NHS
Blood and Transplant

Red Cell Immunohaematology

Jess Gill

BMS Specialist

What is RCI?

NHS Blood and Transplant

- National support for Transfusion Laboratories
- RCI labs located in Blood Centres in
  Birmingham, Bristol (Filton),
  London (Collindale, Tooting),
  Liverpool and Sheffield
- Liverpool hosts the NFFB and reagents
- Filton hosts the IBGRL

- Majority of blood transfusions
  can be facilitated by hospitals, BUT..

BCSH Guidelines 2012..

NHS Blood and Transplant

- If there is any doubt concerning the identity of any antibodies present, or the ability to exclude clinically significant antibodies, a sample should be sent to a red cell reference laboratory.
- Laboratories that are not registered for antibody investigation in an accredited external quality assurance scheme should refer samples from all patients that have given positive results in the antibody screen to a laboratory that is registered for antibody identification.

BCSH Guidelines 2012..

NHS Blood and Transplant

- If a patient is known to have (ever) formed a red cell alloantibody, each new sample must be fully tested to exclude the presence of further alloantibodies.

- When one antibody specificity is detected it is essential that the presence or absence of additional clinically significant alloantibodies is established.

Why Refer to RCI?

NHS Blood and Transplant

- Rare/Anomalous ABO/D blood grouping
- Antibody Confirmation/Identification
- Complex mixtures of antibodies
- Antenatal Investigations;
  - Quantification and titration
  - FMH Investigation
  - Provision of suitable blood for delivery/IUT
- AIHAs/ DAT positive patients
- Suspected Haemolytic Transfusion Reactions
- Advice!
- Panic?

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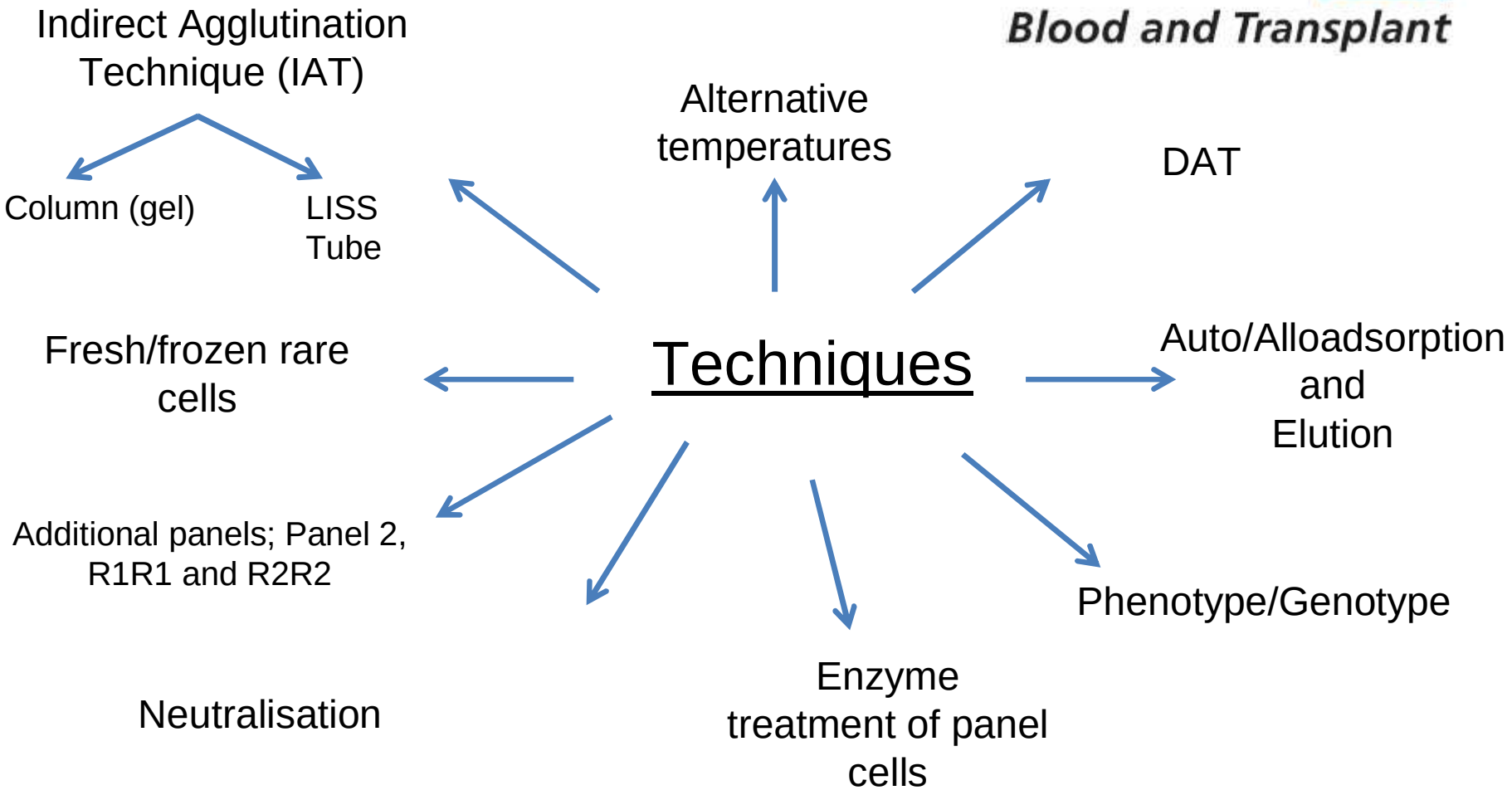
NHS Blood and Transplant



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NHS
Blood and Transplant

- Via NHSBT Liverpool and in liaison with the International Blood Group Reference Laboratory (IBGRL) RCI have access to additional reagents that may not be available to Hospital Labs;
  - Reference antibody identification panels Rare cells to confirm or exclude specificity
  - Rare antisera for phenotyping
  - National Frozen Cell Bank
  - National / international rare cell exchange
  - WHO International Rare Cell Donor Panel

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BCSH Guidelines 2012..

NHS Blood and Transplant

- Antibody specificity should only be assigned when the plasma is reactive with at least 2 examples of reagent red cells expressing the antigen and non-reactive with at least 2 examples of reagent red cells lacking the antigen.
- When one antibody specificity has been identified, it is essential that the presence or absence of additional clinically significant antibodies should be established. This can be demonstrated by choosing reagent red cells that are negative for the recognised specificity but positive for other antigens to which clinically significant antibodies may arise.

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BCSH Guidelines 2012..

NHS Blood and Transplant

- Failure to recognise all of the antibody specificities within a sample can lead to a haemolytic transfusion reaction. Specificities should be excluded using red cells having homozygous expression of the relevant antigen. A single example only of each phenotype is sufficient for exclusion.

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Blood and Transplant

Example Cases

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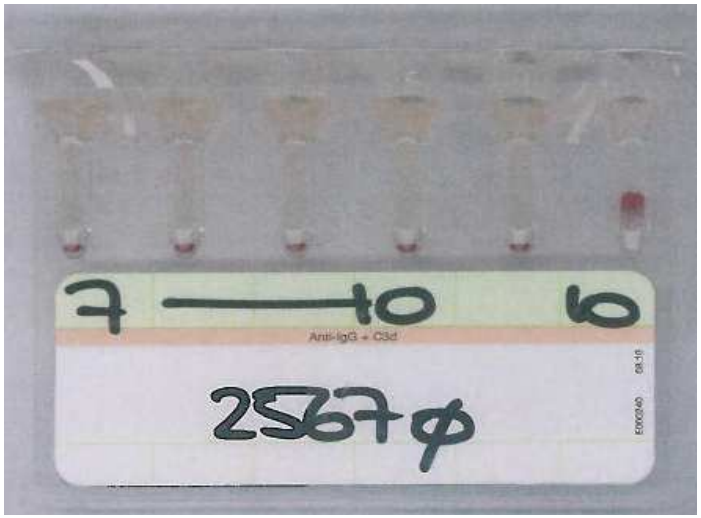

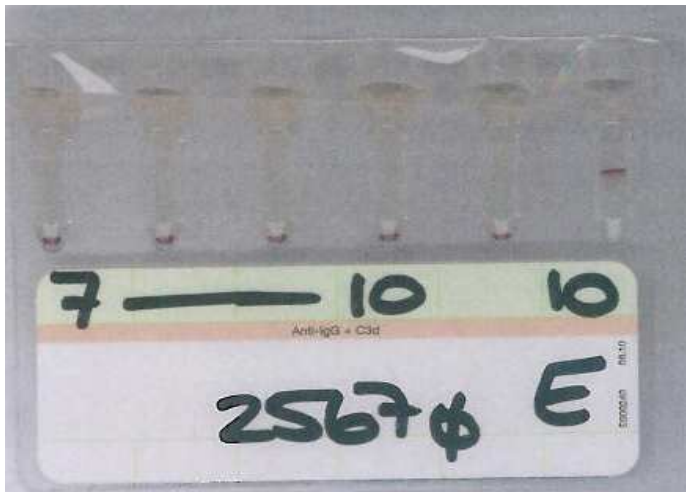

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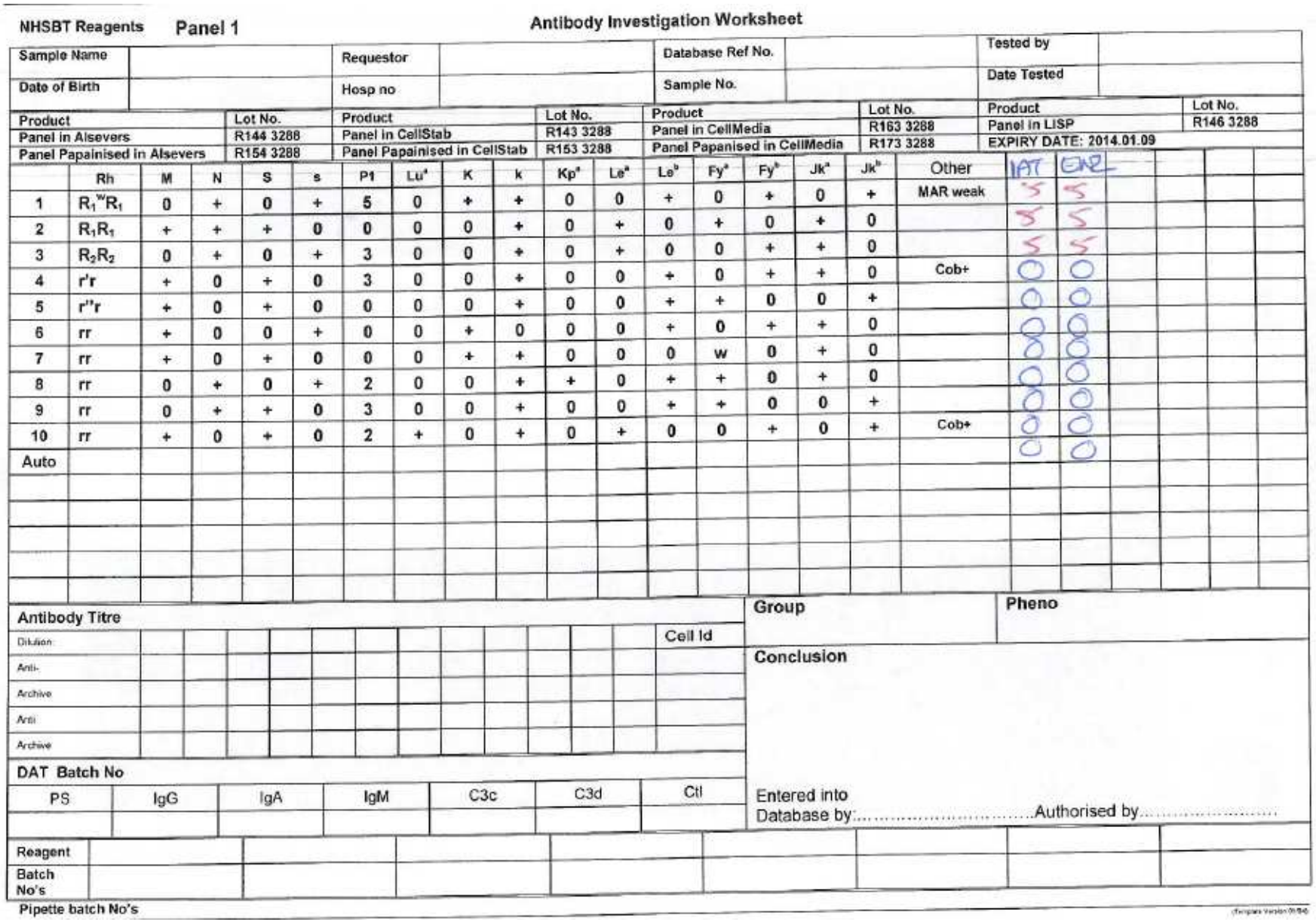

NHSBT Reagents Panel 1

Antibody Investigation Worksheet

Sample Name		Requestor		Database Ref No.		Tested by	
Date of Birth		Hosp no		Sample No.		Date Tested	

Product				Lot No.		Product				Lot No.		Product				Lot No.		Product				Lot No.			
Panel in Alsevers				R144 3288		Panel in CellStab				R143 3288		Panel in CellMedia				R163 3288		Panel in LISP				R146 3288			
Panel Papainised in Alsevers				R154 3288		Panel Papainised in CellStab				R153 3288		Panel Papanised in CellMedia				R173 3288		EXPIRY DATE: 2014.01.09							

	Rh	M	N	S	s	P1	Lu^a	K	k	Kp^a	Le^a	Le^b	Fy^a	Fy^b	Jk^a	Jk^b	Other	IAT	ENZ
1	$R_1^wR_1$	0	+	0	+	5	0	+	+	0	0	+	0	+	0	+	MAR weak	5	5
2	R_1R_1	+	+	+	0	0	0	0	+	0	+	0	+	0	+	0		5	5
3	R_2R_2	0	+	0	+	3	0	0	+	0	+	0	0	+	+	0		5	5
4	r'r	+	0	+	0	3	0	0	+	0	0	+	0	+	+	0	Cob+	0	0
5	r''r	+	0	+	0	0	0	0	+	0	0	+	+	0	0	+		0	0
6	rr	+	0	0	+	0	0	+	0	0	0	+	0	+	+	0		0	0
7	rr	+	0	+	0	0	0	+	+	0	0	0	w	0	+	0		0	0
8	rr	0	+	0	+	2	0	0	+	+	0	+	+	0	+	0		0	0
9	rr	0	+	+	0	3	0	0	+	0	0	+	+	0	0	+		0	0
10	rr	+	0	+	0	2	+	0	+	0	+	0	0	+	0	+	Cob+	0	0
Auto																		0	0

Antibody Titre

Dilution														Cell Id
Anti-														
Archive														
Anti														
Archive														

Group

Pheno

Conclusion

Entered into Database by:.....Authorised by.....

DAT Batch No

PS	IgG	IgA	IgM	C3c	C3d	Ctl

Reagent								
Batch No's								

Pipette batch No's

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Have a go yourself!

Jess Gill

BMS Specialist

FORM FRM786/2.1 Effective: 11/04/13

NHSBT Reagents **Panel 1** **Antibody Investigation Worksheet**

Sample Name		Requestor		Database Ref No.		Tested by	
Date of Birth		Hosp no		Sample No.		Date Tested	

Product	Lot No.	Product	Lot No.	Product	Lot No.	Product	Lot No.
Panel in Alsevers	R144 3312	Panel in CellStab	R143 3312	Panel in CellMedia	R163 3312	Panel in LISP	R146 3312
Panel Papainised in Alsevers	R154 3312	Panel Papainised in CellStab	R153 3312	Panel Papanised in CellMedia	R173 3312	EXPIRY DATE: 2014.12.11	

	Rh	M	N	S	s	P1	Lu^a	K	k	Kp^a	Le^a	Le^b	Fy^a	Fy^b	Jk^a	Jk^b	Other	IAT	EN2				
1	$R_1^wR_1$	0	+	0	+	3	0	0	+	0	0	+	+	0	0	+		3	0				
2	R_1R_1	+	0	+	0	2	0	+	+	0	0	+	0	+	+	0		0	0				
3	R_2R_2	0	+	0	+	0	0	0	+	0	0	+	0	+	0	+		3	5				
4	r'r	0	+	0	+	5	0	0	+	0	0	0	+	+	0	+		3	5				
5	r''r	+	0	+	0	2	0	0	+	0	+	0	+	0	+	0	Rg-	3	5				
6	rr	+	+	0	+	2	0	+	0	0	0	+	0	+	+	0	Chido-	3	5				
7	rr	0	+	0	+	3	0	+	+	0	+	0	+	0	0	+		3	5				
8	rr	+	0	0	+	0	0	0	+	+	0	+	0	+	0	+		3	5				
9	rr	0	+	+	0	3	0	0	+	0	0	+	+	0	0	+		3	5				
10	rr	0	+	0	+	3	+	0	+	0	0	0	+	0	+	0		3	5				
Auto																		0	0				

Antibody Titre

Dilution													Cell Id
Anti-													
Archive													
Anti													
Archive													

DAT Batch No

PS	IgG	IgA	IgM	C3c	C3d	Ctl

Group A RhD Pos

Pheno $C^wc-E^-e^+K^-k^-Fy^{(a-b+)}Jk^{(a+b-)}$

Conclusion

PATIENT 1 : ANTENATAL 28 WEEK SAMPLE

Entered into Database by:.....Authorised by.....

Reagent								
Batch No's								

Pipette batch No's

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FORM FRM4104/1.1 Effective: 06/05/14

NBS Reagents **Reference Panel 1 Worksheet**

Sample Name		Requestor		Database Ref No.		Tested by	
Date of Birth		Hosp no		Sample No.		Date Tested	

Product	Lot No.	EXPIRY DATE : 2014.12.25
Reference Panel 1 in Alsevers	R201 3178	
Reference Panel 1 in Cellstab	R202 3178	

	Rh	M	N	S	s	P1	Lu^a	K	k	Kp^a	Le^a	Le^b	Fy^a	Fy^b	Jk^a	Jk^b	Other	IAT
1	R1wR1	+	0	+	0	3	+	0	+	0	+	0	0	+	+	0		0
2	R1wR1	0	+	0	+	4	0	0	+	0	0	+	+	0	0	+		3
3	R1RZ	+	+	+	0	0	0	0	+	0	0	+	+	0	+	0		3
4	R1RZ	0	+	0	+	0	0	0	+	0	0	+	0	+	0	+		0
5	Ror	0	+	0	+	4	0	0	+	0	0	0	0	0	+	0	V+ VS+	3
6	R1r'	0	+	0	+	4	0	+	0	0	0	+	+	0	0	+		3
7	R1R1	+	0	+	0	3	0	+	+	0	0	+	0	+	+	0		0
8	R1R1	0	+	0	+	0	0	0	+	+	+	0	+	0	+	0		3
9	R1R1	+	0	0	+	2	+	0	+	0	+	0	0	+	0	+		0
10	R1R1	0	+	+	0	3	0	0	+	0	0	+	0	+	0	+		0
Auto																		

Antibody Titre

Dilution:													Cell Id
Anti-													
Archive													
Anti													
Archive													

DAT Batch No

PS	IgG	IgA	IgM	C3c	C3d	Ctl

Group **Pheno**

Conclusion

Entered into Database by:.....Authorised by.....

Reagent								
Batch No's								

Jess Gill *BMS Specialist*

FORM FRM786/2.1 Effective: 11/04/13

NHSBT Reagents **Panel 1** **Antibody Investigation Worksheet**

Sample Name		Requestor		Database Ref No.		Tested by	
Date of Birth		Hosp no		Sample No.		Date Tested	

Product	Lot No.	Product	Lot No.	Product	Lot No.	Product	Lot No.
Panel in Alsevers	R144 3312	Panel in CellStab	R143 3312	Panel in CellMedia	R163 3312	Panel in LISP	R146 3312
Panel Papainised in Alsevers	R154 3312	Panel Papainised in CellStab	R153 3312	Panel Papanised in CellMedia	R173 3312	EXPIRY DATE: 2014.12.11	

	Rh	M	N	S	s	P1	Lu^a	K	k	Kp^a	Le^a	Le^b	Fy^a	Fy^b	Jk^a	Jk^b	Other	IAT	ENZ
1	$R_1^wR_1$	0	+	0	+	3	0	0	+	0	0	+	+	0	0	+		0	0
2	R_1R_1	+	0	+	0	2	0	+	+	0	0	+	0	+	+	0		0	0
3	R_2R_2	0	+	0	+	0	0	0	+	0	0	+	0	+	0	+		0	0
4	r'r	0	+	0	+	5	0	0	+	0	0	0	+	+	0	+		0	0
5	r''r	+	0	+	0	2	0	0	+	0	+	0	+	0	+	0	Rg-	0	0
6	rr	+	+	0	+	2	0	+	0	0	0	+	0	+	+	0	Chido-	0	0
7	rr	0	+	0	+	3	0	+	+	0	+	0	+	0	0	+		0	0
8	rr	+	0	0	+	0	0	0	+	+	0	+	0	+	0	+		WK	1
9	rr	0	+	+	0	3	0	0	+	0	0	+	+	0	0	+		0	0
10	rr	0	+	0	+	3	+	0	+	0	0	0	+	0	+	0		0	0
Auto																		0	0
	ORIR1	0	+	0	+	0	0	0	+	+	0	+	+	+	0	+		WK	1

Antibody Titre

Dilution													Cell Id
Anti-													
Archive													
Anti													
Archive													

DAT Batch No

PS	IgG	IgA	IgM	C3c	C3d	Ctl

Group O RhD Pos

Pheno $C^+c^+E^+e^+K^-$

Conclusion
PATIENT 2: 55 preoperative patient, requires 20xm.

Entered into Database by:.....Authorised by.....

Reagent								

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FORM FRM786/2.1 Effective: 11/04/13

NHSBT Reagents **Panel 1** **Antibody Investigation Worksheet**

Sample Name		Requestor		Database Ref No.		Tested by	
Date of Birth		Hosp no		Sample No.		Date Tested	

Product	Lot No.	Product	Lot No.	Product	Lot No.	Product	Lot No.
Panel in Alsevers	R144 3312	Panel in CellStab	R143 3312	Panel in CellMedia	R163 3312	Panel in LISP	R146 3312
Panel Papainised in Alsevers	R154 3312	Panel Papainised in CellStab	R153 3312	Panel Papanised in CellMedia	R173 3312	EXPIRY DATE: 2014.12.11	

	Rh	M	N	S	s	P1	Lu^a	K	k	Kp^a	Le^a	Le^b	Fy^a	Fy^b	Jk^a	Jk^b	Other	IAT	EN2	TUBE IAT		ELUATE
1	$R_1^wR_1$	0	+	0	+	3	0	0	+	0	0	+	+	0	0	+		0	0	0		0
2	R_1R_1	+	0	+	0	2	0	+	+	0	0	+	0	+	+	0		0	0	0		WK
3	R_2R_2	0	+	0	+	0	0	0	+	0	0	+	0	+	0	+		0	0	0		0
4	r'r	0	+	0	+	5	0	0	+	0	0	0	+	+	0	+		0	0	0		0
5	r''r	+	0	+	0	2	0	0	+	0	+	0	+	0	+	0	Rg-	0	0	0		1
6	rr	+	+	0	+	2	0	+	0	0	0	+	0	+	+	0	Chido-	0	0	0		WK
7	rr	0	+	0	+	3	0	+	+	0	+	0	+	0	0	+		0	0	0		0
8	rr	+	0	0	+	0	0	0	+	+	0	+	0	+	0	+		0	0	0		0
9	rr	0	+	+	0	3	0	0	+	0	0	+	+	0	0	+		0	0	0		0
10	rr	0	+	0	+	3	+	0	+	0	0	0	+	0	+	0		0	0	0		WK
Auto																		5	0	0		
																	xm 1	0				
																	xm 2	0				
																	xm 3	1				
																	xm 4	WK				

Antibody Titre

Dilution														Cell Id
Anti-														
Archive														
Anti														
Archive														

DAT Batch No

PS	IgG	IgA	IgM	C3c	C3d	Ctl
/	Smf	0	0	0	0	0

Reagent								
Batch								

Group
ORhD neg

Pheno $C^{dp}C^+E^-e^+K^-$
Transfused - unable to determine

Conclusion
PATIENT 3: 80 year old female, transfused 14 days previously. NEG SCREEN PRIOR TO ISSUE OF BLOOD.

Entered into Database by:.....Authorised by.....

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NHS
Blood and Transplant

Any Questions?

Jess Gill

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