

UK Living Kidney Sharing Scheme

Breakout Session

Lisa Burnapp

RC/LDC Induction, September 2019

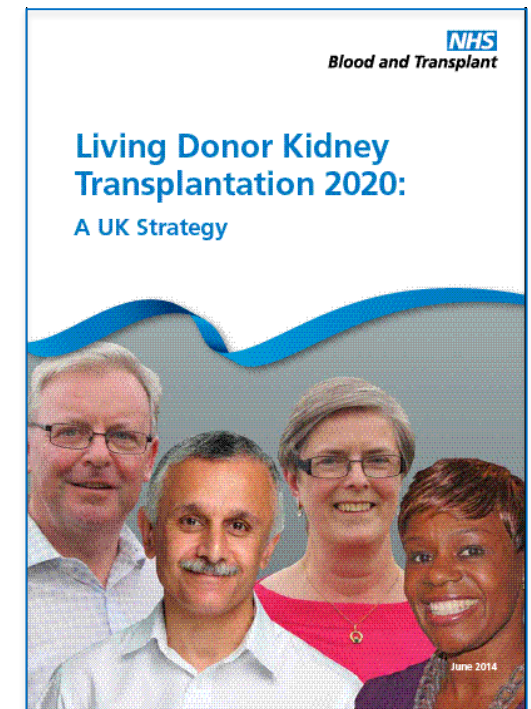


The Ambition

To match world class performance

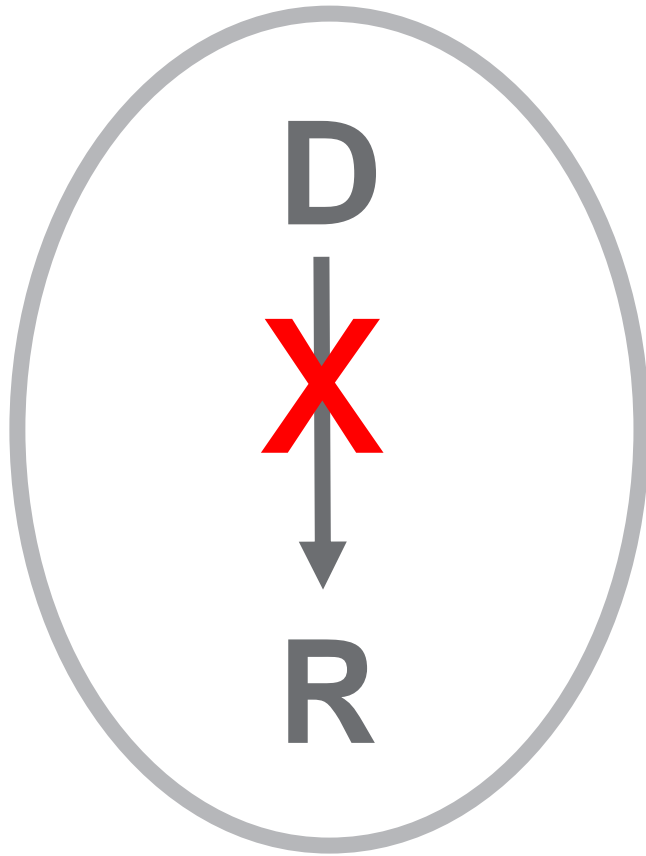
Maximise opportunities for donors and recipients to contribute to and benefit from the UK Living Kidney Sharing Scheme (UKLKSS) by ensuring that it is clinically and cost effective

- 75% of matched donors proceed to donation and achieve maximum number of transplants
- All donors and recipients proceed to surgery within 8 weeks of a suitable match being identified



Living kidney donation

Potential Donor-Recipient pair



- Blood group incompatibility
- Positive crossmatch

Approx 20-30% of possible living donor transplants

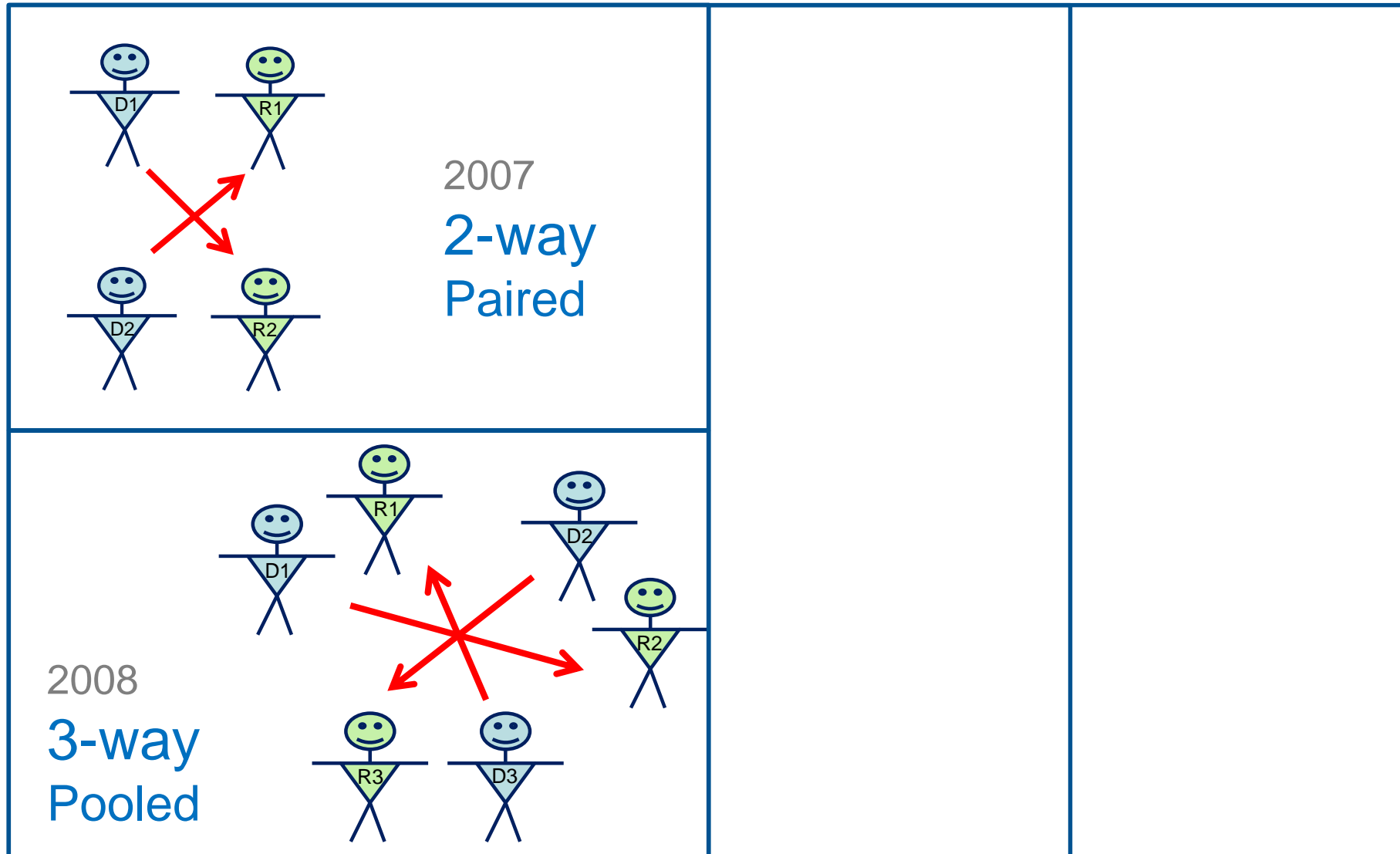
Background



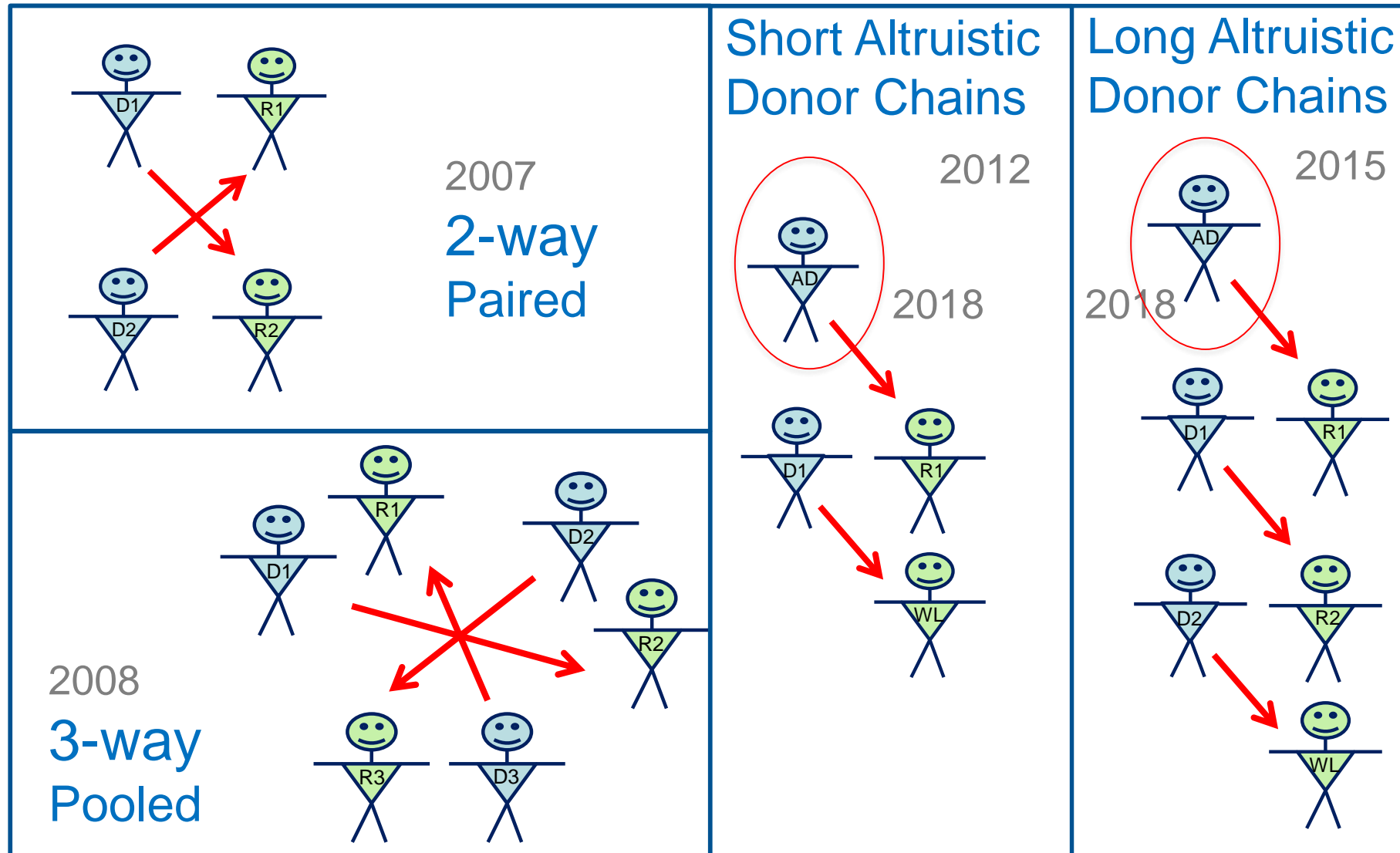
- September 2006 Change in legal framework
Development of national scheme including matching algorithm*
- April 2007 First paired exchange matching run
First non-directed altruistic donation
- Ongoing Review and refinement of the sharing schemes

**Matching algorithm developed with University of Glasgow, Manlove et al*

The scheme today - matching runs identify....

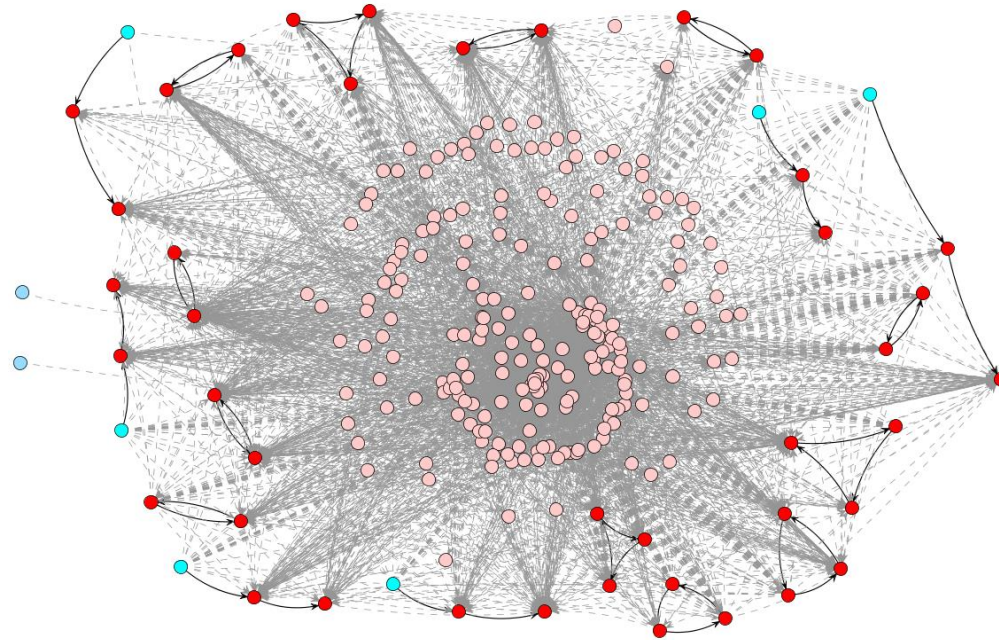


The scheme today - matching runs identify....



Identifying Optimal Combination of Transplants

- Over 200-300 pairs every 'matching run'
- This results in 2000-5000 arcs (donor-recipient matches)
- Arcs are weighted to give preference to certain matches
- Seek to maximise number of transplants according to criteria developed with transplant community



Acknowledgement: Tommy Muggleton

*Matching software implemented by colleagues at University of Glasgow,
School of Computing Science*

Optimal Combination of Transplants¹

1. Maximise 2-way exchanges (inc. embedded in 3-way)
2. Maximise number of transplants
3. Minimise 3-way exchanges
4. Maximise 3-way with embedded 2-way and long chains
5. Maximise 'score' of set of transplants

Score based on

- Previous matching runs for patient
- Sensitisation of patient
- HLA mismatch of identified transplant
- Donor-donor age difference

¹Matching software implemented by colleagues at University of Glasgow, School of Computing Science

Key Characteristics

- UK-wide scheme; centrally run by NHSBT
 - All UK transplant centres participate (adults & children)
 - All work up complete
 - Recipients can be registered with >1 donor
 - Incompatible and compatible pairs
 - Can define individual age & HLA match requirements
 - Permit simple HLA or ABO incompatible transplants through scheme
 - Simultaneous surgery preferred; kidneys travel
 - Anonymity prior to surgery
- Annual timetable; quarterly matching runs
- 'Pre-run' to confirm inclusion of potential donor matches
- All recipients suspended from UK deceased donor transplant list once match identified


Underestimated the Scope

- Compatible pairs
- Non-directed altruistic donors
- Chains v cycles
- Long waiting patients
 - Tailoring to immunological complexity
 - Ethnicity

NHS
Blood and Transplant


UK Living Kidney Sharing Scheme

Your questions answered



- Paired/Pooled Donation
- Non-directed Altruistic Donor Chains

www.organdonation.nhs.uk
enquiries@nhsbt.nhs.uk
0300 123 23 23

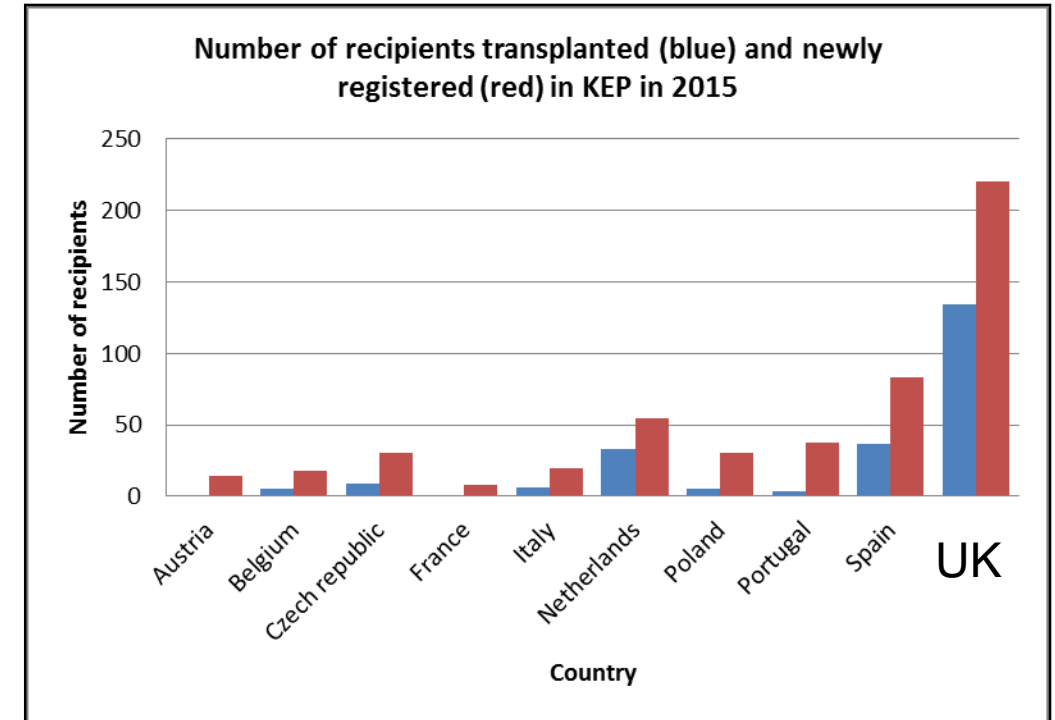
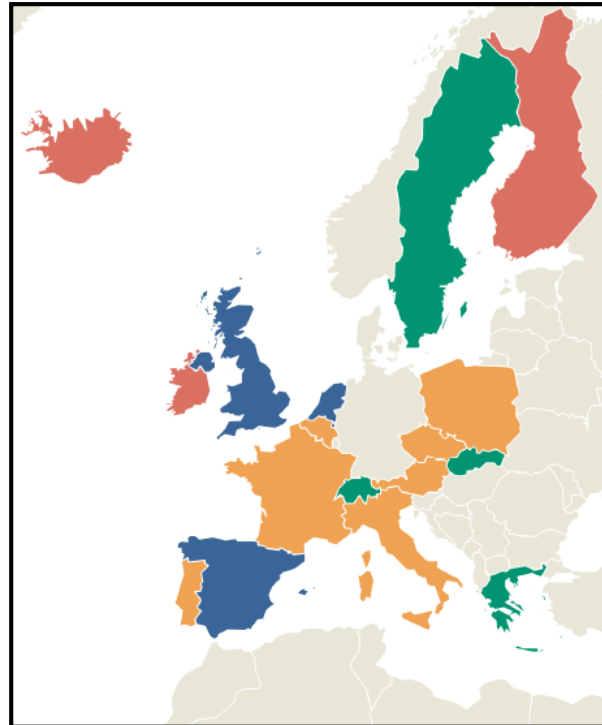
 **Yes I donate**
ORGAN DONATION

UK scheme - largest in Europe



European Network for Collaboration on Kidney Exchange Programmes (ENCKEP)

- Large, advanced programmes
- New, smaller programmes
- Programmes in development
- Countries with no programme

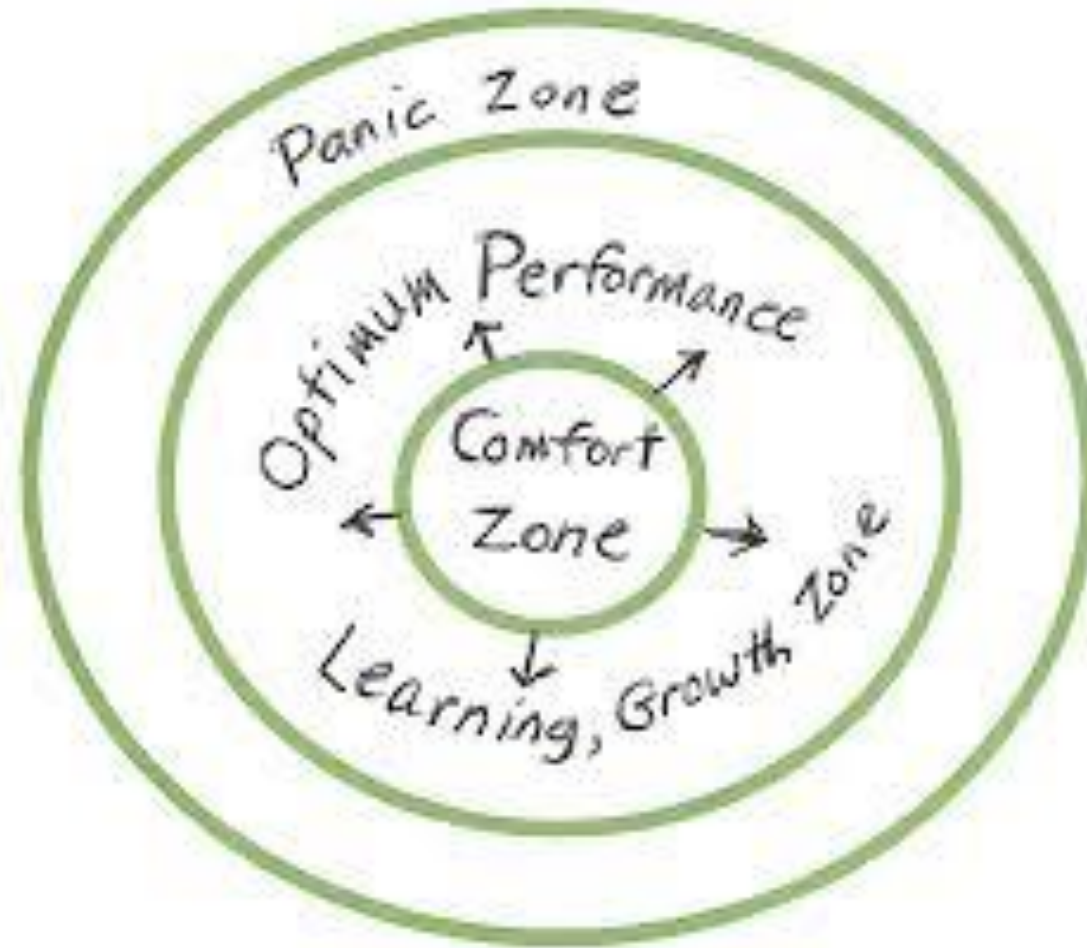


Transplantation

Building kidney exchange programmes in Europe - An overview of exchange practice and activities

Biró, P. et al. (2018) Building kidney exchange programmes in Europe - An overview of exchange practice and activities. *Transplantation*, (doi:[10.1097/TP.0000000000002432](https://doi.org/10.1097/TP.0000000000002432)) (PMID:[30247314](https://pubmed.ncbi.nlm.nih.gov/30247314/)) (Early Online Publication)

How do we manage what we have created?



Priorities



- Maximise transplants
- Increase flexibility in the scheme
- Tackle non-proceeding transplants
- Improve access and awareness



Increasing the Donor Pool

- Inclusion of non-directed donors as a 'default'
- Inclusion of compatible pairs
- Desensitisation and low risk ABOi for highly sensitised recipients

Altruistic donors in the UKLKSS

- Since January 2018, altruistic donors have been registered into the scheme by default
- Limited by:
 - Transition period for donors in assessment prior to January 2018
 - Donors unmatched in the scheme
 - Increased proportion of high priority recipients due to backdated waiting time points to start of dialysis
- In 2018 there were
 - 64 altruistic donors (87 in 2017); 112 transplants (125 in 2017)*
 - 48% of transplants from altruistic donors were as part of a UKLKSS chain (30% in 2017)

	2017	2018
Direct to list	61	33
Chain donation	26	31
Total chain transplants	64	79

*October run yet to complete

Compatible Pairs

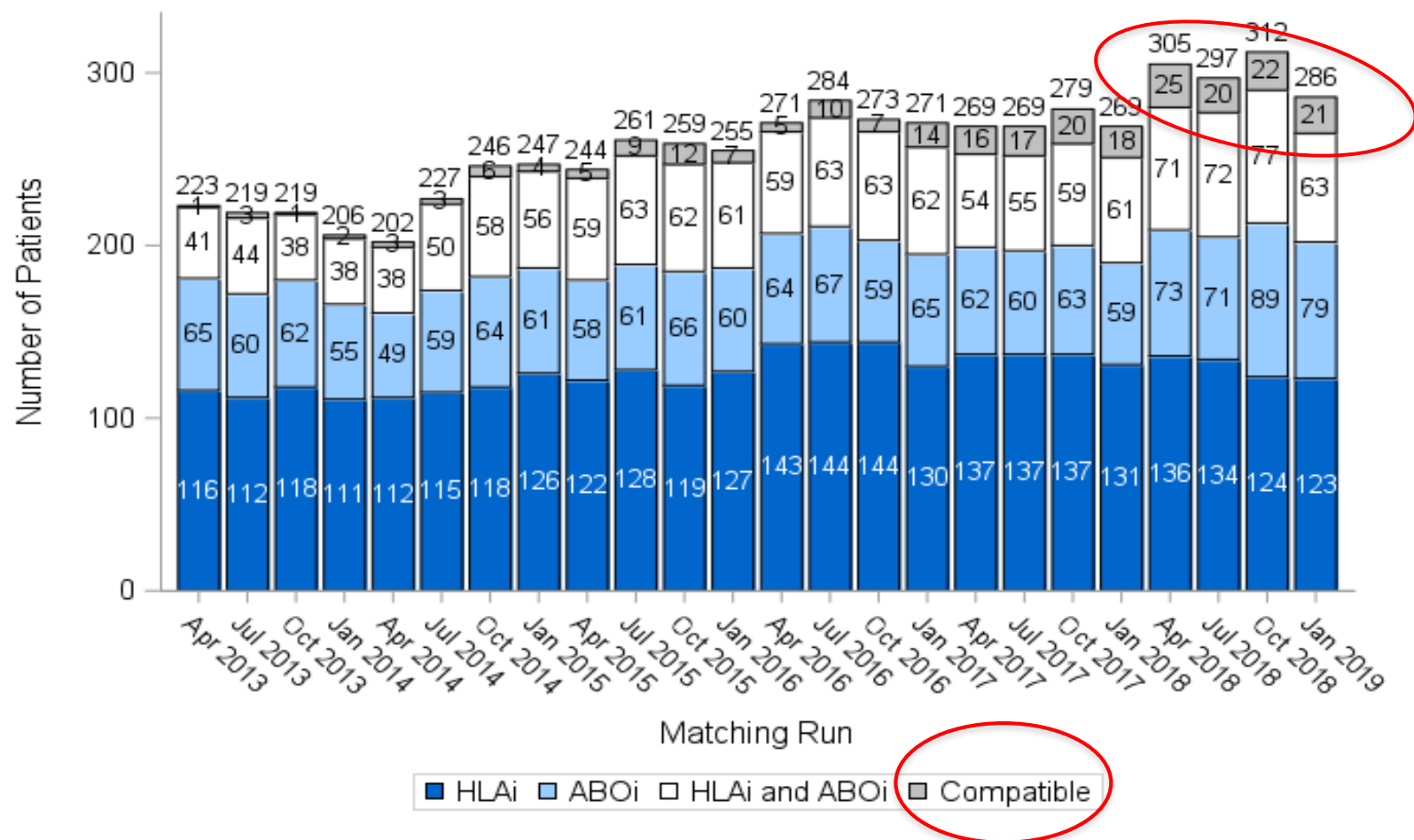
- First compatible pair registered in June 2011
- 148 compatible pairs have been registered in the scheme
- 100 (68%) appeared in only 1 matching run of whom 55 (55%) recipients were transplanted
- 14 (61%) centres registered compatible pairs in the scheme in 2017/18

In summary

- Increasing trend of recipients in compatible pairs transplanted in UKLKSS (25 in 2018)
- 71 patients from a compatible pair have been transplanted through the scheme
- 97 transplants for other patients have been facilitated by compatible pairs
- Proportion of compatible pairs registered varies between centres

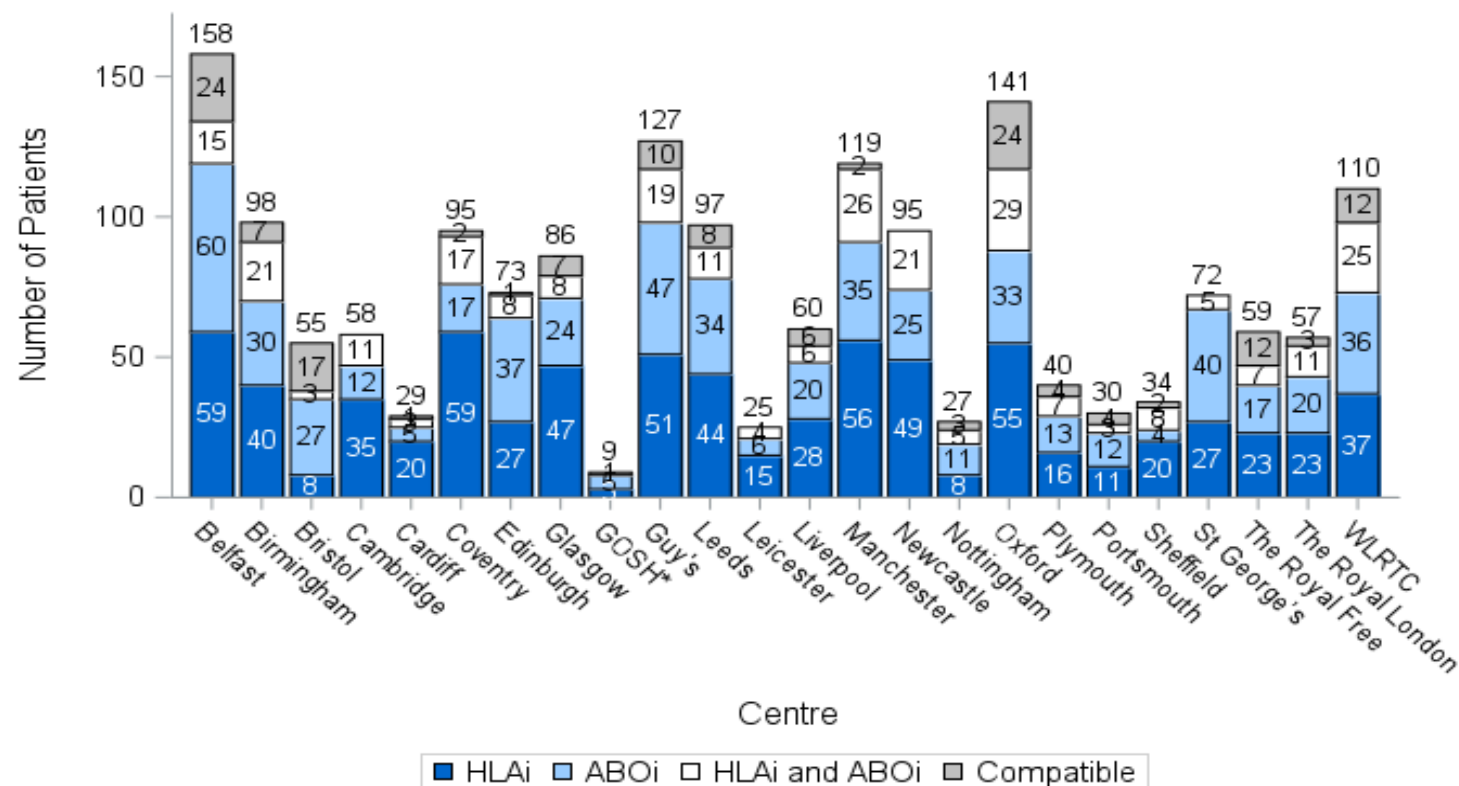
Pair Inclusion by Matching Run

Figure 4.2 Pairs included in matching runs, 1 April 2013 - 31 March 2019



Pair Inclusion by Centre

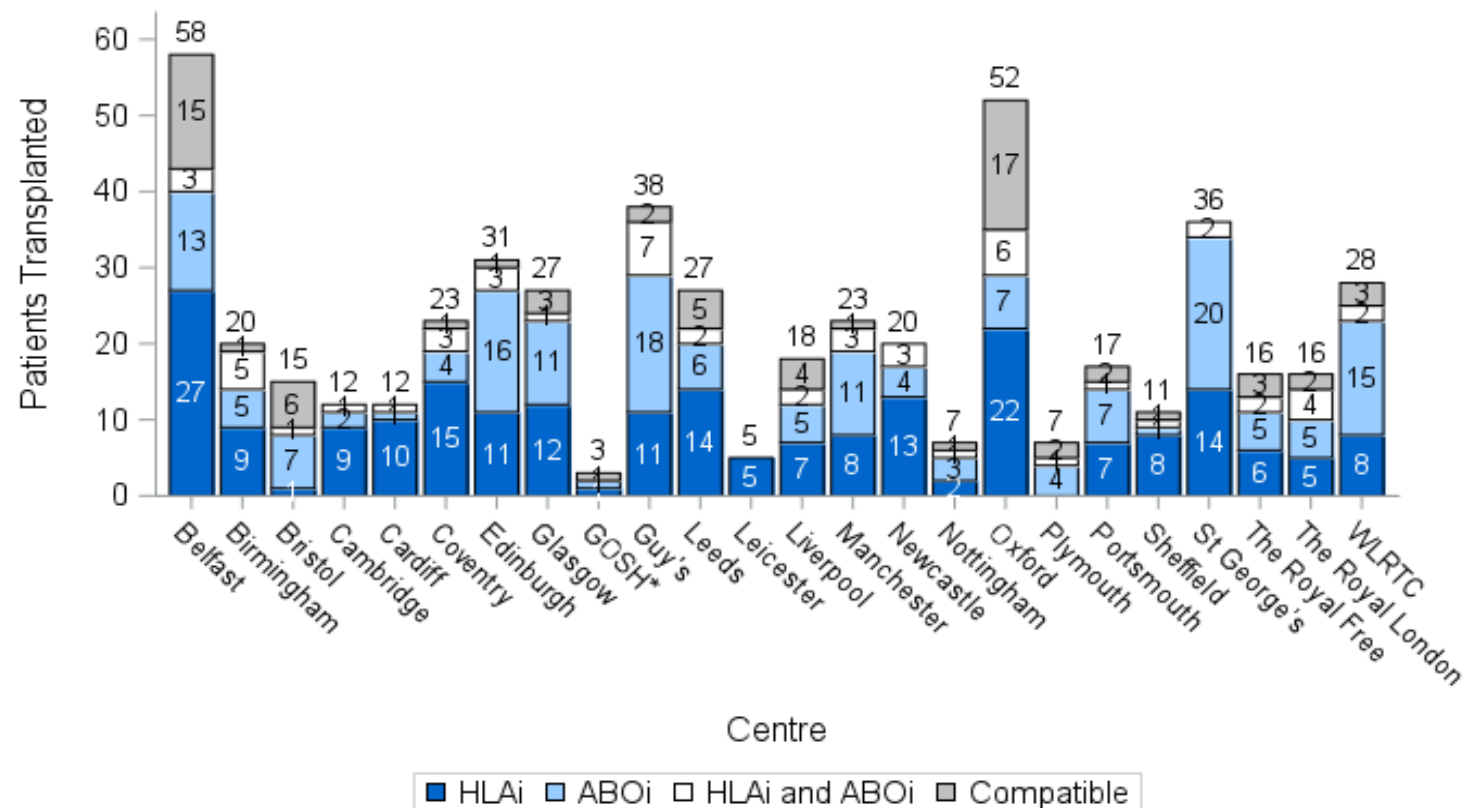
Figure 4.3 Number of pairs included in matching runs, 1 April 2013 - 31 March 2019



*Guy's team assess donors and perform transplants for GOSH recipients

Compatible Pairs

Figure 4.7 Patients transplanted by pair incompatibility in matching runs, 1 April 2015 - 31 March 2019



*Guy's team assess donors and perform transplants for GOSH recipients

Increasing Flexibility

- Recipient age and HLA preferences required at inclusion
- Simplified timetable of key dates for matching runs
- Non-simultaneous surgery
- Prioritisation for transplant for 'paired' recipients if they miss out on a transplant
- Designated weeks of surgery across all centres

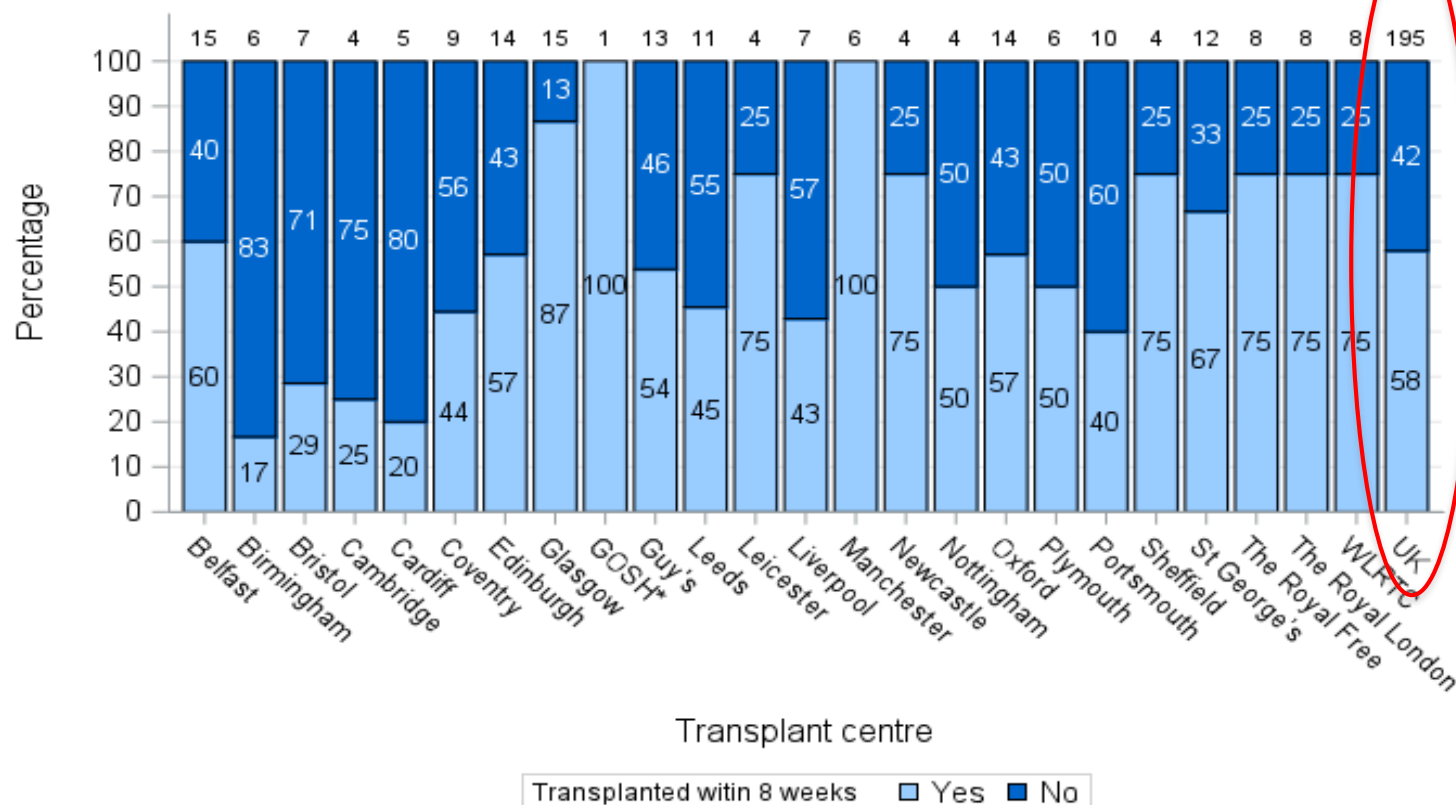
Non-simultaneous Surgery

- Introduced in 2015 to facilitate 'long chains' and logistically complex exchanges
 - Within 2 weeks (10 working days)- discussion with Lead Nurse and notification to Chair of KAG
 - Outside 2 weeks- discussion with Lead Nurse and approval from Chair of KAG
- Low risk of non-proceeding but increased risk associated with
 - Clinical reasons for staggering
 - Extended intervals between transplants
- Requests for recipients requiring priority listing are low; occurs in both simultaneous and non-simultaneous surgery
- 50 non-simultaneous exchanges (133 transplants) to date

	2015	2016	2017	2018
Non- simultaneous exchanges (%)	13 (23%)	12 (22%)	13 (24%)	12 (17%)

Timeliness of Transplantation

Figure 4.9 Centres meeting the 8 week standard, 1 April 2018 - 31 March 2019



Source: Annual Report on Living Donor Kidney Transplantation 2018/19, NHS Blood and Transplant

Non-proceeding Transplants


NHS
Blood and Transplant

Non-proceeding or delayed transplants through the UK Living Kidney Sharing Schemes

This information is being requested to analyse the reasons for non-proceeding transplants identified through the UK Living Kidney Sharing Scheme. The data will then be used as part of the ongoing process of improving the rates of proceeding transplants through the scheme. Before submitting your response please ensure you have discussed the cause and any remedial action with the wider multi-disciplinary team.

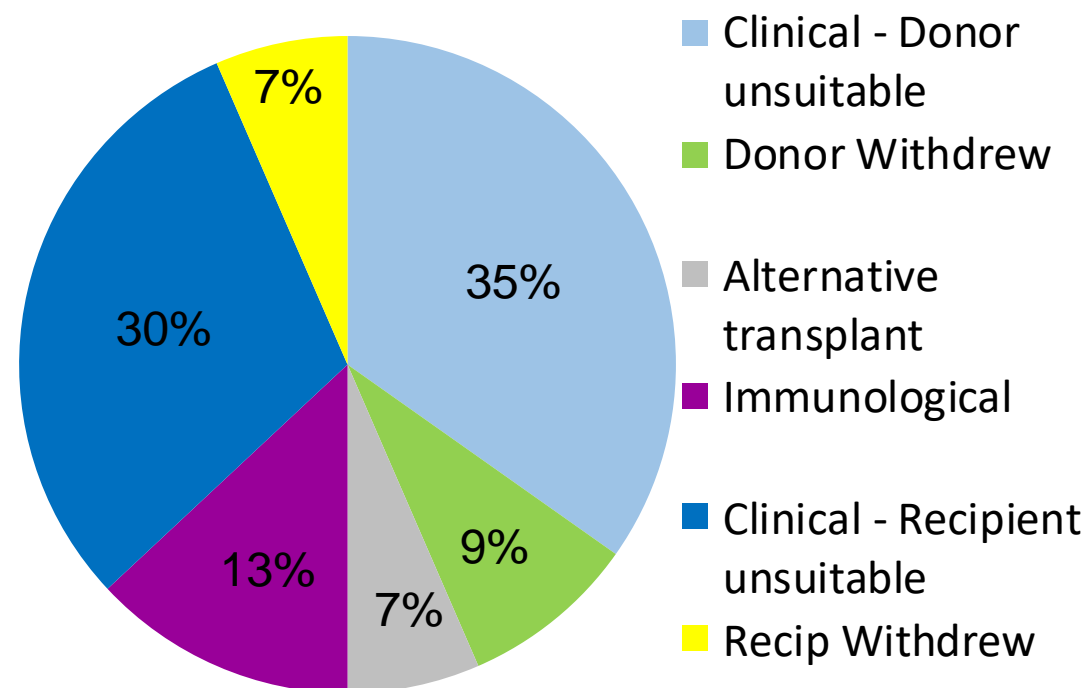
* Feedback ID (from the covering email)

Next

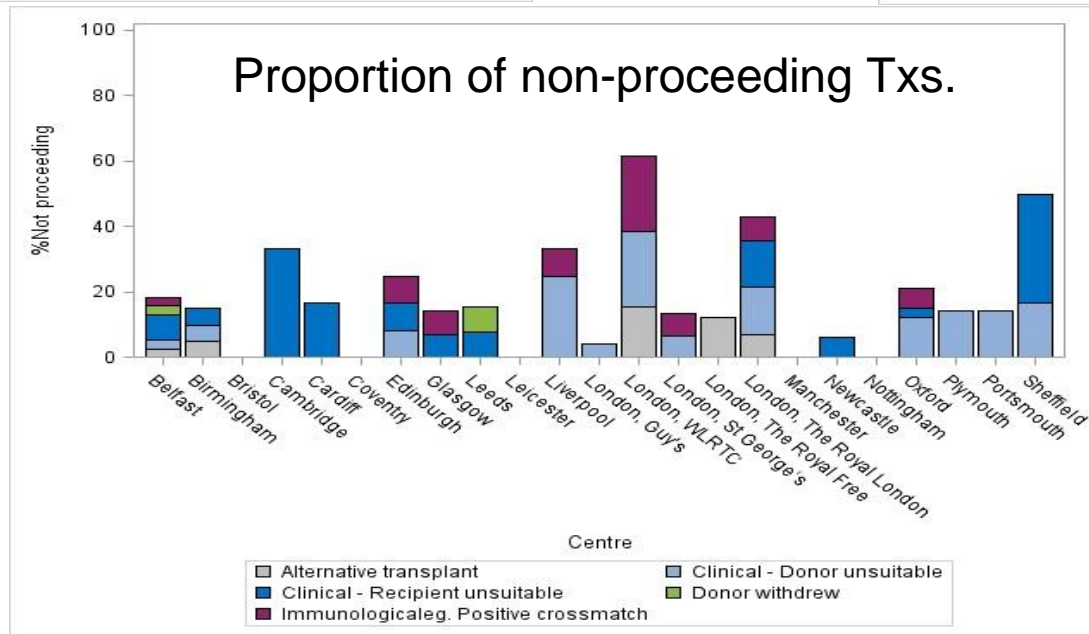
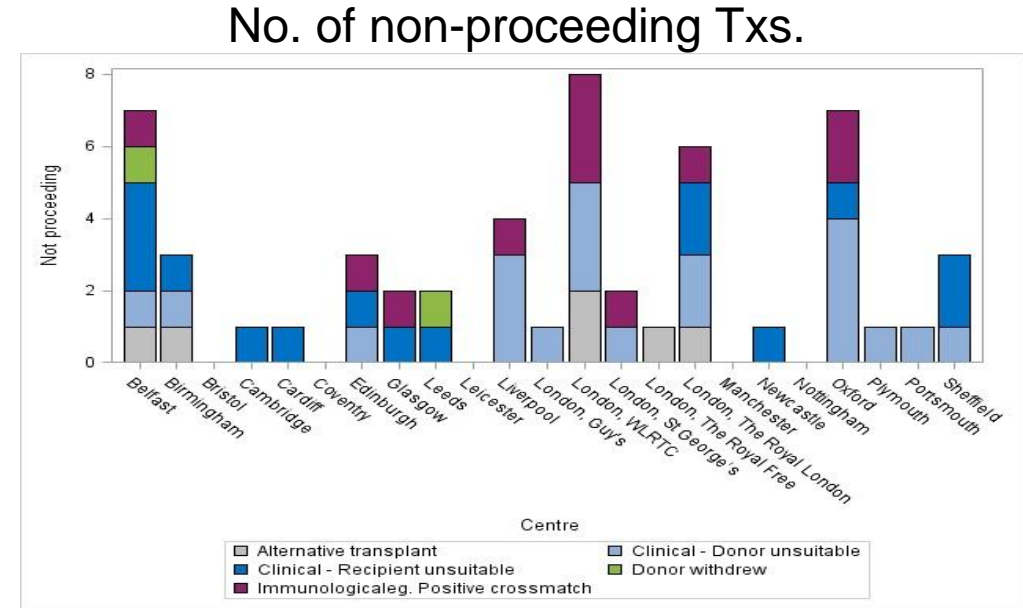
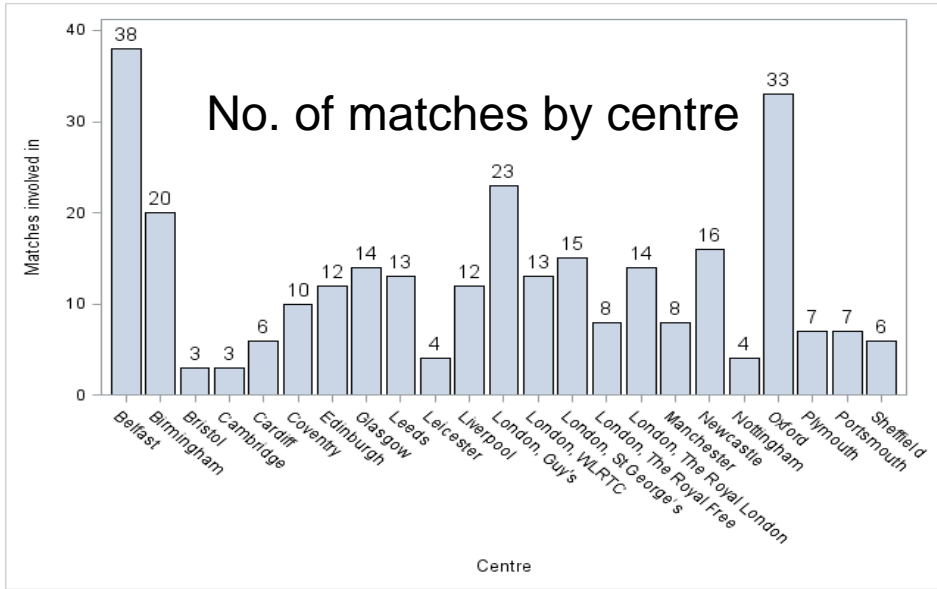
Powered by
 **SurveyMonkey**
See how easy it is to [create a survey](#).

[Privacy & Cookie Policy](#)

October 2017- July 2018 (46 reasons)



Centre-Specific Data



*Data derived from on-line survey monkey

My Mantra

‘If in doubt, leave them out’



Improving Access and Awareness

- Public and patient engagement
- Shared learning
 - Annual activity and centre specific reports
 - UK Living Donor Kidney Network meeting
 - Quarterly newsletter and update
 - Key contacts within ODT
- On-line decision-making resources¹
- Extended portfolio of donor-recipient information²

¹<https://www.odt.nhs.uk/living-donation/living-donor-kidney-transplantation/>

²<https://www.organdonation.nhs.uk/about-donation/living-donation/>

Information to support decision making

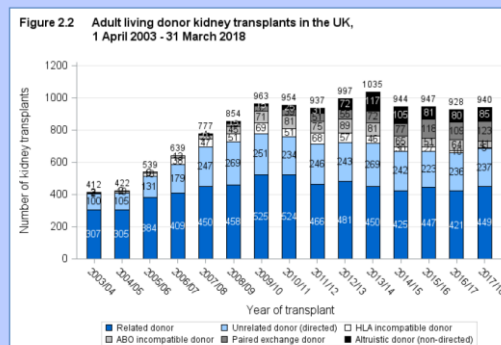
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Blood and Transplant

ANNUAL REPORT ON LIVING DONOR KIDNEY TRANSPLANTATION

REPORT FOR 2017/2018
(1 APRIL 2003 – 31 MARCH 2018)

PUBLISHED SEPTEMBER 2018

Figure 2.2 shows the number of adult living donor kidney transplants performed in the UK between 1 April 2003 and 31 March 2018. The number of transplants increased from 412 in 2003/04 to 940 in 2017/18.



Incompatible Pairs Living Donor Information Application

Variable Select

Recipient Blood Group

Calculated Reaction Frequency

Donor Blood Group

ABOi TX with willing Donor

HLAi TX with willing Donor

Recipient Age

Estimated Chance of Transplant

	Deceased Donor	NLDKSS	ABOi	HLAi
6 Months	-	-	-	-
1 Year	-	-	-	-
3 Years	-	-	-	-

Transplant Survival Rates

	Deceased Donor	NLDKSS	ABOi	HLAi
6 Months	-	-	-	-
1 Year	-	-	-	-
3 Years	-	-	-	-

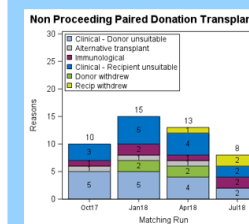
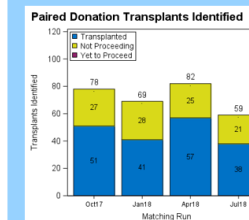
Disclaimer: The information is provided for guidance only

Note: Chances of transplant through the NLDKSS could be increased by considering and antibody incompatible transplant within the scheme

For a more accurate estimation of waiting time for a deceased donor transplant based on more variables, please visit

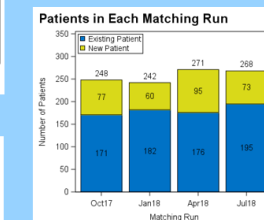
http://www.odt.nhs.uk/doc/chance_of_transplant.xls

UK Living Kidney Sharing Schemes Performance Figures

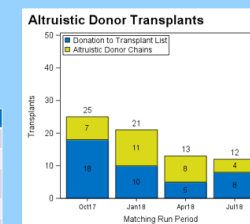
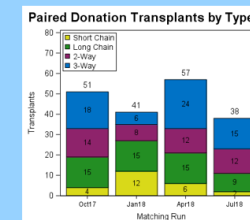


Note: each reason may account for multiple transplants

	Total May 2007 - July 2018
Pairs Registered	2256
Patients Registered	2042
Altruistic Donors in Paired Donation Matching Runs	234
Compatible Pairs Registered	135
Transplants	947



	UKLSS Records	In a Matching Run
Pairs Included	305 (Apr 2018)	
Patients Included	271 (Apr 2018)	
Altruistic Donors Included	17 (Jan 2018)	
Transplants Identified	82 (Apr 2018)	
Transplants Proceeded	57 (Apr 2018)	



<http://www.odt.nhs.uk/living-donation>



Attracting public attention

The Guardian
10th November, 2018

BBC 'Hospital', 2019

World Kidney Day- 14th March

UK's living kidney sharing scheme to hit 1000th transplants milestone this week

Non-directed donors are 'game changers' in fight to cut kidney transplant waiting list

11 March 2019



NHS Blood and Transplant is marking the week of World Kidney Day (14 March) by announcing the 1000th kidney transplant under the UK Living Kidney Sharing Scheme (UKLKSS) is due to be carried out this week.

The scheme started in April 2007 because many 'difficult to match' patients had friends and family who wanted to donate a kidney but weren't a compatible match by blood group or tissue (HLA) type.

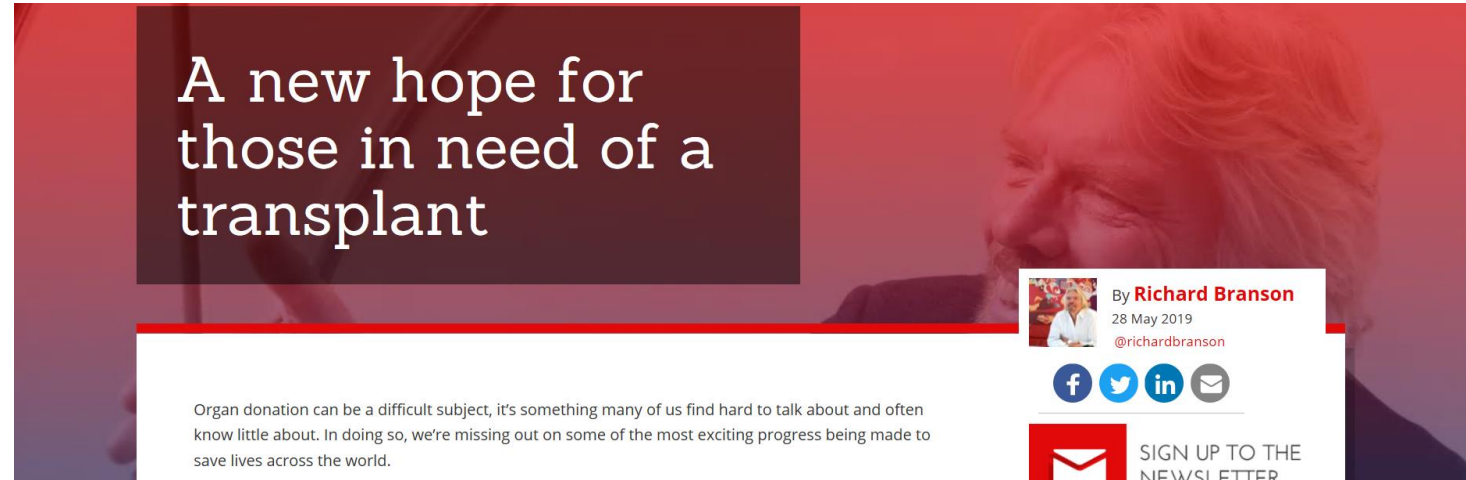
If the patient enters the sharing scheme with their friend or family member, the pair may be matched with another couple in the scheme so that each recipient receives a kidney from the other's friend or family member. This kidney exchange programme increases the number of people who can receive transplants from living kidney donors and the opportunities for patients who wait a long time for a transplant.

The latest 'matching run' to pair up donors and recipients has taken place and the resulting operations will lead to the 1000th transplant scheduled this week (the week commencing March 11). All donors and recipients in the scheme are anonymous and the transplant recipient who becomes the 1000th will come down to how operations are scheduled by hospitals this week.



Reach 251 million

7000 unique views and social media posts



That's where living donation comes in – for those suffering from kidney disease, a transplant from a living donor is a much better option than a deceased donation. People who receive a kidney from a living donor usually live longer than those who receive one from a deceased donor and their statistical life expectancy is far longer than if they did not receive a kidney transplant at all.

Unfortunately, living donation isn't always straightforward. Depending on the country, **40% or more** of recipients are incompatible with their intended donors. In some places, that means potential donors are simply turned away, forcing those in desperate need of a transplant to wait until another compatible donor turns up.

You don't have to know much about the organ donation system to realise that doesn't make much sense. That's why I was interested to learn about Kidney Exchange Programs (KEPs). KEPs increase the number of transplants by pooling and matching pairs of donors and recipients.

The matching process allows one previously incompatible donor-recipient pair, say a kidney patient and a family member willing to donate, to be matched with another pair. Under a KEP, donors are then swapped, resulting in two new compatible pairs. It can sound a little complicated but **this video** provides a clear explanation.

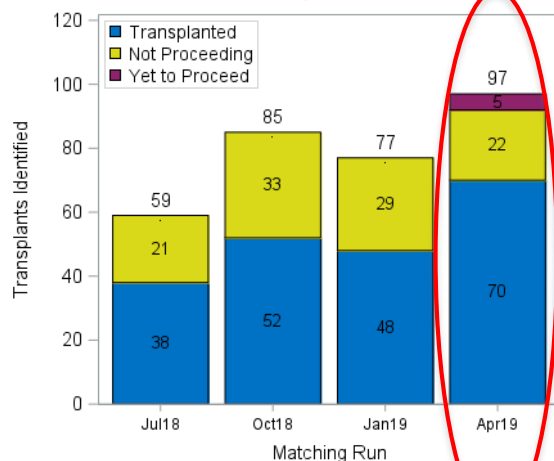
I was pleased to learn that the UK Living Kidney Sharing Scheme (UKLKSS) has become the largest operating KEP in Europe, allowing pairs to match in two and three-way swaps.

Outcomes



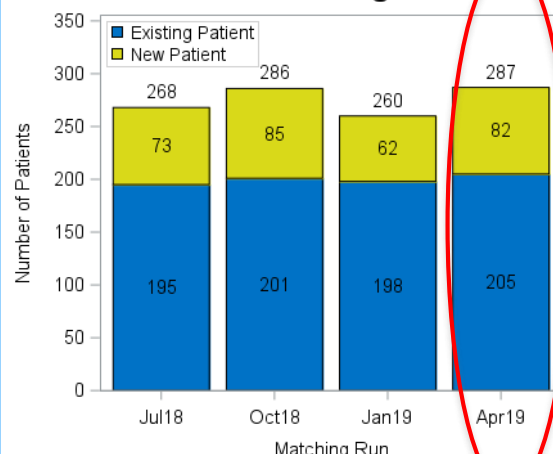
Latest UK Living Kidney Sharing Scheme Performance Figures

Paired Donation Transplants Identified

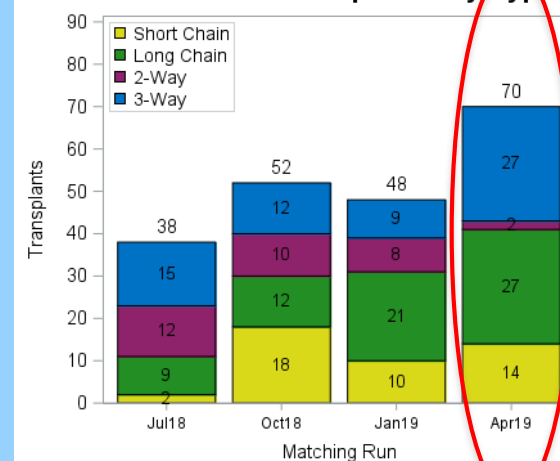


	Total May 2007- Apr 2019
Pairs Registered	2512
Patients Registered	2271
Altruistic Donors in Paired Donation Matching Runs	300
Compatible Pairs Registered	175
Transplants	1117

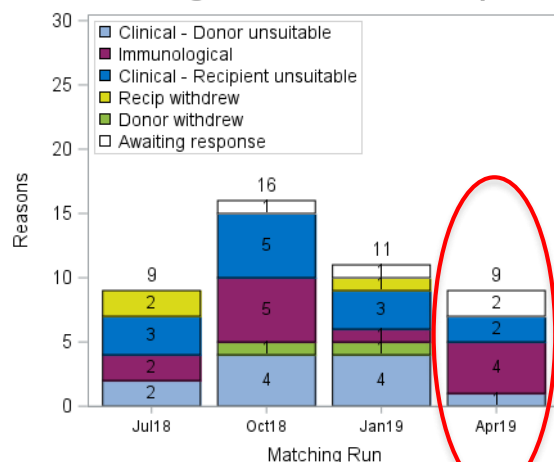
Patients in Each Matching Run



Paired Donation Transplants by Type

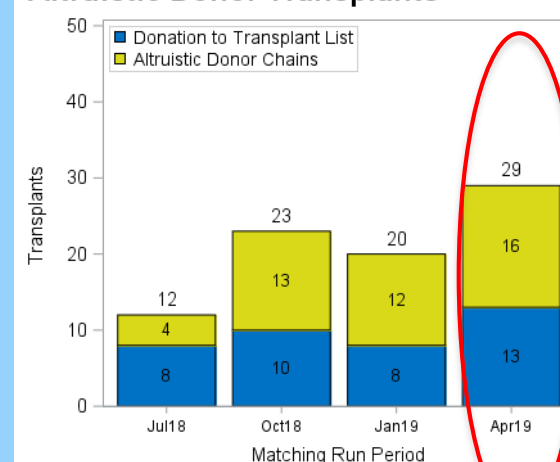


Non Proceeding Paired Donation Transplants



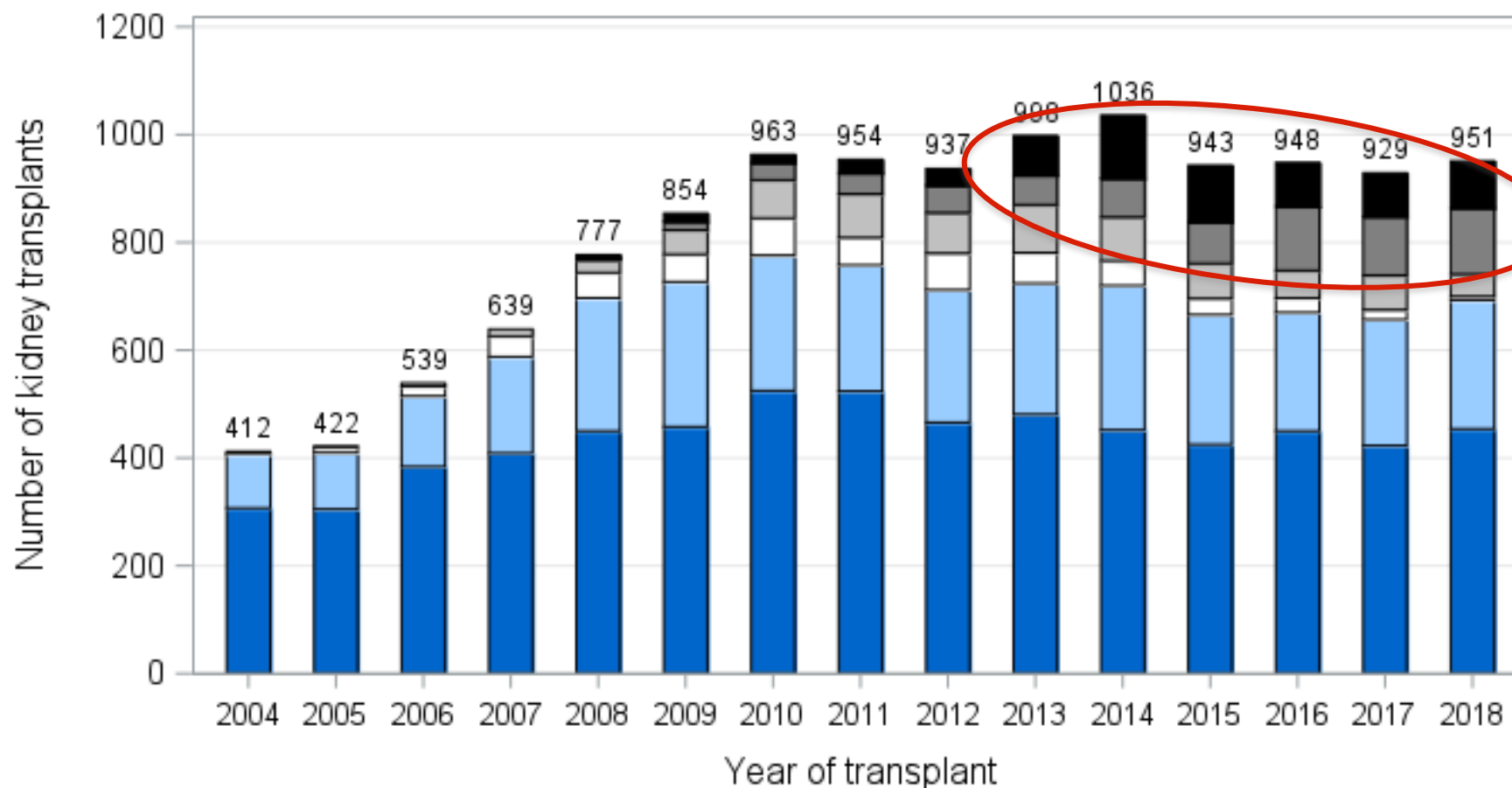
UKLKSS Records	In a Matching Run
Pairs Included	313 (Apr 2019)
Patients Included	287 (Apr 2019)
Altruistic Donors Included	25 (Apr 2019)
Transplants Identified	97 (Apr 2019)
Transplants Proceeded	70 (Apr 2019)

Altruistic Donor Transplants



Note: each reason may account for multiple transplants

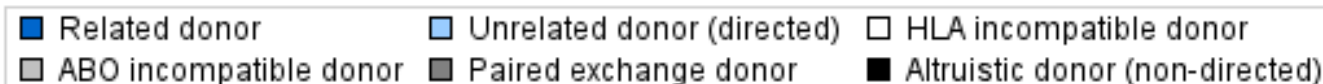
Adult living donor kidney transplants



Increase in altruistic and paired exchange donor transplants

22% of adult LDKT
8% of paediatric LDKT

Fall in incompatible donor transplants

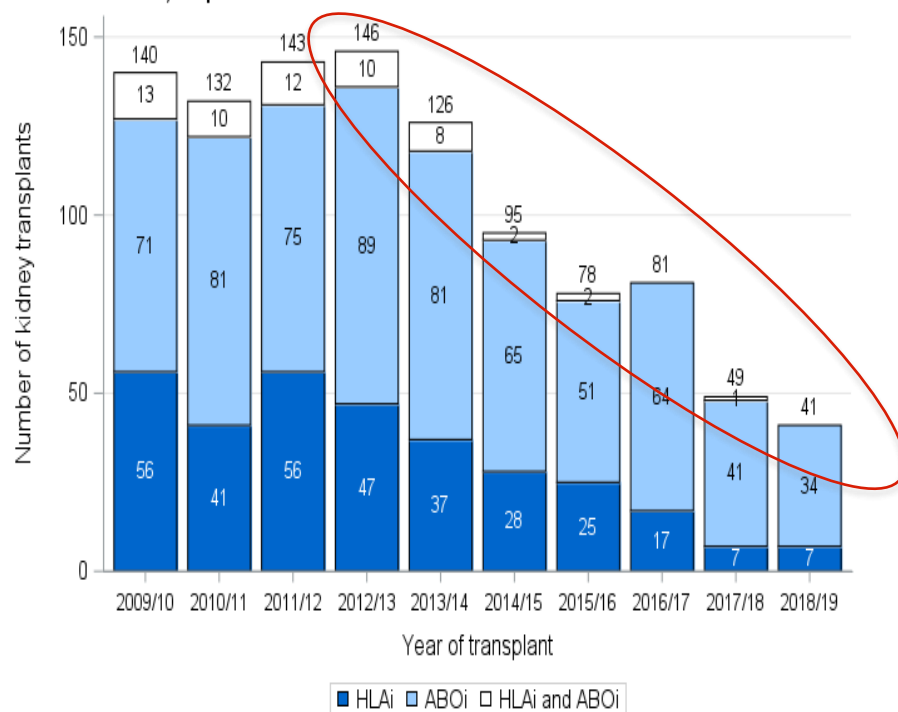


Antibody Incompatible Transplantation

Adult

NHS
Blood and Transplant

Figure 5.2 Adult living donor antibody incompatible kidney transplants in the UK, 1 April 2009 - 31 March 2019

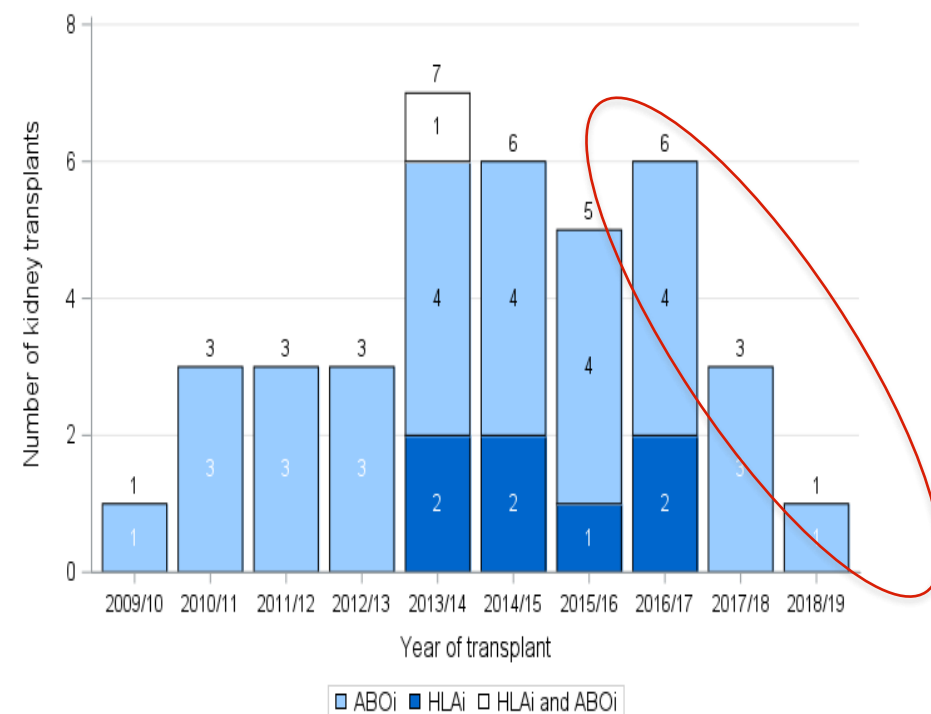


Source: Annual Report on Living Donor Kidney Transplantation 2018/19, NHS Blood and Transplant

Paediatric

NHS
Blood and Transplant

Figure 5.4 Paediatric living donor antibody incompatible kidney transplants in the UK, 1 April 2009 - 31 March 2019

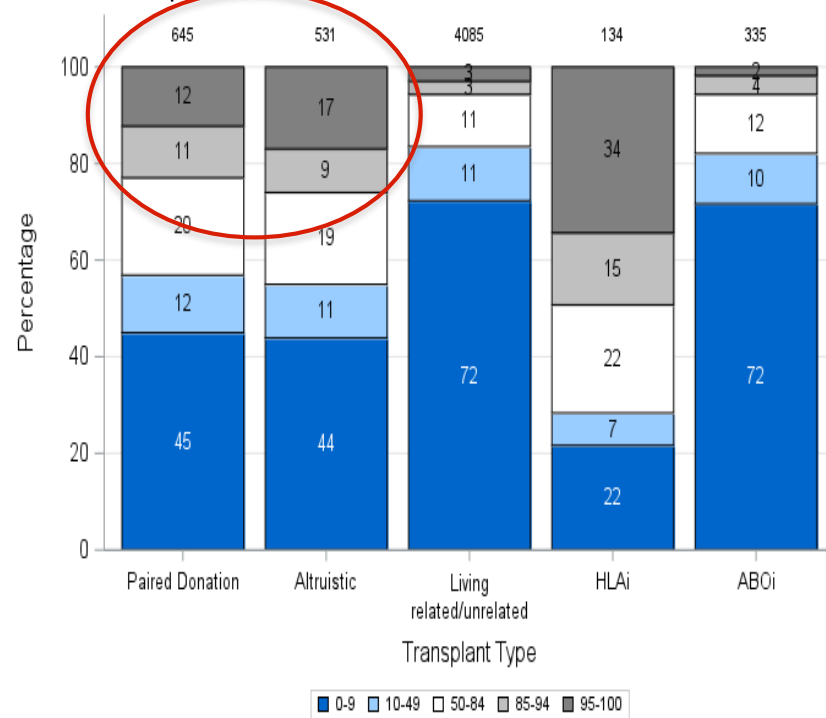


Source: Annual Report on Living Donor Kidney Transplantation 2018/19, NHS Blood and Transplant

Recipient CRF by Transplant Type

Adult

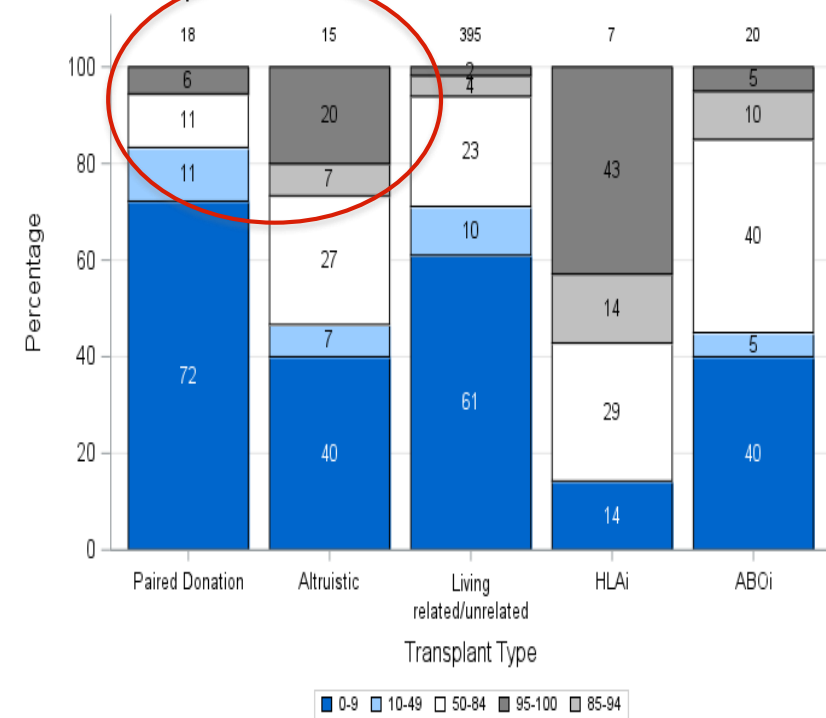
Figure 3.4 Recipient Calculated Reaction Frequency by adult transplant type
1 April 2013 - 31 March 2019



Source: Annual Report on Living Donor Kidney Transplantation 2018/19, NHS Blood and Transplant

Paediatric

Figure 3.12 Recipient Calculated Reaction Frequency by paediatric transplant type
1 April 2013 - 31 March 2019



Source: Annual Report on Living Donor Kidney Transplantation 2018/19, NHS Blood and Transplant

Chance of transplant by blood group

2012 - 2017

Recipient ABO

Donor
ABO

	O	A	B	AB
O	95/307 (31%)	81/144 (56%)	21/43 (49%)	6/12 (50%)
A	106/429 (25%)	56/192 (29%)	27/57 (47%)	2/14 (14%)
B	32/107 (30%)	21/54 (39%)	13/44 (30%)	1/6 (17%)
AB	4/17 (24%)	8/16 (50%)	3/14 (21%)	0/5 (0%)

Chance of transplant by blood group

2012 - 2017

Recipient ABO

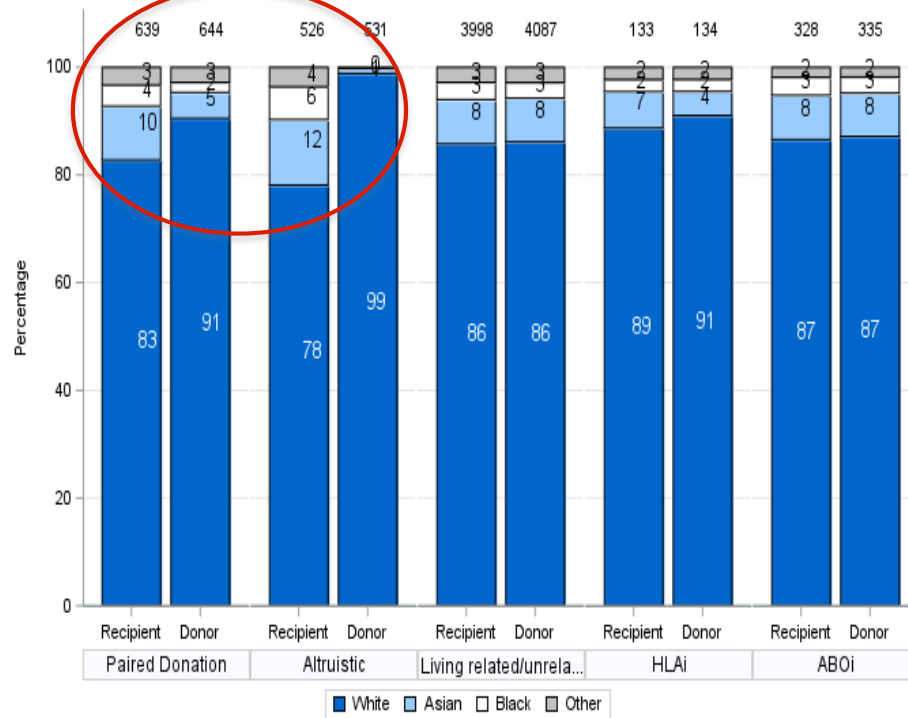
Donor
ABO

	O	A	B	AB
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B	32/107 (30%)	21/54 (39%)	13/44 (30%)	1/6 (17%)
AB	4/17 (24%)	8/16 (50%)	3/14 (21%)	0/5 (0%)

Recipient Ethnicity

Adult

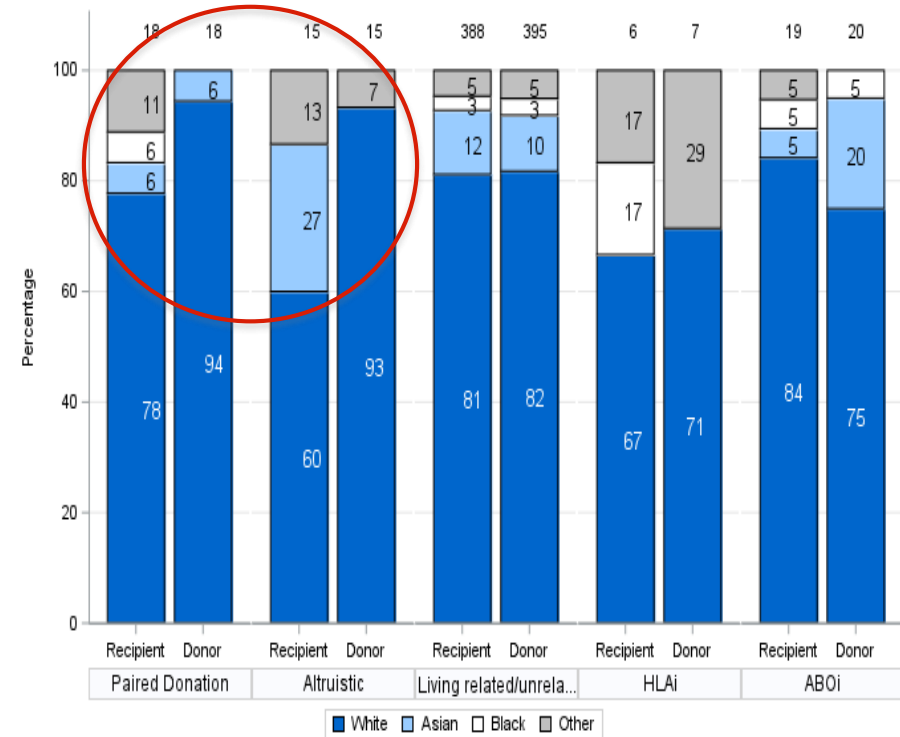
Figure 3.2 Ethnicity of recipient and donor by adult transplant type, 1 April 2013 - 31 March 2019



Source: Annual Report on Living Donor Kidney Transplantation 2018/19, NHS Blood and Transplant

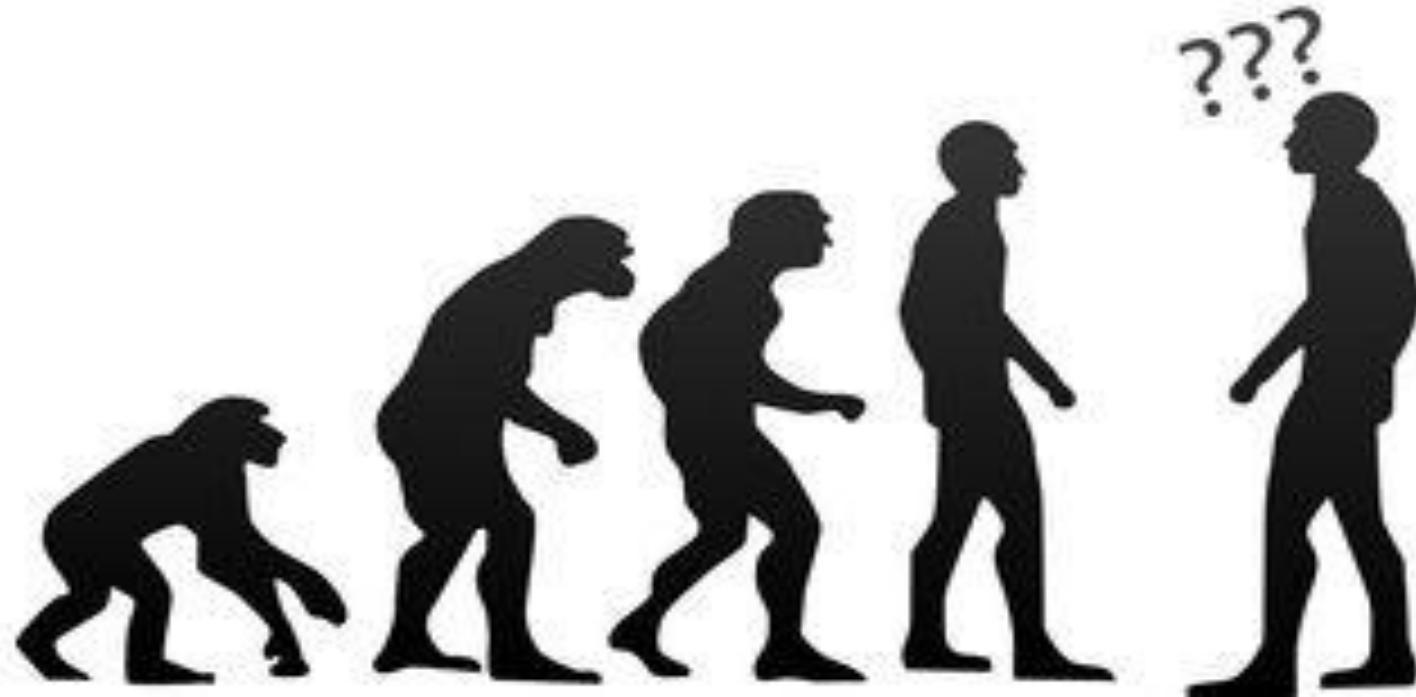
Paediatric

Figure 3.10 Ethnicity of recipient and donor by paediatric transplant type, 1 April 2013 - 31 March 2019



Source: Annual Report on Living Donor Kidney Transplantation 2018/19, NHS Blood and Transplant

The next revolution?



Post 2020

- Continue to innovate and maximise transplant opportunities
 - More compatible pairs; longer ‘chains’; management of higher immune risk recipients within the scheme
- Enhance capacity to meet demand including timeliness of transplantation
 - Collaboration between centres; IT solutions
- Develop IT infrastructure to support
 - Donor-recipient registration and organ offering; theatre scheduling and coordination between centres
- Explore options for collaboration with other European countries
 - Partner in COST European Network for Collaboration on Kidney Exchange Programmes (ENCKEP)
 - Identify possible EU partners for collaboration; set up MoUs


Summary

- The UKLKSS has revolutionised the approach to antibody incompatible transplantation in the UK
- It is the largest national scheme in Europe- international reputation
- Continued evolution will help to make the most of every transplant opportunity to benefit patients waiting for a kidney transplant
- There is more to do!




Resources

- <https://www.odt.nhs.uk/living-donation/uk-living-kidney-sharing-scheme>
- <https://www.organdonation.nhs.uk/become-a-living-donor/>
- <https://bts.org.uk/guidelines-standards/>
- <http://www.giveakidney.org.uk/>


Blood and Transplant


UK Living Kidney Sharing Scheme

Your questions answered



- Paired/Pooled Donation
- Non-directed Altruistic Donor Chains

www.organdonation.nhs.uk
enquiries@nhsbt.nhs.uk
0300 123 23 23



Acknowledgements

NHS Blood and Transplant colleagues

Matthew Robb, Lisa Mumford, Rachel Johnson, Chloe Brown, Iain Harrison, Lin Shelper, David Clegg, Sam Thomas

University of Glasgow (matching algorithms)

David Manlove, Peter Biro, Gregg O'Malley, James Trimble

Transplant centres and referring renal units

Kidney Advisory Group

Chair, Chris Watson; CSO, Sue Fuggle

LDKT 2020 Strategy Implementation Group

Chair, Aisling Courtney



Discussion



Yes I donate
ORGAN DONATION