

Transfusion Matters



Blood and Transplant

SUMMER/AUTUMN 2008
5th EDITION

THE JOURNEY OF A BAG OF BLOOD – FROM HOSPITAL LABORATORY TO PATIENT

This edition of Transfusion Matters follows on from the last edition and focuses on the journey of a bag of blood from when it arrives in the hospital transfusion laboratory to when it is allocated for a specific patient. It includes details of the tests required to determine a patient's blood group, the significance of antibodies and how to ensure the patient receives compatible red cells issued by the hospital transfusion laboratory.



The differences between a group and save and a crossmatch request are explained, along with information on how laboratory IT systems can help make the transfusion process quicker and safer.

The number of blood components issued each year to hospitals is falling, but the number of blood donors is falling too. To help ensure blood is available to those who would not survive without it, we need to ensure all blood components are used appropriately. Appropriate use of blood, the use of emergency (flying squad) blood and the alternatives to transfusion will be highlighted in the next edition.

Additional copies of Transfusion Matters can be obtained from either your Hospital Transfusion Practitioner or Hospital Liaison, NHS Blood & Transplant, John Eccles House, Robert Robinson Avenue, Oxford Science Park, OXFORD, OX4 4GP.

E.mail hospital.liaison@nhsbt.nhs.uk

Welcome to the 5th edition of Transfusion Matters. This newsletter is produced for hospital staff by the National Blood Service Transfusion Liaison Nurse (TLN) team. The National Blood Service is an operating division of NHS Blood and Transplant.

The TLN team are trying to help raise awareness of transfusion issues among ward staff in hospitals. This newsletter is one of our initiatives to help share information about the current issues in blood transfusion.

I would like to thank the readers who took the time to give feedback on the last edition and have pleasure in announcing the winner of the prize draw is Helen Guymer. Helen has been sent a copy of the book 'A Manual for Blood Conservation'. Helen is a registered nurse on a busy surgical ward in North Devon District Hospital, Barnstaple.

Congratulations and thank you from the TLN team.

If you have any comments or suggestions for future editions please email the editor denise.watson@nhsbt.nhs.uk.

Blood Samples for Pre-transfusion Testing

The member of staff taking the blood sample from the patient must ensure the correct and relevant information is recorded on the request form and sample tube. If there are any discrepancies between the form and sample, the laboratory staff must not process the sample until identification is confirmed, even if this may lead to a delay in treatment for patients. In some cases this could mean a repeat sample being sent.

In order for your samples to be processed they must contain the following minimum data:

1. Last Name/Family name (spelt correctly)
2. First Name(s) (in full)
3. Date of Birth (not age or year of birth)
4. NHS number, other unique patient identifier or Address.

The sample should be dated, labelled and signed by the person taking it (at the patient's bedside).¹



Care must be taken at all times as sample errors can have serious consequences. The Serious Hazard of Transfusion (SHOT) Annual Report 2006 reports of an 80 year old female who died from cardiac failure following a transfusion based on a Hb of 3.9g/dL. Investigation showed that the blood sample with a Hb of 3.9g/dL was diluted by an intravenous infusion.²

Blood Groups

Karl Landsteiner discovered the ABO blood group system in 1901 and in 1939 Levine and Stetson discovered the Rh system.³ The four main blood groups are A, B, O and AB. Everyone is also either Rh D negative or Rh D positive.

Red cell ABO blood Group	Antibody in plasma	Compatible red cells
O	Anti -A + Anti -B	O
A	Anti -B	A and O
B	Anti -A	B and O
AB	None	AB, B, A and O

Antibodies

ABO antibodies are described as “naturally occurring” because they are present in the plasma of all healthy adults. Babies under three months have little or no antibodies in their plasma. When a child reaches the age of five years their antibody level will have reached normal adult levels.

NOTE: There are many other antigens on red blood cells, other than A and B. A patient can develop antibodies (known as atypical or irregular) if the red cells transfused contain an antigen the patient does not have.

Following pregnancy or a blood transfusion, atypical antibodies can be detected in some patients. If a patient is known to have a clinically significant atypical antibody they must receive blood which is negative for the corresponding antigen. This is to prevent the occurrence of a transfusion reaction.

Clinically significant antibodies are those that are capable of causing a transfusion reaction due to accelerated destruction of a significant proportion of transfused red cells. Anti-A and anti-B antibodies must always be regarded as clinically significant.

Group & Save (G&S) (also known as group and screen or group and hold)

A group and save involves:

- Determining the patient's ABO and Rh D group.
- Performing an antibody screen, and identifying any atypical antibodies which may be present.
- Checking the results against any historical data that might be available for the patient.

A group and save taken in advance, e.g. in Pre-Assessment clinics, is useful for several reasons:

1. It enables the transfusion laboratory to identify any antibodies and ensure suitable blood is available.
2. These results can be checked by nursing and medical staff who can then decide if the treatment can go ahead as planned, or if further investigations are required.
3. When a crossmatch is requested at a later date it can be checked against the historical record.

When an antibody has been detected, an antibody card will be issued to the patient from either the hospital transfusion laboratory or the National Blood Service. These cards should be carried by the patients at all times and brought to the attention of the medical staff if further transfusions are required.

Antibody levels can rise and fall over a period of time, so it is important to document on the form any previously identified antibodies as these may not always be detected on testing.



A blood sample will be referred to a red cell reference laboratory if there is any doubt concerning the identities of any antibodies present or lack of exclusion of clinically significant antibodies.⁴ Failure to recognize all of the antibody specificities within a sample may lead to a haemolytic transfusion reaction.⁴

Crossmatching of Blood

A crossmatch involves a serological test to ensure compatibility between a unit of blood and the patient.

When requesting a crossmatch, further additional information is required:

- Patient's location.
- Signature/name of person requesting the blood.
- Product information: type, amount, date and time required, special requirements e.g. if the patient requires CMV negative or irradiated blood.

The table below shows when a sample should be taken if the patient has been recently transfused:⁴

Patient transfused within:	Sample to be taken not more than:
3-14 days	24 hours before transfusion
15-28 days	72 hours before transfusion
29 days to 3 months	1 week before transfusion

Electronic Issue

Electronic issue involves the selection and issuing of units without direct serological testing between the patient and the donor red cells.

Crossmatched blood using serological testing usually takes between 30-45 minutes, whereas electronic issue can take as little as 10 minutes.

Hospitals using electronic issue must comply with the national guidelines *"The specification and use of information technology systems in blood transfusion practice"*.⁵

Electronic issue is not recommended for neonates as blood issued has to be compatible with antibodies from the mother that may be present in the baby's blood.⁶

Selecting compatible units

The hospital transfusion laboratory will use the test results together with the information provided on the request form to select and label the correct blood component for the patient. When the staff member goes to collect the blood component from the issue fridge, they must take with them the patient's identification details, match these with the label on the blood component and complete the relevant documentation as per hospital policy.



The SHOT Annual Report 2007 reported nine cases of ABO incompatible transfusions of which seven involved collection of the wrong unit from the storage site.⁷

References:

1. *Requirements for Sample Labelling and Request Form Completion*, NBS Policy MPD/DDR/DD/009/03, 2007.
2. *Serious Hazards of Transfusion Annual Report 2006* <http://www.shotuk.org>
3. Learoyd, P. (2003) *An Introduction to Blood Group Serology and Transfusion*. 3rd edition, Leeds National Blood Service.
4. British Committee for Standards in Haematology Blood Transfusion Taskforce (2004) Guidelines for compatibility procedures in blood transfusion laboratories. *Transfusion Medicine*, **14**, 59-73.
5. British Committee for Standards in Haematology Blood Transfusion Taskforce (2007) The specification and use of information technology systems in blood transfusion practice. *Transfusion Medicine*. **17**, 1-21.
6. British Committee for Standards in Haematology Blood Transfusion Taskforce (2004) Transfusion guidelines for neonates and older children. *British Journal of Haematology*. **124**, 433-453.
7. *Serious Hazards of Transfusion Annual Report 2007* <http://www.shotuk.org>

Have fun with our wordsearch and be in with a chance to win a 'Billy Blood Drop' and a copy of 'Handbook of Transfusion Medicine' – Good luck to all.

WORDSEARCH

A	R	E	Q	U	I	R	E	M	E	N	T	S	B	F	D	Q	W	R	N
C	I	T	Y	L	O	M	E	A	H	G	I	H	K	B	C	V	A	Z	L
H	Y	I	L	R	P	D	W	B	G	U	I	D	E	L	I	N	E	S	D
T	G	D	B	L	O	O	D	S	E	R	V	I	C	E	W	R	D	A	W
O	L	A	B	O	R	A	T	O	R	Y	S	Z	X	G	S	E	W	L	R
I	Q	U	F	H	K	P	V	M	D	E	R	R	O	R	S	N	S	T	G
D	S	G	T	U	I	K	N	G	C	X	E	E	A	L	P	L	C	E	C
E	M	E	R	G	E	N	C	Y	C	U	A	P	N	L	M	O	N	R	K
N	S	D	B	C	V	K	I	P	F	E	C	O	T	C	V	I	K	N	U
T	S	A	R	Q	T	L	A	N	D	S	T	E	I	N	E	R	U	A	I
I	C	U	S	F	U	Q	N	F	K	L	I	B	G	D	A	R	Y	T	P
F	D	T	E	G	R	J	T	U	K	L	O	P	E	F	C	A	H	I	L
I	N	O	S	F	D	Q	I	L	O	P	N	F	N	C	G	D	P	V	B
C	O	M	P	A	T	I	B	L	E	F	T	I	O	V	T	I	L	E	F
A	G	A	A	D	Q	A	O	H	K	P	B	I	P	O	S	A	A	S	N
T	K	T	T	O	F	E	D	G	C	S	A	E	R	K	E	T	S	A	J
I	Y	I	I	H	U	Y	Y	S	D	Q	A	Y	U	L	U	E	M	D	R
O	O	O	E	N	M	G	L	F	L	Y	I	N	G	S	Q	U	A	D	F
N	L	N	N	S	E	B	R	T	E	N	J	U	I	K	E	L	O	R	T
A	F	P	T	R	A	N	S	F	U	S	I	O	N	I	R	R	E	F	A

Find out which one of the following words is **not** in the puzzle!!

ALTERNATIVES
ANTIBODY
ANTIGEN
APPROPRIATE
AUTOMATION
BLOOD SERVICE
COMPATIBLE
EMERGENCY
ERRORS
FLYING SQUAD
GUIDELINES
HAEMOLYTIC
IDENTIFICATION
IRRADIATE
LABORATORY
LANDSTEINER
PATIENT
PLASMA
REACTION
REQUEST
REQUIREMENTS
TRANSFUSION

Send your entry including your name and contact details to 'WORDSEARCH' Hospital Liaison, NHS Blood & Transplant, John Eccles House, Robert Robinson Avenue, Oxford Science Park, OXFORD, OX4 4GP by 31st October, 2008.

