Red cells for emergency use
Best Practice from BSMS Regional Roadshows
BSMS Regional Roadshows 2013: Red Cells for Emergency Use

Summary findings:

The theme for the 2013 Blood Stocks Management Scheme regional roadshows was ‘Red Cells for Emergency Use’. The meetings were held in Sheffield, London and Birmingham, with a joint meeting with Welsh Blood Service ‘WASP’s group held in Llantrisant. The workshops explored many issues around red cells stored and used in emergencies, including what specificity is required, when they are returned to general stock, ways to avoid wastage of those units and how to manage the different stock locations.

As UK Blood Services are facing increasing demand for this blood group, the workshops were designed to produce helpful examples of good practice. Whilst the wide variation between individual hospitals was recognised, this report represents general ideas and a consensus view from the many delegates who participated in the workshops.

When to restock: Is it time to reconsider?

It might seem obvious but when writing an SOP for restocking emergency red cells, you need to consider the frequency with which O RhD Negative red cells are used in your hospital. Emergency units are restocked with the intention to use them for patients who need O RhD Negative cells, but how many of those patients does your hospital see?

This table shows BSMS usage categories (Very High to Very Low), taking an average hospital within those categories, a 52 week year, a 7 day week, and 10.5% of stock being O RhD Negative.

<table>
<thead>
<tr>
<th>Category</th>
<th>Total RBC units per YEAR</th>
<th>O Neg units (used) per WEEK</th>
<th>O Neg units (used) per DAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High</td>
<td>15000</td>
<td>30</td>
<td>&lt;5</td>
</tr>
<tr>
<td>High</td>
<td>12000</td>
<td>24</td>
<td>&lt;4</td>
</tr>
<tr>
<td>Moderate</td>
<td>8000</td>
<td>16</td>
<td>&lt;3</td>
</tr>
<tr>
<td>Low</td>
<td>5000</td>
<td>10</td>
<td>&lt;2</td>
</tr>
<tr>
<td>Very Low</td>
<td>&lt; 2000</td>
<td>4</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

75% of hospitals replying to the survey restocked at seven days or less. Restocking emergency units more frequently might be more work initially but it could reduce the number of O RhD Negative units your hospital receives and that could reduce wastage.

To transfuse or time-expire?

Good stock management of emergency red cells is essential to avoid unnecessary wastage and reported wastage of O RhD Negative red cells is higher than any other blood group.

The 2009 NCA audit of O RhD Negative usage believed mis-matched transfusion to avoid time-expiry was too high, at 10%. Our workshops observed that a wasted unit of any blood group is to be avoided, but as O RhD Negative cells can be transfused across blood groups they should be used whenever possible. Lowering overall stock levels should help, but when should you transfuse to avoid a time-expired unit? The consensus is shown here:

<table>
<thead>
<tr>
<th>BSMS Usage Category</th>
<th>When to transfuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High/High</td>
<td>Consider transfusing to any blood group patient On day of expiry</td>
</tr>
<tr>
<td>Moderate</td>
<td>Within 48 hours of expiry</td>
</tr>
<tr>
<td>Low/Very Low</td>
<td>Within 72 hours of expiry</td>
</tr>
</tbody>
</table>

On weekends and bank holidays you may have lower usage, so that’s another factor to be considered to avoid wasting units.

Emergency Red Cells: Replacing them regularly

There are many demands on transfusion staff and restocking the ‘Flying Squad’ blood might be low on the list of priorities. But the increasing demand for O RhD Negative red cells can lead to reduced stocks for that blood group. To ensure availability for patients who genuinely need this blood, here are some ideas on how to handle the restocking process and reduce subsequent wastage.

Best Practice

- **Visual Aid:** If you use an Emergency Stock noticeboard, put the dates that restock should occur, not the expiry dates, to avoid any delays.
- **Use your laboratory IT system:** Some systems can alert users at a specific time or you can use a daily stock print out.
- **Standard Operating Procedure (SOP):** Ensure your ‘restock’ SOP is clear about timings and incorporate a daily check list.
- **Make it a weekly process**
  - Tasks which are done less frequently or irregularly can be overlooked. Make it a regular weekly routine to restock the ‘Flying Squad’. ...but...
- **Rotate flying squad stock on different dates**
  - Put fresher units in off-site fridges and exchange older units across the site. Do this so that the expiry dates are different, so the units don’t all expire on one or two days. ...and...
- **Smart Ordering from your supplier:**
  - Set up standing orders to receive units over several days, then they won’t all have the same expiry date.
- **Whose job is it anyway?**
  - Replacing the emergency units is sometimes the last job staff will think of, so have one delegated person responsible for product handling.

Barriers

- **Staff Pressures:**
  - High workload, staff shortages and shifts sometimes mean restocking gets overlooked.
- **Staff Training:**
  - Especially when the return is done off-site by non-laboratory staff.
- **Logistics:**
  - Location of the fridges, location of the hospital, distance from the blood centre.
- **Timing:**
  - Bank holiday and weekend periods also cause delayed returns.
It isn’t possible to cover all eventualities; hospitals do have different case-mixes. The unanimous opinion was that emergency red cells should only be used in life or death situations, so hospitals need to ensure there is a sufficient supply, rather than aim to cover every eventuality. Appropriate use is the key. If emergency units are being taken when group specific units could be provided, this needs to be audited by the Hospital Transfusion Committee. ‘Flying Squad’ units with a ‘high-specification’ (selected negative for many antigens) reduces availability for those patients who really require them.

<table>
<thead>
<tr>
<th>RhD Negative cells</th>
<th>✓</th>
</tr>
</thead>
<tbody>
<tr>
<td>If location is such that patients receiving emergency red cells may be female and of child bearing potential. Where possible, a combination of RhD Positive and RhD Negative could be stocked providing collection staff are aware of the risks.</td>
<td></td>
</tr>
<tr>
<td>K- cells</td>
<td>✓</td>
</tr>
<tr>
<td>As K1 is another antigen likely to cause development of red cell antibodies and these can cause complications during pregnancy , it is recommended that emergency red cells are K1 (K-) negative.</td>
<td></td>
</tr>
<tr>
<td>C- and E- cells</td>
<td>✓</td>
</tr>
<tr>
<td>There were mixed thoughts about this, but the prevention of production of other antibodies, such as anti-E or even anti-G made C- E- cells advantageous.</td>
<td></td>
</tr>
<tr>
<td>CMV Negative</td>
<td>✗</td>
</tr>
<tr>
<td>SABTO ‘CMV’ recommendations¹ state that CMV screened products are only required for planned multiple transfusions in pregnancy, not for all transfusions.</td>
<td></td>
</tr>
<tr>
<td>High-titre Negative (HT)</td>
<td>✗</td>
</tr>
<tr>
<td>BCSH “Guidelines for pre-transfusion compatibility procedures in blood transfusion laboratories”² have removed the requirement for high-titre screened red cells for non-ABO matched transfusion.</td>
<td></td>
</tr>
<tr>
<td>Irradiated</td>
<td>✗</td>
</tr>
<tr>
<td>Irradiation reduces the shelf-life and would only be required in extremely unusual circumstances.</td>
<td></td>
</tr>
<tr>
<td>Any other red cell antigens</td>
<td>✗</td>
</tr>
<tr>
<td>Other incompatibilities between patient and donor may exist, but those complications can be managed once the patient’s life is saved.</td>
<td></td>
</tr>
</tbody>
</table>

**Location for ADULT red cells for EMERGENCY locations: O RhD-, C-, E-, K-**

**Specification of ADULT Red Cells**

- A ‘high-specification’ (selected negative for many antigens) reduces availability for those patients who really require them.
- Appropriate use is the key. If emergency units are being taken when group specific units could be provided, this needs to be audited by the Hospital Transfusion Committee. ‘Flying Squad’ units with a ‘high-specification’ (selected negative for many antigens) reduces availability for those patients who really require them.

**Debatable reasons for emergency red cell stock**
- Clinician confidence: either in the processes or in the procedure
  - That the laboratory or hospital collection procedures will be robust enough to provide blood speedily.
  - For some procedures, clinicians insist on having emergency units available, ‘just in case’, but this may also be driven by external guidelines.

**De-locating” units from external fridges**
- Review and audit both usage and wastage annually.
- Shift systems provide a 24/7 presence in transfusion laboratories, let the clinicians know this.
- A remote issue fridge gives access to group-specific red cells if situated closer to the requesting area.
- Devolve costs for all blood products, or wasted units.
- Devolve responsibility for the fridge!

**Barriers to ‘de-locating’ emergency stock**
- The changing skill mix in laboratories might delay provision of group specific red cells. Good staff training is paramount.
- Those less experienced laboratory staff may prefer the ‘security’ of readily available emergency stock.

The delicate balance between a safe service for patients and the optimal use of O RhD Negative red cells was recognised. With the changing environment for many hospital laboratories, opinion was that the potential for increased demand for O RhD negative red cells should be highlighted to the blood services.

**BCSH Compatibility Guidelines**

The BCSH “Guidelines for pre-transfusion compatibility procedures”² recommend that two separate samples are grouped before crossmatched cells can be issued. The guidelines do state that group specific red cells can be issued in emergencies with one sample available, but it was noted that some laboratories who have implemented this recommendation, had seen a subsequent increase in O RhD Negative use. Over 25% laboratories have implemented this already but 25% of survey respondants are remaining with one sample testing, due to cost and staffing issues.

**Best practice for implementing two samples**
- Good training with correct emphasis for clinical staff.
- Emphasis that this is a Patient Safety initiative.
- Use of different sample tubes for second sample.

**Barriers to implementation of two samples**
- Increased reagent and equipment capacity.
- Staffing costs for laboratory.
- Patient demographics, eg neonates.
Red Cells for Adult Emergency Use: 
In Six Easy Steps

1. Red cells for ADULT Emergency use should be a standard specification of O RhD Negative, C-, E-, K-
   Other specifications are unnecessary in genuine emergencies and reduce the supply of typed blood for those who may need it.

2. Emergency red cells should be returned to general stock allowing time to transfuse appropriately. This will be dependant on hospital size. For medium and low usage category hospitals at least seven days will be required.

3. Best practice in returning emergency red cells is usually the result of good SOP’s, good training and good visual aids, with clear indication about date of restock (not expiry).

4. If units are restocked in time, they can be transfused to patients who require O RhD Negative red cells. But if they aren’t used, consider transfusing them to other group patients before they expire, in a time-frame determined by your hospital size.

5. Audit locations of blood fridges regularly and review through your Hospital Transfusion Committee. Removal of the emergency red cells can reduce both use and wastage.

6. Group O RhD Positive blood could be issued as part of a Massive Haemorrhage pack, dependant on age, sex and clinical condition of the patient.

And finally:
Though there were huge variations in practices for provision of emergency red cells, one theme was common to all delegates; that laboratories should be able to provide safe and timely blood for patients in emergencies, without compromising overall blood stocks.

The Blood Stocks Management Scheme greatly appreciates the contributions made by hospitals in supporting these events. We hope that taking a day away from the laboratory to share your views is as beneficial to you, as it is to us! Thank you.

References:
   The report of the SaBTO CMV Steering Group may be found at: www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_132965


This document is available in PDF format from www.bloodstocks.co.uk