Introduction

This project was agreed with the Yorkshire and The Humber (Y&H) Regional Transfusion Committee (RTC) as part of the rolling programme of regional audits around blood transfusion practice. An identical audit was also conducted by the North West Regional Transfusion Committee in 2013 and although the data set was larger (452) these data are included for comparison. The underlying reasons for conducting the audit were to determine that the demand for platelets in the Y&H region is driven by patient need and not inappropriate use and to understand the reasons why sometimes platelets are wasted. In addition the audit was conducted to demonstrate that the recommendations of The 2010 National Comparative Audit of Platelet Use are being fulfilled.

The rate of increase in demand for platelets is slowing down across England and North Wales, however, this has not been reflected in the Y&H region. At the time the audit took place, there was a significant regional increase in demand. Year to date figures for the Y&H region indicated an 8% increase in issues compared to the previous year and an increase of 1.5% nationally.

Platelet wastage as a percentage of issue (WAPI) for the region was running at 3.4% and remains consistently below the national average.

Methods

The audit was designed to provide a quick and efficient data collection process using SNAP online survey software©. Trusts were asked to audit a specific amount of consecutive platelet transfusions according to their Blood Stocks Management Scheme (BSMS) user category for platelets as follows:

- Very High user - 40
- High user - 30
- Moderate user - 20
- Low user - 15
- Very Low user – 10

Data collection took place between November and December 2014. Data was submitted by Transfusion Practitioners working at Trusts in the Y&H region. Appropriate governance arrangements were applied and no patient details were included in the audit.

Audit Standards
Data questions are indicated below with an explanation of the standard underneath. Results are reported as adherence (%) to each criterion.

**STANDARD 1 - Pre transfusion platelet count obtained?**
A platelet count is required within a few hours prior to prophylactic platelet transfusion. As a minimum this should be within 24 hours in in-patients and within 48 hours in out-patients, documentation will denote success in this criterion.

**STANDARD 2 - Indication for transfusion documented on the request form?**
The reason for the platelet transfusion according to the National Blood Transfusion Committee (NBTC) 2011 Indication codes for transfusion documented on the request form denotes success in this criterion or if the indication is guided by thromboelastography.

**STANDARD 3 – Platelet count corresponds with the indication for transfusion?**
The platelet count corresponding to the documented reason for the transfusion according to the NBTC 2011 Indication codes denotes success in this criterion.

**STANDARD 4 – For prophylactic transfusions - single dose given?**
Double dose prophylactic transfusions should not be used routinely. A single dose given for prophylactic transfusion to reach a specific platelet threshold pre-procedure denotes success in this criterion.

**SATNADARD 5 - For pre-procedure transfusions - post platelet count obtained?**
If platelets are necessary pre-procedure they should:
- be transfused close to the procedure to obtain maximum benefit
- include a post transfusion platelet count taken pre procedure
Obtaining a post platelet count pre procedure denotes success in this criterion.

**STANDARD 6 – Were platelets wasted during the audit period?**
If platelets were wasted either avoidable or unavoidable during the period of auditing consecutive transfusions denotes the outcome in this criterion.
Results

For the audit collection period, 390 cases were submitted related to platelet use. Table 1 indicates the organisations and the number of cases submitted.

Table 1

<table>
<thead>
<tr>
<th>Trust</th>
<th>No (%) Submissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airedale NHSFT</td>
<td>20 (5.1%)</td>
</tr>
<tr>
<td>Barnsley NHSFT</td>
<td>15 (3.8%)</td>
</tr>
<tr>
<td>Bradford Teaching Hospitals NHSFT</td>
<td>30 (7.6%)</td>
</tr>
<tr>
<td>Calderdale and Huddersfield NHSFT</td>
<td>20 (5.1%)</td>
</tr>
<tr>
<td>Doncaster and Bassetlaw NHSFT</td>
<td>30 (7.6%)</td>
</tr>
<tr>
<td>Harrogate and District NHSFT</td>
<td>10 (2.5%)</td>
</tr>
<tr>
<td>Hull &amp; East Yorkshire NHS Trust</td>
<td>40 (10.2%)</td>
</tr>
<tr>
<td>Northern Lincolnshire &amp; Goole Hospitals NHSFT</td>
<td>32 (8.2%)</td>
</tr>
<tr>
<td>Sheffield Children’s NHSFT</td>
<td>29 (7.4%)</td>
</tr>
<tr>
<td>Sheffield Teaching Hospitals NHSFT</td>
<td>41 (10.5%)</td>
</tr>
<tr>
<td>The Leeds Teaching Hospital NHS Trust</td>
<td>42 (10.7%)</td>
</tr>
<tr>
<td>The Mid Yorkshire Hospitals NHS Trust</td>
<td>30 (7.6%)</td>
</tr>
<tr>
<td>The Rotherham NHSFT</td>
<td>16 (4.1%)</td>
</tr>
<tr>
<td>York Teaching Hospital NHSFT</td>
<td>35 (8.9%)</td>
</tr>
</tbody>
</table>

Q2 – Does your organisation stock platelets?

Of the 14 NHS Trusts who registered on the audit, 7 (50%) stocked platelets. Trusts who stock platelets are highlighted in blue in table 1. In the audit conducted in the North West (NW), 50% of audited Trusts stocked this component.

The case number (Q3) was assigned by the data completer

Q4 – Is this a prophylactic transfusion?

There were a total of 284/390 (73%) prophylactic transfusions. Fig 1 shows the proportion of prophylactic platelet transfusions by Trust.

Fig 1

% Prophylactic Transfusions by Hospital
Prophylactic transfusions ranged from less than 50% to 100% of platelet transfusions over the audit period depending on the organisation. The average was 72%. In the NW region this figure was 76%.

In general it was the smaller trusts within the region that had the highest proportion of prophylactic platelet transfusions; this probably reflects the range and acuity of the clinical services they provide (inversely proportionate).

**Q5 – Has a pre transfusion platelet count been performed?**

272/284 (96%) prophylactic platelet transfusions had a pre transfusion platelet count performed. Of these, 12 (4%) did not have a pre transfusion platelet count. The equivalent figure in the NW region was also 96%. For all 360 transfusions, 16 (4.2%) did not have a pre transfusion platelet count. In the NW region this figure was 4%. Table 2 indicates the total number of cases with no pre-transfusion platelet count by organisation (total = 16).

**Table 2**

<table>
<thead>
<tr>
<th>Trust</th>
<th>Number where no Pre Transfusion Platelet Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheffield Teaching Hospitals NHSFT</td>
<td>1</td>
</tr>
<tr>
<td>Bradford Teaching Hospitals NHSFT</td>
<td>1</td>
</tr>
<tr>
<td>Doncaster and Bassetlaw</td>
<td>1</td>
</tr>
<tr>
<td>Harrogate and District NHSFT</td>
<td>1</td>
</tr>
<tr>
<td>The Leeds Teaching Hospital NHS Trust</td>
<td>2</td>
</tr>
<tr>
<td>Northern Lincolnshire &amp; Goole Hospitals NHSFT</td>
<td>2</td>
</tr>
<tr>
<td>Calderdale and Huddersfield NHSFT</td>
<td>3</td>
</tr>
<tr>
<td>York Teaching Hospital NHSFT</td>
<td>5</td>
</tr>
</tbody>
</table>

**STANDARD 1 - Pre transfusion platelet count obtained?**

A platelet count is required within a few hours prior to prophylactic platelet transfusion. As a minimum this should be within 24 hours in in-patients and within 48 hours in out-patients this will denote success in this criterion.

*96% of prophylactic platelet transfusions had a pre transfusion platelet count performed*

**Q6 – If a prophylactic transfusion was given, was it a single dose?**

For 284 prophylactic transfusions, single dose platelets were given on 238/284 (84%) of occasions. More than one dose was given on 43 (15%) occasions, the equivalent figure in the NW audit was 14%. There were 3 blanks related to units given. Table 3 indicates the frequency of >1 dose transfusions by organisation.

A limitation of this audit was the lack of a clear definition (Appendix II) of prophylactic transfusion and transfusion episodes (e.g. more than one unit given but over time) It is recommended that clear definitions (of all categories) are provided for future audits.

**Table 3**
1 patient received 3 doses over 48 hours and 2 patients received 4 & 5 doses respectively. The remainder received double dose transfusions.

**STANDRD 4 – For prophylactic transfusions - single dose given?**

Double dose prophylactic transfusions should not be used routinely. A single dose given for prophylactic transfusion not requiring a double dose to reach a specific platelet threshold pre-procedure denotes success in this criterion.

*In 84% of prophylactic transfusions, a single dose was given*

**Q7 – Was the transfusion prior to an invasive procedure?**

91/390 (23%) of transfusions were prior to invasive procedures. In the NW, this figure was 17%.

**Q8 – Was a post transfusion platelet count performed?**

Of the 91 who received transfusions prior to a procedure, 78/91 (86%) received a post transfusion platelet count. In the NW this figure was 82%.

For all transfusions, 286/390 (73%) received a post transfusion platelet count.

**STANDARD 5 - For pre-procedure transfusions - post transfusion platelet count obtained?**

If platelets are necessary pre-procedure they should:
- be transfused close to the procedure to obtain maximum benefit
- include a post transfusion platelet count taken pre-procedure

Obtaining a post platelet count pre procedure denotes success in this criterion.

*91 patients received pre procedure platelets. Of these, 86% had a post-transfusion platelet count*

**Q9 – Has the indication for the transfusion been documented on the request form?**

Where a request form was used (202), 125/202 (61%) had the reason documented. There were no responses indicating the indication had been guided by TEG/ROTEM.
However, 204/390 (52%) were also telephone requests but with some duplication as a form was also submitted (some data from Doncaster incomplete for this question).

In total, it may be 89% had a reason communicated either by form, telephone or other explanation (massive haemorrhage, GI bleed etc) offered. For the NW, combining documented and telephone requests their audit figure is 71%.

**STANDARD 2 - Indication for transfusion documented on the request form?**
The reason for the platelet transfusion according to NBTC 2011 indication codes for transfusion documented on the request form denotes success in this criterion or if the indication is guided by Thromboelastography.

**89% had a reason given either by form, phone or both. For the 202 who completed “a form” 61% indicated a written explanation on the form itself**

**Q10 – Does the platelet count correspond to the indication for the platelet transfusion?**

In 303/390 (78%) the platelet count corresponded to the indication for the transfusion. The NW figure for this measure was 77%.

**STANDARD 3 – Platelet count corresponds with the indication for transfusion?**
The platelet count corresponding to the documented reason for the transfusion according to the NBTC 2011 Indication codes denotes success in this criterion.

**In 78% of cases, the platelet count corresponded with the indication for the transfusion**

**Q11 – Platelet Origin**

76% were ordered from NHS Blood and Transplant (NHSBT) for a named patient, 20% were taken from unallocated stock and 4% were previously ordered/issued for another patient. Equivalent figures for the NW region were 63%, 30% and 4% respectively. There were 88 orders from NHSBT for the 5 platelet stockholding Trusts in the Y&H region.

**Q12- Wastage**

There were 12/390 (3%) instances where the component was indicated as wasted. For the 7 cases that gave a standard explanation the reasons for wastage were 5(MONU), 2 (SONU). 3 did not give a reason. 2 gave an explanation of failure to re-allocate following massive haemorrhage protocol activations. A total of 10 units were actually wasted with 1 returned to stock.

Reasons for wastage as categorised by the Blood Stocks Management Scheme (BSMS)

- MONU – Medically Ordered Not Used (n = 5)
- SONU – Surgically Ordered Not Used (n = 2)
- STEX – Stock Time Expired
- TIMEX – Time Expired
- WOL – Wasted out of the Laboratory
- WI – Wasted Import
- MISC – Miscellaneous
STANDARD 6 – Were platelets wasted during the audit period?
Platelets wasted either avoidably or unavoidably during the period of auditing

denotes the result in this criterion

10 units were actually wasted with 1 indicated as returned to stock. This is 3% of the total and in line with Blood Stocks Management Reports and below the 3.6% target for April 2015. A further unit was MONU but no other details were provided
Summary

Compliance with Standards

STANDARD 1 - Pre transfusion platelet count obtained?
A platelet count is required within a few hours prior to prophylactic platelet transfusion. As a minimum this should be within 24 hours in in-patients and within 48 hours in out-patients this will denote success in this criterion.

96% of all prophylactic transfusions had a pre-transfusion platelet count

STANDARD 2 - Indication for transfusion documented on the request form?
The reason for the platelet transfusion according to NBTC 2011 indication codes for transfusion documented on the request form denotes success in this criterion or if the indication is guided by Thromboelastography.

89% had a reason given either by form, phone or both. For the 202 who completed “a form” 61% indicated a written explanation on the form itself

STANDARD 3 – Platelet count corresponds with the indication for transfusion?
The platelet count corresponding to the documented reason for the transfusion according to the NBTC 2011 Indication codes denotes success in this criterion.

In 78% of cases, the platelet count corresponded with the indication for the transfusion

STANDARD 4 – For prophylactic transfusions - single dose given?
Double dose prophylactic transfusions should not be used routinely.
A single dose given for prophylactic transfusion not requiring a double dose to reach a specific platelet threshold pre-procedure denotes success in this criterion

In 87% of prophylactic transfusions, a single dose was given

STANDARD 5 - For pre-procedure transfusions - post transfusion platelet count obtained?
If platelets are necessary pre-procedure they should:-

- be transfused close to the procedure to obtain maximum benefit
- a post transfusion platelet count pre procedure to be taken

Obtaining a post platelet count pre procedure denotes success in this criterion.

82 received pre procedure platelets. Of these, 90% had a post-transfusion platelet count

STANDARD 6 – Were platelets wasted during the audit period?
If platelets were wasted either avoidable or unavoidable during the period of auditing consecutive transfusions denotes the result in this criterion

10 units were actually wasted with 1 indicated as returned to stock. This is 3% of the total and in line with Blood Stocks Management Reports and below the 3.6% target for April 2015
**Benchmark data**

<table>
<thead>
<tr>
<th>Audit Question</th>
<th>Y&amp;H RTC</th>
<th>NW RTC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does your organisation stock platelets?</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Is this a prophylactic transfusion?</td>
<td>73</td>
<td>76</td>
</tr>
<tr>
<td>Has a pre transfusion platelet count been performed?</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>If a prophylactic transfusion, was a single dose given?</td>
<td>84</td>
<td>86</td>
</tr>
<tr>
<td>Was the transfusion prior to an invasive procedure?</td>
<td>23</td>
<td>17</td>
</tr>
<tr>
<td>Was a post transfusion platelet count performed?</td>
<td>86</td>
<td>81</td>
</tr>
<tr>
<td>Has the indication for the transfusion been documented on the request form?*</td>
<td>89</td>
<td>71</td>
</tr>
<tr>
<td>Does the platelet count correspond to the indication for the platelet transfusion?</td>
<td>78</td>
<td>77</td>
</tr>
</tbody>
</table>

* transfusion indications communicated in a variety of ways - difficult to be accurate

**Discussion**

The most striking observation from this audit is the similarity with the results of the North West RTC audit (completed in October 2013). This suggests the two regions are comparable and practice is similar and although there is scope for improvement it doesn't account for the recent significant rise in issues in Y&H.

<table>
<thead>
<tr>
<th>Region</th>
<th>2009-10 issues</th>
<th>2010-11</th>
<th>2011-12</th>
<th>2012-13</th>
<th>2013-14</th>
<th>Overall % increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y&amp;H</td>
<td>21,597</td>
<td>22,516</td>
<td>22,511</td>
<td>22,582</td>
<td>23,606</td>
<td>9.3%</td>
</tr>
<tr>
<td>NW</td>
<td>33,274</td>
<td>34,588</td>
<td>39,075</td>
<td>39,347</td>
<td>40,605</td>
<td>22%</td>
</tr>
<tr>
<td>National</td>
<td>235,795</td>
<td>244,514</td>
<td>264,790</td>
<td>267,497</td>
<td>271,289</td>
<td>15%</td>
</tr>
</tbody>
</table>

**NHSBT commissioning data**

A review of data over the last four years (above) suggests that it is the timing of the increase that is different in Y&H and in fact the increase to date has been less significant than nationally. In view of this, it is reasonable to expect the demand for platelet components, in the Y&H region, to increase at a higher rate than nationally for some time to come. A more extensive study would be required to establish why this timing difference occurred and for how long we should expect to see a higher rate of growth.

It would appear that improvements in practice have been made since the NCA audit in 2010; the proportion of patients having a pre-transfusion platelet count increased from 88% to 98% and 86% of patients, pre-procedure, had a post transfusion platelet count compared to a national average of 30% in 2010. However, there is a higher incidence of double/multiple dose prophylactic transfusions than previously identified and addressing this should be a priority for the RTC.

A limitation of the audit was a lack of clear definitions of each category e.g. prophylactic and transfusion episode, causing multiple queries and some confusion. In addition this audit was not restricted to haematology patients unlike the 2010 NCA audit. Therefore, the results of these two audits are not directly comparable.
**Recommendations**

In view of the very similar results the following recommendations are based on the NW report and recommendations;

1. Investigate the reasons why 13% of prophylactic transfusions received more than one dose

2. Continue to raise awareness that “double dose prophylactic transfusions should not be used routinely”

3. Consider a regional audit of double dose platelets in October 2016

4. Any repeat audits should ensure unambiguous definitions of classifications

5. To determine why the timing of increased demand varied between regions and the potential impact on future demand, an indepth study in to clinical practice, treatment provision and demographics would be required

**Y&H vs NW RTC Platelet Use**

[Bar chart showing % Compliance for Y&H RTC and NW RTC across different question numbers (Q2 to Q10)]

**Acknowledgements**

All Transfusion staff who submitted audit data for this project
Appendix I – Survey

About the platelet transfusion

Q4 Is this a prophylactic transfusion?
   ○ Yes
   ○ No

Q5 Has a pre transfusion platelet count been performed?
   ○ Yes
   ○ No

Q6 If this is a prophylactic transfusion, was a single dose given?
   ○ Yes
   ○ No
   If "No", how many were given?

Q7 Is this platelet transfusion prior to an invasive procedure?
   ○ Yes
   ○ No

Q8 Has a post transfusion platelet count been performed?
   ○ Yes
   ○ No

Q9 Has the indication for the platelet transfusion been documented on the request form?
   ○ Yes
   ○ No
   ○ Guided by TEG/ROTEM/near patient testing of platelet function
   Other (e.g. telephone request)

Q10 Does the platelet count correspond to the indication for the platelet transfusion?
   ○ Yes
   ○ No
   ○ Guided by TEG/ROTEM/near patient testing of platelet function

Q11 For this platelet transfusion, were the platelets:
   ○ Taken from unallocated stock
   ○ Ordered from NHSBT for this named patient
   ○ Previously ordered/issued for another patient
Wastage

Q12  Were any platelets wasted on this episode?
     ☐ Yes
     ☐ No

Q13  Please indicate the reason for the wastage
     ☐ MONJ - Medically ordered not used
     ☐ SCONJ - Surgically ordered not used
     ☐ STEX - Stock Time Expired
     ☐ TIMEX - Time Expired
     ☐ WOL - Wasted out of the laboratory
     ☐ Wasted Import
     ☐ MISC - Miscellaneous

     Other circumstances (regarding wastage)

Q14  Please indicate the amount of wastage
     MONJ
     SCONJ
     STEX
     TIMEX
     WOL
     WI
     Misc
     Other
Quick Audit Platelet Transfusion Criteria

Criteria for successful completion

CRITERION 1 – Is this a prophylactic platelet transfusion?
Please indicate if the transfusion is to prevent spontaneous bleeding

CRITERION 2 – Has a pre transfusion platelet count been performed?
A platelet count is required within a few hours prior to prophylactic platelet transfusion. As a minimum this should be within 24 hours in in-patients and within 48 hours in out-patients this will denote success in this criterion.

CRITERION 3 – If this is a prophylactic platelet transfusion was a single dose given?
Double dose prophylactic transfusions should not be used routinely. A single dose given for prophylactic transfusion and not requiring a double dose to reach a specific platelet threshold pre an invasive procedure denotes success in this criterion.

CRITERION 4 – Is this platelet transfusion prior to an invasive procedure?
Please indicate if the transfusion is to prevent bleeding associated with an invasive procedure

CRITERION 5 – Has a post platelet transfusion count been performed?
If platelets are necessary pre-procedure they should:
- be transfused close to the procedure to obtain maximum benefit
- a post transfusion platelet count pre procedure to be taken
Obtaining a post platelet count pre an invasive procedure denotes success in this criterion.

CRITERION 6 – Has the indication for transfusion been documented on the request form?
The indication for the platelet transfusion according to NBTC April 2013 indication codes for transfusion documented on the request form denotes success in this criterion or if the indication is guided by Thromboelastography/Thromboelastometry/near patient testing of platelet function

CRITERION 7 – Does the platelet count correspond with the indication for the platelet transfusion?
The platelet count corresponding to the documented reason for the transfusion according to the NBTC April 2013 Indication codes denotes success in this criterion.

CRITERION 8 – For this platelet transfusion were the platelets:
Please indicate one of the following:
- Taken from unallocated stock
- Ordered from NHSBT for this named patient
- Previously ordered/issued for another patient

Please answer questions 9 and 10 when submitting the data for the final transfusion of the audit

CRITERION 9 – Were any platelets wasted during the audit period?
Please indicate if platelets were wasted either avoidably or unavoidably associated with this patient episode

CRITERION 10 – Please indicate the reason for and amount of wastage?
- Reasons for wastage as categorised by the Blood Stocks Management Scheme (BSMS)
- MONU – Medically Ordered Not Used
- SONU – Surgically Ordered Not Used
- STEX – Stock Time Expired
- TIMEX – Time Expired
- WOL – Wasted out of the Laboratory
- WI – Wasted Import
- MISC – Miscellaneous