directed donation) bedside leucocyte depletion filters may be indicated. This must be verified with the provider/local health service policy. Product information on the correct use of these filters must be followed.

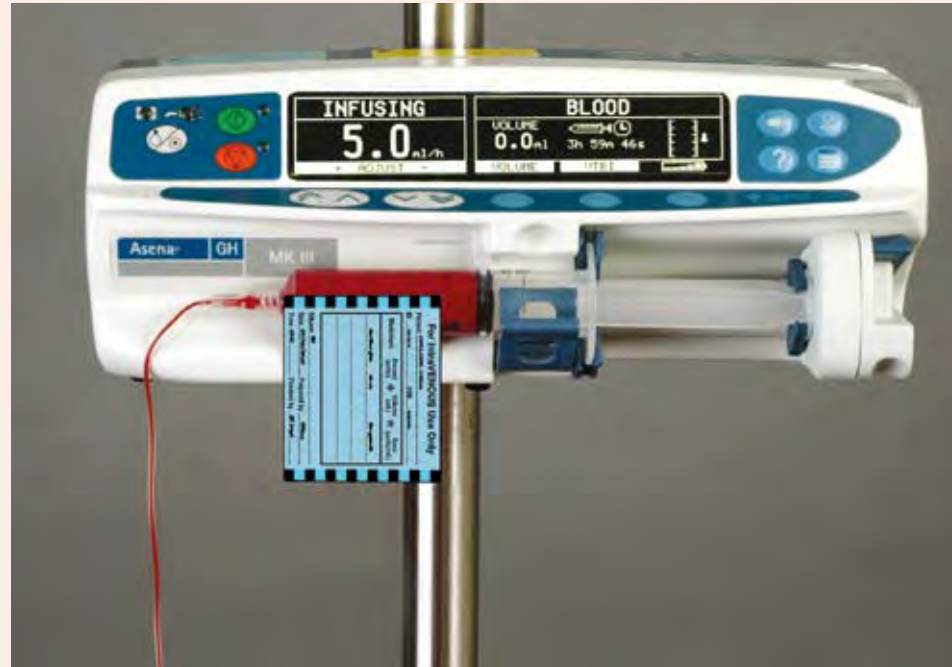
 **WARNING** Stem cell, bone marrow or granulocyte infusions **MUST NEVER** be infused through a leucocyte depletion filter.

RAPID INFUSION DEVICES

- Rapid infusion devices are used to warm and administer blood rapidly (eg. during critical bleeding/massive transfusion).
- Health service policy should outline criteria for use.
- These devices must be operated strictly according to the manufacturer's instructions and health service procedures.
- The detailed use of rapid infusion devices is outside the scope of this document.

PUMPS

Refer to health service policy for guidance on the use of pumps for blood product administration. For red cells and platelets a pump may be used only if the manufacturer has documented evidence that it does not damage the red cells or platelets. See page 11.



SYRINGE DRIVERS

Syringe drivers may be useful for continuous infusion of coagulation factors or for transfusion in the paediatric setting (eg. neonates/infants). If a syringe driver is used, the configuration must ensure that blood components pass through an approved blood filter (170–200 micron).

Always maintain aseptic technique and carefully label the syringe with correct patient details if detached from the bag.

Follow health service guidelines for user-applied labelling.



BLOOD WARMING DEVICES

When warming blood components **ONLY** use specifically designed and approved commercial blood warming devices. **NEVER** improvise by placing a blood pack in hot water, in a microwave or on a radiator as this can damage the product and make it unsafe.


PUMPS

- Commonly used when free flow via gravity is unreliable (eg. central venous access device or small gauge cannula) or where controlled flow rates are required (eg. paediatric patients or those at risk of fluid overload).
- Health service policies and procedures should indicate whether pumps can be used for blood product administration, and should include the situations and products they relate to as well as pump model(s) and maximum flow rates.
- For red cells and platelets, a pump may only be used if the manufacturer has documented evidence that it does not cause haemolysis or damage to red cells or platelets, and has specified the maximum infusion rate at which safety was demonstrated. The maximum rate must not be exceeded.
- Fresh frozen plasma/extended life plasma/cryodepleted plasma and cryoprecipitate contain very few cells and can be given safely via pump.
- The pump line must incorporate an approved blood filter (170–200 micron) when administering blood components to remove clots and clumps of debris.
- The checking procedure prior to spiking and hanging the blood must include a check of the device and settings as well as standard patient identity and blood product checks.

SYRINGE DRIVERS

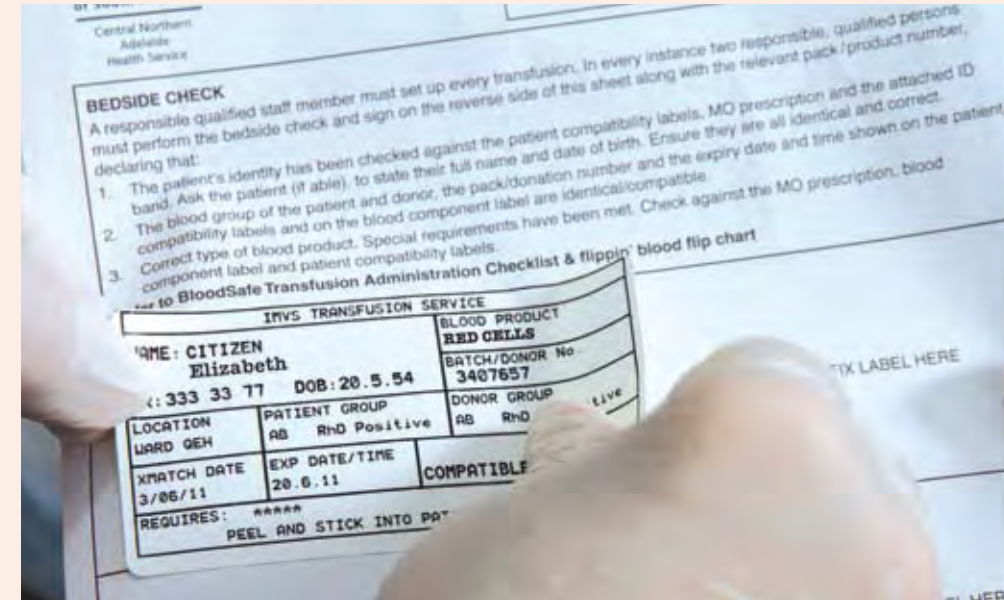
- Syringe drivers may be useful for continuous infusion of coagulation factors (such as Factor VIII or Factor IX) or for transfusion in the paediatric setting (eg. neonates/infants).
- If a syringe driver is used, the configuration must ensure that blood components pass through an approved blood filter (170–200 micron).
- Health service policy must address the importance of aseptic technique, only withdrawing from (spiking) the bag once and labelling of the syringe (if detached from the bag) to ensure correct patient identification and optimum product viability. Follow health service guidelines for user-applied labelling.

BLOOD WARMING DEVICES

 **WARNING** **Improvised warming such as putting the pack in hot water, in a microwave oven or on a radiator must NEVER be used. These methods may damage red cells and cause harm to the patient.**

- Local health service policy should indicate whether blood warmers can be used, including in which situations they are appropriate.
- The device must be validated by the manufacturer for the administration of blood products and used exactly as specified by the manufacturer.
- Indications for blood warmers include: patients with clinically significant cold agglutinins, large volume rapid transfusions (eg. >50 mL/kg/hour in adults or >15 mL/kg/hour in children), exchange transfusions, plasma exchange for therapeutic apheresis in adults and intrauterine transfusions (at the discretion of the fetomaternal specialist).

- Red cells should only be warmed as they flow through a blood administration set using a specifically designed, approved commercial device with a visible thermometer and audible warning alarm.
- Blood warmers must undergo a regular maintenance program (eg. by the health service biomedical provider).
- The operating temperature of the blood warmer must be recorded on the patient's infusion record.
- Red cells must not be warmed above the set point temperature of the approved device – refer to manufacturer's instructions for operational temperatures and alarm settings.
- Blood warmer administration sets must incorporate an approved blood filter (170–200 micron). Prime as per manufacturer's instructions prior to use.
- Due to the risk of contamination from infected water baths, it is recommended that these types be replaced with dry heat blood warming devices.



SUSPECTED TRANSFUSION REACTION

If there is any suspicion of a transfusion reaction, the transfusion service provider must be informed of the clinical details and the product (pack or bottle) should be returned. See 'Reactions' on pages 62–65 for further information.

DOCUMENTATION

Ensure required documentation is completed and included in the medical record.

MEDICATION



Medication must NOT be added to the blood pack or blood administration set prior to, or during the transfusion. Medication may interact with the anticoagulant, additive solutions, or the blood component contained in the bag. A break in integrity of the infusion line may also increase the risk of bacterial contamination of the component.

- While medication can be administered via a separate IV access or separate lumen, caution should be exercised if the medication is associated with adverse effects or it is the first time it has been given. If a reaction occurs, it is difficult to ascertain whether the medication or the blood component was responsible for the adverse effect.

If IV medication needs to be given:

- Use another lumen of a multi-lumen central venous access device if available.
- Use or insert another cannula (eg. continuous drug administration required).
- Or for medications administered intermittently:
 - Stop the transfusion.
 - 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). Ensure the line is clamped above injection port.
 - Administer the medication.
 - Flush the line again with 0.9% Sodium Chloride solution (Normal Saline).
 - Unclamp the line and restart the transfusion.
 - Ensure that this manoeuvre does not result in the transfusion exceeding the 'four hour rule' (see page 4).

The following exception has been shown not to adversely affect red cells:

- Co-administration of morphine, pethidine and/or ketamine diluted ONLY in Normal Saline solution (0.9% Sodium Chloride) for patient-controlled analgesia or by continuous side arm infusion, incorporating a non-reflux valve.
- Follow health service policy regarding the co-administration of patient-controlled analgesia and blood products.
- Further evidence from clinical studies is required to inform clinical practice on the safety and efficacy of co-administration of other medications and blood components.

COMPLETING THE TRANSFUSION

- Adverse effects may manifest after the transfusion has finished. The patient must be advised to report any adverse effects experienced after transfusion.
- For patients transfused in a day treatment centre, follow health service guidelines/policy regarding a period of continued observation after the transfusion is complete in case of a delayed adverse event. Additional information such as a contact sheet or card may be given on discharge to advise patients how to obtain appropriate clinical advice at any time.
- If there is any suspicion of a transfusion reaction, the transfusion service provider must be informed of the clinical details and the product (pack or bottle) should be returned.
- If the transfusion is completed uneventfully, discard the empty pack according to health service policy for disposal of clinical waste (or return to the transfusion service provider if required by health service policy). Glass bottles are not suitable for recycling.
- Ensure documentation is complete.

DOCUMENTATION

The following must be documented in the medical record:

- Indication for blood product transfusion.
- Consent for blood product transfusion.
- Blood product prescription.
- Unique donation/batch number of blood product (Patient Compatibility Label/Product Label or Transfusion Report where in use).
- Names and signatures of both staff members checking the blood product.
- Blood product administration start and finish times.
- Patient observations, including occurrence and management of any adverse reactions.
- Volume of product administered.
- Any equipment used (eg. pumps/blood warming devices including operating temperatures).
- Outcome of the transfusion in terms of desired effect.

Examples: Pre-administration Identity Checks of Patient and Blood Product

⚠ WARNING ENSURE RIGHT PATIENT – RIGHT BLOOD

A final identity check of the patient and blood product AT THE PATIENT'S SIDE immediately before blood administration is vital to ensure the right blood is given to the right patient.

If there are any discrepancies detected during the checking process DO NOT PROCEED – contact the transfusion service provider.

RIGHT PATIENT – full name, date of birth, medical record number.

RIGHT BLOOD PRODUCT – for example, red cells, platelets, FFP, cryoprecipitate and any special requirements (eg. CMV negative, irradiated etc.).

RIGHT PACK – compatible blood group of patient and donor, identical blood donation number, expiry date and time not exceeded.



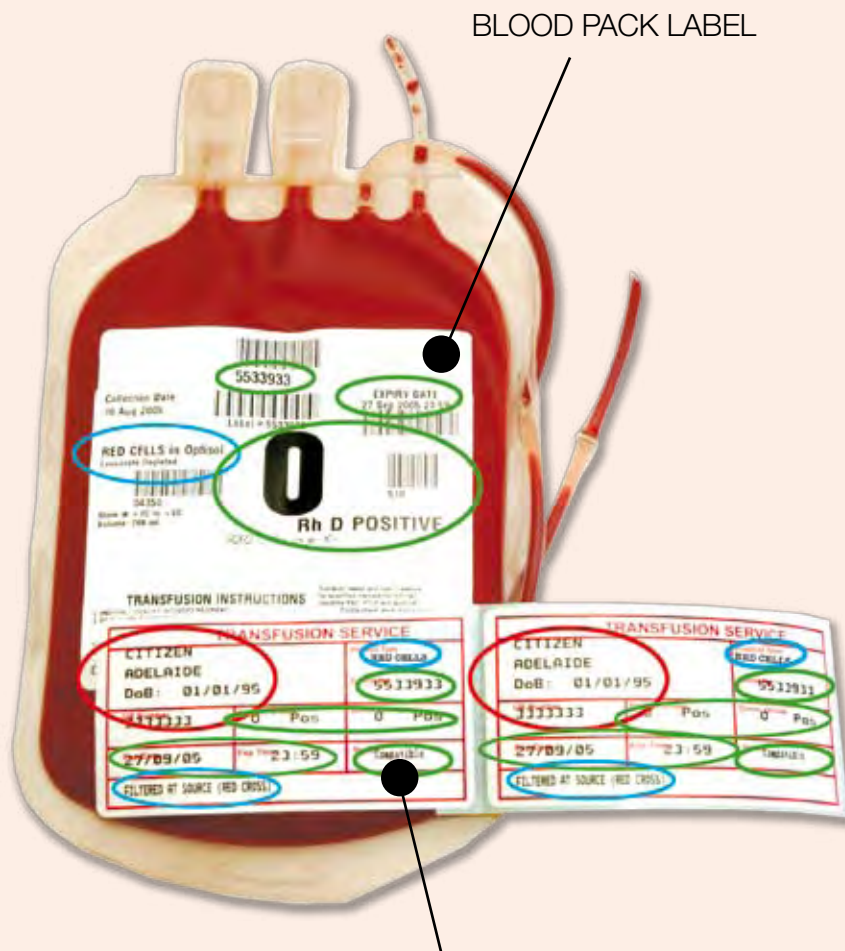
PATIENT IDENTIFICATION

The patient **MUST** wear an ID band or alternative identification as per health service policy.

The discrepancy in blood groups of patient and this product has been recognised by the Transfusion Laboratory. This blood product is suitable for transfusion to this patient.

BLOOD GROUP COMPATIBILITY

⚠ WARNING The blood group on the Blood Pack Label **MUST** be compatible with the patient's blood group as indicated on the Patient Compatibility Label attached to the pack. If the blood group of the blood 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). This information may be contained on the Patient Compatibility Label or on a separate sticker (see example above) or both.



PATIENT COMPATIBILITY LABEL

PRESCRIPTION

Pre-administration Identity Checks of Patient and Blood Product

WARNING ENSURE RIGHT PATIENT – RIGHT BLOOD

A final identity check of the patient and blood product AT THE PATIENT'S SIDE immediately before blood administration is vital to ensure the right blood is given to the right patient.

If there are any discrepancies detected during the checking process DO NOT PROCEED – contact the transfusion service provider.

POSITIVE PATIENT IDENTIFICATION

- All patients (inpatients, outpatients, day patients) MUST be positively identified prior to transfusion AND have an ID band attached to their body (or alternative identification) that complies with national guidelines – refer to health service policy.
- UNCONFIRMED IDENTITY: When a patient's identity cannot be reliably confirmed, (eg. temporary or long-term intellectual impairment, inability to communicate or loss of consciousness), he or she must be registered according to the documented health service procedure as, for example, “Unknown Male” or “Unknown Female” using an emergency medical record number.

STAFF RESPONSIBILITY

- Two staff members (as per health service policy) MUST undertake the identity checks of the patient and blood product AT THE PATIENT'S SIDE (not in a remote clinic/treatment room or at the nursing station) immediately prior to administration. Each of these two staff is responsible for the accuracy of the checking procedure. Although commonly performed co-operatively, consideration should be given to independent checking.

- One of the two people involved in the checking process MUST spike and hang the blood pack/product immediately after checking. If there is a delay, the checking process MUST be repeated.

THE PRE-ADMINISTRATION CHECKS MUST INCLUDE THE FOLLOWING STEPS AT THE PATIENT'S SIDE:


Confirmation of patient identification:

- ⚠ Check the ID band is securely attached to the patient's body.
- ⚠ Ask the patient (if conscious and rational) to state and spell their family name and given name in full, and date of birth (whenever possible). If the patient is unable to state and spell their name, ask a parent, guardian or carer (if present and able to do so), to verify the patient's identity.
- ⚠ Ensure that the stated full name and date of birth are identical to those on the ID band and confirm correct spelling of names.
- ⚠ Ensure that ALL details on the ID BAND (full name, date of birth, medical record number) are:
 - identical to those on the PRESCRIPTION, and
 - identical to those provided on the PATIENT COMPATIBILITY LABEL attached to the pack (family and given name, date of birth, and medical record number if included).

NOTE: The Blood Transfusion Compatibility Report, where used, should NOT form part of the final patient identity check at the patient's side, but may be used to check blood pack information once identity has been established.

Blood Product Checks:

- ⚠ Blood product type is the same on the prescription, on the product and the Patient Compatibility Label.
- ⚠ Special product requirements on the prescription are met (eg. irradiated, CMV negative).
- ⚠ Blood group and donation number on the Patient Compatibility Label are identical to that on the Pack Label.
- ⚠ Blood group on the Pack Label is compatible with the blood group of the patient as indicated on the Patient Compatibility Label attached to the pack; if not identical, the transfusion service provider MUST make a specific comment to indicate it is compatible (or most suitable available).
- ⚠ Pack has not passed its crossmatch expiry or pack expiry date and time.
- ⚠ Pack has no signs of leakage or damaged packaging, clumping of the contents, evidence of haemolysis, unusual discolouration or turbidity.

 **WARNING** DO NOT proceed if any discrepancies are found during the checking process or there is any concern regarding the integrity of the product – contact the transfusion service provider.

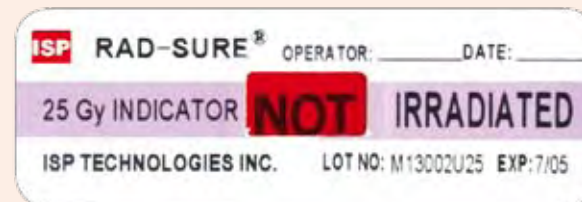
The blood group on the Blood Pack Label MUST be compatible with the patient's blood group as indicated on the Patient Compatibility Label attached to the pack. If the blood group of the blood component and the patient are not identical, the transfusion service provider MUST make a specific comment to indicate that it is compatible (or the most suitable available).

Examples: Product Types for Patients with Special Requirements

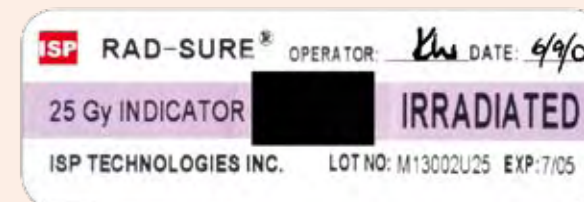


'IRRADIATED' STICKERS

- 'Irradiated' stickers are placed on red cell and platelet packs before irradiation.
- Shown below is an example of an 'irradiated' sticker. Prior to irradiation it has a red area where the word 'NOT' can be seen. The operator and date areas remain blank. Once the pack has been irradiated the red area turns black and the sticker will be signed and dated by the operator.



'Irradiated' sticker prior to irradiation



'Irradiated' sticker after irradiation

RED CELL PACK

Follow the colour coding on this red cell blood pack to find the following attributes:

Leucocyte Depleted, **Irradiated**,
CMV Negative, **Washed**.

IRRADIATED

Irradiation will reduce the shelf-life of red cells. Carefully check the expiry dates/times on the irradiated red cell Blood Pack Label/ Patient Compatibility Label. If unsure of expiry date and time contact the transfusion service provider.

LEUCOCYTE DEPLETED

All red cells and platelets issued by the Australian Red Cross Blood Service are leucocyte depleted.

⚠ WARNING **Special blood product requirements MUST be communicated to the transfusion service provider as soon as they become known to allow a record to be made in the laboratory information system. The special requirements MUST also be documented on the prescription each time the product is prescribed.**

SPECIAL REQUIREMENTS

- Check patient's special requirements against health service policy/guidelines. Health services determine which patient groups will receive special products based on both guidelines and practical considerations and in consultation with the treating medical officer. For more information contact your health service haematologist/transfusion service provider or the Australian Red Cross Blood Service transfusion medicine team in your capital city.
- The prescriber is responsible for documenting special requirements; however it is important to be aware of patient conditions that necessitate them. Check against health service policy and with the treating medical officer/specialist if not prescribed.
- The staff checking the pack must check for special requirements on the Prescription, Blood Pack Label, Patient Compatibility Label and Blood Transfusion Compatibility Report (if used).

LEUCOCYTE DEPLETION of red cells and platelets removes ≥99% of the leucocytes which reduces the risk of transmission of CMV (see CMV negative) and specific types of transfusion reactions (such as febrile non-haemolytic transfusion reactions and HLA alloimmunisation). All red cells and platelets supplied nationally by the Australian Red Cross Blood Service are now leucocyte depleted ('pre-storage') prior to issue.

IRRADIATION of cellular blood components (red cells, platelets and granulocytes) prevents the proliferation of donor T-lymphocytes in the recipient, the immediate cause of transfusion-associated graft versus host disease (TA-GVHD). TA-GVHD is usually fatal, so the main aim is prevention. Irradiation of blood components is performed at Australian Red Cross Blood Service or in some health services. Irradiated products are used in certain patient groups with impaired immune function or in situations where the recipient's immune system (even if competent) may not recognise the T-lymphocytes as foreign (such as when the donation is from a blood relative or matched for HLA tissue type). Refer to local guidelines for indications and timeframes: some are indefinite, others are for specific periods. Typical examples include: intrauterine (including neonates who have received an intrauterine transfusion) and exchange transfusions, recipients of directed donations from blood relatives, stem cell and bone marrow transplant recipients, patients with congenital immune deficiencies, Hodgkin Lymphoma or patients receiving certain types of immunosuppressive drugs (such as purine analogues and related agents, and specific types of antibody therapy) as well as recipients of granulocyte transfusions or HLA-matched platelets.

For more information refer to *ANZSBT Guidelines for the Prevention of Transfusion-Associated Graft-Versus-Host Disease*, 2011 (see 'Resources' on page 67).

CMV NEGATIVE blood products minimise the risk of transfusion-transmitted cytomegalovirus (CMV) which is a common virus typically carried by leucocytes. CMV infection may lead to severe or fatal disease in immunosuppressed patients. CMV negative products should be considered for use in certain patient groups (eg. patients receiving intrauterine and exchange transfusions, neonates, pregnant women and the immunosuppressed including transplant recipients, haematology and oncology patients). The need may be

dependent on the patient's CMV status (evidence or not of past infection). If CMV negative blood is not available, leucocyte depleted blood may be considered as an alternative – consult medical officer/transfusion service provider or Australian Red Cross Blood Service.

WASHED RED CELLS are sometimes required for use in certain patient groups. Washing removes unwanted plasma (containing plasma proteins, which may be the cause of allergic reactions), white cells and platelets. Some patients with a history of transfusion reactions, despite receiving leucocyte depleted blood, may benefit from washed red cells. Washed red cells need to be ordered in advance. Washing will reduce the shelf-life (expiry) of the product. For more information on indications for washed red cells see www.transfusion.com.au

HLA (Human Leucocyte Antigen) – 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.

HPA (Human Platelet Antigen) – MATCHED platelet transfusions are sometimes required for patients with fetomaternal alloimmune thrombocytopenia (FMAIT) or post-transfusion purpura (PTP).

⚠ WARNING **Specialist products can be difficult to source.**

Where possible, advance notice of anticipated needs should be communicated to the transfusion service/product provider so they can plan ahead. This also applies to patients with red cell antibodies or rare blood groups.

BAGS

Flippin' Blood, Second Edition, June 2012

20 Red Cells

24 Platelets

28 Fresh Frozen Plasma (FFP), Extended Life Plasma and Cryodepleted Plasma

32 Cryoprecipitate (Cryo)

Examples: Red Cells



RED CELLS

Visually inspect pack to ensure:

- Bag intact – no leaks including at the ports and pack seams or evidence of tampering.
- No clots, unusual discolouration or turbidity which could indicate bacterial contamination.
- No significant colour difference between tube segments and red cell pack.
- Contact/return to the transfusion service provider if any of the above are detected.



PAEDIATRIC RED CELL PACK

A red cell pack can be divided into four small volume paediatric packs by the Australian Red Cross Blood Service or transfusion service provider. These paediatric packs are used for neonates and small infants to prevent multiple donor exposures if more than one transfusion is required for the patient. Paediatric packs also reduce blood wastage.

STORAGE

Red cells **MUST** be stored in a monitored blood refrigerator (as per current Australian Standard). **NEVER** store blood in a domestic/ward refrigerator.



BLOOD FRIDGE

⚠ WARNING When removing a red cell pack from a blood fridge **it is essential to take documentation with you to the fridge detailing the patient's full name, date of birth and medical record number. This is to ensure the right pack is collected for the right patient.**

Complete the documentation as required by the transfusion service provider and health service.

PRIOR TO COLLECTION OF RED CELL PACK

- Ensure prescription complete and informed consent documented.
- Explain procedure to patient, including symptoms of possible transfusion reactions.
- Ensure IV access patent.
- Record baseline observations (TPR and BP) and general patient status including pre-existing rashes.
- Ensure circumstances/situation appropriate to proceed, including staff availability.
- Check resuscitation equipment, including oxygen and adrenaline are available and in working order and emergency medical support is readily available.











Note: Overnight/out-of-hours transfusion should be avoided unless clinically indicated.


Always check urgency with the medical officer. If there is doubt DO NOT delay the transfusion.

WARNING ENSURE RIGHT PATIENT – RIGHT BLOOD

- The patient's identity MUST always be confirmed prior to transfusion.
- The patient MUST be wearing an ID band (or equivalent as per health service policy) containing the correct patient details.
- Two staff members (as per health service policy) MUST undertake the identity checks of the patient and red cell pack AT THE PATIENT'S SIDE immediately prior to administration. Each of these two staff is responsible for the accuracy of the checking procedure. Although commonly performed co-operatively, consideration should be given to independent checking.
- One of the two people involved in the checking process MUST spike and hang the red cell pack immediately after checking.

PRE-ADMINISTRATION CHECKS AT PATIENT'S SIDE MUST INCLUDE:

-  Check ID BAND is securely attached to patient's body.
-  Ask the patient (if conscious and rational) to state and spell their family name and given name in full, and date of birth (whenever possible). If the patient is unable to state and spell their name, ask a parent, guardian or carer (if present and able to do so), to verify the patient's identity.
-  Ensure that the stated full name and date of birth are identical to those on the ID band and confirm correct spelling of names.
-  Ensure that ALL details on the ID BAND (full name, date of birth, medical record number) are:
 - identical to those on the PRESCRIPTION, and
 - identical to those provided on the PATIENT COMPATIBILITY LABEL attached to the pack (family and given name, date of birth, and medical record number if included).
-  Blood product type is the same on the prescription, on the product and the Patient Compatibility Label.
-  Special product requirements on the prescription are met (eg. irradiated, CMV negative).
-  Blood group and donation number on the Patient Compatibility Label are identical to that on the Pack Label.
-  Blood group on the red cell pack is compatible with the blood group of the patient as indicated on the Patient Compatibility Label attached to the pack; if not identical, the transfusion service provider MUST make a specific comment to indicate it is compatible (or most suitable available).
-  Red cell pack has not passed its crossmatch expiry or pack expiry date and time.
-  Red cell pack has no signs of leakage or damaged packaging, clumping of the contents, evidence of haemolysis, unusual discolouration or turbidity.

 **WARNING** DO NOT proceed if any discrepancies are found during the checking process or there is any concern regarding the integrity of the product – contact the transfusion service provider.

IV BLOOD LINE

- Use a new blood administration set (with 170–200 micron filter).
- Blood administration sets must not be 'piggy-backed' into other lines.
- Change blood administration set every 12 hours if continuing to transfuse, or with new IV fluids, with platelet transfusion or on completion of transfusion of the pack(s), whichever comes first.
- One blood administration set may be used for administration of multiple packs of red cells provided flow rate remains adequate and manufacturer's recommendations are not exceeded.

COMPATIBLE IV SOLUTIONS

- 0.9% Sodium Chloride solution (Normal Saline), albumin 4% or ABO compatible plasma.
- The current formulation of GELOFUSINE® (available in Australia) as stated in the product information.

INCOMPATIBLE IV SOLUTIONS

 **CAUTION** DO NOT infuse with or through a line that has previously contained:

- Electrolyte and colloid solutions containing any calcium (eg. HAEMACCEL®, Hartman's solution or lactated Ringer's solution or GELAFUSAL® [available in New Zealand]) – these should not be administered with blood components collected in an anticoagulant containing citrate as they may cause clotting of the infusion line.
- 5% glucose (dextrose) in water or hypotonic sodium solutions, as they may cause red cells to haemolyse.

CONTINUED ON PAGE 23

RED CELL COMPATIBILITY

- A current transfusion specimen is required (group and screen/save also called a type and screen/hold) for compatibility testing.
- If the blood group of the red cell 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).
- In critical bleeding there may be insufficient time to undertake full compatibility testing and it may be necessary to provide emergency group O red cells which may not be specifically labelled for the patient.

ABO: Red cells must be ABO compatible. For red cells, compatibility is as follows:

Patient Group	Compatible Donor Group
O	O
A	A, O
B	B, O
AB	AB, B, A, O

Note: Group O red cell concentrates may be used for all patient ABO groups. Other rules apply for products containing plasma including whole blood – refer to relevant section for information on other blood components.

Rh(D)

- Red cells should be Rh(D) compatible.
- Rh(D) negative red cells can be given to Rh(D) positive patients.

Note: In certain circumstances, such as critical bleeding or in times of low blood stocks, Rh(D) positive red cells may be issued to Rh(D) negative patients, specifically men and post-menopausal women (after consultation with the haematologist/treating medical officer).

SPECIAL REQUIREMENTS/MODIFICATIONS

- Check patient's special requirements against health service policy/guidelines.
- The staff checking the pack **MUST** check for special requirements on the Prescription, Blood Pack Label, Patient Compatibility Label (and Blood Transfusion Compatibility Report if used).

CONTINUED FROM PAGE 21

PUMPS

- Refer to 'General Transfusion Practices and Equipment' on page 11.

MEDICATION

DO NOT add medication to red cell pack or line.

If medication has to be given see page 13.

TIME OF INFUSION

- Commence within 30 minutes of removal from controlled storage or contact the transfusion service provider.
- Start each red cell pack slowly, where possible. Increase rate (in accordance with prescription) after the first 15 minutes if no adverse reaction.
- Each red cell pack is typically given over 1–3 hours in stable non-bleeding adult patients.
- For patients at risk of circulatory overload, it is usually necessary to transfuse more slowly with frequent monitoring. Concomitant use of diuretics should also be considered.
- Each red cell pack should be completed within 4 hours of removal from controlled storage (see page 4) or before the expiry time on the pack or Transfusion Compatibility Report (if used), whichever is sooner. For more information refer to health service policy.

OBSERVATIONS

- TPR and BP MUST be recorded prior to transfusion, 15 minutes after commencement and on completion of each pack (or as otherwise stipulated by health service policy).
- The patient MUST be observed closely for the first 15 minutes of each pack and regularly throughout the transfusion. When a patient is not under continuous visual observation, consider attending patient for first 30 minutes.
- Refer to health service policy for any additional observations. A typical stipulation is observations (TPR, BP) hourly during transfusion.
- The need for more frequent observations will depend on patient's clinical status.
- Monitor patient closely during and after transfusion for signs of reactions. See 'Reactions' on pages 62–65.

COMPLETING THE TRANSFUSION

- Time each product was completed must be recorded.
- At completion of a transfusion episode, consider a flush (minimum volume) to clear the line ensuring patient receives entire product. Exercise caution in neonates/paediatric patients or others at risk of fluid overload – refer to health service/unit policy. See 'Blood Administration Sets' on page 9.
- Adverse effects may manifest after the transfusion has been completed. The patient must be advised to report any adverse effects experienced after the transfusion has been completed.
- If there is any suspicion of a transfusion reaction the transfusion service provider must be informed of the clinical details and the pack should be returned.
- If the transfusion is completed uneventfully, discard the empty pack according to health service policy for disposal of clinical waste (or return to the transfusion service provider if required by health service policy).

Examples: Platelets



POOLED PLATELET PACK

Platelets from multiple whole blood donors are collected and pooled (combined) into one bag to make an adult dose.



APHERESIS PLATELET PACK

Platelets from a single donor are collected by apheresis into a bag. Sometimes one donor provides enough platelets to make two adult doses and the donation is divided into two bags. Both have the same donation number and are called 1 of 2 and 2 of 2 as shown in the example. Adult bags can also be divided into four smaller volume paediatric packs by the Australian Red Cross Blood Service or the transfusion service provider.

PLATELETS

Platelets are usually a cloudy yellow colour. Visually inspect pack to ensure:

- Bag intact – no leaks including at the ports and pack seams or evidence of tampering.
- No clots, unusual discolouration or turbidity which could indicate bacterial contamination.
- Contact and return to the transfusion service provider if any of the above are detected.

STORAGE

⚠ WARNING DO NOT refrigerate platelets. Refrigeration can render platelets ineffective.

- Kept at room temperature (20°C–24°C).

PLATELET AGITATOR (ROCKER)

Before issue, platelets are stored on a single layer rocker with continuous agitation to ensure optimal gas transport and to minimise platelet aggregation (clumping).



PRIOR TO COLLECTION OF PLATELET PACK

- Ensure prescription complete and informed consent documented.
- Explain procedure to patient, including symptoms of possible transfusion reactions.
- Ensure IV access patent.
- Record baseline observations (TPR and BP) and general patient status including pre-existing rashes.
- Ensure circumstances/situation appropriate to proceed, including staff availability.
- Check resuscitation equipment, including oxygen and adrenaline are available and in working order and emergency medical support is readily available.



WARNING

ENSURE RIGHT PATIENT – RIGHT BLOOD

- The patient's identity **MUST** always be confirmed prior to transfusion.
- The patient **MUST** be wearing an ID band (or equivalent as per health service policy) containing the correct patient details.
- Two staff members (as per health service policy) **MUST** undertake the identity checks of the patient and platelet pack **AT THE PATIENT'S SIDE** immediately prior to administration. Each of these two staff is responsible for the accuracy of the checking procedure. Although commonly performed co-operatively, consideration should be given to independent checking.
- One of the two people involved in the checking process **MUST** spike and hang the platelet pack immediately after checking.

PRE-ADMINISTRATION CHECKS AT PATIENT'S SIDE MUST INCLUDE:

- ⚠ Check ID BAND is securely attached to patient's body.
- ⚠ Ask the patient (if conscious and rational) to state and spell their family name and given name in full, and date of birth (whenever possible). If the patient is unable to state and spell their name, ask a parent, guardian or carer (if present and able to do so), to verify the patient's identity.
- ⚠ Ensure that the stated full name and date of birth are identical to those on the ID band and confirm correct spelling of names.
- ⚠ Ensure that ALL details on the ID BAND (full name, date of birth, medical record number) are:
 - identical to those on the PRESCRIPTION, and
 - identical to those provided on the PATIENT COMPATIBILITY LABEL attached to the pack (family and given name, date of birth, and medical record number if included).
- ⚠ Blood product type is the same on the prescription, on the product and the Patient Compatibility Label.
- ⚠ Special product requirements on the prescription are met (eg. CMV negative, HLA matched).
- ⚠ Blood group and donation number on the Patient Compatibility Label are identical to that on the Pack Label.
- ⚠ Blood group on the blood pack is compatible with the blood group of the patient as indicated on the Patient Compatibility Label attached to the pack; if not identical, the transfusion service provider **MUST** make a specific comment to indicate it is compatible (or most suitable available).
- ⚠ Platelet pack has not passed its pack expiry date and time.
- ⚠ Platelet pack has no signs of leakage or damaged packaging, clumping of the contents, unusual discolouration or turbidity.



WARNING

DO NOT proceed if any discrepancies are found during the checking process or there is any concern regarding the integrity of the product – **contact the transfusion service provider.**

IV BLOOD LINE

- Use a **NEW** blood administration set (with 170–200 micron filter). A blood administration set used for red cells should never be subsequently used for platelets since red cell debris trapped in the filter will trap the platelets. In the setting of critical bleeding/massive transfusion, platelets, plasma and cryoprecipitate may need to be given through the same administration set.
- Blood administration sets must not be 'piggy-backed' into other lines.
- Change blood administration set every 12 hours (if continuing to transfuse), OR with new IV fluids or on completion of transfusion of the pack(s), whichever comes first.

COMPATIBLE IV SOLUTIONS

- 0.9% Sodium Chloride solution (Normal Saline).

INCOMPATIBLE IV SOLUTIONS



CAUTION

DO NOT infuse with or through a line that has **previously contained:**

- Electrolyte and colloid solutions containing any calcium (eg. HAEMACCEL[®], Hartman's solution or lactated Ringer's solution or GELAFUSAL[®] [available in New Zealand]) – these should not be administered with blood components collected in an anticoagulant containing citrate as they may cause clotting of the infusion line.

CONTINUED ON PAGE 27

PLATELET COMPATIBILITY

- The transfusion service provider issues platelets based on a blood group on record.
- 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).

ABO

- ABO identical platelets are 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 HLA matching may be more important than providing the same ABO group.

Rh(D)

- Matching for Rh(D) type is desirable (as platelet products contain small or minimal number of red cells) but may be less important than ABO matching. Platelets do not carry Rh antigens.
- Rh(D) negative platelets can be given to Rh(D) positive patients.
- Rh(D) negative patients, especially women of child-bearing potential, should receive, where possible, Rh(D) negative platelets.
- If Rh(D) positive platelets are given to Rh(D) negative patients, the use of Rh(D) immunoglobulin (Anti-D) may be required – consult treating medical officer/haematologist/transfusion service provider.

SPECIAL REQUIREMENTS/MODIFICATIONS

- Check patient's special requirements against health service policy/guidelines.
- Staff checking the pack must check for special requirements on the Prescription, Blood Pack Label, Patient Compatibility Label (and Blood Transfusion Compatibility Report if used).

BACTERIAL CONTAMINATION SCREENING OF PLATELETS

Platelets from the Australian Red Cross Blood Service routinely have a sample taken for bacterial contamination screening. Platelets are issued as 'negative to date' with respect to their bacterial contamination screening status. However, the cultures continue to be incubated over their full shelf life. Preliminary positive results initiate recall of packs (24 hours/7 days per week) and prompt medical review of patients if already transfused. Additional communication is provided as soon as further results are available (many preliminary positive results eventually turn out to be 'false positives'). Whilst screening detects many of the potentially contaminated packs, a negative result does not exclude the possibility of contamination. When any patient exhibits unexplained signs and symptoms consistent with infection/sepsis during or following transfusion, bacterial contamination must be considered as a potential diagnosis and they should be investigated and treated appropriately. This should include urgent Gram stain and culture of the transfused component where possible as well as urgent notification to transfusion service provider and Australian Red Cross Blood Service.

CONTINUED FROM PAGE 25

PUMPS

- Platelets are commonly administered via gravity. Refer to health service procedures for more information.
- If a pump is required, refer to 'General Transfusion Practices and Equipment' on page 11.

MEDICATION



CAUTION

DO NOT add medication to platelet pack or line.

If medication has to be given see page 13.

TIME OF INFUSION

- Commence immediately or contact the transfusion service provider for advice on required storage conditions/location to preserve platelet function until transfusion can be commenced.
- Start transfusion slowly, where possible. Increase rate (in accordance with prescription) if no adverse reaction.
- Each platelet pack is typically given over 15–30 minutes in stable, non-bleeding adult patients.
- Each pack should be completed within 4 hours of removal from controlled storage (see page 4) or before the expiry time on the pack or Transfusion Compatibility Report (if used), whichever is sooner. For more information refer to health service policy.

OBSERVATIONS

- TPR and BP MUST be recorded prior to transfusion, 15 minutes after commencement and on completion of each pack or as otherwise stipulated by health service policy.
- The patient MUST be observed closely for the first 15 minutes of each pack and regularly throughout the transfusion. When a patient is not under continuous visual observation, consider attending patient during the transfusion or for the first 30 minutes (whichever comes first).
- Refer to health service policy for any additional observations. A typical stipulation is observations (TPR, BP) hourly during transfusion.
- The need for more frequent observations will depend on patient's clinical status.
- Monitor patient closely during and after transfusion for signs of reactions. See 'Reactions' on pages 62–65. Bacterial contamination of platelets should be considered if a significant transfusion reaction occurs – notify the transfusion service provider urgently.

COMPLETING THE TRANSFUSION

- Time each product was completed must be recorded.
- At completion of a transfusion episode, consider a flush (minimum volume) to clear the line ensuring patient receives entire product. Exercise caution in neonates/paediatric patients or others at risk of fluid overload – refer to health service/unit policy. See 'Blood Administration Sets' on page 9.
- Adverse effects may manifest after the transfusion has been completed. The patient must be advised to report any adverse effects experienced after the transfusion has been completed.
- If there is any suspicion of a transfusion reaction the transfusion service provider must be informed of the clinical details and the pack should be returned.
- If the transfusion is completed uneventfully, discard the empty pack according to health service policy for disposal of clinical waste (or return to the transfusion service provider if required by health service policy).

Examples: Fresh Frozen Plasma (FFP), *Extended Life Plasma and **Cryodepleted Plasma



FFP/CRYODEPLETED PLASMA/ EXTENDED LIFE PLASMA

FFP/cryodepleted plasma/extended life plasma is usually a clear yellow colour when thawed.

Visually inspect pack to ensure:

- Bag intact – no leaks including at the ports and pack seams or evidence of tampering.
- No clots, unusual discolouration or turbidity which could indicate bacterial contamination.
- Contact/return to the transfusion service provider if any of the above are detected.

CAUTION FFP/cryodepleted plasma/ extended life plasma may have two expiry dates/times – one from the time of freezing and the other from the time of thawing. Carefully check expiry dates/times on the Pack Label and Patient Compatibility Label.

Some transfusion service providers will place an updated expiry label over the expiry date from freezing as shown in the example on the left.

Some health services have a Blood Transfusion Compatibility Report which may include expiry date/ time from thawing. If unsure of expiry date and time contact the transfusion service provider.

Plasma is separated from whole blood donations or collected by apheresis. A single apheresis donation may be divided into up to 3 adult bags, which have the same donation number and are labelled 1 of 3, 2 of 3, 3 of 3, for example.

Adult plasma bags can also be divided into four small volume paediatric packs by the Australian Red Cross Blood Service or transfusion service provider.

The term ‘*extended life plasma’ is used for FFP that has been thawed and kept in a monitored blood fridge for up to 5 days. It is not kept by all transfusion service providers, only those where it is considered important to maintain a limited inventory of pre-thawed plasma which can be provided with minimal delay to specific patients in time-critical or emergency situations.

**Cryodepleted plasma is fresh frozen plasma that has had the cryoprecipitate component removed. It may be indicated for plasma exchange in thrombotic thrombocytopenic purpura (TTP) and can be substituted for FFP in some situations such as warfarin reversal.



STORAGE

FFP/cryodepleted plasma is stored frozen. Some transfusion service providers keep ‘extended life plasma’ (thawed FFP) in a monitored blood fridge for up to 5 days for use in specific patients.

THAWING EQUIPMENT

Specialised warming equipment is used for thawing FFP/ cryodepleted plasma. Thawing should ONLY be performed by the transfusion service provider and typically takes around 30 minutes.

WARNING NEVER improvise by using other methods such as hot water or a microwave as this could damage the product and make it unsafe.



Fresh Frozen Plasma (FFP), Extended Life Plasma and Cryodepleted Plasma











PRIOR TO COLLECTION OF THE PACK


- Ensure prescription complete and informed consent documented.
- Explain procedure to patient, including symptoms of possible transfusion reactions.
- Ensure IV access patent.
- Record baseline observations (TPR and BP) and general patient status including pre-existing rashes.
- Ensure circumstances/situation appropriate to proceed, including staff availability.
- Check resuscitation equipment, including oxygen and adrenaline are available and in working order and emergency medical support is readily available.

WARNING ENSURE RIGHT PATIENT – RIGHT BLOOD

- The patient's identity MUST always be confirmed prior to transfusion.
- The patient MUST be wearing an ID band (or equivalent as per health service policy) containing the correct patient details.
- Two staff members (as per health service policy) MUST undertake the identity checks of the patient and pack AT THE PATIENT'S SIDE immediately prior to administration. Each of these two staff is responsible for the accuracy of the checking procedure. Although commonly performed co-operatively, consideration should be given to independent checking.
- One of the two people involved in the checking process MUST spike and hang the pack immediately after checking.

PRE-ADMINISTRATION CHECKS AT PATIENT'S SIDE MUST INCLUDE:

-  Check ID BAND is securely attached to patient's body.
-  Ask the patient (if conscious and rational) to state and spell their family name and given name in full, and date of birth (whenever possible). If the patient is unable to state and spell their name, ask a parent, guardian or carer (if present and able to do so), to verify the patient's identity.
-  Ensure that the stated full name and date of birth are identical to those on the ID band and confirm correct spelling of names.
-  Ensure that ALL details on the ID BAND (full name, date of birth, medical record number) are:
 - identical to those on the PRESCRIPTION, and
 - identical to those provided on the PATIENT COMPATIBILITY LABEL attached to the pack (family and given name, date of birth, and medical record number if included).
-  Blood product type is the same on the prescription, on the product and the Patient Compatibility Label.
-  Special product requirements on the prescription are met.
-  Blood group and donation number on the Patient Compatibility Label are identical to that on the Pack Label.
-  Blood group on the blood pack is compatible with the blood group of the patient as indicated on the Patient Compatibility Label attached to the pack; if not identical, the transfusion service provider MUST make a specific comment to indicate it is compatible (or most suitable available).
-  Pack has not passed its pack expiry date and time.
-  Pack has no signs of leakage or damaged packaging, clumping of the contents, unusual discolouration or turbidity.

 **WARNING** DO NOT proceed if any discrepancies are found during the checking process or there is any concern regarding the integrity of the product – contact the transfusion service provider.

IV BLOOD LINE

- Use a new blood administration set (with 170–200 micron filter) unless administered in the setting of critical bleeding/massive transfusion when platelets and plasma may need to be given through the same administration set.
- Blood administration sets must not be 'piggy-backed' into other lines.
- Change blood administration set every 12 hours (if continuing to transfuse), OR with new IV fluids or on completion of transfusion of the pack(s), whichever comes first.

COMPATIBLE IV SOLUTIONS

- 0.9% Sodium Chloride solution (Normal Saline).

INCOMPATIBLE IV SOLUTIONS

 **CAUTION** DO NOT infuse with or through a line that has previously contained:

- Electrolyte and colloid solutions containing any calcium (eg. HAEMACCEL[®], Hartman's solution or lactated Ringer's solution or GELAFUSAL[®] [available in New Zealand]) – these should not be administered with blood components collected in an anticoagulant containing citrate as they may cause clotting of the infusion line.

CONTINUED ON PAGE 31

Examples: Fresh Frozen Plasma (FFP), Extended Life Plasma and Cryodepleted Plasma continued

PLASMA COMPATIBILITY (FFP/CRYODEPLETED PLASMA/ EXTENDED LIFE PLASMA)

- The transfusion service provider issues plasma based on a blood group on record.
- 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).

ABO

- Plasma should be ABO compatible.
- Plasma compatibility is as follows:

Patient Group	Compatible Donor Group
O	O, A, B, AB
A	A, AB
B	B, AB
AB	AB

Note: AB Fresh frozen/extended life/cryodepleted plasma may be used for all patient ABO groups.

Rh(D)

- Plasma may be transfused without regard to Rh(D) type.

SPECIAL REQUIREMENTS/MODIFICATIONS

FFP/cryodepleted plasma/extended life plasma does not contain significant numbers of leucocytes and therefore does not require leucocyte depletion or irradiation. Modifications include IgA deficient plasma (used in consultation with a haematologist/transfusion medicine specialist/immunologist for IgA deficient patients with a history of, or at risk of, anaphylactic transfusion reactions).

Fresh Frozen Plasma (FFP), Extended Life Plasma and Cryodepleted Plasma continued

CONTINUED FROM PAGE 29

PUMPS

- Fresh frozen/cryodepleted/extended life plasma is commonly administered via gravity.
- Safe to administer via pump if required, refer to 'General Transfusion Practices and Equipment' on page 11.

MEDICATION

CAUTION DO NOT add medication to FFP/cryodepleted/extended life plasma pack or line. If medication has to be given see page 13.

TIME OF INFUSION

- Commence immediately or contact the transfusion service provider for advice on required storage conditions/location to preserve coagulation factor function until transfusion can be commenced.
- Start transfusion slowly, where possible. Increase rate (in accordance with prescription) if no adverse reaction.
- Each plasma pack is typically given over 30 minutes in stable, non-bleeding adult patients.
- Each pack should be completed within 4 hours of removal from controlled storage (see page 4), or before the expiry time on the pack or Transfusion Compatibility Report (if used), whichever is sooner. For more information refer to health service policy.

OBSERVATIONS

- TPR and BP MUST be recorded prior to transfusion, 15 minutes after commencement and on completion of each pack or as otherwise stipulated by health service policy.
- The patient MUST be observed closely for the first 15 minutes of each pack and regularly throughout the transfusion. When a patient is not under continuous visual observation, consider attending patient for first 30 minutes.
- Refer to health service policy for any additional observations. A typical stipulation is observations (TPR, BP) hourly during transfusion.
- The need for more frequent observations will depend on patient's clinical status.
- Monitor patient closely during and after transfusion for signs of reactions. See 'Reactions' on pages 62–65.

COMPLETING THE TRANSFUSION

- Time each product was completed must be recorded.
- At completion of a transfusion episode, consider a flush (minimum volume) to clear the line ensuring patient receives entire product. Exercise caution in neonates/paediatric patients or others at risk of fluid overload – refer to health service/unit policy. See 'Blood Administration Sets' on page 9.
- Adverse effects may manifest after the transfusion has been completed. The patient must be advised to report any adverse effects experienced after the transfusion has been completed.
- If there is any suspicion of a transfusion reaction the transfusion service provider must be informed of the clinical details and the pack should be returned.
- If the transfusion is completed uneventfully, discard the empty pack according to health service policy for disposal of clinical waste (or return to the transfusion service provider if required by health service policy).

Examples: Cryoprecipitate (Cryo)



CRYOPRECIPITATE PACKS

A cryoprecipitate dose in adults usually includes more than one pack. The volume of each pack and dose may vary. One unit of cryoprecipitate collected from an apheresis donation is currently equivalent to approximately 2 units of cryoprecipitate collected from whole blood donation. For updated information on current pack sizes/dosing see www.transfusion.com.au or contact the transfusion service provider.



CRYOPRECIPITATE

Cryoprecipitate is usually a cloudy yellow colour.

Visually inspect pack to ensure:

- Bag intact – no leaks including at the ports and pack seams or evidence of tampering.
- No clots, unusual discolouration or turbidity which could indicate bacterial contamination.
- Contact/return to the transfusion service provider if any of the above are detected.

THAWED CRYOPRECIPITATE

CAUTION Cryoprecipitate may have two expiry dates/times – one from the time of freezing and the other from the time of thawing. Carefully check expiry dates/times on the cryoprecipitate Pack Label and Patient Compatibility Label.

Some transfusion service providers will place an updated expiry label over the expiry date from freezing as shown in the example. Some health services have a Blood Transfusion Compatibility Report which may include expiry date/time from thawing. If unsure of expiry date and time contact the transfusion service provider.



STORAGE

Cryoprecipitate is stored frozen. DO NOT refrigerate once thawed.

THAWING EQUIPMENT

Specialised warming equipment is used for thawing cryoprecipitate. Thawing should ONLY be performed by the transfusion service provider and typically takes around 15–30 minutes.

WARNING NEVER improvise by using other methods such as hot water or a microwave as this could damage the product and make it unsafe.












PRIOR TO COLLECTION OF CRYOPRECIPITATE PACK(S)


- Ensure prescription complete and informed consent documented.
- Explain procedure to patient, including symptoms of possible transfusion reactions.
- Ensure IV access patent.
- Record baseline observations (TPR and BP) and general patient status including pre-existing rashes.
- Ensure circumstances/situation appropriate to proceed, including staff availability.
- Check resuscitation equipment, including oxygen and adrenaline are available and in working order and emergency medical support is readily available.

WARNING ENSURE RIGHT PATIENT – RIGHT BLOOD

- The patient's identity MUST always be confirmed prior to transfusion.
- The patient MUST be wearing an ID band (or equivalent as per health service policy) containing the correct patient details.
- Two staff members (as per health service policy) MUST undertake the identity checks of the patient and cryoprecipitate pack AT THE PATIENT'S SIDE immediately prior to administration. Each of these two staff is responsible for the accuracy of the checking procedure. Although commonly performed co-operatively, consideration should be given to independent checking.
- One of the two people involved in the checking process MUST spike and hang the cryoprecipitate pack immediately after checking.

PRE-ADMINISTRATION CHECKS AT PATIENT'S SIDE MUST INCLUDE:

-  Check ID BAND is securely attached to patient's body.
-  Ask the patient (if conscious and rational) to state and spell their family name and given name in full, and date of birth (whenever possible). If the patient is unable to state and spell their name, ask a parent, guardian or carer (if present and able to do so), to verify the patient's identity.
-  Ensure that the stated full name and date of birth are identical to those on the ID band and confirm correct spelling of names.
-  Ensure that ALL details on the ID BAND (full name, date of birth, medical record number) are:
 - identical to those on the PRESCRIPTION, and
 - identical to those provided on the PATIENT COMPATIBILITY LABEL attached to the pack (family and given name, date of birth, and medical record number if included).
-  Blood product type is the same on the prescription, on the product and the Patient Compatibility Label.
-  Blood group and donation number on the Patient Compatibility Label are identical to that on the Pack Label.
-  Blood group on the blood pack is compatible with the blood group of the patient as indicated on the Patient Compatibility Label attached to the pack; if not identical, the transfusion service provider MUST make a specific comment to indicate it is compatible (or most suitable available).
-  Cryoprecipitate pack has not passed its pack expiry date and time.
-  Cryoprecipitate pack has no signs of leakage or damaged packaging, clumping of the contents, unusual discolouration or turbidity.

 **WARNING** DO NOT proceed if any discrepancies are found during the checking process or there is any concern regarding the integrity of the product – contact the transfusion service provider.

IV BLOOD LINE

- Use a new blood administration set (with 170–200 micron filter) unless administered in the setting of critical bleeding/massive transfusion when platelets, plasma and cryoprecipitate may need to be given through the same administration set.
- Blood administration sets must not be 'piggy-backed' into other lines.
- Change blood administration set every 12 hours (if continuing to transfuse), OR with new IV fluids or on completion of transfusion of the pack(s), whichever comes first.

COMPATIBLE IV SOLUTIONS

- 0.9% Sodium Chloride solution (Normal Saline).

INCOMPATIBLE IV SOLUTIONS

 **CAUTION** DO NOT infuse with or through a line that has previously contained:

- Electrolyte and colloid solutions containing any calcium (eg. HAEMACCEL[®], Hartman's solution or lactated Ringer's solution or GELAFUSAL[®] [available in New Zealand]) – these should not be administered with blood components collected in an anticoagulant containing citrate as they may cause clotting of the infusion line.

CONTINUED ON PAGE 35

Examples: Cryoprecipitate (Cryo) continued

CRYOPRECIPITATE COMPATIBILITY

- The transfusion service provider issues cryoprecipitate based on a blood group on record.
- If the blood group of the cryoprecipitate 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).

ABO

- Cryoprecipitate should preferably be ABO compatible.
- In adults ABO incompatible cryoprecipitate can be used with caution (particularly with large volumes).
- Cryoprecipitate compatibility is as follows:

Patient Group	Compatible Donor Group
O	O, A, B, AB
A	A, AB
B	B, AB
AB	AB

Note: AB cryoprecipitate may be used for all patient ABO groups.

Rh(D)

- Cryoprecipitate may be transfused without regard to Rh(D) type.

SPECIAL REQUIREMENTS/MODIFICATIONS

Cryoprecipitate does not contain significant numbers of leucocytes and therefore does not require leucocyte depletion or irradiation.

CONTINUED FROM PAGE 33

PUMPS

- Cryoprecipitate is commonly administered via gravity.
- Safe to administer via pump if required, refer to 'General Transfusion Practices and Equipment' on page 11.

MEDICATION



DO NOT add medication to cryoprecipitate pack or line.

If medication has to be given see page 13.

TIME OF INFUSION

- Commence immediately or contact the transfusion service provider for advice on required storage conditions/location to preserve coagulation factor function until transfusion can be commenced.
- A cryoprecipitate dose usually includes more than one pack.
- Start transfusion slowly, where possible. Increase rate (in accordance with prescription) if no adverse reaction.
- Typically given over 30–60 minutes per standard adult DOSE (ie. at rate of 10–20 mL/kg/hr) in stable, non-bleeding adult patients.
- Each cryoprecipitate pack should be completed within 4 hours of removal from controlled storage (see page 4) or before the expiry time on the pack or Transfusion Compatibility Report (if used), whichever is sooner. For more information refer to health service policy.

OBSERVATIONS

- TPR and BP MUST be recorded prior to transfusion, 15 minutes after commencement and on completion of each pack or as otherwise stipulated by health service policy.
- The patient MUST be observed closely for the first 15 minutes of each pack and regularly throughout the transfusion. When a patient is not under continuous visual observation, consider attending patient for first 30 minutes.
- Refer to health service policy for any additional observations. A typical stipulation is observations (TPR, BP) hourly during transfusion.
- The need for more frequent observations will depend on patient's clinical status.
- Monitor patient closely during and after transfusion for signs of reactions. See 'Reactions' on pages 62–65.

COMPLETING THE TRANSFUSION

- Time each product was completed must be recorded.
- At completion of a transfusion episode, consider a flush (minimum volume) to clear the line ensuring patient receives entire product. Exercise caution in neonates/paediatric patients or others at risk of fluid overload – refer to health service/unit policy. See 'Blood Administration Sets' on page 9.
- Adverse effects may manifest after the transfusion has been completed. The patient must be advised to report any adverse effects experienced after the transfusion has been completed.
- If there is any suspicion of a transfusion reaction the transfusion service provider must be informed of the clinical details and the pack should be returned.
- If the transfusion is completed uneventfully, discard the empty pack according to health service policy for disposal of clinical waste (or return to the transfusion service provider if required by health service policy).

BOTTLES

Flippin' Blood, Second Edition, June 2012

- 38 Bottles: General Information on Recombinant and Fractionated Products, including Rh(D) Immunoglobulin (Anti-D)**
- 40 Intravenous Immunoglobulin – INTRAGAM[®] P 6%**
- 44 Intravenous Immunoglobulin – KIOVIG 10%**
- 48 Intravenous Immunoglobulin – OCTAGAM[®] 5% and OCTAGAM[®] 10%**
- 52 Human Albumin – ALBUMEX[®] 4 and ALBUMEX[®] 20**
- 54 Human Prothrombin Complex Concentrate – PROTHROMBINEX[®]-VF**
- 56 Coagulation Factor VIII – Recombinant and Plasma-derived**
- 58 Coagulation Factor IX – Recombinant and Plasma-derived**

Examples: Bottles – General Information



IMMUNOGLOBULINS

Immunoglobulins manufactured from donor plasma include:

- Intravenous immunoglobulin (IVIg) – refer to specific products in this section
- NORMAL IMMUNOGLOBULIN-VF – intramuscular solution.

Specific immunoglobulins including:

- CMV IMMUNOGLOBULIN-VF – intravenous solution
- TETANUS IMMUNOGLOBULIN-VF – intravenous solution
- TETANUS IMMUNOGLOBULIN-VF – intramuscular solution
- HEPATITIS B IMMUNOGLOBULIN-VF – intramuscular solution
- ZOSTER IMMUNOGLOBULIN-VF – intramuscular solution
- Rh(D) IMMUNOGLOBULIN-VF – intramuscular solution (Anti-D)
- RHOPHYLAC® (Anti-D) for the infrequent occasions when intravenous administration of Rh(D) immunoglobulin is required.

Always read and refer to the specific product information prior to administration. Some products are solutions for intravenous infusion while others are solutions for intramuscular injection only. For updated information on products available in Australia refer to

www.transfusion.com.au



Rh(D) IMMUNOGLOBULIN-VF (Anti-D): for intramuscular administration only

- Rh(D) immunoglobulin-VF (Anti-D) is made from the plasma of Australian donors. It is given as prophylaxis to Rh(D) negative women during pregnancy and following birth of an Rh(D) positive baby to help prevent haemolytic disease of the newborn (HDN). It should be given as soon as possible but preferably within 72 hours of a sensitizing event.
- It is available in 250 IU and 625 IU vials.
- There are guidelines on the prophylactic use of Rh(D) immunoglobulin (Anti-D) in obstetrics which detail appropriate use and indications of this product. See 'Resources' on page 67.

Refer to the product information for specific information on administration and to health service guidelines.



RHOPHYLAC® (Anti-D): for infrequent occasions when intravenous administration is required

RHOPHYLAC® is an imported Rh(D) immunoglobulin (Anti-D). Although it can be given either intramuscularly or intravenously, it is used in Australia for the infrequent occasions when intravenous administration is required. It is indicated for use in consultation with a transfusion expert:

- In large fetomaternal haemorrhage where administration of intramuscular Rh(D) immunoglobulin is either contraindicated or not practical.
- For inadvertent or emergency transfusion of Rh(D) positive blood to an Rh(D) negative female of childbearing potential.

Refer to the product information for specific information on administration.

FRACTIONATED BLOOD PRODUCTS

Plasma is taken from donors when whole blood is donated, or collected by plasmapheresis. The plasma may be used for fresh frozen plasma (FFP) however most plasma is used for products separated from plasma by a process called 'fractionation'. These fractionated blood products are presented in bottles and are also referred to as 'plasma-derived' products to distinguish them from 'recombinant' products which are genetically engineered (see below).

Plasma contains thousands of different proteins, however only about 20 of these are used to produce therapeutic plasma products.

These fit into three main classes:

- **Immunoglobulins** – which are used:
 - for replacement therapy in immune deficiencies
 - to enhance immune response
 - to treat auto-immune disorders.
- **Albumin** – used to treat fluid loss or supplement low albumin levels in specific circumstances.
- **Clotting factors** – used to treat haemophilia and other bleeding disorders.

Australian plasma-derived products are manufactured by CSL Biotherapies. Australia also imports some products to meet clinical demand. Manufacturers regularly update the product information and consumer medicine information. Prior to administration of each product, consult the product information contained in the box or available through www.transfusion.com.au

RECOMBINANT PRODUCTS

Some genetically engineered (recombinant) clotting factors are now available.

The functions of plasma-derived immunoglobulins have yet to be replicated by recombinant products.

INFORMATION ON PRODUCTS NOT CONTAINED IN *FLIPPIN' BLOOD*, SECOND EDITION

Flippin' Blood, Second Edition contains specific information on MOST intravenously administered products (fractionated and recombinant) currently available in Australia. It does not include ALL products however, such as:

- Immunoglobulins administered intramuscularly.
- Products used infrequently or for rare disorders (eg. rare hereditary factor deficiencies other than Haemophilia A and B).
- New products manufactured by CSL Biotherapies that become available in Australia in the future such as EVOGAM® (16% subcutaneous immunoglobulin) and INTRAGAM® 10 NF (10% intravenous immunoglobulin).
- New imported products that may become available in the future in Australia to supplement local supply.

Always refer to specific product information contained in the box and available through www.transfusion.com.au

Examples: INTRAGAM® P 6% – Intravenous Immunoglobulin (IVIg)



INTRAGAM® P 6%

INTRAGAM® P 6% is a human intravenous immunoglobulin (IVIg) solution for infusion. It is available in 3 g (50 mL) or 12 g (200 mL) vials. Always read product information in the box carefully before commencing.



STORAGE

- INTRAGAM® P 6% must be refrigerated between 2°C to 8°C (do not freeze). Once removed from refrigeration, store below 25°C and use within 3 months.
- When refrigerated, INTRAGAM® P 6% should be stored in a monitored blood fridge (in transfusion service where available). It must not be stored in a domestic/ward refrigerator.
- Removal from remote storage must be documented in the register or electronic system for the purposes of tracking as per health service procedures/transfusion service provider requirements.
- Do not use after the expiry date.
- Store protected from light.
- INTRAGAM® P 6% contains no antimicrobial preservative. Use in one patient, on one occasion only.
- Contact transfusion service/product provider for advice re handling/return of any unused bottles (not opened).
- Used bottles MUST be discarded in medical waste and are not suitable for recycling.

VISUALLY INSPECT PRODUCT

- INTRAGAM® P 6% should be a clear or slightly opalescent, colourless to pale yellow liquid.
- Do not use solutions that are cloudy or have deposits (any sediment or particles) – contact the transfusion service provider.

DOCUMENTATION OF BATCH NUMBER PEEL OFF LABEL

- All product batch numbers must be documented in the patient's medical record.
- Products have a peel off label with the batch number making documentation easy.
- The transfusion service provider may also attach peel off label(s).

ADMINISTRATION FROM GLASS BOTTLES

Administration from glass bottles requires a vented system. A vented system can be in the form of a vented spike adaptor, a side air vent in an IV line or an airway needle.

Standard IV Line (pictured below, left)

Some standard IV lines have a side air vent. The side air vent must be open to allow adequate air flow when administering fluid from a glass bottle.

Vented Spike Adaptor (pictured below, centre and right)

The vented spike adaptor provides an efficient and safe vented system. Unlike airway needles there are no risks of needle stick injuries or filters becoming wet and causing inadequate flow rates.



⚠ WARNING DO NOT administer INTRAGAM® P 6% using infusion protocols for ANY other brands of IVIg (including OCTAGAM® 5%, OCTAGAM® 10% and KIOVIG 10%). ONLY administer INTRAGAM® P 6% using the infusion rates for this specific concentration of INTRAGAM. DO NOT confuse with INTRAGAM® 10 NF (10% IVIg) which may be available in the future.

CONTRAINDICATIONS AND PRECAUTIONS

- Always refer to the full product information.
- Patients with rare total IgA deficiency should have the IVIg product with the lowest IgA content – INTRAGAM® P 6% is the preferred product.

PRIOR TO ADMINISTRATION

- Correct reversible risk factors for adverse reactions (such as dehydration) before infusion is given.
- Ensure prescription is complete, including the BRAND and CONCENTRATION of IVIg prescribed.
- Check informed consent is documented as per health service policy.
- Explain procedure to patient, including symptoms of possible reactions.
- Ensure IV access patent.
- Record baseline observations (TPR and BP) and general patient status including pre-existing rashes.
- Ensure circumstances/situation appropriate to proceed.
- Check resuscitation equipment, including oxygen and adrenaline are available and in working order.
- Read the product information in the box.
- Allow the product to reach room temperature.

BLOOD GLUCOSE TESTING

⚠ WARNING Some types of blood glucose testing systems may falsely interpret the maltose contained in INTRAGAM® P 6% as glucose. This may result in falsely elevated glucose readings and, consequently, in the inappropriate administration of insulin. If measurement of blood glucose is required, test prior to the infusion or measure with a glucose-specific method (see product information).

ENSURE RIGHT PATIENT – RIGHT PRODUCT

⚠ WARNING Verify CORRECT patient, product (including brand and concentration) and prescription.

- The patient's identity MUST always be confirmed prior to administration. See page 15.
- Check as per IV medication/health service policy.

IV LINE/PUMPS

- The use of a pump is recommended to ensure constant delivery of accurate rates.
- A new standard IV line or blood administration set (170–200 micron filter) may be used.
- Administration from a glass bottle requires a vented system. See page 40.

MEDICATION/OTHER IV FLUIDS

⚠ CAUTION DO NOT mix/piggy back this product with other medications or IV fluids.

- Administer via a separate IV line.
- Premedication may be prescribed (eg. for a history of reaction as per treating doctor).
- Consider clearing the line with 0.9% Sodium Chloride solution (Normal Saline) on completion of infusion. See page 9.

COMPATIBLE IV SOLUTIONS

- IV line can be cleared with 0.9% Sodium Chloride solution (Normal Saline) or 5% Glucose.

CONTINUED ON PAGE 43



WARNING DO NOT administer INTRAGAM[®] P 6% using infusion protocols for ANY other brands of IVIg (including OCTAGAM[®] 5%, OCTAGAM[®] 10% and KIOVIG 10%). ONLY administer INTRAGAM[®] P 6% using the infusion rates for this specific concentration of INTRAGAM. DO NOT confuse with INTRAGAM[®] 10 NF (10% IVIg) which may be available in the future.

INTRAGAM[®] P 6% INFUSION RATES

The following example of infusion information is taken from the South Australian BloodSafe Administration Guide. ALWAYS refer to local health service guidelines/protocols and product information, and seek advice from the treating doctor.

- Start slowly, increase rate gradually only if tolerated.
- If line is primed with 0.9% Sodium Chloride solution (Normal Saline) rather than the product, consider this volume in timing of rate increases.

PAEDIATRIC INFUSION RATES*	ADULT INFUSION RATES*
NOTE: RATES for paediatric infusions are in mL/kg/hr (medical officer to calculate – use ideal body weight in obese patients).	NOTE: RATES for adult infusions are in mL/hr (or mL/min) and are not weight-based.
1 mL/kg/hr for 15–30 minutes	60 mL/hr (1 mL/min) for 15 min – (15 mL)
2 mL/kg/hr for 15–30 minutes	120 mL/hr (2 mL/min) for 15 min – (30 mL)
4 mL/kg/hr thereafter with a maximum rate of 240 mL/hr	240 mL/hr (4 mL/min) until complete

*In high-risk patients (eg. > 65 years, diabetics, obese, those with pre-existing or risk factors for cardiac disease, renal failure or arterial or venous thromboembolic events, hyperviscosity, paraprotein or dehydration), **consideration should be given to reducing the rate of infusion.** See product information and consult treating doctor.

- In septic patients or those with multiple risk factors discuss timing of IVIg administration with an expert.
- During an infusion, subsequent vials may commence at same rate that the preceding vial finished.
- Each bottle should be completed within 4 hours.
- It is recommended that subsequent infusions are given according to the same protocol (consult treating doctor if there has been a change in health status or reaction to a previous infusion).

CONTINUED FROM PAGE 41

INTRAGAM® P 6% INFUSION RATES

ALWAYS refer to local health service guidelines/ protocols and product information, and seek advice from the treating doctor. Refer to the adjacent page for an example of infusion information taken from the South Australian BloodSafe Administration Guide.

REACTIONS

- Tend to be related to the rate of the infusion and are more common in certain patient groups – refer to product information.
- Symptoms/signs may include: dyspnoea, wheezing, chest tightness, coughing, changes in blood pressure, tachycardia, flushing, fever, rigors, skin rash/urticaria, headache, vomiting, nausea and abdominal and back pain.
- If a reaction does occur – stop administration immediately, assess vital signs, notify the medical officer, and provide emergency care as required.
- For minor reactions (headache is most common) the infusion can often be restarted cautiously at a slower rate after the patient has improved clinically.
- Follow your institutional procedure for managing and reporting adverse events to IVIg. Inform the transfusion service/product provider.

OBSERVATIONS

Refer to health service policies/procedures for IVIg infusions, product information for any specific recommendations as well as considering individual patient factors and consulting with the treating doctor.

General recommendations:

- Close observation is required and the patient's general status should be monitored regularly throughout the infusion.
- A common approach is to take TPR and BP:
 - as a baseline prior to commencing
 - with each rate increase
 - hourly once maximum rate is achieved
 - on completion
 - if the patient experiences new or increased symptoms.

OBSERVATION POST INFUSION

The following patients should be monitored for 1 hour after completion of the infusion:

- those who have not had IVIg before
- those who have switched from another product
- where there has been a long interval since the last infusion
- where there has been a significant deterioration in health
- those who have had a reaction to the current or previous infusion.

Other patients should be observed for at least 20 minutes. Refer to product information, health service procedures and consult treating doctor.

Examples: KIOVIG 10% Intravenous Immunoglobulin (IVIg)



KIOVIG 10%

KIOVIG 10% is a human intravenous immunoglobulin (IVIg) solution for infusion. It is available in 1 g (10 mL), 2.5 g (25 mL), 5 g (50 mL), 10 g (100 mL) and 20 g (200 mL) vials. Always read product information in the box carefully before commencing.



STORAGE

- KIOVIG 10% must be refrigerated between 2°C to 8°C (do not freeze). Once stored at room temperature it must remain at room temperature and must be used within a defined period from the date of manufacture – see product information.
- When refrigerated, KIOVIG 10% should be stored in a monitored blood fridge (in transfusion service where available). It must not be stored in a domestic/ward refrigerator.
- Removal from remote storage must be documented in the register or electronic system for the purposes of tracking as per health service procedures/transfusion service provider requirements.
- Do not use after the expiry date.
- Store protected from light.
- KIOVIG 10% contains no antimicrobial preservative. Use in one patient, on one occasion only.
- Contact transfusion service/product provider for advice on handling/return of any unused bottles (not opened).
- Used bottles MUST be discarded in medical waste and are not suitable for recycling.

VISUALLY INSPECT PRODUCT

- KIOVIG 10% should be a clear or slightly opalescent, colourless to pale yellow liquid.
- Do not use solutions that are cloudy or have deposits (any sediment or particles) – contact the transfusion service provider.

DOCUMENTATION OF BATCH NUMBER

PEEL OFF LABEL

- All product batch numbers must be documented in the patient's medical record.
- Products have a peel off label with the batch number making documentation easy.
- The transfusion service provider may also attach peel off label(s).

ADMINISTRATION FROM GLASS BOTTLES

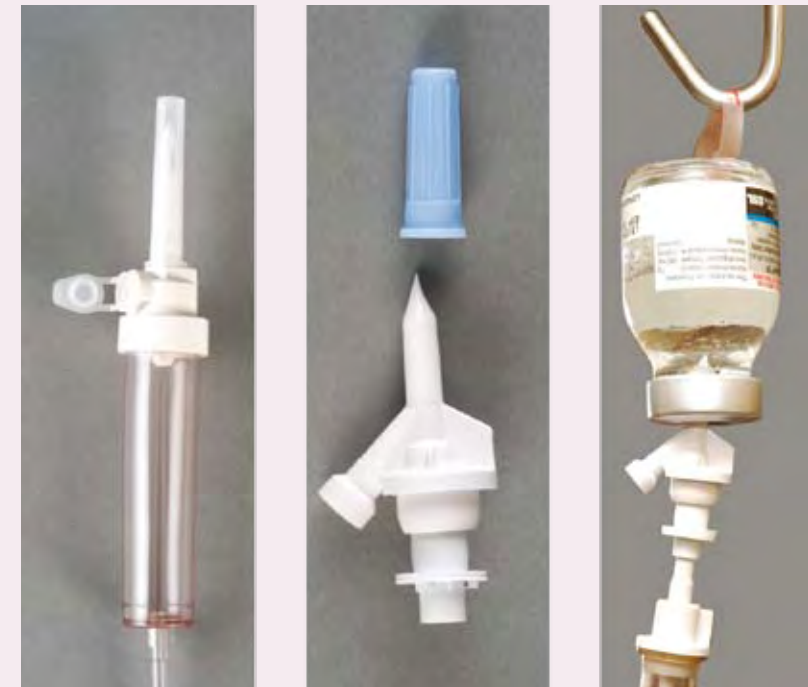
Administration from glass bottles requires a vented system. A vented system can be in the form of a vented spike adaptor, a side air vent in an IV line or an airway needle.

Standard IV Line (pictured below, left)

Some standard IV lines have a side air vent. The side air vent must be open to allow adequate air flow when administering fluid from a glass bottle.

Vented Spike Adaptor (pictured below, centre and right)

The vented spike adaptor provides an efficient and safe vented system. Unlike airway needles there are no risks of needle stick injuries or filters becoming wet and causing inadequate flow rates.



⚠ WARNING DO NOT administer KIOVIG 10% using infusion protocols for any other concentrations or brands of IVIg (including OCTAGAM® 10%, OCTAGAM® 5% and INTRAGAM® P 6%).

CONTRAINDICATIONS AND PRECAUTIONS

- Always refer to the full product information.
- Patients with rare total IgA deficiency should have the IVIg product with the lowest IgA content – INTRAGAM® P 6% is the preferred product.

PRIOR TO ADMINISTRATION

- Correct reversible risk factors for adverse reactions (such as dehydration) before infusion is given.
- Ensure prescription is complete, including the BRAND and CONCENTRATION of IVIg prescribed.
- Check informed consent is documented as per health service policy.
- Explain procedure to patient, including symptoms of possible reactions.
- Ensure IV access patent.
- Record baseline observations (TPR and BP) and general patient status including pre-existing rashes.
- Ensure circumstances/situation appropriate to proceed.
- Check resuscitation equipment, including oxygen and adrenaline are available and in working order.
- Read the product information in the box.
- Allow the product to reach room temperature.

ENSURE RIGHT PATIENT – RIGHT PRODUCT

⚠ WARNING Verify CORRECT patient, product (including brand and concentration) and prescription.

- The patient's identity MUST always be confirmed prior to administration. See page 15.
- Check as per IV medication/health service policy.

IV LINE/PUMPS

⚠ CAUTION DO NOT mix/piggy back this product with other medications or IV fluids.

- The use of a pump is recommended to ensure constant delivery of accurate rates.
- A new standard IV line or blood administration set (170–200 micron filter) may be used.
- Administration from a glass bottle requires a vented system. See page 44.

MEDICATION/OTHER IV FLUIDS

- Administer via a separate IV line.
- Premedication may be prescribed (eg. for a history of reaction as per treating doctor).
- Consider clearing the line with 0.9% Sodium Chloride solution (Normal Saline) on completion of infusion. See page 9.

COMPATIBLE IV SOLUTIONS

- IV line can be cleared with 0.9% Sodium Chloride solution (Normal Saline) or 5% Glucose.

CONTINUED ON PAGE 47

WARNING DO NOT administer KIOVIG 10% using infusion protocols for any other concentrations or brands of IVIg (including OCTAGAM® 10%, OCTAGAM® 5% and INTRAGAM® P 6%).

KIOVIG 10% INFUSION RATES

The following example of infusion information is taken from the South Australian BloodSafe Administration Guide. ALWAYS refer to local health service guidelines/protocols and product information, and seek advice from the treating doctor.

- Infusion rates should be calculated and prescribed by the treating doctor. Use ideal body weight to calculate infusion rates in obese patients.
- Start slowly, increase rate gradually only if tolerated.
- If 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*
NOTE: RATES below are in mL/kg/hr:
0.5 mL/kg/hr for 30 minutes
1.0 mL/kg/hr for 30 minutes
2.0 mL/kg/hr for 30 minutes
3.0 mL/kg/hr with a maximum rate of 300 mL/hr

The *routine* use of higher rates is not recommended.

*In high-risk patients (eg. > 65 years, diabetics, obese, those with pre-existing or risk factors for cardiac disease, renal failure or arterial or venous thromboembolic events, hyperviscosity, paraprotein or dehydration), **a more conservative maximum rate of less than 2 mL/kg/hr (maximum 200 mL/hr) is recommended.** For more information on high risk patients see product information and consult treating doctor.

- In septic patients or those with multiple risk factors discuss timing of IVIg administration with an expert.
- During an infusion, subsequent vials may commence at same rate that the preceding vial finished.
- Each bottle should be completed within 4 hours.
- It is recommended that subsequent infusions are given according to the same protocol (consult treating doctor if there has been a change in health status or reaction to a previous infusion).

CONTINUED FROM PAGE 45

KIOVIG 10% INFUSION RATES

ALWAYS refer to local health service guidelines/ protocols and product information, and seek advice from the treating doctor. Refer to the adjacent page for an example of infusion information taken from the South Australian BloodSafe Administration Guide.

REACTIONS

- Tend to be related to the rate of the infusion and are more common in certain patient groups – refer to product information.
- Symptoms/signs may include: dyspnoea, wheezing, chest tightness, coughing, changes in blood pressure, tachycardia, flushing, fever, rigors, skin rash/urticaria, headache, vomiting, nausea and abdominal and back pain.
- If a reaction does occur – stop administration immediately, assess vital signs, notify the medical officer, and provide emergency care as required.
- For minor reactions (headache is most common) the infusion can often be restarted cautiously at a slower rate after the patient has improved clinically.
- Follow your institutional procedure for managing and reporting adverse events to IVIg. Inform the transfusion service/product provider.

OBSERVATIONS

Refer to health service policies/procedures for IVIg infusions, product information for any specific recommendations as well as considering individual patient factors and consulting with the treating doctor.

General recommendations:

- Close observation is required and the patient's general status should be monitored regularly throughout the infusion.
- A common approach is to take TPR and BP:
 - as a baseline prior to commencing
 - with each rate increase
 - hourly once maximum rate is achieved
 - on completion
 - if the patient experiences new or increased symptoms.

OBSERVATION POST INFUSION

The following patients should be monitored for 1 hour after completion of the infusion:

- those who have not had IVIg before
- those who have switched from another product
- where there has been a long interval since the last infusion
- where there has been a significant deterioration in health
- those who have had a reaction to the current or previous infusion.

Other patients should be observed for at least 20 minutes. Refer to product information, health service procedures and consult treating doctor.

Examples: OCTAGAM® 5% and OCTAGAM® 10% – Intravenous Immunoglobulin (IVIg)



OCTAGAM® 5% formulation



OCTAGAM® 10% formulation

OCTAGAM® 5% AND OCTAGAM® 10%

OCTAGAM is a human intravenous immunoglobulin (IVIg) solution for infusion. OCTAGAM® 5% is available in 1 g (20 mL), 2.5 g (50 mL), 5 g (100 mL) and 10 g (200 mL) vials.

OCTAGAM® 10% is available in 2 g (20 mL), 5 g (50 mL), 10 g (100 mL) and 20 g (200 mL) vials.

Always read the product information contained in the box before commencing.

STORAGE

- OCTAGAM® 5% must be refrigerated between 2°C to 8°C (do not freeze) or stored below 25°C.
- OCTAGAM® 10% must be refrigerated between 2°C to 8°C (do not freeze). Once removed from refrigeration, it may be stored below 25°C for a single period of 3 months, in which case the product expires at the end of the 3-month period. Do not return to refrigeration after storage below 25°C.
- When refrigerated, OCTAGAM® 5% and OCTAGAM® 10% should be stored in a monitored blood fridge (in transfusion service where available). It must not be stored in a domestic/ward refrigerator.

- Removal from remote storage must be documented in the register or electronic system for the purposes of tracking as per health service procedures/transfusion service provider requirements.
- Do not use after the expiry date.
- Store protected from light.
- OCTAGAM® 5% and OCTAGAM® 10% contain no antimicrobial preservative. Use in one patient, on one occasion only.
- Contact transfusion service/product provider for advice re handling/return of any unused bottles (not opened).
- Used bottles MUST be discarded in medical waste and are not suitable for recycling.

VISUALLY INSPECT PRODUCT

- OCTAGAM® 5% and OCTAGAM® 10% should be a clear or slightly opalescent, colourless to pale yellow liquid.
- Do not use solutions that are cloudy or have deposits (any sediment or particles) – contact the transfusion service provider.



DOCUMENTATION OF BATCH NUMBER PEEL OFF LABEL

- All product batch numbers must be documented in the patient's medical record.
- Products have a peel off label with the batch number making documentation easy.
- The transfusion service provider may also attach peel off label(s).

ADMINISTRATION FROM GLASS BOTTLES

Administration from glass bottles requires a vented system. A vented system can be in the form of a vented spike adaptor, a side air vent in an IV line or an airway needle.

Standard IV Line (pictured below, left)

Some standard IV lines have a side air vent. The side air vent must be open to allow adequate air flow when administering fluid from a glass bottle.

Vented Spike Adaptor (pictured below, centre and right)

The vented spike adaptor provides an efficient and safe vented system. Unlike airway needles there are no risks of needle stick injuries or filters becoming wet and causing inadequate flow rates.



OCTAGAM[®] 5% and OCTAGAM[®] 10% – Intravenous Immunoglobulin (IVIg)

⚠ WARNING DO NOT administer OCTAGAM[®] using infusion protocols for ANY other brands of IVIg (including KIOVIG 10% and INTRAGAM[®] P 6%). ONLY administer OCTAGAM[®] using the infusion rates specific for the concentration: OCTAGAM 5% and OCTAGAM 10% have DIFFERENT infusion rates.

CONTRAINDICATIONS AND PRECAUTIONS

- Always refer to the full product information.
- Patients with rare total IgA deficiency should have the IVIg product with the lowest IgA content – INTRAGAM[®] P 6% is the preferred product.

PRIOR TO ADMINISTRATION

- Correct reversible risk factors for adverse reactions (such as dehydration) before infusion is given.
- Ensure prescription is complete, including the BRAND and CONCENTRATION of IVIg prescribed.
- Check informed consent is documented as per health service policy.
- Explain procedure to patient, including symptoms of possible reactions.
- Ensure IV access patent.
- Record baseline observations (TPR and BP) and general patient status including pre-existing rashes.
- Ensure circumstances/situation appropriate to proceed.
- Check resuscitation equipment, including oxygen and adrenaline are available and in working order.
- Read the product information in the box.
- Allow the product to reach room temperature.

BLOOD GLUCOSE TESTING

⚠ WARNING Some types of blood glucose testing systems may falsely interpret the maltose contained in OCTAGAM[®] 5% and OCTAGAM[®] 10% as glucose. This may result in falsely elevated glucose readings and, consequently, in the inappropriate administration of insulin. If measurement of blood glucose is required, test prior to the infusion or measure with a glucose-specific method (see product information).

ENSURE RIGHT PATIENT – RIGHT PRODUCT

⚠ WARNING Verify CORRECT patient, product (including brand and concentration) and prescription.

- The patient's identity MUST always be confirmed prior to administration. See page 15.
- Check as per IV medication/health service policy.

IV LINE/PUMPS

- The use of a pump is recommended to ensure constant delivery of accurate rates.
- A new standard IV line or blood administration set (170–200 micron filter) may be used.
- Administration from a glass bottle requires a vented system. See page 48.

MEDICATION/OTHER IV FLUIDS

⚠ CAUTION DO NOT mix/piggy back this product with other medications or IV fluids.

- Administer via a separate IV line.
- Premedication may be prescribed (eg. for a history of reaction as per treating doctor).
- Consider clearing the line with 0.9% Sodium Chloride solution (Normal Saline) on completion of infusion. See page 9.

COMPATIBLE IV SOLUTIONS

- IV line can be cleared with 0.9% Sodium Chloride solution (Normal Saline) or 5% Glucose.

CONTINUED ON PAGE 51

Examples: OCTAGAM[®] 5% and OCTAGAM[®] 10% – Intravenous Immunoglobulin (IVIg) continued

⚠ WARNING DO NOT administer OCTAGAM[®] using infusion protocols for ANY other brands of IVIg (including KIOVIG 10% and INTRAGAM[®] P 6%). ONLY administer OCTAGAM[®] using the infusion rates specific for the concentration: OCTAGAM[®] 5% and OCTAGAM[®] 10% have DIFFERENT infusion rates.

OCTAGAM[®] 5% and OCTAGAM[®] 10% INFUSION RATES

⚠ WARNING Infusion rates for OCTAGAM[®] 5% and OCTAGAM[®] 10% are DIFFERENT.

The following example of infusion information is taken from the South Australian BloodSafe Administration Guide. ALWAYS refer to local health service guidelines/protocols and product information, and seek advice from the treating doctor.

- Infusion rates should be calculated and prescribed by the treating doctor. Use ideal body weight to calculate infusion rates in obese patients.
- Start slowly, increase rate gradually only if tolerated.
- If line is primed with 0.9% Sodium Chloride solution (Normal Saline) rather than the product, consider this volume in timing of rate increases.

OCTAGAM [®] 5% INFUSION RATES*	OCTAGAM [®] 10% INFUSION RATES*
NOTE: RATES below are in mL/kg/hr:	NOTE: RATES below are in mL/kg/hr:
1.0 mL/kg/hr for 30 minutes	0.5 mL/kg/hr for 30 minutes
2.0 mL/kg/hr for 30 minutes	1.0 mL/kg/hr for 30 minutes
3.0 mL/kg/hr for 30 minutes	2.0 mL/kg/hr for 30 minutes
4.0 mL/kg/hr for 30 minutes	3.0 mL/kg/hr with a maximum rate of 300 mL/hr
5.0 mL/kg/hr with a maximum rate of 480 mL/hr	
The <i>routine</i> use of higher rates is not recommended. *In high risk† patients a more conservative maximum rate of less than 4 mL/kg/hr (maximum 300 mL/hr) is recommended. Refer to product information.	The <i>routine</i> use of higher rates is not recommended. *In high risk† patients a more conservative maximum rate of less than 2 mL/kg/hr (maximum 200 mL/hr) is recommended. Refer to product information.

† High risk patients: eg. > 65 years, diabetics, obese, those with pre-existing or risk factors for cardiac disease, renal failure or arterial or venous thromboembolic events, hyperviscosity, paraprotein or dehydration. For more information see product information and consult treating doctor.

- In septic patients or those with multiple risk factors discuss timing of IVIg administration with an expert.
- During an infusion, subsequent vials may commence at same rate that the preceding vial finished.
- Each bottle should be completed within 4 hours.
- It is recommended that subsequent infusions are given according to the same protocol (consult treating doctor if there has been a change in health status or reaction to a previous infusion).

CONTINUED FROM PAGE 49

OCTAGAM[®] 5% and OCTAGAM[®] 10% INFUSION RATES

ALWAYS refer to local health service guidelines/ protocols and product information, and seek advice from the treating doctor. Refer to the adjacent page for an example of infusion information taken from the South Australian BloodSafe Administration Guide.

REACTIONS

- Tend to be related to the rate of the infusion and are more common in certain patient groups – refer to product information.
- Symptoms/signs may include: dyspnoea, wheezing, chest tightness, coughing, changes in blood pressure, tachycardia, flushing, fever, rigors, skin rash/urticaria, headache, vomiting, nausea and abdominal and back pain.
- If a reaction does occur – stop administration immediately, assess vital signs, notify the medical officer, and provide emergency care as required.
- For minor reactions (headache is most common) the infusion can often be restarted cautiously at a slower rate after the patient has improved clinically.
- Follow your institutional procedure for managing and reporting adverse events to IVIg. Inform the transfusion service/product provider.

OBSERVATIONS

Refer to health service policies/procedures for IVIg infusions, product information for any specific recommendations as well as considering individual patient factors and consulting with the treating doctor.

General recommendations:

- Close observation is required and the patient's general status should be monitored regularly throughout the infusion.
- A common approach is to take TPR and BP:
 - as a baseline prior to commencing
 - with each rate increase
 - hourly once maximum rate is achieved
 - on completion
 - if the patient experiences new or increased symptoms.

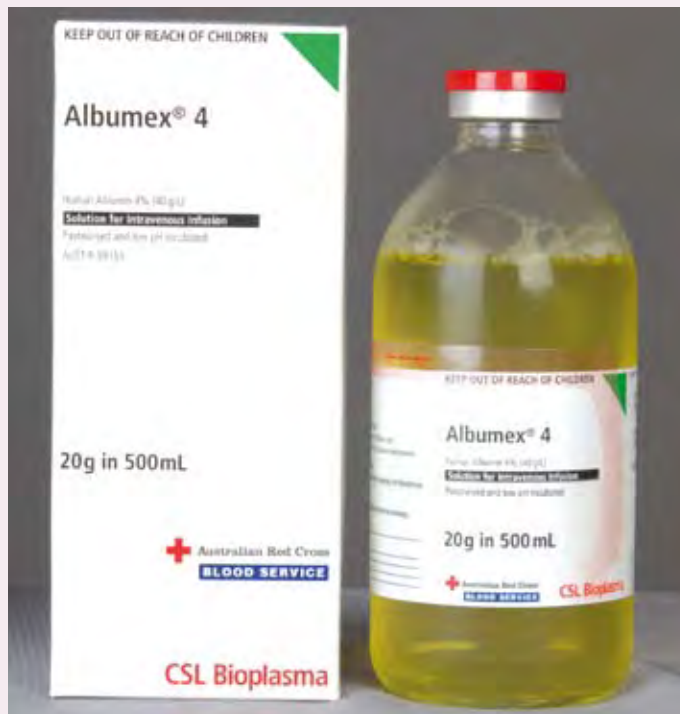
OBSERVATION POST INFUSION

The following patients should be monitored for 1 hour after completion of the infusion:

- those who have not had IVIg before
- those who have switched from another product
- where there has been a long interval since the last infusion
- where there has been a significant deterioration in health
- those who have had a reaction to the current or previous infusion.

Other patients should be observed for at least 20 minutes. Refer to product information, health service procedures and consult treating doctor.

Examples: ALBUMEX® 4 and ALBUMEX® 20 – Human Albumin



ALBUMEX® Human Albumin Solution

⚠ WARNING ALBUMEX® is available in two concentrations, ALBUMEX® 4% and ALBUMEX® 20% albumin which come in a number of different volume bottles. Care should be taken to ensure the correct concentration is administered.

STORAGE

- ALBUMEX® is stored below 30°C and should not be frozen.
- ALBUMEX® may be stored in a refrigerator (however this is not essential if room temperature is always below 30°C).
- Removal from remote storage must be documented in the register or electronic system for the purposes of tracking as per health service procedures/transfusion service provider requirements.
- Do not use after the expiry date.
- Store protected from light.
- Used bottles MUST be discarded in medical waste and are not suitable for recycling.

VISUALLY INSPECT PRODUCT

- Do not use if product is turbid or cloudy, or contains any sediment or particles – contact the transfusion service provider.
- ALBUMEX® usually has a clear to pale yellow colour but may occasionally have a green discoloration due to small amounts of biliverdin, which is normal and harmless. Biliverdin is a green-coloured breakdown product of haemoglobin and is carried by albumin in human plasma.



DOCUMENTATION OF BATCH NUMBER PEEL OFF LABEL

- All product batch numbers must be documented in the patient's medical record.
- Products have a peel off label with the batch number making documentation easy.
- The transfusion service provider may also attach peel off label(s).



PRODUCT INFORMATION

Always read the product information contained in the box before commencing.

⚠ WARNING ALBUMEX[®] Human Albumin solution is available in two concentrations, ALBUMEX[®] 4% and ALBUMEX[®] 20%. Care should be taken to ensure the correct concentration is administered. Administration of 20% albumin instead of 4% in error could result in severe circulatory overload.

PRIOR TO ADMINISTRATION

- Ensure prescription complete and informed consent documented as per health service policy.
- Explain procedure to patient, including symptoms of possible reactions.
- Ensure IV access patent.
- Record baseline observations (TPR and BP).
- Ensure circumstances/situation appropriate to proceed.
- Read the product information contained in the box.

ENSURE RIGHT PATIENT – RIGHT PRODUCT

⚠ WARNING Verify CORRECT patient, product (including concentration) and prescription.

- The patient's identity MUST always be confirmed prior to administration. See page 15.
- Check as per IV medication/health service policy.

IV LINE

- A new standard IV line or blood administration set (170–200 micron filter) may be used.
- DO NOT 'piggy-back' into other lines.
- Administration from glass bottles requires a vented system. See page 48.
- Consider clearing the line with 0.9% Sodium Chloride solution (Normal Saline) on completion of infusion. See page 9.

PUMPS

- A pump can be used to ensure constant delivery of accurate rates.

MEDICATION/OTHER IV FLUIDS

⚠ CAUTION Refer to product information for details of specific incompatibilities/interactions.

COMPATIBLE IV SOLUTIONS

- 0.9% Sodium Chloride solution (Normal Saline).

TIME OF INFUSION

- The infusion rate/time is as ordered by the medical officer. Refer to specific product information.
- Each bottle should be completed within 4 hours (follow health service policy).
- An ALBUMEX[®] bottle must only be accessed once using an aseptic technique.
- If ALBUMEX[®] is drawn into a syringe and administered via a syringe pump it must be completed within 4 hours.
- Follow health service guidelines for user-applied labelling of injectable medicines, fluids and lines.

OBSERVATIONS

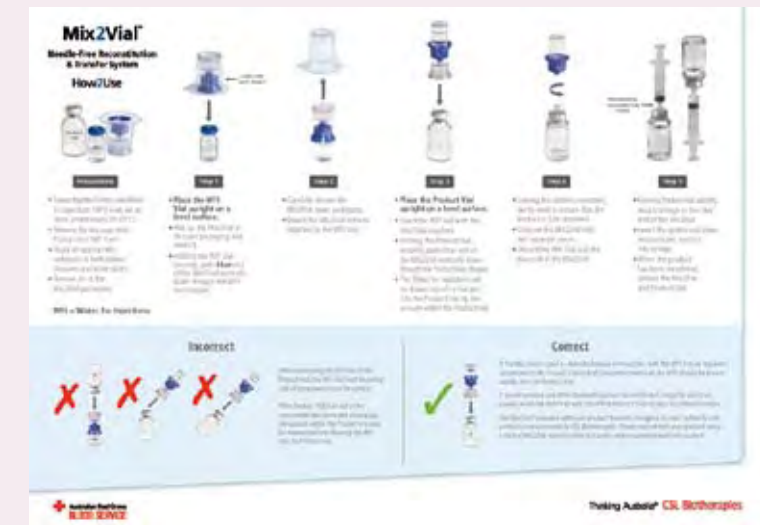
- The patient's clinical condition will dictate the frequency of observation.
- Usually TPR and BP are taken before commencement, hourly throughout the infusion and on completion. Refer to health service policy.
- Patients should be monitored for circulatory overload and hypersensitivity to the product.
- Accurate fluid balance documentation is important.

REACTIONS

- Adverse reactions to albumin solution are uncommon and are usually mild and transient.
- Symptoms of adverse reactions may include: chills, fever, allergic reactions (hypotension, urticaria, skin rash, anaphylaxis), nausea, vomiting and increased salivation.
- If a reaction does occur – stop administration immediately, assess vital signs, notify the medical officer and provide emergency care as required. Inform transfusion service provider/product provider.

⚠ WARNING Administration of concentrated Albumin (ALBUMEX[®] 20) may cause sudden cardiac failure in some patients due to circulatory overload.

Examples: PROTHROMBINEX®-VF – Human Prothrombin Complex



PRODUCT INFORMATION

Additional resources are also available such as this *Quick Reference Guide, Mix2Vial® – How2Use* (available through www.transfusion.com.au).

PROTHROMBINEX®-VF

PROTHROMBINEX®-VF is a plasma-derived product and is currently the only brand of Human Prothrombin Complex available in Australia.

STORAGE

- PROTHROMBINEX®-VF must be refrigerated between 2°C to 8°C (do not freeze). Once removed from refrigeration, store below 25°C for a single period of 6 months. The product must not be returned to refrigeration after storage below 25°C.
- Removal from remote storage must be documented in the register or electronic system for the purposes of tracking as per health service procedures/transfusion service provider requirements.

- When refrigerated, store in a monitored blood fridge (in transfusion service where available). It must not be stored in a domestic/ward refrigerator.
- Do not use after the expiry date.
- Store protected from light.
- Contact transfusion service/product provider for advice re handling/return of any unused bottles (not opened).
- Used bottles MUST be discarded in medical waste and are not suitable for recycling.

DOCUMENTATION OF BATCH NUMBER

- All product batch numbers must be documented in the patient's medical record.
- The transfusion service provider may attach peel off label(s).

HUMAN PROTHROMBIN COMPLEX (PROTHROMBINEX[®]-VF)

Human prothrombin complex (PROTHROMBINEX[®]-VF) is a plasma-derived coagulation factor concentrate containing Factors II, IX and X. It may be used in settings of congenital or acquired coagulation deficiencies of these factors, including for rapid warfarin reversal according to Australian Warfarin Reversal Consensus Guidelines*. These guidelines also outline the role of vitamin K and fresh frozen plasma in warfarin reversal.

PRIOR TO ADMINISTRATION

- Ensure prescription complete and informed consent documented as per health service policy.
- Explain procedure to patient, including symptoms of possible reactions.
- Read the product information contained in the box.

ENSURE RIGHT PATIENT – RIGHT PRODUCT

 **WARNING** Verify **CORRECT** patient, product and prescription.

- The patient's identity **MUST** always be confirmed prior to administration. See page 15.
- Check as per IV medication/health service policy.

RECONSTITUTION

 **CAUTION** The product **MUST** be reconstituted and filtered as per the product information.

- Failure to reconstitute correctly may result in vacuum loss or incomplete dissolution of the product.
- DO NOT shake vial/syringe once mixed with diluent.
- Each vial **MUST** be filtered prior to administration (using the Mix2Vial[®] system supplied with the product).
- If vacuum is lost, follow product information and contact transfusion service/product provider.

INFUSION

- Administered IV as a bolus dose – inject PROTHROMBINEX[®]-VF solution at a rate not exceeding 3 mL per minute.
- When the contents of more than one vial are to be given, it may be convenient to pool the total amount prior to administration in a large syringe or sterile bag. This must be done aseptically. A pump may be used if desired.
- Follow health service guidelines for user-applied labelling of injectable medicines, fluids and lines.
- DO NOT mix/piggy back this product with other medications or IV fluids/blood products.

OBSERVATIONS

- Bolus doses are administered under constant visual observation.
- Observe for signs of an adverse reaction and tissue infiltration.

REACTIONS

- Symptoms may include: fever, chills, dizziness, nausea or vomiting, itching, skin rash, tightness of the chest, wheezing or breathlessness.
- If a reaction does occur – stop administration immediately, assess vital signs, notify the medical officer, and provide emergency care as required. Inform transfusion service provider/product provider.

UPON COMPLETION

- When IV is removed, apply pressure to site until bleeding has completely resolved.
- Used bottles **MUST** be discarded in medical waste and are not suitable for recycling.

* Warfarin Reversal Consensus Guidelines 2004 (MJA 2004; 181(9): 492–497) on behalf of the Australasian Society of Thrombosis and Haemostasis – update for the *Medical Journal of Australia* (MJA) currently in progress.

Examples: Coagulation Factor VIII – Recombinant and Plasma-derived



COAGULATION FACTOR VIII – RECOMBINANT AND PLASMA-DERIVED

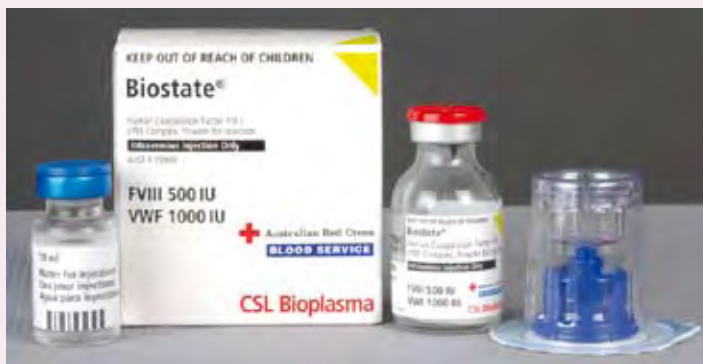
Factor VIII is available as a recombinant or plasma-derived product. Verify that the prescription clearly states type of Factor VIII and brand to be administered. Always read the product information contained in the box before commencing.

RECOMBINANT FACTOR VIII

Factor VIII is available as a recombinant factor (eg. KOGENATE® and XYNTHA®) and is now the preferred product for treatment and prophylaxis of Haemophilia A. This does not contain von Willebrand Factor and is not indicated for the treatment of bleeding in von Willebrand Disorder.

PLASMA-DERIVED FACTOR VIII

BIOSTATE® is plasma-derived Factor VIII that contains von Willebrand Factor and is used to treat patients with von Willebrand Disorder and occasional patients with Haemophilia A.



STORAGE

- Refer to individual product information.
- Removal from remote storage must be documented in the register or electronic system for the purposes of tracking as per health service procedures/transfusion service provider requirements.
- Do not use after the expiry date.

DOCUMENTATION OF BATCH NUMBER PEEL OFF LABEL

- All product batch numbers must be documented in the patient's medical record.
- Products have a peel off label with the batch number making documentation easy.
- The transfusion service provider may also attach peel off label(s).

PRODUCT INFORMATION

Always read the product information contained in the box before commencing.

Coagulation Factor VIII – Recombinant and Plasma-derived

⚠ WARNING Prescriptions for plasma-derived Factor VIII should clearly specify the ‘active entity’ of the ordered dose (ie. whether the dose is in Factor VIII units or in von Willebrand Factor units) as these are present in different amounts and confusion can lead to the wrong dose being given.

FACTOR VIII (ANTI-HAEMOPHILIC FACTOR)

Factor VIII (anti-haemophilic factor) is a coagulation factor concentrate used in the treatment of traumatic and spontaneous bleeds, perioperative management and prevention (prophylaxis) of bleeding in patients with Haemophilia A (Factor VIII deficiency).

- Factor VIII is available as a recombinant or plasma-derived product.
- Recombinant Factor VIII is now the preferred product for Haemophilia A and there are several different brands available. There may be occasional patients who have chosen or need to remain on the plasma-derived product.

VON WILLEBRAND FACTOR

Plasma-derived Factor VIII contains von Willebrand Factor and is used to treat patients with von Willebrand Disorder. The current Australian product is BIOSTATE® which contains Factor VIII and von Willebrand Factor in a 1:2 ratio. Prescriptions should therefore specify the ‘active entity’ of the ordered dose (ie. Factor VIII units or von Willebrand Factor units), otherwise the prescribed dose should be clarified.

PRIOR TO ADMINISTRATION

- Verify that the prescription is complete, including clearly stating the type of Factor VIII (eg. recombinant or plasma-derived and the brand).
- Ensure informed consent documented as per health service policy.

- Check previous treatment history with patient/carer (ie. current product type and brand used for treatment/prophylaxis of bleeds).
- Explain procedure to patient, including symptoms of possible reactions.
- Read the product information contained in the box.
- Refer to Haemophilia Treatment Centre (HTC)/health service procedures prior to proceeding.

ENSURE RIGHT PATIENT – RIGHT PRODUCT

⚠ WARNING Verify **CORRECT** patient, product (including brand and strength) and prescription.

- The patient’s identity **MUST** always be confirmed prior to administration. See page 15.
- Check as per IV medication/health service policy.

RECONSTITUTION

⚠ CAUTION For instructions on reconstitution/filtration, refer to the individual product information and any other support materials accompanying the product.

- Failure to reconstitute correctly may result in vacuum loss or incomplete dissolution of the product.
- DO NOT shake vial/syringe once mixed with diluent.
- A filter may be incorporated in the reconstitution device or butterfly infusion set accompanying the product. Check the product information for filter type, location and correct use. If the filter provided is contained in the butterfly infusion set, but it is not being used to administer the product, refer to the product information and any accompanying support materials for instructions re filtration or contact the transfusion service/product provider or HTC for advice.

INFUSION

- Administered IV – either as a bolus dose or continuous infusion.
- DO NOT mix/piggy back this product with other medications or IV fluids/blood products.
- Bolus dose administration – refer to individual product information for appropriate rate.
- Continuous infusion – administered via an infusion device. Prime line with product. Refer to HTC/health service procedures. Rate as specified by prescribing medical officer.
- Follow health service guidelines for user-applied labelling of injectable medicines, fluids and lines.

OBSERVATIONS

- Bolus doses are administered under constant visual observation. Refer to HTC/health service procedures.
- Observe for signs of an adverse reaction and tissue infiltration.

REACTIONS

- Symptoms may include: skin rash, itching, tightness in throat or chest, shortness of breath, chest pain or wheezing.
- If a reaction does occur – stop administration immediately, assess vital signs, notify the medical officer, and provide emergency care as required. Inform transfusion service provider/product provider.

UPON COMPLETION

- When IV is removed, apply pressure to site until bleeding has completely resolved.
- Used bottles **MUST** be discarded in medical waste and are not suitable for recycling.

A range of guidelines for use of coagulation factors and management of haemophilia and other bleeding disorders (Australian Haemophilia Centre Directors’ Organisation), are available at www.ahcdo.org.au/publications

Examples: Coagulation Factor IX – Recombinant and Plasma-derived



COAGULATION FACTOR IX – RECOMBINANT AND PLASMA-DERIVED

Factor IX is available as a recombinant or plasma-derived product. Verify that the prescription clearly states the type of Factor IX and brand to be administered. Always read the product information contained in the box before commencing.

RECOMBINANT FACTOR IX

BENEFIX® is a recombinant Factor IX concentrate.

PLASMA-DERIVED FACTOR IX

MONOFIX®-VF is a plasma-derived Factor IX concentrate.

Recombinant Factor IX is now the product of choice for Haemophilia B. There may be occasional patients who have chosen or need to remain on MONOFIX®-VF.



STORAGE

- Refer to individual product information.
- Removal from remote storage must be documented in the register or electronic system for the purposes of tracking as per health service procedures/transfusion service provider requirements.
- Do not use after the expiry date.

DOCUMENTATION OF BATCH NUMBER PEEL OFF LABEL

- All product batch numbers must be documented in the patient's medical record.
- Products have a peel off label with the batch number making documentation easy.
- The transfusion service provider may also attach peel off label(s).

PRODUCT INFORMATION

Always read the product information contained in the box before commencing.

Coagulation Factor IX – Recombinant and Plasma-derived

FACTOR IX (ANTI-HAEMOPHILIC FACTOR)

Factor IX (anti-haemophilic factor) is a coagulation factor concentrate used in the treatment of traumatic and spontaneous bleeds, perioperative management and prevention (prophylaxis) of bleeding in patients with Haemophilia B (Factor IX deficiency).

- Factor IX is available as a recombinant or plasma-derived product.
- Recombinant Factor IX is now the preferred product for Haemophilia B. There may be occasional patients who have chosen or need to remain on the plasma-derived product. The current plasma-derived Australian product is MonoFIX®-VF.

⚠ WARNING 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. Refer to Haemophilia Treatment Centre (HTC)/health service procedures/guidelines.

PRIOR TO ADMINISTRATION

- Verify that the prescription is complete, including clearly stating the type of Factor IX (eg. recombinant or plasma-derived and the brand).
- Ensure informed consent documented as per health service policy.
- Check previous treatment history with patient/carer (ie. current product type and brand used for treatment/prophylaxis of bleeds).
- Explain procedure to patient, including symptoms of possible reactions.
- Read the product information contained in the box.
- Refer to HTC/health service procedures prior to proceeding.

ENSURE RIGHT PATIENT – RIGHT PRODUCT

⚠ WARNING Verify **CORRECT** patient, product (including type and brand) and prescription.

- The patient's identity **MUST** always be confirmed prior to administration. See page 15.
- Check as per IV medication/health service policy.

RECONSTITUTION

⚠ CAUTION For instructions on reconstitution and filtration, refer to the individual product information and any other support materials accompanying the product.

- Failure to reconstitute correctly may result in vacuum loss or incomplete dissolution of the product.
- DO NOT shake vial/syringe once mixed with diluent.
- A filter may be incorporated in the reconstitution device or butterfly infusion set accompanying the product. Check the product information for filter type, location and correct use. If the filter provided is contained in the butterfly infusion set, but it is not being used to administer the product, refer to the product information and any accompanying support materials for instructions re filtration or contact the transfusion service/product provider or HTC for advice.

INFUSION

- Administered intravenously – either as a bolus dose or continuous infusion.
- DO NOT mix/piggy back this product with other medications or IV fluids/blood products.
- Bolus dose administration – refer to individual product information for appropriate rate.

- Continuous infusion – administered via an infusion device. Prime line with product. Refer to HTC/health service procedures. Rate as specified by prescribing medical officer.
- Follow health service guidelines for user-applied labelling of injectable medicines, fluids and lines.

OBSERVATIONS

- Bolus doses are administered under constant visual observation. Refer to HTC/health service procedures.
- Observe for signs of an adverse reaction and tissue infiltration.

REACTIONS

- Symptoms may include: skin rash, itching, tightness in throat or chest, shortness of breath, chest pain or wheezing.
- If a reaction does occur – stop administration immediately, assess vital signs, notify the medical officer, and provide emergency care as required. Inform transfusion service provider/product provider.

UPON COMPLETION

- When IV is removed, apply pressure to site until bleeding has completely resolved.
- Used bottles **MUST** be discarded in medical waste and are not suitable for recycling.

A range of guidelines for use of coagulation factors and management of Haemophilia and other bleeding disorders (Australian Haemophilia Centre Directors' Organisation), are available at www.ahcdo.org.au/publications

REACTIONS AND RESOURCES

Flippin' Blood, Second Edition, June 2012

62 Management of Suspected Transfusion Reactions

66 Useful Resources

Steps in the Management of Suspected Transfusion Reactions*

***NOTE: THIS IS A GUIDE ONLY – FOLLOW HEALTH SERVICE PROCEDURES/GUIDELINES.** Clinical management must be tailored to the patient's specific situation in consultation with medical staff and the transfusion service provider/haematologist/transfusion medicine specialist.

- 1. STOP the transfusion immediately.**
- 2. CHECK vital signs, provide emergency care and seek urgent medical advice/Medical Emergency Team (MET) support as required by the clinical situation.**
- 3. MAINTAIN IV access but DO NOT flush existing line (use a new IV 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).**

After the transfusion is terminated (except for some types of mild reactions – see page 65):

- 7. SEND freshly collected blood and urine samples, blood product and IV line (connected, clamped and sealed for safe transport) as required by the transfusion service provider.**

- Each blood product transfused carries a small risk of an acute or delayed adverse effect.
- 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 features 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, bacterial contamination of blood packs, anaphylaxis, transfusion-related acute lung injury (TRALI) and transfusion-associated circulatory overload (TACO). See pages 63–65 for more information.

***NOTE: THIS IS A GUIDE ONLY – FOLLOW HEALTH SERVICE PROCEDURES/GUIDELINES.** Clinical management must be tailored to the patient’s specific situation in consultation with medical staff and the transfusion service provider/haematologist/transfusion medicine specialist.

REACTION TYPE	SIGNS AND SYMPTOMS NOT ALL MAY BE PRESENT	IMMEDIATE CLINICAL ACTIONS IN CONJUNCTION WITH MEDICAL STAFF AND EXPERT ADVICE*
MILD ALLERGIC	Localised urticaria, pruritis, rash. NO signs of a moderate to severe reaction (see page 65).	STOP transfusion. Follow steps on opposite page and see page 65 for more information. Antihistamines may be administered. If reaction subsides, transfusion may be completed.
SEVERE ALLERGIC	Features of allergy/anaphylaxis: flushing, wheezing, dyspnoea, nausea, vomiting, chest/abdominal pain, angioedema, urticaria, hypotension.	STOP transfusion. Follow steps on opposite page and see page 65 for more information. Adrenaline and/or steroids may be indicated – Follow health service anaphylaxis guidelines/protocols and seek expert advice. ⚠ WARNING May become medical emergency; support blood pressure and maintain open airway. Consult a haematologist/transfusion medicine specialist/transfusion service provider.
FEBRILE	Unexpected fever (eg. $\geq 38^{\circ}\text{C}$ or $\geq 1^{\circ}\text{C}$ above baseline, if baseline $\geq 37^{\circ}\text{C}$), may be accompanied by chills, rigors.	STOP transfusion. Follow steps on opposite page and see page 65 for more information. Mild febrile reactions usually respond to antipyretics – avoid aspirin in thrombocytopenic and paediatric patients. Rule out a septic reaction, haemolytic reaction and TRALI. ⚠ WARNING Fever alone may be the first manifestation of a life threatening reaction (see reactions below).
SEPTIC REACTION	Fever, chills, rigors, nausea, vomiting, hypotension, tachycardia, dyspnoea, bleeding due to disseminated intravascular coagulation (DIC).	STOP transfusion. Follow steps on opposite page and see page 65 for more information. Administer broad spectrum antibiotic coverage after obtaining blood cultures from the patient. Seek expert advice. ⚠ WARNING May become medical emergency; support blood pressure. Send pack to the transfusion service provider for urgent culture and Gram stain. Notify transfusion service provider to contact Australian Red Cross Blood Service urgently to ensure quarantine and testing of related components from the same donation/donor.
ACUTE HAEMOLYTIC	Rigors, fever, flank or IV site pain, tachycardia, dyspnoea, hypotension, bleeding due to disseminated intravascular coagulation (DIC), oliguria, haemoglobinuria, haemoglobinaemia.	STOP transfusion. Follow steps on opposite page and see page 65 for more information. Induce diuresis with fluids and diuretics. Seek expert advice. ⚠ WARNING May become a medical emergency; support blood pressure and maintain open airway. DO NOT administer additional packs until advised safe by the haematologist/transfusion medicine specialist/transfusion service provider.
TRANSFUSION-RELATED ACUTE LUNG INJURY (TRALI)	Dyspnoea, respiratory failure, noncardiogenic pulmonary oedema, may be accompanied by hypotension, chills, fever.	STOP transfusion. Follow steps on opposite page and see page 65 for more information. Administer supplemental oxygen and employ ventilation support as necessary. Seek expert advice. ⚠ WARNING May become medical emergency; support respiratory function and blood pressure. Notify transfusion service provider to contact Australian Red Cross Blood Service to ensure quarantine and testing of related components from the same donation/donor.
TRANSFUSION-ASSOCIATED CIRCULATORY OVERLOAD (TACO)	Symptoms and signs of acute left ventricular failure (eg. dyspnoea, tachypnoea, tachycardia, raised jugular venous pressure, basal lung crackles).	STOP transfusion. Follow steps on opposite page and see page 65 for more information. Consider TRALI (see above). Position patient upright. Administer standard medical treatment for acute left ventricular failure (eg. oxygen and diuretics). ⚠ WARNING Circulatory overload from transfusion may be life-threatening.

Transfusion Reactions and Other Transfusion-Related Adverse Events

***NOTE:** The following information is taken directly from the Australian and New Zealand Society of Blood Transfusion and the Royal College of Nursing Australia, *Guidelines for the Administration of Blood Products*, Second Edition (2011), Sydney, Australia (www.anzsb.org.au/publications).

- Transfusion reactions or other transfusion-related adverse events can be associated with significant morbidity and, rarely, with mortality.
- Many of the serious adverse events following blood transfusion are unpredictable.
- A severe haemolytic or septic transfusion reaction can occur within a few minutes of infusing even a small volume of blood.
- It is essential to 'RECOGNISE, REACT and REPORT' suspected adverse events.
- The most important events include:
 - Acute and delayed haemolytic transfusion reactions
 - Febrile (non-haemolytic) transfusion reactions
 - Allergy and anaphylaxis (including IgA/anti-IgA reactions)
 - Transfusion-related acute lung injury (TRALI)
 - Transfusion-associated circulatory overload (TACO)
 - Post-transfusion purpura (PTP)
 - Transfusion-associated graft versus host disease (TA-GVHD)
 - Transfusion-transmitted infection (TTI) including sepsis from bacterially contaminated blood components.

⚠ WARNING If a transfusion reaction or other adverse event is suspected, other patients may be at risk either because of patient identity error (eg. ABO-incompatible transfusion to a second patient) or because other blood components collected from the implicated donor may also be affected (eg. in cases of bacterially contaminated blood components).

- In an unconscious or anaesthetised patient, hypotension and uncontrolled bleeding may be the only signs of an acute haemolytic transfusion reaction.
- Adverse events related to patient identification errors are the most common cause of preventable harm related to transfusion.

REPORTING OF TRANSFUSION REACTIONS OR OTHER TRANSFUSION-RELATED ADVERSE EVENTS

- Some health departments mandate reporting of sentinel events related to transfusion, eg. acute haemolytic reactions such as due to ABO-incompatibility. Similarly it may be necessary to report adverse events particularly those associated with plasma-derived blood products or recombinant products to the national medicines regulatory agency – ie. the Therapeutic Goods Administration (TGA) in Australia. In addition, there may be voluntary reporting of serious adverse events and near misses to a state, territory or national haemovigilance system.
- Irrespective of such a requirement, health services must have a policy and process for recording and reviewing adverse events related to blood product transfusion, including near misses, which should take into account:
 - If a moderate or severe reaction is suspected, the haematologist or transfusion medicine specialist must be notified for advice on appropriate clinical intervention and serological investigations.

- All adverse events related to blood product administration must be reported to the local hospital transfusion service provider as well as the Australian Red Cross Blood Service or manufacturer where appropriate.

⚠ WARNING If a reaction is a result of a suspected ABO mismatch or bacterial contamination, the transfusion service provider must be notified IMMEDIATELY as there may be implications for other patients or products.


- Suspected cases of other TTI should be reported immediately to the transfusion service provider who will notify the product manufacturer or distributor (eg. the Australian Red Cross Blood Service, or other supplier).
- Serious near misses and adverse events related to blood transfusion, including incorrect blood product transfused, acute and delayed transfusion reactions (including anaphylaxis, TA-GVHD, TRALI, PTP) must be reported to the institution's incident reporting system and reviewed by the hospital transfusion committee or other defined governance committee.
- The reporting and analysis of near miss events is an important aspect of a quality improvement system for blood product therapy.

Management of Possible Transfusion Reactions Based on Severity

***NOTE:** The following information is taken directly from the Australian and New Zealand Society of Blood Transfusion and the Royal College of Nursing Australia, *Guidelines for the Administration of Blood Products*, Second Edition (2011), Sydney, Australia (www.anzsbt.org.au/publications).

MANAGEMENT OF POSSIBLE TRANSFUSION REACTIONS

- The most common adverse transfusion outcome is a rise in the patient's temperature. This may be due to the transfusion or incidental and as a result of the patient's underlying illness.

 **WARNING** A temperature rise to $\geq 38^{\circ}\text{C}$ or $\geq 1^{\circ}\text{C}$ above baseline (if baseline $\geq 37^{\circ}\text{C}$) should prompt the interruption of the transfusion and a clinical assessment of the patient.

- The following information is provided to assist the immediate clinical management of a patient with a suspected transfusion reaction. It may not equate to the individual state, territory or national requirements for reporting of transfusion-related events to a haemovigilance program.
- The health service should consider and accommodate separate reporting guidelines, particularly with regard to the extent of a temperature rise, in its policies related to haemovigilance (see Section 9.1.3 of *ANZSBT/RCNA Guidelines for the Administration of Blood Products* for more information).

MANAGEMENT OF MILD TRANSFUSION REACTIONS

- The following could be considered signs of a mild transfusion reaction:
 - Isolated temperature rise $< 1.5^{\circ}\text{C}$ above baseline without ANY signs of a serious reaction (including any of those listed under 'Management of Moderate to Severe Reactions').
 - Localised rash/pruritis.

- If a mild transfusion reaction is suspected:
 - STOP the transfusion.
 - Maintain IV access.
 - Monitor and record the patient's temperature, pulse, respirations and blood pressure.
 - Repeat all clerical and identity checks of the patient and blood pack.
 - Contact medical staff immediately for further management and investigation.
- If the temperature rise is $< 1.5^{\circ}\text{C}$ above baseline or the patient has ONLY localised rash or pruritis, the patient observations are stable and the patient is otherwise well, an antipyretic or antihistamines may be administered at the discretion of the physician and the transfusion then continued with caution and close observation.
- If signs or symptoms persist, develop or deteriorate subsequently, STOP the transfusion and manage as for a severe transfusion reaction (see 'Management of Moderate to Severe Reactions' below).

MANAGEMENT OF MODERATE TO SEVERE TRANSFUSION REACTIONS

- Any of the following could be considered signs of a moderate to severe transfusion reaction:
 - Temperature $\geq 1.5^{\circ}\text{C}$ above baseline.
 - Hypotension/shock OR hypertension.
 - Tachycardia.
 - Tachypnoea, wheeze, stridor.
 - Rigors or chills.
 - Nausea, vomiting or pain (local, chest, back).

- If a moderate or severe transfusion reaction is suspected the following steps MUST be undertaken:
 - STOP the transfusion immediately and seek urgent medical advice; Medical Emergency Team (MET) support may be required depending on the specific clinical situation.
 - Maintain venous access using a new administration set and 0.9% Sodium Chloride solution (Normal Saline), but do not discard the blood administration set and do not flush the original line.
 - Repeat all clerical and identity checks of the patient and blood pack.
 - Immediately report the reaction to the transfusion service provider, who will advise on return of the implicated product and administration set, and any further blood or urine samples needed from the patient.
 - Monitor and record the patient's temperature, pulse, respirations and blood pressure.
 - Record the volume and colour of any urine passed (looking for evidence of haemoglobinuria).
- If a blood product is returned to the transfusion service provider, the product bag/line should be sealed without contamination for transportation.
- Further management, including subsequent transfusion, will depend on the type and severity of the reaction and results of associated investigations. Further transfusions should not be commenced without the advice or consent of the transfusion service provider/transfusion medicine specialist/consultant haematologist in consultation with the managing clinician.

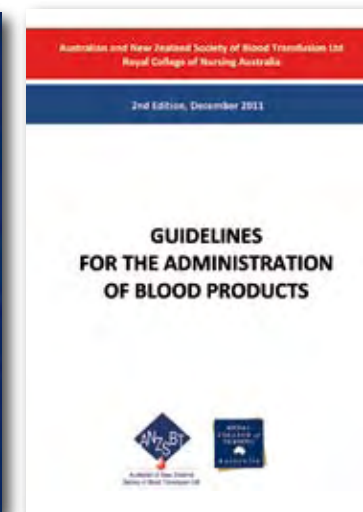
Examples: Useful Resources



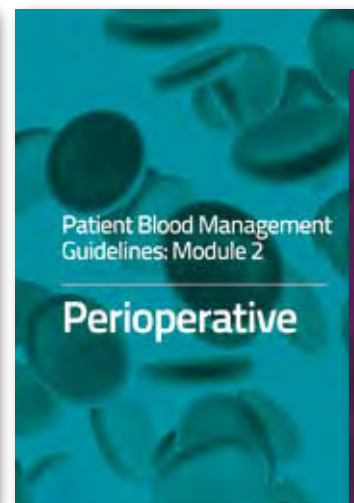
Australian Red Cross Blood Service Clinical Website www.transfusion.com.au



Australian and New Zealand Society of Blood Transfusion www.anzsb.org.au



Patient Blood Management Guideline Development www.nba.gov.au/guidelines/review.html



National Safety and Quality Health Service Standards, 2011 – See Standard 7: Blood and Blood Products www.safetyandquality.gov.au

DECISION TO TRANSFUSE

- **Patient Blood Management Guideline Development**
www.nba.gov.au/guidelines/review.html
- **Clinical Practice Guidelines on the Use of Blood Components (red blood cells, platelets, fresh frozen plasma, cryoprecipitate), NHMRC ASBT, 2001 – under review, see above**
www.nhmrc.gov.au/_files_nhmrc/file/publications/synopses/cp78.pdf
- **Criteria for the Clinical Use of Intravenous Immunoglobulin in Australia, Australian Health Ministers' Conference 2007 – under review**
www.nba.gov.au/ivig/pdf/criteria.pdf
- **Guidelines on the Prophylactic Use of Rh(D) Immunoglobulin (Anti-D) in Obstetrics, NHMRC/NBA, 2003**
www.nba.gov.au/pubs/pdf/glines-anti-d.pdf
- **Guidelines for use of Coagulation Factors and Management of Haemophilia and other Bleeding Disorders (a range of guidelines), Australian Haemophilia Centre Directors' Organisation**
www.ahcdo.org.au/publications
- **Warfarin Reversal: Consensus Guidelines, on behalf of the Australasian Society of Thrombosis and Haemostasis, 2004. Baker RI et al, MJA; 181 (9): 492–497 – under review**
www.mja.com.au/journal/2004/181/9/warfarin-reversal-consensus-guidelines-behalf-australasian-society-thrombosis-and
- **Australian and New Zealand Society of Blood Transfusion (ANZSBT) Guidelines for the Prevention of Transfusion-Associated Graft-Versus-Host Disease, 2011**
www.anzsbt.org.au/publications/PreventionofTA-GVHD.pdf.pdf

CONSUMER INFORMATION

(adult, paediatric, other languages)

- **Australia and New Zealand Society of Transfusion (ANZSBT) Publications**
www.anzsbt.org.au/publications/index.cfm
- **BloodSafe**
www.health.sa.gov.au/bloodsafe/
- **Government of Western Australia, Patient Blood Management**
www.health.wa.gov.au/bloodmanagement/home/
- **Blood Matters**
www.health.vic.gov.au/bloodmatters/
- **Clinical Excellence Commission – Blood Watch**
www.cec.health.nsw.gov.au/resources
- **Australian Red Cross Blood Service**
www.mytransfusion.com.au

PRE-TRANSFUSION TESTING, COLLECTION AND TRANSPORT

- **Australian and New Zealand Society of Blood Transfusion (ANZSBT) Guidelines for Pretransfusion Laboratory Practice (5th Edition, March 2007) – under review**
www.anzsbt.org.au/publications/index.cfm
- **National Pathology Accreditation Advisory Council (NPAAC) Requirements for Transfusion Laboratory Practice (1st Edition, 2008)**
www.health.gov.au/internet/main/publishing.nsf/Content/health-npaac-docs-transfusion.htm

ADMINISTRATION

- **Australian and New Zealand Society of Blood Transfusion (ANZSBT) and the Royal College of Nursing Australia (RCNA), Guidelines for the Administration of Blood Products, Second Edition (2011), Sydney, Australia**

www.anzsbt.org.au/publications/documents/ANZSBT_Guidelines_Administration_Blood_Products_2ndEd_Dec_2011_Hyperlinks.pdf

- **British Committee for Standards in Haematology (BCSH), Guidelines on the Administration of Blood Components (2009)**
www.bcsbguidelines.com/documents/Admin_blood_components_bcsb_05012010.pdf
- **American Association of Blood Banks (AABB) Blood Administration Practices**
www.aabb.org/resources/bct/Pages/default.aspx
- **National Recommendations for User-applied Labelling of Injectable Medicines, Fluids and Lines (2012)**
www.health.gov.au/internet/safety/publishing.nsf/Content/PriorityProgram-06_UaLIMFL

STANDARDS

- **Australian Commission for Safety and Quality in Health Care (ACSQHC): National Safety and Quality Health Service Standards (2011)**
www.safetyandquality.gov.au/internet/safety/publishing.nsf/Content/com-pubs_PP7-NSQHSS
- **The Australian Council on Healthcare Standards ACHS Standards EQUIP 5**
www.achs.org.au/equip5
- **Australian Standard (AS 3864-1997) for Medical Refrigeration Equipment – For the Storage of Blood and Blood Products (1997) – under review**
www.standards.org.au
- **International Organization for Standardization (ISO) Graphical Symbols – Safety Colours and Safety Signs – Part 2: Design Principles for Product Safety Labels (ISO-3864-2:2004 [E])**
www.iso.org/iso/home.htm



BloodSafe eLearning Australia

www.bloodsafelearning.org.au

See the *Clinical Transfusion Practice* course which has been completed by >100,000 learners in Australia or new courses (right).



BloodSafe eLearning Australia – Iron Deficiency Anaemia course

www.bloodsafelearning.org.au



BloodSafe eLearning Australia – Postpartum Haemorrhage course

www.bloodsafelearning.org.au

EDUCATION

- **BloodSafe eLearning Australia**
www.bloodsafelearning.org.au
- **Clinical Excellence Commission (CEC):
The transfusion question**
www.thetransfusionquestion.com.au
- **iTRANSFUSE Fact Sheets**
www.transfusion.com.au/iTransfuse/fact_sheets

STATE-BASED TRANSFUSION PRACTICE IMPROVEMENT COLLABORATIVE PROGRAMS

- **South Australian BloodSafe Program**
www.health.sa.gov.au/bloodsafe
- **Victorian Blood Matters Program**
www.health.vic.gov.au/bloodmatters
- **New South Wales Blood Watch Program**
www.cec.health.nsw.gov.au/programs/blood-watch
- **Queensland Blood Management Program**
www.health.qld.gov.au/qhcss/qbmp/default.asp
- **Western Australian Patient Blood Management Program**
www.health.wa.gov.au/bloodmanagement/home

Comments and suggestions for revision are welcome and can be forwarded to:

South Australian BloodSafe Program
C/— Australian Red Cross Blood Service,
Transfusion Medicine Services
301 Pirie Street, Adelaide,
South Australia 5000 Australia

Email: bloodsafeflipchart@redcrossblood.org.au

Internet: www.health.sa.gov.au/bloodsafe

REFERENCES

American Association of Blood Banks (AABB). (2010). *Primer of Blood Administration*. Chapter 5 Blood Administration Practices. www.aabb.org

Australian and New Zealand Society of Blood Transfusion (ANZSBT) and the Royal College of Nursing Australia (RCNA). (2011). *Guidelines for the Administration of Blood Products*, Second Edition. Sydney, Australia. www.anzsb.org.au/publications

Australian Commission on Safety and Quality in Healthcare (ACSQHC). (2008). *A National Standard for Patient Identification Bands in Australia*. www.safetyandquality.gov.au/our-work/patient-identification/a-national-standard-for-patient-identification-bands-in-australia/

Australian Red Cross Blood Service clinical website. www.transfusion.com.au

Birch, C., Hogan, C., and Mahoney, G. (2001). Co-administration of Drugs and Blood Products. *Anaesthesia and Intensive Care*, 29(2):137–140.

British Committee for Standards in Haematology (BCSH). (2009). *Guideline on the Administration of Blood Components*. www.bcsghguidelines.com/documents/Admin_blood_components_bcsgh_05012010.pdf

Callum, J. L., et al. (2011). *Bloody Easy 3 Third Edition: Blood Transfusions, Blood Alternatives and Transfusion Reactions, A Guide to Transfusion Medicine*. Ontario Regional Blood Coordinating Network, Ontario, Canada. www.transfusionontario.org/media/HOPE-SUN-BloodyEasy-EN_FINAL-LoRes.pdf

Einsele, H., Northoff, H., and Neumeister, B. (2004). Granulocyte Transfusion. *Vox Sanguinis*, 87:205–208.

Hanan, M., Yousef, R. F., Padmore, D., Neurath, D. and Rock, G. A. (2006). The Effect of Patient-controlled Analgesia on Co-administered Red Blood Cells. *Transfusion*, 46:372–376.

United Kingdom Blood Services. (2007). *Handbook of Transfusion Medicine*, Fourth Edition. TSO, Norwich. www.transfusionguidelines.org.uk/docs/pdfs/htm_edition-4_all-pages.pdf

World Health Organization (WHO). (2002). *The Clinical Use of Blood Handbook*. WHO Blood Transfusion Safety, Geneva. www.who.int/bloodsafety/clinical_use/en/Handbook_EN.pdf