Blood Protocol – Components

Contents

Purpose

To ensure a blood component is safe to transfuse

To ensure that the right patient receives the right blood component at the right time at the right rate and the right prescribed dose.

To ensure patients are monitored closely to detect a potential adverse reaction

Scope

IV Certificated Registered Nurses / IV Certificated Registered Midwives / IV endorsed Enrolled Nurses

IV Certificated Registered Nurse Practitioners

Anaesthetic Technicians

Medical Officers

Duty Nurse Managers

Clinical Team Coordinators

Clinical Nurse Managers

Registered Anaesthetic Technicians & Trainee Anaesthetic Technicians, Operating Theatre staff

NZBS Staff

Students of Nursing and Midwifery as an observation role only.

Supporting material

2408295 Blood Protocol – Pre-Transfusion

2408294 Blood Protocol – Adverse Transfusion Reaction

2405559 Massive Transfusion Protocol – Adult

232679 Paediatric Massive Transfusion

2405524 Hand Hygiene Policy

2407578 Infection Prevention and Control

2403034 Peripheral Intravenous Therapy

2401678 Roles and Responsibilities Policy

2400571 Direction and Delegation

2401682 Student Nurse-Midwife Roles and Responsibilities Policy

2401690 QMR022A CDHB Resuspended Red Cells Transfusion Sheet ("QMR form")

2403338 QMR022B CDHB Blood and Blood Product Transfusion Sheet ("QMR form")

2401439 Checklist - Caring for patients who decline blood products

Packaging and use of blood products during transit with Air Ambulance

Definition

Blood Component is the term used for the separated cellular elements

- Re-suspended Red Blood Cells
- Fresh Frozen Plasma
- Cryoprecipitate
- Platelets (pooled, frozen or apheresis)
- Granulocytes

Safety Notice

ALL staff has permission to call **STOP** during the transfusion process or at any stage where there are any concerns about patient safety.

A transfusion must only take place in clinical areas that are appropriately resourced with enough trained staff available to monitor and observe the patient for the duration of transfusion

Blood Components Issued from a Blood Fridge

2407961 Emergency Blood Fridge - Removing O Negative Blood

239861 Burwood Blood Fridge Policy

Only trained personnel are authorised to issue blood or blood products from a Blood Fridge. Procedural instructions for issue should be located beside a blood fridge.

Procedural Considerations

Two authorised IV certified personnel are required for all blood transfusion procedures.

QMR forms

Original QMR022 forms should be sent to Blood Bank. This is to avoid duplication of records.

If a request for issue is scanned to Blood Bank, the issued blood component will be returned to the requesting area with the scanned form. The scanned form then supersedes the original form. Any transfusion documentation including administration checks or signatures MUST NOT be transcribed onto the original form.

Controlled Storage of Blood Components

Blood components should not be refrigerated after reaching room temperature. Platelets should never be refrigerated

Blood components must only be stored in an NZBS validated blood fridge

Components for research must be stored in NZBS validated and approved fridges and freezers

Vascular access

Ensure the patient has dedicated patent vascular access prior to requesting blood to avoid any delays in transfusion

- 18-20g or larger is recommended for adults
- 22-24g for paediatric patients. A smaller gauge cannula may restrict the flow rate and impact on transfusion/infusion times
- Multi lumen access devices such CVAD's are safe for continuous co-administration of other therapeutic solutions if administered through separate lumens. Concurrent medications or infusions via other lumens are permissible as rapid dilution occurs once in the bloodstream.
- Transfusion requires a dedicated lumen.

Administration Sets

All blood components require the use of a transfusion giving set, or a standard giving set with a blood filter added into the line prior to priming a unit of blood. Fresenius Transfusion Set (TR00) has no ports or vent and includes a built-in blood filter, for use with Fresenius Volumetric Infusion Pumps.

Transfusion administration sets for blood components should

- Contain a **170-200-micron blood filter** to trap cellular aggregates, cellular debris and clots potentially harmful to the patient.
- **NOT have any ports** – ports introduce risk of medications or fluids being co-administered during transfusion of blood cells
- **NOT have a vent** - a vent introduces risk of airborne contamination into the unit of blood cells
- **only be primed with normal saline or blood**

One administration set can be used for 2-4 units of red blood cells within a twelve-hour period provided the flow rate remains adequate. In a massive transfusion situation, 8-10 units may be transfused before the set is changed (if the flow rate remains adequate).

Platelets should be transfused before red blood cells or a new line used. Flush with normal saline before and after platelet transfusion if the same set is to be subsequently use for the transfusion of red cells.

Do not spike any component until you have completed the bedside checks and ready for transfusion.

The administration set should be discarded in the yellow biohazard rubbish bin on completion of any blood component transfusion.

Neonates & Infant Transfusion: Blood administered by syringe to a small infant or neonate should be drawn up via a 170-200-micron blood filter.

Blood Warmer

- A blood warmer is required for large volume rapid transfusions (Massive Transfusion), exchange transfusions or when a patient has significant cold reactive antibodies ('cold agglutinins' - Blood Bank will indicate if the use of a fluid warmer is required)

- Only an approved monitored warming system must be used. The warming system must be equipped with visible thermometer and an audible alarm as malfunction can result in red cell haemolysis. Blood components must not be warmed above 41°C.

Pumps

- Only approved electro-mechanical infusion devices may be used for transfusions.
- Pumps may be used but are not necessary for platelet or fresh frozen plasma transfusions due to the rate that they are transfused
- DO NOT use for granulocyte transfusions

Double Independent Bedside Check

All pre-transfusion checks are to be performed at the patient's side

Double independent checking requires two independent checks performed at the patient's side prior to commencing any transfusion. This is to ensure the right patient receives the right transfusion at the right place and right time. Health professionals performing a double independent check are referred to as the "first checker" and "second checker".

- The **"second checker"** completes the administration checks FIRST identifying any problems and correcting them. The "**first checker**" does the final check immediately prior to commencing transfusion and staying with the patient for the first fifteen minutes.
- Students are only able to observe transfusion practice or participate as a "third checker".

Roles

In non-emergency situations one independent checker should be the Health Professional caring for the patient – an IV certified RN or RM, Anaesthetic Technician or Medical Officer. This person is recognised as the **"first checker"** and has overall responsibility for the blood transfusion.

Any other IV certified RN or RM, Anaesthetic Technician, or an IV endorsed Enrolled Nurse, may perform the role as **"second checker".**

IV endorsed Enrolled Nurses are only able to perform the second checker role.

Once the second checker has completed the blood administration checks, the **"first checker"**

- repeats the same bedside checks and determines that it is safe to proceed with the transfusion
- commences the transfusion
- **remains with the patient for the first fifteen minutes** to detect early signs of a reaction
- **completes the first set of observations**, and
- Reassesses the patient before leaving the patient bedside.

Remaining observations and patient monitoring may be delegated to another health professional after the first fifteen minutes of patient monitoring and recorded observations.

Patient Safety Checks

1. Patient Identification

Complete the independent checks **immediately prior to commencing transfusion**.

Ask the patient to state their full name and date of birth. Use open questions to avoid yes/no type answers.

In community settings the patient must have photo ID as proof of identification.

In the hospital setting, check that you have the correct patient and that a wristband is being worn. **No Wristband = No Transfusion.** Confirm the patient's identity against their wristband details (details must be clearly readable) including family and given names in full, NHI number, and date of birth.

Ensure the patient wristband details or photo ID match the patient identifiers on the -

- Completed consent form (signed and dated by the patient/identified welfare guardian or identified NOK). Take note of any expiry date on the consent form.
- Prescription on the National Medication Chart
- Record of Transfusion sheet (QMR form)
- Blood component swing label

2. Prescription – check for

- the right blood component to be transfused
- special requirements e.g. irradiated, diuretics, pre-medication
- dose/volume of blood component
- rate of infusion

3. Blood component unit label and swing label checks

- Confirm the ABO group and Rh type matches on both labels. Check HCS Blood Bank laboratory results for the patient blood group and compatibility tables
- Confirm the unit number matches on both labels
- Check the expiry date on the blood bag label
- Gently massage the bag contents to check the colour and consistency.

All documentation must match exactly.

Any discrepancies noted during the administration checking process must be reported to Blood Bank immediately before proceeding with the transfusion. Blood Bank will advise on what action to take.

Pre-Medication

Febrile Non-Haemolytic Transfusion Reactions:

Shivering usually occurs 30-60 minutes after the start of the transfusion followed by fever. Treatment with antipyretics for symptomatic rise in temperature may be justified but not advised as routine premedication.

Allergic Reactions:

Can be mild (isolated urticarial or rash) to sever (Anaphylaxis). Treatment with antihistamine or hydrocortisone for generalised allergic reactions is justified. Pre medication may be appropriate before transfusing a patient who has previously experienced repeated allergic reactions. Routine premedication with antihistamines are not advised as it is both unnecessary and may modify important signs of a transfusion reaction.

Administration

Adhere to infection control principles

Explain the procedure to the patient

Document the start time on the QMR form and prescription chart to ensure that the transfusion will finish within the time prescribed or within **four hours** of blood leaving controlled storage. The start time begins once the blood reaches the patient's vein.

Remember –

- a transfusion does not officially begin until donor blood reaches the patient bloodstream
- each blood component is from a different blood donor and has the potential to cause a transfusion reaction.
- to advise the patient on signs and symptoms of a transfusion reaction. Most reactions are mild however it is important to recognise reactions early and seek medical advice.
- To ensure the call bell is within easy reach of a patient, that they are easily visible and can get attention quickly should signs and symptoms of a transfusion reaction develop.

Rate – Red Blood Cells

Paediatrics:

- **top-up transfusion in a non-bleeding patient** is typically given at 5mL/kg/hr
- **Exchange transfusion**: depends on stability of the baby - discuss with NICU consultant
- R**esuscitation**: rapid infusion based on the patient haemodynamics

Adults:

- **top-up transfusion in a non-bleeding patient**: most adults will tolerate one unit every 90 minutes.
- Consider a slower rate in patients with or at risk of congestive cardiac failure
- **Resuscitation**: rapid infusion based on the patient haemodynamics

Patient Monitoring

All blood component transfusions require observations prior, during and at the end of transfusion. Record all observations on Patientrack or clinical observation chart (where Patientrack is not available)

Observations MUST include

- Temperature
- Respiration rate (in addition to pulse oximetry)
- HR & Blood Pressure
- Continuous cardiorespiratory monitoring for babies under 12 months of age

Baseline observations must be taken within an hour of commencement of transfusion.

Observations for each blood component transfused must be recorded at minimal intervals of -

- 15 minutes after commencing transfusion
- 30 minutes after commencement
- 1 hr after commencement
- Hourly intervals until completion
- Final set of observations once the transfusion is completed

Observations should be monitored more frequently if the patient's condition gives cause for concern.

Follow this monitoring procedure for every consecutive blood component

Documentation

A blood component unit is regarded as transfused even if only a few mLs of blood has passed through the cannula and should be documented in the patient's records accordingly.

Swing Label
The swing label remains attached to the blood component during transfusion to clearly identify the patient details for which the blood was issued. **At the end of transfusion** remove the swing label and attach to the back of the QMR022A or QMR022B form.

Units issued from a blood fridge will have an extra section on the swing label – this lower third is used for documentation when issuing blood from the blood fridge and should be attached to Blood Fridge documentation at time of removal from the Blood Fridge

Record of Transfusion includes -

- Completed Consent and Prescription including sample signatures / MCNZ registration number
- Completed QMR form with signatures confirming independent bedside checks were performed
- Record start and finish times on either the prescription chart or QMR form for auditing purposes.
- Swing label adhered to QMR form

- Clinical Progress note including
  - Indication for transfusion
  - expected and actual response
  - signs or symptoms outside normal limits that occurred, and any corrective or clinical actions taken
  - Reference to any Adverse Transfusion Reaction (ATR) - Notification to Blood Bank form (NZBS111F009) if indicated

Safe Transfusion Practice

Contact the Transfusion Nurse Specialist (81620) or Blood Bank (80310) if any concerns

Transport Bag

Blood component units should always be transported in a sealed plastic bag or the NZBS transport bag to protect it from contaminants and poor handling.

The transport bag also provides some privacy for patient details and shows respect for human tissue in public areas.

Use for double bagging for safe disposal of used blood components in the yellow biohazard bag.

The time written on the transport bag represents 30 minutes from when the blood was removed from controlled storage. This indicates the period of time where blood can be safely returned to Blood Bank stock for re-issue.

Return any unused blood components to Blood Bank as soon as possible to avoid wastage.

Only blood issued as blood fridge stock can be placed in a blood fridge. Trained personnel are responsible for placing blood in a blood fridge.

Overnight Transfusions

Routine transfusions should be completed between the hours **0600 - 2200 hours.**

Overnight transfusions should only occur when considered essential by the prescribing physician for clinically urgent cases only.

Ensure adequate resources/staffing to support safe transfusion and patient monitoring.

Time constraints

Blood components should not be exposed to room temperature for any longer than thirty minutes unless being transfused. Blood component transfusion should **commence within 30 minutes** from time of issue or returned to Blood Bank controlled storage conditions within this period.

Note: Controlled storage is any NZBS validated blood fridge, and in accordance with local policy

If more than 30 minutes has lapsed and the blood component is still required by the patient, it can be transfused up to 4 hours from the time of issue, at which time the unit expires.

DO NOT transfuse blood components exposed to room temperature for more than four hours due to the risk of bacterial proliferation.

Note: Issue time is the time when components or products leave controlled storage conditions

- Rate of delivery may need reviewed to complete transfusion within the remaining time available, if commencement of transfusion has been delayed.
- Stop the transfusion/infusion when the component/product expires.

Disposal of used or partially used blood components

If a blood component unit has been spiked but the blood has not passed through the cannula, inform Blood Bank so that the patient's file in the electronic blood management system can be amended to reflect the unit was not transfused. Discard by double-bagging in a yellow biohazard waste bag.

All used/spiked units of blood are disposed of in the yellow bio-hazard waste bag unless -

- they are required to be returned to Blood Bank with an Adverse Transfusion Reaction (ATR) Notification to Blood Bank form
- there is a manufacturing fault or damage to the blood bag during transportation. Return to Blood Bank with an Orderly.

Use the transport bag to return the used blood components to Blood Bank via a runner.

Compatible Medications and Intravenous Fluids

Use only 0.9% sodium chloride for injection as a flush pre and post transfusion

It is not necessary to flush the IV line in between multiple units of red blood cells however if a delay is expected a 0.9% sodium chloride 100ml bag can be used to keep the line and cannula patent.

Do not add any medications to any blood component or in the same IV giving set

Opioids may be administered simultaneously using a dedicated PCA pump

DO NOT co-administer 5% Dextrose solution (may induce haemolysis) or Lactated Ringer's (contains calcium ions, which may induce clot formation in the blood bag and/or administration set)

Lamson Tube

The Lamson tube system can be used for requesting and issuing single blood component units. All multiple blood component requests must be collected from Blood Bank by a runner.

The Lamson tube system **must not** be used for special red cell units or Granulocytes.

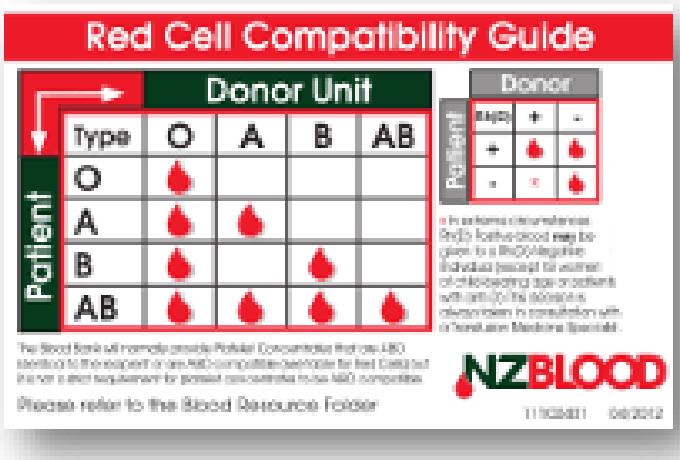
Do not return damaged units in the Lamson tube and risk contaminating (shutting down) the system.

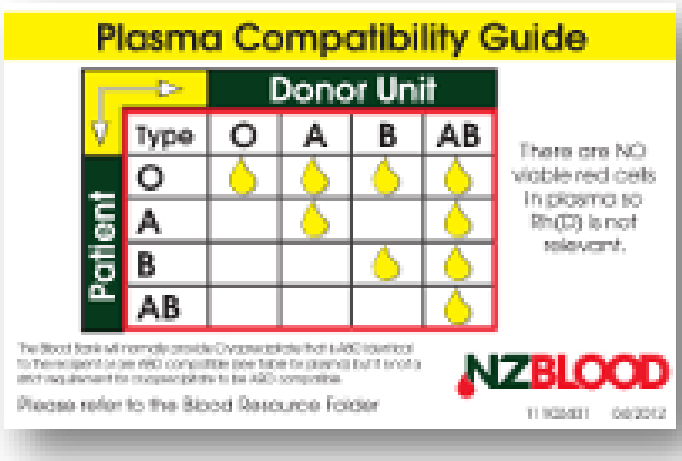
Verbal Prescriptions

In special circumstances a blood component may be prescribed verbally. The transfusion must be commenced in the presence and direct supervision of the prescribing Medical Officer. The prescribing Medical Officer must prescribe the transfusion retrospectively within 24 hours.

A prescription is not required for blood components administered intra-operatively but should be recorded as given on the Anaesthetic Record by the Anaesthetist.

Compatibility





Adverse Transfusion Reactions

2408294 Blood Protocol – Adverse Transfusions Reactions

Granulocytes

Granulocytes are a special blood component used rarely. They are leucocytes suspended in blood plasma and may contain red cells and platelets.

- Buffy Coat units are 35-65mLs (multiple units will be required per dose). There is no need to change the transfusion set between units.
- Apheresis units are 200-500mL per unit.
- Granulocytes are not leukodepleted so must be **irradiated** to reduce the incidence of graft vs host disease (GvHD) which is almost always fatal

IMPORTANT –

- Granulocytes must be ABO compatible due to the presence of red cells and platelets.
- MUST be transfused with a standard blood filter
- Must NOT be agitated during storage
- Must NOT be administered with a volumetric infusion pump
- Must NOT be transported in the Lamson tube system
- Shelf life is 24 hrs from time of collection.
- Transfuse within 4 hours of issue from Blood Bank; slowly over 2-4 hours
- Monitor patient closely for febrile reactions. These are common and often rate related.
- Ensure administration of Amphotericin B and Granulocytes is separated by several hours to reduce the risk of pulmonary reactions.

Wastage

To avoid unnecessary wastage in the hospital setting, **any potential delay in transfusion** should result in blood components being returned to controlled storage conditions in Blood Bank **within 30 minutes of issue**.

- Once a delay is resolved, blood components can be re-issued to the patient.
- If a transfusion is cancelled, the unit will be returned to stock.

Multiple Transfusions – Why give two when one will do?

A patient should be reassessed after each unit of re-suspended red cells to avoid inappropriate or unnecessary transfusion.

Check the patient's haemoglobin and any adverse symptoms before requesting another unit.

Blood boxes for transport of blood:

Do not open boxes containing blood components unless transferring blood to a blood fridge (stock replacement) or immediate transfusion is necessary. Breaking the security tab will result in unused units being discarded. Patient documentation will be attached external to the box for flight teams to check blood supplied by Blood Bank.

Policy Measurement

CDHB transfusion guidelines are compliant with both the Australia and NZ Society of Blood Transfusion (ANZSBT) and New Zealand Blood Service (NZBS) recommendations.

NZBS DHB Clinical Oversight Programme (Audit) audits for documented evidence that:

- Blood components have been administered by a nurse or clinician with the appropriate training and certification to do so.
- Prescriptions are present, accurate and correctly completed
- Informed consent has been provided
- Adequate Record of Transfusion is retained in patient clinical notes for traceability that a blood component was used in the clinical setting. This includes the presence of the issued swing label, documented start and finish times and double independent check signatures evidencing patient ID and component have been completed prior to use.

- Policies and procedures related to valid informed consent, prescribing, transfusion administration support safe transfusion practice

References

ANZSBT. (2019). Guidelines for the Administration of Blood Products.

Canadian Society for Transfusion Medicine. Choosing Wisely. Why give two when one will do?

Haematology Red Book

Hospital Health Pathways

Lippincott Procedures

NZ Blood Service Resource folder

NZBS 111G122 Transfusion Medicine Handbook. A guide to the Clinical Use of Blood Components, Blood Products and Blood Transfusion Procedures in New Zealand. Also available from Transfusion Nurse Specialist

NZBS 111i002 Blood Transfusion Therapy-Blood Component & Blood Product Administration (NZBCL121)