National Audit of the

Clinical Blood Transfusion Process

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CONTENTS

Background	1
Aims and Objectives	1
Organisation and project timetable	1
The audit	2
Participants	2
Institutional audit	2
Blood transfusion documentation	4
Monitoring acute blood transfusion reactions	8
Questionnaire	8
Review meeting	8
Summary	11
References	12
Acknowledgements	13

Appendix 1	Membership of Steering Group
Appendix 2	List of participants
Appendix 3	Institutional audit
Appendix 4	Blood transfusion documentation
Appendix 5	Monitoring acute blood transfusion reactions
Appendix 6	Questionnaire

BACKGROUND

Assessment of the quality assurance of blood transfusion pays little attention to the clinical interface. The British Committee for Standards in Haematology (BCSH) makes recommendations for good transfusion practice through its Blood Transfusion Task Force and laboratory performance is monitored by the National External Quality Assurance Scheme (NEQAS) for Blood Group Serology. To improve the quality of care of patients being transfused, the Research Unit of the Royal College of Physicians convened a workshop in January 1992 with input from the British Society for Haematology (BSH), the British Blood Transfusion Society (BBTS) and the Royal College of Pathologists. Nine audit protocols were produced based on a set of background papers[1] presented at the workshop and were published by the Royal College of Physicians as a joint document from the four professional bodies[2].

In March 1994, an application was submitted to the National Health Service Executive (NHSE) for central funding to support a national pilot audit of some of the workshop protocols. These comprised the proforma for 1) documentation of blood transfusions to patients in medical wards 2) clinical practice in the event of adverse reactions to transfusion and 3) an institutional audit of the existence and content of local policies and procedures for the administration of blood in individual hospitals.

AIMS AND OBJECTIVES

The aim of the study was to assess the quality of the clinical transfusion process by audit. Explicit standards were not set before commencement of the project although the audit proformas embodied implicit standards based on BCSH guidelines for documentation of blood transfusion in the hospital setting[3]. The objective of the study was to collect baseline data to determine actual current practice on a national basis from which rigorous standards for good practice could be generated. The results would be used to develop, by consensus among participants, guidelines for best practice in the clinical areas audited, and to establish a nationally tested tool for auditing these clinical procedures. It was important to ensure that the project was more than an exercise in documentation of inadequacies of care and that the results should be used to influence practice and to improve the care of patients receiving blood transfusions.

ORGANISATION AND PROJECT TIMETABLE

In March 1995, haematologists were invited, through the BSH network of regional representatives, to participate in the project. A small working group, the Blood Transfusion Audit Steering Group, whose membership is given in Appendix 1, was convened to steer the project nationally and to address procedural issues which might arise in the course of the project. A project co-ordinator, based in the Research Unit of the Royal College of Physicians was appointed to co-ordinate the work on a national basis. The project began in September 1995.

Each participating centre received a copy of the published protocols and was visited by the project co-ordinator who met with the Consultant Haematologist and, where possible, representatives of nursing and audit staff. Half the participating centres

were visited by the project co-ordinator during the first year and the other half during the second year of the project. The audits were carried out prospectively following this meeting with the aim of assessing 30-50 patients per unit. The last units to carry out the audit submitted their data in July 1997.

A questionnaire, based on the audit, was circulated to participants in May 1997 to assess their views on best practice for comparison with actual practice as revealed by the audit.

Participants were invited to attended a review meeting on 4th July 1997 at which the data and the audit proformas were discussed together with the results of the previously circulated questionnaire.

AUDIT

Participants

53 haematologists initially expressed interest in the audit and 50 hospitals eventually took part (Appendix 2). Most areas of England were represented and there were participants from Scotland, Wales and Northern Ireland (Fig 1).

Institutional Audit (RU43A)[2]

47 completed proformas were received and analysed. The data are given in appendix 2.

Q1a Written policies for the taking of samples for blood grouping and crossmatching. Written policies existed in 94% (44/47) of hospitals and in these the majority of the staff (39/44) were given training and/or written copies of the procedure.

Q1b Policies for the transfusion of blood on the wards existed in 89% (42/47) of hospitals. These hospitals also had written policies for the administration of blood on the ward and most included guidance on monitoring transfusion (38/42) and advice about what to do if a transfusion reaction occurs (41/42). In 93% (39/42) of hospitals copies of the policy were available on all wards. Of the hospitals with written policies 79% (33/42) indicated that staff involved in the administration of blood are given training in these procedures, but had difficulty in answering the question: *When was the most recent training session on the ward?* This was also a difficult question to analyse. Careful scrutiny of all the answers suggested that there was a clear ongoing training programme for staff in only 5/47 hospitals.

Q2 Hospital transfusion committees. In 79% (37/47) of hospitals, there is a transfusion committee and in 65% of these (24/37) audits of transfusion practice had been carried out; in all but one of these (23/24), recommendations on transfusion practice had been made based on results of the audits.

Q3 Maximum surgical blood order schedule. This existed in 87% (41/47) of hospitals and in 71% of these (29/41) regular review is carried out.

Fig 1 Participating centres - geographical distribution

Q4 Predeposit autologous transfusion. 30% (14/47) of hospitals operated a predeposit autologous transfusion service but in only half of these (8/14) were patients informed of the service.

Q5 Informed consent. No hospitals required informed consent for blood transfusion.

Audit on Blood Transfusion Documentation (RU43B)[2]

Data were received from the 50 centres listed in Appendix 2.
The aggregated results (n=2366) are included as Appendix 4

Q1 Location of the compatibility report at the time of transfusion. The results are shown in Fig 2 and, at first glance, reflect variable practice. However, when the consistency of practice within individual hospitals was examined by grouping hospitals according to maximum percentage of response (Fig 3), practice remained variable in the majority, but one third (17/50) of hospitals achieved a consistency greater than 80%.

Q2 Filing nursing observations in the patients' notes. Nursing observations on 78% of transfusions audited were filed in the patient's notes. As shown in Fig. 4, practice did differ between hospitals. In 24/50 more than 90% of notes contained nursing observations but in 3/50 hospitals less than 40% were filed.

Q3&4 Nursing observations. The number of responses was greater than the number of observations filed, suggesting that at least some of the data were obtained prospectively at the time of transfusion. Pulse and temperature were measured with almost equal frequency. Blood pressure was measured less frequently, particularly during subsequent monitoring of transfusion. Prior to transfusion, pulse and temperature were recorded in 76% of cases. Following commencement of transfusion, pulse and temperature were measured in 82%; within this group only 60% of the observations were made within 30 minutes. Pulse was measured at hourly intervals thereafter in 58%. Urine output was recorded in 32% of patients though it was unclear whether this was directly related to the transfusion or whether it simply reflected general management of the patient at that time.

Q5 Filing of compatibility report in patients' notes. The compatibility report was filed in the case notes following 90% of all transfusions audited. When practice in individual hospitals was examined (Fig. 5), in 30/50 hospitals over 90% of compatibility reports were filed in the case notes and in 7 of these hospitals all of the compatibility reports had been filed; however, in 8/50 hospitals 80% or less of the compatibility forms had been filed.

Transfusion date and two signatures for each unit transfused. The transfusion date and two signatures were recorded for only 85% and 79% respectively of all units transfused. Again, practice between individual hospitals varied considerably, as shown in Fig. 6. In 16 hospitals over 90% of returns had both the date and two signatures for all units, and in 6 of these hospitals 100% of returns were complete for all this information.

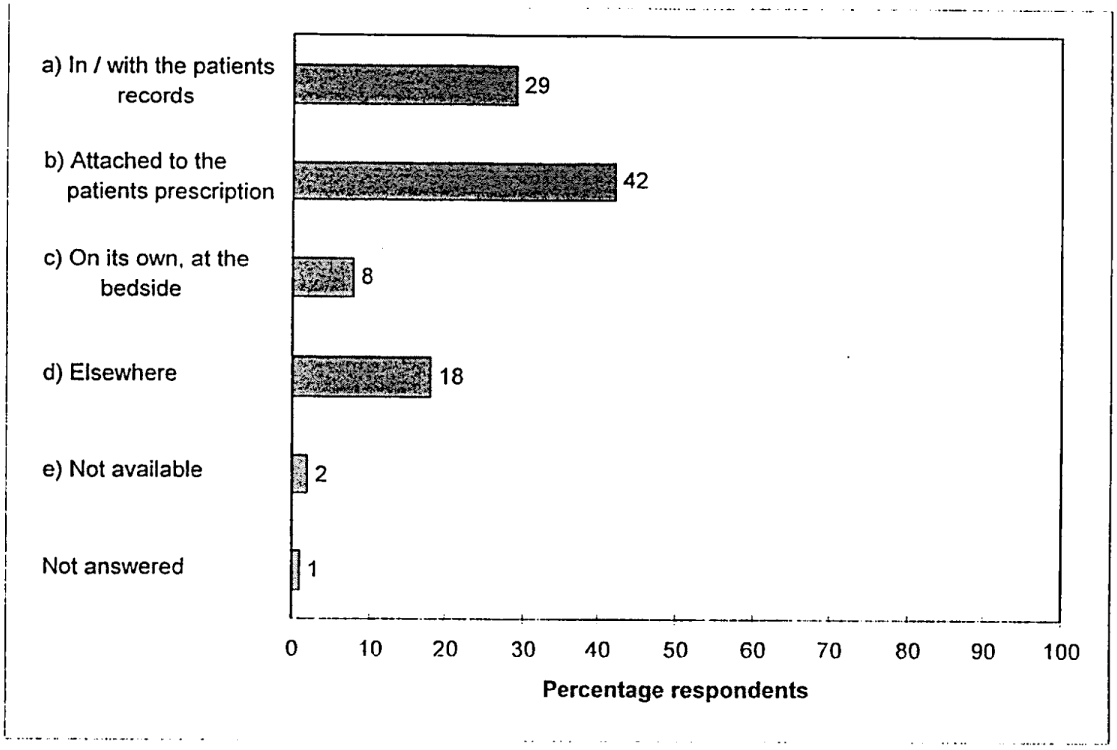

Figure 2 : Location of compatibility report at the time of the transfusion.

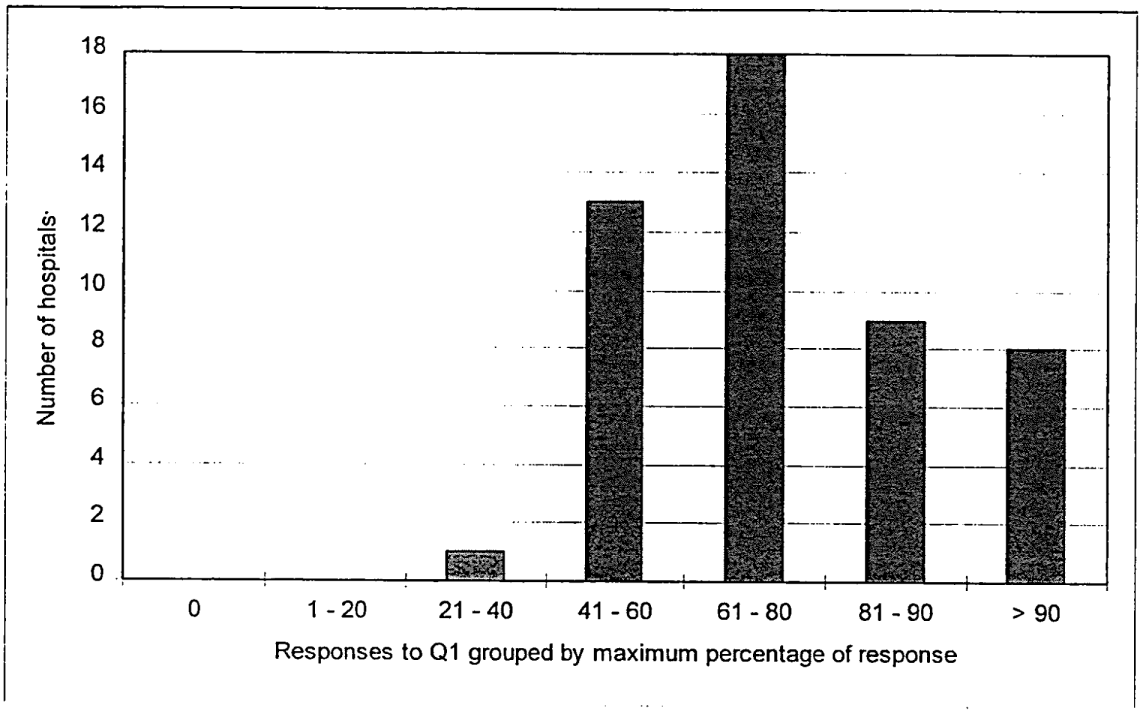

Figure 3 : Consistency of response to Q1 - location of compatibility report.

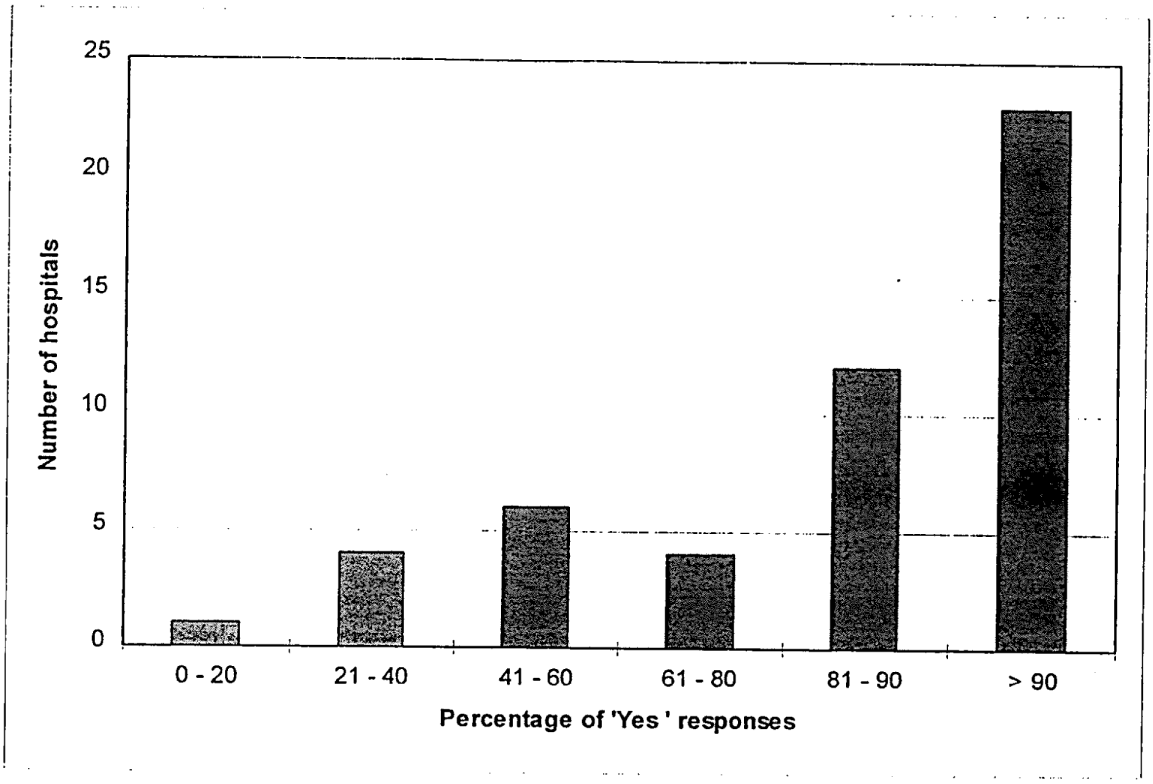

Figure 4 : Filing the Nursing observations of the transfusion in the patients notes.

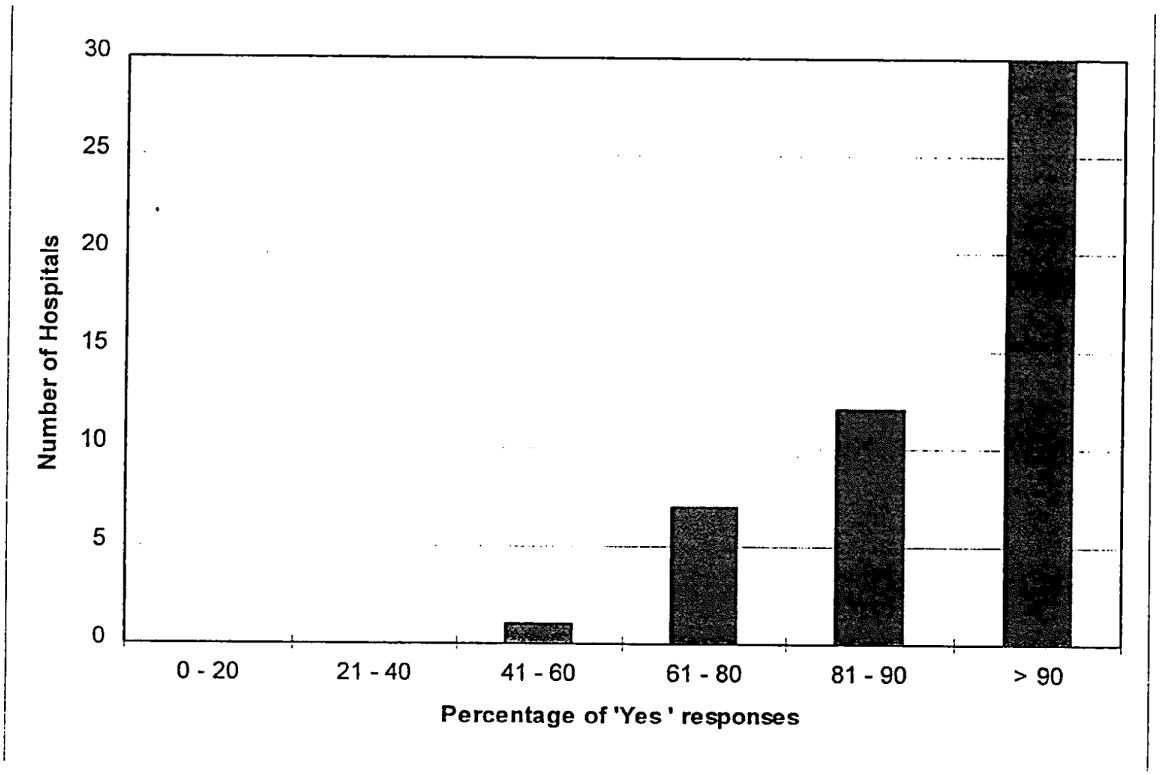

Figure 5 : Filing the compatibility report in the patients' notes

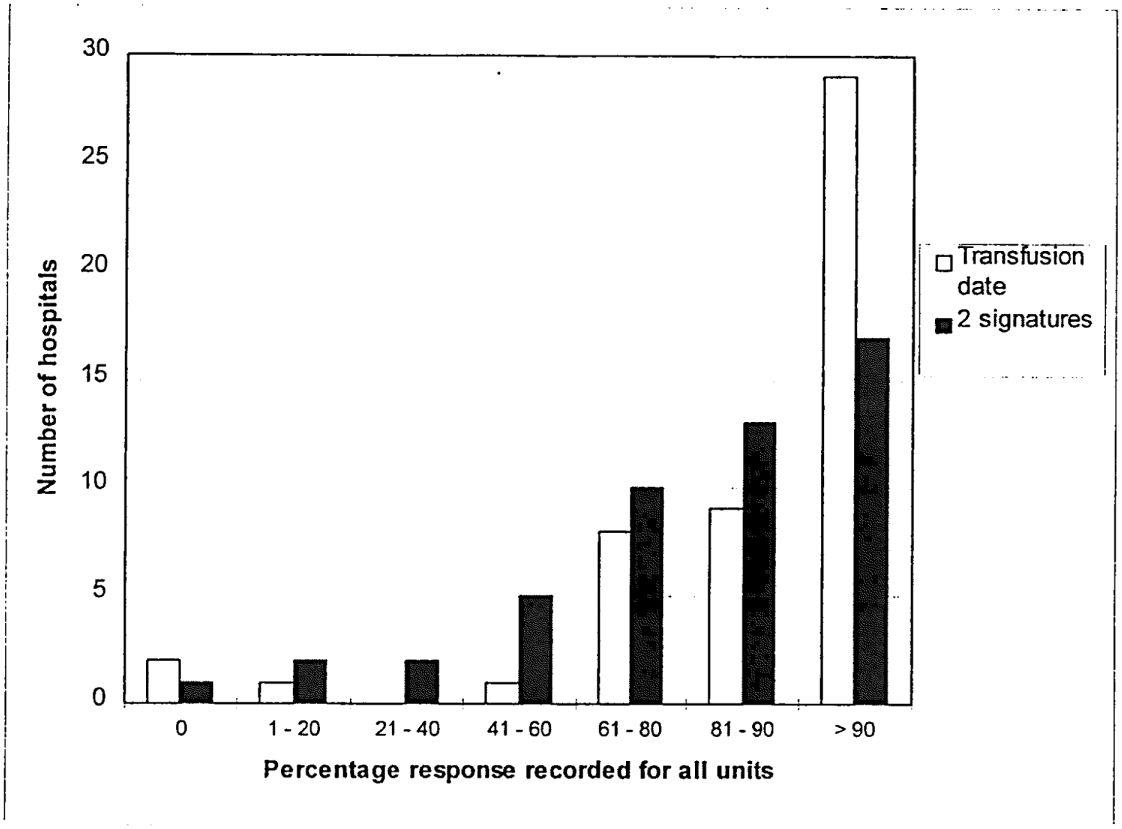

Figure 6 : Recording of 2 signatures and date for all units.

Q6 Information available in the casenotes. The indication for transfusion was evident, as was the date the transfusion was given and the number of units transfused in 90% of transfusions. The pre-transfusion haemoglobin was available in 89% but only 50% of casenotes contained information on post-transfusion haemoglobin. The transfusion caused an adverse reaction in 3.3% (66 cases) and the recording of this was equally distributed between the medical and nursing notes.

Audit on monitoring acute blood transfusion reactions (RU43C1/C2)[2]

Relatively few returns were made for the audit of monitoring acute transfusion reactions (n=35 from 16 hospitals). These data are not further discussed, but the aggregated results are included as Appendix 5.

QUESTIONNAIRE

A questionnaire based on the audit proformas RU43A and RU43B was circulated to participants in May 1997 to determine their views on what best practice should be and to be used as a basis for discussion at the Review Meeting (see below). The questionnaire was completed and returned by 36 of the 50 participants. The results of the questionnaire are included as Appendix 6.

REVIEW MEETING

A review meeting to discuss the audit was held on 4th July 1997 at the Royal College of Physicians in London.

Participating haematologists and nursing staff were invited. The meeting was attended by 68 nursing, medical and audit staff from 47 of the 50 participating hospitals. Dr Deirdre Cunningham, Director of Health Policy and Public Health, Lambeth Southwark & Lewisham Health Authority chaired the meeting. The results of the audit and questionnaire were presented and a comparison between actual (the audit) and best practice (the questionnaire) was made.

Four discussion groups were assembled. Each was asked to consider the following questions about blood transfusion practice and documentation:-

1. What are the important issues about which there is consensus about essential practice?
2. What are the important issues about which there is scope for flexibility about best practice?
3. What is controversial?
4. What is not important?
5. Which areas require more audit?

Each group presented their responses to the whole meeting and this was followed by a whole group discussion to ascertain areas of consensus and controversy. Notes from individual small group and whole group discussions were taken and an audio recording was made. A collation of the responses to the cue questions was made and these are summarised in Box 1.

Areas where there was agreement and disagreement were predictable from the results of the questionnaire.

Patient safety. Concerns about the safety aspects of blood administration and the need to highlight this important area were strongly expressed. There was a consensus about the need for documentation to be traceable and permanent.

Patient identification. Correct patient identification and checking against prescription, compatibility report and the unit to be transfused is essential to prevent errors. There was an agreement amongst audit participants that name bands/wrist bands are the safest way to authenticate verbal statements of identity (i.e. full name and date of birth) by the patients themselves.

Training. Training was considered important but was viewed as an area about which there is scope for flexibility. National principles were considered to be essential but there needs to be enough flexibility to allow for occupational variance and local practice. The consensus was that there is scope for core undergraduate and post-qualification education, but that this needs to be supplemented with profession-specific education. It was also stressed that any education programme needs to be ongoing.

The compatibility form. It was generally felt that the compatibility report is an important document and that it should be readily available during the transfusion. However, its precise location (e.g. medical notes, nursing notes, prescription chart etc.) is not crucial as long as a locally agreed policy is consistently adopted. Policies must be owned locally, be workable and reflect the realities of local circumstances which may differ from ward to ward.

There was disagreement as to whether two witnesses and two signatures were necessary to confirm patient identification and to check blood prior to transfusion. Arguments centred on whether two witnesses are a more reliable check than one. It was argued that people often see what they expect to see and that this is more likely to be the case if it is corroborated by someone else. Sole responsibility for checking might not necessarily be less safe. In addition, practical difficulties can arise in finding another person who is available and competent to understand the implications of what they are checking. The NHS is not overpopulated with qualified nurses and doctors in many clinical settings.

Monitoring and observations. The frequency of observations to be made during transfusion was the topic of much discussion amongst the audit participants with no clear consensus emerging. There was a general agreement that only a few ml of incompatible blood are needed to trigger a severe transfusion reaction and it was accepted that the patient be closely observed after each new unit of blood for appropriate signs within the period of maximum risk i.e. within the first 15 min or so. There was a consensus that baseline observations of temperature, pulse and blood pressure should be recorded shortly before the commencement of each new unit but, thereafter, blood pressure recording as routine was felt to be unnecessary. In most

Box 1: Responses to cue questions after small and large group discussions

What are the important issues about which there is consensus about essential practice?

- Always strive for patient safety
- The need for standard national principles and core training for blood sampling procedures and administration of blood.
- Development of local policies which interpret standard national principles
- Clear statement of the reason for transfusion in the medical notes
- All documentation must be traceable and permanent
- A compatibility report should be used in all checking procedures and should be readily accessible
- Lines of accountability for medical, laboratory and ward staff must be clear
- The means to identify patients correctly must be clear
- Monitoring of patients during transfusion should be minimal but effective
- The need for a quality mechanism to review critical events and overview risk management.

What are the important issues about which there is scope for flexibility about best practice?

- Documentation must be readily accessible during transfusion and located according to a clear local policy. The precise location is not critical
- The nature and frequency of observations during transfusions
- The nature of training. This should be determined by professional education but should include standard elements and be ongoing.

Controversial areas of practice

- The nature and frequency of patient observations
- Who writes local policies
- The need for two signatures to confirm adequacy of the checking procedure
- The use of wristbands for patient identification
- The need for a doctor to be present during transfusion
- The action to be taken in the event of a transfusion reaction.

Which areas of practice are not important

- Routine fluid balance
- Routine post-transfusion haemoglobin measurements
- Routine blood pressure observations during transfusion

Which areas require more audit

- Administration of blood in other medical specialities such as surgery
- Best practice as regards the rate of transfusion
- Awareness of local policies amongst staff involved in taking of samples for crossmatching and the administration of blood
- The value of written patient information about transfusion
- Patient outcome

clinical situations, pulse is probably adequate, though the necessity for even this was questioned. In many clinical settings it would possibly be adequate to keep under general observation the understanding patient who would be encouraged to report anything untoward. Specific observations could be made in this event as necessary.

However, there was some agreement that taking the pulse 15 minutes following commencement of the unit and thereafter at hourly intervals would at least ensure that the patient was kept under general observation and would form a record that such observations had been made. It was suggested by some audit participants that patients might usefully be categorised as high or low risk as regards the nature and frequency of observations necessary, but there is convincing argument for maintaining close observation in the initial stages irrespective of whether a patient is assessed as clinically high or low risk.

Urine observations. A clinical sign which attracted much discussion was the usefulness of recording fluid balance. There was a consensus that this was unnecessary although it was generally agreed that inspection of the urine to check for haemoglobinuria was a useful sign which is under-utilised.

The audit proforma. This study highlighted weaknesses in the design of the proformas RU43A and 43B which could be improved to obtain more precise information of areas considered to be relevant and important by the participants. There was wide support for the proformas to be redesigned in the light of discussion at the Review Meeting and for a second audit to be carried out using the new proformas.

SUMMARY

Participants considered the audit of blood transfusion was relevant to an important area of clinical practice. Discussion amongst the participants at the review meeting resulted in a consensus on best practice in many procedures. It was also agreed that some local practices, although different, were nevertheless acceptable, provided that all staff were aware of the local policy.

The audit proforma should be revised to accommodate these observations and should be used for a re-audit after local policies had been reviewed. This would complete the audit cycle. The expected output of the pilot audit is a nationally tested tool for auditing the quality of the clinical blood transfusion process. Ultimately, consensus amongst participants about best practice and documentation should influence the formulation of national guidelines in association with a professional body, such as BCSH. This in turn would enable performance indicators to be set for clinical blood transfusion.

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For further information about the work of the Research Unit or any of their projects, please contact:

Research Unit
The Royal College of Physicians
11 St Andrews Place
Regents Park
London NW1 4LE

tel: 0171 935 1174
fax: 0171 487 3988
e-mail:Research.Unit@rcplondon.ac.uk

or visit the web site of the Royal College of Physicians at:
www.rcplondon.ac.uk

APPENDIX 1

Membership of Steering Group

Prof. A H Waters, Professor of Haematology, St. Bartholomew's Hospital, London (Chairman)

Dr. P O Skacel, Senior Lecturer in Transfusion Medicine, Honorary Consultant Haematologist, Imperial College School of Medicine, Hammersmith Hospital, London

Dr. M F Murphy, Consultant Haematologist, National Blood Service, Oxford

Mr. J. Wilkinson, Lecturer, Advanced Nurse Education, Royal College of Nursing, London.

Ms. G. Hartigan, Audit co-ordinator, Royal College of Physicians Research Unit, London (Secretary) - until March 1997

APPENDIX 2

List of participants

Dr. David Bareford, City Hospital, Birmingham
Dr. J. Beard, Conquest Hospital, St. Leonard's on Sea
Dr. Judith Behrens, St. Helier Hospital, Carshalton
Dr. David Bevan, St. George's Hospital, London
Dr. Manju Bhavnani, Royal Albert Edward Infirmary, Wigan
Dr. P Black, Greenwich District Hospital, London
Dr. Lee Bond, York District Hospital, York
Dr. C. Chapman, Royal Infirmary, Leicester
Dr. A Copplestone, Derriford Hospital, Plymouth
Dr. J. F. Davidson, Royal Infirmary, Glasgow
Dr. Sally Davies, Central Middlesex Hospital, London
Dr. Jenny Duguid, Royal Liverpool University Hospital, Liverpool
Dr. J. G. Erskine, Crosshouse Hospital, Kilmarnock
Dr. M. J. Galloway, Bishop Auckland General Hospital, Bishop Auckland.
Dr. P. Gover, Eastbourne District Hospital, Eastbourne
Dr. E. S. Greene, Princess Margaret Hospital, Swindon
Dr. Husni Habboush, Nevill Hall Hospital, Abergavenny
Dr. C. M. James, Royal Hampshire County Hospital, Winchester
Dr. S. A. N. Johnson., Musgrove Park Hospital, Taunton
Dr. Lydia Jones, Epsom District Hospital, Epsom
Dr. Jane Keidan, Queen Elizabeth Hospital, Kings Lynn
Dr. Susan Kelly, Wycombe General Hospital, High Wycombe
Dr. Anne Kyle, Antrim Hospital, Antrim
Dr. E. C. Logan, King's Mill Centre for Health Care Services, Sutton-in-Ashfield
Dr. Hilary Lumley, Mayday Hospital, Thornton Heath
Dr. Paddy McHugh, Kingston Hospital, Kingston-upon-Thames
Dr. A. Milne, Northampshire Hospital NHS Trust, Basingstoke
Dr. Elisabeth Moffat, Royal Gwent Hospital, Newport
Dr. M. F. Murphy, John Radcliffe Hospital, Oxford
Dr. S. D. Nelson, Craigavon Area Hospital Group Trust, Portadown
Dr. D. R. Norfolk, The General Infirmary at Leeds, Leeds
Dr. Kate Pendry, Bury General Hospital, Bury
Dr. G. Robbins, Royal Surrey County Hospital, Guildford
Dr. Megan Rowley, Queen Mary's University Hospital, London
Dr. I. R. Samaratunga, Farnborough Hospital, Orpington
Dr. G. Satchi, Whiston Hospital, Prescot
Dr. J. Shirley, Frimley Park Hospital, Frimley
Dr. Nuala Simpson, Ipswich Hospital NHS Trust, Ipswich
Dr. P. O. Skacel, Imperial College School of Medicine, Hammersmith Hospital, London
Dr. Paul Stevenson, Fazakerley Hospital, Liverpool
Dr. R. J. Stockley, Worcester Royal Infirmary, Worcester
Dr. G. P. Summerfield, Middlesborough General Hospital, Middlesborough
Dr. J. Wallis, Freeman Hospital, Newcastle-upon-Tyne
Prof. A. H. Waters, St. Bartholomew's Hospital, London

Dr. Ann Watson. Stoke Mandeville Hospital, Aylesbury
Dr. E. J. Watts, Basildon Hospital, Basildon
Dr. N. C. West, West Cumberland Hospital, Whitehaven
Dr. B. Woodcock, Southport and Formby District General Hospital, Southport.
Dr. Alison Worsely, Poole Hospital NHS Trust, Poole
Dr. Ann Youart, Hartlepool General Hospital, Hartlepool

APPENDIX 3

INSTITUTIONAL AUDIT PROFORMA FOR BLOOD TRANSFUSION PRACTICE (RU43A)

(n = 47)

1. Are therewritten policies for the following?

	Yes		*No*	
	Total	***Percent***	***Total***	***Percent***
a) The taking of samples for blood grouping and cross-matching	44	93.6%	3	6.4%

If yes (n = 44), are the staff who take these samples:

(i) Given a copy of the procedure?	36	81.8%	8	18.2%
(ii) Given training in the procedure?	39	88.6%	5	11.4%

	Yes		*No*	
	Total	***Percent***	***Total***	***Percent***
b) The transfusion of blood on the wards	42	89.4%	5	10.6%

If yes, (n = 42)

i) Are copies of the policy available on all wards?	39	92.9%	3	7.1%
ii) Are the staff involved in blood transfusion given training in the procedures?	33	78.6%	9	21.4%
iii) Does the policy include guidance on monitoring transfusion?	38	90.5%	4	9.5%
iv) Does the policy include advice about what to do if a transfusion reaction occurs?	41	97.6%	1	2.4%

2.

	Yes		*No*	
	Total	*Percent*	*Total*	*Percent*
Does the hospital have a Transfusion Committee?	37	78.7%	10	21.3%
If yes (n = 37), has the committee carried out audits of transfusion practice?	24	64.9%	13	35.1%
If yes (n = 24), were recommendations made, based on the results of the audits?	23	95.8%	1	4.2%

3.

	Yes		*No*	
	Total	*Percent*	*Total*	*Percent*
Does the hospital have a maximum surgical blood ordering schedule?	41	87.2%	6	12.8%
If yes (n = 41),as it reviewed at regular (at least yearly) intervals?	29	70.7%	12	29.3%

4.

	Yes		*No*	
	Total	*Percent*	*Total*	*Percent*
Does the hospital provide a pre-deposit autologous transfusion service?	14	29.8%	33	70.2%
If yes (n =14), are patients informed of the service?	8	57.1%	6	42.9%

5.

	Yes		*No*	
	Total	*Percent*	*Total*	*Percent*
Does the hospital require informed patient consent for blood transfusion?	0		47	100%

APPENDIX 4

AUDIT ON BLOOD TRANSFUSION DOCUMENTATION (RU43B)

This is the total results of 50 Hospitals, who participated in the audit. (n = 2366)

1. Where was the compatibility report at the time of transfusion?

	Total	*Percentage*
a) In / with the patients record	695	29.4%
b) Attached to the patient's prescription chart	989	41.8%
c) On its own, at the bedside	189	8%
d) Elsewhere	421	17.8%
e) Not available	49	2.1%
Not answered	23	1%

Elsewhere (d) represents 17.8% of the results, the following table is a further breakdown.

	Total	*Percentage*
Nursing notes	177	42%
Other ward areas	77	18.3%
Nursing station	53	12.6%
Nursing charts	38	9%
Out patients	30	7%
Separate folder at bedside	11	3%
With blood	6	1.4%
Blood Bank	4	1%
With patient	3	0.7%
Off ward	1	0.2%
Other	15	3.5%
Not specified	6	1.4%

2. **Were the nursing observations of the transfusion filed in the patient's notes?**

	Total	*Percentage*
Yes	1853	78.3%
No	494	20.9%
Not answered	19	1%

3. **Were the following nursing observations recorded before the transfusion?**

	Yes		*No*		*Not answered*	
	Total	*Percent*	*Total*	*Percent*	*Total*	*Percent*
a) Temperature	1812	76.6%	490	20.7%	64	2.7%
b) Pulse	1807	76.4%	495	20.9%	64	2.7%
c) Blood pressure	1744	73.7%	559	23.6%	63	2.7%

4. **Were the following observations recorded during the transfusion?**

4a) Temperature following commencement of transfusion

	Total	*Percentage*
Yes	1948	82.3%
No	325	13.7%
Not answered	93	3.9%

If yes, how many minutes after commencement of transfusion? n = 1948.

1851 forms were returned with a time recorded of greater than 0.

	Total	*Percentage*
0 - 30 minutes	1099	59.4%
31 - 60 minutes	527	28.5%
>60 minutes	225	12.2%

Mean : 45.3 **Median (50%) :** within 30 minutes **Mode :** 60

4b) Pulse following commencement of transfusion?

	Total	*Percentage*
Yes	1936	81.8%
No	335	14.2%
Not answered	95	4.1%

If yes, how many minutes after commencement of transfusion? n = 1936

1840 forms were returned with a time recorded of greater than 0.

	Total	*Percentage*
0 - 30 minutes	1114	60.5%
31 - 60 minutes	525	28.5%
>60 minutes	201	10.9%

Mean : 43.9 **Median (50%) :** within 30 minutes **Mode :** 60

4c) Blood pressure after commencement of transfusion

	Total	*Percentage*
Yes	1731	73.2%
No	539	22.8%
Not answered	96	4.1%

If yes, how many minutes after commencement of transfusion? n = 1731

1631 forms were returned with a time recorded of greater than 0.

	Total	*Percentage*
0 - 30 minutes	961	58.9%
31 - 60 minutes	444	27.2%
>60 minutes	226	13.9%

Mean : 47.9 **Median (50%) :** within 30 minutes **Mode :** 60

4d) Temperature at hourly intervals thereafter

	Total	*Percentage*
Yes	1347	56.9%
No	919	38.8%
Not answered	100	4.2%

4e) Pulse at hourly intervals thereafter

	Total	*Percentage*
Yes	1367	57.8%
No	899	38%
Not answered	95	4%

4f) Blood pressure at hourly intervals thereafter

	Total	*Percentage*
Yes	1102	46.6%
No	1165	49.2%
Not answered	99	4.2%

4g) Urine output

	Total	*Percentage*
Yes	699	31.5%
No	1440	64.9%
Not answered	69	3.1%

5) **Was the compatibility report filed in the patients notes?**

	Total	*Percentage*
Yes	2130	90%
No	192	8.1%
Not answered	44	1.9%

If yes (n = 2130), was the transfusion date and a signature of 2 responsible officers who did ID checks, recorded for each unit transfused?

	All Units		*Some Units*		*No Units*		*Not answered*	
	Total	*%*	*Total*	*%*	*Total*	*%*	*Total*	*%*
a) Transfusion date (n = 2143)	1732	81%	132	6.1%	172	8%	107	4.9%
b) 2 Signatures (n = 2141)	1597	74.6%	239	11%	197	9.2%	108	5%

6) **Was the following information available in the case notes?** (Many respondents did not answer this section.

	Yes		*No*	
	Total	*Percent*	*Total*	*Percent*
a) The indication for the transfusion (n = 2353)	2114	89.8%	239	10.2%
b) The date that the transfusion was given (n = 2355)	2151	91.3%	204	8.7%
c) The number of units transfused (n = 2351)	2108	89.7%	243	10.3%
d) Pre transfusion haemoglobin (n = 2332)	2089	88.8%	243	11.2%
e) Post transfusion haemoglobin (n = 2349)	1369	58.3%	980	41.7%

These figures are taken out of 2025, as 341 did not answer this section.

	Yes		*No*	
	Total	***Percent***	***Total***	***Percent***
f) Whether the transfusion caused an adverse reaction.	66	3.3%	1959	96.7%
If yes, where was it recorded? (n = 66)				
i) Nursing notes	28	42.4%		
ii) Medical notes	29	43.9%		
Not specified	9	13.6%		

APPENDIX 5

AUDIT OF ACUTE BLOOD TRANSFUSION REACTIONS
(RU43C1/C2)

A total of 16 hospital took part in this section. (n = 35).

1. Diagnosis:

	Total
Acute leukaemia	1
Anaemia	3
Solid Tumour	3
Inflammatory bowel disease	2
Chronic lymphatic leukaemia	3
Lymphoma	4
Myeloma	4
Myelodysplasia	9
Rheumatoid Arthritis	1
Gastro-intestinal haemorrhage	1
Sickle cell anaemia	1
Chronic myeloid leukaemia	1
Alcoholic liver disease	1

2. What blood components were given?

	Number
a) Red blood cells	35
b) Platelets	1
c) Fresh frozen plasma	2

3. **If red cells were given, did request for cross-match provide information, on the following?**

	Total that said YES	Percentage
a) History of previous pregnancies	3	8.6%
b) History of previous transfusions	15	42.9%
c) History of previous transfusion reactions	5	14.3%

4. **Check of patient and donation identity before transfusion:**

	Total that said YES
a) Was first signature legible?	30
b) Was second signature legible?	25

5. **Where was the transfusion started?**

	Total that said YES
a) Accident & Emergency department	0
b) Intensive care unit	0
c) Operating theatre	0
d) Ward	22
e) Day ward	13

6. **Were the date & time of the start of the transfusion recorded for the following?**

	Total that said YES
a) First unit	33
b) Supposedly implicated unit	31

7. **Was the time of the reaction recorded?** Yes = 29

8. **Were the donation numbers of all units given on that day recorded?** Yes = 35

9. **Was the donation number of the implicated unit identified?** Yes = 28

10. **Indicate symptoms / signs of transfusion reaction:**

	Total that said YES
a) Fever (rise > 1°C)	31
b) Chills	4
c) Rigors	7
d) Itching / rash	1
e) Back pain	0
f) Chest pain / discomfort	0
g) Dyspnoea / difficult breathing	2
h) Dark urine	0
i) Restlessness	0
j) Drop in blood pressure	1

11. Were the following observations recorded during the transfusion?

	Total the said YES
a) Pulse	34
b) Blood pressure	30
c) Temperature	34

12a. How often were the observations recorded, before the acute reaction?

	Total	Percentage
0 - 15 minutes	7	20%
16 - 30 minutes	7	20%
31 - 60 minutes	11	31.4%
61 - 120 minutes	1	2.9%
121 - 240 minutes	4	11.4%
No observations recorded	2	5.7%
Not stated	3	8.6%

12b. How often were the observations recorded, after the reaction?

	Total	Percentage
0 - 15 minutes	6	17.1%
16 - 30 minutes	11	31.4%
31 - 60 minutes	13	37.1%
61 - 120 minutes	1	2.9%
121 - 240 minutes	1	2.9%
Not stated	3	8.8%

13. **Was a doctor informed?** Yes = 26.

Time the doctor was informed after the reaction.

	Total	Percentage
Within 5 minutes	9	34.6%
6 - 10 minutes	4	15.4%
11 - 15 minutes	1	3.8%
16 - 20 minutes	1	3.8%
21 - 30 minutes	3	11.5%
4 hours and 15 minutes after	1	3.8%
16 hours after	1	3.8%
Not known	6	23%

14. **Did the doctor see the patient?**

	Total
Yes	22
No	13

If yes, (n = 22) how soon after s/he was informed?

	Total	Percentage
Within 10 minutes	8	36.4%
11 - 15 minutes	5	22.7%
16 - 30 minutes	1	4.5%
31 - 60 minutes	1	4.5%
16 hours after	1	4.5%
Not known	6	27.3%

If no, (n = 13) was advice given by telephone?

	Total	Percentage
Yes	7	53.8%
No	6	46.2%

What type of advice was given? (Multiple advice given)

	Total
a) Continue as before	1
b) Slow drip rate	2
c) Stop and observe	3
d) Discontinue transfusion	4
e) Other	2

15. **Was any medication prescribed?** Yes = 19
(The total = 40, as more then one medication prescribed)

	Total
a) Paracetamol	12
b) Antihistamine	11
c) Diuretic	1
d) Hydrocortisone	12
e) Adrenaline	0
f) Other	4

16. **Was the doctor who gave the advice a haematologist?**

	Total
Yes	7
No	28

If no, (n = 28) did s/he inform the haematologist? Yes = 5

If yes, (n = 7) how soon after did the doctor inform the haematologist?

	Total
1 hour after	1
12 hours after	2
Next day	1
Not stated	3

17. **Was transfusion of a unit of blood abandoned?**

	Total that said YES
Yes	13

If yes, (n = 13) what volume of the unit had been transfused?

	Total
< 1 ml	2
100 ml	1
Most of the unit	3
Not known	2
Not stated	5

18. **Was a subsequent unit given? (n = 13)**

	Total	Percentage
Yes	10	77
No	3	23

If yes, (n = 10) how soon after the previous unit was abandoned?

	Total	Percentage
Within 1 hour	0	
>1 - <=4 hours	1	10%
>4 - <=12 hours	5	50%
>12 hours	3	30%
Not stated	1	10%

Was the subsequent unit tolerated well? (n = 13)

	Total	Percentage
Yes	8	64.5%
No	5	38.5%

19. **Were blood samples taken? (n = 13)**

	Total
Yes	4
No	9

If yes, how soon after the transfusion reaction?

	Total
Within 15 minutes	1
Within 1 hour	1
Within 1 hour 30 minutes	1
Not stated	1

20. Was a urine sample collected?

	Total that said YES
Yes	4

If yes, (n = 4) how soon after the reaction?

	Total
Within 30 minutes	1
Within 1 hour	2
Within 1 hour and 30 minutes	1

21. Was the unit returned to the transfusion lab? Yes = 4

If yes, how soon after the transfusion of the unit was abandoned?

	Total
Within 30 minutes	1
Within 1 - 2 hours	3

22. Presumed cause of reaction:

	Total
Leucocyte antibody reaction	3
Patient hypotensive before transfusion	1
White blood cell reaction, staph epidermidis grown from bag	1

23. Was the reaction reported to any of the following? (n = 5)

	Total
a) Hospital blood transfusion laboratory	5
b) Hospital Transfusion Committee	0
c) Transfusion Centre	0

APPENDIX 6

BLOOD TRANSFUSION QUESTIONNAIRE
CIRCULATED MAY 1997 (number of respondents = 36)

SECTION 1: Organisational Matters

1. Every hospital should have a written policy for the taking of samples for blood grouping and cross-matching

Yes		*No*		*Not answered*	
Total	*Percentage*	*Total*	*Percentage*	*Total*	*Percentage*
36	100%	0		0	

2. All members of staff (including doctors) who take blood samples should receive a copy of the policy

Yes		*No*		*Not answered*	
Total	*Percentage*	*Total*	*Percentage*	*Total*	*Percentage*
31	86.1%	3	8.3%	2	5.6%

If No, please list any members of staff whom you feel should receive a copy of the policy: (n = 3)

Comments:

- Every ward, and on every transfusion
- Phlebotomists and nursing staff.
- Question not answered correctly.

3. All members of staff (including doctors) who take blood samples should receive training in the procedure

Yes		*No*		*Not answered*	
Total	*Percentage*	*Total*	*Percentage*	*Total*	*Percentage*
34	94.4%	2	5.6%	0	

4. **Every hospital should have a written policy for the administration of blood on the wards**

Yes		*No*		*Not answered*	
Total	*Percentage*	*Total*	*Percentage*	*Total*	*Percentage*
36	100%	0		0	

5. **All relevant professions should be aware of the content of the policy**

Yes		*No*		*Not answered*	
Total	*Percentage*	*Total*	*Percentage*	*Total*	*Percentage*
36	100%	0		0	

6. **A copy of the policy should be available on every ward**

Yes		*No*		*Not answered*	
Total	*Percentage*	*Total*	*Percentage*	*Total*	*Percentage*
36	100%	0		0	

7. **The policy should contain clear information on the seriousness of ABO incompatible transfusions and the likelihood of a reaction occurring early after commencement of transfusion**

Yes		*No*		*Not answered*	
Total	*Percentage*	*Total*	*Percentage*	*Total*	*Percentage*
35	97.2%	1	2.8%	0	

8. **The policy should contain a list of clinical signs and symptoms associated with adverse transfusion reaction**

Yes		*No*		*Not answered*	
Total	*Percentage*	*Total*	*Percentage*	*Total*	*Percentage*
35	97.2%	1	2.8%	0	

9. **The policy should contain a clear statement on what to do if a transfusion reaction occurs**

Yes		*No*		*Not answered*	
Total	*Percentage*	*Total*	*Percentage*	*Total*	*Percentage*
36	100%	0		0	

10. **The policy should contain a clear statement as to where the compatibility report should be at the time of transfusion (as measurable audit standard)**

Yes		*No*		*Not answered*	
Total	*Percentage*	*Total*	*Percentage*	*Total*	*Percentage*
34	94.4%	2	5.6%	0	

11. **The policy should contain a clear statement on pre-transfusion nursing observations (temperature, pulse, blood pressure) required, including the timing of such observations (as measurable audit standard)**

Yes		*No*		*Not answered*	
Total	*Percentage*	*Total*	*Percentage*	*Total*	*Percentage*
36	100%	0		0	

12. **The policy should contain a clear statement on nursing observations (temperature, pulse, blood pressure) required following commencement of the transfusion of each unit, including the timing of such observations (as measurable audit standard)**

Yes		*No*		*Not answered*	
Total	*Percentage*	*Total*	*Percentage*	*Total*	*Percentage*
35	97.2%	1	2.8%	0	

13. **The policy should contain a clear statement on subsequent nursing observations (temperature, pulse, blood pressure) required for each unit, including the timing of such observations (as measurable audit standard)**

Yes		*No*		*Not answered*	
Total	*Percentage*	*Total*	*Percentage*	*Total*	*Percentage*
35	97.2%	0		1	2.8%

14. **The policy should contain a clear statement on the minimum details required for documentation (content of compatibility report, content of nursing documentation, content of medical documentation) of the process (as a measurable audit standard)**

Yes		*No*		*Not answered*	
Total	*Percentage*	*Total*	*Percentage*	*Total*	*Percentage*
34	94.4%	2	5.6%	0	

15. **The policy should contain a clear statement on which types of documentation (compatibility report, nursing documentation, medical documentation) should be retained as a permanent record of the transfusion (as measurable audit standard)**

Yes		*No*		*Not answered*	
Total	*Percentage*	*Total*	*Percentage*	*Total*	*Percentage*
33	91.7%	2	5.6%	1	2.8%

16. **Every hospital should have a Hospital Transfusion Committee**

Yes		*No*		*Not answered*	
Total	*Percentage*	*Total*	*Percentage*	*Total*	*Percentage*
29	80.6%	7	19.4%	0	

17. **The Hospital Transfusion Committee should have responsibility for auditing blood transfusion practice. (n = 29)**

Yes		*No*		*Not answered*	
Total	*Percentage*	*Total*	*Percentage*	*Total*	*Percentage*
26	89.7%	0		3	10.3%

SECTION II: The Compatibility Report

1. **Which of the following do you consider to be the most appropriate place for the compatibility report at the time of transfusion?**

	Total	*Percentage*
a) In the patient's notes	11	30.6%
b) Attached to the prescription chart	24	66.7%
c) On its own at the bedside	1	2.8%
d) Elsewhere	0	

2. **Please indicate whether you regard the following as essential, desirable or not important:**

a) The transfusion date should be recorded on the compatibility report for all units transfused

	Total	*Percentage*
Essential	27	75%
Desirable	6	16.7%
Not important	3	8.3%

b) The signatures of the two responsible officers who did the ID checks should be recorded on the compatibility report for all units transfused

	Total	*Percentage*
Essential	28	77.8%
Desirable	5	13.9%
Not important	2	5.6%
Not appropriate	1	2.8%

c) The compatibility report should be filed securely in the patient's notes as a permanent record of the transfusion

	Total	*Percentage*
Essential	35	97.2%
Desirable	1	2.8%
Not important	0	

If you have indicated **Desirable** or **Not important**, do you feel that the compatibility report should be filed securely in the patient's notes for a specified period of time following the transfusion? (n = 1)

	Total	*Percentage*
Yes	1	100%
No	0	

If Yes, what should be the specified period of time? (n = 1)

- Lifetime in notes before destruction's / microfilm

SECTION 111: Nursing Documentation

1. **Please indicate whether you regard the following as essential, desirable, or not important:**

a) Baseline temperature should be recorded before commencement of transfusion

	Total	*Percentage*
Essential	27	75%
Desirable	8	22.2%
Not important	1	2.8%

If you have indicated **Essential** or **Desirable**, how soon before commencement of transfusion should it be recorded? (n = 35)

	Total	*Percentage*
Not more than 1 hour before commencement of transfusion	24	68.6%
Not more than 4 hours before commencement of transfusion	7	20%
Other	3	8.6%
Not stated	1	2.9%

If **Other**, please specify. (n = 3)

- Immediately prior to transfusion
- Start of transfusion
- Within 15 minutes

b) Baseline pulse should be recorded before commencement of transfusion

	Total	*Percentage*
Essential	26	72.2%
Desirable	10	27.8%
Not important	0	

If you have indicated **Essential** or **Desirable**, how soon before commencement of transfusion should it be recorded? (n = 36)

	Total	*Percentage*
Not more than 1 hour before commencement of transfusion	28	77.8%
Not more than 4 hours before commencement of transfusion	4	11.1%
Other	3	8.3%
Not stated	1	2.8%

If **Other**, please specify. (n = 3)

- Immediately prior to transfusion
- Start of transfusion
- Within 15 minutes

c) Baseline blood pressure should be recorded before commencement of transfusion

	Total	*Percentage*
Essential	22	61.1%
Desirable	14	38.9%
Not important	0	

If you have indicated **Essential** or **Desirable**, how soon before commencement of transfusion should it be recorded? (n = 36)

	Total	*Percentage*
Not more than 1 hour before commencement of transfusion	24	66.7%
Not more than 4 hours before commencement of transfusion	8	22.2%
Other	3	8.3%
Not stated	1	2.8%

If **Other**, please specify. (n = 3)

- Immediately prior to transfusion
- Start of transfusion
- Within 15 minutes

d) Temperature should be recorded following commencement of transfusion of each unit transfused

	Total	*Percentage*
Essential	28	77.8%
Desirable	5	13.9%
Not important	3	8.3%

If you have indicated **Essential** or **Desirable**, please specify how soon it should be recorded.

Recorded following commencement of each unit transfused 28 completed this part of the question.	*Total*	*Percentage*
0 - 15 minutes	16	57.1%
16 - 30 minutes	8	28.6%
31 - 60 minutes	3	10.7%
> 60 minutes	1	3.6%

Thereafter, until commencement of transfusion of next unit to be transfused 25 completed this part of the question.	***Total***	***Percentage***
0 - 30 minutes	4	16%
31 - 60 minutes	19	76%
> 60 minutes	2	8%

e) Pulse should be recorded following commencement of transfusion of each unit transfused

	Total	***Percentage***
Essential	24	66.7%
Desirable	7	19.4%
Not important	4	11.1%
Not stated	1	2.8%

If you have indicated **Essential** or **Desirable**, please specify how soon it should be recorded.

Recorded following commencement of each unit transfused 28 completed this part of the question.	***Total***	***Percentage***
0 - 15 minutes	16	57.1%
16 - 30 minutes	10	35.7%
31 - 60 minutes	1	3.6%
> 60 minutes	1	3.6%

Thereafter, until commencement of transfusion of next unit to be transfused 24 completed this part of the question	*Total*	*Percentage*
0 - 30 minutes	5	20.8%
31 - 60 minutes	18	75%
> 60 minutes	1	4.2%

f) blood pressure should be recorded following commencement of transfusion of each unit transfused

	Total	*Percentage*
Essential	21	58.3%
Desirable	7	19.4%
Not important	6	16.7%
Not stated	2	5.6%

If you have indicated **Essential** or **Desirable**, please specify how soon it should be recorded.

Recorded following commencement of each unit transfused 24 completed this part of the question	*Total*	*Percentage*
0 - 15 minutes	15	62.5%
16 - 30 minutes	5	20.8%
31 - 60 minutes	2	8.3%
> 60 minutes	2	8.3%

Thereafter, until commencement of transfusion of next unit to be transfused 18 completed this part of the question	***Total***	***Percentage***
0 - 30 minutes	5	27.8%
31 - 60 minutes	10	55.5%
> 60 minutes	3	1.7%

2. **Do you think that fluid balance/urinary output should be recorded routinely for every patient undergoing transfusion?**

	Total	***Percentage***
Yes	6	16.7%
No	29	80.6%
Not stated	1	2.8%

3. **Do you think that nursing observations of the transfusion should be filed in the patient's notes as a permanent record?**

	Total	***Percentage***
Yes	28	77.8%
No	7	19.4%
Not stated	1	2.8%

If No, do you think that the nursing observations should be filed in the patient's notes for a specified period of time following the transfusion? (n = 7)

	Total	***Percentage***
Yes	5	71.4%
No	2	28.6%
Not stated	0	

If Yes, what should be the specified period of time? (n = 5)

- 4 Weeks
- 5 Weeks
- 6 Months
- Can be discarded after discharge summary is written
- During the rest of the hospital admission

SECTION IV: Medical Documentation

1. **Please indicate whether you regard the following as Essential, Desirable or Not important:**

a) The reason for the transfusion should be hand-written by a doctor in the patient's case-notes

	Total	*Percentage*
Essential	18	50%
Desirable	16	44.4%
Not important	2	5.6%

b) The date of transfusion should be hand-written by a doctor in the patient's case-notes

	Total	*Percentage*
Essential	17	47.2%
Desirable	13	36.1%
Not important	6	16.7%

c) The number of units transfused should be hand-written by a doctor in the patient's case-notes

	Total	*Percentage*
Essential	17	47.2%
Desirable	13	36.1%
Not important	6	16.7%

2. **Do you think that a pre-transfusion haemoglobin should be recorded routinely for every patient undergoing transfusion?**

	Total	*Percentage*
Yes	30	83.3%
No	6	16.7%

If Yes, please specify how soon before transfusion the haemoglobin should be recorded. (n = 30)

	Total
Depending on clinical circumstances	5
1 Week prior to transfusion	9
Up to 4 days prior to transfusion	1
Up to 3 days prior to transfusion	1
Up to 2 days prior to transfusion	4
Up to 24 hours prior to transfusion	2
Within a few hours or the same day of transfusion	3
Not stated	4
No limit	1

If No, please specify if there are any clinical situations where you would regard the recording of a post-transfusion haemoglobin as essential. (n = 6)

	Total
Regularly transfused patients	2
Elective transfusion for anaemia	1
In cases of gastro-intestinal haemorrhage, transfuse dependent patients and, paediatric cases	1
Elective top ups, emergency and blood transfusion for bleeding less relevant.	1
No comment	1

3. **Do you think that a post-transfusion haemoglobin should be recorded routinely for every patient who has undergone a blood transfusion?**

	Total	*Percentage*
Yes	7	19.4%
No	29	80.6%

If Yes, please specify how soon after transfusion the haemoglobin should be recorded (n = 7)

	Total
A few hours to a few weeks, depending on clinical situation	1
Within 24 hours	3
End of last unit	1
Transfusion regime (thalamassaemia etc), controlled blood loss	1
No comment	1

If No, please specify if there are any clinical situations where you would regard the recording of a post-transfusion haemoglobin as essential. (n = 29)

	Total
Where patient is haemorrhaging and suffering a haemolytic reaction	7
Where patient is haemorrhaging	7
Post operative patients	3
Multiple transfused patients	3
On going management of gastro-intestinal bleeds, suspected haemolysis and paediatric cases	1
In suspected transfusion reaction, poor clinical response, and to finalise transfusion in selected patients	1
If further transfusions are considered on patients who are haemodynamically unstable	1
Should be mandatory for most in-patient settings	1
Regular checks needed for haematology in-patients to predict demand	1
No comment	4

SECTION V: Miscellaneous

Please list any other documentation procedures, NOT mentioned in this questionnaire, which you consider essential or desirable in improving the quality of the clinical blood transfusion process. Please give you reasons and state whether the documentation should form part of the permanent patient record.

Essential:

A safe time to return unused blood to the blood bank

Documentation to support what happens to the blood from the time it leaves the blood bank, audit trail.

Documentation needs to be clear minimal and not reliant on doctors

The date and reason for decisions on specialised blood products, eg leucodepleted, CMV requirements, irradiated cells and whether or not this is indefinite or temporary

The person taking the blood sample should sign that they have identified the patient as the one on the request form which may be signed by another doctor

IV administration charts must be signed by a doctor (hand written or by unique electronic code which can identify the doctor for a specific period)

Policy for blood samples should include procedure for unidentified patients in A&E department etc

Action taken in the event of a reaction to blood or blood products (permanent record)

Documentation of all complications of transfusion, even bruising and/or infected drip sites etc

Documentation on the clinical benefits to patients, and the duration of benefits to transfusion dependent patients.

Rejection policy for samples received for crossmatch especially inadequate labelled samples

Clear documentation of checking procedures prior to giving transfusion

Ready availability of medical supervision if not on site then by phone

Medical prescription for the transfusion in clear identification of doctor, ie capitals and signature

Documentation verbal comments of patients for the transfusion in case notes, permanent record.

Nursing observations should be minimised. Pre-transfusion temperature, pulse and blood pressure are repeated at the end of all units transfused. General checking of patients condition before each unit and observations if indicated

One hospital has enclosed their local blood and blood product transfusion record

Desirable:

It may happen that specific consent for blood transfusion will be necessary. I feel it would be desirable to have the words, "and blood transfusion if necessary", to be put in the ordinary consent form.

When to use filters in blood transfusion

A transfusion committee may be desirable but we have found that small groups discussion over certain issues more effective than a regular committee meeting

Automated system, eg, bedside barcoded patients and compatibility response to reduce risk of

HTC - "No" Depends on the hospital management structure and nature of liaison between laboratory and clinicians. Have executive function and direct access to appropriate groups. Someone / persons, terms of reference very important ?? should be centrally established.