Evaluation of the *Learnbloodtransfusion* education programme[1]: Module 1 Safe Transfusion Practice

Scottish National Blood Transfusion Service

Dr Annetta Smith[2]
Dr Ruth Jepson[2]
Dr Iain Atherton[2]
Mr Larry Doi[2]
Alexandra Gray[3]
Elizabeth Pirie [3]

[1] Previously known as Better Blood Transfusion Continuing Education Programme
[2] School of Nursing and Midwifery and Health, University of Stirling
[3] NHS National Services Scotland

Acknowledgements

We are grateful to the all the NHS staff who took the time to participate in the survey and the interviews. Additionally, we would like to acknowledge the support provided by the team at the BBT who collated and managed participant information.

The views expressed in this report are those of the researchers and do not necessarily reflect those of the Scottish National Blood Transfusion Service.

Contact details for further information on the evaluation:

Dr Annetta Smith
University of Stirling,
School of Nursing, Midwifery and Health
Macaulay Road,
Stornoway,
HS1 2AF
Tel. (01851) 708250
e-mail as5@stir.ac.uk

Contents

Executive Summary

This report is an evaluation of the *Learnbloodtransfusion* (LBT) module 1 Safe Transfusion Practice. It relates findings from a survey and in-depth interviews carried out with module participants. Participants' knowledge of blood transfusions was tested, views were sought on transfusion practice and perceptions of module 1 were investigated. Those who took module 1 recently were compared with those who were at different time points post module, and comparisons were made between those that had done the eLearning version of module 1 with participants who had taken module 1 face-to-face.

Summary of the findings

- No difference was found in knowledge between those who took the course recently and those who were up to two years post module.
- Some evidence indicates a slight reduction in the degree of emphasis participants place on the importance of understanding aspects of transfusions as time lapsed.
- The main difference between eLearners and face-to-face learners related to whether or not they did module 1 in their own time; eLearners were more likely to take module 1 in their own time and less likely to receive protected time.
- The findings also highlight the value that practitioners attribute to module 1, in particular how module participation contributed to risk reduction regarding transfusion practice.
- Participants reported that they had a greater awareness of the risks around the transfusion process and suggested that they took steps to reduce those risks.

1. Terms of Reference

1.1 Commissioning

This review was commissioned and funded by Scottish National Blood Transfusion Service (SNBTS). However, the report contained in this document is the work of the authors and does not necessarily represent the views of SNBTS.

1.2 Evaluation of Module 1 of the LBT education programme

The core aim of the LBT education programme is to assist practitioners involved in the transfusion process to provide high standards of care and minimise risk to patients and practitioners.

The aim of this evaluation was to establish whether Module 1 Safe Transfusion Practice (henceforth referred to as module 1) improves practitioners' knowledge and understanding of, and attitudes towards, safe practice for patients undergoing blood transfusions. In addition, whether completing module 1 can minimise the risk of unsafe blood transfusion practice.

Objectives

- To establish practitioners' levels of knowledge, understanding and attitudes of safe practice for patients undergoing blood transfusions
- To establish how knowledge, understanding, and attitudes change over time since completing the module (if at all)
- To establish the perceived value of module 1 to practitioners
- To determine whether completion of module 1 by practitioners can minimise the risk of unsafe transfusion practice

Research questions

1. How is the knowledge, understanding, attitudes and practice of practitioners with regard to safe practice for patients undergoing a blood transfusion influenced by the amount of time elapsed since programme completion?

2. Were there differences in variables such as knowledge and attitudes between those who accessed module 1 via eLearning and those who accessed it face-to-face?

3. Was module 1 of value to the users / NHSScotland Boards?

We originally had a fourth research question which aimed to compare the knowledge, understanding, attitudes and practice of people who had completed module 1 with those who had never taken it. However, we were unable to identify a large enough sample of people who had never undertaken module 1. This was partly due to recruitment issues within NHSScotland at the time the evaluation was being conducted; there were significant reductions in the number of health professionals being recruited who would have completed module 1 as part of their induction training.

2. Methodology

The research used both quantitative and qualitative methods to obtain data to meet the objectives and the key research questions described. These are outlined in Table 1. The survey tools were designed by the researchers; a copy of the survey is included in appendix 1. The survey was initially piloted with over 100 NHS professionals and revised in the light of their comments.

Table 1: Research Questions and methods of data collection

Research Questions	Research Method
1. How is the knowledge, attitudes and practice of practitioners with regard to safe practice for patients undergoing a blood transfusion influenced by the amount of time elapsed since module completion ?	Survey
2. Were there differences in variables such as knowledge and attitudes between those who accessed module 1 via eLearning and those who accessed it face-to-face?	Survey
3. Was module 1 of value to the users/ NHS Boards?	In–depth telephone interviews

2.1 The survey instrument

A survey was designed by the researchers to answer research questions 1 and 2. The survey collected data on:

- the individual respondent, such as the NHS board in which (s)he worked, their profession and clinical speciality
- the mode of delivery of module 1 (eLearning or face to face), reasons for undertaking it, and whether they got protected time
- attitudes towards module 1 such as relevance, importance, value
- current practice such as how often they were involved in blood transfusions, whether safe transfusion was carried out, factors affecting good practice
- knowledge of blood transfusions (multiple choice questions adapted from module 1)

2.2 Participants and Sampling Strategy

Quantitative Sampling Strategy

Two groups were targeted to construct the sample, staff who had completed Module 1 Safe Transfusion Practice via eLearning and those who had attended a face-to-face session. For the eLearning and face-to-face cohorts a census approach to sampling was used. All practitioners who had completed module 1 were sampled at different time points post-completion (see Table 2). The eLearning cohort was identified using the *LearnPro* database and the face-to-face learners were identified from the BBT NHSScotland training database.

Table 2 Quantitative Sampling Strategy

Sample
Cohort 1 eLearning 6-8 weeks post completion of STP Module 1
Cohort 2 eLearning 12-14 months post completion of STP Module 1
Cohort 3 eLearning 22-24 months post completion of STP Module 1
Cohort 4 Face-to-Face 6 weeks – 24 months post attendance at STP Module 1 session

Qualitative Sampling Strategy

All participants in the questionnaire survey were asked if they were willing to participate in in-depth telephone interviews to gain a deeper understanding of their perceptions of the value of their learning. A random sample was selected from the responses which included different staff groups involved in the transfusion process (n=8). Interviews were also undertaken with a number of NHSScotland Hospital Transfusion Committee (HTC) Chairs (n=3). The interviews expanded on the information from the survey and provided depth of context and clarification of issues as necessary.

2.3 Data collection

Both paper and electronic versions of the survey questionnaire were created to promote wide participation. The electronic survey was administered via *SurveyMonkey*™ (http://www.surveymonkey.com/). Practitioners were provided with different URLs to access the survey depending on which cohort they were in. To increase the response rate, practitioners who completed the survey were invited to participate in a prize draw for a book token to the value of £100. The respondents were given 2 weeks to respond to the survey and then a reminder was sent out.

3. Introduction

3.1 Learnbloodtransfusion (LBT) Education Programme

The Department of Health Circular Blood Transfusion (MEL1999(9)) recommends that all staff involved in the transfusion process are supported by training and education. To support this recommendation in NHS Scotland (NHSS), the Scottish National Blood Transfusion Service (SNBTS) Better Blood Transfusion (BBT) team developed the *Learnbloodtransfusion* education programme. The programme includes three levels (modules) of study:

Module 1: Safe Transfusion Practice
Module 2: Blood Component Use
Module 3: Appropriate Transfusion Practice

Module 1 (evaluated in this research) is the foundation module of the LBT programme and covers the correct procedures for requesting, sampling, collecting, administrating blood components and monitoring the transfused patient. It is designed for all staff groups involved in the administration of blood components, including medical and nursing staff, operating department practitioners, clinical support workers and porters. Details of modules 2 and 3 can be found here http://www.learnbloodtransfusion.org.ouk

LBT uses a variety of teaching materials, and is delivered face-to-face and through eLearning. The eLearning content is supported by an online recording and assessment system (*LearnPro* NHS™) that records, tracks and reports on learner outcomes, namely the completion of modules and units. From a learner's perspective, the system offers the ability to print a certificate of achievement as evidence of their theoretical and/or clinical competence and the capability to manage their individual learner account.

In 2006, NHS Quality Improvement Scotland developed Clinical Standards for Blood Transfusion, and all Scottish hospitals were audited against these standards. The Standards state that only staff who have completed the LBT programme appropriate to their role should participate in the clinical transfusion process (NHS QIS, 2006).

The LBT programme was launched in 2004; the aim of this evaluation was to establish whether undertaking Module 1: Safe Transfusion Practice improved practitioners' knowledge and understanding of, and attitudes towards, safe practice for patients undergoing blood transfusions. In addition, whether module 1 could minimise the risk of unsafe blood transfusion practice.

3.2 Analysis of survey data

All data was imported into SPSS™ for data analysis. Analysis was carried out to address research questions 1-3 as follows:

Research Question 1 – How is the knowledge, understanding, attitudes and practice of practitioners influenced by time elapsed since module completion?
Only those who had completed module 1 by eLearning were included in the analysis to answer this research question. Responses were analysed comparing those 6-8 weeks since completing module 1 to those 12-14 months and those 22-24 months post completion.

Knowledge was tested with a series of multiple choice questions, options given included a correct answer, several incorrect answers, and an option for respondents to acknowledge that they don't know. Proportions in each group with correct answers, and who did not know, were compared to each other to ascertain whether increased time since module completion influenced responses.

Attitudes were assessed with a range of questions asking respondents to rate the importance of knowledge in relation to different aspects of blood transfusions. Again, the groups were compared to one another, this time to assess if increasing time from module completion was at all linked to a reduction in the degree of importance attached to knowledge.

Practice was assessed with various questions aimed at ascertaining if specific steps were taken to ensure blood transfusions were carried out safely. As with analysis of knowledge and attitude questions, groups were compared to ascertain if increased time after completing a module was associated with any indication of reduced thoroughness of practice.

Research Question 2 – Were there differences in variables such as knowledge and attitudes between those who accessed module 1 via eLearning and those who accessed it face-to-face?

As well as knowledge and attitudes, various questions were asked of respondents relating to whether module 1 was attended in their own time, and whether learning needs were met. We compared responses based on the mode of module delivery (eLearning and face-to-face).

3.3 Analysis of telephone interviews

The main aim of the in depth interviews was to answer Research Question 3 - *Was module 1 of value to the users / NHS Boards?*

The interviews expanded on the information from the survey and provided depth of context and clarification of issues as necessary. Interviews were conducted with health care practitioners who represented different groups of staff involved in transfusion

practice (n=8) and with NHS Boards Hospital Transfusion Committees (HTC) chairs who were asked about their perception of the value of the LBT education programme module (n=3).

Informed consent was obtained either prior to the interview, or verbally (and recorded) at the time of the interview. The in-depth telephone interviews were audio-recorded and transcribed and analysis facilitated by use of NVivo^{TM}. Analysis was guided by the research aim and questions but open coding also allowed for new themes to emerge.

3.4 Ethical approval

The evaluation received ethical approval from the School of Nursing, Midwifery & Health (University of Stirling) Ethics Committee. All research is required to seek clearance from the School Ethics Committee, which complies with the requirements of the ESRC (Economic and Social Research Council) Research Ethics Framework. The Committee includes an independent Chair and lay representation. Details of the procedures are available at http://www.dass.stir.ac.uk/research/ethics/. As this was an evaluation study, advice was sought and approval gained from the NHS South East Scotland Research Ethics Service.

Embedded in the electronic survey was a short consent form which responders had to complete before filling in the survey. Participants who completed the paper version also completed a short consent form.

3.5 Confidentiality and anonymity

Confidentiality and anonymity was maintained throughout the study. For the survey, all data was anonymised. For the qualitative interviews, any quotes used in reports and publications were not attributable to any individual participant. Transcribers employed on the project were required to observe confidentiality.

3.6 Data Handling

We fully complied with the terms of the Data Protection Act 1998. All data was held on a secure, password protected University computer. The analysis took place on University of Stirling computers. Both the survey data and the qualitative data will be retained in a secure archive setting for 6 years to facilitate future analysis and publication of the study material.

4. Analysis of Findings

4.1 Overview of survey participants

Once we excluded anyone who did not indicate agreement to participate on the survey forms (n=34), a total of 678 responses remained. The specific groups from which these were drawn are shown in Table 3. The largest response, unsurprisingly, came from those who had most recently completed the eLearning module (44.4% of the entire sample), fewest from those who had completed module 1 22-24 months previously (12.2%). Those who done the face to face version of module 1 constituted a little over a fifth of the sample (20.6%).

Table 3: Numbers participating in survey by mode of delivery

Mode of delivery	Sampled	Responders		Response rate
	N	n	%	%
ELearning				
6-8 weeks post module	1227	301	44.4	24.5
12-14 months post module	882	154	22.7	17.5
22-24 months post module	610	83	12.2	13.6
Face to face	1000	140	20.6	14.0
Total	3719	678	100	18.0

As shown in Table 4, responses were drawn from a range of practitioners, specialties and Health Boards. Unsurprisingly, given the geographical distribution of the Scottish population, most respondents were drawn from Greater Glasgow Health Board (23.7% of all responses) with the fewest from the Western Isles (0.4%). Most respondents were nurses (62.1%) but also included doctors (4.9%), midwives (6.5%), operating department practitioners (1.8%), health care assistants (4.6%) and porters (2.4%). Visual inspection of responses to the 'other' category, which included a notable proportion of responses, indicated that many of these were undergraduate nurses. Undergraduate nurses and midwives are expected to complete module 1 during their pre-registration programme and it is not surprising that they were well represented in the respondents. Areas worked in also encompassed a cross-section of NHS specialties, with medical (12.2%), theatre (13.1%) and surgical (8.6%) being particularly well represented. Again, visual inspection of entries for the 'other' category demonstrated that many of these were undergraduate nurses who work in different areas depending on practice placements.

Responses also indicated reasons why participants had taken module 1. Respondents were offered six different options plus an 'other' option and could identify as many as they considered relevant. The main reason indicated was prompting by a line manager (46.4%) followed by their considering module 1 as a Continuing Professional Development requirement (26.2%). Prompts were also received from transfusion link trainers (12.7%), e-mail prompts from the *LearnPro*™ system (10.0%) and e-mails or letters from transfusion practitioners. 'Other' reasons indicated included module 1 being a requirement for nursing undergraduates, a recommendation by a Health Board that GPs working in community hospitals should have the training, and setting a personal example.

Respondents were also likely to be carrying out activities relating to blood transfusions on a regular basis. More than a quarter of respondents (27%) who indicated frequency of involvement identified that they were involved in transfusions at least on a weekly basis. A further quarter (28%) indicated at least monthly involvement.

The importance of formal and informal systems to support module participation was highlighted in the interviews. Most of the participants who were interviewed identified designated staff that had responsibility for co-ordinating, promoting and facilitating participation. These included transfusion trainers, individuals from training departments and ward based staff. It is interesting to note that examples were given of informal support systems where ward staff assisted colleagues who were less familiar with eLearning systems to get set up with module 1.

Table 4 – Overview of survey participants

Total no. respondents by group	n	%		N	%
6-8 weeks post module	301	44.4	22-24 months post module	83	12.2
12-14 months post module	154	22.7	Face to face group	140	20.6
Total	678	100			
Health Board	**n**	**%**		**N**	**%**
Ayrshire & Arran	30	4.4	Highland	48	7.1
Borders	11	1.6	Lanarkshire	33	4.9
Dumfries & Galloway	26	3.8	Lothian	78	11.5
Fife	26	3.8	Orkney	9	1.3
Forth Valley	70	10.3	Shetland	11	1.6
Grampian	101	14.9	Tayside	56	8.3
Greater Glasgow	161	23.7	Western Isles	3	0.4
Missing	15	2.2			
Total	678	100.0			
Role	**n**	**%**		**N**	**%**
Biomedical scientist	25	3.7	Midwife	44	6.5
Biomedical support worker	3	0.4	Operating Department Practitioner	12	1.8
Qualified doctor	33	4.9	Nurse	421	62.1
Foundation year 1 trainee	2	0.3	Phlebotomist	3	0.4
Foundation year 2 trainee	3	0.4	Porter	16	2.4
Health care assistant	31	4.6	Other	64	9.4
Missing	21	3.1			
Total	678	100.0			
Main area of work/department	**n**	**%**		**n**	**%**
A/E	22	3.2	Haematology	35	5.2
Agency/bank	6	.9	medicine for the elderly	33	4.9
Children and young people	7	1.0	Obstetrics & gynaecology	38	5.6
Community based	27	4.0	Oncology	15	2.2
Critical care	49	7.2	Orthopaedics	21	3.1
Medical	83	12.2	Portering department	12	1.8
Neonatal	20	2.9	Theatre	89	13.1
Surgical	58	8.6	Other	149	22.0
Missing	14	2.1			
Total	678	100.0			

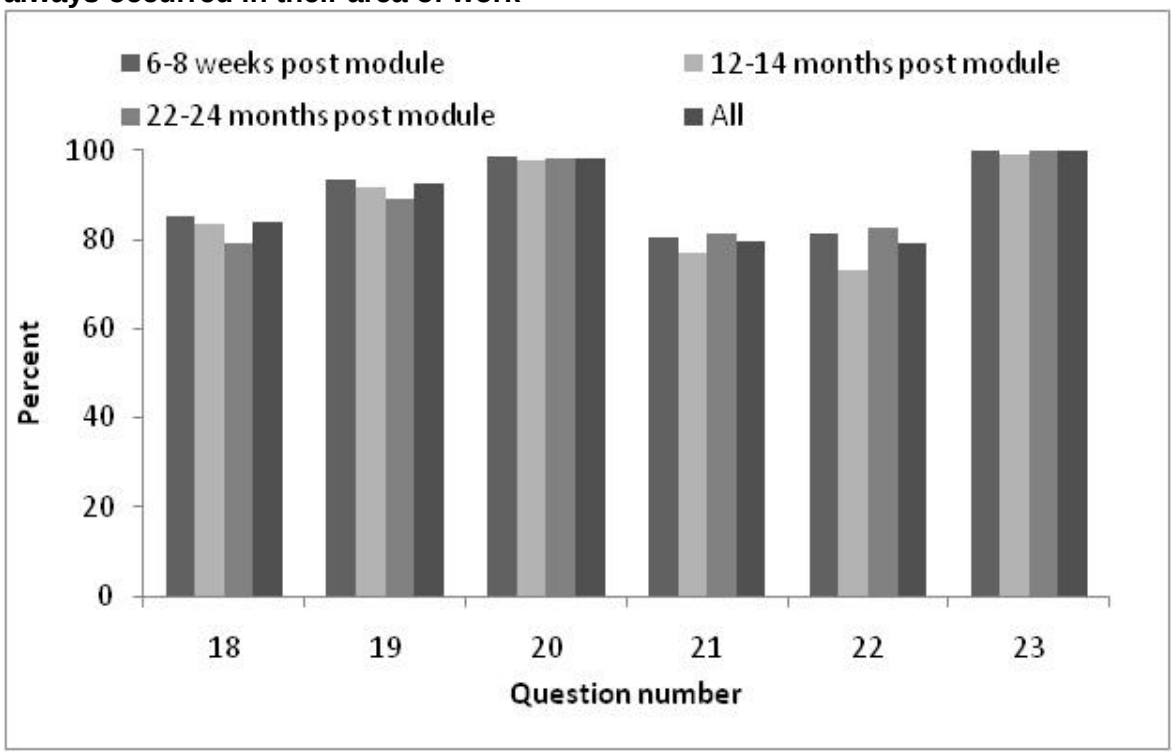
4.2 Perceptions of Current Transfusion Practice

Participants were asked six questions that aimed to ascertain how often, in their

experience, blood transfusion practice fell short of recommended practice. Options enabled respondents to indicate whether a particular practice occurred all the time, above 80% of the time, 60-80% of the time and so forth down to 'never'. A 'not relevant to my role' option and 'other' option were also provided. Analysis of those responding using the 'other' category, in which respondents could indicate why they had chosen this option, indicated that most had used it for reasons of the question not being relevant (e.g. were not involved in that part of the transfusion process). Analysis was thus able to focus only on participants who saw the questions as relevant to them.

Any answer that indicated the participant did not believe the practice occurred all of the time is a concern. Analysis thus focussed on proportions of those who perceived practice in their area to, on occasions, fall short of the ideal. Figure 1 shows the percentages indicating that they believed a practice to always occur in their area of work (that is, ticking the 'always' option).

Figure 1 – Percentage of eLearner respondents who perceive ideal practice always occurred in their area of work



Proportions indicating ideal practice are high for each question. Question 21 and 22 had the lowest proportion indicating ideal practice, question 21 asking if full patient/component checks were always done in an emergency situation; however, even here 79% indicated belief that good practice would still always occur.

Statistical analysis comparing proportions in each time period indicating good practice 100 percent of the time found no significant difference between groups. The same finding held for all six of these practice questions. Responses provide no evidence to indicate deteriorating practice associated with time since module completion.

All participants who were interviewed also confirmed that transfusion practice reflected

established protocols (and as described in module 1) and did not deviate even in emergency situations. The following comment was typical of observations made about existing practice and suggests positive perceptions prevailed amongst respondents

> *'Practice and protocols as described in module 1 are adhered to including emergency blood and always adhered to regardless of circumstances. We have major haemorrhage protocols and module information fits into that.'*

Comparison of eLearner to face-to-face responses to questions 18-23, indicated no significant differences. Those who did module 1 were equally as likely to report ideal practice all of the time as those who had taken module 1 face-to-face.

It is however concerning that whilst peoples' perception is that current practice is safe and protocols are adhered too, potentially one in five patients may be at risk of an adverse event occurring because satff have failed to follow the correct procedures.

4.3 Perceptions of module content

Several questions in the survey were designed to elicit attitudes to aspects of blood transfusions covered in module 1. One set of questions asked respondents how important they viewed knowledge on particular aspects relating to blood transfusions. Participants could indicate how important each aspect was ranging from very important down to not important at all. Their responses are shown in Table 5.

High proportions of respondents regarded each of the aspects questioned about as being very important. 'Procedures for administering a blood transfusion safely' and 'monitoring of a blood transfused patient' were viewed as being very important by especially high percentages of respondents, over 90% in both cases amongst those 6-8 weeks post module completion.

Table 5 – Attitudes of eLearners to knowledge of blood transfusion by time since completing module

How IMPORTANT do you think it is for you to know about the following:	Period post module	Very important	Quite important	Neither important nor unimportant	Not important	Not important at all	p
Different blood components	6-8 weeks	84.3	13.9	1.1	0.0	0.7	0.32
	12-14 months	80.0	17.2	2.1	0.7	0.0	
	22-24 months	78.4	16.2	5.4	0.0	0.0	
Blood requesting procedures	6-8 weeks	84.0	11.7	3.2	0.4	0.7	<0.01
	12-14 months	73.9	20.4	3.5	1.4	0.7	
	22-24 months	78.7	15.3	4.2	0.6	1.2	
Procedures for pre-transfusion blood sample testing	6-8 weeks	77.0	14.8	5.3	1.8	1.1	<0.01
	12-14 months	62.8	24.8	9.7	2.1	0.7	
	22-24 months	70.3	19.8	6.6	1.8	1.6	
Blood component storage	6-8 weeks	86.2	10.3	2.1	0.7	0.7	0.25
	12-14 months	83.2	11.2	3.5	0.7	1.4	
	22-24 months	78.4	16.2	5.4	0.0	0.0	
Transfusion administration	6-8 weeks	91.9	2.8	2.5	1.8	1.1	0.37
	12-14 months	90.3	4.9	2.8	0.7	1.4	
	22-24 months	86.3	6.8	4.1	0.0	2.7	
Monitoring transfusion patient	6-8 weeks	92.6	3.9	1.1	1.4	1.1	0.04
	12-14 months	90.3	5.6	2.8	0.0	1.4	
	22-24 months	82.4	10.8	4.1	0.0	2.7	

***** Responses were coded 1 (very important) to 5 (not important at all). A Kruskal-Wallis test applied to ascertain whether differences between groups were statistically significant.

Table: 6 Attitudes to importance of knowledge relating to pre-transfusion blood sample testing by role

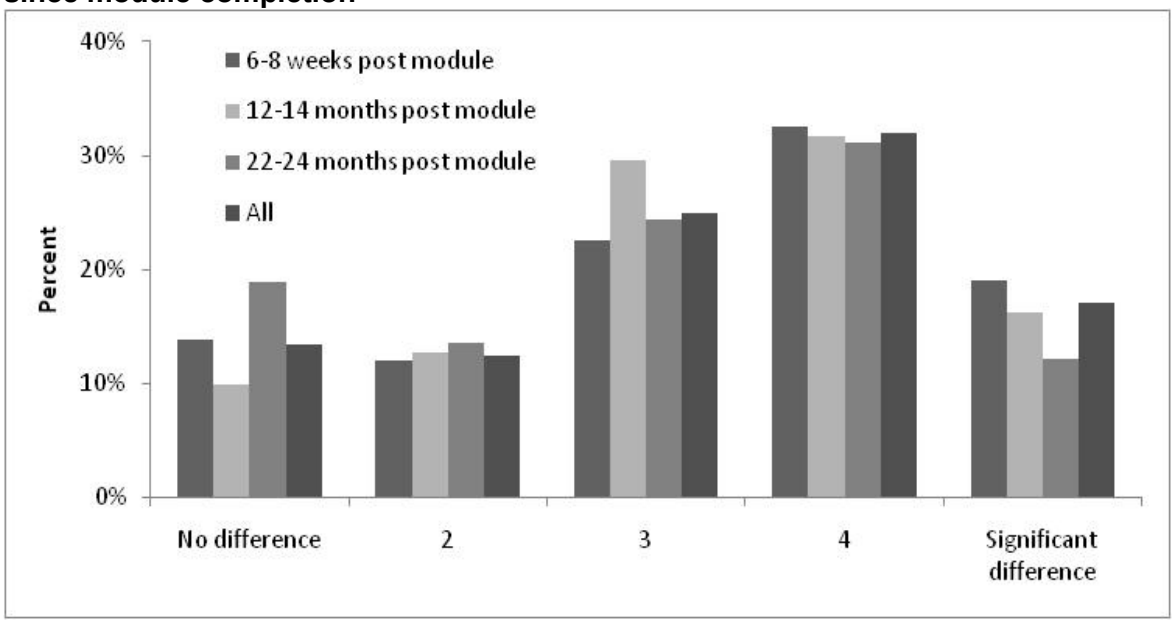
Role	Very		Quite		Neither important nor unimportant		Not		Not at all		Total	
	no.	%	no.	%	no.	%	no.	%	no.	%	no.	%
Biomedical scientists and phlebotomists	23	77	4	13	1	3	0	0	2	7	30	100
Qualified doctors	23	72	7	22	0	0	1	3	1	3	32	100
Health care assistants and porters	33	77	5	12	4	9	1	2	0	0	43	100
Nurses (including student nurses)	317	79	64	16	17	4	3	1	2	0	403	100
Midwives	33	77	7	16	3	7	0	0	0	0	43	100
Other (including foundation year and operating practitioners	63	85	8	11	1	1	2	3	0	0	74	100
Total	492	79	95	15	26	4	7	1	5	1	625	100

Table 6 shows how important participants believed knowledge of pre-transfusion blood sample testing is according to their roles. The table indicates little difference between groups with the majority perceiving this aspect to be at least quite important. At least 90% of respondents in each category indicated the issue to be *quite* or *very* important. This said, arguably even small percentages perceiving this to be not important is of concern. Conversely, those indicating little importance may well be working in areas where they are not involved in this specific procedure. That being the case, attaching little significance to this activity would be unsurprising.

Notably, for all but one of the aspects indicated, time since completion was associated with a decline in proportions who considered knowledge to be very important. When responses were ranked, added and compared, two of these trends were shown to be statistically significant. Respondents were more likely to rate knowledge of blood testing procedures and procedures for pre-transfusion blood sample testing higher if they had completed module 1 more recently ($p<0.01$ in both cases). Whether this indicates a lowering recognition of the importance of such knowledge or a more reflective attitude in light of time passed is open to question. The finding, however, provides support for the need to have updates on blood transfusing to maintain importance of different aspects of transfusion practice in the mind of practitioners.

One question provided further indication as to perceptions relating to module 1 and practice by those completing module 1 by eLearning. This question asked respondents to rate how much they believed module 1 to have made a difference to their practice. Responses ranged from 1 (no difference) to 5 (significant difference). Figure 2 provides a visual impression of the responses by the time since module completion.

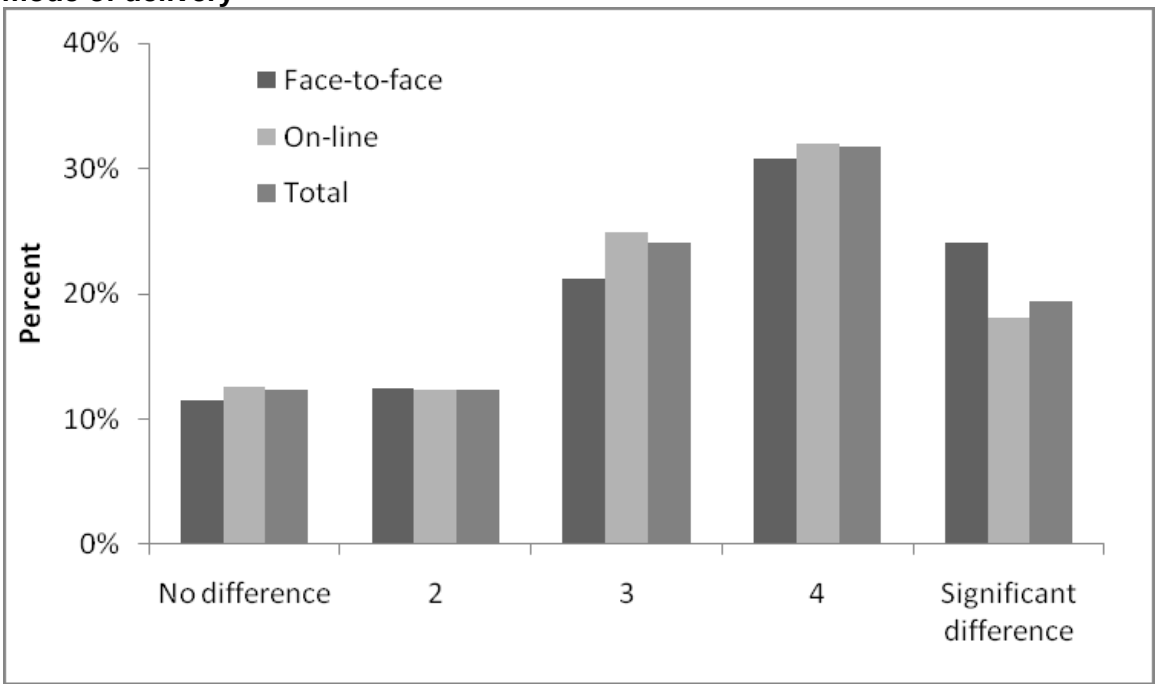
Figure 2 – On a scale of 1-5, how much difference do you think the Safe Transfusion Practice Module 1 has made to your practice? Responses by time since module completion



The modal response, regardless of time since module completion, was 4. That respondents tended towards the 'Significant difference' end of the scale indicates a perception that module 1 made a notable difference to practice. Statistically, no significant difference was evident between the three groups. Even after up to two years had passed, respondents still viewed module 1 as having made a considerable difference to their practice. Time did not appear to reduce their view as to the difference module 1 had made.

Figure 3 shows proportions of respondents responding to the practice question (Question 25) which asked them to rate the extent to which they believed Module 1 had influenced their practice. Most respondents tended towards indicating that module 1 had made a notable difference, the modal response being a score of 4. No significant difference was found when those who had previously taken module 1 by eLearning were compared to those who had done it face-to-face (p=0.72).

Figure 3 – Extent to which Module 1 perceived to have influenced practice by mode of delivery



These responses suggest that the impact of module 1 on practice is equivalent regardless of whether it was taken by eLearning or face-to-face. As was discussed earlier, the questions do indicate perceptions and these may differ from actual practice. Nonetheless, the lack of difference between modes of delivery provides indication that how module 1 was delivered did not affect the degree to which practice was influenced.

Qualitative interviews suggested that practice did improve as a result of taking module 1, the suggestion being that reflective consideration and its demonstration in practice was a prominent issue. One manager described how ward staff who had completed module 1 demonstrated practice change,

> *'They make reference to information that was in module 1 and are more questioning about practice. They also question other peoples' practice'*

Participants were not aware of practice changes resulting from module participation; this finding is not surprising as they had confirmed in both the survey and interviews that transfusion practice did reflect established protocols. However it is important to note that data from the qualitative interviews highlighted how module 1 had helped to emphasise the concepts of safety and risk reduction with transfusion practice. For example, participants who were interviewed suggested that module participation reduced the risk of complacency, and emphasised the importance of checking procedures, blood group compatibility and patient observations. Examples of practice that highlighted increased risk awareness were given by a nurse and midwife,

> *'Most people are more aware if they see someone with blood products in their hand and are now less likely to distract them'*

> *'I am more aware of the risks and not so easily distracted when looking after someone with transfusion.'*

Furthermore there was recognition that when staff undertook module 1 self-confidence improved. The interview participants who had direct patient contact stated that they

were more confident looking after transfused patients after acquiring recent knowledge from module 1 and better understood the rationale which underpinned the actions they implemented in practice.

Analysis of qualitative interviews supports the findings from the survey data and further provides evidence of ways in which module 1 has been useful for underpinning both transfusion knowledge and practice. The interviews affirmed positive perceptions of module 1s' relevance, with module 1 being described as being 'very relevant to practice' and 'reflective of the reality of practice'. Notably participants stated how module 1 updated and reinforced existing knowledge for experienced staff and helped to develop knowledge and learning for newer staff groups, including clinical support workers. The following observation from a nurse summarises general perceptions of module 1,

> *'The area I work in has a lot of transfusions and you need to keep up-to-date with current practice. The main advantages of module 1 are that it stays very fresh in your mind and keeps you aware of main issues.'*

Hospital Transfusion Committee Chairs (HTC) chairs described module 1 as relatively straightforward, appropriate for everyone and their transfusion responsibilities. They expressed the opinion that module 1 should not be any more complicated than it was. The generic nature of module 1 was mainly perceived as advantageous because it standardised training and ensured that all those who completed it had access to the same information. It was also suggested that it fostered a unified and consequently safer approach to transfusion practice.

While it was acknowledged that module 1 was useful revision for senior medical staff it was regarded as being basic, and it did not assist them with the transfusion decisions they were required to make in the course of their practice. One haematologist observed,

> *'Because in general I think they (senior medical staff) are more involved with decisions to use blood and blood components and they find that amongst the mass of the many other hundred things to do it really is at a very basic level.'*

This perspective however, was not shared by all for example, one HTC chair maintained that anyone involved in blood transfusion in any way should undertake module 1. Comments about participation included,

> *'That does not mean that they (senior medical staff) always get in right because a lot have said that they have completed most of the stuff and they have repeated it to get a better mark.'*

> *'It is relevant to practice, even if people who do it don't think they should do it that is because they are not actually thinking about what they need to know'.*

As a result of the perception that the module content was basic, it was reported that some senior medical staff were unwilling to participate in it. The learning aspects that senior medical staff thought of as more relevant to their needs are covered in modules 2 and 3. Suggestions to increase compliance for this group included; combining the information from the 3 modules, focusing on key areas of information that are relevant to senior medical staff practice and emphasising information that will help with practice decisions, for example alternatives to transfusion and blood component information.

There was agreement that module 1 was of value to junior medical staff who may not always cover the module aspects in their undergraduate curriculum, and the requirement for them to understand principles of safe transfusion practice was highlighted.

One HTC chair was of the opinion that it was mainly registered staff such as nurses who undertook module 1 with few, if any, health care assistants (HCA), portering or non clinical staff involved. This perception may reflect differences in working practices across Board areas and between clinical specialities, or it may reflect a lack of understanding by the interviewee.

Differences in the role that health care assistants (HCA) have in blood transfusion practice emerged from the interviews. One of the interviewees noted that HCA's were not involved in transfusion practice in maternity care and therefore were not expected to complete module 1. However, other interviewees described the importance of HCA participation in module 1. In an area where HCA had undertaken module 1, the benefits were highlighted by the nurse manager,

> *'Since all staff do module 1 including clinical support workers everyone is aware of protocols and risks. Has been particularly useful to clinical support workers, as they are more informed about patient monitoring and this heightened awareness and detecting problems. Everybody does it and it is great that support workers are aware of it as well.'*

This involvement was reinforced by one HCA who was not directly involved in the care of a patient on blood transfusion but who worked in a clinical area where transfusion was commonplace and observed,

> *'I may not administer the products but by doing all of module 1 including the administration scenarios it allows me to understand better what goes on so it enhances my knowledge.'*

This participant noted that although he was not responsible for patient monitoring when someone was having a blood transfusion, he would notice if a patient experienced a reaction. He also described his involvement in transfusion procedures, such as blood collection.

Two interview participants who had advanced knowledge of haematology commented on module 1 content. One had fed back comments about inconsistencies with module information and had made suggestions, which had been responded to. One had disagreed with a technical point with one of the answers given in module 1 and suggested that opportunity for user feedback would be useful. However, it is important to note that opportunity for feedback has been an existing feature of module 1.

4.4 Method of module delivery

The analysis and results of this section compare the responses of participants who were asked how module 1 was delivered last time they took it. Of the 501 participants who answered this question, 393 (78.4%) indicated they had taken it online and 108 (21.6%) indicated they had taken it face to face.

Participants were asked a range of questions ascertaining information about their experience of module 1. These questions were asked firstly for those who did module 1 face-to-face and then for those who did the eLearning module. Responses to these questions are shown in Table 7 where those who completed eLearning are compared and contrasted to those who took it face-to-face.

Table 7 – Experience of module: comparison of eLearners to face-to-face learners

Question	Face-to-face	eLearner
Did you get protected time?	79.6	29.7
Did you attend the session in your own time?	24.1	58.0
Did the content meet all your learning needs?	90.0	93.7
Did you have an opportunity to consolidate your learning?	89.3	78.4
Did you experience IT difficulties?	na	20.8

Those who took module 1 face-to-face were more likely to have received protected time in order to do module 1 compared to eLearners (79.6% as opposed to 29.7% respectively). As a result, most eLearners (58.0%) did module 1 in their own time. Over 90% of eLearning and face-to-face learners felt that module 1 had met their learning needs.

When the five knowledge questions were added up the eLearners scored 4.1 compared to 3.9 by face-to-face learners, a difference which was not statistically significant (p=0.17). Proportions answering each question correctly were high.

In relation to attitudes, again there was no appreciable difference between eLearning and face-to-face learners in response to the question in which respondents were asked to rate the importance of knowledge regarding different aspects of blood transfusing. What differences existed were not statistically significant. As noted in relation to time since module completion, the highest proportions indicating *very important* occurred for knowing procedures for administering a blood transfusion safely (89.6% of face-to-face learners) and for knowing how to monitor a blood transfused patient (90.6% of face-to-face learners saw this as *very important*, as did 88.9% of eLearners).

All the participants who agreed to be interviewed had completed the eLearning version of module 1. Comments about the eLearning presentation format of module 1 were very positive, with all interviewees stating that this would be the preferred approach to module participation. Access to module 1 was mainly described as straightforward, once email accounts had been verified. The creation of individual email accounts was described as being the most problematic part of the whole process. One manager indicated that restricted computer access due to the limited amount of computers in ward areas and the need to leave them free for ward use during the day meant that

most staff accessed module 1 during evening or nights shifts.

Participants described how they were able to methodically work through module 1 and were mainly very confident using the eLearning approach. It is however, important to note that one manager described how in her practice area staff had demonstrated different levels of confidence with eLearning. As some staff had more limited experience of eLearning they were supported by colleagues who were more experienced. However, once access problems to module 1 were overcome and staff started to work through module sections they reported module 1 as easy to use.

The face-to-face option was described as more resource intensive than eLearning, requiring staff to leave practice areas at prescribed times. In contrast, the flexibility of eLearning meant that participants could undertake module 1 at a time that was convenient to them and to their practice area. This flexibility was regarded as being particularly beneficial both from the individuals and the mangers perspective as module 1 could be done at a time that suited practice. One manager described how staff with on-line access could use 'peaks and troughs' to take advantage of completing module 1 in quieter periods therefore making module involvement easier to manage. Examples were given where module input occurred during quieter periods in practice,

> *'I can do it in down time when it is a bit quieter when I have spare 5 minutes and can go back to each part'*

In contrast to the survey responses all but one of the interviewees completed module 1 in practice time. This was possible as staff could take advantage of quieter periods and were able to 'dip in and out' of module 1 as circumstances permitted. However one manager noted that although the majority of staff had completed module 1 in the ward, this was because it had been new to them and thought that more would complete further updates at home as they became familiar with module 1 and delivery method. A midwife noted,

> *'There is not enough time at work as too much going on… at home can do it in my own time in peace.'*

The majority of interview participants agreed that protected time should be given, while a nurse and midwife suggested that they had a certain level responsibility for their own updating and would not necessarily seek protected time to complete module 1.

4.5 Knowledge and Understanding

We were able to analyse time since response with participants who had completed the eLearning module as we were able to target people at particular periods post completion. eLearning respondents were asked five multiple choice questions relating to the safe administration of blood transfusions. Specific questions and the percentages answering them correctly, who don't know, or who did not answer the question amongst those who responded to the electronic survey are shown in Table 8.

Analysis indicated no difference in responses based on time since completing module 1; the majority of participants answered questions correctly regardless of how long since they had finished module 1. Perhaps more importantly, proportions answering incorrectly were very small; *i.e*. some respondents recognised they did not know the answer and indicated this by ticking the 'don't know' option.

Comparison of the three groups indicated no statistically significant differences. Proportions knowing which blood group O RhD negative appear to increase with

greater time since module completion. However, this trend is not statistically significant (p=0.13).

A little over 40% of respondents in each group answered all five questions correctly with over 75% answering at least 4 out of 5 correctly. There was no statistical difference in total scores achieved by respondents in each group (p=0.92)[2].

Table 8 – ELearners' responses to multiple choice knowledge questions by time passed since module completion

Question:	Time post module	Correct		Incorrect		Did not know		Total		p*
		n	%	n	%	n	%	n	%	
Which blood group can be considered safe for transfusing someone who is Group, RhD negative?	6-8 wks	215	86.0	26.0	10.4	9	3.6	250	100	0.13
	12-14 m	116	88.5	8.0	6.1	7	5.3	131	100	
	22-24 m	64	92.8	1.0	1.4	4	5.8	69	100	
	Total	395	87.8	35.0	7.8	20	4.4	450	100	
What is the maximum amount of time a unit of red blood cells can be out of controlled storage temperature before the transfusion is completed?	6-8 wks	172	70.2	68.0	27.8	5	2.0	245	100	0.93
	12-14 m	88	66.2	37.0	27.8	8	6.0	133	100	
	22-24 m	48	70.6	17.0	25.0	3	4.4	68	100	
	Total	308	69.1	122.0	27.4	16	3.6	446	100	
What action should be taken where a red blood cell component has been out of the fridge for 40 minutes and the patient is going to be delayed for a further hour?	6-8 wks	179	73.4	58.0	23.8	7	2.9	244	100	0.25
	12-14 m	102	76.7	22.0	16.5	9	6.8	133	100	
	22-24 m	47	69.1	17.0	25.0	4	5.9	68	100	
	Total	328	73.7	97.0	21.8	20	4.5	445	100	
What is the most common cause of an incompatible blood transfusion?	6-8 wks	230	92.7	13.0	5.2	5	2.0	248	100	0.86
	12-14 m	117	87.3	6.0	4.5	11	8.2	134	100	
	22-24 m	61	89.7	2.0	2.9	5	7.4	68	100	
	Total	408	90.7	21.0	4.7	21	4.7	450	100	
Mr A is receiving a red cell transfusion and 10 minutes after the unit has commenced he complains of shortness of breath - what action should be taken?	6-8 wks	236	94.8	13.0	5.2	0	0.0	249	100	0.98
	12-14 m	122	93.8	8.0	6.2	0	0.0	130	100	
	22-24 m	65	97.0	2.0	3.0	0	0.0	67	100	
	Total	423	94.8	23.0	5.2	0	0.0	446	100	

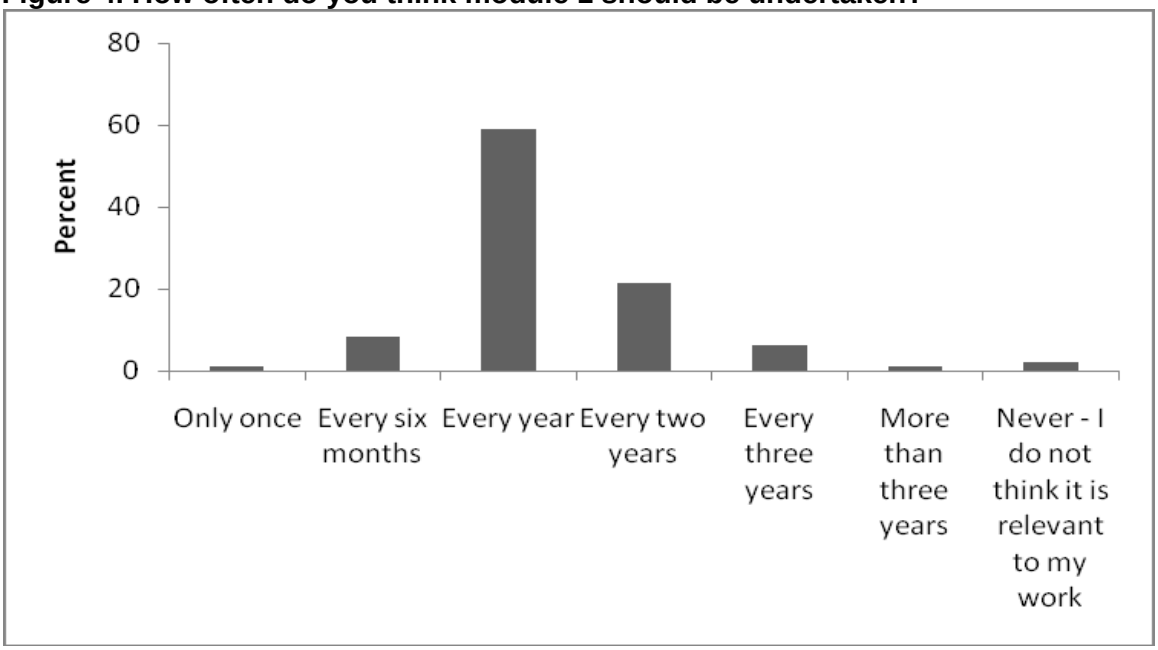
***** p values taken from Chi-square test for trend comparing proportion answering questions correctly across the three groups

[2] P value calculated using Kruskal-Wallis Test

4.6 Module Re-validation

All respondents, those responding to the electronic and paper survey questionnaires, were asked how often they felt module 1 should be undertaken, responses ranging from never to every six months. The responses and proportions indicating their preferred option are shown in Figure 4. The majority of participants (59.0%) believed an annual update to be appropriate, followed by a notable proportion (21.5%) who indicated every two years. Fewer than 10% of all responses indicated any of the other options. A considerable proportion of respondents thus believed module 1 should be done every 1-2 years.

Figure 4. How often do you think module 1 should be undertaken?



There were varied views from the interview participants about the frequency that module 1 should be undertaken. These ranged from every 6 months to the more commonly suggested biennial updates. One participant felt that module 1 should be done every 6 months particularly when staff are not working with transfusions on a regular basis. However, the majority felt that two yearly updates would be the ideal and could provide the opportunity for update of practice changes. Reference was also made to the value of module 1 for 'refreshing' knowledge. The following comment summarises the perceptions of frequency for module update,

> *'We should do module 1 every two years, more frequent than that would be a waste of time and further away and people might start to forget things*.'

5. Conclusions

5.1 Summary of findings

The aim of this evaluation was to establish whether Module 1 improves practitioners' knowledge and understanding of, and attitudes towards, safe practice for patients undergoing blood transfusions. In addition, whether module 1 can minimise the risk of unsafe blood transfusion practice. This section provides a summary of the key findings.

Research Question 1 investigated how the knowledge, understanding, attitudes and practice of practitioners with regard to safe practice for patients undergoing a blood transfusion influenced by the amount of time elapsed since programme completion. The survey data indicated that there was no degradation of knowledge over the period surveyed with all the cohorts. However, survey data indicated that participants who took the survey more recently were more likely to place greater importance on knowing particular components such as sampling procedures. Interview data also supported the value participants placed on updating and refreshing knowledge via module 1. Both survey and interview data indicated that respondents favoured a maximum two yearly update intervals.

A high proportion of participants suggested that observed practice reflected the theoretical content of module 1.

Research Question 2 investigated whether differences existed in variables such as knowledge and attitudes between those who accessed module 1 via eLearning and those who accessed it face-to-face. The survey found no difference between eLearning learners and face-to-face learners regarding knowledge retention. The mode of module delivery was not associated with any marked differences in knowledge, practice or attitudes. The main difference found was that those who undertook module 1 by eLearning were more likely to do so in their own time reflecting the greater flexibility and accessibility offered by electronic delivery

Research Question 3 reviewed module 1 value to the users and NHS Boards. The content of module 1 was seen as being important for practice. Module 1 had increased the awareness of the risks around transfusion procedures and learners had the understanding that they could take steps to reduce these risks in their own practice and the practice of others involved in transfusion. Because staff that completed module 1 and had access to the same information, the degree of reliability this afforded to all people involved in transfusion practice was valued and seen to promote more consistent and thus safer practice. Module 1 was mainly regarded as relevant for all healthcare workers involved either directly or indirectly in transfusion practice. Whilst there was general agreement to support the participation of all staff, there were mixed views on whether module 1 is appropriate for all senior medical staff. These views were not about module 1 content per se but were about the transfusion knowledge required to underpin decision making at an advanced level of medical practice.

5.2 Recommendations

Based on the evaluation results (both from the survey and the interviews) we make the following recommendations:

- eLearning offers greater flexibility but is often undertaken in the participants' own time. SNBTS and the NHS may wish to consider ways of incorporating it into staff work time
- Although knowledge and safe practice did not appear to diminish over time

since taking module 1, there is evidence that attitudes did change. The respondents themselves all wanted to complete module 1 on at least a 2 yearly basis. Completing it more frequently may help to ensure that that there is a continuing culture of safe practice. A 2-year revalidation period is recommended.

- Whilst there was mainly agreement that module 1 is relevant to all staff who participate in transfusion practice, a requirement to create clear learning pathways, and/or signpost the relevant modules /units that would support **all** learners' knowledge requirements is recommended.
- The BBT continue to support both eLearning and face-to-face delivery and consideration given the ongoing resource required to support delivery of both methods

5. References

NHS Quality Improvement Scotland *Clinical Standards for Blood Transfusion* 2006
http://www.healthcareimprovementscotland.org/home.aspx

Scottish Executive Health Department *Better Blood Transfusion*. Health Service Circular Management Executive Letter (1999(9)

6. Appendices

Questionnaire

1. I understand that my participation in this survey is voluntary and that I am free to stop filling in the survey at any time, without giving a reason.

2. I understand that my data will only be used for the purpose of this project and to inform future developments of Scottish National Blood Transfusion learning resources. It will not be passed onto any 3rd party.

3. I agree to take part in the survey

4. In which health board do you work?

- Ayrshire & Arran
- Borders
- Dumfries and Galloway
- Fife
- Forth Valley
- Grampian
- Greater Glasgow & Clyde
- Highland
- Lanarkshire
- Lothian
- Orkney
- Shetland
- Tayside
- Western Isles

5. What is your role?

- Biomedical scientist
- Biomedical support worker
- Qualified Doctor
- Foundation year 1 trainee
- Foundation year 2 trainee
- Health Care Assistant
- Midwife
- Nurse
- Phlebotomist
- Porter
- Operating Department Practitioner
- Other (please specify)

6. If you have a professional qualification (e.g. RN, MBChB) what year was it obtained?

7. What is you MAIN area of work/department?

- A/E
- Agency/bank
- Children & young people
- Community based
- Critical care
- Medical
- Neonatal
- Surgical
- Haematology
- Medicine of the Elderly
- Obstetrics & gynaecology
- Oncology
- Orthopaedics
- Portering Department
- Theatre

8. Have you undertaken Module 1 Safe Transfusion Practice before?

- Yes
- No, this will be my first time
- Not sure

9. If yes, how was the module delivered last time?

- Face-to-face
- On-line
- Can't remember

10. If you took the module face-to-face, what difficulties (if any) did you encounter?

- ☐ Difficulty in obtaining time off to attend
- ☐ Doing it in my own time
- ☐ Finding the content too difficult
- ☐ Other please specify)

11. If you undertook the module on-line, what difficulties did you encounter (if any)?

- ☐ Having to do it in my own time
- ☐ Difficulty in getting access to a computer
- ☐ Getting uninterrupted time in which to do it
- ☐ Being unfamiliar with on-line learning
- ☐ Being unfamiliar with computers
- ☐ Other (please specify)

12. How will you be undertaking the module this time?

- ○ Face-to-face
- ○ On-line
- ○ Not sure

The following statements provide us with information on what you feel you need to know about blood transfusions. There are no right or wrong answers.
How important do you think it is for you to know the following:

13. How relevant do you think the Safe Transfusion Practice module 1 is to you?

- ○ Very relevant
- ○ Quite Relevant
- ○ Neither relevant, nor irrelevant
- ○ Not very relevant
- ○ Not relevant at all

14. How often do you think you should have to undertake the SafeTransfusion Practice module 1 to maintain your knowledge and skills?

- ○ Only once
- ○ Every six months
- ○ Every year
- ○ Every two years
- ○ Every three years
- ○ More than 3 years
- ○ Never -I do not think it is relevant to my work

The following statements provide us with information on what you feel you need to know about blood transfusions. There are no right or wrong answers.

15. How IMPORTANT do you think it is for you to know about the following?

	Very Important	Quite important	Neither important nor unimportant	Not important	Not important at all
The different blood components	○	○	○	○	○
Procedures for requesting blood components	○	○	○	○	○
Procedures for taking a blood sample for pre-transfusion testing	○	○	○	○	○
How to store and collect blood components safely	○	○	○	○	○
Procedure for administering a blood transfusion safely	○	○	○	○	○
Monitoring of a blood transfused patient	○	○	○	○	○

We would like to know about current practice in your area – please answer as truthfully as you can:

16. How often have you been involved with the blood transfusion process in the past 3 months? (includes taking a pre-transfusion sample, informing a patient they will require a blood transfusion, checking blood components for transfusion, taking/collecting blood components for transfusion or monitoring a transfused patient)

- Never
- Rarely (less than once a month)
- Often (less than once a week but more than once a month)
- Very often (about once a week)
- Frequently (most days/shifts)
- Not sure

18. The prescription chart is checked to make sure the blood has been prescribed:

- Always
- Nearly all the time (above 80%)
- Most of the time (around 60-80%)
- Around half of the time (40-60%)
- Less than half of the time (20-40%)
- Almost never (less than 20% of the time)
- Never
- Not applicable to my role
- Other (please specify)

17. When a blood component is delivered to the ward area/department, someone checks that the correct patient is in the clinical area:

- Always
- Nearly all the time (above 80%)
- Most of the time (around 60-80%)
- Around half of the time (40-60%)
- Less than half of the time (20-40%)
- Almost never (less than 20% of the time)
- Never
- Not applicable to my role
- Other (please specify)

19. The patient/component identification checks are undertaken immediately prior to the transfusion commencing:

- Always
- Nearly all the time (above 80%)
- Most of the time (around 60-80%)
- Around half of the time (40-60%)
- Less than half of the time (20-40%)
- Almost never (less than 20% of the time)
- Never
- Not applicable to my role
- Other (please specify)

20. Two people independently check the identification details with the patient (if conscious) before commencing a blood transfusion (*an independent check is where each practitioner checks the identification/component details with the patient separately from each other):

- Always
- Nearly all the time (above 80%)
- Most of the time (around 60-80%)
- Around half of the time (40-60%)
- Less than half of the time (20-40%)
- Almost never (less than 20% of the time)
- Never
- Not applicable to my role
- Other (please specify)

21. Do you undertake the full patient/component identification checks in an emergency situation:

- Always
- Nearly all the time (above 80%)
- Most of the time (around 60-80%)
- Around half of the time (40-60%)
- Less than half of the time (20-40%)
- Almost never (less than 20% of the time)
- Never
- Not applicable to my role
- Other (please specify)

22. If you suspect a severe transfusion reaction would you stop the transfusion:

- Always
- Nearly all the time (above 80%)
- Most of the time (around 60-80%)
- Around half of the time (40-60%)
- Less than half of the time (20-40%)
- Almost never (less than 20% of the time)
- Never
- Not applicable to my role
- Other (please specify)

23. What factors do you think REDUCE your thoroughness in carrying out safe blood transfusion practice? (You can tick more than one box)

- ☐ The existing practice in the clinical area where I work
- ☐ How busy I am
- ☐ How busy others in my clinical area are
- ☐ The staffing/skill mix in my clinical area
- ☐ If it is an emergency situation
- ☐ How well I think I know the patient and their identification details
- ☐ Not having completed the Safe Transfusion Practice module 1
- ☐ *None* - I always carry out safe blood transfusion practice
- ☐ Other (please specify

In this section we are keen to know about your opinions of the Safe Transfusion Practice module. There are no right or wrong answers so please answer as truthfully as possible. So, thinking back to when you last undertook the module, please answer the following:

24. On a scale of 1-7, how much do you think the safe transfusion module IMPROVED YOUR UNDERSTANDING OF the following?

Improved my understanding considerably	**1 2 3 4 5**	**Did not improve my understanding at all**
The different blood components	○ ○ ○ ○ ○	☐
Procedures for requesting blood components (e.g. what to include on request forms)	○ ○ ○ ○ ○	☐
Procedures for taking a blood sample for pre-transfusion testing	○ ○ ○ ○ ○	☐
How to store and collect blood components safely	○ ○ ○ ○ ○	☐
Procedure for administering a blood transfusion safely	○ ○ ○ ○ ○	☐
Monitoring of a blood transfused patient	○ ○ ○ ○ ○	☐

25. On a scale of 1 - 5, how USEFUL did you find learning about the following aspects of safe blood transfusion practice?

	Very useful	**1 2 3 4 5**	**Not useful at all**
The different blood components	○ ○ ○ ○ ○		☐
Procedures for requesting blood components (e.g. what to include on request forms)	○ ○ ○ ○ ○		☐
Procedures for taking a blood sample for pre-transfusion testing	○ ○ ○ ○ ○		☐
How to store and collect blood components safely	○ ○ ○ ○ ○		☐
Procedure for administering a blood transfusion safely	○ ○ ○ ○ ○		☐
Monitoring of a blood transfused patient	○ ○ ○ ○ ○		☐

26. On a scale of 1 - 5, how much difference do you think the Safe Transfusion Practice module 1 has made to your practice?

No difference **1 2 3 4 5** Significant difference

○ ○ ○ ○ ○

27. If you think the Safe Transfusion module 1 has made NO difference to your practice, please tick the reason(s) why (you can tick as many as you wish)

- ☐ I am rarely/never involved in the blood transfusion process
- ☐ I have worked with blood transfusions for a long time & I know what safe practice is
- ☐ I have always had a high level of safe practice
- ☐ I can't remember what I learnt
- ☐ The culture of the area where I work means I can't change my practice, even if I wanted to
- ☐ Other (please specify)

Questions in this section provide us with information on your knowledge of blood transfusions. Please answer the questions without referring to any sources.

28. Miss Y, age 35, requires a transfusion for post-operative haemorrhage. She is Group O, RhD Negative. Which of the following groups of red cells should be considered safe to transfuse?

- ○ A+ or A
- ○ AB+ or AB
- ○ B+ or B
- ○ O+
- ○ Not applicable to my role

29. What information is essential on a Transfusion Request form (you can tick more than one answer)?

- ☐ Surname
- ☐ DOB
- ☐ Unique Identification No e.g. CHI
- ☐ Hospital
- ☐ Date sample drawn
- ☐ Forename
- ☐ Sex/Gender
- ☐ Ward
- ☐ Date and time of request
- ☐ Diagnosis/reason for request
- ☐ Number and type of blood components required
- ☐ Not applicable to my role

30. Which of the following steps must be completed when taking a sample for pre-transfusion testing (you can tick more than one answer)?

- ☐ Verify patient identification details with patient and/or against identification band
- ☐ Check details on patient's identification band against documentation
- ☐ Take blood sample and label it with the details taken from the patient's identification band
- ☐ All of the above
- ☐ Not applicable to my role

31. What is the maximum amount of time a unit of red blood cells can be out of Controlled Storage Temperature before the transfusion is completed?

- ○ 3 hours
- ○ 4 hours
- ○ 4 hours 30 mins
- ○ 2 hour

32. A blood transfusion was due to be given but the patient had to go to X-ray. The blood has been out of the fridge at the nurse's station for 25 minutes but there is no sign of the patient returning. Can you return the blood to the blood fridge?

No, it has been out of the fridge for too long

- ○ Yes, as long as it is returned immediately
- ○ Yes, as long as it is returned in the next 15 minutes
- ○ Yes, it has not been in a warm room so time does not matter
- ○ Not applicable to my role

33. What is the most common cause of an incompatible blood transfusion?

- Laboratory error
- Pack mis-grouping
- Administration error (i.e. the wrong unit of blood being given to the patient)
- Undetectable antibody
- Not applicable to my role

34. Mr A is receiving a red cell transfusion and 10 minutes after the unit has commenced he complains of shortness of breath. What action should be taken?

- The doctor should prescribe a diuretic
- The rate of the transfusion should be slowed
- The transfusion should be stopped and expert advice sought
- The transfusion should be continued but expert advice sought
- The patient should be reassured and the transfusion continued
- Not applicable to my role