

RINTAG
7th May 2019
November 2018 Kidney Acceptance

Status – Public

Executive Summary

Following discussion at the October 2018 RINTAG meeting, the ODT Research team conducted an exercise with kidney researchers during the month of November 2018. The researchers were asked to provide information as to why they had not accepted an offer of a kidney. Those reasons, along with the information about the kidneys listed in the research offer messages sent by NHSBT's Hub Operations, have been analysed.

No one single factor influences the acceptance rates of research kidneys. A combination of the kidney's parameters (the donor's age, reason for not transplanting, time of offer, location) and the studies' needs (acceptance criteria, staff and reagent availability) are at play.

Ask of RINTAG

To note the paper and recommend that further analysis is carried out by the Statistics & Clinical Studies team

Background

The aim of this exercise was to understand why researchers do not respond to organ offers made by the Hub. The ODT Research team have a duty to make the most of every organ donor's gift by placing any organs that can't be transplanted into research studies and increasing research acceptance rates as much as possible.

In order to achieve this aim, there were two sources of data available for the Team to analyse: feedback from the researchers themselves about why they didn't respond to an offer and the offer messages themselves.

Methodology

In order to keep the volumes of data manageable the ODT Research team considered the research kidney offers made within one month (November 2018). The full methodology is available in Appendix A.

Kidney acceptance rates usually hover around the 50% mark. The average acceptance rate over 11 months (1st May 2018 to 31st March 2019) is 46%. These acceptance figures include acceptance by tissue banks, who are contacted when all ranked studies have declined an offer.

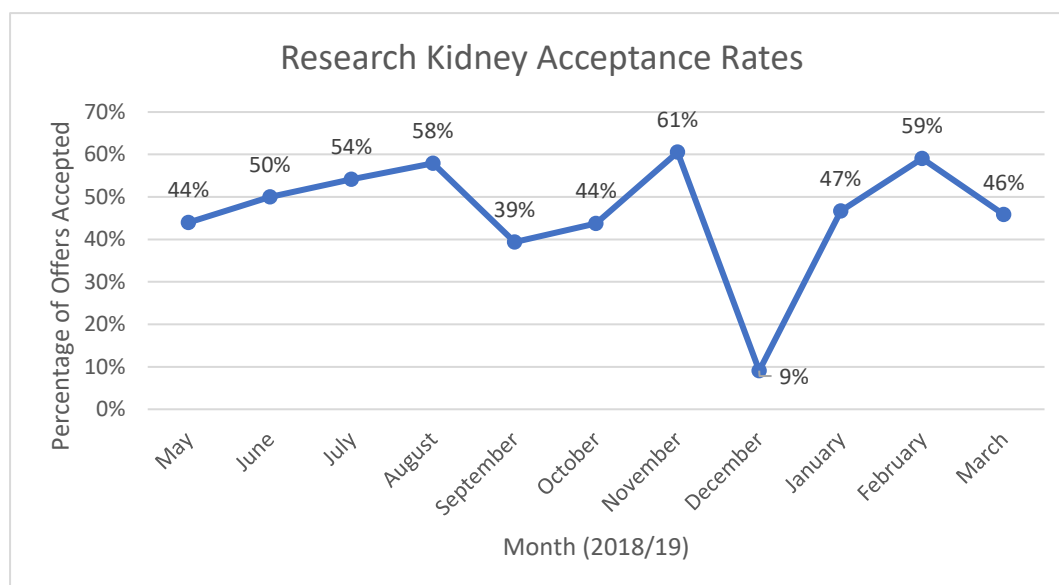


Figure 1: A graph tracking the acceptance rate of research kidneys offered through the national allocation scheme, per month. Please note that acceptance here includes acceptance by tissue banks.

There were 38 kidneys offered during November 2018 (data in Appendix B), and 8 studies able to accept them, located in Bristol, Cambridge, London and Newcastle.

Reasons given by researchers for not responding to an offer

The responses are broken down by study in Appendix C. 5 out of 8 studies gave responses for every declined kidney. One study, although live, was not ready to accept kidneys so no responses were received from them.

The most common reason for not accepting a kidney was that the reason it was turned down for transplantation also meant that it was unsuitable for research. This suggests that it will be difficult to reach acceptance rates of 100% if the kidneys offered are unsuitable for research by their very nature.

5 out of the 8 kidney studies involve perfusion in some way, meaning that their inclusion criteria are – on the face of it – narrower. A good balance between perfusion and translational science studies is desirable because the translational science studies can still make use of kidneys that wouldn't meet criteria for perfusion.

A researcher from a translational science study noted that a 'good' research kidney, suitable for perfusion, is still desired by the typically lower-ranked translational science studies. They are unlikely to receive one of these kidneys given their ranking so accept 'less good' kidneys to do their research.

For every kidney that was declined, at least one researcher stated that the primary reason it was turned down for transplantation also that meant they couldn't accept it for their research.

Data from the Offer Messages themselves

Reasons turned down for transplantation

The 'Primary Reason Turned Down for Transplantation' is listed in the research offer message and as noted above, was the most common reason given by researchers for not responding to an offer.

Therefore, the reasons why the kidneys were turned down for transplantation were compared against whether they were accepted, to see if any particular reason correlated strongly with acceptance or decline.

The reasons turned down for transplantation vary in detail, for example from 'Anatomy' to 'kidney has an intimal tear at the bifurcation of renal artery'. Researchers can ask the Hub employees for more information over the phone to inform their decision.

A limitation of the data used in this analysis is that it only contains the wording from the offer message, rather than that additional information communicated over the phone. As such the reasons are imprecise and there are no obvious correlations between the reasons turned down for transplantation and whether a kidney was accepted or declined.

Another limitation is that the Research team don't understand the nuances of the inclusion and exclusion criteria of each study to know if a kidney would have been suitable for them.

Reason Kidney Was Untransplantable	Number of kidneys with this reason that were accepted	Number of kidneys with this reason that were declined
Anatomy	1	4
Anatomy and Function	3	0
Anatomy and Histology	2	0
Cancer	1	3
Cold Ischaemic Time (CIT)	1	0
CIT and aneurysms in hylum	0	1
CIT and high Remuzzi score	0	2
Damage	3	3
Function and Past Medical History	2	0
Infection and Poor perfusion	1	0
Past Medical History	0	1
Past Medical History and Histology	2	0
Poor function	4	4
Total	20	18

Table 1: The reasons why the research kidneys in November 2018 were not transplanted compared against whether the kidneys were accepted or declined.

Ischaemic time

Ischaemic time has been thought of as one of the most important factors affecting acceptance of research organs, and feedback from the study that can transplant kidneys has shown that this plays a large role in whether they can accept a kidney or not.

The mean duration between time of perfusion and the offer message being sent out was 11 hours and 54 minutes for all kidneys. It was 10 hours and 56 minutes for accepted kidneys, and 12 hours and 58 minutes for disposed kidneys. These are not statistically significantly different (two sample T-test; $p=0.246$).

This measure of ischaemic time (although the best proxy available) doesn't tell the full story as it doesn't include the additional time taken for the organ to be transported from its current location to the research site, which researchers will factor into their decision to accept or decline.

Time of Offer

Several researchers have reported that if kidneys could be reoffered at 9am then they would be more likely to accept them. This would likely require the Specialist Nurse in Organ Donation (SNOD) to wait with the kidney until 9am and would cause additional workload for the Hub.

Of the kidneys that were declined, a higher proportion were offered over the weekend. One of the perfusion researchers noted that they require non-clinical issue blood to do their perfusion experiments, and this can only be issued from 9am – 5pm, Monday to Friday. This helps to explain why acceptance is poorer over weekends.

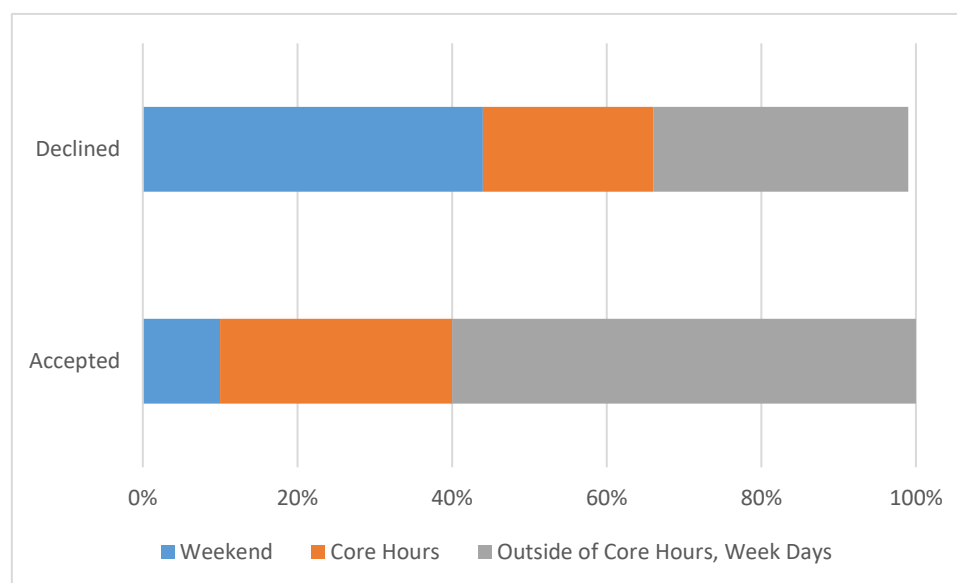


Figure 2: The breakdown of time of offer for accepted and declined kidneys. Core hours are 8am - 6pm, Monday to Friday. Outside of core hours, week days are 6pm - 8am, Monday to Friday. Weekends include bank holidays.

Miles to Study Location

It might be expected that kidneys located a long distance away from an active study are more likely to be declined - because researchers have to pay for their own transportation to collect them.

For example, there were no active studies in the north-west of England and kidneys offered from the Royal Liverpool, Wythenshawe and Birmingham were all declined (Fig. 3). However, areas with several active studies such as Cambridge and London did not have 100% acceptance rates.

Kidneys that were accepted were located an average of 48 miles away from the study that accepted them.

Of the 20 accepted kidneys, 13 were in the same city as the study that accepted them (65%). However, there were some extraordinary distances travelled by the accepted kidneys, the longest being from Newcastle to Bristol (kidney no.38 in Appendix B). This distance might be explained by the relatively short ischaemic time at the time of offer and that the donor was young.

13 of the 18 declined kidneys (72%) were also located in cities where studies were running.

The distance between a kidney and a study was only once reported as the main factor for decline. The kidney in question was located in Edinburgh and the study that was interested was in Cambridge.

It's possible that because the donor hospital is listed first in the offer message (ahead of the organ's current location), researchers read this first, and were put off by the distance to their study. Listing the organ's current location first might help to improve acceptance rates.

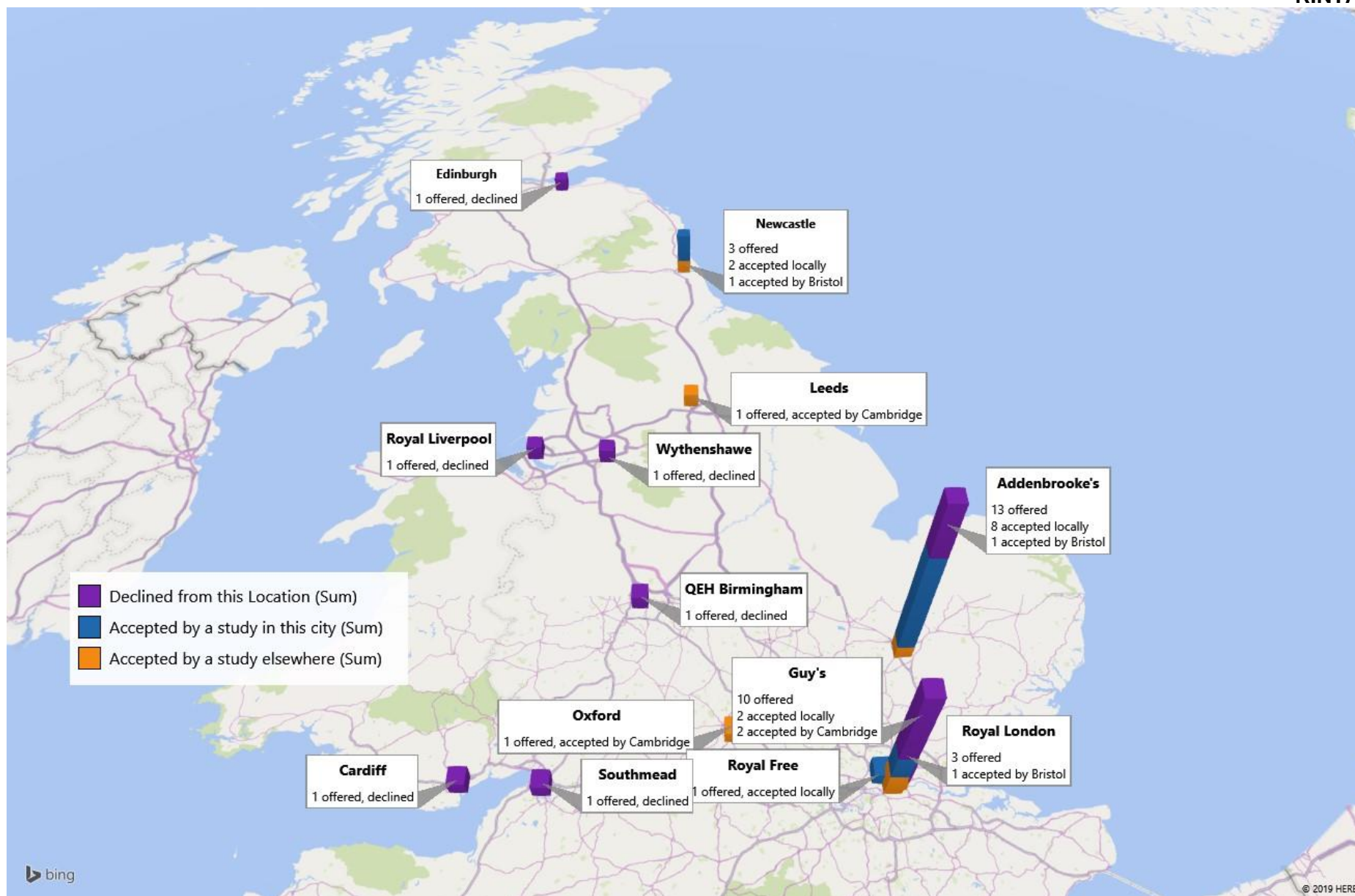


Figure 3: A cartographical representation of the location at time of offer of kidneys offered for research during November 2018, and their fates. The height of the bars correspond to the number of research kidneys offered from this location. Active studies were located in Newcastle, Cambridge, London and Bristol.

Research Restrictions

Approximately one third of the research organs that are offered through the national allocation scheme have a restriction on their use put in place by the donor family. These restrictions are usually on genetic analysis, use of animals or commercial research.

Whilst half of the active kidney studies did at least one form of restricted research, none of the studies reported that this was why they couldn't accept a kidney.

25% of the accepted kidneys had a restriction on them; 39% of the declined kidneys had a restriction on them.

Donor Age

Donor age was often mentioned as a reason for decline.

The average age of a kidney that was offered for research in November 2018 was 57 years. The average age of an accepted kidney was 53, and a declined kidney was 61. These are not significantly different according to a two-tailed T test ($p=0.064$).

Pairs of kidneys

When discussing the 'ideal' research kidney, one of the researchers involved in this piece of work noted that they like to accept pairs of kidneys where possible, as it allows for better assessment of a novel therapeutic agent.

There were 11 pairs of kidneys offered in November 2018, 8 of them simultaneously (in one offer message).

The acceptance rate of pairs (both offered simultaneously and not) was 50%, compared to an overall acceptance rate of 53%.

Conclusions

The data used to inform this paper, whilst easily accessible, have some limitations. Where most researchers reported that the reason a kidney was turned down for transplantation was also why they couldn't accept it, those reasons (as listed in the offer messages) are too vague to draw any meaningful conclusions. Only one month's worth of data may not paint a totally representative picture.

Analysing the parameters from the offer message didn't provide as much illumination as hoped, underscoring the complexity of the original issue; that understanding why some research kidneys are accepted and others disposed of is challenging.

Notwithstanding this, some important insights have been identified. Swapping the order of the donor hospital and the organ's current location in the research offer message would be a quick and easy way to see if researcher psychology has an effect on acceptance.

The next step would be to ask the Statistics & Clinical Studies team to carry out a logistic regression analysis on a larger dataset.

Hannah Tolley
ODT Research Manager

Appendix A: Methodology

The ODT Research team are copied into all research organ offers made by Hub Operations. The offer information is transcribed into a spreadsheet which, combined with data from EOS, allows the monitoring of research organ offer and acceptance rates.

Each Monday in November 2018, the Research team sent out an email to all active kidney researchers containing a list of the previous week's disposed research kidneys. The information listed for each disposed kidney was:

- Left/Right
- Donor Number
- Date of Offer
- Kidney Location When It Was Offered
- Primary Reason Turned Down for Transplantation
- Donor Age
- Perfusion Time
- Restrictions on Consent

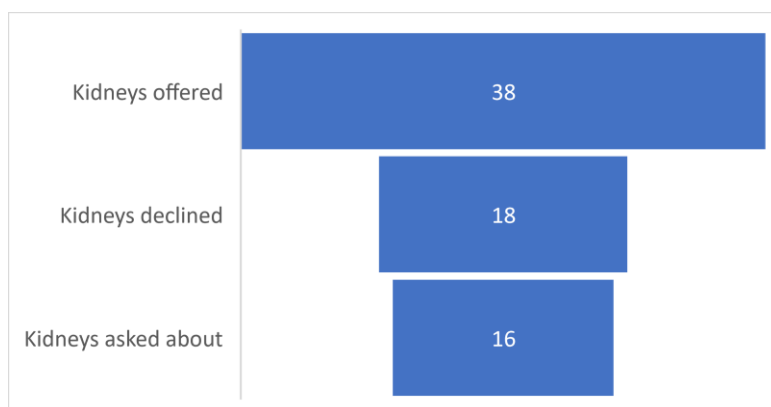
The researchers were also given a drop-down list of reasons why they didn't accept the kidney and asked to select the most appropriate one. The reasons were:

- Researcher unavailable
- No lab technician available to process
- Transport costs too expensive to pick up a kidney from this location
- Already processing a kidney (or other organ) for research
- The 'Primary reason declined for transplantation' meant this kidney was also unsuitable for our research
- Did not receive the offer message/text
- Other donor characteristics (i.e. age, blood group) meant this kidney was unsuitable for our research
- Ischaemic time / time since perfusion too long
- Restrictions on consent (i.e. DNA/animal/commercial) meant this kidney was unsuitable for our research
- Presumed higher ranking study than ours would accept this kidney
- Difficult to source consumables at this time (i.e. non-clinical issue blood)
- Other (please specify)

There was an additional column to add extra detail.

38 kidneys were offered during November, the highest since data collection began in May 2018. The data is available in Appendix B.

The researchers were asked to provide information on their reasons for decline for 16 kidneys.



Two declined kidneys were not asked about due to a recording error.

There were 8 live studies at the time:

- 3 in Cambridge
- 3 in London
- 1 in Bristol
- 1 in Newcastle

Appendix B: Data on Kidneys Offered for Research in November 2018

No.	Pair/single?	Pair offered at the same time?	Time of Day category	Location at time of offer	Accepted by a ranked study	Location of Study that Accepted	CIT at time of offer	Reason why it wasn't transplanted (free text)	Reason why it wasn't transplanted (categorised)	Donor Age	Most common reason for not accepting
1	Single		Core Hours	Leeds	Yes	Cambridge	06:31	Poor function	Poor function	49	
2	Pair	Yes	Weekend	Guy's	No		15:35	Organs Damaged	Damage	70	The 'Primary reason declined for transplantation' meant this kidney was also unsuitable for our research
3			Weekend	Guy's	No		15:35	Organs Damaged	Damage	70	The 'Primary reason declined for transplantation' meant this kidney was also unsuitable for our research
4	Single		Weekend	Addenbrooke's	No		14:01	Anatomical	Anatomy	78	Joint between: 'Primary reason' and researcher unavailable
5	Single		Weekend	QE, Birmingham	No		10:38	Anatomical, please call for details	Anatomy	43	The 'Primary reason declined for transplantation' meant this kidney was also unsuitable for our research
6	Single		Core Hours	Guy's	Yes	Cambridge	22:22	Cold Ischaemia Time	CIT	44	
7	Pair	No	Outside of Core Hours, Week Days	Wythenshawe	No		04:22	Anatomy	Anatomy	56	The 'Primary reason declined for transplantation' meant this kidney was also unsuitable for our research
8			Weekend	Edinburgh	No		09:17	Poor perfusion	Poor function	56	Other
9	Single		Weekend	Addenbrooke's	Yes	Cambridge	08:39	Function	Poor function	74	

10	Single		Weekend	Oxford	Yes	Cambridge	06:59	Anatomical	Anatomy	69	
11	Pair	Yes	Outside of Core Hours, Week Days	Addenbrooke's	Yes	Cambridge	16:38	Function	Poor function	68	
12			Outside of Core Hours, Week Days	Addenbrooke's	Yes	Cambridge	16:38	Function	Poor function	68	
13	Single		Outside of Core Hours, Week Days	Cardiff	No		15:08	Past Medical History/Age	Past Medical History and Age	60	6 different reasons given
14	Single		Outside of Core Hours, Week Days	Newcastle	Yes	Newcastle	14:47	KIDNEY HAS A INTIMAL TEAR AT THE BIFICATION OF RENAL ARTERY	Damage	64	
15	Pair	Yes	Outside of Core Hours, Week Days	Addenbrooke's	Yes	Cambridge	07:47	Anatomy and Function	Anatomy and Function	55	
16			Outside of Core Hours, Week Days	Addenbrooke's	Yes	Cambridge	07:47	Anatomy and Function	Anatomy and Function	55	
17	Single		Outside of Core Hours, Week Days	Addenbrooke's	Yes	Bristol	11:37	Damage	Damage	54	
18	Pair	Yes	Core Hours	Royal London	No	Tissue Bank - Cardiff	11:15	Remuzzi Score 7	Poor function	70	Joint: The 'Primary reason declined for transplantation' meant this kidney was also unsuitable for our research and Other Donor factors
19			Core Hours	Royal London	No	Tissue Bank - Cardiff	11:15	Remuzzi Score 7	Poor function	70	Joint: The 'Primary reason declined for transplantation'

											meant this kidney was also unsuitable for our research and Other Donor factors
20	Pair	No	Outside of Core Hours, Week Days	Guy's	No	Tissue Bank - Cardiff	12:52	LYMPH NODES FOUND ON PANCREAS BIOPSY PENDING	Cancer	54	The 'Primary reason declined for transplantation' meant this kidney was also unsuitable for our research
21			Core Hours	Royal London	Yes	Bristol	22:08	NO HISTOPATHOLOGY REPORT AVAILABLE.	Cancer	54	
22	Pair	Yes	Outside of Core Hours, Week Days	Addenbrooke's	Yes	Cambridge	09:05	PAST MEDICAL HISTORY - HISTOLOGY	Past Medical History and Histology	39	
23			Outside of Core Hours, Week Days	Addenbrooke's	Yes	Cambridge	09:05	PAST MEDICAL HISTORY - HISTOLOGY	Past Medical History and Histology	39	
24	Pair	No	Outside of Core Hours, Week Days	Guy's	Yes	Cambridge	13:09	Anatomical - Awaiting Histopathology Results	Anatomy and Histology	49	
25			Core Hours	Newcastle	Yes	Newcastle	16:39	Anatomy waiting for histology report	Anatomy and Histology	49	
26	Single		Core Hours	Addenbrooke's	No		05:51	PATCHY PERFUSION AND INFARCT ON LOWER POLE	Poor function	67	
27	Pair	Yes	Outside of Core Hours, Week Days	Guy's	Yes	London	07:02	Function / PMH	Function and Past Medical History	61	
28			Outside of Core	Guy's	Yes	London	07:02	Function / PMH	Function and Past Medical History	61	

			Hours, Week Days								
29	Single		Outside of Core Hours, Week Days	Addenbrooke's	Yes	Cambridge	04:38	Infection / Poor Perfusion	Infection and Poor perfusion	34	
30	Single		Outside of Core Hours, Week Days	Guy's	No		09:07	Damage	Damage	58	Joint: The 'Primary reason declined for transplantation' meant this kidney was also unsuitable for our research and Other Donor factors
31	Pair	Yes	Weekend	Addenbrooke's	No		18:16	CIT AND BIOPSY SCORE OF 5	CIT and high Remuzzi score	71	Other donor characteristics (i.e. age, blood group) meant this kidney was unsuitable for our research
32			Weekend	Addenbrooke's	No		18:16	CIT AND BIOPSY SCORE OF 5	CIT and high Remuzzi score	71	Other donor characteristics (i.e. age, blood group) meant this kidney was unsuitable for our research
33	Single		Weekend	Southmead	No		08:59	Abnormal anatomy	Anatomy	73	Other donor characteristics (i.e. age, blood group) meant this kidney was unsuitable for our research
34	Pair	Yes	Outside of Core Hours, Week Days	Guy's	No		13:48	Clear renal cell carcinoma	Cancer	40	The 'Primary reason declined for transplantation' meant this kidney was also unsuitable for our research
35			Outside of Core Hours, Week Days	Guy's	No		13:48	Clear renal cell carcinoma	Cancer	40	

36	Single		Core Hours	Royal Free	Yes	London	07:53	Function and anatomy	Anatomy and Function	61	
37	Single		Core Hours	Royal Liverpool	No		25:24	ANEURYSMS IN HYLUM (1 PARTICULARLY LARGE) AND CIT OF 26 HOURS	CIT and aneurysms in hylum	55	The 'Primary reason declined for transplantation' meant this kidney was also unsuitable for our research
38	Single		Core Hours	Newcastle	Yes	Bristol	02:27	Damage	Damage	18	

Kidney no.	Pair/single?	Pair offered at the same time?	Time of Day category	Kidney location at time of offer	Accepted by a ranked study	Location of Study that Accepted
1	Single		Core Hours	Leeds	Yes	Cambridge
2	Pair	Yes	Weekend	Guy's	No	
3			Weekend	Guy's	No	
4	Single		Weekend	Addenbrooke's	No	
5	Single		Weekend	QE, Birmingham	No	
6	Single		Core Hours	Guy's	Yes	Cambridge
7	Pair	No	Outside of Core Hours, Week Days	Wythenshawe	No	
8			Weekend	Edinburgh	No	
9	Single		Weekend	Addenbrooke's	Yes	Cambridge
10	Single		Weekend	Oxford	Yes	Cambridge
11	Pair	Yes	Outside of Core Hours, Week Days	Addenbrooke's	Yes	Cambridge
12			Outside of Core Hours, Week Days	Addenbrooke's	Yes	Cambridge
13	Single		Outside of Core Hours, Week Days	Cardiff	No	

14	Single		Outside of Core Hours, Week Days	Newcastle	Yes	Newcastle
15	Pair	Yes	Outside of Core Hours, Week Days	Addenbrooke's	Yes	Cambridge
16			Outside of Core Hours, Week Days	Addenbrooke's	Yes	Cambridge
17	Single		Outside of Core Hours, Week Days	Addenbrooke's	Yes	Bristol
18	Pair	Yes	Core Hours	Royal London	No	Tissue Bank - Cardiff
19			Core Hours	Royal London	No	Tissue Bank - Cardiff
20	Pair	No	Outside of Core Hours, Week Days	Guy's	No	Tissue Bank - Cardiff
21			Core Hours	Royal London	Yes	Bristol
22	Pair	Yes	Outside of Core Hours, Week Days	Addenbrooke's	Yes	Cambridge
23			Outside of Core Hours, Week Days	Addenbrooke's	Yes	Cambridge
24	Pair	No	Outside of Core Hours, Week Days	Guy's	Yes	Cambridge
25			Core Hours	Newcastle	Yes	Newcastle
26	Single		Core Hours	Addenbrooke's	No	
27	Pair	Yes	Outside of Core Hours, Week Days	Guy's	Yes	London
28			Outside of Core Hours, Week Days	Guy's	Yes	London
29	Single		Outside of Core Hours, Week Days	Addenbrooke's	Yes	Cambridge
30	Single		Outside of Core Hours, Week Days	Guy's	No	
31	Pair	Yes	Weekend	Addenbrooke's	No	
32			Weekend	Addenbrooke's	No	
33	Single		Weekend	Southmead	No	

34	Pair	Yes	Outside of Core Hours, Week Days	Guy's	No	
35			Outside of Core Hours, Week Days	Guy's	No	
36	Single		Core Hours	Royal Free	Yes	London
37	Single		Core Hours	Royal Liverpool	No	
38	Single		Core Hours	Newcastle	Yes	Bristol

Appendix C – Reasons given by researchers

Reason/Study	A**	B*	C*	D*	E*	F	G	H
The 'Primary reason declined for transplantation' meant this kidney was also unsuitable for our research	12	9			8	2	4	
Other donor characteristics (i.e. age, blood group) meant this kidney was unsuitable for our research	2		4		3	8		
Researcher Unavailable								
<i>Researcher on call previous night or when offer was made</i>			7					
<i>Researcher operating when offer was made</i>			1					
<i>No other information given</i>							7	
Other (please specify)								
<i>Kidney had already been assessed in another QAS centre</i>		6						
<i>Missed the offer message</i>						6		
<i>Out of area - unable to collect</i>								2
Ischaemic time / time since perfusion too long	2				2		2	
Did not receive the offer message/text		1					3	
Already processing a kidney (or other organ) for research					2			
Transport costs too high to pick up an organ from this location					1			
Difficult to source consumables at this time (i.e. non-clinical issue blood)			1					
No lab technician available to process								
Restrictions on consent (i.e. DNA/animal/commercial) meant this kidney was unsuitable for our research								
Presumed higher ranking study than ours would accept this kidney								
Total responses received from this study (max. of 16)	16	16	13	0	16	16	16	2

*denotes this study involves perfusion, which tends to mean it has more selective inclusion criteria.

†denotes a study that can transplant the kidneys it receives. There are sites in Cambridge, Newcastle and Guy's that assess these kidneys for their quality (QAS centres).