# Policy

**Order, Selection and Release of Blood Products**

NSWHP PD 022

## 1. Purpose

To define the requirements for the ordering, selection and release of blood products from the transfusion laboratory.

## 2. Background

The minimum requirements for selection of blood products and obtaining of blood products from the blood bank laboratory are defined in this policy to ensure that the appropriate and correct product is obtained for the right patient.

## 3. Scope

This policy applies to all NSWHP blood bank staff.

## 4. Definitions

**Consent:** A documented dialogue that has occurred between patient and clinician about the risk, benefits and appropriateness of the proposed procedure, retained in the patient's health care record [1].

**Prescription**: The written authorisation from the clinician to administer a blood product, retained in patient's health care record [1].

**Order Request**: The mechanism of communication directing the blood bank laboratory to perform pretransfusion testing and/or blood product preparation. [1]

**Issue Request**: A blood collection slip, prescription chart or patients medical record showing patient's identification details and specific details of blood product required, in order to initiate issue of a blood product from the laboratory.

**Critical Bleeding**: Life threatening major haemorrhage likely to result in the need for massive transfusion [2].

## 5. Policy Statement

This policy is applied whenever blood products are prescribed and ordered for a patient leading to dispense of the blood product from the blood bank laboratory.

### 5.1. Ordering Blood Products from the Blood Bank Laboratory

For Information: Following a decision to transfuse a patient, consent must be documented in the patient's health care record by the clinician 1. The clinician must also document a prescription to administer the blood product in the patient's health care record consistent with jurisdictional or facility requirements [1].

Where crossmatched red blood cells (RBC) are required, the blood bank laboratory must have a valid Group and Screen [2.]

Order Requests for blood products must be received by the blood bank laboratory before testing or issue of the blood products can occur [2]. An Order Request is required where blood products have to be prepared (crossmatched, thawed or obtained by the laboratory or where approval is required).

Order Requests may be written, verbal* or electronic [2]. *Verbal requests must be documented by the person receiving the request and confirmed (e.g., by repeating back the information provided).

Records of verbal requests must be retained e.g., by scanning the written note/form[2] for at least four years [8]. See Table 1 for information required for a verbal request.

**Table 1**: Information required for documenting a verbal request [2]

| Demographic Information | Product Information |
|---|---|
| Full name | Product required |
| Date of Birth | Number of units or dose |
| MRN or alternative identifier | Date and time required |
| Prescribing clinician's name | Reason or clinical indication |
| Requestor's name | Location of intended transfusion |
| Name of staff member receiving request | Date and time of verbal request |

### 5.2. Dispense and Issue of Blood Products from the Blood Bank Laboratory

The dispense and issue of blood products from the laboratory is a critical process to ensuring safe transfusion. Staff must always ensure they are dispensing the "right patient" with the "right product".

An Issue Request is required for the laboratory to dispense a blood product. The Issue Request must show the patient's identification details and specific details of the blood product required (including dose/quantity). The staff member issuing the blood product is responsible for ensuring that blood product labelling exactly matches details on the Issue Request.

The following information is required to be identical with the Issue Request [1]:

a) The patient identification on the compatibility label attached to the product

b) The patient identification on the compatibility report form or dispense sheet (if used)

c) The blood product type

d) Discrepancies between the identifiers on one or more of compatibility labels, dispense sheets, Issue requests, and/or the Electronic Medical Record, and which are due to electronically truncated long names, must be resolved by discussion with the relevant Laboratory Manager prior to the release of the products.

Where ward orderlies are organised for transporting products, they must provide an Issue Request or be able to state the patient's name and MRN which matches an Issue Request already received by the laboratory (e.g., by fax or electronically).

Issue Request documentation is to be retained or electronically stored for a period of at least one month

## 5.3. Selection of Blood Products

### 5.3.1. Routine Transfusion

RBC and Platelet products should be of the same ABO/RhD type as the patient, but selection of different but compatible ABO/RhD types is permissible [2] (refer to table 2).

Group O RBC must be selected when the patient's ABO group cannot be determined, or before a confirmed blood group is obtained, or if pretransfusion testing is incomplete [2].

If the patient has a clinically significant antibody (or a history of such antibodies), RBC negative for the corresponding antigen should be selected for crossmatching [2] (refer to table 3).

RhD Negative RBC and Platelets should wherever possible be provided to: RhD negative female patients of child bearing potential, females of child bearing potential with unknown blood group (emergency), RhD negative children (<16 years), RhD negative patients who will receive repeated transfusions, or are likely to become transfusion dependent (refer to table 2 [7]).

Plasma products should preferably be of the same ABO group as the patient, but selection of different but compatible ABO types is permissible [2] (refer to table 2). Plasma products can be selected without regard to the patient's RhD status [2]

**Table 2: Component compatibility [7]**

| **Red Cells** | **Group O patient** | **Group A patient** | **Group B patient** | **Group AB patient** | **Unknown patient** |
|---|---|---|---|---|---|
| 1st Choice | O | A | B | AB | O[a] |
| 2nd Choice | | O | O | A or B | |
| 3rd Choice | | | | O | |
| | | | | | |
| **Platelets** | **Group O patient** | **Group A patient** | **Group B patient** | **Group AB patient** | **Unknown patient** |
| 1st Choice | O | A | B | AB | A[b c] or O[c] |
| 2nd Choice | A[b] | B[c] or O[c] | A[b c] or O[c] | A[c] or B[c] | |
| 3rd Choice | B | AB | AB | O[c] | |
| | | | | | |
| **Plasma components** | **Group O patient** | **Group A patient** | **Group B patient** | **Group AB patient** | **Unknown patient** |
| 1st Choice | O | A | B | AB | AB or A[d e] |

| | | | | | |
|---|---|---|---|---|---|
| 2nd Choice | A | AB | AB | A[d] | |
| 3rd Choice | B | B[d] | A[d] | B[d] | |
| 4th Choice | AB | | | | |
| | | | | | |

| | |
|---|---|
| a | If the patient is a female of child bearing potential, O RhD negative red cells should be used until patients group is established |
| b | Group A platelets with the A2 subtype do not express significant amounts of A antigen and are therefore preferable to other group A platelets when transfusing group O and B recipients |
| c | Apheresis platelets that have low titre anti-A/B pose a lower risk of haemolysis when transfusing ABO incompatible components |
| d | Plasma components that have low titre anti-A/B pose a lower risk of haemolysis when transfusing ABO incompatible components |
| e | Group A plasma may be used |
| Note: | RhD negative patients: 1st choice – should receive RhD negative Red Cells & Platelets.<br>RhD positive Red Cells & Platelets transfused to RhD negative patient can result in formation of anti-D.<br>The following should receive RhD negative Red Cells & Platelets:<br>RhD negative patients with anti-D<br>RhD negative female patients of child bearing potential<br>Females of child bearing potential with unknown blood group (emergency)<br>RhD negative children (<16 years)<br>RhD negative patients who will receive repeated transfusions, or are likely to become transfusion dependent |
| Note: | RhD positive patients: Can normally receive either RhD positive or RhD negative components safely |

**Table 3: The clinical significance of red cell alloantibodies and selecting blood for transfusion [2]**

| Antibody specificity | Clinically significant | Selection of units* |
|---|---|---|
| Anti-$A_1$ | Rarely | IAT crossmatch compatible at 37 °C |
| Anti-HI ($A_1$ and $A_1B$ individuals) | Rarely | IAT crossmatch compatible at 37 °C |
| Anti-M (active at 37 °C) | Rarely | Antigen negative |
| Anti-N (active at 37 °C) | Rarely | IAT crossmatch compatible at 37 °C |
| Anti-S, -s, -U | Yes | Antigen negative |
| Anti-$P_1$ | Rarely | IAT crossmatch compatible at 37 °C |
| Anti-D, -C, -c, -E, -e | Yes | Antigen negative |
| Anti-$C^w$ | Rarely | IAT crossmatch compatible at 37 °C |
| Anti-$Lu^a$ | Rarely | IAT crossmatch compatible at 37 °C |
| Anti-$Lu^b$ | Yes | Antigen negative |
| Anti-K, -k | Yes | Antigen negative |
| Anti-$Kp^a$ | Rarely | IAT crossmatch compatible at 37 °C |
| Anti-$Le^a$, -$Le^b$, -$Le^{a+b}$ | Rarely | IAT crossmatch compatible at 37 °C |
| Anti-$Fy^a$, -$Fy^b$ | Yes | Antigen negative |
| Anti-$Jk^a$, -$Jk^b$ | Yes | Antigen negative |
| Anti-$Co^a$ | Yes | Antigen negative |
| Anti-$Co^b$ | Sometimes | IAT crossmatch compatible at 37 °C |
| Anti-$Wr^a$ | Rarely | IAT crossmatch compatible at 37 °C |
| HTLA antibodies | Unlikely | Local policy or seek advice from reference laboratory |
| Antibodies to low- or high-frequency antigens | Depends on specificity | Local policy or seek advice from reference laboratory |
| Other antibodies active by IAT at 37 °C | Depends on specificity | Local policy or seek advice from reference laboratory |

HTLA, High-titre, low-avidity; IAT, indirect antiglobulin test; * Antigen-negative red cells should be crossmatched by IAT at 37 °C

### 5.3.2. Use of K negative RBC

Women of childbearing potential who are K negative, or if their K type has not been determined, should wherever possible be given K negative RBC [3]. If K negative RBC are required in an emergency and none are available, in consultation with the clinician K untyped units should be provided, before K positive units, to avoid unnecessarily delaying transfusion. Refer to Critical Bleeding.

### 5.3.3. Use of CMV negative RBC and Platelets

CMV seronegative cellular blood products (RBC and Platelets) are required in the following circumstances [2]:

a) All pregnant women receiving elective transfusions during pregnancy (but not during delivery)[2]

b) Intrauterine transfusions[2]

c) Neonates (up to 28 days post expected date of delivery)[2].

Universal leukodepletion of cellular blood products leads to a significantly reduced risk of CMV transmission, and these products are now considered "CMV-safe" [2]. CMV safe (leukodepleted) blood products can be used in all other circumstances including:

a) Solid organ (renal, pancreas etc) and haematopoietic stem cell transplants (autograft, allograft, mismatched, etc)

b) Patients with haematological and solid organ malignancies

c) Immunodeficient patients, including those with the human immunodeficiency virus (HIV).

If CMV seronegative blood products are required in an emergency situation but none are available, CMV safe (leukodepleted) may be used to avoid unnecessarily delaying transfusion [2]. Refer to 5.3.9 Critical Bleeding.

### 5.3.4. Use of Irradiated Products

For patients at risk of TA-GVHD all RBC, platelets and granulocytes must be irradiated (stem cells must not be irradiated)[4]. Refer to *Indications for irradiated components*[9]

The Local Health Districts may require that broader categories of patients also require irradiated products as a risk mitigation strategy.

If irradiated RBC are required in an emergency situation but none are available, in consultation with the clinician the option of non-irradiated RBC should be offered, to avoid unnecessarily delaying transfusion. Refer to Critical Bleeding.

All patients who require irradiated blood components must have an alert on their electronic transfusion laboratory records [4]. Laboratory systems must be in place to prevent cellular blood components that are not irradiated being ordered or released for transfusion to patients requiring such components [4]

### 5.3.5. Extended Life Plasma (ELP)

ELP is a separate but complimentary product to thawed FFP but which in contrast has an extended shelf life of up to 5 days after thawing at 2-6 degrees.

Where FFP is not transfused within 24 hours of thawing it may be converted to ELP as long as it has been maintained under appropriately controlled storage.

Each health service must consider whether ELP is applicable for use in its local setting. The hospital transfusion committee must provide guidance for the clinical indications and contraindications of plasma.

ELP must be clearly identifiable and traceable with the change in product type from FFP to ELP and updated expiry date and time being recorded in the LIS.

The laboratory must apply a label that obscures the original product name (FFP) and storage conditions and states the product type (ELP), storage conditions and expiry (i.e., 5 days post thaw).

### 5.3.6. Washed Blood Products

Washing of red cells removes unwanted plasma proteins, including antibodies and is used for:

a) Patients with reactions to transfused plasma proteins (e.g., IgA deficiency) [5]

b) Patients with severe allergic reactions of unknown cause [5]

c) Patients with severe reactions despite leucocyte depletion [5]

d) Patients with paroxysmal nocturnal haemoglobinuria who experience reactions despite group-specific leucocyte depleted fresh red cells [5]

e) Patients with T-activation when units from donors with low anti-T titres are not available or severe autoimmune haemolytic anaemia where excess complement may worsen destruction of red cells[5].

If washed RBC are required in an emergency situation but none are available, to avoid unnecessarily delaying transfusion there should be consultation with the clinician offering the option of random RBC for transfusion. Refer to 5.3.9 Critical Bleeding

### 5.3.7. Special circumstances where no compatible blood is available

Autoantibodies, or allo-antibodies to multiple or high frequency red cell antigens, can present the situation where no compatible blood is available.

If the IAT autocontrol is negative, then an allo-antibody should be suspected, and sample should be investigated further and/or referred to a specialist reference laboratory for investigation and advice.

Extended phenotype (pretransfusion) or genotype can assist with antibody identification and/or selection of phenotype matched RBC (Rh, K/k, Fya/b, Jka/b, S/s) for transfusion.

There should be dialogue between the requesting clinician and a haematologist before incompatible RBC are provided for transfusion.

If the IAT autocontrol is positive then an autoantibody would be suspected, but an alloantibody cannot be excluded.

To reduce the risk of incompatibility with an underlying alloantibody:

a) Rh/K matched RBC should be provided

b) Provision of fully phenotype matched (Rh/K/Fy,Jk,Ss) RBC would reduce the risk further but may not be readily available

c) Adsorption of the patient's plasma may remove autoantibody activity and reveal the presence of a coexisting alloantibody [2]

   I. If the patient has had recent red cell transfusions (last 3 months) then autoadsorption could also remove alloantibody and therefore is of little value.

   II. The sample can be referred to a specialist reference laboratory for investigation and advice

d) If crossmatch is incompatible there should be dialogue between the requesting clinician and a haematologist before incompatible RBC are provided for transfusion.

### 5.3.8. Immunotherapies Affecting Pretransfusion Testing

A number of immunotherapies may cause panagglutinins which can interfere with pretransfusion testing, by affecting the antibody screen and/or the blood group.

### Prior to Treatment with Mab 6

1. Clinician should notify the laboratory that a patient is to commence on specific Mab and Order group and screen, extended red cell phenotype
2. Laboratory should record an alert in the laboratory information system
3. Laboratory Testing
    - Blood group (ABO and RhD)-resolve any discrepant results
    - Antibody screen (IAT)
    - Antigen typing: Rh (C,c,E,e),K(k if K+),Jka,Jkb,Fya,Fyb,S,s is recommended as minimum
    - Perform phenotype if not transfused in last 3 months
    - Perform genotype if transfused in the last 3 months or has a positive DAT

### Urgent Transfusions

1. Issue blood using institutional protocols
2. If time allows, select antigen negative red cells matched to patient phenotype
3. If patient is on anti-CD38 select Kell neg units

### Non-Urgent transfusions

1. Plan transfusions in advance
2. If blood group results are not concordant then requires further investigations depending on the specific Mab
3. If IAT is positive further testing is required depending on the specific Mab

### Anti-CD38 e.g., Daratumumab, Isatuximab

1. CD 38 is expressed on red cells and can cause panagglutination
2. Reagent red cells can be treated with DTT or with trypsin to denature cell surface CD38
3. Due to the complexity of testing, it may be necessary to refer the specimen to a specialist reference laboratory

### Anti-CD47 e.g. magrolimab

1. CD 47 is expressed on red cells as part of the Rh complex.
2. Results in panagglutination and may cause false positive reactions in the reverse group, the antibody screen and sometimes a positive DAT.
3. To determine if there are underlying antibodies IAT testing may be performed using an AHG reagent that does not detect human IgG subclass 4.

### 5.3.9. Critical Bleeding

In an emergency situation a pretransfusion specimen should be obtained as soon as possible before blood products are administered [2].

If blood products are required before a specimen has been received, or a confirmed blood group obtained, or pretransfusion testing is completed[2] the:

a) RBC must be group O [2]

b) RhD positive blood may be suitable in critical bleeding for all patients except females of childbearing potential or patients known to have anti-D antibodies.

c) ABO/RhD compatible RBC should commence as soon as possible following completion of pretransfusion testing [2]

d) RBC must not be issued on the basis of historical blood group [2]

e) ABO nonidentical platelets may be given in the absence of confirmed blood group [2]

f) Group AB or A (low anti-A/B haemolysin) plasma products may be given in the absence of a confirmed group [2]

g) If the IAT antibody screen is positive, the patient's clinician and the laboratory haematologist (or director) must be informed that there may be a delay while the antibody is identified, and compatible RBC are found 2. It may be necessary to provide ABO RhD compatible but IAT serologically incompatible RBC until further investigations are completed [2].

h) Where provision of K negative RBC, or CMV negative RBC or platelets, or Irradiated RBC, or washed RBC are required but will cause delay, these requirements may be overridden in critical bleeding in consultation with the clinician

i) RBC issued before completion of pretransfusion testing must be clearly identified; for example, as "un-crossmatched blood" or "emergency issue – compatibility testing not completed" and a crossmatch segment from the unit should be retained in case retrospective testing is required [2].

#### 5.3.10. Massive Transfusion Protocol (MTP)

An MTP developed in consultation with and acceptable to the facility must be available [2]

a) The MTP needs to ensure rapid provision of RBC (up to 4 units at a time), plasma, cryoprecipitate, and platelets (available at the earliest opportunity and in ratios to minimise the danger of coagulopathy - e.g., 1 to 1 ratio).

b) Once an MTP is initiated the next MTP shipment is to be prepared in advance as soon as the previous shipment has been taken, until the MTP is deactivated.

c) In the presence of a clinically significant antibody, RBC dispensed for MTP should be antigen negative, but IAT crossmatching is not required. If antigen negative is not available, then random units un-crossmatched units may be provided in consultation with clinician and/or haematologist.

#### 5.3.11. Mass Casualty Major Incident Blood Release Policy[10]

Defines altered requirements for the release of blood in a Mass Casualty Major Incident i.e., Code Brown emergency to avoid delaying issuing blood to critically bleeding/injured patients.

## 6. Roles and Responsibilities

This policy applies to all NSW Health Pathology staff involved in pretransfusion laboratory practice including Laboratory Managers, Staff Specialists, Scientists and Technical Officers and laboratory staff.

## 7. Legal and Procedure Framework

### 7.1. Related Legislation and Supporting Documents

1. ANZSBT Guidelines for Administration of Blood Products, 2018

2. ANZSBT Guidelines for Transfusion and Immunohaematology Laboratory Practice, 1st Edition revised January 2020. https://anzsbt.org.au/pages/anzsbt-guidelines.html
3. NPAAC Requirements for Transfusion Laboratory Practice, 2017
4. ANZSBT Guidelines Prevention of Transfusion-Associated Graft-Versus-Host Disease (TA-GVHD), 2011
5. Australian Red Cross Blood Service, Product Overview (https://transfusion.com.au/products_overview ), August 2017
6. ANZSBT Transfusion management of patients treated with monoclonal (Mab) therapies that interfere with immunohaematology testing Dec 2021
7. Australian Red Cross Blood Service, Component compatibility, April 2019 https://transfusion.com.au/blood_basics/compatibility
8. NPAAC Requirements for the Retention of Laboratory Records and Diagnostic Material, 2018
9. Australian Red Cross Blood Service, Indications for Irradiated Components (https://transfusion.com.au/indications_irradiated_components ), Oct 2018
10. Mass Casualty Major Incident – Code Brown Emergency Blood Release Policy NSWHP_PD_021

### 7.2. Related Procedure Document Suite

*[List and include hyperlinks to the policy documents directly related to this document that together form a suite or framework for a specific policy matter e.g. policies, procedures, guidelines and supporting documents such as forms, templates.]*

Insert text here and delete italicised instructions above.

## 8. Review

This policy will be reviewed by 20/11/2025.

## 9. Risk

| | |
|---|---|
| **Risk Statement** | Defining minimum requirements for selection of blood products and obtaining of blood products from the blood bank laboratory in this policy will ensure the appropriate and correct product is obtained for the right patient |
| **Risk Category** | Clinical Care and Patient Safety |

## 10. Further Information

For further information, please contact:

| | |
|---|---|
| **Policy Contact Officer** | Position: Lead, Transfusion Clinical Stream |
| | Name: Mark Dean |
| | Telephone: 02 4320 3894 |
| | Email: Mark.Dean@health.nsw.gov.au |

## 11. Version History

The approval and amendment history for this document must be listed in the following table.

| Version No | Effective Date | Approved By | Approval Date | Procedure Author | Risk Rating | Sections Modified |
|---|---|---|---|---|---|---|
| V1.0 | 03/10/2019 | Clinical Governance Quality and Risk Committee | 03/10/2019 | Mark Dean | Medium | New Policy. |
| V2.0 | 01/02/2021 | Executive Director Strategy and Transformation | 1/02/2021 | Mark Dean | Medium | - 5.2(d) Discrepancies between patient identifiers added<br>- Pg 6 Extended Life Plasma (ELP) paragraph added<br>-7.2 ANZSBT Guidelines for Transfusion and Immunohaematology Laboratory Practice updated<br>- 8. Review date updated |
| V3.0 | 08/08/2022 | Director Clinical Operations | 27/06/2022 | Mark Dean | Medium | S5.2 Dispense, and Issue of Blood Products form the Blood Bank Laboratory updated.<br>S5.3.5 ELP information added<br>S5.3.8 Immunotherapies Affecting Pretransfusion Testing – updated.<br>S.7.1 Related Legislation and supporting Documents – updated. |
| V4.0 | 21/11/2023 | Director Clinical Operations | 20/11/2023 | Mark Dean | Medium | Review date extended.<br>Re-published without further change. |