WHERE DO ALL THE O D NEGATIVE RED CELLS GO? A SNAPSHOT AUDIT OF NHSBT HOSPITALS

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Blood Stocks Management Scheme
NHS

NHS Blood and Transplant

Background

The Blood Stocks Management Scheme (BSMS) receives data on issues of blood components from 4 blood services, England, Wales, Northern Ireland and Eire. Issues of O RhD- red cells have been increasing over the last few years, but in the landscape of reducing red cell demand, this is particularly challenging for the blood services. BSMS, together with the Patient Blood Management (PBM) O RhD- working group from NHSBT, undertook a snapshot audit of O RhD- red cells issued to hospitals in the last quarter of 2015, to see if we could gain a better understanding of where this blood group is being used, to provide better information to the blood services for demand forecasting.

Figure 1

Fate Code	Fate Reason
1	O- PATIENT
2	Allogeneic ABO mismatch transplant
3	Solid Organ Transplant mismatch
4	Phenotype/ other requirement unavailable (e.g. CMV-, HbS-)
5	Transfused from Massive haemorrhage pack
6	Correct ABO group unavailable (e.g. B-)
7	Transfused to avoid time-expiry
8	Unit Wasted due to time-expiry
9	Unit Wasted through OTCOL (out of temperature control)
10	Other

Donation No (These units were issued to your hospital in late 2015)	Patient details			Diagnosis OR directorate (if known)	"FATE" (enter the number from above table)
	Sex	Age / DOB	ABO/Rh		
G052515362834J					
G052515364121G					
G092315284467B					
G052515743457E					
G0735152031601					
G0525154931630					
G052515358593V					
G052515372727U					
G092315284372P					
G052515481567O					

Audit

A list of O RhD- donations issued to NHSBT hospitals during October-December 2015 was obtained from the NHSBT PULSE IT system. From the list, 10 random O RhD- unit numbers were obtained for each hospital to reduce the possibility that one clinical case may skew the results for a hospital. Hospitals who received less than 10 units were not included.

A proforma was developed with the PBM group, of possible fate for the unit, with transfusions for clinical reasons, transfusion to avoid wastage and two categories of wastage included. To encourage participation this was limited to 10 reasons. We asked the hospitals to find out where the donation had gone, to give us the sex, age and directorate that the patient was under, plus assign one of the 10 codes to the units. To limit the search to the laboratory IT system, further information about **why** it was transfused (clinically) was not required (see Figure 1). The proformas were emailed to the hospital transfusion laboratory manager and hospitals were given two weeks to complete the information and return to BSMS where the results were analysed.

Analysis

112 (out of 250) hospitals returned a completed survey. BSMS then categorised the hospitals, using the PULSE code, to their **Red Cell Usage** category. This is total red cell issues, not O RhD- issues. The number of O- RBC issues to each category was calculated from BSMS Gross Issues data (Table 1). The results are shown in the pie charts (Figure 2).

3 categories are highlighted as being 'inappropriate or avoidable wastage'; Transfusion to avoid time-expiry, Time-expiry and Out of Temperature Control (OTCOL) (Table 2).

Not all units were traced, due to movement to other hospitals. No units were assigned to Code 3, Solid Organ Transplant patients.

Table 1

Red Cell User Category	No hospitals in category	Surveys received	Category Range (units p.a.)	O- issues in category (Q3)	% of total O- issues
Very High	46	22	> 10,000	20,861	43.3%
High	48	20	7,000 – 10,000	10,435	21.6%
Moderate	79	40	4,000 – 7,000	11,817	24.5%
Low	50	25	800 – 4,000	4,143	8.6%
Very Low	33	5	< 800	970	2.0%

Figure 2 Results by category

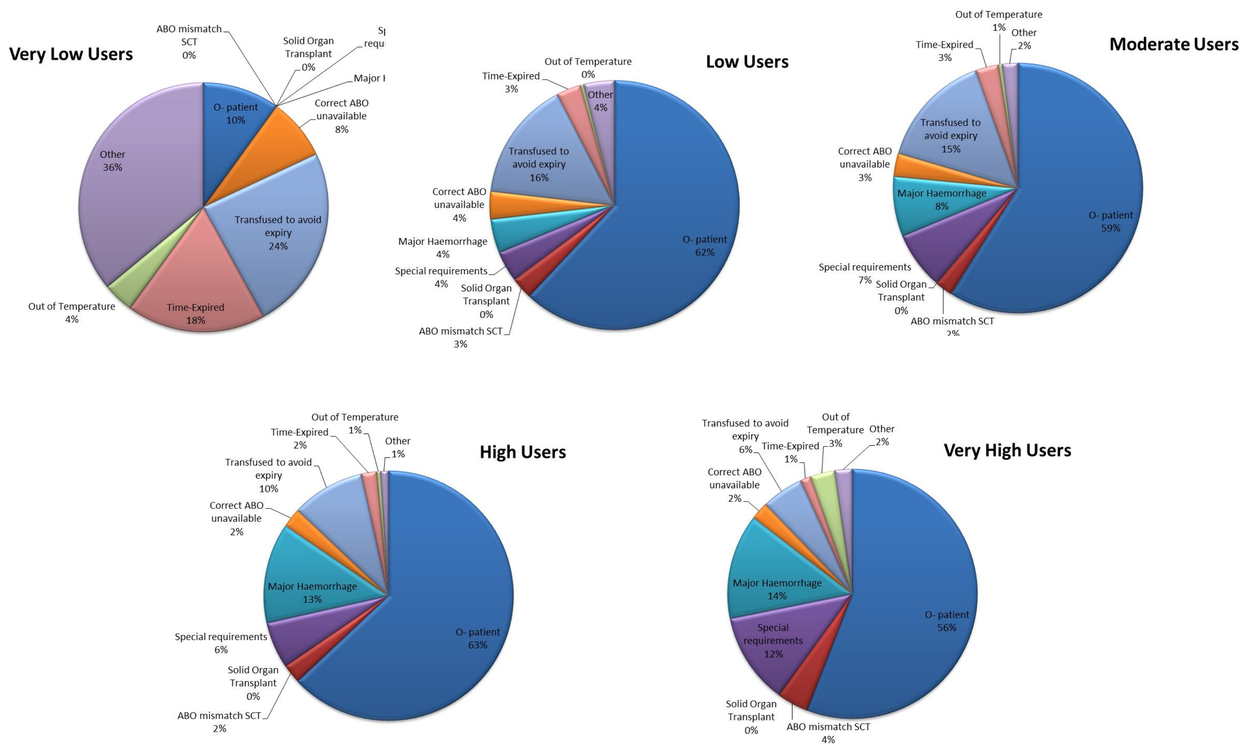
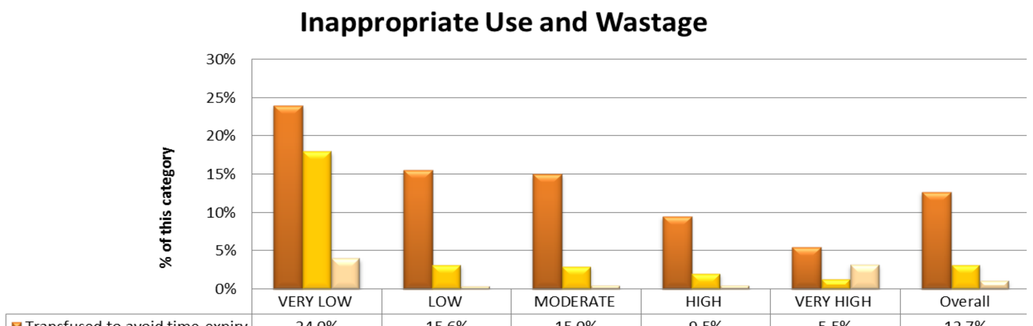


Table 2



	VERY LOW	LOW	MODERATE	HIGH	VERY HIGH	Overall
Transfused to avoid time-expiry	24.0%	15.6%	15.0%	9.5%	5.5%	12.7%
Wasted (time-expiry)	18.0%	3.2%	3.0%	2.0%	1.4%	3.2%
Wasted (OTCOL)	4.0%	0.4%	0.5%	0.5%	3.2%	1.2%

Results (see Figure 3)

- Only 56.7% of the O D- units audited were transfused to O- patients. The *Very Low* hospitals were the outlier, at 10% but *Low to Very High* category hospitals were all disappointingly only between 56-63%.
- Substitutions, either for phenotyped or special requirements such as CMV- are attributed as a reason for mismatched transfusion and this did account for 7% overall, but the *Very High* users used over 10% of O- due to this. 3% were transfused due to unavailability of correct ABO group.
- ABO mismatch allogeneic transplants accounted for less than 4% overall (*Very High* – 4.1%, *High*, *Moderate* and *Low* ~3%) which was surprising as this is often thought to be driving up O D- demand.
- Massive Haemorrhage use was much higher than anticipated, at 8.8% overall, with *High* and *Very High* users at 13.1% and 13.6%. (Figure 4). When the volume of issues by category is factored in to these findings, over 10% of all O D- issues may be used in massive haemorrhage packs.
- Transfusions to avoid time-expiry accounted for 12.7% of all units. Whilst the *Very low* category was at 24%, it was surprising that *Moderate* users transfused 15% of O D- to avoid time-expiry and *High* users 9.5%. *Very high* users, who receive large volumes of O D- has a 5.5% use. Considering volumes of issues, eliminating all 'inappropriate' transfusions in *Very Low* users would save ~ 238 units in total per quarter, whereas a reduction from 5.5% to 4.5% in the *Very High* users, in this 'Transfusion to avoid Time-expiry' category, would save about the same number of units.
- Time-expiry wastage was low at 3.2% and Out of Temperature Control wastage was lower overall at 1.2%, however the *Very High* users had higher OTCOL than Timex at 3.2%.

Figure 3

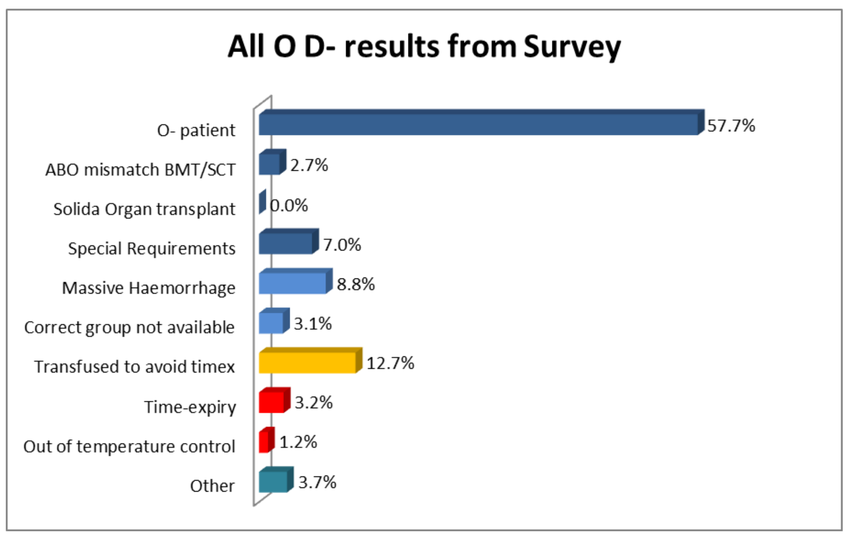
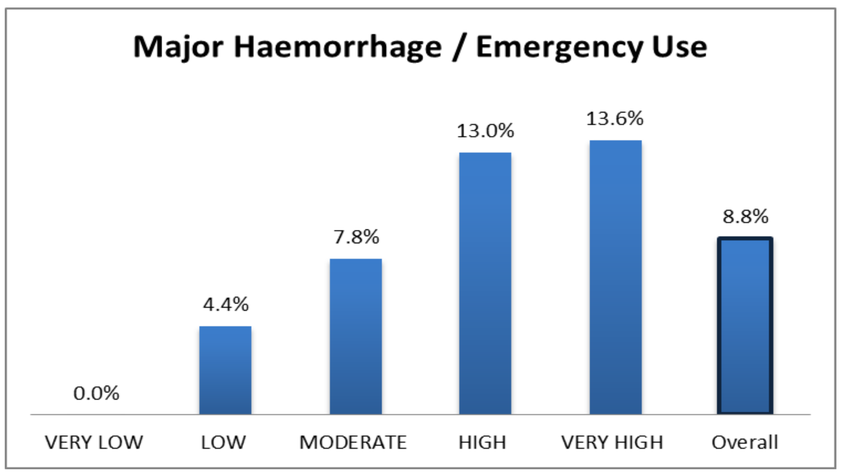


Figure 4



Conclusion

1. Small hospitals have challenges with wastage. Stock sharing with larger hospitals would overcome some of this mis-use / wastage.
2. Large hospitals may mis-use or waste smaller percentages of O RhD- issues but this amounts to much higher numbers of units. Small improvements in these hospitals would reap significant numbers of O RhD- units.
3. Transfusion to avoid time-expiry must be regarded as an inappropriate transfusion. This is an inventory problem and should be improved by reducing stock where possible. BSMS is now producing a monthly report which will indicate stock levels held in terms of 'days stock'.