



PROCEDURE / GUIDELINE

SUBJECT: ADMINISTRATION OF BLOOD PRODUCTS FOR PAEDIATRIC PATIENTS IN JHCH

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DISTRIBUTION: All Clinical Units Kaleidoscope GNS.

Emergency, Intensive Care, Operating Theatres

PERSON RESPONSIBLE FOR MONITORING AND REVIEW:

Clinical Nurse Consultant / Educator Oncology

Paediatric Haematologist

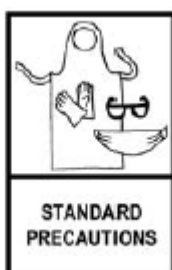
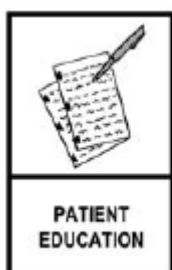
COMMITTEE RESPONSIBLE FOR RATIFICATION AND REVIEW:

Kaleidoscope GNS Quality Committee; Kaleidoscope Executive Advisory Group

Disclaimer

It should be noted that this document reflects what is currently regarded as a safe and appropriate approach to care. However, as in any clinical situation there may be factors that cannot be covered by a single set of guidelines, this document should be used as a guide, rather than as a complete authoritative statement of procedures to be followed in respect of each individual presentation. It does not replace the need for the application of clinical judgment to each individual presentation.

S.W.P.



DOCUMENT REVISION February 2009:

Changes have been made in relation to the need for blood filters and filter size p.7-8

RISKS

Risk of body fluid splash

Manual handling injury

CONTROLS

Use personal protective equipment
Gloves, apron, and protective eyewear.

Transport blood products to ward
In secure container.

Attach blood products to giving set
below eye level.

Child to be in bed/chair at an
appropriate height.

THIS DOCUMENT DOES NOT CONTAIN A PROCEDURE FOR INTRAGAM®. Please see 13.27 for “ Administration of IntraGAM®”

OUTCOMES:

- The correct patient receives the correct blood product.
- The blood product is given via the correct route.
- The administration of the infusion is in accordance with the medical order.
- Documentation of the transfusion is noted on the fluid balance chart in the History, Examination and Progress Notes and on the cross-match summary sheet.
- The patient is monitored closely throughout the transfusion for evidence of any adverse reactions.
- Compliance with NHMRC/national clinical practice guidelines and standards for the safe and appropriate use of all blood products.
- All blood products, except Factor VIII and IX, should be infused within 4 hours.

GENERAL CONSIDERATIONS:

Pre-Transfusion Testing

All blood collected for pre-transfusion testing must be **hand written** onto the EDTA blood tube label with the **patient’s full surname, first name/s, middle names, , medical record number, date of birth, ward, date/time of collection and signature of the collector**. The identification of the patient and verification of correct sample labelling must be witnessed by a second person (who may be a parent) and signed also date and time for on the request form.

Any discrepancies in patient identification details on the sample label and PRE-TRANSFUSION REQUEST FORM (N75031) will result in the collection being discarded, and recollection will be necessary.

A group and save (Gp&Save) is valid for 28 days, except for patients who have been transfused within the last three months, in which case 72 hour validity applies.

To check a Gp&Save: go to the ward computer and left click onto the Citrix Program Neighbourhood, left click on the Gp&Save Validity symbol, enter your username and password and enter "H" prefix and then the patients MRN and surname. This will advise if there is a current valid group and save available.

Obtaining blood products from Blood Bank

New Procedure for obtaining Platelets, FFP and Cryoprecipitate from Blood Bank/ Transfusion Lab

- The HIC (Health Insurance Commission) have allowed billing for the **release** of Platelets, FFP and Cryoprecipitate. (Packed Cells release is already part of XM)
- HAPS cannot charge unless they have a general request form signed by a **medical officer**
- When a request for any of these products is received, the ward needs to provide a **General request form signed by a medical officer**, to the person collecting the product from the lab

(If the person collecting the product does not have a general request form, or it is not signed by a medical officer the product will be issued, however Blood Bank/ Transfusion Lab will require a general request form signed by a Medical Officer to be faxed to them on return to the ward.)

- Blood products may be obtained from Blood Bank/Blood Transfusion Lab by the wards-person who will require a general pathology request form with the blood product required and the patient's details listed. Nursing staff collecting blood products from Blood Bank, are required to show the patient identification label prior to the blood product being released to them to take back to the ward.
- Only one (1) unit of packed cells may be collected at a time.
- Commence the transfusion of any blood product within thirty (30) minutes of its arrival to the ward. If the blood product is not commenced within (30) minutes, return it to Blood Bank to be stored at the correct temperature.

Pre-Transfusion Procedure

For all blood products verify:

- The medical order, IV fluid order, medical officer documentation in the medical record, the pt summary sheet (provided with the blood product) and the reason for the transfusion.
- Informed and written consent has been obtained by medical officer, including potential risks and benefits of blood product therapy explained to the patient/family and documented.
- Education to patient of the potential transfusion reactions that may occur and the appropriate action to take to ensure medical attention.
- Record baseline temperature (T), pulse (P), respirations (R) and blood pressure (BP).
- Ensure the patient has a patent cannula or Central Venous Access Device (CVAD) in-situ.
- Inspect the blood or blood product for clots or other solid matter. If present check with Blood Bank/Blood Transfusion Lab before commencing the transfusion
- The patient's details, medical record number, **ID Bands**, blood group (including ABO and Rh) CMV/ Irradiation / leucodepletion status against the transfusion request form.
- The blood product details, including pack number, blood group (including ABO and Rh) CMV/ Irradiation / leucodepletion status and expiry date against the details on the patient summary sheet (provided with the blood product) and the medical order for the transfusion.
- All verification is to be carried out by two (2) registered clinicians - either; RNs, EEN and RN or MO, or MOs at the bedside and signed for on the Record of Transfusion and Medical Order.
- Verify identification verbally with the patient, parent/guardian whenever able.
- In the event of any discrepancies, do not use the blood product and notify Blood Bank.
- Rh (D) negative patients should receive Rh (D) negative platelets. However, if there is a shortage of Rh (D) negative platelets Rh (D) positive platelets may be used after consultation with the paediatric oncologist/ haematologist. If Rh (D) positive platelets are given to an Rh (D) negative female Rh (D) immunoglobulin 250 international units must be given within 72 hours of the transfusion.
- If an Rh (D) negative female requires further platelet transfusion within 4 weeks of receiving Rh (D) positive platelets and only Rh (D) positive platelets are available consultation with the paediatric oncologist/ haematologist is required.

- It is very unlikely that paediatric patients that are Rh (D) negative would receive Rh (D) positive packed cells. Consultation with the paediatric oncologist/ haematologist is essential.

Irradiated Blood Products

- Irradiation of the blood product reduces the risk of Transfusion related Graft Versus Host Disease following transfusion of blood products for patients who are immunosuppressed.
- The Blood Bank / blood transfusion lab at John Hunter Hospital has an Irradiator in the department.
- All Paediatric Oncology and other immunosuppressed patients receive **irradiated** blood products even if no chemotherapy has been given yet. This should requirement should be indicated under special requirements on the pre-transfusion request form
- Once red blood cells have been irradiated the expiry date will be adjusted and the length of the expiry reduced to fourteen (14) days from the date of irradiation.
- Platelets expiry is unchanged at 5 days.



Figure 1. Irradiation label

The permanent bright orange label includes the date and dose of irradiation and any reduction in shelf life

CMV Negative Blood Products

- Cytomegalovirus (CMV) is a herpes virus that can remain latent in the granulocytes. CMV- negative blood products prevent the possible transmission of the CMV virus to patients. Patients most at risk of acquiring CMV via transfusion are immunosuppressed patients
- All paediatric oncology patients who are CMV negative or their CMV status is unknown (ie: new patients) receive **CMV negative** products depending on availability.

- Blood Bank keeps a record of the CMV status of the oncology patients once they have been supplied with this information.
- In the event that only CMV positive platelets are available and are to be given to a known CMV negative patient there is **NO** need to use a leucodepleting filter as all platelets are leucodepleted at time of collection.
- In the event that only CMV positive red blood cells are available and are to be given to a known CMV negative patient a leucodepleting filter must be used.

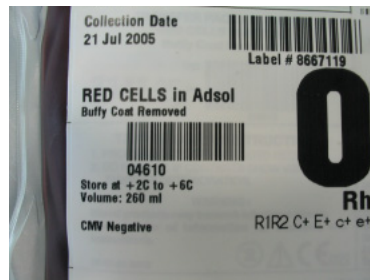


Figure 2. CMV specific details located on left side below the volume of pack

Leukocyte Filtered Blood Products

- The presence of granulocytes in blood and blood products has been shown to be responsible for many adverse side effects associated with transfusions including viral transmission (CMV), non-haemolytic transfusion reactions and initiating and suppressing different immune responses.
- Packed cells and platelets are leucodepleted at the Australian Red Cross Blood Service (pre-storage). If the red cell/platelet blood component label or the patient compatibility label indicates the product has been leucodepleted, a leucodepletion filter is not required during administration.
- CAUTION: Do not use leucodepletion filters for granulocyte or stem cell transfusions

Drug Administration and Blood Products

- Turn off any Intravenous fluids and medication sidelines infusing prior to commencing transfusion unless multiple lumens
- Avoid administering any drugs in the same lumen as the blood product.
- Check compatibility of drugs and IV fluid with the blood product prior to infusing
- If any medications **must** be administered during the transfusion eg Frusemide (Lasix®), pre and post flush the line with 0.9% Normal Saline at the closest injection port for the patient. Or give through a separate IV access if available..
- If the patient has a Central venous access device with more than one lumen; one lumen can be utilised for blood products and the other separate lumen can be used

for the continuation of IVT or medication. Please take into consideration the total fluid volume.

In specific circumstances as ordered by the consultant: Co-administration of morphine, and or/ketamine diluted in normal saline (ie: patient controlled analgesia or continuous side arm infusion) via a non reflux valve can be given. It has been shown not to adversely affect red blood cells (Birch, 2001)

PACKED RED CELLS

Packed red cells are generally given to restore haemoglobin levels for patient's with symptoms associated with acute or chronic anaemia.

Although important, the recipient's haemoglobin and haematocrit level should not be the deciding factor for initiating transfusion, but be supported by the assessment of the potential to relieve clinical signs and symptoms and prevent morbidity and mortality.

PROCEDURE:

Administration

Establish patency of cannula or Central Venous Access Device (CVAD).

Verification of the order and the consent for the transfusion.

Check the blood product at the bedside with two (2) RNs or MO

- Commence transfusion as per the medical order IV fluid order medical officer documentation in the medical record and the pt summary sheet (provided with the blood product).
- If the patient has a temperature >38.5C, check with the MO whether the transfusion should be delayed. Paracetamol may be given.
- All blood products must be transfused via a giving set containing a 170-200 micron filter unless otherwise stipulated and a burette. Most standard giving sets contain appropriate filters. The FNC1119 Baxter Continuous – Flo Blood/Solution set currently in use has a 200 micron filter.
- Packed cells are to be transfused via a Baxter Pump.

- Blood products must not be transfused via an administration set that has had drugs or solutions other than 0.9% Normal Saline infused through it.
- Infusion sets suitable for the administration of blood or blood products should be changed after every 2nd unit of blood, or if more than 4 hours elapses between units, and on the completion of the therapy.
- The use of interlink connectors are suitable for blood product infusions.
- Prime the giving set with 0.9% Normal Saline
- Commence the transfusion within 30 minutes of the blood product arriving to the ward.
- The rate of infusion may vary according to the patient's medical condition and the medical orders, but must not be longer than four (4) hours per unit of packed cells.
- Any part of a unit of packed cells that has not been transfused within four (4) hours must be discarded because of the high risk of bacterial contamination in blood that has been un-refrigerated for longer than 4 hours.
- If both packed cells and platelets are required, where possible give the platelets first
- The volume of a unit of packed red cells is written on the bag label – record this on pt fluid balance.

Observations

- Record baseline temperature (T), pulse (P), respirations (R) and blood pressure (BP).
- Repeat in fifteen minutes (15) then hourly for each unit and an hour post transfusion.
- Also attend PRN if any concerns / change in condition

PLATELETS

- Platelets should be brought to the ward for immediate use.
- Platelets **must** be returned to Blood Bank/Blood Transfusion Lab if not used within 30 minutes of arriving to the ward.
- Platelets are **not** to be filtered with a leukodepletion filter (eg: Terumo ®) as they are leukodepleted at collection.
- Platelets are to free flow, **not** to be infused via a pump.
- Platelets are to be administered via a standard giving set with a 170-200 micron filter and burette.
- Platelets are **not** to be placed in a refrigerator as are administered at room temperature.

- The shelf life of platelets is limited to five (5) days, if platelets are not needed Blood Bank/Blood Transfusion Lab needs to be informed as soon as possible.
- One (1) platelet pack is now obtained from a pool of 4 buffy coats from ABO identical donors. This has reduced the incidence of platelet reactions and premedication is no longer necessary but may be required for patients with a known reaction from previous transfusions.
- Patients with a known history of reactions to platelets may still require a premedication preferably one (1) hour prior to the transfusion. To be ordered by the MO.
- Platelets are transfused over thirty (30) minutes to one (1) hour.
- Record baseline observations, then 15 minutes from the commencement of the transfusion. Also attend PRN if any concerns / change in condition.
- **Most patients will get one (1) platelet pack (equivalent to 4 units) Patients < 2 years of age should get a maximum volume of 20mls/kg as per MO transfusion orders which may be less than a full bag. (Discard remaining amount)**



Figure 4. Platelet pack. Note: Do Not Refrigerate label.

FRESH FROZEN PLASMA (FFP)

- FFP is given to patients with coagulation deficiencies including Disseminated Intravascular Coagulopathy (DIC), during induction chemotherapy for leukaemia, coagulopathy associated with asparaginase therapy and sepsis.
- It contains all of the labile clotting factors.
- FFP is kept frozen.
- It is thawed on request by the MO, and must be collected from Blood Bank. Thawing takes thirty (30) minutes.
- Each unit of FFP should be transfused over 10-15 minutes, unless otherwise indicated. –as per MO transfusion order.

- Prior to commencement of FFP ensure the medical order IV fluid order medical officer documentation in the medical record and the pt summary sheet (provided with the blood product).
- 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/ blood transfusion lab for appropriate refrigeration for up to 24 hours.
- FFP does **not** require leukocyte filters and can be given via an intravenous line approved for blood administration and incorporating a standard 170-200 micron filter.
- Procedure for checking and hanging FFP same as other blood products.
- Record baseline observation, then 15 minutes from the commencement of the transfusion and PRN.

Establish patency of cannula or Central Venous Access Device (CVAD).

Verification of the order and the consent for the transfusion. Check the blood product at the bedside with two (2) RNs or MO.

- Repeat of the baseline observations is only necessary upon the completion of the infusion, unless the patient's condition indicates otherwise.
- Allergic reactions may occur as per Transfusion reaction guidelines Table 1

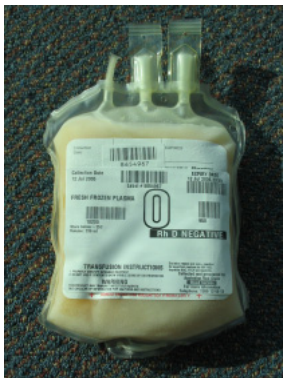


Figure 5. Fresh Frozen Plasma (FFP)

CRYOPRECIPITATE

- Cryoprecipitate is given for the promotion of haemostasis when fibrinogen levels are reduced or dysfunctional. It contains high levels of fibrinogen, factor VIII.
- Cryoprecipitate is stored frozen.
- It is thawed on request by the MO, and must be collected from Blood Bank. Thawing takes up to thirty (30) minutes.
- The units are pooled together in Blood Bank and the total dose is infused over 30 minutes.

- Thawed cryoprecipitate should ideally be transfused as soon after thawing as possible due to potential deterioration of the clotting factors.
- Procedure for checking and hanging cryoprecipitate is the same as other blood products.
- Cryoprecipitate does **not** require leukocyte filters and can be given via an intravenous line approved for blood administration and incorporating a standard 170-200 micron filter and a Baxter pump.
- Record baseline observation, then 15 minutes from the commencement of the transfusion and PRN.
- Allergic reactions may occur as per Transfusion Reaction Guidelines Table 1.

ALBUMEX® 4 or 20

- Albumex® was formerly known as Concentrated Albumin and Albumex® 4 (that was formerly known as SPPS and NSA). It is indicated in hypovolemic shock, burns and occasionally in an acutely unwell patient with hypoproteinaemia.
- Each bottle (either 50 or 500mls) is infused at the amount and rate ordered by the MO.
- The product 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. To be taken out of the fridge at least half an hour prior to reach room temperature.
- It is infused via a standard blood giving set given via an intravenous line approved for blood administration and incorporating a standard 170-200 micron filter, with a infusion pump and with an airway needle inserted in the bottle.
- Any portion of an opened bottle of Albumex® that is not transfused must be discarded, as it contains no antimicrobial agent.
- Albumex® MUST be used within 4 hours.
- Procedure for checking and hanging Albumex® same as for other blood products. (see above)
- Baseline observations.
- Repeat of the baseline observations is only necessary upon the completion of the infusion, unless the patient's condition indicates otherwise.
- The batch number must be recorded on the patient summary sheet (removalable stickers are provided on each bottle).



Figure 6. Albumex

INTRAGAM: See Protocol 13.27.

COMPLETION OF THE TRANSFUSION

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 correct PPE. In the event of an adverse reaction the used bags are to be saved and returned to Blood Bank for further investigation.

It is compulsory for the RN/EEN completing the transfusion to answer, sign and date the Adverse Event Data section in the Blood & Blood Products Transfusion Form (HNEMR17)

ADVERSE REACTIONS

- If any adverse reaction is suspected **TURN OFF THE TRANSFUSION IMMEDIATELY**
- Quick and correct evaluation of all transfusion reactions is necessary, because of the potential life-threatening nature of some of the reactions.
- Notify the MO immediately.
- The most common adverse sequelae to the transfusion of blood products are non-haemolytic transfusion reaction (NHFT) fever, rigors and urticaria. Treat the patient according to the table **Adverse Reaction Guidelines** and notify the MO
- 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.
- As with any fluid infusion, a patient may develop fluid overload, which may present as breathlessness and tachycardia. The patient must be medically reviewed and treated as ordered.

- 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 4-8 days after transfusion, but may occur up to two (2) weeks later. Lumbar pain, fever, jaundice and red/dark urine are the most common symptoms, but may go unnoticed by the patient. Pathology results will confirm or diagnose, as the patient will have a falling haemoglobin, increased bilirubin and haemoglobinuria, if severe.
- Blood Bank/ blood transfusion lab should be notified of all serious reactions as soon as possible.
- Adverse reaction notification form located in the back of the pre-transfusion request form MUST be completed and submitted to Blood Bank/Blood Transfusion Lab.
- In the event of a reaction the remaining blood product and giving set are to be sent to Blood Bank/ Blood Transfusion Lab with information regarding the reaction.
- Any adverse event relating to blood or blood transfusion must be reported using IIMS.

Table 1

Adverse Reaction Guidelines

Type of reaction	Signs & symptoms	Nursing Management /Treatment	Prevention
<p>Febrile/Pyrogenic Most common type</p>	<ul style="list-style-type: none"> Pyrexia- a temperature rise of >1.0 C from the baseline reading Rigors 	<ul style="list-style-type: none"> Cease temporarily Give paracetamol Symptoms should resolve within 30 minutes, if not, have patient medically reviewed 	<ul style="list-style-type: none"> Do not transfuse blood more rapidly than ordered Leukocyte depletion filter if due to HLA antibodies
<p>Urticarial (may progress on to anaphylaxis)</p>	<ul style="list-style-type: none"> Urticaria (hives) Pyrexia Dyspnoea 	<ul style="list-style-type: none"> Cease transfusion temporarily Seek medical advice- symptoms will usually resolve with anti-histamines Monitor patient closely 	<ul style="list-style-type: none"> Prophylactic premedication if a patient has a past history of reactions Triple washed RBC
<p>Allergic/ Anaphylactic</p>	<ul style="list-style-type: none"> Urticaria Pyrexia Dyspnoea Facial Oedema Laryngo/Bronchospasm Hypotension Tachycardia Cardiac Arrest 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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
<p>Acute Haemolytic This type of reaction is not common but can be fatal</p>	<ul style="list-style-type: none"> Pyrexia/Rigors Lumbar pain Constricting pain in the chest Warmth/ pain along the infusion vein, but not as a single symptom Haemoglobinuria Oliguria Feeling of "Impending Doom" 	<ul style="list-style-type: none"> 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 MET team call if indicated Save all urine Save all used blood packs 	<ul style="list-style-type: none"> Careful checking of both patient and the blood pack details
<p>Sepsis due to bacterial contamination of donor blood NB This type of reaction is rarely seen but can be fatal</p>	<ul style="list-style-type: none"> Hyperpyrexia Pain in limbs and chest Headache Pallor Burning pain along the infusion vein Hypotension Tachycardia Collapse, shock Cardiac arrest 	<ul style="list-style-type: none"> Cease transfusion and remove giving set This is a medical emergency- seek medical review immediately MET team call as indicated Commence saline infusion Maintain blood pressure Monitor patient closely Save all used blood packs 	<ul style="list-style-type: none"> Do not use blood that is known to have been incorrectly stored, or has been out of a monitored blood fridge, un-hung, for more than 30 minutes without checking the temperature of pack with blood bank (<10⁰C) Discard any blood not transfused within 4 hours

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CONSULTATION:

Dr. Sandra Deveridge – HAPS Haematologist TMH

Michelle McKay – CNC Transfusion Practice

Dr Janis Chamberlain Paediatric Oncologist JHCH

Cathie Milton – CNC Haematology MMH

Dr. Frank Alvaro - Paediatric Oncologist JHCH

Dr. Steven Keogh - Paediatric Oncologist JHCH

Janet Wallace- Patient Safety Officer HNE

SIGN OFF BY:

Michelle McKay – CNC Transfusion Practice

Dr Steven Keogh - JHCH Paediatric Oncology Staff Specialist

Lyndal Moore - Clinical Nurse Educator/ Late Effects Coordinator Paediatric Oncology.

Diane Cotterell - CNC Paediatric Oncology

AUTHOR: Lyndal Moore- CNE/ Late Effects Coordinator Paediatric Oncology.