

**NHS BLOOD AND TRANSPLANT
ORGAN DONATION AND TRANSPLANTATION DIRECTORATE
KIDNEY ADVISORY GROUP**

AUDIT OF THE KIDNEY FAST TRACK SCHEMES

INTRODUCTION

- 1 On 1 November 2012 and 1 March 2013, the donor after brain death (DBD) and donor after circulatory death (DCD) Kidney Fast Track Schemes (KFTS) were respectively implemented. Both schemes were designed to optimise the utilisation of kidneys available for transplantation through simultaneous offering of previously declined, difficult to place kidneys to a number of centres who had 'opted-in' to receive such offers.
- 2 Under the KFTS, clinicians are discouraged from discarding kidneys (with no contraindications to transplantation) without first offering the organs through the KFTS. Furthermore, entry criteria for the KFTS were redesigned to ensure that all previously declined, difficult to place kidneys were Fast-Tracked. Kidneys from DBD (and DCD) donors are offered through the KFTS if a) at any point the kidney is deemed to be unusable, b) 5 kidney transplant centres decline the kidney for either donor or organ quality reasons (*3 centres for DCD kidneys*) or c) the organ has accrued 6 hours of cold ischaemia time and has not been accepted for transplantation (*3 hours for DCD kidneys*). Since the 10 July 2013, this six hour criterion excludes DBD kidneys which were initially offered as part of a multi organ offer, for example SPK or liver and kidney.
- 3 An audit of the first 42 months of the DBD KFTS and the first 38 months of the DCD KFTS has been undertaken. For DCD kidneys, the effect of the new National DCD kidney allocation scheme is examined. Finally, outcomes from kidneys which do and do not go through the scheme are presented.

DATA AND METHODS

- 4 Data were obtained from the UK Transplant Registry on:
 - 5,113 DBD kidneys offered between 1 November 2012 and 30 April 2016.
 - 6,226 DCD kidneys offered between 1 March 2013 and 30 April 2016.
- 5 Currently there are 11 centres in the UK who are registered in the KFTS:

Bristol	Leeds	Oxford
Cambridge	Leicester	Royal Free
Cardiff	Liverpool	Royal London
Guys	Newcastle	
- 6 For the kidneys which were transplanted, 3 year patient and graft survival were considered using a Kaplan Meier survival curve. In addition, recipient outcome measures: DGF (delayed graft function), and eGFR (estimated glomerular filtration rate) at 3 and 12 months post-transplant, were explored by whether the kidney was placed through the KFTS or not. eGFR was estimated using the 4 variable MDRD equation.

THE DBD DONOR KIDNEY FAST TRACK SCHEME

- 7 **Figure 1** summarises the pathway for 5,113 DBD kidneys offered (2,814 donors) during the first 42 months of the DBD KFTS. Of the 5,113 DBD kidneys offered, 1035 (20%) were offered through the KFTS after having not been successfully allocated through the national allocation scheme. 646 (62%) were retrieved and 373 (58%) of those resulted in a transplant. The remaining 273 (42%) continued to be deemed unsuitable for transplantation.
- 8 **Figure 2** shows 3 year patient and graft survival after adult DBD kidney transplant, stratified by whether the kidney was offered through the DBD KFTS. No paediatric patient in the UK has received a kidney through the DBD KFTS. There were no statistically significant differences in graft or patient survival for those kidneys that were transplanted through the DBD KFTS ($p=0.38$ and $p=0.58$ respectively).
- 9 **Table 2** presents the cause of failure of kidneys offered through the DBD kidney fast track scheme.
- 10 **Table 3** shows that a significant difference was seen across all recipient outcome measures, by whether the kidney was placed through the DBD KFTS or not. Kidneys which were placed through the DBD KFTS experienced a lower proportion of immediate function (59% cf. 68%) and a lower eGRF at 12 months (49 cf. 53), when comparing to those which were placed outside the scheme.

THE DCD DONOR KIDNEY FAST TRACK SCHEME

- 11 **Figure 3** summarises the pathway for 6,226 DCD kidneys offered (3,191 donors) during the first 38 months of the DCD KFTS. Of the 6,226 DCD kidneys offered, 690 (41%) were retrieved and 358 (52%) of those resulted in a transplant while the remaining 332 (48%) continued to be deemed unsuitable for transplantation.
- 12 The time period examined covers both the previous local arrangements for allocating DCD kidneys and the new National DCD kidney allocation scheme. A statistically significant difference ($p<0.0001$) was found in the number of kidneys being fast tracked between the two schemes. In the previous local arrangements 23% of kidneys were fast tracked, however this has increased to 31% since the introduction of the new National DCD kidney allocation scheme.
- 13 **Figure 4** shows 3 year patient and graft survival after adult DCD kidney transplant, stratified by whether the kidney was offered through the DCD KFTS. No paediatric patient has received a kidney through the DCD KFTS. There was a borderline statistically significant difference in patient survival for those kidneys that were transplanted through the DCD KFTS ($p=0.1$). However a statistically significant difference was observed in graft survival ($p=0.006$).

- 14 **Table 3** presents the cause of failure of kidneys offered through the DCD kidney fast track scheme.
- 15 **Table 6** shows that a borderline significant difference was seen across all recipient outcome measures, by whether the kidney was placed through the DCD KFTS or not. Kidneys which were placed through the DCD KFTS experienced a lower proportion of immediate function (46% cf. 54%) and a lower eGRF at 12 months (44 cf. 58), when comparing to those which were placed outside the scheme.

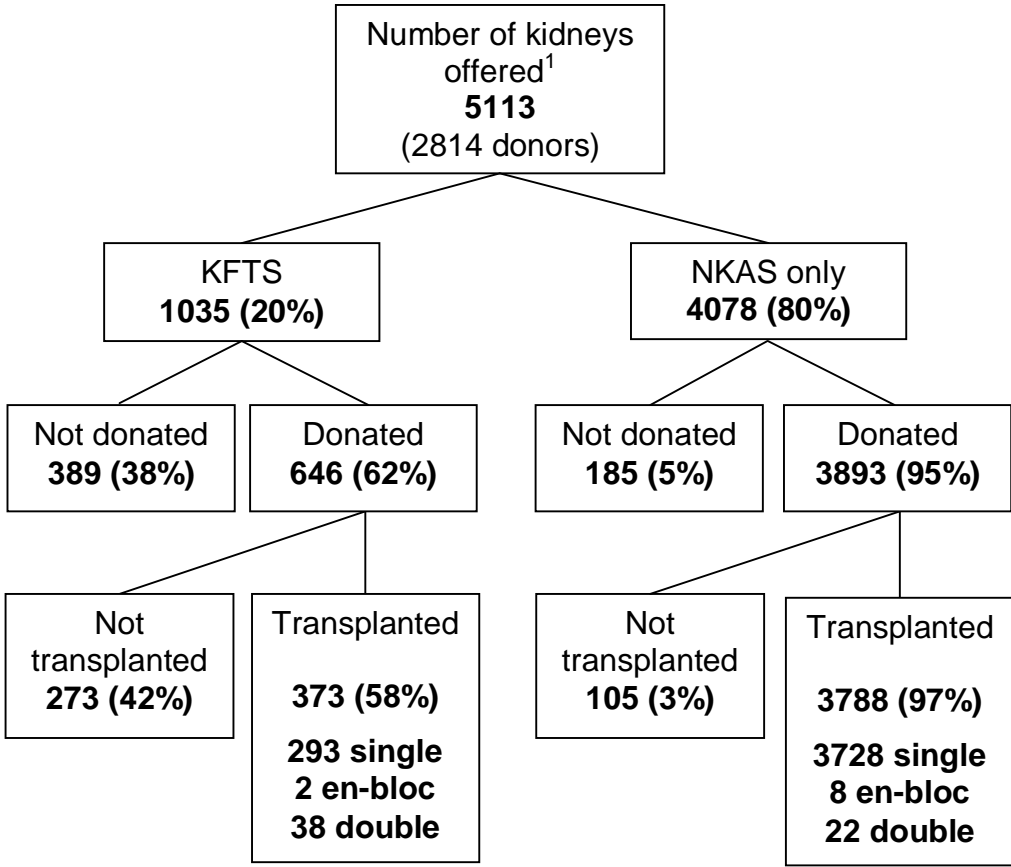
SUMMARY

- 16 The DBD KFTS went live on 1 November 2012. During the first 42 months, 20% of offered DBD kidneys were Fast-Tracked having first been offered through the national allocation scheme, 36% of those resulted in a transplant.
- 17 No differences in graft or patient survival were observed for patients who received a kidney through the DBD KFTS compared to the national DBD scheme at 12 months post-transplant. However significant differences were observed in DGF and eGFR at 3 and 12 months post-transplant.
- 18 The DCD KFTS went live on 1 March 2013. In the first 38 months, 27% of offered DCD kidneys were Fast-Tracked having first been offered through local arrangements, 21% of these kidneys resulted in a transplant. It has been seen that since the introduction of the new National DCD allocation scheme, the number of DCD kidneys entering the DCD KFTS has significantly increased.
- 19 Borderline difference in patient survival was observed for patients who received a kidney through the DCD KFTS compared to those transplanted through local offering arrangements or the National DCD Kidney allocation scheme (depending on the time period). However a difference was observed in graft survival.

ACTIONS AND RECOMMENDATIONS

- 20 There are currently 11 centres registered for the KFTS. If any centre wishes to opt in or out of the scheme, please contact Mick Stokes in the ODT Duty Office.
- 21 Both the DBD and DCD KFTS are being instigated appropriately for most kidneys and will continue to be audited regularly. This is now simpler because both DBD and DCD kidneys are allocated via a National Scheme and all kidney offering is facilitated through the ODT Duty Office.

**Figure 1 DBD Kidneys Offered
1 November 2012 to 30 April 2016**



¹All kidneys resulting in a SPK or multi-organ transplant have been excluded

Transplant centre

Leeds	65
Guy's	64
Oxford	40
Royal Free	35
Cambridge	27
Cardiff	23
Edinburgh	18
Liverpool	16
Newcastle	14
Royal London	11
Leicester	9
Manchester*	3
WLRTC*	2
Overseas*	2
St Georges*	1
Nottingham*	1
Portsmouth*	1
Bristol	1
Birmingham*	1
Coventry*	1

92% of donated kidneys transplanted:
 – **83 percentage points** through **standard offering**
 – **8 percentage points** through **KFTS**

*Not a registered centre in the KFTS

Figure 2

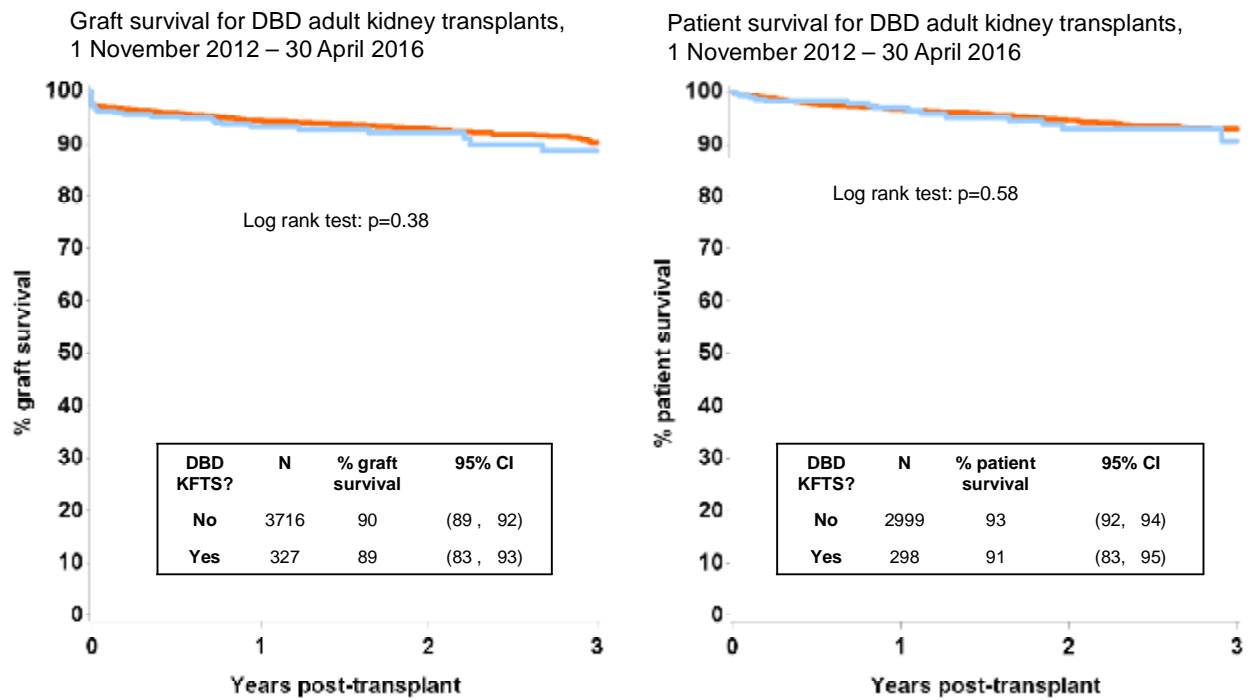


Table 2 Cause of failure for those kidneys which were offered through the DBD KFTS, were transplanted and failed

Cause of failure	N
Other	11
Recipient died, graft was functioning at time of death	9
Rejection while taking immunosuppressive drug(s)	4
Vascular or ureteric operative problems (excluding vascular thrombosis)	3
Non-viable kidney	2
Vascular (arterial or venous) thrombosis	2

Table 3 Recipient outcomes measures, by whether the kidney was offered through the DBD KFTS

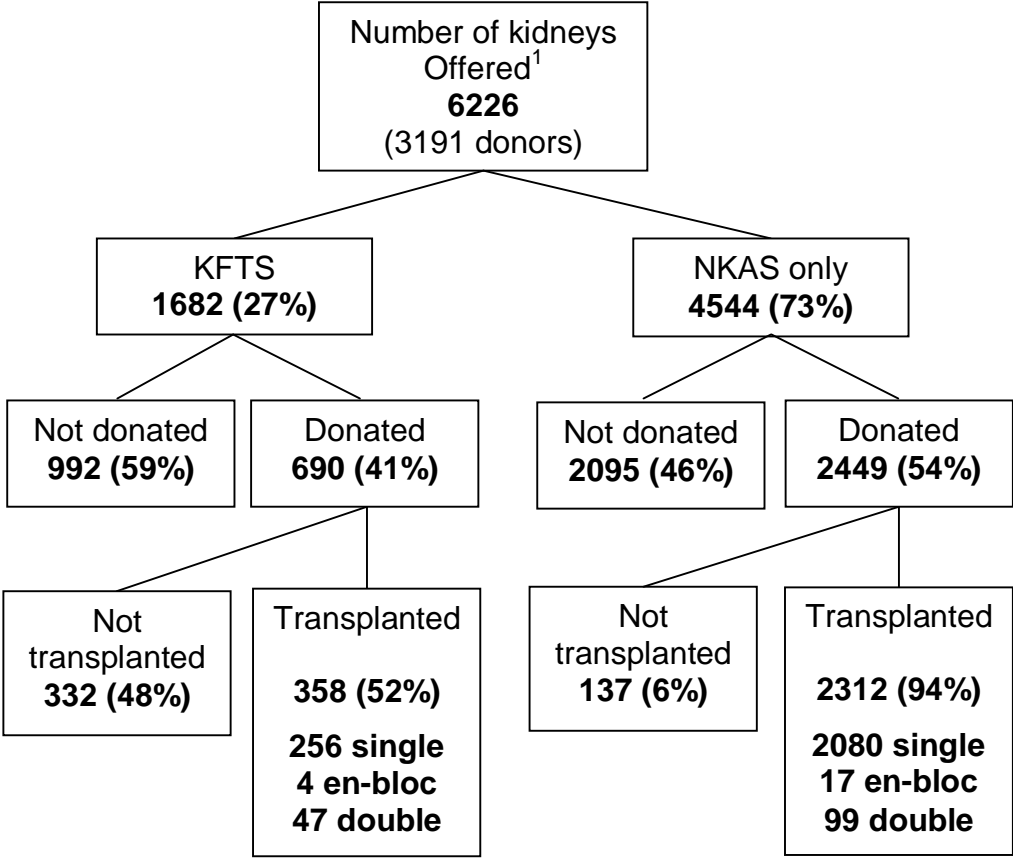
Variable	Was the kidney placed into the DBD KFTS?		P-value	
	No	Yes		
DGF	N	3758	333	<0.001
	Immediate	2567 (68%)	196 (59%)	
	Delayed	534 (14%)	79 (24%)	
	PNF	70 (2%)	7 (2%)	
	Unknown	587 (16%)	51 (15%)	
Recipient eGFR at 3 months	N	3191	275	<0.001
	Median	50	47	
	IQR	37-66	33-59	
	Range	5-243	8-115	
Recipient eGRF at 12 months	N	2610	244	0.001
	Median	53	49	
	IQR	40-69	35-62	
	Range	5-253	10-115	

IQR: Interquartile range, Range: Minimum and maximum values reported

A Chi squared test was used to test for differences in DGF for the KFTS indicator.

A Kruskal-Wallis test was used to test for differences in eGFR at 3 and 12 months and the KFTS indicator.

**Figure 3 DCD Kidneys Offered
1 March 2013 to 30 April 2015**



¹All kidneys resulting in a SPK or multi-organ transplant have been excluded

Transplant centre

Oxford	60
Leeds	57
Guy's	54
Royal Free	35
Cambridge	32
Cardiff	30
Leicester	13
Liverpool	9
Newcastle	8
Edinburgh	4
Bristol	2
Glasgow*	1
Manchester*	1
Royal London	1

85% of donated kidneys transplanted:
 – **74** percentage points through **standard offering**
 – **11** percentage points through **KFTS**

*Not a registered centre in the KFTS

Figure 4

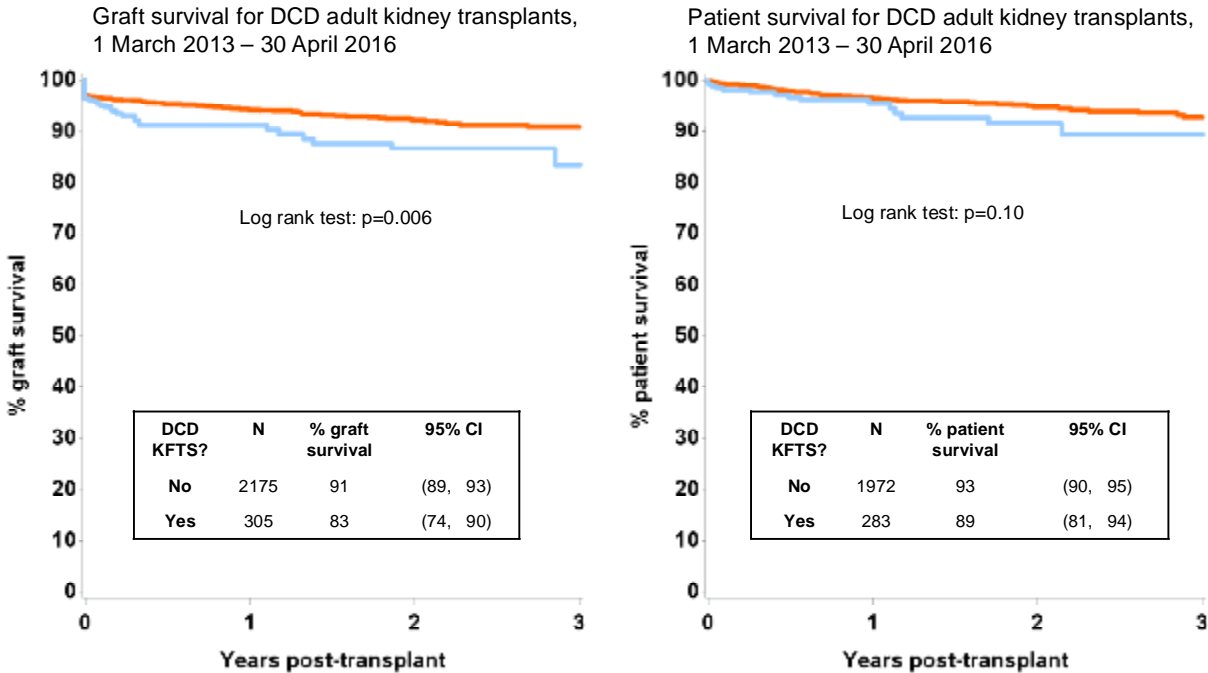


Table 5 Cause of failure for those kidneys which were offered through the DCD KFTS, were transplanted and failed

Cause of failure	N
Other	13
Recipient died, graft was functioning at time of death	9
Rejection while taking immunosuppressive drug(s)	6
Non-viable kidney	4
Vascular or ureteric operative problems (excluding vascular thrombosis)	3
Vascular (arterial or venous) thrombosis	1

Table 6 Recipient outcomes measures, by whether the kidney was offered through the DCD KFTS

	Variable	Was the kidney placed into the DCD KFTS?		P-value
		No	Yes	
DGF	N	2196	307	0.09
	Immediate	1182 (54%)	142 (46%)	
	Delayed	611 (28%)	101 (33%)	
	PNF	45 (2%)	8 (3%)	
	Unknown	358 (16%)	56 (18%)	
Recipient eGFR at 3 months	N	1850	246	0.03
	Median	44	41	
	IQR	33-58	31-55	
	Range	7-159	8-127	
Recipient eGFR at 12 months	N	1435	187	0.07
	Median	48	46	
	IQR	36-63	35-58	
	Range	6-145	11-146	

IQR: Interquartile range, Range: Minimum and maximum values reported

Fisher's exact test was used to test for differences in DGF for the KFTS indicator.

A Kruskal-Wallis test was used to test for differences in eGFR at 3 and 12 months and the KFTS indicator.