

Recommendations for emergency group O red blood cell use in Victoria

The ongoing shortage of group O RhD negative red blood cells (RBC) is a challenge that all health services must manage. The current Victorian 12-month average for O RhD negative RBC issues is 16.2¹ per cent, whereas only 8.7 per cent of new Australian donors are O RhD negative.

The Victorian Department of Health recommends the following changes to the emergency provision of RBCs in Victoria, to preserve group O RhD negative RBC for patients where clinically required.

Where the patient's blood group is unknown:

- provide group **O RhD positive** RBCs from the outset of transfusion support for females over (>) 50 years and males over (>) 18² years
- provide group **O RhD negative** RBCs for females of childbearing potential (50 years and under (≤), including children) and males 18² years and under (≤)
- for females ≤50 years and males ≤18² years, provide **no more than 4 units of group O RhD negative** RBCs in the absence of confirmed RhD negative status
 - the total number provided may be as few as two units depending on the availability of O RhD negative RBC
 - if ongoing supply of group O emergency blood is required, it is reasonable to use O RhD positive RBC irrespective of sex, age, or childbearing potential
- use clinical judgement if the person's sex or age cannot be determined.

Actions

- Victorian public and private health services, and laboratories, should review emergency transfusion protocols and other supporting procedures to implement the above recommendations.
- Give specific consideration to how this will be applied to areas where emergency inventory is held remotely from the laboratory, and where patients of all ages are treated (such as in emergency departments).
- Conduct stakeholder consultation and education prior to and throughout the implementation of change.
- Implement audit of emergency use group O RBC to ensure compliance with policy. Investigate non-compliance, and take action to resolve compliance issues.
- Report acute transfusion reactions or antibody formation post emergency use group O RBC transfusion to local and state haemovigilance systems.

1 Current at 30 September 2022.

2 Or based on organisational definition of paediatrics.

Rationale

Appropriate use of group O RhD negative RBCs is important to ensure availability for those patients for whom there is no alternative. This includes:

1. group **O RhD negative** patients with **anti-D antibodies**
2. group **O RhD negative females of childbearing potential (≤50 years)**, to prevent risk of haemolytic disease of fetus and newborn (HDFN)
3. in an emergency to **females of childbearing potential (≤50 years) of unknown blood group**, to prevent risk of HDFN
4. group **O RhD negative children** (males and females ≤18² years)
5. in an emergency to **children (males and females ≤18² years) of unknown blood group**.

A large amount of O RhD negative RBCs is held for emergency use where the patient's blood group is unknown.

Most of this is not used for emergency purposes (Hirani 2017; Blood Matters 2018). It is often electively transfused to non-group O RhD negative patients to ensure it is not time-expired (Blood Matters 2018).

O RhD negative donors have been donating frequently to address the supply shortfall, but this is not sustainable. Reducing demand for O RhD negative RBC will improve the ongoing sufficiency of supply without undue pressure on blood donors.

Group O RhD positive RBCs are a safe and recommended therapy for most emergency transfusions where the patient's blood group is unknown (ANZSBT 2020).

The following key points support this change:

- The National Blood Authority (NBA) is currently preparing a National Statement for the Emergency Use of Group O RBC, which includes the use of group O RhD positive RBC.
- This strategy is standard practice in other Australian states (Queensland and New South Wales), United Kingdom, Europe, United States of America and Canada.
- There is no difference in risk of acute transfusion reaction between O RhD positive and O RhD negative RBCs.
- More than 85 per cent of the population are RhD positive (Hirani 2022). Therefore, group O RhD positive RBCs are ABO and RhD compatible for these patients.
- In Australia, the median trauma age is 48, with 72 per cent of trauma patients being male (ATR 2019–20).
- The risk of RhD alloimmunisation in emergency patients with unknown blood group receiving O RhD positive blood is 3–6 per cent (Selleng 2017). RhD negative trauma patients receiving group O RhD positive RBC, RhD alloimmunisation varies between 21–42 per cent (Seheult 2022) (Ji 2022) (Yazer 2020) (Yazer 2019).
- RhD negative blood is not universally compatible and may result in alloimmunisation to other blood group antigens.
- Use of emergency blood is not without risks. It should only ever be used in life-threatening situations to enable the patient to survive without serious ABO incompatibly consequences (STIR 2020).

Key messages

- The risk of serious morbidity or mortality resulting from traumatic haemorrhage should be prioritised over potential risk of alloimmunisation.
- Emergency use group O RBC are to be used only in an emergency to save a patient's life and when there is no current valid pretransfusion specimen.
- A pretransfusion specimen must be obtained as soon as possible and where feasible prior to transfusion of any emergency use group O RBC. This will enable the transfusion service to provide units compatible with the patient's group and minimise group O RBC use.
- Prior to confirmation of recipient blood group:
 - up to four units **O RhD negative** RBC for female patients of childbearing potential (≤ 50 years, including children) and males $\leq 18^2$ years wherever possible
 - **O RhD positive** RBC for females >50 years and males $>18^2$ years
 - where **four units** of emergency use O RhD negative RBC have been transfused to a patient of unknown RhD group, then consider **O RhD positive** RBC for subsequent emergency use irrespective of sex, age or childbearing potential (Seheult 2022).
- As soon as group-specific or compatible blood is available for transfusion, unused emergency use group O RBC must be returned to the pathology provider (or blood fridge), ensuring cold chain compliance is maintained.
- For RhD negative patients who have been transfused RhD positive RBC, it may be appropriate to continue to transfuse RhD positive RBC until the conclusion of the critical bleeding episode. The risk of alloimmunisation remains the same despite the number of RhD positive RBC transfused (Seheult 2022).
- Where laboratories issue 'packs' for massive transfusion, consideration must be given to patient safety regarding the management of O RhD positive and O RhD negative RBC.
- Where both emergency use O RhD positive and O RhD negative RBC are kept in satellite fridges, consideration must be given to how these are managed including clear labelling and indications for use.

Should you have any enquiries,
please email **Blood Matters**
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