Interpretive Educational Scheme (iED)
Clinical Scenario 1/2024 – Renal Transplantation

Dispatched on 7th May 2024

Summary of Results

There were 46 responses received. 15 from laboratories based in the UK and Ireland (UK&I) and 31 from laboratories based in the rest of the World (RoW).

Samples from a patient, TM, requiring a kidney transplant following a failing renal transplant were received in the laboratory in 2015. Details of the patient are shown in Table 1.

Table 1: Patient Information

Patient ID	TM
Primary Disease	IgA Nephropathy
Current Age	58
Donor Gender	Female
Ethnicity	Asian
Dialysis	Haemodialysis
Patient HLA Type	A*24:02, A*-; B*15:32 (B62), B*51:02; C*01:02, C*12:03; DRB1*04:05, DRB1*14:54; DQB1*03:01, DQB1*05:03; DQA1*01:04, DQA1*03:03; DPB1*01:01, DPB1*02:01; DPA1*01:03, DPA1*02:02
ABO Group	O Rh(D)+
Sensitising Events	*Previous Kidney Transplant from deceased Donor 1*: Transplanted on 07/09/2010 Donor HLA type: A*02, A*-; B*50, B*15 (B62); C*03 (Cw10), C*06; DRB1*04:01, DRB1*13:02; DQB1*03:02, DQB1*06:04; DPB1*02:01/123:01, DPB1*04:02; DPA1*01, DPA1*03
	Blood Transfusion: None known.
	Pregnancies: 1985, 1994, 1996 and 2005

The patient's husband, AM, was initially investigated as a potential live donor but was deemed unsuitable to cardiac issues, see Table 2.

Table 2: Potential Donor Information

Potential Donor ID	AM
HLA Type	A*11, A*33; B*44, B*15:11; C*07, C*03 (Cw9); DRB1*04, DRB1*15; DQB1*03:02, DQB1*05

Following her first kidney transplant in 2010 the Patient had early cellular rejection. She also suffered from BK nephropathy. The patient experienced antibody mediated rejection and eventual graft failure leading to the requirement for re-transplantation.

The available patient samples were tested prior to activation on the deceased donor kidney register in 2016 using One Lambda LABScreen Single Antigen Bead (SAB) kits. Results are shown in Table 3a and 3b. All results are technically valid.

Table 3a: LABScreen SAB Kit Class I Testing Across Multiple Sample Dates (only Antigen Specificities with MFI >1000 displayed)

Bead Allele Specificity	Bead Antigen Specificity	13/09/2016	05/08/2016	09/05/2016	09/12/2015
A*02:01	A2	3954.74	7383.08	841.03	743.89
A*02:03	A2	289.78	1007.2	86.66	103.56
A*02:06	A2	3688.43	6789.13	705.88	493.62
A*68:01	A68	3108.35	6541.13	575.39	282.87
A*68:02	A68	2216.27	4997.09	322.1	287.45
A*69:01	A69	3081.97	5203.86	504.22	458.25
B*18:01	B18	1496.99	5516.12	1727.54	25.79
B*27:05	B27	1535.64	2955.62	648.59	623.6
B*27:08	B27	1170.6	2325.75	458.76	324.48
B*35:01	B35	908.87	2167.86	422.42	213.6
B*38:01	B38	1563.49	5164.35	575.25	76.11
B*40:01	B60	3129.3	5932.05	1159.85	321.01
B*40:02	B61	2375.15	5018.82	1120.35	100.37
B*40:06	B61	1251.84	3195.59	875.69	159.08
B*41:01	B41	1707.01	4491.84	1570.61	2.53
B*44:02	B44	1936.41	5345.63	1580.48	260.82
B*44:03	B44	2758.33	5428.67	1871.16	351.92
B*45:01	B45	2666.97	6990.4	1895.49	308.63
B*47:01	B47	1162.44	3228.83	828.61	17.42
B*49:01	B49	10373.37	12743.05	7371.81	6612.37
B*50:01	B50	12367.24	14118.77	9787.07	9050.16
B*52:01	B52	536.53	2121.81	345.87	2.23
B*53:01	B53	777.78	1917.38	315.68	196.1
B*55:01	B55	327.45	1671.67	254.38	28.52
B*56:01	B56	1690.16	3300.83	980.69	521.34
B*15:10	B71	1718.03	4862.07	1497.02	251.29

Table 3b: LABScreen SAB Kit Class II Test Results Across Multiple Sample Dates (only Antigen Specificities with MFI >1000 displayed)

Bead Allele Specificity	Bead Antigen Specificity	13/09/2016	05/08/2016	09/05/2016	09/12/2015
DRB1*01:03	DR103	16305.73	17600.63	18660.27	12775.65
DRB1*04:01	DR4	0	0	27.47	0
DRB1*04:03	DR4	0	0	2.53	0

DRB1*04:02	DR4	16018.75	16068.42	17837.45	15000.48
DRB1*04:04	DR4	0	0	28.29	0
DRB1*04:05 (self)	DR4	0	0	16.62	0
DRB1*07:01	DR7	3252.88	2717.04	1536.68	841.15
DRB1*08:01	DR8	3585	3230.56	2686.9	521.83
DRB1*10:01	DR10	1874.18	1871.87	1741.47	1168.24
DRB1*11:01	DR11	11204.17	11368.89	11756.72	7210.33
DRB1*11:04	DR11	11117.85	10624.33	10407.08	6716.56
DRB1*12:01	DR12	15151.3	15270.54	16968.73	12071.91
DRB1*12:02	DR12	11089	10630.48	10002.12	6010.28
DRB1*13:01	DR13	17022.93	18035.94	20687.57	16589.25
DRB1*13:03	DR13	17730.14	18598.13	21237.06	15753.95
DRB1*16:01	DR16	9734.93	9843.45	8686.92	4406.42
DRB1*16:02	DR16	13748.39	13678.04	13353.34	7136.04
DRB5*01:01	DR51	10667.06	10934.94	10334.61	5066.36
DRB5*02:02	DR51	2641.63	2549.98	2158.66	356.73
DQA1*01:03, DQB1*06:01	DQ6	18899.82	19435.62	22044.06	18029.45
DQA1*01:02, DQB1*06:02	DQ6	15133.37	14999.07	14864.78	18697.97
DQA1*01:01, DQB1*06:02	DQ6	15035.29	15929.26	17746.35	17632.43
DQA1*01:03, DQB1*06:03	DQ6	19936.56	20859.4	23883.48	19713.53
DQA1*01:02, DQB1*06:04	DQ6	17609.44	17126.56	14450.98	24690.49
DQA1*01:02, DQB1*06:09	DQ6	19447.37	19711.32	23221.64	18459.03
DQA1*02:01, DQB1*03:02	DQ8	21997.98	21365.99	17340.35	29526.09
DQA1*03:01, DQB1*03:02	DQ8	20563.24	21007.41	18002.97	30339.67
DQA1*03:02, DQB1*03:02	DQ8	19020.68	20295.45	23958.38	18395.96
DQA1*02:01, DQB1*03:03	DQ9	20238.72	19742.47	22259.7	20805.51
DQA1*03:01, DQB1*03:03	DQ9	21798.53	20820.2	18601.08	28985.64
DQA1*03:02, DQB1*03:03	DQ9	20449.2	21078.99	23737.96	18326.74

Q1. The patient is to be activated on the deceased donor kidney register. What unacceptable antigens would you assign?

Specificity	Summary		
	UK&I %	RoW %	Total %
A2	80	71	74
A68	80	65	70
A69	80	65	70
B18	47	55	52
B27	40	42	41
B35	33	32	33
B38	47	48	48
B41	40	55	50
B44	73	61	65
B45	73	61	65
B47	47	39	41
B49	80	77	78
B50	80	81	80
B51	0	3	2
B52	33	26	28
B53	13	10	11
B55	13	10	11
B56	47	52	50
B60	80	61	67
B61	67	61	63
B71	47	55	52
B72	0	3	2
Cw10 (mm)	27	6	13
Cw6 (mm)	27	6	13
Cw9	7	0	2

Specificity	Summary		
	UK&I %	RoW %	Total %
DQ5	0	3	2
DQ6	80	81	80
DQ8	80	81	80
DQ9	80	81	80
DR10	13	29	24
DR103	80	74	76
DR11	80	81	80
DR12	80	81	80
DR13	80	77	78
DR15	0	13	9
DR16	80	81	80
DR7	73	48	57
DR8	80	52	61
DR51	80	61	67
DR4 (self)	7	71	50
DPB1*04:02 (mm)	13	6	9

Other responses:

UK&I	• Antibodies >2000MFI (current and/or historic). We do not list previous transplant mismatches unless they are proven antibody positive. • List current & historic reacting >1000 and review and calculate cRF. Assess number of potential donors. To increase opportunity, we would remove historic antibody first. • All HLA Class I and II specificities with an MFI >1000 with the exception of DRB1*04:02 because we cannot report allelic specificities with ODT and DR4 is a self-antigen.
RoW	• Any antigen with MFI>1000 in any of the samples for the last year. • All antigens with an antibody with an MFI (Mean Fluorescence Intensity) greater than 1000 for the HLA-A, HLA-B, and HLA-DRB1 loci, and those with an MFI greater than 8000 for the HLA-DQ locus. • Antigens with MFI > 2000 on at least one of the four tested serums. • Antigens considered repeated mismatches associated with the previous donor and husband. Antigens if donor-specific antibodies (DSA) is >3000 mfi. Individual risk assessment is conducted with regards to DSA ranging from 1000-3000 mfi and with repeated mismatches with no DSA present. • All antigens that the patient has antibodies to, are considered unacceptable. This is of course variable depending on each transplant center's MFI cutoff. • Ag whose MFI is > 2000, whatever the date of the serum.

The patient was registered on the deceased donor kidney register in September 2016.
A potential live donor, the patient's biological son, expressed an interest in becoming a donor at this time. Details of this donor and the crossmatching results are provided in Table 4a and 4b.

Table 4a: Potential Donor Information for Live Donor 1

Donor ID	NH - Live Donor 1
Relation to Patient	Biological Son
Donor HLA Type	A*24:02, A*24:07; B*15 (62), B*35; C*04, C*12; DRB1*12:02, DRB1*04:05; DQB1*03:01, -
Donor Age At XM	31
Donor Gender	Male
Infectious Disease Testing	Hepatitis B Positive
ABO	O Rh(D)+

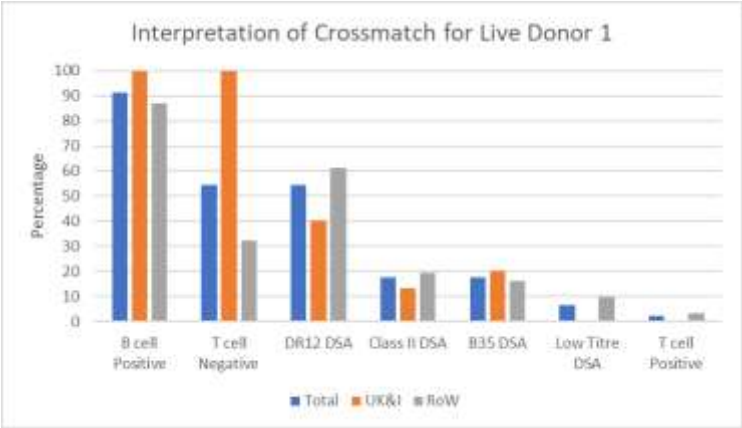
Table 4b: Details of Flow Cytometry Crossmatch Results for Live Donor 1

XM Results	Allogeneic Results			
	T-Cell	LCS*	B-Cell	LCS*
09/12/2015	**NEG**	39	**POS**	156
13/09/2016	**NEG**	36	**POS**	203

**A Linear Channel Shift (LCS) of ≥40 is considered positive*

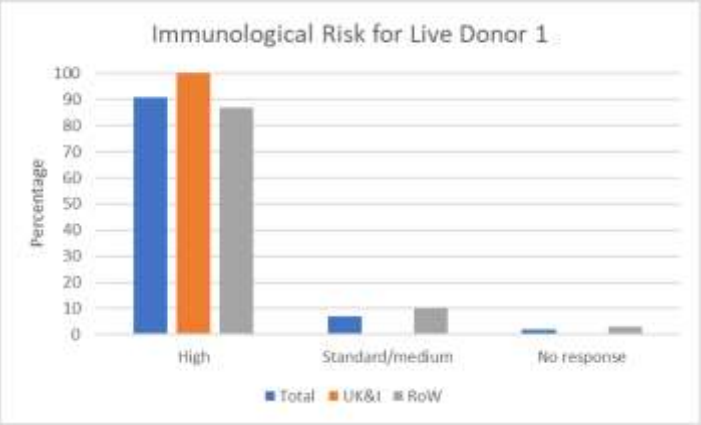
Q2a. What is your interpretation of this crossmatch result?

Interpretation	Total (n=46)		UK&I (n=15)		RoW (n=31)	
	Count	%	Count	%	Count	%
B cell Positive	42	**91**	15	**100**	27	**87**
T cell Negative	25	**54**	15	**100**	10	**32**
DR12 Donor Specific Antibody	25	**54**	6	**40**	19	**61**
Class II Donor Directed Antibody	8	**17**	2	**13**	6	**19**
B35 Donor Specific Antibody	8	**17**	3	**20**	5	**16**
Low Titre Donor Specific Antibody	3	**7**	0	**0**	3	**10**
T cell Positive	1	**2**	0	**0**	1	**3**



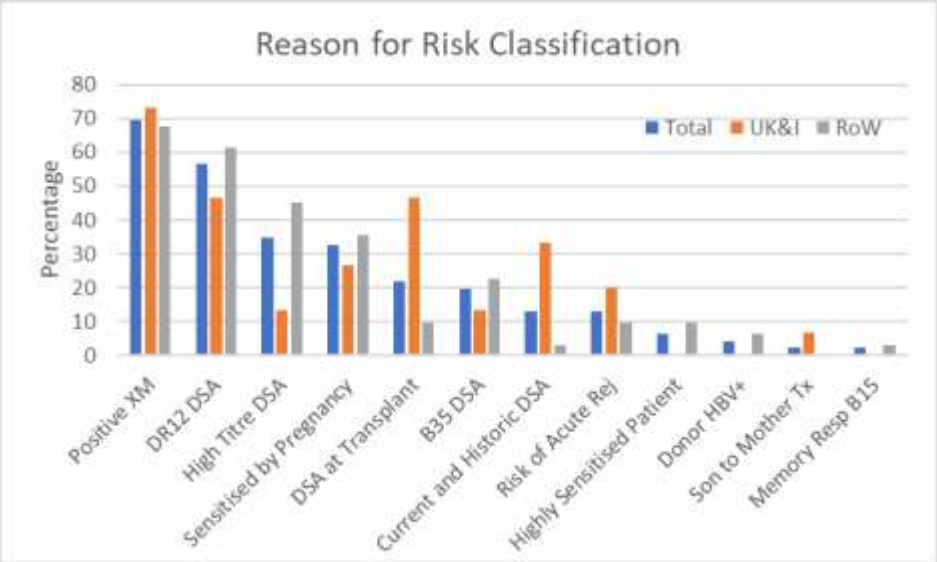
Q2b. What immunological risk would you assign to this transplant?

Response	Total (n=46)		UK&I (n=15)		RoW (n=31)	
	Count	%	Count	%	Count	%
High	42	**91**	15	**100**	27	**87**
Standard/medium	3	**7**	0	**0**	3	**10**
No response	1	**2**	0	**0**	1	**3**



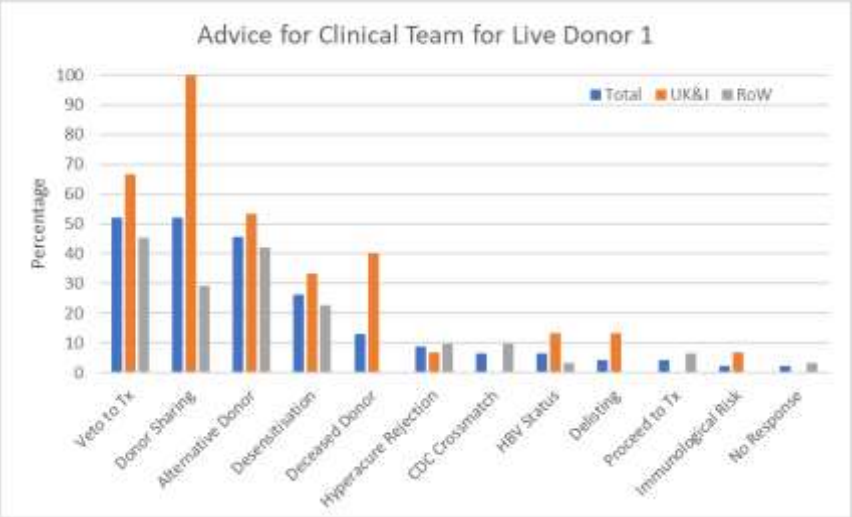
Q2c. Give your reason for this classification

Reason	Total (n=46)		UK&I (n=15)		RoW (n=31)	
	Count	%	Count	%	Count	%
Positive Crossmatch	32	**70**	11	**73**	21	**68**
DR12 Donor Specific Antibody	26	**57**	7	**47**	19	**61**
High Titre Donor Specific Antibody	16	**35**	2	**13**	14	**45**
Patient Sensitised by Pregnancy	15	**33**	4	**27**	11	**35**
Donor Specific Antibody at Time of Transplant	10	**22**	7	**47**	3	**10**
B35 Donor Specific Antibody	9	**20**	2	**13**	7	**23**
Current and Historic Antibodies	6	**13**	5	**33**	1	**3**
High Risk of Acute Rejection	6	**13**	3	**20**	3	**10**
Highly Sensitised Patient	3	**7**	0	**0**	3	**10**
Donor HBV+	2	**4**	0	**0**	2	**6**
Son to Mother Transplant	1	**2**	1	**7**	0	**0**
Memory Response to B15	1	**2**	0	**0**	1	**3**



Q2d. What advice would you provide to the clinical team?

Advice	Total (n=46)		UK&I (n=15)		RoW (n=31)	
	Count	%	Count	%	Count	%
Contraindication/Veto to Transplant	24	**52**	10	**67**	14	**45**
Kidney Sharing Scheme	24	**52**	15	**100**	9	**29**
Source Alternative Donor	21	**46**	8	**53**	13	**42**
Desensitisation	12	**26**	5	**33**	7	**23**
Wait for Deceased Donor	6	**13**	6	**40**	0	**0**
Risk of Hyperacute Rejection	4	**9**	1	**7**	3	**10**
Perform CDC Crossmatch	3	**7**	0	**0**	3	**10**
Investigate/Treat HBV Status	3	**7**	2	**13**	1	**3**
Delisting	2	**4**	2	**13**	0	**0**
Proceed to Transplant with Adjusted Immunosuppression/Post-transplant Monitoring	2	**4**	0	**0**	2	**6**
High Immunological Risk	1	**2**	1	**7**	0	**0**
No Response	1	**2**	0	**0**	1	**3**



The patient's son withdrew from the live donor process due to ill health.
The patient stopped taking immunosuppression in July 2017.
A second live donor came forward in 2019. This donor resides in a different country. A laboratory local to the donor provided HLA genotyping results and a 'virtual crossmatch' was performed comparing the donor information and the patient's antibody profile. Details of this live donor and the associated results are provided in Table 5a and 5b.

Table 5a: Potential Donor Information for Live Donor 2

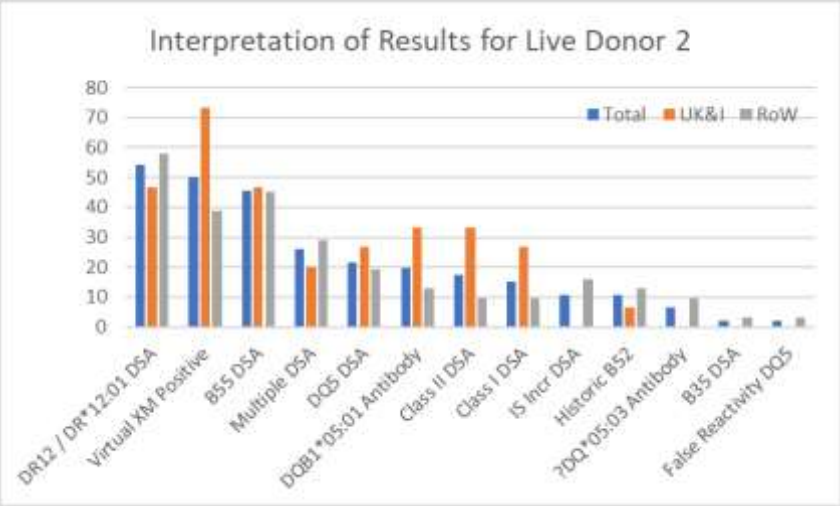
Donor ID	NA - Live Donor 2
Relation to Patient	Niece
Donor HLA Type	A*11, A*-; B*52, B*55; C*01, C*07; DRB1*12, DRB1*14; DQB1*05, -
Donor Age at XM	30
Donor Gender	Female
ABO	O Rh(D)+

Table 5b: Summary of Potential Donor Specific Antibodies (DSA) to Live Donor 2

Bead Allele Specificity	Bead Antigen Specificity	Serum Dates Analysed		
		05/08/16	12/09/17	18/09/19
*B*52:01*	*B52*	*2122*	*Neg*	*Neg*
*B*55:01*	*B55*	*1672*	*2574*	*15075*
*DRB1*12:01*	*DR12*	*15271*	*22358*	*17950-79*
*DRB1*12:02*	*DR12*	*10631*	*22841*	*17716*
*DQA1*01:01, DQB1*05:01*	*DQ5*	*69*	*14979*	*16353*
*DQA1*01:02, DQB1*05:02*	*DQ5*	*0*	*320*	*565*

Q3a. How would you interpret these results?

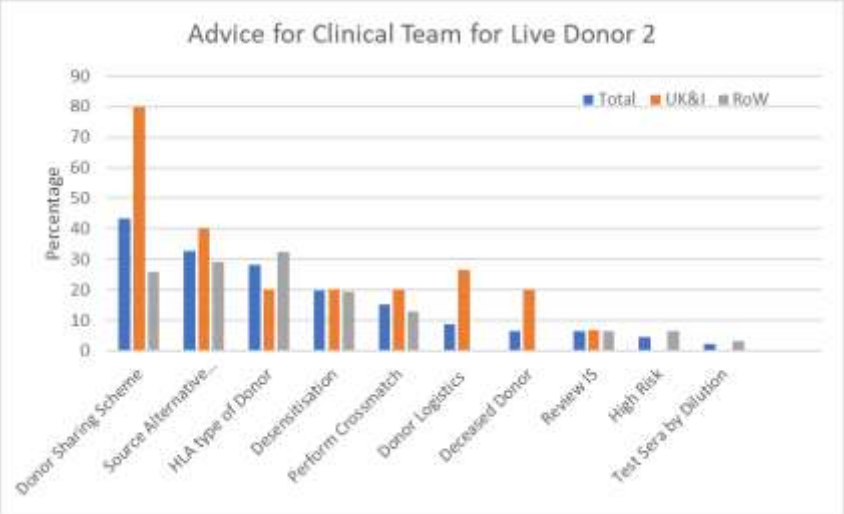
Interpretation	Total (n=46)		UK&I (n=15)		RoW (n=31)	
	Count	%	Count	%	Count	%
DR12 / DR*12:01 DSA	25	**54**	7	**47**	18	**58**
Virtual Crossmatch Positive	23	**50**	11	**73**	12	**39**
B55 DSA	21	**46**	7	**47**	14	**45**
Multiple DSA	12	**26**	3	**20**	9	**29**
DQ5 DSA	10	**22**	4	**27**	6	**19**
Potential DQB1*05:01 Antibody	9	**20**	5	**33**	4	**13**
Class II DSA	8	**17**	5	**33**	3	**10**
Class I DSA	7	**15**	4	**27**	3	**10**
Immunosuppression Increased DSA	5	**11**	0	**0**	5	**16**
Historic B52 DSA	5	**11**	1	**7**	4	**13**
Test for DQ*05:03 Antibody	3	**7**	0	**0**	3	**10**
B35 DSA	1	**2**	0	**0**	1	**3**
False Reactivity Against DQ5	1	**2**	0	**0**	1	**3**



Q3b. What actions, if any, would you recommend to the clinical team?

Advice	Total (n=46)		UK&I (n=15)		RoW (n=31)	
	Count	%	Count	%	Count	%
Contraindication/Veto to Transplant	22	**48**	7	**47**	15	**48**
Donor Sharing Scheme	20	**43**	12	**80**	8	**26**
Source Alternative Donor	15	**33**	6	**40**	9	**29**
Verification HLA type of Donor	13	**28**	3	**20**	10	**32**
Desensitisation	9	**20**	3	**20**	6	**19**
Perform Crossmatch	7	**15**	3	**20**	4	**13**
Donor Logistics (Overseas)	4	**9**	4	**27**	0	**0**
Wait for Deceased Donor	3	**7**	3	**20**	0	**0**
Review Immunosuppression	3	**7**	1	**7**	2	**6**

High Risk	2	**4**	0	**0**	2	**6**
Test Sera by Dilution	1	**2**	0	**0**	1	**3**



The patient received the offer of a kidney from a deceased donor, Deceased Donor 2, in April 2021. Details of the donor are provided in Table 6a and results from the flow cytometry crossmatch are provided in Table 6b and a summary of donor specific antibodies in Table 6c.

Table 6a: Potential Donor Information

Donor ID	Deceased Donor 2
Donor Type	Deceased Cardiac Death
Donor HLA Type	A*11, A*26; B*35, B*37; C*04, C*06; DRB1*04:07/04:92, DRB1*10; DQB1*03:01, DQB1*05:01; DQA1*01, DQA1*03; DPB1*04:01, DPB1*-; DPA1*01, DPA1*-
Donor Age	53
Donor Gender	Female
ABO	O Rh(D)+

Table 6b: Details of Flow Cytometry Crossmatch Results for Deceased Donor 2

FCXM Results	Allogeneic Results				Autologous Results			
	T-Cell	LCS*	B-Cell	LCS*	T-Cell	LCS*	B-Cell	LCS*
12/09/2017	**POS**	81	**POS**	129	**NEG**	0	**NEG**	0
06/06/2018	**POS**	82	**POS**	119	**NEG**	5	**NEG**	0
13/02/2019	**POS**	78	**POS**	146	**NEG**	0	**NEG**	0
10/02/2021	**POS**	74	**POS**	168	**NEG**	3	**NEG**	1

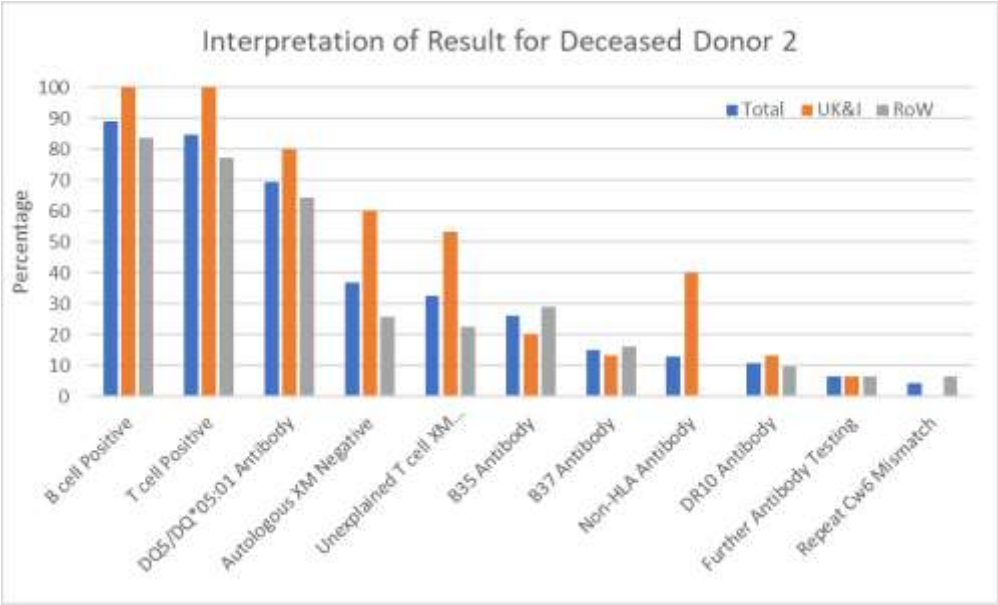
**A Linear Channel Shift (LCS) of ≥40 is considered positive*

Table 6c: Summary of Potential Donor Specific Antibodies (DSA) to Deceased Donor 2

Bead Allele Specificity	Bead Antigen Specificity	Serum Date			
		12/09/17	06/06/18	13/02/19	10/02/21
B*35:01	B35	1945	Neg	Neg	1423
B*37:01	B37	1114	Neg	Neg	Neg
DRB1*10:01	DR10	2013	Neg	Neg	Neg
DQA1*01:01, DQB1*05:01	DQ5	14979	15574	19306	20195
DQA1*01:02, DQB1*05:02	DQ5	320	398	461	1512

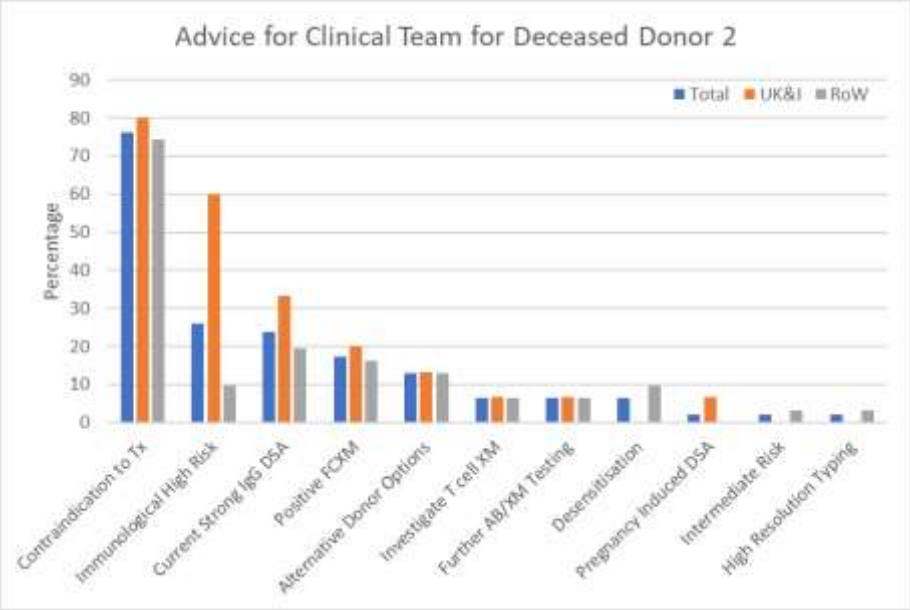
Q4a. What would your initial assessment of these results be?

Interpretation	Total (n=46)		UK&I (n=15)		RoW (n=31)	
	Count	%	Count	%	Count	%
B cell Positive	41	**89**	15	**100**	26	**84**
T cell Positive	39	**85**	15	**100**	24	**77**
DQ5/DQ*05:01 Antibody	32	**70**	12	**80**	20	**65**
Autologous Crossmatch Negative	17	**37**	9	**60**	8	**26**
Unexplained T cell XM Result	15	**33**	8	**53**	7	**23**
B35 Antibody	12	**26**	3	**20**	9	**29**
B37 Antibody	7	**15**	2	**13**	5	**16**
Non-HLA Antibody	6	**13**	6	**40**	0	**0**
DR10 Antibody	5	**11**	2	**13**	3	**10**
Perform Further Antibody Testing	3	**7**	1	**7**	2	**6**
Repeat Cw6 Mismatch	2	**4**	0	**0**	2	**6**



Q4b. What clinical advice would you provide to the clinical team based on these results?

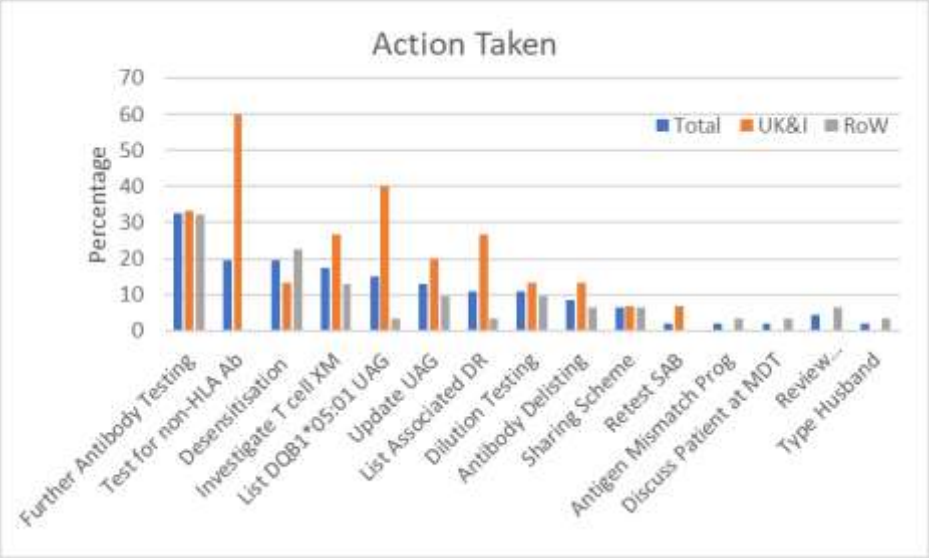
Advice	Total (n=46)		UK&I (n=15)		RoW (n=31)	
	Count	%	Count	%	Count	%
Contraindication/Veto to Transplant	35	**76**	12	**80**	23	**74**
Immunological High Risk	12	**26**	9	**60**	3	**10**
Current Strong IgG DSA	11	**24**	5	**33**	6	**19**
Positive FCXM	8	**17**	3	**20**	5	**16**
Alternative Donor Options	6	**13**	2	**13**	4	**13**
Investigate Cause of T cell XM	3	**7**	1	**7**	2	**6**
Further AB/XM Testing	3	**7**	1	**7**	2	**6**
Desensitisation	3	**7**	0	**0**	3	**10**
Pregnancy Induced DSA	1	**2**	1	**7**	0	**0**
Intermediate Risk	1	**2**	0	**0**	1	**3**
High Resolution Typing	1	**2**	0	**0**	1	**3**



Q4c. What action, if any, would you take after this donor offer?

Action	Total (n=46)		UK&I (n=15)		RoW (n=31)	
	Count	%	Count	%	Count	%
Antibody Testing Using Alternative Kit / Extended Panel	15	**33**	5	**33**	10	**32**
Test for non-HLA Antibody e.g. HNA	9	**20**	9	**60**	0	**0**
Desensitisation / Imlifidase	9	**20**	2	**13**	7	**23**
Investigate Cause of Positive T cell Crossmatch	8	**17**	4	**27**	4	**13**
List DQB1*05:01 as Unacceptable Antigen	7	**15**	6	**40**	1	**3**
Update Unacceptable Antigens	6	**13**	3	**20**	3	**10**

List DR Antigens Associated with DQB1*05:01 e.g. DR1 and DR103	5	**11**	4	**27**	1	**3**
Dilution Testing	5	**11**	2	**13**	3	**10**
Antibody Delisting	4	**9**	2	**13**	2	**6**
Enter into Kidney Sharing Scheme	3	**7**	1	**7**	2	**6**
Retest SAB	1	**2**	1	**7**	0	**0**
Antigen Mismatch Programme	1	**2**	0	**0**	1	**3**
Discuss Patient at Multidisciplinary Team Meeting	1	**2**	0	**0**	1	**3**
Review Immunosuppression	2	**4**	0	**0**	2	**6**
High Resolution Typing of Patient's Husband	1	**2**	0	**0**	1	**3**



The donation did not proceed from this deceased donor.
In 2021 the laboratory introduced a second antibody test kit and the patient was tested using One Lambda LABScreen Single Antigen Bead (SAB) kits (results are shown in Table 7a and 7b) and Immucor LIFECODES SAB kits (results are shown in Table 8a and 8b). All results are technically valid.

Table 7a: LABScreen SAB Kit Class I Test Results Across Multiple Sample Dates (only Antigen Specificities with MFI >1000 displayed)

Bead Allele Specificity	Bead Antigen Specificity	28/08/2021	10/05/2021	10/02/2021
A*01:01	A1	14573.81	18335.7	44.03
A*02:01	A2	22999.7	24069.3	5682.36
A*02:03	A2	23000.6	23879.8	3707.41
A*02:06	A2	23158.85	23703.7	4540.78
A*03:01	A3	19828.06	22271.15	59.83
A*11:01	A11	19272.3	21758.21	44.89
A*11:02	A11	19800.66	22056.88	418.79
A*24:02	A24	0	0	2.61

A*24:03	A24	1694.5	3156.43	24.65
A*25:01	A25	19670.77	21011.84	60.59
A*26:01	A26	20233.95	22100.3	77.21
A*29:01	A29	21657.05	23400.93	86.79
A*29:02	A29	21580.57	23007.74	99.15
A*30:01	A30	19166.33	21786.99	53.9
A*30:02	A30	10295.21	15329.04	20.73
A*31:01	A31	22912.11	24458.36	66.58
A*32:01	A32	19026.07	21124.79	71.28
A*33:01	A33	22606.07	24261.79	65.29
A*33:03	A33	22584.67	23912.08	139.77
A*34:01	A34	22239.35	23815.26	0
A*34:02	A34	22125.69	23527.68	166.19
A*36:01	A36	15319.79	19373.26	42.35
A*43:01	A43	20210.97	22813.9	6.09
A*66:01	A66	22263.64	23304.24	23.56
A*66:02	A66	21741.22	23184.98	0
A*68:01	A68	22999.6	24655.01	461
A*68:02	A68	23482.19	24685.29	335.14
A*69:01	A69	23132.41	23601.38	1290.63
A*74:01	A74	22656.33	24162.46	141.13
A*80:01	A80	18912.8	20863.21	0
B*07:02	B7	2013.52	3619.44	2957.28
B*13:01	B13	15448.87	20138.04	17243.53
B*13:02	B13	21588.31	23480.39	22635.42
B*14:01	B64	3695.73	6054.5	5814.45
B*15:10	B71	3792.2	6476.21	5449.28
B*15:16	B63	16624.01	20052.33	1916.64
B*27:05	B27	1860.32	4018.23	1530.42
B*27:08	B27	4726.76	7812.57	5357.55
B*35:01	B35	1031.15	2416.89	1423.44
B*39:01	B39	2197.92	3971.81	3302.53
B*40:01	B60	21156.71	23443.35	22315.05
B*40:06	B61	20975.5	23106.8	21824.86
B*40:02	B61	22730.26	23690.29	23307.08
B*41:01	B41	20982.92	23287.93	22478.37
B*42:01	B42	5015.37	7472.56	5725.38
B*44:02	B44	16906.88	20061.27	18043.88
B*44:03	B44	19979.5	22411.07	20595.37
B*45:01	B45	20895.65	23089.16	22177.23
B*49:01	B49	23128.63	24503.29	23364.61
B*47:01	B47	16346.46	19800.91	17984.89

B*50:01	B50	23078.86	24340.32	23507.8
B*54:01	B54	6016.13	8847.78	6073.59
B*55:01	B55	11626.29	14579.47	12563.78
B*56:01	B56	6283.77	9511.8	8076.23
B*57:01	B57	19487.24	21655	877.66
B*57:03	B57	19042.66	21683.03	776.55
B*58:01	B58	18578.92	21151.32	1328.87
B*67:01	B67	4975.02	7180.18	6189.26
B*73:01	B73	16400.8	18536.28	9258.96
B*78:01	B78	8851.12	12088.29	10708.96
C*02:02	Cw2	9587.19	12338.43	592.08
C*04:01	Cw4	9140.42	12229.47	124.57
C*05:01	Cw5	14737.75	17922.36	1633.7
C*06:02	Cw6	15720.17	18314.04	382.68
C*07:02	Cw7	16547.48	20139.59	710.5
C*15:02	Cw15	13724.25	15002.94	480.25
C*17:01	Cw17	20132.12	23465.66	1166.26
C*18:02	Cw18	14776.57	18458.09	222.46

Table 7b: LABScreen SAB Kit Class II Test Results Across Multiple Sample Dates (only Antigen Specificities with MFI >1000 displayed)

Bead Allele Specificity*	Bead Antigen Specificity	28/08/2021	10/05/2021	10/02/2021
DRB1*01:03	DR103	20560.25	23559.67	21103.78
DRB1*03:01	DR17	5068.52	8528.23	7832.96
DRB1*03:02	DR18	5948.24	9380.29	7499.31
DRB1*04:01	DR4	55.21	117.3	149.76
DRB1*04:02	DR4	19922.92	22125.16	19373.65
DRB1*04:03	DR4	52.35	99.67	119.96
DRB1*04:04	DR4	84.62	191.3	166.77
DRB1*04:05	DR4	41.07	62.99	80.89
DRB1*07:01	DR7	19204.33	21980.65	18494.15
DRB1*08:01	DR8	13504.11	17049.84	15335.93
DRB1*11:01	DR11	21158.36	22953.61	20522.64
DRB1*11:04	DR11	19238.78	22040.33	19748.45
DRB1*12:01	DR12	19909.15	22744.27	19974.29
DRB1*12:02	DR12	20067.42	23157.05	19601.55
DRB1*13:01	DR13	23184.85	25765.84	23227.64
DRB1*13:03	DR13	21931.13	24479.73	21838.78
DRB1*14:01	DR14	72.53	161.56	128.69
DRB1*14:02	DR14	8421.66	12778.51	10423.96
DRB1*14:54	DR14	39.28	70.08	82.09

DRB1*15:01	DR15	19196.13	21455.29	19227.53
DRB1*15:02	DR15	19407.02	23036.81	19635.27
DRB1*15:03	DR15	19190.18	22129.75	20194.49
DRB1*16:01	DR16	19133.21	20948.09	18816.81
DRB1*16:02	DR16	21064.03	22949.48	20431.48
DRB5*01:01	DR51	21000.83	23401.62	20582.11
DRB5*02:02	DR51	20136.04	22190.67	19435.82
DQA1*02:01, DQB1*02:01	DQ2	807.88	1736.63	2379.82
DQA1*03:01, DQB1*02:01	DQ2	1417.89	2785.14	3312.93
DQA1*04:01, DQB1*02:01	DQ2	683.7	1477.49	1993.03
DQA1*05:01, DQB1*02:01	DQ2	3178.99	5496.23	6526.36
DQA1*02:01, DQB1*02:02	DQ2	478.77	1211.41	1879.51
DQA1*02:01, DQB1*04:01	DQ4	9006.87	11737.57	8175.14
DQA1*03:03, DQB1*04:01	DQ4	9022.99	12333.1	10963.68
DQA1*02:01, DQB1*04:02	DQ4	10105.86	13084.89	10409.22
DQA1*04:01, DQB1*04:02	DQ4	6148.32	10440.07	5208.97
DQA1*01:01, DQB1*05:01	DQ5	18640.34	21627.74	20194.78
DQA1*01:02, DQB1*05:02	DQ5	543.31	1002.11	1511.47
DQA1*01:03, DQB1*06:01	DQ6	23857.71	26005.38	23463.62
DQA1*01:02, DQB1*06:02	DQ6	20524.86	24143.12	21423.42
DQA1*01:01, DQB1*06:02	DQ6	22510.37	24694.02	21745.23
DQA1*01:03, DQB1*06:03	DQ6	23956.67	26180.67	23565.85
DQA1*01:02, DQB1*06:04	DQ6	23348.2	26218.19	23500.39
DQA1*01:02, DQB1*06:09	DQ6	23994.15	25906.43	23340.33
DQA1*03:01, DQB1*03:01	DQ7	55.99	169.03	156.05
DQA1*02:01, DQB1*03:01	DQ7	21.38	89.28	62.52
DQA1*05:03, DQB1*03:01	DQ7	37.11	130.27	72.08
DQA1*05:05, DQB1*03:19	DQ7	4213.22	8240.85	2609.07
DQA1*06:01, DQB1*03:01	DQ7	8.44	89.72	74.51
DQA1*02:01, DQB1*03:02	DQ8	22108.97	25268.03	21759.72
DQA1*03:01, DQB1*03:02	DQ8	23166.21	25835.11	22059.2
DQA1*03:02, DQB1*03:02	DQ8	24207.74	26383.69	23516.87
DQA1*02:01, DQB1*03:03	DQ9	22024.58	25609.47	21956.38
DQA1*03:01, DQB1*03:03	DQ9	20199.6	23837.42	20140.69
DQA1*03:02, DQB1*03:03	DQ9	24277.43	26094.31	22868.42

*Note no DPB or DPA antibodies were identified

Table 8a: LIFECODES SAB Kit Class I Test Results Sample Date 28/08/2021

Bead Allele Specificity	Serological Equivalent	MFI	Software Assignment
*A*02:05*	A2	20743	Positive
*A*02:03*	A203	20637	Positive
*A*02:01*	A2	23545	Positive
*A*68:02*	A68(28)	19896	Positive
*A*66:01*	A66(10)	18561	Positive
*A*02:02*	A2	19602	Positive

Bead Allele Specificity	Serological Equivalent	MFI	Software Assignment
*B*55:01*	B55(22)	7444	Positive
*B*78:01*	B78	6591	Positive
*C*05:01*	Cw5	15006	Positive
*C*07:02*	Cw7	15496	Positive
*B*56:01*	B56(22)	5986	Positive
*B*82:02*		5826	Positive

*A*66:02*	A66(10)	18453	Positive
*A*68:01*	A68(28)	21664	Positive
*A*74:01*	A74(19)	21725	Positive
*A*11:01*	A11	18182	Positive
*A*69:01*	A69(28)	25235	Positive
*A*31:01*	A31(19)	21295	Positive
*A*34:02*	A34(10)	21579	Positive
*A*33:03*	A33(19)	20865	Positive
*A*33:01*	A33(19)	22489	Positive
*B*50:01*	B50(21)	18560	Positive
*A*03:01*	A3	17870	Positive
*B*49:01*	B49(21)	17832	Positive
*A*25:01*	A25(10)	18768	Positive
*A*29:02*	A29(19)	19850	Positive
*A*26:01*	A26(10)	19555	Positive
*A*43:01*	A43	20200	Positive
*A*32:01*	A32(19)	20670	Positive
*B*40:01*	B60(40)	17538	Positive
*B*57:01*	B57(17)	17704	Positive
*B*58:01*	B58(17)	18543	Positive
*A*11:02*	A11	17552	Positive
*B*45:01*	B45(12)	21326	Positive
*A*29:01*	A29(19)	21445	Positive
*B*41:01*	B41	20764	Positive
*A*30:01*	A30(19)	18610	Positive
*B*73:01*	B73	17233	Positive
*B*47:01*	B47	16653	Positive
*B*44:03*	B44(12)	15191	Positive
*B*40:02*	B61(40)	15730	Positive
*B*44:02*	B44(12)	15319	Positive
*B*13:02*	B13	16150	Positive
*A*80:01*	A80	13499	Positive
*C*17:01*		29608	Positive
*A*36:01*	A36	11614	Positive
*C*06:02*	Cw6	18170	Positive
*B*15:16*	B63(15)	9945	Positive
*C*18:01*		18147	Positive
*A*01:01*	A1	9353	Positive
*C*04:03*		14174	Positive
*B*67:01*	B67	6419	Positive
*C*07:01*	Cw7	16024	Positive
*C*15:02*		11251	Positive

*B*42:01*	B42	5521	Positive
*B*27:08*	B2708	3906	Positive
*C*02:02*	Cw2	12222	Positive
*B*14:01*	B64(14)	3152	Positive
*B*15:18*	B71(70)	2934	Positive
*B*54:01*	B54(22)	2994	Positive
*B*27:05*	B27	2822	Positive
*B*39:01*	B3901	2252	Positive
*B*14:02*	B65(14)	2608	Positive
*A*24:03*	A2403	2171	Positive
*C*04:01*	Cw4	9322	Positive
*B*07:02*	B7	1983	Positive
*B*27:03*	B27	1870	Positive
*B*37:01*	B37	1425	Positive
*B*81:01*	B81	1521	Positive
*B*18:01*	B18	827	Positive
*B*15:03*	B72(70)	783	Positive
*B*38:01*	B38(16)	653	Positive
B*07:03	B703	659	Negative
B*48:01	B48	624	Negative
B*35:01	B35	575	Negative
B*53:01	B53	480	Negative
B*59:01	B59	385	Negative
B*35:08	B35	423	Negative
C*08:02	Cw8	603	Negative
C*08:01	Cw8	466	Negative
B*08:01	B8	149	Negative
B*46:01	B46	127	Negative
C*03:04	Cw10(w3)	183	Negative
B*52:01	B52(5)	107	Negative
C*03:03	Cw9(w3)	184	Negative
B*15:12	B76(15)	101	Negative
A*24:02	A24(9)	98	Negative
B*15:02	B75(15)	53	Negative
B*51:01	B51(5)	46	Negative
C*12:02		122	Negative
C*14:02		106	Negative
C*01:02	Cw1	57	Negative
B*15:13	B77(15)	0	Negative
A*23:01	A23(9)	67	Negative
B*15:01	B62(15)	29	Negative
C*16:01		130	Negative

Table 8b: LIFECODES SAB Kit Class II Test Results Sample Date 28/08/2021

Bead Allele Specificity		Serological Equivalent	MFI	Software Assignment
*DRB1*04:02*		DR4	19809	Positive
*DRB1*13:01*		DR13(6)	20026	Positive
*DRB1*13:03*		DR13(6)	19457	Positive
*DRB1*15:02*		DR15(2)	18840	Positive
*DRB1*01:03*		DR103	20166	Positive
*DRB1*12:01*		DR12(5)	22434	Positive

Bead Allele Specificity		Serological Equivalent	MFI	Software Assignment
DPB1*01:01	DPA1*03:01	DPw1	129	Negative
DRB1*14:04		DR1404	45	Negative
DRB3*02:02		DR52	56	Negative
DPB1*01:01	DPA1*01:03	DPw1	92	Negative
DRB3*01:01		DR52	27	Negative
DRB1*04:01		DR4	62	Negative

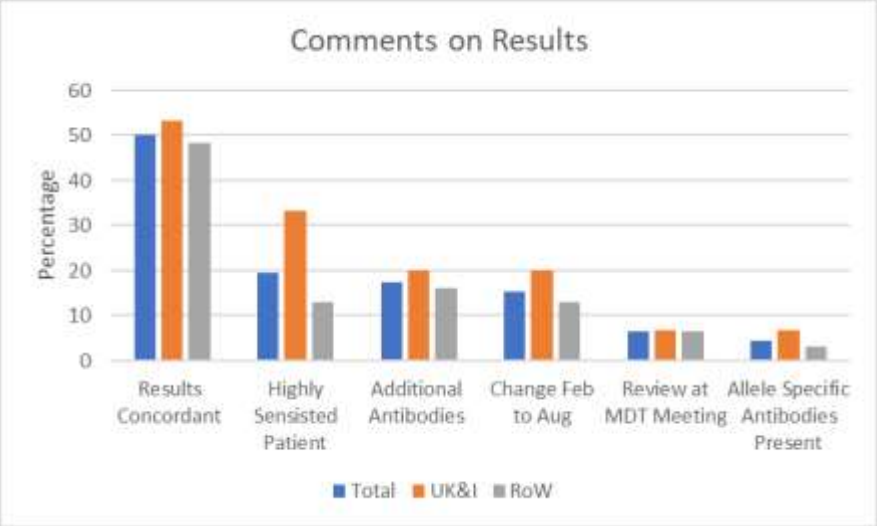
*DRB5*02:02*		DR51	18987	Positive
*DRB1*13:05*		DR13(6)	26633	Positive
*DRB1*11:04*		DR11(5)	27139	Positive
*DRB1*16:01*		DR16(2)	23219	Positive
*DRB5*01:01*		DR51	27228	Positive
*DRB1*11:01*		DR11(5)	26828	Positive
*DRB1*16:02*		DR16(2)	20283	Positive
*DRB1*15:01*		DR15(2)	20431	Positive
*DRB1*11:03*		DR11(5)	30846	Positive
*DRB1*14:03*		DR1403	24041	Positive
*DRB1*12:02*		DR12(5)	32717	Positive
*DRB1*15:03*		DR15(2)	21085	Positive
*DRB1*03:03*		DR18(3)	17338	Positive
*DRB1*03:01*		DR17(3)	15838	Positive
*DRB1*07:01*		DR7	15663	Positive
*DRB1*03:02*		DR18(3)	17390	Positive
*DRB1*08:02*		DR8	15000	Positive
*DRB1*08:01*		DR8	15562	Positive
*DQB1*06:02*	*DQA1*01:02*	DQ6(1)	23114	Positive
*DQB1*03:02*	DQA1*02:01	DQ8(3)	21815	Positive
*DQB1*06:04*	*DQA1*01:02*	DQ6(1)	19957	Positive
*DQB1*03:02*	DQA1*03:01	DQ8(3)	22217	Positive
*DQB1*03:03*	DQA1*03:02	DQ9(3)	22069	Positive
*DQB1*06:03*	*DQA1*01:03*	DQ6(1)	29760	Positive
*DQB1*03:02*	DQA1*03:02	DQ8(3)	23384	Positive
*DQB1*06:01*	*DQA1*01:03*	DQ6(1)	21428	Positive
*DQB1*03:03*	*DQA1*04:01*	DQ9(3)	23660	Positive
*DQB1*03:03*	DQA1*06:01	DQ9(3)	23817	Positive
*DQB1*06:01*	DQA1*02:01	DQ6(1)	21805	Positive
*DQB1*05:01*	*DQA1*01:02*	DQ5(1)	19807	Positive
*DQB1*06:01*	*DQA1*01:04*	DQ6(1)	22314	Positive
*DQB1*04:01*	DQA1*02:01	DQ4	15033	Positive
*DQB1*04:01*	DQA1*05:01	DQ4	15353	Positive
*DQB1*04:02*	*DQA1*04:01*	DQ4	12893	Positive
*DQB1*04:02*	DQA1*06:01	DQ4	13948	Positive
*DQB1*04:02*	DQA1*03:01	DQ4	11385	Positive
*DQB1*04:01*	*DQA1*04:01*	DQ4	11913	Positive
*DQB1*05:01*	*DQA1*01:01*	DQ5(1)	11639	Positive
*DPB1*05:01*	DPA1*02:01	DPw5	1611	Positive
*DPB1*05:01*	DPA1*02:02	DPw5	1038	Positive
*DPB1*05:01*	DPA1*03:01	DPw5	616	Positive
*DQB1*05:02*	*DQA1*01:02*	DQ5(1)	2652	Positive
*DQB1*05:03*	*DQA1*01:04*	DQ5(1)	2185	Positive

DRB1*04:03		DR4	-7.38	Negative
DRB4*01:01		DR53	12	Negative
DQB1*03:01	DQA1*05:01	DQ7(3)	311	Negative
DPB1*13:01	DPA1*02:01		67	Negative
DPB1*15:01	DPA1*02:01		56	Negative
DPB1*04:01	DPA1*02:02	DPw4	87	Negative
DPB1*17:01	DPA1*02:01		35	Negative
DRB1*10:01		DR10	33	Negative
DPB1*01:01	DPA1*02:01	DPw1	68	Negative
DRB1*14:01		DR14(6)	31	Negative
DPB1*04:01	DPA1*04:01	DPw4	8	Negative
DPB1*09:01	DPA1*02:01		37	Negative
DPB1*01:01	DPA1*02:02	DPw1	52	Negative
DRB1*01:02		DR1	7	Negative
DRB3*03:01		DR52	22	Negative
DRB1*01:01		DR1	16	Negative
DRB1*04:04		DR4	-28.98	Negative
DPB1*02:01	DPA1*01:03	DPw2	83	Negative
DPB1*04:01	DPA1*01:03	DPw4	41	Negative
DPB1*04:01	DPA1*03:01	DPw4	39	Negative
DPB1*04:02	DPA1*01:03	DPw4	7	Negative
DPB1*18:01	DPA1*01:03		34	Negative
DPB1*19:01	DPA1*02:01		42	Negative
DPB1*13:01	DPA1*04:01		40	Negative
DPB1*03:01	DPA1*01:03	DPw3	3	Negative
DRB1*04:05		DR4	-26.34	Negative
DQB1*03:01	DQA1*03:01	DQ7(3)	51	Negative
DPB1*04:02	DPA1*03:01	DPw4	-1.49	Negative
DQB1*03:01	DQA1*06:01	DQ7(3)	62	Negative
DPB1*28:01	DPA1*02:02		6	Negative
DPB1*14:01	DPA1*02:01		17	Negative
DPB1*11:01	DPA1*02:01		-2.33	Negative
DQB1*02:02	DQA1*05:01	DQ2	285	Negative
DQB1*02:02	DQA1*03:02	DQ2	293	Negative
DQB1*02:02	DQA1*02:01	DQ2	285	Negative
DQB1*03:01	DQA1*03:02	DQ7(3)	62	Negative
DPB1*04:01	DPA1*02:01	DPw4	0	Negative
DQB1*02:01	DQA1*02:01	DQ2	252	Negative
DRB1*09:01		DR9	-3.29	Negative
DQB1*02:01	DQA1*05:01	DQ2	215	Negative
DPB1*06:01	DPA1*01:03	DPw6	0	Negative

Q5. Comment on these results

Comments	Total (n=46)		UK&I (n=15)		RoW (n=31)	
	Count	%	Count	%	Count	%
Results Concordant Between Kits	23	**50**	8	**53**	15	**48**
Highly Sensitised Patient	9	**20**	5	**33**	4	**13**
Additional Antibodies Detected / Increased Levels	8	**17**	3	**20**	5	**16**

Change in Level Feb to Aug	7	**15**	3	**20**	4	**13**
Review at Multidisciplinary Meeting	3	**7**	1	**7**	2	**6**
Allele Specific Antibodies Present	2	**4**	1	**7**	1	**3**



Further unacceptable antigens were listed in line with the patient antibody profile. In 2023 the patient had a calculated reaction frequency (cRF) of 100% and had been waiting 6 years for a transplant.
The patient had no further deceased offers so dilution testing was performed in 2023 to inform the option of delisting, see Table 9a and 9b.

Table 9a: LABScreen SAB Kit Class I Dilution Test Results (only Antigen Specificities with MFI >1000 at Neat displayed)

Bead Antigen Specificity	Bead Allele Specificity	Serum Date 14/08/2023		
		NEAT	1:4	1:16
A1	A*01:01	5414	2777	691
A2	A*02:01	21623	20910	15443
A2	A*02:03	21178	18774	11911
A2	A*02:06	20476	19197	13698
A3	A*03:01	9760	5723	1872
A11	A*11:01	12078	7693	2643
A11	A*11:02	11185	7500	2567
A24	A*24:02	0	0	13
A24	A*24:03	1958	1061	283
A25	A*25:01	5007	3038	896
A26	A*26:01	7204	4218	1246
A29	A*29:01	9507	5759	1786
A29	A*29:02	9304	5603	1776
A30	A*30:01	8618	4980	1672
A30	A*30:02	1759	859	211
A31	A*31:01	13993	9710	3918

A32	A*32:01	5071	2855	802
A33	A*33:01	11557	7958	2760
A33	A*33:03	13905	9856	3717
A34	A*34:01	10660	6828	2418
A34	A*34:02	11552	7278	2576
A36	A*36:01	5782	3062	881
A43	A*43:01	7038	4128	1209
A66	A*66:01	9636	6290	2138
A66	A*66:02	10926	7021	2576
A68	A*68:01	16816	13388	6070
A68	A*68:02	14282	10702	4691
A69	A*69:01	17771	14550	7302
A74	A*74:01	14119	9857	3807
A80	A*80:01	7849	4256	1196
B13	B*13:01	1971	952	256
B13	B*13:02	7754	5153	1782
B63	B*15:16	2066	1255	357
B60	B*40:01	10375	7465	3000
B61	B*40:02	6905	3435	897
B61	B*40:06	6476	3800	1201
B41	B*41:01	10312	7348	3137
B44	B*44:02	2360	1188	317
B44	B*44:03	3220	1709	462
B45	B*45:01	9839	7294	2992
B49	B*49:01	12929	9504	4105
B47	B*47:01	5859	4052	1541
B50	B*50:01	14044	10754	6037
B55	B*55:01	3748	2496	884
B57	B*57:01	9370	7325	3204
B57	B*57:03	8023	6471	2868
B58	B*58:01	6624	4880	2059
B73	B*73:01	4790	2966	975
B78	B*78:01	2299	1493	506
Cw4	C*04:01	2298	1215	352
Cw5	C*05:01	5497	3162	967
Cw6	C*06:02	9022	5955	2225
Cw7	C*07:02	3804	1979	508
Cw15	C*15:02	7686	4995	1625
Cw17	C*17:01	6664	3642	1077
Cw18	C*18:02	10169	6954	2403

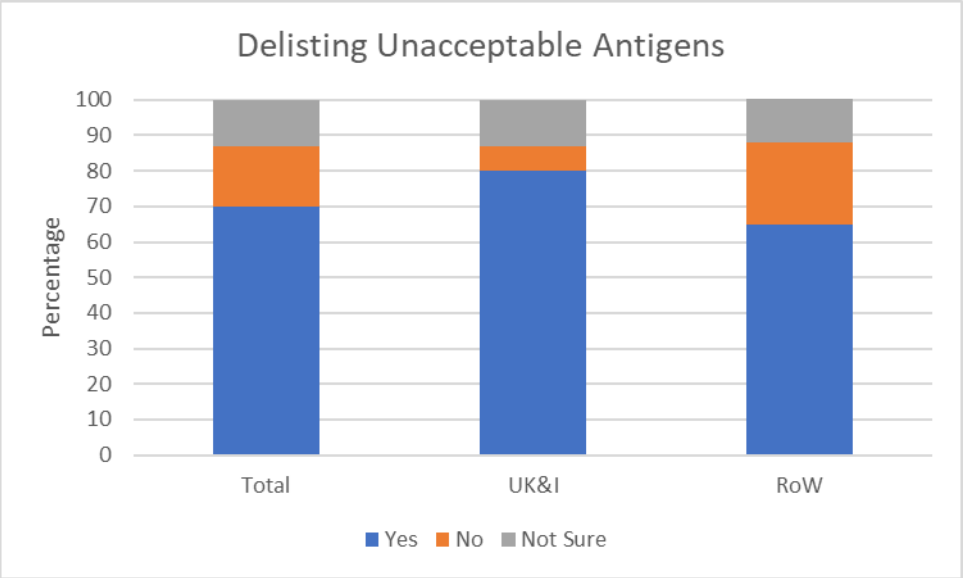
Table 9b: LABScreen SAB Kit Class II Dilution Test Results (only Antigen Specificities with MFI >1000 at Neat displayed)

Bead Antigen Specificity	Bead Allele Specificity	Serum Date 14/08/2023		
		Neat	1:4	1:16
DR103	DRB1*01:03	18139	15708	13229
DR4	DRB1*04:01	33	36	22
DR4	DRB1*04:02	16980	16431	13226
DR4	DRB1*04:04	0	30	41
DR4	DRB1*04:05	34	43	37
DR4	DRB1*04:03	48	35	28
DR7	DRB1*07:01	12853	5584	2282
DR8	DRB1*08:01	12284	5064	2098
DR11	DRB1*11:01	16994	14410	10508
DR11	DRB1*11:04	17046	14460	10768
DR12	DRB1*12:01	17234	14560	11236
DR12	DRB1*12:02	13986	11061	7728
DR13	DRB1*13:01	20376	18689	16066
DR13	DRB1*13:03	20067	18336	15112
DR15	DRB1*15:01	9446	7242	4270
DR15	DRB1*15:02	7782	5785	3047
DR15	DRB1*15:03	8829	6846	3719
DR16	DRB1*16:01	14656	10052	5943
DR16	DRB1*16:02	15271	10822	7063
DR51	DRB5*01:01	16701	13438	9599
DR51	DRB5*02:02	7513	5711	3443
DQ5	DQA1*01:01,DQB1*05:01	14120	9034	5771
DQ5	DQA1*01:02,DQB1*05:02	39	19	31
DQ6	DQA1*01:03,DQB1*06:01	21428	19419	20971
DQ6	DQA1*01:02,DQB1*06:02	20643	18809	18425
DQ6	DQA1*01:01,DQB1*06:02	19531	18113	17350
DQ6	DQA1*01:03,DQB1*06:03	21041	18976	19872
DQ6	DQA1*01:02,DQB1*06:04	21514	18478	19384
DQ6	DQA1*01:02,DQB1*06:09	20919	18595	20067
DQ8	DQA1*02:01,DQB1*03:02	19735	17418	17703
DQ8	DQA1*03:01,DQB1*03:02	19414	17988	17522
DQ8	DQA1*03:03,DQB1*03:02	21766	18308	20920
DQ9	DQA1*02:01,DQB1*03:03	20762	18626	19585
DQ9	DQA1*03:01,DQB1*03:03	21020	18319	19216
DQ9	DQA1*03:02,DQB1*03:03	20924	18385	20483

Q6a. Based on the information provided, would you delist any unacceptable antigens?

Response	Total (n=46)		UK&I (n=15)		RoW (n=31)	
	Count	%	Count	%	Count	%
Yes	32	**70**	12	**80**	20	**65**

No	8	**17**	1	**7**	7	**23**
Not Sure	6	**13**	2	**13**	4	**13**

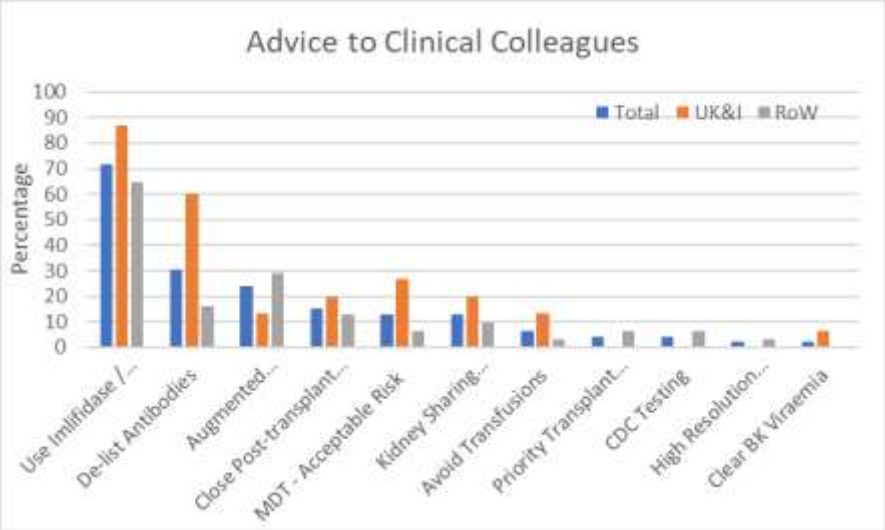


Q6b. Give reasons for your answers.

Reasons	Total (n=46)		UK&I (n=15)		RoW (n=31)	
	Count	%	Count	%	Count	%
Imlifidase / Desensitisation	7	**15**	4	**27**	3	**10**
Avoid Removal of Repeat Mismatches / Pregnancy Induced Antibodies	5	**11**	4	**27**	1	**3**
Multi-Disciplinary Team Meeting	5	**11**	3	**20**	2	**6**
Remove Antibodies <1,000 at Dilution	5	**11**	1	**7**	4	**13**
Remove Antibodies <2,000 at Dilution	4	**9**	2	**13**	2	**6**
Remove Antibodies <3,000 at Dilution	4	**9**	2	**13**	2	**6**
Dilution Not Used Locally	4	**9**	1	**7**	3	**10**
Remove Antibodies <5,000 at Dilution	2	**4**	2	**13**	0	**0**
Prozone not Evident / Antibodies Decreased at Dilution	4	**9**	1	**7**	3	**10**
Delist CI Antibodies Only	3	**7**	1	**7**	2	**6**
Remove Antibodies <10,000 at Dilution	2	**4**	0	**0**	2	**6**
Remove Historical Positive Antibodies	2	**4**	1	**7**	1	**3**
Remove Antibodies <6,000 at Dilution	1	**2**	0	**0**	1	**3**
Remove Antibodies <4,000 at Dilution	1	**2**	0	**0**	1	**3**
Remove Antibodies <3,000 at Dilution	1	**2**	0	**0**	1	**3**
Remove Antibodies <2,500 at Dilution	1	**2**	0	**0**	1	**3**
Perform 3rd Party Crossmatching	1	**2**	1	**7**	0	**0**
Non-Complement Fixing Antibodies	1	**2**	0	**0**	1	**3**

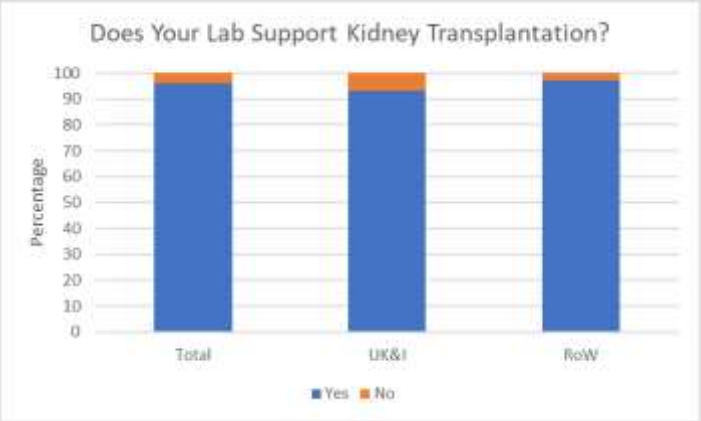
Q6c. What advice would you provide to clinical colleagues regarding the management of this patient?

Advice	Total (n=46)		UK&I (n=15)		RoW (n=31)	
	Count	%	Count	%	Count	%
Use Imlifidase / Desensitisation	33	**72**	13	**87**	20	**65**
De-list Antibodies	14	**30**	9	**60**	5	**16**
Augmented Immunosuppression	11	**24**	2	**13**	9	**29**
Close Post-transplant Monitoring	7	**15**	3	**20**	4	**13**
MDT - Acceptable Risk	6	**13**	4	**27**	2	**6**
Kidney Sharing Scheme	6	**13**	3	**20**	3	**10**
Avoid Transfusions	3	**7**	2	**13**	1	**3**
Priority Transplant Programmes	2	**4**	0	**0**	2	**6**
CDC Testing	2	**4**	0	**0**	2	**6**
High Resolution Typing Donors	1	**2**	0	**0**	1	**3**
Clear BK Viraemia	1	**2**	1	**7**	0	**0**



Q7. Does your laboratory support testing for kidney transplantation?

Response	Total (n=46)		UK&I (n=15)		RoW (n=31)	
	Count	%	Count	%	Count	%
Yes	44	**96**	14	**93**	30	**97**
No	2	**4**	1	**7**	1	**3**



Q8. Do you have any comments on the scientific aspects of this scenario?

- The patient is approaching 7 years on the wait list. She could have been reviewed earlier. Assessing her cRF, chance of transplant and therefore look at delisting specificities earlier. If she had still not received offers the patient could then be considered for transplant with Imlifidase desensitisation. As the son does not share a haplotype with the husband it would have been useful to know if the patient had any pregnancies with the current husband to aid antibody interpretation.
- We would not have performed a prospective 'wet' crossmatch at time of 2nd deceased donor offer due to the presence of donor directed DQB1*05:01 antibodies at High MFI. The presence of these antibodies would have been identified at time of offer. This laboratory currently does not perform dilution testing in order to delist HLA antibody specificities.
- In this Laboratory we have found it very difficult to find a match for patients with high antibody levels unless a HLA matched family donor, preferably sibling is used as a donor.
- This patient will not find a compatible donor easily due to being very highly sensitized.
- We perform delisting and desensitization protocols in our lab.
- This case is fairly typical of challenging highly sensitized re-transplant patients. The case highlights the need for regular HLA antibody testing, particularly after potential sensitizing events, and of using multiple platforms including solid phase bead assays and physical crossmatching, for example the flow crossmatch against deceased donor 2 detected class I HLA antibody at a strength not predicted by the antibody testing history. The case also highlights the need for full high resolution HLA genotyping in that the live donors had incomplete low resolution HLA typing results which makes full virtual crossmatch assessment difficult.

Comments and suggested responses from the UK H&I experts providing this scenario*

Question 1

UK NEQAS for H&I cannot comment on the validity of unacceptable antigen definition strategies, but we note some variability between individual responses. Laboratories should have robust processes to align testing to expected crossmatch results or clinical outcome. We would encourage all laboratories to complete regular clinical audits to determine if their definition of unacceptable antigens remains relevant.

It is worth noting the patient has a possible allele-specific antibodies against HLA-DRB1*04:02. The patient is DRB1*04:05.

Question 2

The donor is the patient's son. The crossmatch is T cell Negative and B cell Positive. The patient has a donor specific antibody (DSA) to DRB1*12:02 detected at >10,000 MFI. There is an A*24:07 mismatch but there is no cognate bead to A24:07 on the One Lambda kit panel. There is a potential B35 antibody detected at 2167 in serum date 05/08/16 but this was not tested in the crossmatch.

The DR12 antibody is likely a result of sensitisation through pregnancy.

UK NEQAS for H&I would state this is a high risk transplant (https://bts.org.uk/wp-content/uploads/2016/09/06_BTS_BSHI_Antibodies-1.pdf). We have made this decision because the patient has high levels of circulating IgG HLA Class II antibodies specific for mismatched donor HLA present at the time of transplantation.

We would recommendation this immunological risk level indicates a contraindication to direct transplantation from this donor. It would be advisable to investigate alternative donor sources such as a kidney sharing scheme. It may also be prudent to consider desensitisation for this patient.

Question 3

A virtual crossmatch would likely be positive given the level of donor specific antibodies present. The DR12 antibody is particularly concerning as it is likely pregnancy derived.

The high-resolution HLA genotype of Live Donor 2 has not been provided by the testing centre. It would be useful to know this to determine if DQ5 is matched to the patient (patient is DQB1*05:03).

In terms of recommendations to the clinical team for this transplant we would consider this a high immunological risk level and as such a contraindication to direct transplantation from this donor. It may be advisable to investigate kidney sharing schemes but as the donor is based in a different country to the patient this may not be logistically viable. Once again desensitisation may be an option for the patient. It may be worth considering if any antibodies could be delisted to increase the chance of a deceased donor offer.

Question 4

The allogeneic crossmatch is T cell positive and B cell positive. The autologous crossmatch is T and B cell negative. It appears the patient has a DQB1*05:01 antibody, which may be derived from pregnancy.

In terms of recommendations to the clinical team for this transplant we would indicate the high immunological risk level indicates a contraindication to direct transplantation from this donor.

It would be useful to perform high-resolution HLA genotyping on the patient's husband to determine his DQB1*05 allele type. The T cell crossmatch result does not correlate to Class I antibody strength and warrants further investigation.

Question 5

The MFI values from the One Lambda SAB kit are increasing. There is general concordance between the two kits. There are a number of allele specific antibodies evident: A*24:03, DRB1*04:02 and DQB1*05:01 (the patient is HLA-A*24:02, DRB1*04:05, DQB1*05:03).

Question 6

It may be useful to consider delisting antibodies that have reduced at 1:16 dilution. There are a number of Class I antibodies which this could be applied to. This may create an opportunity to find a suitable deceased donor organ. This information may also be useful to inform the impact of potential desensitisation treatment.

In terms of future considerations this patient may be a suitable candidate for Imlifidase treatment. To avoid further offers from unsuitable deceased donors it may be worth considering listing allelic antibodies if possible in your local programme or alternatively listing antigens associated with the unacceptable antigen of interest e.g. to account for the DQB1*05:01 antibody associated antigens DR1, DR103, DR10, DR15, DR16 and DR14 could be listed as unacceptable.

Please note:

These comments have been compiled by subject matter experts from the UK NEQAS for H&I Steering Committee in accordance with current guidelines. We accept that guidelines are not always explicit for every situation and therefore the responses may be aligned with the clinical practices of an individual transplant centre and may not be directly applicable across all settings. UK NEQAS are not necessarily endorsing these responses as the only correct action, just one possible view which, we acknowledge, may be biased towards UK practice.