

Inventory Practice Survey December 2009

- - Platelets (v1.1)- -

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1 Background

The Blood Stocks Management Scheme (BSMS) has collected data from hospitals about their platelet issues and wastage since April 2003. A survey was carried out in 2003 to look at platelet inventory management in hospitals and a follow-on survey has now been carried out. This report will look at platelet inventory management in 2009, and then go on to look at how practice has changed since 2003. The survey examined three main aspects of platelet inventory management; ordering, stock and storage, and training.

2 Summary of key findings and recommendations

- There has been significant progress in the management of both major haemorrhage and massive transfusion in recent years and this is reflected in the protocols now available in hospitals.

- Improvements since 2003 in availability of a platelet ordering standard operating procedure, the review period of SOPs, and in meeting the UKBTS (Red Book) storage guidelines have been driven by the implementation of the Blood Safety and Quality Regulations 2005.
- This survey has provided evidence of a major change where hospitals in the Very Low platelet usage category do not now maintain storage facilities and only order platelets for immediate use. This has resulted in a significant fall in the number of non compliant hospitals.
- There are increasing numbers of hospitals holding stocks of platelets. Hospitals should consider the improvement in availability, potential increase in wastage and transport pressures when considering holding a stock of platelets.
- Group A platelets are more widely stocked by hospitals than group O. A Negative platelets are the choice for those hospitals considering holding stock. Flexibility and collaboration between the hospital laboratory and blood service is essential when ordering stock platelets.
- Training on indications for use is provided to junior doctors but not by all hospitals. However there is a significant improvement in the number of hospitals providing training for junior doctors since 2003. The role of the Transfusion Practitioner appears to have been key to the provision of training.
- Delivery of training and education about the appropriate use of platelets to junior medical staff may ensure appropriate use. There is evidence that other methods of providing training such as e-learning have been introduced since 2003.

3 Survey Response

The 2009 inventory practice survey was sent to 294 hospitals in England, Wales and Northern Ireland.

230 hospitals returned the survey, a rate of over 78% for the three blood services (Table 1).

Blood Service	Number of hospitals that responded	Number of hospitals served by blood service	Response rate
NHSBT	208	268	78%
NIBTS	8	10	80%
WBS	14	16	88%
Total	230	294	78%

Table 1 - Survey response rate by blood service

Hospitals have been clustered into five different categories depending on their platelet usage, ranging from Very High to Very Low. This allows direct comparison of inventory practice across similar hospitals, and to contrast practice in high usage hospitals with low usage ones.

These platelet usage categories are calculated based on data provided by the blood services about the number of platelets issued to each hospital as well as the number of deliveries of platelets that each hospital receives. An algorithm is then used to calculate the category.

The Welsh Blood Service (WBS) does not provide data on platelet issues to the BSMS and so it has not been possible to calculate platelet usage categories for the 16 WBS served hospitals. Thus only hospitals from NHSBT and NIBTS will be used for looking at differences in inventory management in hospitals with varying platelet usage levels. The response rate was above 70% for all platelet usage categories (Table 2).

Platelet usage category	Number of hospitals in platelet usage category	Number of hospitals that responded	Response rate
Very High	48	35	73%
High	49	40	82%
Moderate	58	49	84%
Low	68	53	78%
Very Low	55	39	71%
All hospitals	278	216	78%

Table 2 - Response rates for each platelet usage category (WBS excluded).

4 Platelet ordering

Hospitals were asked to provide information about their platelet ordering practices. Topics covered included the type of procedures that are in place, whether orders are placed in a block or ordered when required, and whether HLA platelets are also ordered.

4.1 Standard Operating procedures for ordering from the blood services

All hospitals were asked whether or not they have a Standard Operating Procedure (SOP) in place for ordering from the blood service.

- 89% of hospitals (205/230) have a SOP in place for ordering platelets from the blood service.
- 20 hospitals do not have a SOP, of which 45% come from the Very High/High platelet usage categories (Figure 1).
- The remaining five hospitals did not answer the question.

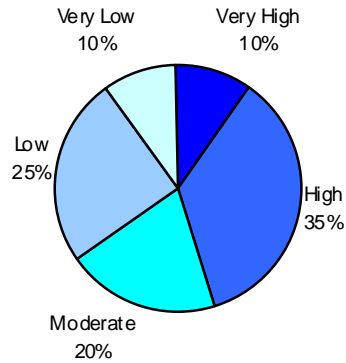


Figure 1 - The hospitals that do not currently have a SOP for ordering grouped by platelet usage category (WBS excluded).

- 10/20 hospitals that do not currently have a SOP have no plans to introduce one in the next 12 months. Five of these hospitals are in the High platelet usage category, representing 13% of the total hospitals in the category.
- One hospital commented that they did intend to bring in a SOP, but are waiting for the introduction of NHSBT’s Online Blood Ordering System (OBOS).

How often are SOPs reviewed?

- 93% (191/205) are reviewing their SOP every two years or more frequently (Figure 2).
- Seven hospitals (3%) do not have a set review period and update the SOP “whenever appropriate”.

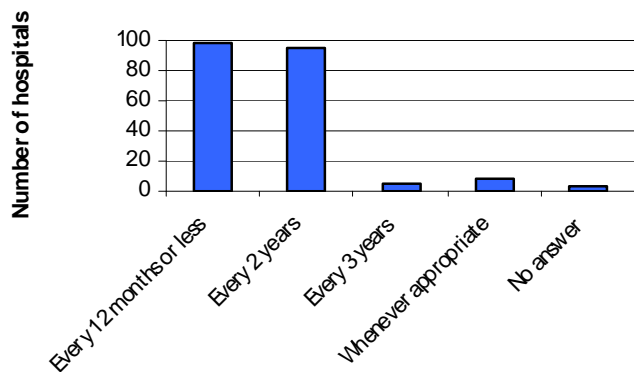


Figure 2 – Review periods for platelet ordering SOPs

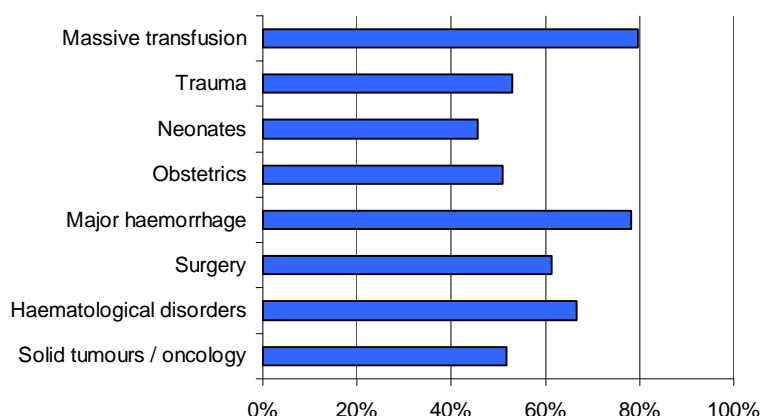
4.2 Use of standard protocols for platelet requests within hospitals

In addition to being asked about their SOPs for ordering from the blood service, hospitals were asked about whether standard protocols were available within the hospital for generating platelet requests for specific patients.

Hospitals were asked whether standard protocols were available for eight different groups of patients.

- The most commonly held standard protocol was for massive transfusion in 80% of hospitals. Major haemorrhage followed with 78% (Figure 3).

Figure 3 - The percentage of hospitals that have a standard protocol in place for each patient type.



- 76 hospitals have SOPs for all eight patient types (Table 3).
- There is a clear relationship between level of platelet usage and the percentage of hospitals that have all eight SOPs available (Table 3). This may be because some of the smaller hospitals do not provide services to all patient types.
- To see if this might be the case the frequency of standard protocols for obstetrics was analysed only in hospitals with obstetric units. A lower percentage of Very Low usage hospitals were still found to have a standard protocol compared to higher usage hospitals (Table 4).

Protocol available	Platelet Usage category				
	Very High	High	Moderate	Low	Very Low
Solid tumours / oncology	66%	63%	59%	53%	28%
Haematological disorders	89%	75%	73%	66%	41%
Surgery	63%	80%	73%	58%	41%
Major haemorrhage	80%	85%	84%	81%	69%
Obstetrics	63%	80%	73%	58%	41%
Neonates	54%	65%	53%	53%	13%
Trauma	60%	70%	59%	58%	26%
Massive transfusion ¹	80%	93%	80%	83%	72%
All 8 protocols	57%	53%	41%	21%	8%

Table 3 - Percentage of hospitals in each platelet usage category with standard protocols available (WBS excluded).

¹ Definition Handbook of Transfusion Medicine, UK Blood Services, 4th Edition, D B L McClelland

Platelet Usage Category	Hospitals with obstetric SOP in place	Total hospitals with an obstetric unit	Percentage with SOP in place
Very High	17	24	71%
High	26	33	79%
Moderate	28	43	65%
Low	26	48	54%
Very Low	4	11	36%

Table 4 - Hospitals with a standard protocol for obstetric patients as a percentage of hospitals with an obstetric unit (WBS excluded).

4.3 Ordering regimes

Platelet ordering rationale varies greatly from hospital to hospital. Some hospitals choose to order platelets on a per patient basis when a request comes in, whereas others try to group their requests to order several units at once. Many factors can influence a hospital's decision on how to order.

- 104/230 hospitals (45%) generally only order platelets when requested (Figure 4).
- 16 hospitals (7%) routinely collate platelet requests, whilst a further 38 (17%) hospitals stated that they generally use block ordering but use per patient ordering in an emergency.
- 70 hospitals (30%) use a mixture of both block and per patient ordering.

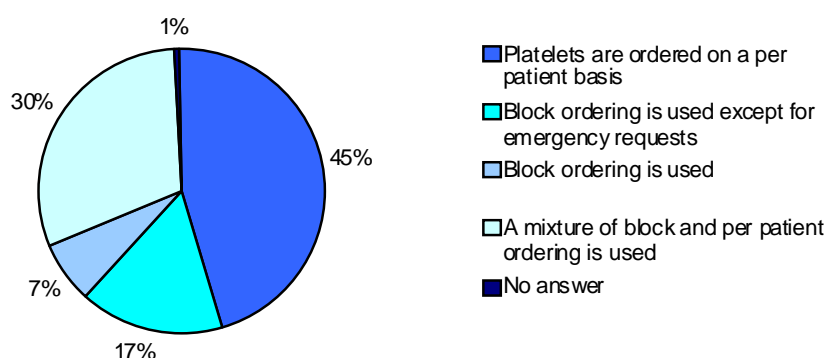


Figure 4 - Platelet ordering regimes

- Of the 16 hospitals that rely solely on block ordering 50% came from the Very High or High platelet usage category.
- Five hospitals come from the Low or Very Low category (Table 5).

Table 5 - Hospitals that rely solely on block ordering

Platelet Usage Category	Number of hospitals
Very High	4
High	4
Moderate	3
Low	4
Very Low	1
Total	16

4.4 Number and timing of block orders

124 hospitals use block orders to some extent; 16 hospitals routinely collate platelet requests, 38 use block ordering unless there is an emergency, and 70 use a mixture of per patient and block ordering.

All 124 hospitals were asked about the number and timing of their block orders. 119 provided answers.

- The proportion of hospitals with more than one block order per day increases as platelet usage increases (Figure 5).
- 100% of Very Low usage hospitals only have one order per day. In contrast one Very High usage hospital has four block orders per day and a further five place three orders.

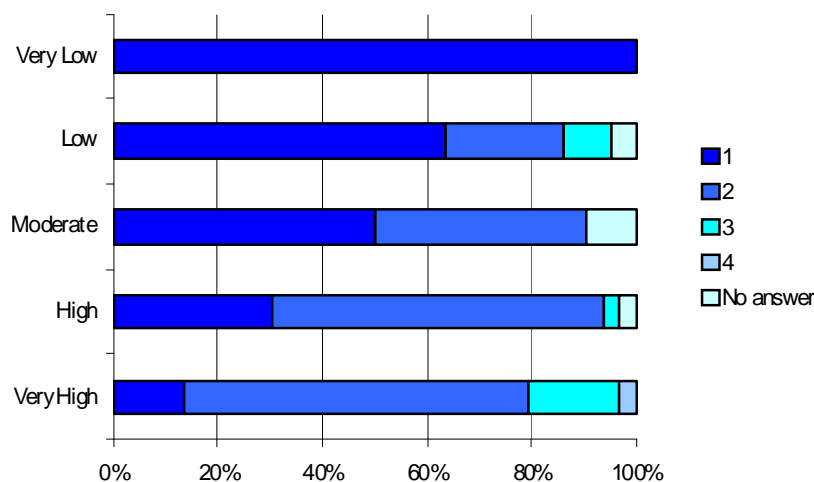


Figure 5 - Number of block orders per day by platelet usage category (WBS excluded).

Of the 119 that provided information about how many platelet orders they place each day, 113 also provided information about when their main order arrived.

- 71/113 hospitals (63%) received their main order the same day. However, of those that did not arrive the same day, all orders were placed either in the afternoon or evening (Table 6).
- Two hospitals appeared to receive evening orders the same day; these were most likely placed in the early morning before 0800.

Delivery time of main block order	Time of day of order			Total number of hospitals
	Morning (0801 – 1200)	Afternoon (1201 – 1800)	Evening/night (1801 – 0800)	
Same day	54	15	2	71
Next day	0	35	7	42

Table 6 - Order delivery times

- Seven hospitals that said that they only use per patient ordering provided information about number and timing of block orders. It is not clear whether they were referring to red blood cell block orders rather than platelet orders, or whether they were referring to the time they are likely to submit per patient orders.

4.5 Platelet Deliveries

Hospitals were asked about their platelet deliveries from the blood service and how many of them are on an ad-hoc basis rather than a routine scheduled delivery. The hospitals were asked to estimate their reliance on ad-hoc delivery ranging from no reliance at all to 100% reliance.

- 219/230 hospitals said that they rely on ad-hoc delivery to some extent.
- Five hospitals stated that they have no reliance on ad-hoc delivery (Figure 6), and three of these came from the Very Low platelet usage category. This may be because these hospitals are using their own transport, as one hospital commented that they use a courier service instead of ad-hoc deliveries from the blood service.
- 34 hospitals have 100% reliance on ad-hoc delivery and 23/34 (68%) of these are in the Very Low usage category.
- One Very High usage hospital relies 100% on ad-hoc delivery.

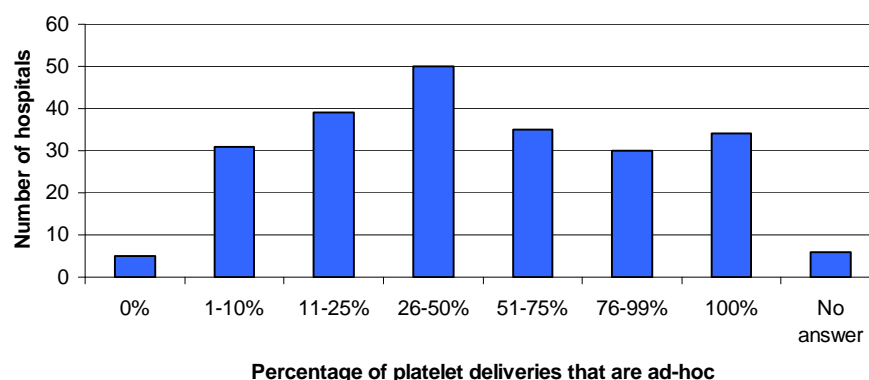


Figure 6 - The proportion of platelet deliveries that are on an ad-hoc basis.

The 219 hospitals that use ad-hoc delivery to some extent were then asked to provide information about the reasons why their platelets are received on an ad-hoc basis. Hospitals could give multiple answers.

- Emergency request was the most commonly given reason (78%) , followed by sporadic clinician ordering with 55% (Table 7).
- 86% of the hospitals that gave “very few platelets ordered” as a reason for ad-hoc deliveries came from the Very Low or Low usage categories.
- The main “other” reason given for the ad-hoc delivery was “too few routine orders” , and this answer was given by four hospitals. Additional reasons included:
 - Unpredictability of platelet use (3 hospitals)
 - Hospital is very close to the stock centre (2 hospitals).
 - Do not have storage facilities and therefore can’t order platelets in advance of use (2 hospitals -one High usage, one Low usage).

Reason for ad-hoc deliveries	Number of hospitals	Percentage
No SOP in place	5	2%
Emergency request	170	78%
HLA platelets required	75	34%
Request received after block order placed	108	49%
Sporadic clinician ordering	120	55%
Very few platelets ordered	71	32%
Other	18	8%

Table 7 – Reasons given for ad-hoc delivery of platelets

4.6 HLA matched platelets

As well as ordering standard platelets hospitals were asked whether they order HLA matched platelets.

- 170/230 of hospitals (74%) order HLA matched platelets.
- 65% of the hospitals that do not order HLA matched platelets come from the Very Low platelet usage category (Figure 7).

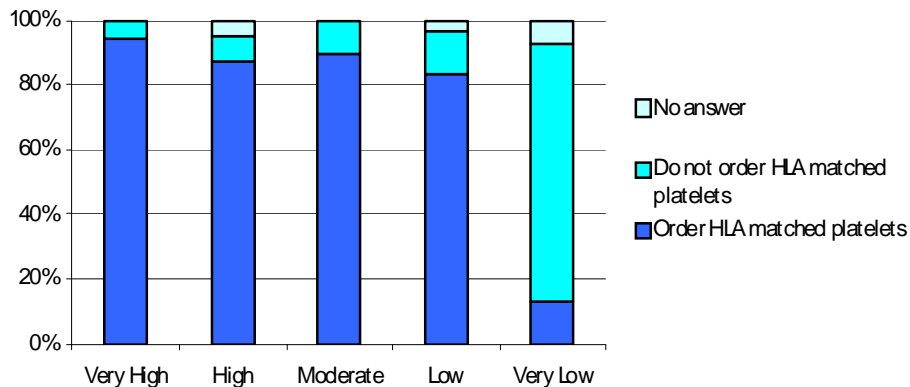


Figure 7 - The percentage of hospitals that order HLA matched platelets across platelet usage categories (WBS excluded).

- The most common reason for HLA matched platelet use is confirmed HLA antibodies, and this reason was given by 147/170 hospitals (86%) (Figure 8).
- Three hospitals (2%) stated that the decision to use HLA matched platelets was made by the clinician rather than the laboratory.

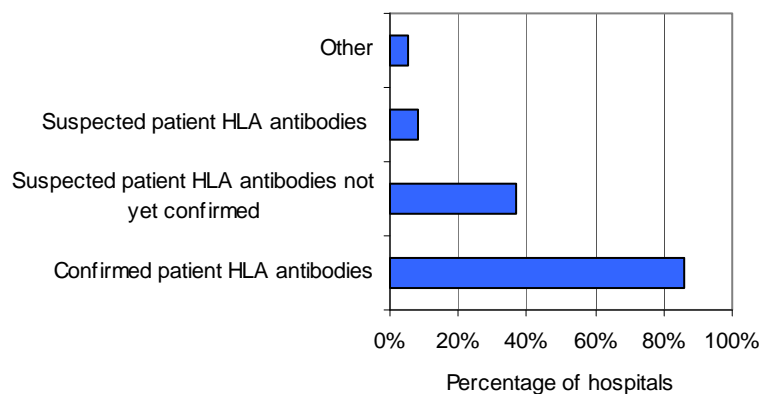


Figure 8 – Reasons for ordering HLA matched platelets. Hospitals could give

5 Stock and storage

The short shelf life of platelets makes it difficult for hospitals to routinely stock platelets. However, some hospitals do hold stock and the aim of this section is to examine how many units are being stocked and of which blood group. This section also looks at the storage facilities across all hospitals, regardless of whether or not they routinely keep stocks.

5.1 Stock

All hospitals were asked whether they hold a stock of platelets i.e. that they keep platelets in the laboratory that have not been ordered for a specific patient.

- 51 hospitals (22%) are routinely holding a stock of platelets (Table 8).
- A further nine hospitals hold stock on occasion, either to cover weekends, or if it is deemed necessary depending on the in-patient mix and diagnosis.

Are stocks held?	Number of hospitals	Percentage
Stocks are held	51	22%
Stocks are held sometimes to cover weekends	5	2%
Stocks sometimes held depending on patient mix and diagnosis	4	2%
Platelets are only ordered for patients	163	71%
No answer	7	3%

Table 8 - How many hospitals hold platelet stocks?

- The 60 hospitals that hold stock (51 that hold stock routinely plus the additional nine that hold stock on occasion), come primarily from Very High and High platelet usage hospitals (Figure 9).
- 25/60 hospitals (45%) said that they make their stock available to other laboratories either within or outside the hospital or NHS trust.

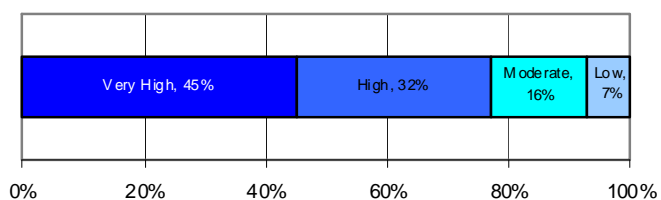


Figure 9 - Stockholders by platelet usage category (WBS excluded).

The 60 stockholding hospitals were also asked about the reasons that they hold stocks. Each hospital could give multiple answers.

- The primary reason for holding stocks amongst the Low usage hospitals was "Take too long to arrive" with three out of four hospitals stating this as a reason (Table 9).
- The Very High and High usage hospitals gave "Haematology/oncology" as the primary reason for keeping platelet stocks, followed by Surgery.
- The main "other" reason given was "to reduce ad-hoc deliveries" (three hospitals).

Platelet usage category	Cardiac surgery	Haematology / oncology	Take too long to arrive	Massive trauma	Vascular surgery	Other
Very High	64%	76%	24%	56%	60%	12%
High	39%	56%	22%	28%	50%	28%
Moderate	22%	33%	22%	33%	56%	22%
Low	0%	25%	75%	25%	25%	0%

Table 9 – Reasons for stocking platelets as percentage of the number of hospitals in the cluster that hold stock (WBS excluded).

5.1.1 Type of platelets stocked

Hospitals that stock platelets were asked which blood groups they generally hold and how many units. 47/60 hospitals that keep stock provided data about the type of stock held.

- The average number of units held is three and ranged from one to 12.
- The most widely held blood group is A positive, accounting for 39% (50/128) of the total units held (Figure 10).

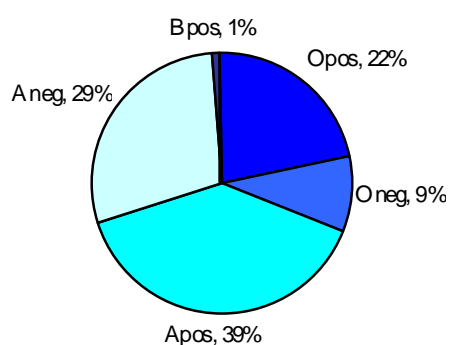


Figure 10 - The proportions of each blood group that are held

5.1.2 Would more hospitals like to keep platelet stocks?

All 163 hospitals that do not currently hold stock were asked whether they would like to hold stock, and to provide information as to what blood group they would be interested in holding.

- 10/163 hospitals (6%) that do not currently hold stock expressed an interest in holding stock in the future.
- The most commonly desired blood group was A negative, with 60% of hospitals expressing an interest in keeping this blood type (Table 10).

Blood group	Number of hospitals
O positive	1
A positive	4
A negative	6

Table 10 - The number of hospitals that would like to keep platelets of each blood type.

- The average number of units a hospital would stock is two with a range of between one and four units.
- Only one hospital would like to hold O positive platelets, and this hospital would also like to stock A positive.
- 49% of the total number of units that hospitals would like to hold are A negative (Figure 11).

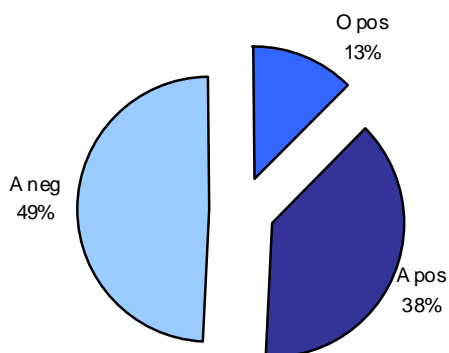


Figure 11 - Blood groups that hospitals would like to stock as a percentage of the total number of units

The hospitals that would like to keep stocks come from a range of platelet usage categories (Table 11)

- 6/35 (17%) of Very High usage hospitals do not stock, or intend to stock, platelets. Two further hospitals did not provide data on whether or not stock is held.

Table 11 - The platelet usage categories of the hospitals that would like to keep stocks in the future (WBS excluded).

Platelet Usage Category	Number of hospitals
Very High	2
High	3
Moderate	2
Low	2
Very Low	0
Total	9

5.2 Storage guidelines

All hospitals were asked to provide information about their storage facilities, regardless of whether or not they routinely hold stock. However, hospitals had the option to answer that they do not store platelets.

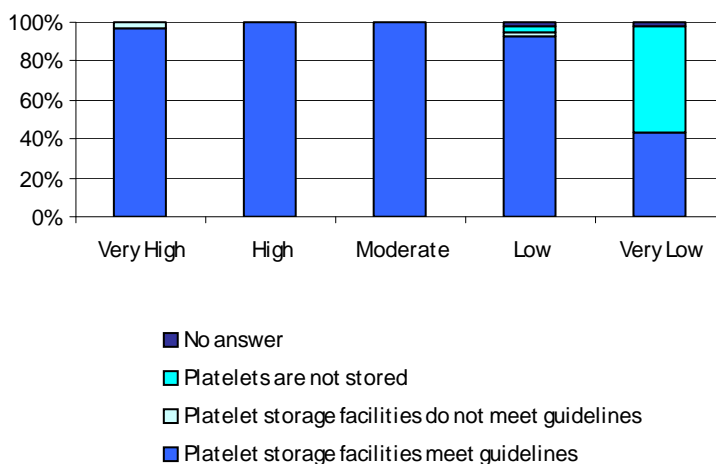
- 200/230 hospitals (87%) indicated that their platelet storage facilities meet the UKBTS guidelines (Table 12).
- 24 (10%) do not store platelets.
- Only four hospitals (2%) do not meet the UKBTS guidelines.

	Number of hospitals	Percentage
Platelet storage facilities meet guidelines	200	87%
Platelet storage facilities do not meet guidelines	4	2%
Don't store platelets	24	10%
No answer	2	1%

Table 12 - Do hospitals meet the UKBTS platelet storage guidelines?

- 21/23 of the hospitals that do not store platelets come from the Very Low usage category.
- 2/4 of the hospitals that do not meet the guidelines are issued platelets by the WBS, so it is unclear which platelet usage category they would fall into.

Figure 12 - Hospitals that meet the red book guidelines for platelet storage by platelet usage category (WBS excluded).



6 Training

Good inventory management relies on communication between the laboratory and clinical staff. All hospitals were asked to provide information about whether training in the indications for the use of platelets is provided to junior medical staff, and if so what it entails and who it is provided by.

- 99 hospitals (44%) provide training in the use of platelets (Figure 13).
- 59 hospitals (26%) are unsure of the type of training provided or did not answer the question.
- The percentage of hospitals providing training increases as the platelet usage increases (Figure 14).

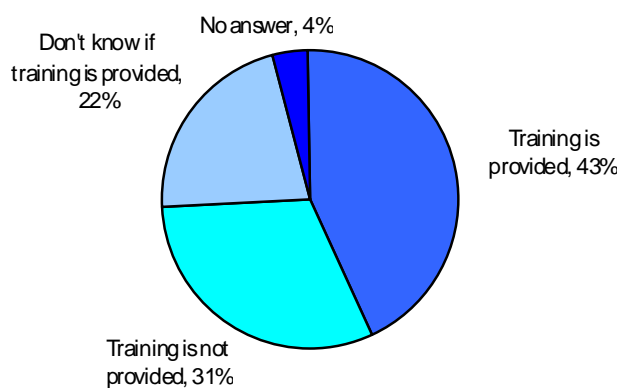


Figure 13 - Is training in the indications for platelet use provided to junior medical staff?

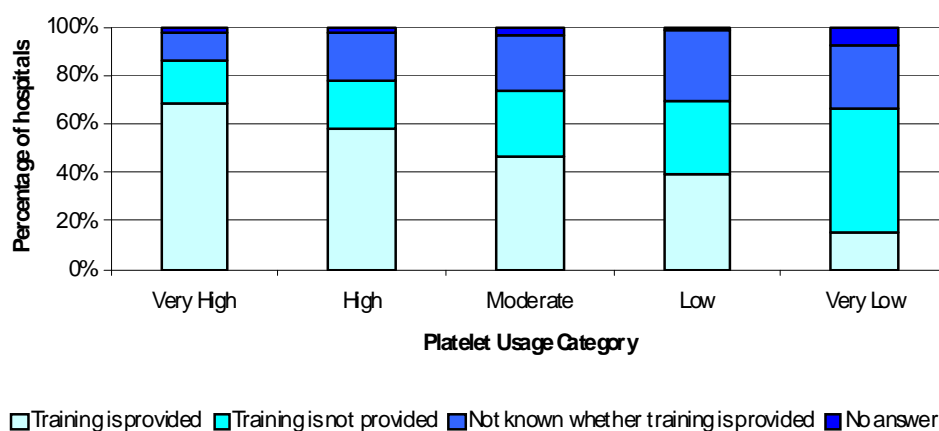


Figure 14 - Training provision across platelet usage categories (WBS excluded).

The 99 hospitals that provide training were asked what items are covered in the training. Hospitals could give multiple answers.

- The most commonly covered topic was “platelet trigger levels” (82% of hospitals providing training) (Table 13).

Topic	Percentage of hospitals
Platelet trigger levels	82%
Platelet request protocols	76%
Emergency planning	22%
Platelet ordering cut-off times	35%
Review of national guidelines	33%

Table 13 - Items that are covered in the platelet training

Hospitals also provided information about who in the hospital provides the training in the use of platelets. Hospitals could give more than one answer if several people contribute to the training.

Responsibility for training is primarily taken by the transfusion practitioner. They were involved with the training in 85% of hospitals (Table 14).

- 5% (5/99) of hospitals use e-learning to provide training on the use of platelets.

Training provider	Number of hospitals	Percentages of hospitals that provide training
Transfusion practitioner	84	85%
Consultant Haematologist	50	51%
Transfusion Laboratory Personnel	24	24%
Clinician other than haematologist	4	4%
Other	13	13%

Table 14 - Who provides training in the indications for the use of platelets?

- Many hospitals provide platelet training from a variety of sources. 43 hospitals (43%) use more than one source of training. One hospital used five different sources for training (Table 15).

Table 15 - Number of training sources per hospital

	Number of sources of training						Total
	No answer	1	2	3	4	5	
Number of hospitals	3	53	25	16	1	1	99

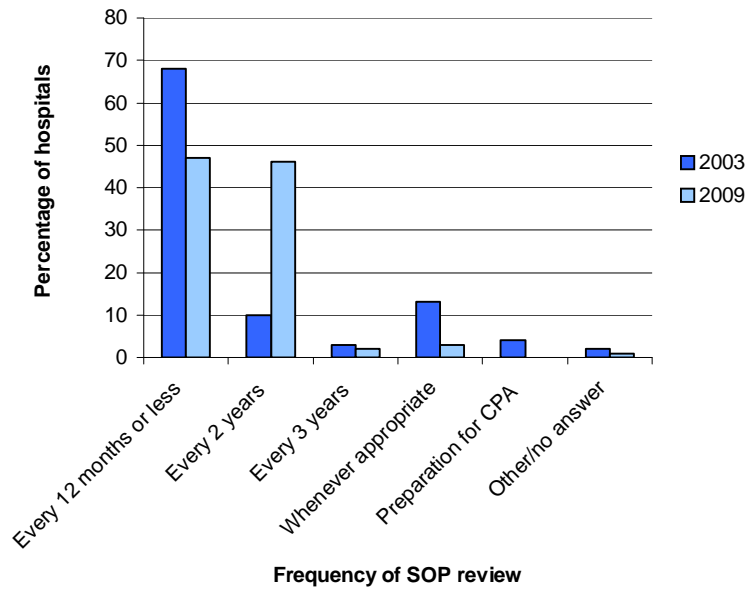
7 What has changed since 2003?

The 2009 survey is a follow-up to a similar survey that was carried out in 2003. In this section the main changes to practice during this period are highlighted.

7.1 Ordering practice

- 205 hospitals (89%) have a Standard Operating Procedure (SOP) for ordering platelets from the blood services compared to 73% in 2003.
- The frequency of SOP review has reduced between 2003 and 2009 with 97/205 (47%) now reviewing their SOP every 12 months or less compared to 68% in 2003 (Figure 15).
- However, an increased number of hospitals gave a definitive timescale for review of the SOP in 2009, with fewer hospitals reviewing the SOP "Whenever appropriate" (4% in 2009 compared to 13% in 2003).

Figure 13 -The frequency of SOP review



Improvements in the availability and the review period of SOP for ordering platelets have been driven by the implementation of the Blood Safety and Quality Regulations 2005.

- The most commonly held standard protocol in 2003 for ordering from the transfusion laboratory was for haematological disorders, but this has been overtaken by Massive transfusion in 2009.
- Two of the patient types surveyed, Trauma and Massive Transfusion, were not included in the survey in 2003, and so comparative data is not available (Table 16).

Standard Protocol	Percentage of hospitals	
	2003	2009
Solid tumours / oncology	35%	52%
Haematological disorders	63%	67%
Surgery	32%	61%
Major haemorrhage	53%	78%
Obstetrics	23%	51%
Neonates	22%	46%
Trauma	n/a	53%
Massive transfusion	n/a	80%

Table 16 - The percentages of hospitals with standard protocols for specific

There has been significant progress in the management of both major haemorrhage and massive transfusion in recent years and this is reflected in the protocols now available in hospitals.

7.2 Stock and storage

- The number of hospitals routinely holding a stock of platelets has increased from 10% in 2003 to 22% in 2009 (from 23 hospitals to 51 hospitals).
- The number of hospitals making stock available to other hospitals has increased considerably from 26% in 2003 to 42% in 2009.
- There has been a significant shift in the most commonly held blood group from O pos in 2003 to A pos in 2009 (Figure 16).
- The number of hospitals stocking A negative platelets has increased from 15% in 2003 to 29% in 2009.

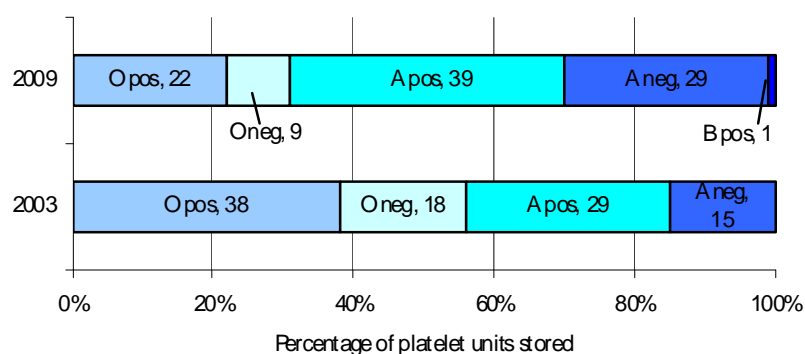


Figure 14 - The proportions of each blood group that are held as stock

Hospitals should consider the improvement in availability, potential increase in wastage and transport pressures when considering holding a stock of platelets.

Flexibility and collaboration between the hospital laboratory and blood service is essential when ordering platelets.

Guidelines

- 200 hospitals (87%) indicated that their platelet storage facilities meet the UKBTS guidelines compared with 79% in 2003 (Figure 17).
- Only four hospitals (2%) do not meet the guidelines compared to 29 hospitals in 2003 (13%).
- The major change has occurred in the Very Low platelet usage category, where there has been a significant fall in the number of non-compliant hospitals from 45% in 2003 to none in 2009. 54% of Very Low usage hospitals do not now maintain storage facilities and only order platelets for immediate use compared to only 11% in 2003.

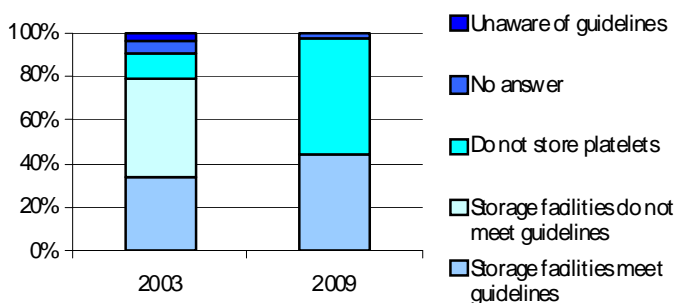


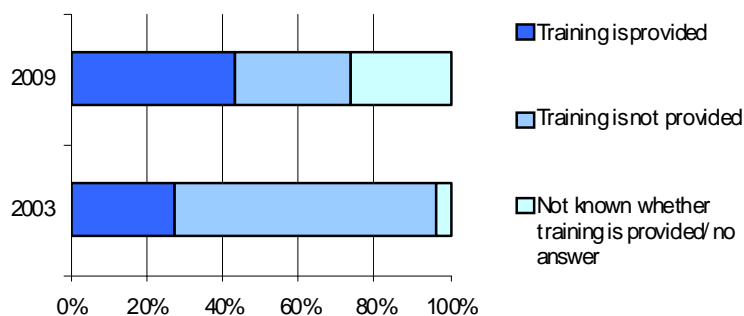
Figure 15 - The proportion of Very Low usage hospitals that meet the guidelines (WBS excluded).

Improvements in compliance with the UKBTS guidelines regarding storage of platelets have been driven by the implementation of the Blood Safety and Quality Regulations 2005. This survey has provided evidence of a major change where hospitals in the Very Low platelet usage category do not now maintain storage facilities and only order platelets for immediate use. This has resulted in a significant fall in the number of non compliant hospitals.

7.3 Training

- The number of hospitals providing training in the use of platelets has increased from 27% in 2003 to 44% in 2009 (from 61 hospitals to 99 hospitals) (Figure 18).
- The number of hospitals unsure of the type of training provided or not answering the question has dramatically increased this year compared to 2003 (from 5% to 26%, equating to 10 hospitals compared to 59).
- The main training provider has moved from being the Consultant Haematologist in 2003 to the Transfusion Practitioner in 2009.

Figure 16 - The percentage of hospitals providing training in the indications for use of platelets



Training on indications for use is provided to junior doctors but not by all hospitals. However there is a significant improvement in the number of hospitals providing training for junior doctors since 2003. The role of the Transfusion Practitioner appears to have been key to the provision of training. Delivery of training and education about the appropriate use of platelets to junior medical staff may ensure appropriate use. There is evidence that other methods of providing training such as e-learning have been introduced since 2003.

8 Glossary

NHSBT – National Health Service Blood and Transplant

WBS – Welsh Blood Service

NIBTS – Northern Ireland Blood Transfusion Service

UKBTS – UK Blood Transfusion Services

HLA - Human Leucocyte Antigen

Changes to document V1.0

Version 1.1

1. Addition of reference for massive transfusion Page 5