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PURPOSE AND SCOPE

To order and safely administer Red Cells (RC's)

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PROCEDURE

1. Emergency RC's

See [Emergency RC's - Policy 34.2](#)

2. Requests for RC's

To make a request for a RC transfusion the doctor or Nurse Practitioner must:

1. Complete the Blood Product Request Form in full (MR/17A).
2. Write the order for RC's on the Blood Product Prescription Form (MR/61AA) along with the NHMRC indication code.
3. Write the indications for a RC transfusion in the patient's medical record including the coded comment for indication of transfusion.
4. Communicate order to nursing staff.

NHMRC Guidelines and coded indication comments are available on each ward as well as the reverse side of the Blood Product Prescription Form (MR/61AA).

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The professional performing venepuncture for a blood sample required for Serological Cross Match must:

1. Verbally identify the patient by asking the patient to state their name and date of birth and crosscheck this information with the Blood Product Request Form (MR17A). **See Patient Identification Policy 23.13.**
2. Collect the blood sample in a 10ml BD vacutainer “Pink Top”, EDTA tube.
3. At the patients side **handwrite** the patient details (full name, date of birth & UR number) on the blood tube, along with the date, time and name of the professional collecting the blood sample.
4. Sign and date the Blood Product Request Form (MR/17A) **(This must only be done by the professional drawing the blood specimen at the bedside).**
5. Send the completed form and specimen to Peter Mac Blood Bank

Incorrectly labeled blood specimens or request forms will not be accepted by Peter Mac Blood Bank. The specimen will be discarded and another blood specimen will be required.

Note: The plasma sample for cross match is valid for 72 hours. Peter Mac Blood Bank may have a valid plasma sample on hold for cross match. This information is available on the Patient Browser (under the Transfusion Profile folder).

3. Transportation of Red Cells

To collect red cells from Blood Bank:

1. Contact Peter Mac Blood Bank or refer to Patient Browser (Transfusion History) to establish the RC's are ready for release.
2. The Medical or Nursing staff is required to complete a Blood Product Release Form.
3. The person collecting the red cells (generally the PSA) presents the Blood Product Release Form to the Blood Bank Scientist.
4. The Blood Bank Scientist will log out the red cells from the Release Fridge and will place the unit in a transport eski for delivery to the ward.
5. Blood issued to the ward may remain un-refrigerated for a maximum of **20 minutes** before the transfusion commences (or return the unit to the Blood Bank).

Only **one unit at a time** can be collected from Blood Bank (excluding emergency transfusions and delivery of products to theatre).

Theatre may transport multiple units, which are then logged into the Theatre Blood Fridge prior to the commencement of surgical cases. At completion of the morning or afternoon theatre lists/cases, all products must be logged back into the Blood Bank Release Fridge. Red cells **must not** be transported routinely with the patient to ward if un-transfused in theatre and should be returned to Blood Bank and re-logged into the Blood Product Release Fridge.

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4. Procedure for Administering Red Cells

Equipment Required

NOTE: All blood components, except Granulocytes, are to be administered through an intravenous line incorporating a standard (170-200µm) filter to remove clots and aggregates. Plum A+ Administration sets are filter free lines, therefore blood components need to be administered via an Add-A-Line Secondary Medication Set through channel B.

- Plum A+ Administration set
- Add-A-Line Secondary Medication Set
- 3 way tap (if patient has only single intravenous access)
- Non sterile Gloves
- Safety Goggles
- Blood Product Prescription Form (MR/61AA)
- Transfusion Report Form (MR/17AA)
- Leukocyte Removal Filter (if required)

The recommended cannula gauge for adequate flow rate of the red cell transfusion is 18 - 20 gauge. CVADs are also adequate.

Product and Recipient Identification Procedure

Two Division 1 Registered Nurses or Division 1 Nurse and resident medical officer (RMO) confirm that the following points correspond immediately prior to the transfusion, at the patient's bedside.

The transfusion must not commence if any discrepancies are found. Clarification must be sought by contacting the Blood Bank Scientist.

1.	Patient's full name and date of birth (DOB)	<ul style="list-style-type: none"> • Verbally with the patient (where possible) • Patient's Identification Band • Transfusion Report Form (MR/17AA) • Blood Product Prescription Form MR/ 61AA • Patient Label on the product
2.	Patient's Unit Record Number (UR Number)	<ul style="list-style-type: none"> • Patient's Identification band • Transfusion Report Form • Patient Label on the product • Blood Product Prescription Form MR/ 61AA
3.	ABO & Rh Blood Group of the patient	<ul style="list-style-type: none"> • Transfusion Report Form • Patient Label on the Product
4.	ABO & Rh Blood Group of the Product	<ul style="list-style-type: none"> • ARCBS Label on the Product • Transfusion Report Form • Patient label on the Product

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5.	ARCBS Donation Number	<ul style="list-style-type: none"> • ARCBS Label on the Product • Transfusion Report Form • Patient label on the Product
6.	Crossmatch Expiry	<ul style="list-style-type: none"> • Patient label on the Product • Scientist's signature present • Transfusion Report Form
7.	Expiry of the Product	<ul style="list-style-type: none"> • ARCBS Label on the Product
8.	Pack Integrity	<ul style="list-style-type: none"> • Pack is intact • Absence of clots, discoloration and foreign bodies
9.	Check to:	<ul style="list-style-type: none"> • Ensure the product is labeled irradiated (all products) and leukodepleted. • Ensure the product is labeled as non reactive for Hepatitis B & C, HIV, HTLV 1 & syphilis • Read "additional" scientist comments about the product

Both professionals checking the product **must** sign the Transfusion Report Form (MR/17AA) after checking **each unit** of red cells.

A summary of this checking procedure is tabulated on the Transfusion Report Form.

Administration Procedure

1. Prior to commencing the transfusion ensure that the patient has received adequate education and has been offered the Peter Mac Blood Transfusion Patient Information Brochure and ensure the patient has had an opportunity to ask questions about blood product transfusions and has given informed (verbal) consent to the transfusion.
2. Prime the Plum A+ Administration set with Normal Saline 0.9%. It is recommended that there is access to an IV line primed with Normal Saline in addition to the Plum A+ administration set for immediate use if a transfusion reaction occurs. (An example of this set up is utilising a 3-way tap at the cannula site connecting a blood giving set and a standard giving set).
3. Administer any prescribed pre-medication at least 20-30 minutes prior to commencing the transfusion, where such a delay is consistent with the clinical indication for the transfusion.
4. Connect Add-A-Line Secondary Medication set to channel B and back prime with Normal Saline 0.9%. Connect blood component to Add-A-Line.
5. Prior to commencement of **each unit** of RC's a set of baseline observations (temperature, pulse rate, respiration rate and blood pressure and O₂ saturations) needs to be recorded on the reverse side of the Transfusion Report Form (MR/17AA).
6. **Complete the product checking procedure** outlined above at the patient's bedside.

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7. Instruct patient to report any symptoms such as fever, chills, dyspnoea, back pain or headache.
8. Connect the RC's following completion of the product and recipient identification procedure.
9. Unless otherwise indicated by the patient's clinical condition, the transfusion should proceed no faster than 5mL/min for the first 15 minutes. The patient should be closely observed during this period. If no signs of a transfusion reaction are observed the rate can be increased according to the Blood Product Prescription Form (MR/61AA).

Note: It is recommended that the initial volume to be infused (VTBI) is set at that which will be transfused in the first 15 minutes. This ensures close monitoring of the patient and also that observations after the first 15 minutes are undertaken.

Observations (temperature, pulse rate, respiration rate and blood pressure) must be recorded for each unit at the following times:

- i. Prior to each transfusion record baseline vital signs
- ii. **Remain with the patient for the first 5 minutes of the infusion** and observe for adverse effects.
- iii. Record vital signs after the first 15 minutes of the transfusion
- iv. Record vital signs at completion of the transfusion.

Continue to closely monitor the patient throughout the duration of the transfusion. More frequent vital signs may be required if the patient becomes unwell, shows signs of reaction or has an unstable condition.

Patients with congestive heart failure, increased intracranial pressure or renal dysfunction will require more frequent monitoring.

10. Ensure that the completed Transfusion Report Form (MR/17AA) is filed in the patient's medical record
11. At completion of the transfusion flush the Plum A+ administration set (Line A) with 30 ml Normal Saline 0.9%. (Do not flush Leukocyte Removal Filters with Normal Saline).
12. Dispose of empty blood packs in the appropriate infectious waste bins. (In the event of a transfusion reaction or incomplete transfusion, notify Peter Mac Blood Bank and return all used and unused blood packs for further testing.)
13. Complete transfusion reaction column on Blood Products Orders / Prescription Form (MR61AA)

Points to Note Regarding Administration

- a) Infusion pumps should be used to administer blood, although it can be given directly through a standard IV administration set incorporating a standard (170 to 260 µm) filter.
- b) **A new blood administration / giving set should ideally be used following platelet administration.**
- c) IV **giving sets** should ideally be changed after every second unit of blood transfused and/or at the completion of the blood transfusion.

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- d) RC's should **not be warmed** unless specifically ordered by the medical staff (e.g.: for patients with cold agglutinin disease). See Blood Warming Policy 34.13.
- e) **No medications or solutions** should be added to or infused through the same tubing with RC's except 0.9% Sodium Chloride.
- f) Blood issued to the ward may remain un-refrigerated for a maximum of **20 minutes** before the transfusion commences (or return the unit to the Blood Bank).
- g) The average volume of a RC unit is 300mL.
- h) If a product is not labeled as **irradiated** it must not be transfused and should be immediately returned to Blood Bank.
- i) **Red Cells are now universally leukodepleted at source (ARCBS) for Peter Mac patients. Occasionally non-leukodepleted products are distributed and issued due to inventory constraints; a leukodepletion filter should be supplied by Peter Mac Blood Bank in these unusual circumstances. If there is uncertainty contact blood bank**
- j) RC's should generally be **administered over 2-3 hours per unit**, unless being administered for the treatment of hemorrhage or hypovolaemia. If co-morbidities exist, such as congestive heart failure, raised intracranial pressure or renal dysfunction (oliguria) a slower transfusion rate may be required.
- k) Completion of the transfusion should be prior to component expiry or **within four hours** from time of issue from blood bank, whichever is sooner.
- l) **Blood product transfusion between 2000 - 0700 is not recommended for semi-elective transfusions** due to reduced overnight staffing on the wards. Clinical observation of patients and detection of a serious transfusion reaction may be reduced. Psychosocial factors are also pivotal in these recommendations.

5. Transfusion Reactions

Signs and Symptoms of a Transfusion Reaction

Fever, shivering/chills, restlessness, anxiety, dyspnoea, chest pain, back pain, urticaria, facial flushing, tachycardia, hypotension, feelings of impending doom, headache, or nausea.

Be aware that clinical symptoms, not changes in vital signs, may be the first indications of a transfusion reaction.

Nursing Intervention (if Adverse Reaction is Apparent or Suspected)

- a) Cease transfusion immediately.
- b) DO NOT REMOVE INTRAVENOUS ACCESS.**
- c) Check all vital signs and confirm red cells were intended for recipient.
- d) Notify the medical officer.
- e) Leave blood infusion line intact until situation has been discussed or a medical officer has reviewed the patient.
- f) Carry out any further action as indicated by the medical officer, which may include:
 - Resumption of transfusion after management of current reaction and pre medication.
 - Calling M.E.T. or Code Blue (if clinically indicated).

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- Removal of red cell pack without completion of the unit.
 - Change the intravenous line and replace with a line using Sodium Chloride 0.9%.
 - Collection of blood from the patient by venepuncture from the opposite side to the infusion (4 ml of blood in a EDTA pink top tube, 10 ml in a EDTA pink top tube, yellow top lithium tube and blood cultures).
 - Collect urine specimen.
 - Retain & return red cell pack immediately to Peter Mac Blood Bank.
- g) Complete a Patient Safety Incident Report Form, ring Blood bank (ext 1533) communicate a transfusion reaction.
- h) Complete documentation in the patient medical record.

Advice regarding red cell transfusion reactions can be obtained from either the Haematopathology staff (Consultant, Registrar or Scientists) or the Clinical Haematology Staff (Consultant or Registrar).

6. General Information About Red Cell Transfusion

Product Description

RC's are the cellular component remaining after plasma from whole blood is removed by centrifugation. The red cells are re-suspended in an isotonic nutrient supplement solution to aid the storage of red cells. White cells and platelets are present in the Red Cells pack (in small numbers) and are potential immunizing agents.

Saline Washed RC's

Saline washing of red cells removes platelets and cellular debris, diminishes plasma to trace levels, and reduces the number of leukocytes (but does not eliminate them). Washed packed cells are used for patients with recurrent or severe allergic reactions that are considered to be related to one or more plasma proteins.

Buffy Coat Poor RC's

Buffy Coat Poor red cells are collected via a method that removes the buffy coat from the whole blood. The buffy coat contains a large percentage of leukocytes. Buffy Coat Poor Red Cells are not routinely ordered for Peter Mac patients due to our universal leukodepletion policy which is more effective in removing leukocytes.

Indications

Red cells are the treatment of choice for most patients with a symptomatic deficit in oxygen carrying capacity. The decision to transfuse should be individualized on a patient by patient basis. The guidelines published by the NHMRC/ANZSBT should be considered and include:

Indication Code	Haemoglobin	Considerations
01	< 70 g/L	Lower thresholds may be acceptable in patients without symptoms and/or where specific therapy is available.
02	70-100 g/L	Likely to be appropriate during surgery associated with major blood loss or if there are signs or symptoms of impaired oxygen transport
03	>80 g/L	May be appropriate to control anaemia-related symptoms in a patient on chronic transfusion regimen or during marrow suppressive therapy.
04	>100 g/L	Not likely to be appropriate unless there are specific indications

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Storage

Red cells are stored at 2-6°C in a refrigerator that complies with Australian Standards Association criteria. This is the Blood Bank or Theatre refrigerator only. Blood products should not be stored in ward medication refrigerators.

Blood Groups

Every patient requires an ABO & Rhesus Blood Group determination, antibody screen & serological crossmatch performed before red cells are released from Blood Bank.

ABO Group identical cells are preferred but are not essential but ABO compatibility testing between donor & recipient is mandatory unless emergency procedures are instituted.

Recipient's/ Patient's Blood Group	Donor Blood Group, First Choice	Second Choice
Group A	Group A	Group O
Group B	Group B	Group O
Group O	Group O	Nil else
Group AB	Group AB	Group A

Leukodepletion/Filtration

(Refer to Policy 34.12 Special Product Requirements - Leukodepletion/CMV Negative Products/Irradiation)

Peter Mac has a universal policy of leukodepletion of all red cell products.

The aim of leukodepletion is to reduce febrile non-haemolytic transfusion reactions and alloimmunization.

Products labeled leukodepleted do not require the use of bedside leukocyte removal filters. In rare cases of patients with unusual red cell phenotypes, bedside filtration may be required and will be labeled as such on the Blood Transfusion Issue Form and the appropriate filter provided by Blood Bank.

CMV Status of Patient

(Refer to Policy 34.12 Special Product Requirements - Leukodepletion/CMV Negative Products/Irradiation)

CMV status can be identified on the Patient Browser (Transfusion Profile) and includes CMV IgG and/or IgM positive/ negative.

For patients who are CMV seronegative and considered potentially at risk for CMV disease now or in the future, it is the doctor's responsibility to request CMV Negative products on the Blood Product Request Form (MR/17A).

- If CMV seronegative red cells are unavailable, the treating Consultant/Registrar should be contacted regarding the appropriateness to proceed with the requested transfusion or wait until CMV products become available.
- Leukodepletion of red cells reduces the transmission of CMV, however may not be as efficacious as a CMV negative product.

Irradiation

Peter MacCallum Cancer Centre has a **universal policy of irradiation of all cellular blood products**. Transfusion Associated Graft Versus Host Disease (TA-GVHD) is due to survival and engraftment of transfused donor T lymphocytes. Irradiation is performed to decrease the risk of TA-

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GVHD by inactivating the T lymphocytes. If a product is not labelled as irradiated it **must not** be transfused and should be immediately returned to Blood Bank.

Expiry

The expiry date of the product is clearly displayed on the top right hand corner of the product label. Expired products must not be transfused and should be immediately returned to PMCC Blood Bank. A Crossmatch is valid for 72 hours. This expiry date is displayed on the Patient Product label on each unit and is signed by the Scientist.

7. Haemovigilance

In an attempt to promote haemovigilance and best transfusion practice, PMCI Blood Bank scientific or medical staff may discuss the clinical indication or need to transfuse if requests are outside the NHMRC guidelines.

8. References:

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FURTHER INFORMATION

PMCC Blood Bank, ARCBS or Peter Mac Nursing Education Department.

Approvers Transfusion Committee
Authorizers Director of Haematology and Medical Oncology