Clinical Guideline

Blood Administration in Neonates

Sites where Clinical Guideline applies	All Newborn Service sites in HNELHD
This Clinical Guideline applies to:	
1. Adults	No
2. Children up to 16 years	No
3. Neonates – less than 29 days	Yes
Target audience	Clinicians in Neonatal units in HNELHD
Description	Provides information for neonatal clinicians regarding emergency access, transfusion management and care when administering blood products/components

Hyperlink to Guideline

Keywords	Neonate, newborn, NICU, SCU, albumin, blood, cryoprecipitate, fresh frozen plasma (FFP), irradiated, packed cells, platelets, transfusion, emergency blood
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Registration number and dates of superseded documents	Blood Administration and Blood Products in NICU JHCH_NICU_15.01

Related Legislation, Australian Standard, NSW Ministry of Health Policy Directive or Guideline, National Safety and Quality Health Service Standard (NSQHSS) and/or other, HNE Health Document, Professional Guideline, Code of Practice or Ethics:

- NSW Health Policy Directive PD 2018_042 Blood Management
- NSW Health Policy Directive IB 2020_010 Consent to Medical and Healthcare Treatment Manual
- NSW Health Policy Directive PD2017_032 Clinical Procedure Safety
- HNELHD Policy Compliance Procedure PD2018_042:PCP 2 and PD 2005_406:PCP 2 Blood and Blood Products: Administration and Management for Neonatal and Paediatric Patients
- HNELHD Policy Compliance Procedure PD2017_032:PCP 2 Clinical Procedure Safety (Levels 1,2 and 3)

Position responsible for Clinical Guideline Governance and authorised by	Dr Paul Craven, Executive Director, Children, Young People and Families Services
Clinical Guideline contact officer	Jo Davis, CNC, Newborn Services, NICU JHCH
Contact details	Jo.davis1@health.nsw.gov.au
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Note: Over time links in this document may cease working. Where this occurs please source the document in the PPG Directory at: http://ppg.hne.health.nsw.gov.au/

PURPOSE AND RISKS

This document has been developed to provide support and guidance to the health clinician to provide high quality, safe and timely care for newborns and to ensure that the risks of harm to the child associated with administration of blood and blood products are prevented, identified and managed. This practice requires informed consent.

The risks are:

- *Incorrect blood or blood product/component being administered to the patient*
- *Reaction to blood or blood product/component by the infant*
- *Transfusion related circulatory overload*

The risks are minimised by:

- *Clinicians having knowledge of the correct procedure to prescribe and check blood/products*
- *Clinicians seeking assistance if the blood administration is outside their scope of practice*
- *Following the instructions set out in the clinical procedure*
- *Recognition of the common clinical signs of adverse events for blood administration and awareness of escalation for review*
- *Rectification of the causes of the risks to the patient*

Any unplanned event resulting in, or with the potential for injury, damage or other loss to infants/staff/family as a result of this procedure must be reported through the Incident Management System and managed in accordance with the NSW Health Policy Directive PD2020_020: Incident Management Policy. This would include unintended injury that results in disability, death or prolonged hospital stay.

It is mandatory for staff to follow relevant: "Five moments of hand hygiene", infection control, moving safely/safe manual handling, documentation practices and to use HAIDET for patient/carer communication: ***H****and hygiene* ***A****cknowledge,* ***I****ntroduce,* ***D****uration,* ***E****xplanation,* ***T****hank you or closing comment.*

Risk Category*: Clinical Care & Patient Safety*

CLINICAL PROCEDURE SAFETY LEVEL

Every clinician involved in the procedure is responsible for ensuring the processes for clinical procedure safety are followed. The following level applies to this procedure (click on the link for more information):

Level 2 procedure

CONTENT

GUIDELINE

While not requiring mandatory compliance, staff must have sound reasons for not implementing standards or practices set out within guidelines issued by HNE Health, or for measuring consistent variance in practice.

Introduction

Blood transfusion approach requires caution due to emerging evidence of harm caused from blood transfusions and a lack of evidence for benefit (except in acute haemorrhage, bone marrow disease or suppression). Clinician's must ensure they are aware of the requirement for patient blood management (PBM) according to the 3 PBM pillars, including:

- Management of correctable causes of anaemia with targeted therapies to avoid transfusion
- Minimising blood loss
- Optimisation of the infant's physiological ability to tolerate anaemia

If transfusion is unavoidable clinicians must be aware of the requirement for safe and appropriate use of blood components and blood products.

Emergency Blood

Top

When emergency blood is requested, staff are to follow the following procedure:

- Contact blood bank and ask for "urgent uncross-matched O-negative blood".
- Complete the highlighted 'Life Threatening/Critical Bleeding' section on the 'Delivery of Blood/Blood Product Form' (see Appendix 2) and write "uncross-matched blood". If the mothers name is available this can be filled in, but if details are not yet available blood will still be dispensed.
- Upon provision of form, blood bank will release an adult pack of blood.
- Blood will be O-negative, Cytomegalovirus (CMV) negative, irradiated and as fresh as possible.
- If the blood is not used within 30 minutes of dispensing, it must be returned to blood bank with the e-Blood release summary.
- If the blood is used, and the patient is un-identified at the time of release, a maternal sticker can be placed on the e-Blood release summary which accompanies the blood, where possible.
- If possible the e-Blood release summary should be faxed to pathology. If staff are unable to do this, blood bank staff will follow up within 24 hours from the blood being released.

Screening

Top

Pre-transfusion testing, Group & Save and/or Crossmatch is undertaken in at risk neonates that includes:

- Critical or unwell infants
- Extreme premature infants (<28 weeks)
- Foetal Anaemia
- Infants with history of bleeding (birth or postnatal)

- Pre-surgery
- Other clinical indication

All blood collected for pre-transfusion testing must be hand written onto the Adult EDTA blood tube (tagged Group and Save) label and request form with the exact details that appear on the infants identification sticker. Hand written information required includes the:

- Infant's full surname, first name (only if on ID sticker) or "baby of" (not B/O)
- Mother's full name
- Sex of infant
- Medical record number (MRN)
- Date of birth (DOB)
- Unit name
- Date/time of collection
- If the baby is a twin you must write 'Twin 1' or 'Twin 2' (not l or II).

Any discrepancies in infant identification details on the sample label and request for transfusion form will result in the collection being discarded.
Recollection will be necessary and an ims+ must be completed.

A Group & Save is valid for 4 months from the birth date of a neonate and for 3 days if there is antibodies detected.

Consent for Transfusion and Refusal

Top

The Medical Officer (MO)/Neonatal Nurse Practitioner (NNP) gaining consent from the parent or guardian is also to sign in the consent section allocated on the Paediatric/Neonatal Blood Components and Blood Products Administration form page. In case of repeated use of a blood product in a short time frame the consent can be obtained given for multiple transfusions following discussion with the Consultant, Fellow or NNP – please ensure this is documented on the Paediatric/Neonatal Blood Components and Blood Products Administration form and documented in the patients notes. Parent must be provided with the Parent Fact Sheet (see Appendix 4). In the event blood or blood products/components are administered without documented parental and medical consent an ims+ must be completed.

In an emergency situation blood and blood products can be administered when ordered by an MO or NNP without waiting for parental consent.

Prescription of Blood

Top

Completed prescription must be documented on 'Paediatric/Neonatal Blood Components and Blood Products Administration form' (see Appendix 3), including:

- Patient weight
- Reason for transfusion
- Date
- Blood component/blood product
- Dose/rate
- Prescriber print name and signature

Collecting Blood Products

Top

Blood products may be obtained from Blood Bank/Blood Transfusion Lab by medical, nursing or technical assistant (TA) staff (see education and credentialing of staff).

Blood Bank will require the following information:

- 'Delivery of Blood/Blood Product Form' with the identified blood product requested
- Volume/amount of blood product required
- Reason for the transfusion
- The infant's details (MRN, name, DOB, sex)

For small volume transfusion, only one (1) unit of packed cells may be collected at a time. Commence the transfusion of any blood product within 30 minutes of its arrival to the unit. If the blood product is not commenced within this time, return it to Blood Bank to be stored at the correct temperature in a dedicated approved blood fridge.

Blood Products in Neonates

Top

Irradiated blood products

- Irradiation of the blood product reduces the risk of Transfusion related Graft Versus Host Disease following transfusion of blood products to patients who are immuno-suppressed.
- All neonatal patients should receive irradiated blood products. This requirement should be indicated under special requirements on the on the 'Delivery of Blood/Blood Product Form'.
- Once red blood cells (RBC) have been irradiated the expiry date will be adjusted and the length of the expiry. No RBC should be used post 14 days from the date of irradiation.
- Platelets expiry is unchanged at 5 days.

CMV Negative blood products

- CMV is a herpes group virus that can remain latent in the granulocytes. CMV negative blood products may reduce the transmission of the CMV virus to infants.
- All neonatal patients should receive CMV negative products (*where available*)
- Occasionally a non CMV negative blood product is not available. All blood products in NSW are leucodepleted at time of collection. Leucodepletion also reduces risk of CMV transmission; such products can be used at the discretion of the neonatologist if required. Further leucodepletion is not required

Packed Red Blood Cells

Top

Packed red blood cells (PRBC) are generally given to restore haemoglobin levels for infants with symptoms associated with anaemia or to restore blood volume in acute blood loss.
Although important, the recipient's haemoglobin and haematocrit level should not be the deciding factor for initiating transfusion, but be supported by assessment to relieve clinical signs and symptoms and prevent morbidity and mortality.
The table below gives a guideline for haemoglobin levels for red blood cell (RBC) transfusion in neonates (see Table 1).

AGE IN DAYS	RESPIRATORY SUPPORT	NO RESPIRATORY SUPPORT
1 - 7 days	**≤ 104 g/L**	**≤ 90 g/L**
8 - 14 days	**≤ 90 g/L**	**≤ 77 g/L**
≥ 15 days	**≤ 77 g/L**	**≤ 68 g/L**

Table 1: Haemoglobin threshold levels (g/L) triggering RBC transfusion for neonates

- RBC transfusions are generally 20 mL/kg to treat infants with anaemia as defined by the guide above.

- Smaller volumes of 10mL-20mL/kg may be considered at times at the discretion of the Consultant/Fellow.
- Packed RBC should ideally be transfused within a 3 hour time period, use cannot exceed 4 hours and they must commence within 30 minutes of removal from blood bank fridge.
- RBC must be transfused via a giving set containing a 170-260 micron filter.
- Furosemide (frusemide) may be given intravenously mid-transfusion at the discretion of the Medical Officer/NNP. Refer to the Furosemide neonatal medication protocol.

Non-emergency packed cells provided to a neonate will be:

- < 7 days old wherever possible but not >14 days old
- Irradiated
- Kell negative
- CMV negative

Special Considerations

For exchange transfusions, freshest available (definitely <5 days and within 24 hours of irradiation) will be provided. In the unlikely situation that an infant that is Rh (D) negative is to receive Rh (D) positive packed cells, prior consultation with the Neonatologist/and Haematologist is essential.
If both packed cells and platelets are required, where possible give the platelets first.

Platelets

Top

Platelet transfusions are given for thrombocytopaenia, common in premature infants. Abnormalities in the platelet count are secondary to an increase in destruction of platelets, or a decrease in production of platelets. Neonatal factors associated with thrombocytopaenia are Hypoxic Ischaemic Encephalopathy (HIE), Neonatal Alloimmune Thrombocytopenia (NAIT), Idiopathic Thrombocytopenic Purpura (ITP), inherited bone marrow disorders, Disseminated Intravascular Coagulopathy (DIC), exchange transfusions, infection, Necrotising Enterocolitis (NEC), cold injury, polycythaemia and pulmonary hypertension.
A platelet count for a newborn is $250x10^9$/Land a count of $<150x10^9$/L is considered abnormal and should be investigated.

Transfusion may be considered if platelets are:

- $50x10^9$/L -$100x10^9$/L with active bleeding or
- $30x10^9$/L - $50x10^9$/L with coagulopathy or surgical plan or
- $<30x10^9$/L with no active bleeding

- Platelet transfusions are generally 15-20mL/kg.
- Platelets are not to be placed in a refrigerator as are administered at room temperature.
- Platelets are transfused over 30 minute to one (1) hour period.
- Platelets must be transfused via a giving set containing a 170-260 micron filter.
- Platelets are not to be filtered with a leucodepletion filter as they are leucodepleted at collection.
- Rh (D) negative patients should receive Rh (D) negative platelets, wherever possible – if Rh (D) positive platelets are given to an Rh (D) negative infant, suggest discussion with Haematology and Neonatologist for advice regarding Anti-D dosing...
- Consideration for ordering is required in regional sites, as platelets will need to be ordered for the following day for those who do not keep onsite.

Fresh Frozen Plasma (FFP)

Top

FFP may be given to patients with coagulation deficiencies including HIE, DIC and sepsis. It contains all of the labile clotting factors**.**

- FFP is stored frozen. It is thawed on request by the MO/NNP and must be promptly collected from Blood Bank. Thawing takes 30 minutes.
- FFP transfusions are generally 10-20mL/kg.
- Thawed FFP should be used as soon as possible after thawing due to possible deterioration of the clotting factors. If a delay occurs FFP may be returned to Blood Bank for appropriate refrigeration for up to 24 hours.
- FFP is transfused over a one (1) hour period.
- FFP must be transfused via a giving set containing a 170-260 micron filter.

Cryoprecipitate

Top

Cryoprecipitate is given for the promotion of haemostasis when fibrinogen levels are reduced or dysfunctional. It contains high levels of fibrinogen, factor VIII, VWF and several other clotting proteins.

- Cryoprecipitate is stored frozen**.** It is thawed on request by the MO/NNP, and must be promptly collected from Blood Bank. Thawing takes 30 minutes and it must be stored at room temperature post thawing and not returned to the fridge.
- Cryoprecipitate transfusions are generally 10-20mL/kg.
- Thawed cryoprecipitate should ideally be transfused immediately after thawing. It must be used within 6 hours due to potential deterioration of the clotting factors. If a delay occurs contact the Blood Bank.
- Cryoprecipitate is transfused over a one (1) hour period.
- Cryoprecipitate must be transfused via a giving set containing a 170-260 micron filter.

Albumin

Top

Albumin may be indicated in an acutely unwell infant with hypoproteinaemia. Albumin is available in a 4% or 20% solution.

- Transfusions of Albumin 4% are 25mL/kg to give 1 gram/kg.
- Transfusions of Albumin 20% are 5mL/kg to give 1 gram/kg.
- Albumin needs to come to room temperature prior to administration, as a large percentage of reactions to this product are a result of being transfused cold. Remove from the fridge at least half an hour prior to reach room temperature.
- Albumin is transfused over a one (1) hour period.
- Albumin must be used within 4 hours.
- Any portion of an opened bottle of Albumin that is not transfused must be discarded, as it contains no antimicrobial agent.
- Albumin must be transfused via a low protein binding 200 micron filter.

Pre-transfusion Procedure

Top

Complete the following in relation to the 'Paediatric/Neonatal Blood Components and Blood Products Administration' Form (HNE029401):

- Double check the written prescription is signed by the MO/NNP
- Confirm informed and written consent has been obtained and documented by MO/NNP and a parent/guardian
- Confirm indication for transfusion is recorded
- Complete order verification by 2 clinicians at the bedside and co-sign

- Prior to commencing the transfusion complete the checklist for administration of blood products

Complete the following in relation to the blood product:

- Confirm the product type matches the prescription
- Check the infant's details with the identification (ID) bands with the blood product issue form and the blood pack label.
- Check the blood product details including;
    - Pack/product number,
    - Blood group
    - CMV negative (where applicable)
    - Irradiation status (where applicable)
    - Expiry date
- Verify identification verbally with the parent/guardian whenever able
- Inspect the blood or blood product for clots or other solid matter, if present check with Blood Bank before commencing the transfusion.

Complete the following in relation to the infant:

- Complete baseline observations;
    - Temperature (T)
    - Heart Rate (HR)
    - Respiratory Rate (RR)
    - Oxygen Saturation (SpO_2)
    - Blood Pressure (BP)
- Ensure the infant has suitable access; i.e. patent cannula, umbilical venous catheter (UVC), the primary lumen can be utilised for blood products while the secondary lumen is used for the continuation of IV therapy or medication.
- Prior to administering any blood products ensure a Newborn Screen Test (NBST) is collected if not already completed

In the event of any discrepancies, do not use the blood product and notify Blood Bank

Special Considerations

Top

Medication and Fluid Administration with Blood Products

- Avoid administering any drugs in the same lumen as the blood product.
- Ideally blood products should be administered independently of other IV fluid or medication administration.
- Where able, turn off any intravenous fluids and medication sidelines infusing, prior to commencing transfusion unless using multiple lumens and there is a dedicated lumen for the blood products alone. Always check with MO/NNP prior.
- If any medications must be administered during the transfusion e.g. diuretics, and there is no other intravenous access, flush the line with sodium chloride 0.9% before and after the blood product is administered at the closest injection port for the infant.
- Check compatibility of drugs and IV fluid with the blood product prior to infusing.

Administration Procedure

Top

Equipment required

- Clean procedure trolley

- Sterile dressing pack/or sterile plastic drape
- 70% Alcohol and 2% Chlorhexidine prep pads
- Suitable PPE
- Neonatal blood giving set (built in 200 micron filter)
- 50mL Luer lock syringe

Albumin only

- Low protein binding 200 micron filter
- Blunt needle
- Low volume infusion line

Procedure

Top

- Standard precautions must be used when administering/disposing of blood products (this includes gloves and eye protection).
- All blood products (excluding Albumin) must be transfused via a giving set containing a 170-260 micron filter.
- Blood products are ideally transfused using a syringe pump.
- Use aseptic non-touch technique when delivering all blood products.
- Blood products must not be transfused via an administration set that has had drugs or solutions other than sodium chloride 0.9% infused through it.
- Commence the transfusion as soon as possible or within 30 minutes of the blood product arriving to the unit.
- Attend and record baseline observations.
- Repeat observations;
    - 15 minutely for first hour
    - Then hourly until transfusion is ceased
- Set-up required equipment on clean trolley and maintain an aseptic approach.
- Attach a 50mL Luer lock syringe to the Luer lock connection of the blood administration set.
- Use the spike end of the blood set to ‘spike’ the blood bag. Once the blood bag is spiked it is to remain attached and be suspended from an IV pole.
- Fill the blood filter to the line on the drip chamber by gently squeezing and releasing the drip chamber.
- Using the syringe, withdraw the volume of blood prescribed plus an additional 5mL to allow for priming.
- Tilt the syringe and expel all the air out of the extension tubing set to start priming.
- Apply gentle pressure to the syringe plunger to prime the remainder of the blood administration set.
- Prior to connecting to the patient ensure the correct volume of blood is in the syringe. If more blood is required withdraw further until the correct amount of blood to be infused is in the syringe.
- Transfuse via the syringe pump at the rate prescribed and check with a second clinician.
- Label syringe with an IV label including correct patient details and volume in syringe.
- Clean access port and connect in line with aseptic technique.

For Albumin Only

- Following aseptic set-up, connect syringe with drawing up needle, access Albumin vial and draw up required volume plus 3mL to allow for priming.
- Connect low volume infusion line with Albumin filter (low protein binding 200 micron filter).
- Connect syringe to low volume infusion line and prime the administration set.

- Prior to connecting to the patient ensure the correct volume of Albumin is in the syringe. If more Albumin is required withdraw further until the correct amount of Albumin to be infused is in the syringe.
- Transfuse via the syringe pump at the rate prescribed and check with a second clinician.
- Label syringe with an IV label including correct patient details and volume in syringe.
- Clean access port and connect in line with aseptic technique.

Completion of the Transfusion

Top

- Upon completion of a transfusion of blood products, the giving set and blood bags are disposed of in the contaminated waste bin whilst adhering to standard precautions (this includes gloves and eye protection).
- In the event of an adverse reaction the used bags are to be saved and returned to Blood Bank for further investigation.
- Enter the completed transfusion details into NICUS and CAP (for population into the patient's discharge summary).
- Complete the back page of the 'Paediatric/Neonatal Blood Components and Blood Products Administration Form'.

Adverse Reactions

Top

Transfusion reaction in neonatal patients is unusual. The most common adverse sequelae to the transfusion of blood products are non-haemolytic febrile transfusion reaction (NHFTR) fever, rigors and urticaria. Treat the patient according to the Adverse Reaction Management Guide and notify the MO/NNP (see Appendix 5). The other transfusion reactions, such as anaphylaxis, acute haemolysis and sepsis (secondary to bacterial infection in the blood) are uncommon and require immediate medical attention and close monitoring, as these are potentially life threatening situations.

- If any adverse reaction is suspected stop the transfusion and notify the MO/NNP immediately.
- As with any fluid infusion, an infant may develop fluid overload, which may present with respiratory distress and tachycardia. The infant must be medically reviewed and treated as ordered.
- Blood Bank should be notified of all serious reactions as soon as possible.
- Any adverse event relating to blood or blood transfusion must be reported using ims+ system.
- Any adverse reactions must be documented on the Adverse Event data page of the 'Paediatric/Neonatal Blood Components and Blood Products Administration' Form (HNE029401), this is compulsory.
- Adverse Reaction Notification Form located in the back of the Pre-Transfusion Request Form must be completed and submitted to Blood Bank, with the remaining blood product and giving set.
- Although the most common transfusion reactions occur at the time of transfusion, it is possible for patients to have delayed transfusion reactions. Delayed haemolytic reactions commonly occur 4 to 8 days after transfusion, but may occur up to two weeks later. Lumbar pain, fever, jaundices and red/dark urine are the most common symptoms. Pathology results will confirm or diagnose, as the patient will have a falling haemoglobin, increased bilirubin and haemoglobinuria, if severe.

Education and Credentialing of Staff

Top

- Credentialing is mandated for all staff who participate in the blood transfusion process. Credentialing is defined as satisfactory completion of the BloodSafe eLearning Australia “Clinical Transfusion Practice” course. All new staff should complete this training within four weeks of commencing employment within a HNE facility/or furnish evidence of previous completion.
- Medical and nursing staff should be encouraged to complete the Patient Blood Management module.
- Staff members who are involved in transport of blood may do the “Transporting Blood” module, or “Collecting Blood Specimens” module, as appropriate to their responsibilities.
- All unit managers are required to keep a record of credentialed staff. Credentialing is valid for 2 years, and must be repeated after this time.

IMPLEMENTATION PLAN

The clinical guideline will be:

- Circulated to General Managers and Cluster Managers.
- Circulated to the clinicians via the Tiered Neonatal Network/Newborn Services, Children, Young People and Families Services and the Women's Health and Maternity Network.
- Made available on the intranet (PPG) and HNEKids website.
- Presented at facility units meetings and tabled for staff to action.

MONITORING AND AUDITING PLAN

- The person or leadership team who has approved the clinical guideline is responsible for ensuring timely and effective review of the guideline.
- Evaluation will require a review of the most current evidence as well as consideration of the experience of HNELHD staff in the implementation of the clinical guideline.
- Data derived from incidents, monitoring and evaluation should inform the review of the clinical guideline either as required or scheduled.
- Implementation, education support and monitoring compliance be completed by local Clinical Educators and Managers.
- Amendments to the guideline will be ratified by the Manager and Head of Newborn Services & WHaM Network (where applicable) prior to final sign off by Children, Young People and Families Services.

CONSULTATION WITH KEY STAKEHOLDERS

AUTHOR:	**Helene Anderson, Nurse Unit Manager, NICU JHCH** **Jo Davis, CNC Newborn Services, NICU JHCH**
REVIEWERS:	Laura Street, Neonatal Nurse Practitioner, NICU JHCH Samantha Hassall, Registered Nurse, NICU JHCH Dr Larissa Korostenski, Neonatologist, NICU JHCH Dr Liz Cotterill, Lead Paediatrician, Armidale Rural Referral Hospital Jo Proctor, Clinical Nurse Educator, SCU, The Maitland Hospital Michelle Jenkins, Senior Paediatric Pharmacist, JHCH Kirstin Berry, Medication Safety and Quality Manager, JHH Bryony Ross, Paediatric Haematologist, JHCH
CONSULTATION:	Tiered Neonatal Network/Newborn Services HNELHD Women's Health and Maternity Services Network Children, Young People and Families Services District Quality Use of Medicines Committee District Clinical Quality & Patient Care Committee District Blood and Blood Products Committee
APPROVED BY:	Natalie Butchard, Manager Newborn Services, NICU JHCH Dr Larissa Korostenski, Head of Newborn Services, NICU JHCH Dr Paul Craven, Executive Director, CYPFS

OTHER USEFUL LINKS

HNELHD Policy Compliance Procedure PD2005_406:PCP 3 Consent for Clinical Treatment and Care
NSW Health Policy Directive PD 2014_024 Patient Identification Bands

APPENDICES

1. Glossary & Abbreviations
2. Delivery of Blood/Blood Product Form
3. Paediatric/Neonatal Blood Components and Blood Products Administration Form
4. Parent Fact Sheet
5. Adverse Reaction Management Guide

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FEEDB ACK

Any feedback on this document should be sent to the Contact Officer listed on the front page.

APPENDIX 1

GLOSSARY & ABBREVIATIONS

Acronym or Term	Definition
B/O	Baby of
BP	Blood Pressure
CMV	Cytomegalovirus
DIC	Disseminated Intravascular Coagulation
DOB	Date of birth
EDTA	Ethylenediaminetetraacetic Acid
FFP	Fresh Frozen Plasma
HIE	Hypoxic Ischaemic Encephalopathy
HNELHD	Hunter New England Local Health District
HR	Heart rate
ID	Identification
ims+	Incident Management System
ITP	Idiopathic Thrombocytopenic Purpura
IV	Intravenous
MO	Medical Officer
MRN	Medical Record Number
NAIT	Neonatal Alloimmune Thrombocytopenia
NBST	Newborn Screening Test
NEC	Necrotizing enterocolitis
NHFTR	Non-Haemolytic Febrile Transfusion Reaction
NICU	Neonatal Intensive Care Unit
NNP	Neonatal Nurse Practitioner
PBM	Patient Blood Management

PPE	Personal Protective Equipment
PRBC/RBC	Packed Red Blood Cells/Red Blood Cells
Rh (D)	Rhesus Disease
RR	Respiratory rate
SCU	Special Care Unit
SpO_2	Peripheral capillary oxygen saturation
TA	Technical Assistant
T	Temperature
UVC	Umbilical Venous Catheter
WHaM	Women's Health and Maternity Network

APPENDIX 2

DELIVERY OF BLOOD/BLOOD PRODUCT FORM

NSW Health Pathology

NSW Health Pathology (APA)

JOHN HUNTER HOSPITAL
Phone: (02) 4921 4000 or 1800 801 949
Fax: (02) 4921 4992

John Hunter Hospital
Lookout Rd
NEW LAMBTON NSW 2305

RCPA NATA

Transfusion Laboratories

John Hunter Laboratory	4921 4413
Maitland Laboratory	4939 2258
Mater Laboratory	4921 1848
Belmont Laboratory	4923 2700

DELIVERY OF BLOOD/BLOOD PRODUCT FORM

PATIENT LAST NAME | GIVEN NAME (S) | SEX | DATE OF BIRTH

PATIENT ADDRESS

POST CODE

MRN

YOUR REFERENCE

TEL (HOME) | TEL (BUS/MOBILE) | HOSPITAL CODE / WARD / CLINIC

JHH

LABORATORY USE ONLY

Checked by:

REQUESTING CLINICIAN

Name:

Signature:

Contact No:

Special requirements (Irradiated, CMV neg):

LIFE THREATENING / CRITICAL BLEEDING

(Please phone testing laboratory. See phone number above.)

Location for transfusion:

Date: / /

Fill in this section if BLOOD PRODUCT is required. Request may not be processed until clinical information is given.
See reverse for NHMRC/NBA Patient Blood Management Guidelines.

Red Cells: No. of Units | Platelets: No. of Units | Fresh frozen plasma: No. of Units | Cryoprecipitate: No of Units

Other Blood Products (include dosage):

Accredited for compliance with NPAAC Standards and ISO 15189

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APPENDIX 3

PAEDIATRIC/NEONATAL BLOOD COMPONENTS AND BLOOD PRODUCTS ADMINISTRATION FORM

HNE029401

HUNTER NEW ENGLAND LOCAL HEALTH DISTRICT

Facility_____

PAEDIATRIC / NEONATAL BLOOD COMPONENTS AND BLOOD PRODUCTS ADMINISTRATION FORM

FAMILY NAME	MRN
GIVEN NAME	☐ MALE ☐ FEMALE
D.O.B. ____/____/____	M.O.
ADDRESS	
LOCATION / WARD	
COMPLETE ALL DETAILS OR AFFIX PATIENT LABEL HERE	

PATIENT WEIGHT IS :_____Kg

PERSON COMPLETING TRANSFUSION TO DOCUMENT
How did the patient respond to the transfusion? Symptoms resolved / Symptoms improved / No change
Did an adverse event occur during the transfusion? No or Yes (If yes, continue below)
Name_____Designation:_____Signature:_____Date:_____ COMPULSORY TO ANSWER AND SIGN.

☐ **The medical officer was notified that the patient had a reaction during the transfusion.**

During the transfusion episode, all calling criteria for Clinical Review and Rapid Response as per Age Appropriate Observation Chart must be followed.

STOP THE TRANSFUSION until reviewed by a Medical Officer if any adverse event occurs including if:-

- **there is a significant change to baseline observations**
- **escalation to Clinical Review or Rapid Response is required**

Notify the Medical Officer and complete this page, and an IIMS report.

CLINICAL SYMPTOMS (Please circle)				
Hypotension	Fever	Back pain	Headache	Urticaria
Rigor	Sweating	Dyspnoea	Wheezing	Skin rash
Nausea	Vomiting	Pain at infusion site		Oozing from wounds
Tachycardia		Haematuria		Oozing from venepuncture sites

If symptoms are severe, the Laboratory should be contacted for advice on appropriate samples for investigation.
Laboratory Investigation Required? Circle: Yes or No.

ADVERSE EVENT DATA (Please tick)	IIMS REPORT ATTENDED: Y☐ N☐ IIMS No:
Component or Product: ☐ ordered for or delivered to the *incorrect patient* ☐ *administered to the incorrect patient* ☐ was *the incorrect product for the intended patient* ☐ was delivered to an *incorrect location* ☐ *Special requirements* (Irradiated, CMV Neg) were not met	
☐ Red cell component out of blood fridge > 30 mins	☐ Red cell transfusion time exceeds 4 hours.
☐ Incorrect equipment used for transfusion	
Other:	
OUTCOME OF ADVERSE EVENT	
☐ Symptoms and signs resolved	☐ Patient transferred to HDU / ICU
Patient required further management – please detail:	
Warnings for future transfusions:	
Signature of person completing the adverse event documentation:_____	
Print Name:_____ Designation:_____ Date:_____	

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BINDING MARGIN – DO NOT WRITE

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HUNTER NEW ENGLAND LOCAL HEALTH DISTRICT

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PAEDIATRIC / NEONATAL BLOOD COMPONENTS AND BLOOD PRODUCTS ADMINISTRATION FORM

FAMILY NAME	MRN
GIVEN NAME	☐ MALE ☐ FEMALE
D.O.B. ____/____/____	M.O.
ADDRESS	
LOCATION / WARD	
COMPLETE ALL DETAILS OR AFFIX PATIENT LABEL HERE	

Print Patient Name.
Check Label is correct.

HNEMR17C

INSTRUCTIONS For the use of this Blood and Blood Products form: PATIENT WEIGHT IS :_____Kg

For the parents and responsible persons of patients less than 16 years of age.

1. ALL OBSERVATIONS during the transfusion must be recorded on the age appropriate Observation Chart.
2. PAGE 1: Documentation of Patient informed **CONSENT.** Parent / responsible person given Patient Information Brochure or equivalent.
3. PAGE 2: **PRESCRIPTION** and **Reason** for Transfusion for ALL blood **COMPONENTS** (Red Cells, Platelets, Plasma, Cryoprecipitate)
4. PAGE 3: **PRESCRIPTION** and **Reason** for Transfusion for ALL blood **PRODUCTS** (eg. Albumin, Immunoglobulins, Clotting Factors)
5. PAGE 4: Recording and **Reporting any adverse event** as a result of the transfusion.

CONSENT MUST BE OBTAINED FOR TRANSFUSION OF ALL BLOOD COMPONENTS AND BLOOD PRODUCTS

CONSENT FOR TRANSFUSION PATIENT / PERSON RESPONSIBLE TO COMPLETE

The Doctor has discussed my / my child's present condition and the various ways in which I / my child might be treated. The doctor has recommended the administration of blood components or products as part of the management of my/ my child's condition.

I have read the blood transfusion information on the Patient Information Brochure provided, which contains information about the risk of transfusion.

I have had the opportunity to ask questions and I am satisfied with the explanations and answers to my questions.

I understand the nature of the treatment and that undergoing the treatment carries risks.

I understand that I may withdraw my consent at any time prior to the treatment.

I request and consent to the treatment and the care plan outlined and described for me /my child.

PATIENT'S PRINTED NAME	SIGNATURE	DATE	INTERPRETER ☐ Not required
OR			
PERSON RESPONSIBLE PRINT NAME	SIGNATURE	DATE	INTERPRETER ☐ Not required
MEDICAL OFFICER'S NAME	SIGNATURE	DATE	INTERPRETER ☐ Not required

I am/ my child is receiving transfusion on a regular basis. I would like to consent to multiple transfusions over the next 12 months. I understand that I may withdraw my consent at any time and my consent may become invalid if my circumstances change.

PATIENT'S PRINTED NAME	SIGNATURE	DATE	INTERPRETER ☐ Not required

If a 12 month consent is valid and has been sighted the Patient or Person responsible does NOT need to sign again.

Date of original consent:_____ Checked by: Designation_____ Signature:_____

Date Checked:_____ Print Name:_____

REFUSAL OF CONSENT: Pursuant to section 174 of the *Children and Young Persons (Care and Protection) Act 1998*, consent is not required to treat a child or young person if treatment is required urgently to save the life, or prevent serious damage to the health of the child or young person. ***Where treatment is not urgent and consent is refused by either the parents of a minor, or a minor aged 14 or above, refer to the NSW Ministry of Health Policy:*** PD2005_406 Consent to Medical Treatment - Patient Information.
I have been informed of the consequences that may occur as a result of refusing treatment with blood components or blood products. I specifically refuse this treatment.

Patient Name (Printed): _____ **Signed / Responsible person:**_____ **Date:**_____

MO* (print name):_____ **MO Signature:**_____

* The Medical Officer is advised to make detailed documentation in the patient medical record of the information provided to the patient / responsible person and the discussion that took place.

Patient has an Advance Care Directive: YES NO (Compliance with this directive is mandatory.)

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BLOOD COMPONENTS AND BLOOD PRODUCTS ADMINISTRATION FORM

Medication

APPENDIX 3

PAEDIATRIC/NEONATAL BLOOD COMPONENTS AND BLOOD PRODUCTS ADMINISTRATION FORM

HUNTER NEW ENGLAND LOCAL HEALTH DISTRICT

Facility _____

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FAMILY NAME	MRN
GIVEN NAME	☐ MALE ☐ FEMALE
D.O.B. ____ / ____ / ____	M.O.
ADDRESS	
LOCATION / WARD	
COMPLETE ALL DETAILS OR AFFIX PATIENT LABEL HERE	

PRESCRIPTION OF BLOOD COMPONENT: All the components below are administered IV - Intravenously.

ALERT: Check Blood Volume prescribed against patient's weight. PATIENT WEIGHT IS :_____Kg

DATE	BLOOD COMPONENT	DOSE/RATE mLs / HR	PACK ID No.	DATE GIVEN	TIME GIVEN	TIME CEASED	GIVEN BY	CHECKED** BY
Prescriber Signature: _____ Print NAME: _____								
Prescriber Signature: _____ Print NAME: _____								

OBSERVATIONS MUST BE RECORDED ON THE AGE APPROPRIATE OBSERVATION CHART.
NB: Documentation on Page 4 must be attended when the transfusion is completed.
Frequency of observations shall be: Baseline, 15 minutes, then hourly until completion, or until transfusion is ceased if 4 hours have passed since the RED CELL product left monitored refrigerated storage.

BLOOD COMPONENTS. ORDER AND REASON FOR TRANSFUSION.

Red cells:	Platelets:	Fresh Frozen Plasma (FFP)	Cryoprecipitate:
No. of mLs	No. of Units	No. of Units	No. of Units .....
Hb .....g/L	Platelet count: x10⁹/L	PT.....s aPTT.....s	Fibrinogen .....g/L
REASON:	**REASON:**	**REASON:**	**REASON:**
☐ Acute blood loss / haemorrhage ☐ Symptomatic anaemia (eg. Dizziness, shortness of breath, ↓activity, feeding difficulty) ☐ Sepsis, Oxygen therapy, Continuous Positive Airways Pressure (CPAP), Necrotising Enterocolitis (NEC). ☐ Bone Marrow failure or disease, or condition causing refractory anaemia	☐ Bone Marrow failure or disease ☐ Haemorrhage / bleeding where thrombocytopenia or platelet dysfunction is considered a major contributing factor eg. Massive transfusion, post cardiac bypass. ☐ Pre-surgery / invasive procedure with low platelet count	☐ Haemorrhage or bleeding where deficiency of coagulation factors is considered to be a major contributing factor. Eg Massive transfusion. ☐ Pre surgery or invasive procedure NB: FFP is NOT the appropriate product for Warfarin Reversal. Prothrombinex should be used.	☐ Haemorrhage or bleeding where deficiency of fibrinogen is considered to be a major contributing factor. Eg Massive transfusion. ☐ Fibrinogen deficiency or dysfunction

**For safe administration of blood components: Check required for EVERY unit. (☐ Initial)

1 2 3 4 5 6

☐☐☐☐☐☐ There is a written prescription signed by MO and patient / responsible person.
☐☐☐☐☐☐ The indication for transfusion is recorded.
☐☐☐☐☐☐ The product type matches the prescription.
☐☐☐☐☐☐ Patient's name identified verbally, on identification band, on the issue form and blood component label IN THE PRESENCE OF THE PATIENT by two staff (Registered Nurse or Medical Officer, and checked by Enrolled Nurse, Registered nurse / midwife or Medical Officer).
☐☐☐☐☐☐ The donor number on the Blood Service label, on the issue form and on Laboratory compatibility label match.
☐☐☐☐☐☐ Checked expiry date on the blood component, and checked for integrity, discolouration, consistency, intact seals.
☐☐☐☐☐☐ Patient / parent / responsible person has been told to report any changes or symptoms to staff

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BINDING MARGIN – DO NOT WRITE

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HUNTER NEW ENGLAND LOCAL HEALTH DISTRICT

Facility _____

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FAMILY NAME	MRN
GIVEN NAME	☐ MALE ☐ FEMALE
D.O.B. ____ / ____ / ____	M.O.
ADDRESS	
LOCATION / WARD	
COMPLETE ALL DETAILS OR AFFIX PATIENT LABEL HERE	

PRESCRIPTION OF BLOOD PRODUCT: PATIENT WEIGHT IS :_____Kg

DATE	BLOOD PRODUCT	DOSE /RATE mLs / HR	DATE GIVEN	TIME GIVEN	GIVEN BY	CHECKED BY
Prescriber Signature: _____ Print NAME: _____						
Prescriber Signature: _____ Print NAME: _____						
Prescriber Signature: _____ Print NAME: _____						

Record Batch numbers of products here or attach Peel-off batch labels. Initial each batch number or label as it is administered, as per policy.

BLOOD PRODUCT ORDER AND REASON FOR ADMINISTRATION.

Route of administration IV (intravenous), IM (intramuscular), SC (subcutaneous).

BLOOD PRODUCT Route of Administration		VOLUME / DOSE	REASON FOR TRANSFUSION / PRODUCT TYPE (Check box)
Albumex 4%	IV	☐ 50mL ☐ 500mL	☐ Low Albumin ☐ Plasmapheresis ☐ Dialysis
Albumex 20%	IV	☐ 10mL ☐ 100mL	☐ Low Albumin ☐ Paracentesis of ascites
Prothrombinex	IV	☐ 500 IU	☐ Warfarin Reversal ☐ Factor replacement
Rh Anti-D Immunoglobulin	IM	IU	☐ Sensitisation with Rh Pos component.
Zoster Ig	IM	IU	☐ Close contact exposure
Tetanus Ig	IM	IU	☐ Close contact exposure
Hepatitis Ig:	IM	☐ 100 IU ☐ 400 IU	☐ Exposure
Advate	IV	Dose:	☐ Factor deficiency
Benefix	IV	Dose:	☐ Factor deficiency
Biostate	IV	Dose:	☐ Factor deficiency
Fibrogammin	IV	☐ 250 IU ☐ 1250 IU	☐ Factor deficiency
Kogenate	IV	Dose:	☐ Factor deficiency
Xyntha	IV	Dose:	☐ Factor deficiency
Intravenous Immunoglobulin	IV	Dose:	☐ Intragam OR Specify Product Name and Concentration:
Subcutaneous Immunoglobulin	SC	Dose:	Specify Product Name and Concentration:
Other			

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HNEMH17C

BLOOD COMPONENTS AND BLOOD PRODUCTS ADMINISTRATION FORM

APPENDIX 4

PARENT FACT SHEET

Information for parents

Babies Receiving a Blood Transfusion

Australian Red Cross Lifeblood

What is a blood transfusion?

A blood transfusion involves blood being given through a tube into the bloodstream. Transfusion has been recommended because it is the best option for your baby at this point.

Do I need to give consent for a blood transfusion?

Yes, consent is necessary prior to your baby being given a transfusion. Consider the following statements and if you have any doubts, please ask your clinical team.

- ✓ I understand why transfusion has been recommended and other possible options for treatment.
- ✓ I am aware of the expected benefits of a transfusion for my baby.
- ✓ I am aware of the potential risks and side effects.
- ✓ I am aware of which blood products will be transfused to my baby.
- ✓ I am aware of how the transfusion will be given and how long it will take.

In an emergency, there may not be time to discuss your baby's transfusion and obtain your consent. However, the reasons for the transfusion will be explained to you as soon as possible.

Which blood product might my baby receive?

After blood is collected from a donor it is separated into parts so your baby only receives the part that they need.

Red blood cells

Red blood cells carry oxygen around the body. A low number of red blood cells results in anaemia. Some causes of anaemia include prematurity, blood loss and increased red cell breakdown (haemolytic disease of the newborn).

Platelets

Platelets help to stop bleeding by forming a clot. A low platelet count can be due to too few platelets being made, too many being used or too many being destroyed. Some causes include infection and antibodies.

Plasma (fresh frozen plasma, cryoprecipitate)

Plasma is the liquid part of blood containing important proteins. It may be required in acute bleeding where proteins in the plasma are reduced.

Plasma products

Plasma products are concentrated blood proteins. Each product has a specific purpose:

- Albumin helps maintain fluid levels.
- Immunoglobulins help the immune system.
- Clotting factors are for treating specific bleeding problems.

Are transfusions safe?

Australian Red Cross Lifeblood collects blood for transfusion in Australia from voluntary donors. Our blood supply is one of the safest in the world and most babies will have no complications during or after their transfusion.

Although transfusions are generally very safe, there are some associated risks. However, precautions are taken to avoid any complications. There are three key risks to be aware of:

Having a reaction

Reactions are uncommon and can range from mild to severe. Mild reactions are the most common and include a rash or slight fever. Severe reactions include breathing difficulties, high fever and severe allergy (anaphylaxis).

Your baby will be carefully monitored during and after the transfusion. Alert the nursing staff if you have any concerns about your baby during the transfusion.

Catching an infection

In Australia, blood is carefully screened for infections. This includes screening donors and testing the blood after it has been donated. The risk of catching any diseases such as Hepatitis C or HIV is less than one in a million.

Receiving the wrong blood product

This is a rare occurrence and is usually caused by a checking error. This is prevented by multiple checks in the laboratory and at the bedside prior to beginning a transfusion. It is important that your baby is wearing an identification band throughout the process.

APPENDIX 4

PARENT FACT SHEET

How is blood given?

Your baby will need a small plastic tube placed into a vein.

The blood product will be carefully checked to make sure it matches your baby's blood.

The transfusion will begin.

Your baby will be closely monitored. We usually observe no change in the baby during their transfusion.

The transfusion will take less than four hours.

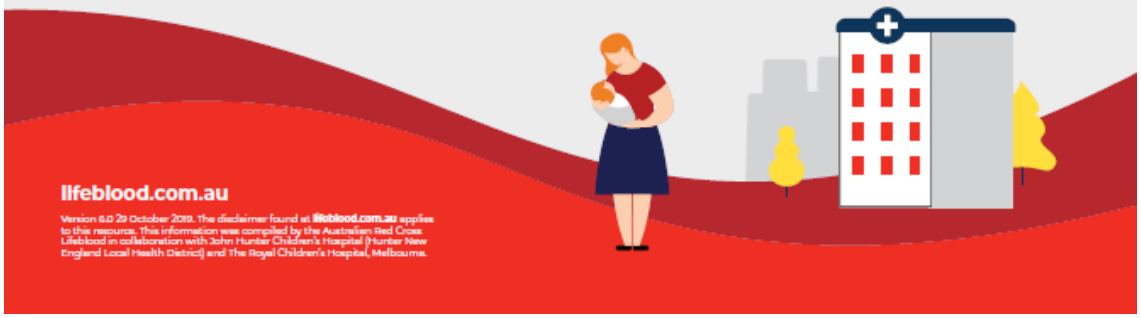
If you have any concerns about your baby at any stage of the process, alert nursing staff immediately.

Frequently asked questions

Will this transfusion affect my baby in the future?
A transfusion will be given only if medically necessary. From what we know so far, there are limited long-term effects. If your baby needs a transfusion in the future, remember to mention that they have had one before as it may influence which blood is given.

Will the blood transfusion affect the newborn screening test?
Yes, there is a chance it might. This test is usually done between 48–72 hours after birth. If the blood spot sample has not yet been taken, your baby will need it done before receiving a transfusion. They may also need a further sample after transfusion.

Can I donate blood to my baby?
The risks from receiving blood from donors provided by Lifeblood is extremely low, so parents' blood is not used. In addition, there are some increased risks of rare transfusion reactions when babies receive blood from relatives.



lifeblood.com.au

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APPENDIX 5

ADVERSE REACTION MANAGEMENT GUIDE

TYPE OF REACTION	SIGNS & SYMPTOMS	MANAGEMENT TREATMENT	PREVENTION
Febrile/Pyrogenic Most common type	• Pyrexia- a temperature rise of >1.0°C from the baseline reading • Rigors	• Cease temporarily • Give paracetamol • Symptoms should resolve within 30 minutes, if not, have patient medically reviewed	• Do not transfuse blood more rapidly than ordered • Leukocyte depletion filter if due to HLA antibodies
Urticarial (may progress on to anaphylaxis)	• Urticaria (hives) • Pyrexia • Dyspnoea	• Cease transfusion temporarily • Seek medical advice: symptoms will usually resolve with anti-histamines • Monitor patient closely	• Prophylactic premedication if a patient has a past history of reactions • Triple washed RBC
Allergic/ Anaphylactic	• Urticaria • Pyrexia • Facial Oedema • Laryngo/bronchospasm • Hypotension • Tachycardia • Cardiac Arrest	• Cease transfusion immediately • Seek urgent medical review • Check with MO with continuing the transfusion • Commence normal saline infusion if patient is hypotensive • Monitor patient closely	• Prophylactic premedication if patient has a past history of reactions • Use of triple washed red cells if required • Leukocyte depletion filter if due to HLA antibodies
Acute Haemolytic This type of reaction is not common but can be fatal	• Pyrexia/Rigors • Acute signs of pain • Haemoglobinuria • Oliguria	• Cease transfusion immediately remove giving set and maintain IV access with new set and commence normal saline infusion • Seek urgent medical review • Maintain Blood Pressure • Monitor patient closely • Save all used blood packs	• Careful checking of both patient and the blood pack details
Sepsis due to bacterial contamination of donor blood NB. This type of reaction is **rarely** seen but can be fatal	• Hyperpyrexia • Pallor • Hypotension • Tachycardia • Collapse, shock • Cardiac arrest	• Cease transfusion and remove giving set • This is a medical emergency-seek medical review immediately • Commence saline infusion • Maintain blood pressure • Monitor patient closely • Save all used blood packs	• Do not use blood that is known to have been incorrectly stored, or has been out of a monitored blood fridge, unused for more than 30 minutes without checking the temperature of pack with blood bank (<10^0C) • Discard any blood not transfused within 4 hours