

Guidelines for the Blood Transfusion Services

Chapter 25: Standards for electronic data interchange within the UK Blood Transfusion Services

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25.1: Introduction

UK Blood Establishments and hospital blood bank computer systems have developed to provide sophisticated control of information on donors, blood components and patients, with secure methods of information transfer utilising barcodes and electronic data capture. However, secure information transfer between Blood Establishments and their customer hospitals has been limited to the barcoded information incorporated on the blood packs, and is of restricted scope.

In the future it is hoped that international electronic data interchange standards such as HL7 (not for profit organisation setting standards for healthcare IT communication in UK – www.hl7.org.uk) will be developed and adopted by Blood Establishments. The Joint UKBTS/HPA Professional Advisory Committee (JPAC) Standing Advisory Committee on Information Technology (SACIT) will continue to monitor developments by special interest groups in this area. Currently the International Society of Blood Transfusion (ISBT) Working Party on Information Technology has established an Interface Task Force to look at setting standards between laboratory instruments and Blood Establishment computer systems based on HL7 and LIS2 (EC programme promoting the information society in Latin America). The development and implementation of these international standards will take many years and SACIT has long recognised the desirability of developing UK standards for data transfer. The messages defined in this document are well established in the UK and should continue to be used.

This document describes a standard for messages used in communication between Blood Services and their customers. Each message comprises a standard envelope and a message content. The envelope specifies the overall structure of UKBTS messages and identifies the specific message content included inside the envelope. The message content will comply with one of the message protocols defined in this document. Each message protocol defines the content and format of a specific type of data transaction.

The standard does not address the delivery mechanism, or any surrounding envelopes. Thus, it provides a standard which is relevant to delivery mechanisms as diverse as e-mail messages, web page downloads, ftp transfers, or ASCII text files.

At the same time it retains a standard presentation of messages which readily identifies them as belonging to the UKBTS set, and allows a general process to identify the type of message received, the source and the destination.

25.2: Control of message structures

The standard is controlled by SACIT. All messages utilising the UKBTS envelope must comply with an approved message structure.

Proposals for new messages, or amendment to existing messages, should be submitted in the first instance to the Chair of SACIT. These will be reviewed by SACIT and if approved will be incorporated into the standard. While the objective is to obtain standards applied throughout the UK, the two-level structure does allow the flexibility of defining different structures at the message protocol level where essential.

25.3: General protocol

The general protocol defines the general character of the overall message, and elements which are common to both the envelope and the message content. The message uses standard ASCII characters throughout, and lines are terminated with the carriage return (ASCII 13) character. Fields are all fixed width and left-justified. Leading zeros for numeric fields are used only where explicitly indicated.

Please note that this standard does not necessarily conform to any particular operating system standard for specifying a text file. For example, Unix-based operating systems (including Apple Mac OS X) use line feed (ASCII 10) to terminate text lines and Microsoft Windows uses a combination of carriage return and line feed (ASCII 13 and ASCII 10). Apple Mac operating systems prior to OS X used a single carriage return to terminate text lines. Due to these inconsistencies files containing electronic data interchange messages must always be processed character by character and not rely on specific text processing functions.

The following are standard components of every line transmitted:

- The line number: A sequential number defining the line in the file, which is located in character positions 1 to 5 of every line. The header line will always have a line number of 00001.
- The checksum: The checksum immediately precedes the carriage return terminator of each line. The checksum is calculated by taking the sum of the ASCII value of all characters in the line, and then determining the modulus 97 remainder which becomes the checksum.

25.4: Envelope definition

The envelope definition defines the content of the first and last lines of the file/transmission (see Table 25.1).

The first or header line contains an identifier specifying that this is a message complying with a UKBTS specification, the date and time generated, the source and destination of the message, and the protocol number which identifies the relevant protocol to which the message conforms.

Source and destination identifiers for the Blood Establishments will be the ISBT 128 collection facility identification code. It is anticipated that hospital blood banks will use the identifier assigned by their local Blood Establishment.

The terminator line contains a record count indicating the total number of message lines excluding the header and terminator lines, and a standard terminator message.

25.5: Message protocols

Table 25.2 indicates the protocols defined to date.

Table 25.1 Envelope definition

Field	Length	Description	Format	Mandatory?	Notes
Header line					
1	5	Line number	NNNNN	Y	Always 00001 for header
2	10	Fixed text	'UKBTSSTART'	Y	
3	8	Date	YYYYMMDD	Y	
4	4	Time	HHMM	Y	
5	6	Protocol number	NNNNNN	Y	Allocated by UK SACIT
6	6	Source ID	XXXXXX	Y	
7	6	Destination ID	XXXXXX	Y	
8	2	Checksum	NN	Y	
9	1	Terminator	Carriage return	Y	
Footer line					
1	5	Line number	NNNNN	Y	
2	9	Fixed text	'UKBTSSTOP'	Y	
3	5	No. of records	NNNNN	Y	
4	2	Checksum	NN	Y	
5	1	Terminator	Carriage return	Y	

Table 25.2 Message protocol numbers

Protocol number	Title	Description
000001	Blood component dispatch information	Defines the message used to transfer information on blood component issues
000002	Blood derivative dispatch information	Defines the message used to transfer information on blood derivative issues
000003	Reagent dispatch information	Defines the message used to transfer information on reagent issues
000004	Blood component dispatch acknowledgement	Defines the message used to transfer information on blood components received
000005	Blood component fate information	Defines the message used to transfer information on the fate of blood components received

The message protocols contain a range of data defined as either mandatory or optional. The mandatory fields give essential information and must contain valid data. The optional fields give the flexibility to build in a wide range of additional information, but if not required are left as blank (space character) fields.

25.6: Protocol 000001 – blood component dispatch information

Update Notice: Chapter 25 - Tables 25.5 has been updated following the issue of Change Notification 29 - 2015

Two data line structures are defined within this protocol. The first is a single line containing administrative information (order no., dispatch no.), and the second is a multiple occurrence line with an entry for each item on the dispatch. To distinguish between the two line types, a line type indicator is included as the first field following the line number (see Tables 25.3 to 25.6).

Table 25.3 Message protocol 000001: blood component dispatch information: administration line

Field	Length	Description	Format	Mandatory?	Notes
1	5	Line number	NNNNN	Y	
2	1	Line type	N	Y	=‘1’
3	12	Order no.	C(12)	Y	
4	12	Dispatch no.	C(12)	Y	
5	8	Date	YYYYMMDD	Y	
6	4	Time	HHMM	N	
7	2	Checksum	NN	Y	
8	1	Terminator	Carriage return	Y	

Table 25.4 Message protocol 000001: blood component dispatch information: dispatch line

Field	Length	Description	Format	Mandatory?	Notes
1	5	Line number	NNNNN	Y	
2	1	Line type	N	Y	=‘2’
3	15	Unit identifier	C(15)	Y	ISBT 128 donation identification number (data characters with check character, e.g. ‘G151797123456L’)
4	9	Product code	C(9)	Y	Component code (either a full 9-character Codabar code (including start and stop characters), or an 8-character ISBT 128 product code excluding the data identifier characters)
5	2	Group ABO	C(2)	Y	‘A’, ‘B’, ‘O’ or ‘AB’
6	1	Group RhD	C(1)	Y	‘+’ or ‘-’
7	8	Date bled	YYYYMMDD	N	

8	8	Date of expiry	YYYYMMDD	Y	
9	4	Time of expiry	HHMM	N	
10	30	Red cell characteristics	C(30)	N	Position indicates antigen content (see Table 25.5), '+' or '-' for confirmed results, 'P' or 'N' for unconfirmed results
11	1	HLA flag	C(1)	N	'Y': indicates that HLA information is included either in the comment field or on separate documentation Space: no information
12	1	CMV	C(1)	N	'+' : positive '-' : negative Space: unknown
13	1	Irradiated	C(1)	N	'Y': yes 'N' or space: no 'P': info in product code
14	10	Platelet-specific phenotype	C(10)	N	Position indicates antigen, content (see Table 25.6) '+' : positive result '-' : negative result
15	1	IgA	C(1)	N	'Y': indicates that IgA information is included either in the comment field or on separate documentation Space: no information
16	1	High-titre haemolysin	C(1)	N	'Y': present 'N': not present Space: untested
17	1	Neonatal	C(1)	N	'Y': suitable for neonatal use 'N': unsuitable Space: untested 'P': info in product code
18	1	Filtered	C(1)	N	No longer used
19	3	Volume	NNN	N	mL

20	10	Pack lot no.	C(10)	N	
21	1	Methylene blue	C(1)	N	No longer used
22	1	Clinical use	C(1)	Y	'Y': suitable for clinical use 'N': unsuitable for clinical use
23	1	Issue type	C(1)	Y	'R': routine issue 'S': selected, unmatched 'X': crossmatched 'G': autologous
24	10	Cost code /price	C(10)	N	
25	2	Added value code	C(2)	N	
26	30	Comment	Free text	N	
27	2	Checksum	NN	Y	
28	1	Terminator	Carriage return	Y	

Table 25.5 Message protocol 000001: blood component dispatch information. Field 10: further characteristic codes

Character position in field	Characteristic	Character position in field	Characteristic
1	C	16	Jk ^a
2	c	17	Jk ^b
3	E	18	P ₁
4	e	19	A ₁
5	C ^w	20	Lu ^a
6	M	21	Lu ^b
7	N	22	Kp ^a
8	S	23	Kp ^b
9	s	24	HbS
10	K	25	HEV
11	k	26	Unassigned
12	Le ^a	27	Unassigned
13	Le ^b	28	Unassigned
14	Fy ^a	29	Unassigned
15	Fy ^b	30	Unassigned

25.7: Protocol 000002 – blood derivative dispatch information

Two data line structures are defined within this protocol. The first is a single line containing administrative information (order no., dispatch no.), and the second is a multiple occurrence line with an entry for each item on the dispatch. To distinguish between the two line types, a line type indicator is included as the first field following the line number (see Tables 25.7 and 25.8).

Table 25.6 Message protocol 000001: blood component dispatch information. Field 14: platelet-specific phenotype

Character position in field	Antigen
1	HPA-1a
2	HPA-1b
3	HPA-3a
4	HPA-3b
5	HPA-5a
6	HPA-5b
7	Unassigned
8	Unassigned
9	Unassigned
10	Unassigned

Table 25.7 Message protocol 000002: blood derivative dispatch information: administration line

Field	Length	Description	Format	Mandatory?	Notes
1	5	Line number	NNNNN	Y	
2	1	Line type	N	Y	= '1'
3	12	Order no.	C(12)	Y	
4	12	Dispatch no.	C(12)	Y	
5	8	Date	YYYYMMDD	Y	
6	4	Time	HHMM	N	
7	2	Checksum	NN	Y	
8	1	Terminator	Carriage return	Y	

25.8: Protocol 000003 – reagent dispatch information

Two data line structures are defined within this protocol. The first is a single line containing administrative information (order no., dispatch no.), and the second is a multiple occurrence line with an entry for each item on the dispatch. To distinguish between the two line types, a line type indicator is included as the first field following the line number (see Tables 25.9 and 25.10).

Table 25.8 Message protocol 000002: blood derivative dispatch information: dispatch line

Field	Length	Description	Format	Mandatory?	Notes
1	5	Line number	NNNNN	Y	
2	1	Line type	N	Y	= '2'
3	15	Batch number	C(15)	Y	
4	15	Product code	C(15)	Y	Unique pharmaceutical product identification code
5	40	Product description	C(40)	N	Free-format text
6	30	Manufacturer's name	C(30)	N	Free-format text
7	8	Expiry date	YYYYMMDD	Y	
8	4	No. of vials/bottles	N(4)	Y	
9	10	Cost code/price	C(10)	N	
10	5	Actual dosage value	N(5)	N	Decimal values permitted
11	5	Actual dosage units	C(5)	N	Free-format text
12	30	Comment	C(30)	N	Free-format text
13	2	Checksum	NN	Y	
14	1	Terminator	Carriage return	Y	

Table 25.9 Message protocol 000003: reagent dispatch information: administration line

Field	Length	Description	Format	Mandatory?	Notes
1	5	Line number	NNNNN	Y	
2	1	Line type	N	Y	= '1'
3	12	Order no.	C(12)	Y	
4	12	Dispatch no.	C(12)	Y	
5	8	Date	YYYYMMDD	Y	
6	4	Time	HHMM	N	
7	2	Checksum	NN	Y	
8	1	Terminator	Carriage return	Y	

Table 25.10 Message protocol 000003: reagent dispatch information: dispatch line

Field	Length	Description	Format	Mandatory?	Notes
1	5	Line number	NNNNN	Y	
2	1	Line type	N	Y	= '2'
3	15	Batch number	C(15)	Y	
4	15	Product code	C(15)	Y	Unique reagent identification code
5	40	Product description	C(40)	N	Free-format text
6	30	Manufacturer's name	C(30)	N	Free-format text
7	8	Expiry date	YYYYMMDD	Y	
8	4	No. of vials/bottles	N(4)	Y	
9	10	Cost code/price	C(10)	N	
10	30	Comment	C(30)	N	Free-format text
11	2	Checksum	NN	Y	
12	1	Terminator	Carriage return	Y	

25.9: Protocol 000004 – blood component dispatch acknowledgement

Two data line structures are defined within this protocol. The first is a single line containing administrative information (order no., dispatch no.), and the second is a multiple occurrence line with an entry for each item on the dispatch. To distinguish between the two line types, a line type indicator is included as the first field following the line number (see Tables 25.11 and 25.12).

Table 25.11 Message protocol 000004: blood component dispatch acknowledgement: administration line

Field	Length	Description	Format	Mandatory?	Notes
1	5	Line number	NNNNN	Y	
2	1	Line type	N	Y	= '1'
3	12	Order no.	C(12)	N	
4	12	Dispatch no.	C(12)	Y	From associated dispatch information message
5	8	Date of acknowledgement	YYYYMMDD	Y	
6	4	Time of acknowledgement	HHMM	N	
7	2	Checksum	NN	Y	
8	1	Terminator	Carriage return	Y	

Table 25.12 Message protocol 000004: blood component dispatch acknowledgement: dispatch line

Field	Length	Description	Format	Mandatory?	Notes
1	5	Line number	NNNNN	Y	
2	1	Line type	N	Y	= '2'
3	15	Unit identifier	C(15)	Y	ISBT 128 donation identification number (data characters with check character, e.g. 'G151797123456L')
4	9	Product code	C(9)	Y	Component code (either a full 9-character Codabar code (including start and stop characters), or an 8-character ISBT 128 product code excluding the data identifier characters)
5	1	Received	C(1)	Y	'Y' or 'N'
6	2	Checksum	NN	Y	
7	1	Terminator	Carriage return	Y	

25.10: Protocol 000005 – blood component fate information

One data line structure is currently defined within this protocol (see Tables 25.13 and 25.14). The data line is a multiple occurrence line with an entry for each item in the message. The data line has a line type indicator in common with the previous protocols to allow for additional line types to be created if required. It is expected that this message will be generated daily and will include information on all units that are:

- free for use
- allocated to a patient (either directly or notionally)
- marked as transfused or wasted in the period from the date the report was last gathered (minus 5 days) up until the present date.

This message will be used for all products with the exception of certain batched products (such as anti-D). Some batched products are excluded as each dose may not be allocated a unique unit number (platelet pools are not excluded).

Table 25.13 Message protocol 000005: blood component fate information: data line

Field	Length	Description	Format	Mandatory?	Notes
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1	5	Line number	NNNNN	Y	
2	1	Line type	N	Y	= '1'
3	15	Unit number	C(15)	Y	ISBT 128 donation identification number (data characters with check character, e.g. 'G151797123456L')
4	9	Product code	C(9)	Y	Component code (either a full 9- character Codabar code (including start and stop characters), or an 8- character ISBT 128 product code excluding the data identifier characters)
5	2	Group ABO	C(2)	Y	'A', 'B', 'O' or 'AB'
6	1	Group RhD	C(1)	Y	'+' or '-'
7	1	Status	C(1)	Y	F = free A = allocated T = transfused W = wasted C = Confirmed transfusion Note: Confirmed transfusion refers to transfusions that have been positively confirmed by electronic means
8	5	Wasted classification code	C(5)	N	Only used if 'Status' (Field 7) is marked as wasted (W). The wasted classification codes are maintained by the Blood Stocks Management Scheme (see Table 25.14)
9	8	Date used /wasted	YYYYMMDD	N	Only if marked as wasted (W) or transfused (T or C). Presumptive YYYYMMDD should be included if exact date not known
10	4	Time used /wasted	HHMM	N	Only if marked as wasted (W) or transfused (T or C). Optional
11	3	Patient age	NNN	N	Only if marked as transfused (T or C). Optional. Age in number of full years
12	1	Patient gender	C(1)	N	Only if marked as transfused (T or C). Optional. M = male, F = female

13	10	Blank field	C(10)	N	Area reserved for future use
14	2	Checksum	NN	Y	
15	1	Terminator	Carriage return	Y	

Table 25.14 Message protocol 000005: blood component fate information. Field 8: wasted classification code

Product super- group	Code	Full name	Code usage	Date started	Date stopped
RED CELL	TIMEX	Time expiry	The expiry date on the unit has passed	01 Apr 2001	N/A
RED CELL	OTCOL	Out of temperature control outside laboratory	Unit has been left out of temperature range for longer than 30 minutes on the wards, in theatres or in any other non-laboratory location	01 Apr 2001	N/A
RED CELL	OTCIL	Out of temperature control inside laboratory	Unit has been left out of temperature range for longer than 30 minutes in the laboratory	01 Apr 2001	31 Mar 2003
RED CELL	FFAIL	Fridge failure	The unit has been discarded as a direct result of a fridge failure	01 Apr 2003	N/A
RED CELL	MISCN	Miscellaneous	Any other reason the unit is wasted that is not covered by other codes	01 Apr 2001	N/A
PLATELET	MORNU	Medically ordered not used	Platelets ordered for medical procedure but not used	01 Apr 2003	N/A
PLATELET	SORNU	Surgically ordered not used	Platelets ordered for surgical procedure but not used	01 Apr 2003	N/A

PLATELET	STMEX	Stock time expired	If a stock of platelets is held, the expiry date on the unit has passed	01 Apr 2003	N/A
PLATELET	WOSOL	Wasted outside of laboratory	Unit has been left out of temperature range for longer than 30 minutes outside the laboratory	01 Apr 2003	N/A
PLATELET	WIMPT	Wasted import	Unit imported with patient but not used	01 Apr 2003	N/A
PLATELET	MISCN	Miscellaneous	Any other reason the unit is wasted that is not covered by other codes	01 Apr 2003	N/A

Note: These codes are managed by the Blood Stocks Management Scheme. For further information visit www.bloodstocks.co.uk