West Midlands Regional Transfusion Committee

Survey of Group O Rh (D) Negative Red Cells

March 2014

WMRTC Audit Group

Charles Baker
Suzette Biggs
Andrea Harris
Mike Herbert
Craig Taylor
Caroline Tuckwell
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Summary</td>
<td>3</td>
</tr>
<tr>
<td>Introduction</td>
<td>4</td>
</tr>
<tr>
<td>Objectives</td>
<td>4</td>
</tr>
<tr>
<td>Method</td>
<td>5</td>
</tr>
<tr>
<td>Results</td>
<td>5</td>
</tr>
<tr>
<td>Recommendation</td>
<td>16</td>
</tr>
<tr>
<td>References</td>
<td>17</td>
</tr>
</tbody>
</table>
Executive Summary

1. The West Midlands (WM) region has consistently for a number of years had higher issues of group O Rh (D) Negative red cells than the national average.

2. 21 WM Transfusion Laboratories (TL's) supplied data to the survey – 18 NHS hospitals, and 3 private (or independent) hospitals.

3. The majority of these hospitals transfuse between 5,000 – 10,000 red cells each year (Blood Stocks Management Scheme category – Medium user).

4. Of the 18 NHS hospitals, 11 (61%) of TL’s do not work within a formalised network framework to enable the movement of short dated red cell stock.

5. The number of emergency group O Rh (D) Negative red cells in the main hospital issue blood fridge ranges 1 – 5 units, with an average 2.4 units. For satellite fridges, the range is 0 – 8 units, with an average of 2.4 units.

6. The majority of satellite fridges (73.3%) are located in areas where there is an associated risk of bleeding.

7. All hospitals with an Emergency Department (ED) are geographically located whereby the TL is within 10 minutes walk to the ED. Of the hospitals where this is greater than a 5 minute walk, only one has a satellite fridge in the ED.

8. 17/21 (81%) of the hospitals surveyed can supply Indirect Antiglobulin Test (IAT) crossmatched blood within 45 minutes of receipt of a sample.

9. 18/21 (85.7%) of responses stated they had a policy/protocol/procedure for the clinical use of emergency O-ve red cells. 3 of these are a standalone document, whereas the other 15 are embedded within a larger document, which may make it more difficult to access in a timely manner.

10. There is evidence of frequent reviews (at least every 6 months) of group O Rh (D) Negative red cell use by Hospital Transfusion Committees (HTC’s).
Introduction
O RhD negative (O-ve) red cells are a limited resource. In the UK, only 7.8% of the population are O-ve (BSMS 2008). Balance between supply and demand remains a challenge, with hospital requirements in England and North Wales (supplied by NHS Blood and Transplant) often exceeding 10.5%.

In December 2008, the Chief Medical Officer's National Blood Transfusion Committee (NBTC) commissioned an audit for the use of O-ve red cells, which resulted in a key recommendation for hospitals to reduce O-ve stockholding to below 12%. A repeat National Comparative Audit (NCA) in 2010 recommended stock levels should be reduced to 10.5% in order to avoid unnecessary use of O-ve blood and to reduce wastage due to time expiry.

Historically, hospitals within the West Midlands Regional Transfusion Committee (WM RTC) have placed a greater demand on O-ve red cells than the national average. Reasons for this are unclear, and although since this 2008 NBTC audit there has been an improvement, demand from the WM RTC hospitals remains above the national average, as shown in figure 1.

Figure 1: O-ve red cell issues (%); National (Hospitals in England and North Wales) and WM RTC

This regional survey report for the WM RTC should be read in conjunction with the NBTC 2008 report and is intended to provide more in depth information to enable regional teams and hospitals to identify local areas for action.

Objectives
The objectives of this survey are to:-
- identify hospital practices associated with high usage / stockholding of O-ve red cells;
- to understand why these may occur;
- to identify examples of good practice that may be shared widely.
Method
Data was collected using Survey Monkey over a three month period from January to March 2012. Only data relating to adult units was collected; paedipacks were excluded from this survey.

Results
21 Transfusion Laboratories (TL’s) submitted responses. 18 NHS hospitals, and 3 private (or independent) hospitals. 3 of the NHS hospitals are specialist service hospitals (obstetrics, paediatrics and orthopaedics).

Q1 - What is your hospital's current bed capacity?
Figure 2 provides a summary of the responses.

Figure 2 – Bed Capacity of Hospitals

These figures can be broken down further, with Table 1 showing type or category of hospital against number of beds.

Table 1 – Category of Hospital and Number of Beds

<table>
<thead>
<tr>
<th>Number of Beds</th>
<th>Category of Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 50 beds</td>
<td>1 x private hospital</td>
</tr>
<tr>
<td>51 – 200 beds</td>
<td>2 x private hospital</td>
</tr>
<tr>
<td></td>
<td>1 x specialist hospitals</td>
</tr>
<tr>
<td></td>
<td>1 x district general hospital (DGH)</td>
</tr>
<tr>
<td>201 – 400 beds</td>
<td>2 x specialist hospitals</td>
</tr>
<tr>
<td></td>
<td>4 x DGH</td>
</tr>
<tr>
<td>401 – 600 beds</td>
<td>4 x DGH</td>
</tr>
<tr>
<td>600+ beds</td>
<td>3 DGH’s &amp; 2 University Hospitals</td>
</tr>
<tr>
<td>Unknown/No response</td>
<td>1 DGH</td>
</tr>
</tbody>
</table>
Q2 - How many red cells in total were transfused at your hospital in the last 12 months?
Figure 3 provides a summary of the responses.

Figure 3 – Number of Red Cells Transfused in the last 12 months

Table 2 shows a direct correlation between bed capacity and red cell use for hospitals which are not exclusively specialist hospitals, whereas the specialist hospitals reflect risk of haemorrhage to its particular speciality.

Table 2 – Bed Capacity Compared to Red Cell Use per Hospital

<table>
<thead>
<tr>
<th>Bed Capacity</th>
<th>Number of hospitals</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-50</td>
<td>1</td>
<td>&lt;1000</td>
</tr>
<tr>
<td>51-200</td>
<td>3</td>
<td>1,001-2,000</td>
</tr>
<tr>
<td>51-200 *</td>
<td>1</td>
<td>3,001-4,000</td>
</tr>
<tr>
<td>201-400**</td>
<td>1</td>
<td>1,001-2,000</td>
</tr>
<tr>
<td>201-400***</td>
<td>5</td>
<td>5,000-10,000</td>
</tr>
<tr>
<td>401-600</td>
<td>1</td>
<td>4,000-5,000</td>
</tr>
<tr>
<td>401-600</td>
<td>3</td>
<td>5,000-10,000</td>
</tr>
<tr>
<td>600+</td>
<td>5</td>
<td>10,000-15,000</td>
</tr>
<tr>
<td>600+</td>
<td>1</td>
<td>&gt;15,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>21</td>
<td></td>
</tr>
</tbody>
</table>

*Specialist Hospital – Obstetrics  **Specialist Hospital - Orthopaedics  
***Specialist hospital - Paediatrics
Q3 - How many other hospitals are there within your Trust / Organisation with a Transfusion Laboratory?

Figure 4 provides a summary of the responses.

**Figure 4 – Number of Hospital Transfusion Laboratories per Trust**

The majority (56%) of transfusion laboratories are standalone i.e. they are the sole providers of red cells to their Trust.

9 responses were from hospitals where their Trust has more than one Transfusion Laboratory. Two hospitals (10%) are based in Trusts with 2 laboratories. Five (24%) are in Trusts with 3 laboratories. Two (10%) have 4 or more laboratories and provide a hub and spoke model for their transfusion services (both of these are private sector run organisations).

Q4 - If there are other hospitals in your Trust with a transfusion laboratory, do you stock share O-ve red cells internally (e.g. to prevent time expiry).

Of the hospitals participating in a network that are not hubs 5/7 (71%) operate a stock sharing scheme.

Q5 - Do you have a Service Level Agreement (SLA) to stock share O-ve red cells with a Transfusion Laboratory external to your Trust?

Only 3 hospitals stated that they a specific SLA with other laboratories not within their legal entity.

An example SLA is available at: [http://www.transfusionguidelines.org.uk/docs/misc/oig_tools_qa_sla_v7.doc](http://www.transfusionguidelines.org.uk/docs/misc/oig_tools_qa_sla_v7.doc)
Q6 - How many emergency O-ve red cell units do you stock in your main issue fridge?
Figure 5 provides a summary of the responses.

Figure 5 – Stockholding of Emergency O-ve red cells in main issue fridge

The majority of hospitals (15/20, 75%) have 2 or less emergency O-ve units available in their main issue fridge.

Of the 5 hospitals which have more than 2 units one is a trauma centre and one does not have a manned transfusion laboratory at night.

The average ratio is 2.5 emergency O-ve units per issue fridge.

For these 20 hospitals, the total number of emergency O-ve units in stock in their main issue fridge at any one time is 50 units.

1 hospital did not reply to this question.

Q7 - How many satellite fridges do you have in total across all sites?
Figures 6 and 7 provides a summary of the responses.

Figure 6 – Number of Satellite fridges
There is no correlation between hospital size, red cell use or networking arrangements in relation to the number of satellite fridges distributed throughout the region.

Q8 - How many emergency O-ve units do you have in your satellite fridges (not including your main issue fridge)?

Table 3 shows how many emergency O-ve units are stocked in each of the satellite fridges.

Table 3 – Number of Emergency O-ve Units in Satellite Fridges

<table>
<thead>
<tr>
<th>Number of Emergency O-ve units</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td>1</td>
</tr>
<tr>
<td>No response</td>
<td>1</td>
</tr>
</tbody>
</table>

The total number of emergency O-ve red cells in satellite fridges is less than in the main issue fridges (ratio 2.5:1 for main issue fridge compared with 2.1:1 for satellite fridges). The hospital with 8 units in its satellite fridges is a hub with no transfusion laboratories at its spoke sites.
For these 20 hospitals, the total number of emergency O-ve units in stock in their main issue fridge at any one time is 50 units, and in their satellite fridges is 38 units, resulting in a total of 88 units.

Q9 - Where are your satellite fridges situated?
Figure 8 provides a summary of the responses.

Satellite fridges are situated in “traditional” specialty areas where haemorrhage is generally accepted as a common risk. There is an increasing trend to provide such fridges in areas where there is a high number of transfusions but the risk of haemorrhage is low i.e. haematology/oncology wards, critical care units etc. There are fewer fridges in the A&E setting but this may change as these departments become accredited trauma units or centres.

Q10 – How far a walk is your Emergency Department (ED) from the main transfusion laboratory?

This question was asked to assist understanding of logistical factors.

Figure 9 shows how long it takes to walk from the ED (where a large number of requests for emergency blood originate) and the transfusion laboratory. This is important when considering the delivery of samples so that cross-matched blood can be provided, as well as the collection of blood components.
Figure 9 – Travel Time (minutes walk) from ED to main Transfusion Laboratory

Travel Time (minutes walk) between Emergency Department and Transfusion Laboratory

All the transfusion laboratories are situated within 10 a minute walk (1 kilometre) with the majority 10/17 (59%) are less than 5 minutes (500 metres). The 3 private hospitals and the orthopaedic specialist unit did not respond because of a lack of ED facilities. Of the 4 hospitals with satellite fridges in the ED, 3 are trauma centres and 1 has an ED department less than 5 minutes from the main laboratory.

Q11 – Do you allow remote release of emergency O-ve Units

11/21 (52.4%) allow the remote release of emergency O-ve units, which is an aid to networking laboratories and reduces the risk of a delay in providing emergency red cells in episodes of unexpected massive haemorrhage. However, this also has the potential to increase emergency O-ve red cell use.

Q12 - How long does it take for an Indirect Antiglobulin Test (IAT) Crossmatch from receipt of a sample to issue of red cells in an emergency situation?

Technical developments since 2001 in automation in blood transfusion processes, along with the impact of the Blood Safety Quality Regulations (2005) which have driven improvements in transfusion laboratory procedures, have made a major impact in turnaround times to provide crossmatched blood. Figure 9 demonstrates that with fully automated platforms most transfusion laboratories (17/21, 81%) can process an urgent sample within 45 minutes.
Q13 - Do you electronic issue red cells?

Electronic Issue further speeds up the provision of patient specific red cells as it negates the need to perform a serological crossmatch of donor units (which can take up to 45 minutes). 11/21 (52.4%) of hospitals use electronic issue for red cells.

Q14 - Main issue fridge: What is the trigger for the rotation of emergency O-ve red cells?

Rotation of O-ve units from emergency stock back into general stock is important to help reduce time-expiry wastage. Stock should be returned to general stock with sufficient time to allow appropriate usage.

14/18 (77.7%) of hospitals rotate their emergency O-ve red cells with a least 7 days expiry and another 4/18 (22.3%) had a variable trigger.

Q15 - Satellite fridges: What is the trigger for the rotation of emergency O-ve red cells?

The same triggers for the main issue fridge applied in general to satellite fridges.

Q16 - What is the average shelf life (number of days) of emergency O-ve units returned to stock?

100% stated that the shelf life of emergency O-ve units returned to stock was at least 7 days.
Q17 - Do you have a policy/protocol/procedure for the clinical use of emergency O-ve red cells?

18/21 (85.7%) of responses stated they had a policy/protocol/procedure for the clinical use of emergency O-ve red cells.

Q18 - Is it a stand alone or part of a larger a policy/protocol/procedure?

3/18 (17%) have a standalone written document and two of these hospitals are classified as low users in the Blood Stocks Management Scheme.

For 15/18 (83%) hospitals, this emergency protocol is embedded within a larger document, which may make it more difficult to locate in a timely manner.

Figure 11 – Number of hospitals with a clinical use of emergency O-ve red cells procedure, and how it is available

Q19 - How often is this routinely reviewed by your Hospital Transfusion Committee/Team?

Of the 18 responses: 1/18 (6%) stated a no fixed review period, 5/18 (28%) review their document annually, 6/18 (33%) have a biennial cycle and 6/18 (33%) review every 3 years (figure 12).
Figure 12 – How often is clinical use of emergency O-ve red cells procedure reviewed by Hospital Transfusion Committee/Team

![Bar Chart: Hospital Transfusion Committee/Team Review period]

Q20 - On how many occasions in the last 12 months have emergency O-ve red cell units been used?

18/21 (85.7%) of hospitals responded.

The median number of issues is 8 per year, except for the small users of red cells who fall into the category 1-5 issues per year. A direct correlation between size or hospital speciality to frequency of issue could not be established.

Figure 13 – Number of occasions in the last 12 months emergency O-ve red cell units have been used

![Bar Chart: Number of episodes of emergency O Rh (D) Neg red cell issues]
Q21 - Which specialties have used emergency O-ve red cells in the past 12 months.

The categories of clinical specialities which have used emergency O-ve red cell issue fall into the usual “risk” areas. However, one cardiac centre did not have any issues, and some hospitals reported endoscopy bleeds and renal bleeds.

Figure 14 - Specialties that have used emergency O-ve red cells in the past 12 months.

Q22 - How often does your Hospital Transfusion Committee/Team review your O-ve red cell use?

16/21 (76%) of hospitals review their O-ve red cell use at least every 6 months.

2/21 (9%) have an annual review.

All the responses indicate review only if O-ve red cell usage is part of the massive haemorrhage protocol.
Recommendations

1. All hospitals should formally risk assess the need for emergency O-ve red cell units based upon frequency of issue, proximity to main laboratory of high risk areas, age/sex of hospital population and extent of service provision outside normal working hours.

2. There should be a stand alone policy/protocol/procedure for the clinical use of O-ve red cells which should be based on the principles set out in The Chief Medical Officer’s National Blood Transfusion Committee paper “appropriate use of group O Rh (D) negative red cells” – January 2009.

“D positive red cells may be selected for D negative patients in the following situations:

i. Female patients > 50 years.

ii. Adult males who are D negative or whose D status is unknown.

iii. Patients undergoing a large volume transfusion (> 8 units), excluding children, females of childbearing potential and patients with immune anti-D.

   The policy for use of D positive red cells to a D negative recipient should be documented and controlled by validated rules in the LIMS where applicable.

D negative red cells should always be selected for:

i. D negative women of childbearing potential (<51 years).

ii. D negative patients <18 years old.

   iii. Patients who have formed immune anti-D, even if not currently detectable.

   iv. Transfusion-dependant D negative adults”

3. Stockholding of O-ve red cells should not be more than 11% of the total stockholding for red cells.

4. Hospital Transfusion Committees should explore a systematic review of strategies to reduce the use of emergency O-ve red cell units.

5. Transfusion laboratories should use the NHSBT educational resources to help clinical and laboratory staff in hospitals promote the safe and appropriate use of O RhD negative red cells and reduce wastage.

http://hospital.blood.co.uk/safe_use/o_rhd_negative_educational_resources/
References

http://www.bloodstocks.co.uk/usefulresources/bloodgroupdistribution/index.asp

The Chief Medical Officer’s National Blood Transfusion Committee (2009) *The Appropriate Use of Group O Rh (D) Negative Red Cells*  
http://www.transfusionguidelines.org.uk/docs/pdfs/nbtc_bbt_o_neg_red_cells_recs_09_04.pdf

National Comparative Audit (2010) Re-audit of the Use of Group O RhD Negative Red Cells  