



Blood and Transplant

**QUARTERLY REPORT ON
NRP RETRIEVALS**

1 April 2015 - 31 March 2021

As at 10 May 2021



Cohorts considered

This report presents information on NRP activity in the UK for the period 1 April 2015 to 31 March 2021, and compares to standard DCD retrievals in the same period. Note that NRP activity is recorded against the team who performed NRP which may be different from the main retrieval team in attendance.

Tables 1 and 2 show activity for all teams who have at least one NRP attendance reported to NHSBT. The remainder of the report considers DCD attendances by Cambridge and Edinburgh only, as an evaluation of established services. The exception to this is Table 5 which presents liver graft failure reasons for all other NRP attendances combined.

Transplant and graft survival analyses are based on first transplants only performed at any transplant centre in the period 1 April 2015 to 31 March 2020 where the organ was retrieved by Cambridge or Edinburgh, and survival information is available, and is reported for liver only, kidney only, or simultaneous pancreas and kidney (SPK) transplants respectively. Delayed graft function information is provided for all transplants of the specified organ, with islet transplants included in pancreas numbers.

Activity

Table 1 DCD attendances by period and retrieval team, 1 April 2015 - 31 March 2021

Period	Retrieval team	All DCD attendances	Total proceeding¹	NRP attendances	NRP proceeding
2015/16	Oxford	64	36	-	-
	Birmingham	98	65	-	-
	Edinburgh	75	49	3	2
	Cambridge	160	119	11	10
2016/17	Oxford	79	48	-	-
	Birmingham	101	62	-	-
	Edinburgh	78	57	20	15
	Cambridge	132	90	15	11
2017/18	Oxford	66	43	-	-
	Birmingham	124	80	-	-
	Edinburgh	74	48	27	19
	Cambridge	143	101	22	20
2018/19	Oxford	81	55	4	4
	Birmingham	126	96	1	1
	Edinburgh	60	35	18	10
	Cambridge	137	90	31	21
2019/20	Oxford	90	60	1	1
	Birmingham	111	74	4	3
	Edinburgh	60	47	18	16
	Cambridge	164	116	34	27
2020/21 Q1	Oxford	5	5	-	-
	Birmingham	9	7	-	-
	Edinburgh	4	2	3	1
	Cambridge	4	4	-	-
2020/21 Q2	Oxford	20	13	-	-
	Birmingham	23	14	-	-
	Edinburgh	25	16	2	2
	Cambridge	29	25	13	12
2020/21 Q3	Oxford	16	10	-	-
	Birmingham	25	15	-	-
	Edinburgh	13	9	11	8
	Cambridge	29	18	13	9
2020/21 Q4	Oxford	13	11	-	-
	Birmingham	11	7	-	-
	Edinburgh	15	12	11	9
	Cambridge	22	18	14	10

¹Proceeded to donate at least one organ for the purpose of transplantation

Table 2 DCD organs retrieved and transplanted, by retrieval team and period, 1 April 2015 - 31 March 2021

Period	Retrieval team	Standard DCD								NRP Performed							
		Liv ret	Liv txd	Kid ret	Kid txd	Panc ret	Panc txd	Lng ret	Lng txd	Liv ret	Liv txd	Kid ret	Kid txd	Panc ret	Panc txd	Lng ret	Lng txd
2015/16	Oxford	17	12	70	68	7	5	14	10	-	-	-	-	-	-	-	-
	Birmingham	39	27	121	112	14	8	10	8	-	-	-	-	-	-	-	-
	Edinburgh	23	17	90	86	14	7	2	2	2	2	4	3	-	-	-	-
	Cambridge	54	37	212	194	24	12	9	9	8	6	18	14	9	3	-	-
2016/17	Oxford	29	16	86	80	8	3	6	4	-	-	-	-	-	-	-	-
	Birmingham	29	22	122	114	7	3	6	6	-	-	-	-	-	-	-	-
	Edinburgh	11	10	82	75	6	1	4	2	7	6	28	28	1	-	-	-
	Cambridge	42	30	155	143	18	10	9	7	9	8	22	17	6	2	-	-
2017/18	Oxford	23	15	82	75	5	3	5	5	-	-	-	-	-	-	-	-
	Birmingham	38	29	153	143	14	7	6	6	-	-	-	-	-	-	-	-
	Edinburgh	4	4	53	49	4	1	2	-	11	7	34	31	4	3	-	-
	Cambridge	37	21	157	143	12	4	12	12	17	16	40	35	8	2	6	6
2018/19	Oxford	24	14	100	93	7	5	14	11	1	1	8	5	2	2	-	-
	Birmingham	45	36	181	168	19	6	14	10	1	1	2	2	1	1	-	-
	Edinburgh	3	1	49	45	1	-	-	-	8	6	20	19	3	3	2	-
	Cambridge	26	18	135	127	13	7	5	5	18	15	42	39	5	5	8	6
2019/20	Oxford	25	15	117	106	12	6	13	11	-	-	2	2	-	-	-	-
	Birmingham	39	28	141	130	11	7	10	6	1	1	6	4	1	-	2	2
	Edinburgh	7	2	62	55	4	1	4	2	10	5	28	23	1	-	4	4
	Cambridge	25	14	172	162	13	5	8	6	23	17	54	43	9	4	-	-
2020/21 Q1	Oxford	2	2	10	10	-	-	2	2	-	-	-	-	-	-	-	-
	Birmingham	4	4	14	14	1	-	2	2	-	-	-	-	-	-	-	-
	Edinburgh	-	-	2	2	-	-	-	-	1	1	2	2	-	-	-	-
	Cambridge	3	2	8	8	-	-	2	-	-	-	-	-	-	-	-	-
2020/21 Q2	Oxford	9	7	22	20	3	3	2	2	-	-	-	-	-	-	-	-
	Birmingham	6	3	28	28	3	2	2	2	-	-	-	-	-	-	-	-
	Edinburgh	3	1	28	23	1	-	4	2	2	2	4	4	1	1	-	-
	Cambridge	4	2	22	21	1	1	-	-	9	8	24	21	-	-	-	-
2020/21 Q3	Oxford	5	2	20	19	2	1	-	-	-	-	-	-	-	-	-	-
	Birmingham	7	3	30	29	1	-	2	2	-	-	-	-	-	-	-	-
	Edinburgh	-	-	2	1	-	-	-	-	5	4	16	15	1	1	-	-
	Cambridge	5	4	18	18	3	2	2	-	9	8	18	15	1	-	-	-
2020/21 Q4	Oxford	4	1	21	20	-	-	6	3	-	-	-	-	-	-	-	-
	Birmingham	3	3	12	11	1	-	-	-	-	-	-	-	-	-	-	-
	Edinburgh	1	-	6	5	2	-	2	2	5	2	18	16	1	-	-	-
	Cambridge	3	-	14	13	1	-	2	-	10	9	20	18	4	3	4	1

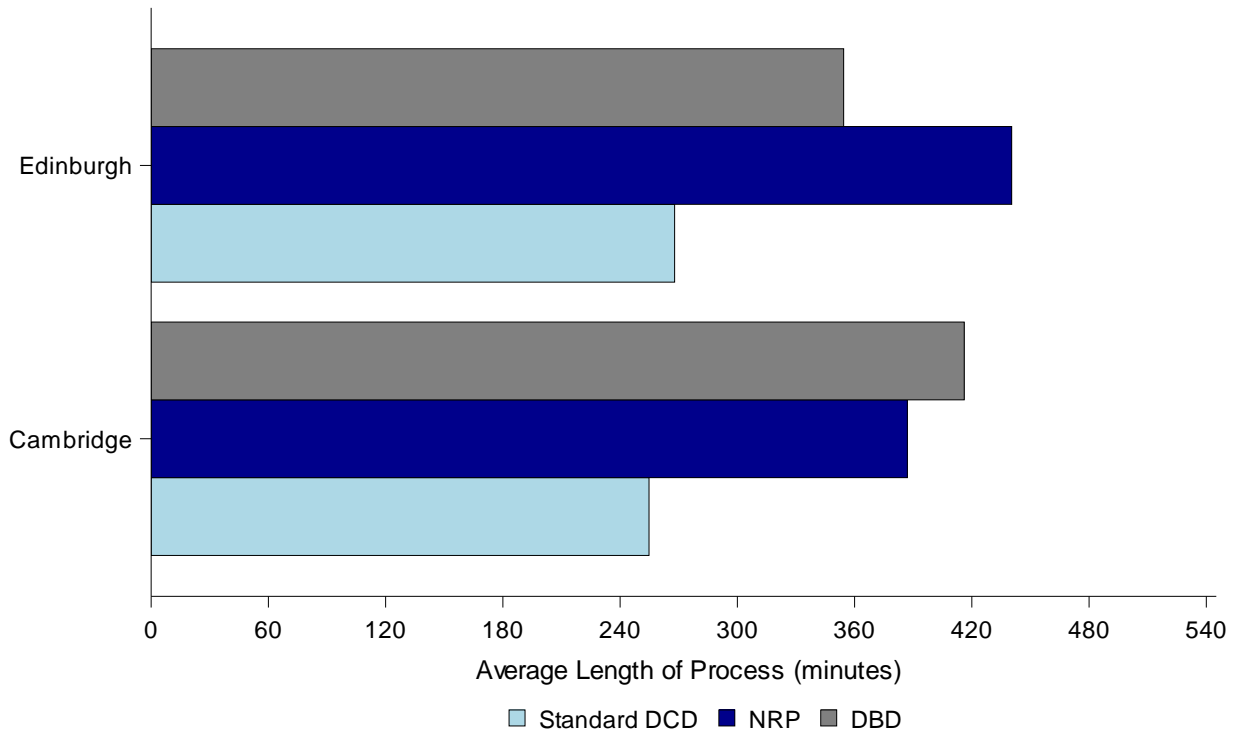
**Table 3 Number of liver transplants by transplant centre and retrieval team for NRP cases,
1 April 2015 - 31 March 2021**

Transplant centre	Cambridge team		Edinburgh team		Birmingham team		Oxford team	
	N	%	N	%	N	%	N	%
Newcastle	-	-	1	3	-	-	-	-
Cambridge	84	97	1	3	1	50	-	-
Royal Free	1	1	2	6	-	-	-	-
King's College	1	1	-	-	-	-	-	-
Birmingham	1	1	1	3	1	50	1	100
Edinburgh	-	-	30	86	-	-	-	-

Table 4 Organ damage reported for DCD organs retrieved, by organ and method, 1 April 2015 - 31 March 2021

	Liver		Kidney		Pancreas		Lung	
	Std	NRP	Std	NRP	Std	NRP	Std	NRP
Organs retrieved	251	154	1267	392	117	54	67	24
Damage information recorded on HTA-B (% of retrieved)	229 (91%)	142 (92%)	1225 (97%)	381 (97%)	105 (90%)	48 (89%)	57 (85%)	21 (88%)
Damage (% of reported)								
None	195 (85%)	136 (96%)	1083 (88%)	330 (87%)	93 (89%)	46 (96%)	43 (75%)	21 (100%)
Mild	18 (8%)	5 (4%)	81 (7%)	29 (8%)	4 (4%)	1 (2%)	8 (14%)	0 (0%)
Moderate	13 (6%)	1 (1%)	49 (4%)	17 (4%)	3 (3%)	0 (0%)	4 (7%)	0 (0%)
Severe	3 (1%)	0 (0%)	12 (1%)	5 (1%)	5 (5%)	1 (2%)	2 (4%)	0 (0%)

Figure 1 Average length of process (theatre arrival to end of operation) for DBD, standard DCD and NRP by team, 1 April 2015 - 31 March 2021



Liver outcomes

Table 5 Cause of failure for liver transplant recipients where failure has been reported by retrieval team and NRP status, 1 April 2015 - 31 March 2021

Cause	Cambridge		Edinburgh		Other team NRP
	Standard	NRP	Standard	NRP	
Total transplanted	128	87	35	35	3
Acute rejection	1	1	1	0	0
Chronic rejection	1	0	0	0	0
Primary non-function	6	0	2	0	0
Hepatic artery thrombosis	0	0	0	0	0
Vascular occlusion	0	0	0	1	0
Non-thrombotic infarction	1	0	0	0	0
Recurrent disease	1	0	0	0	0
Biliary complications	3	1	1	0	0
Recipient died, graft was functioning at time of death	12	4	2	3	0
Other	5	2	1	0	0
Unknown	1	1	0	0	0

Figure 2 Kaplan-Meier transplant survival function for DCD first liver only transplant recipients by NRP status, 1 April 2015 - 31 March 2020

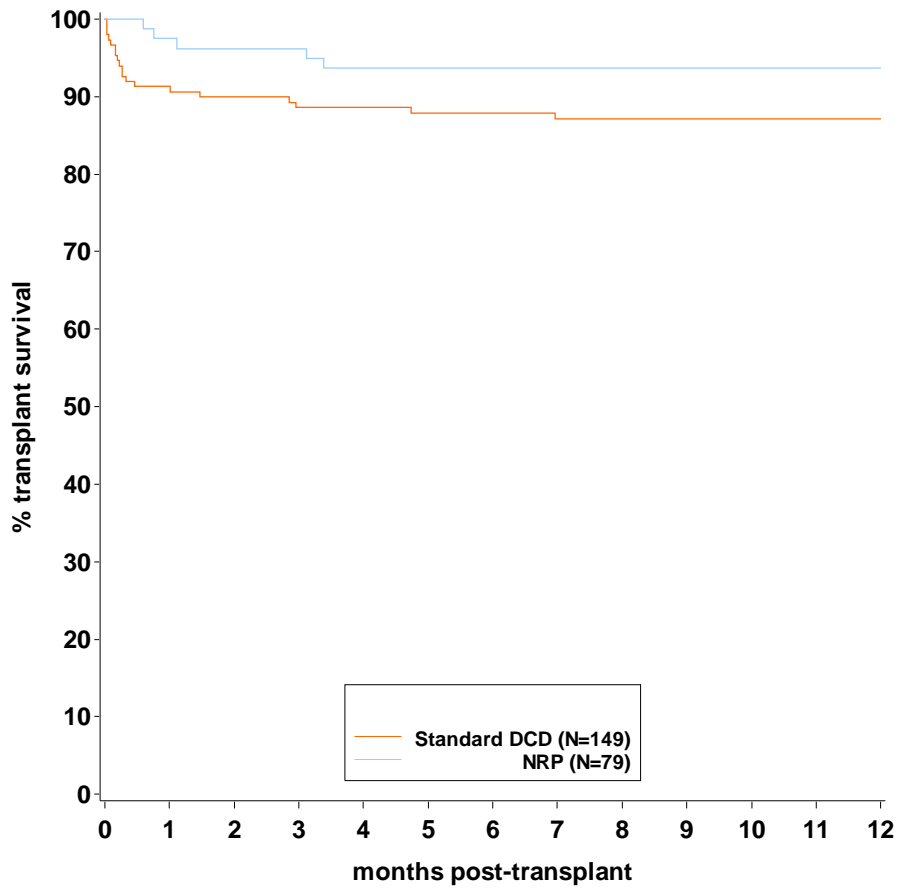


Table 6 Transplant survival rates following DCD first liver only transplant by NRP status, 1 April 2015 - 31 March 2020

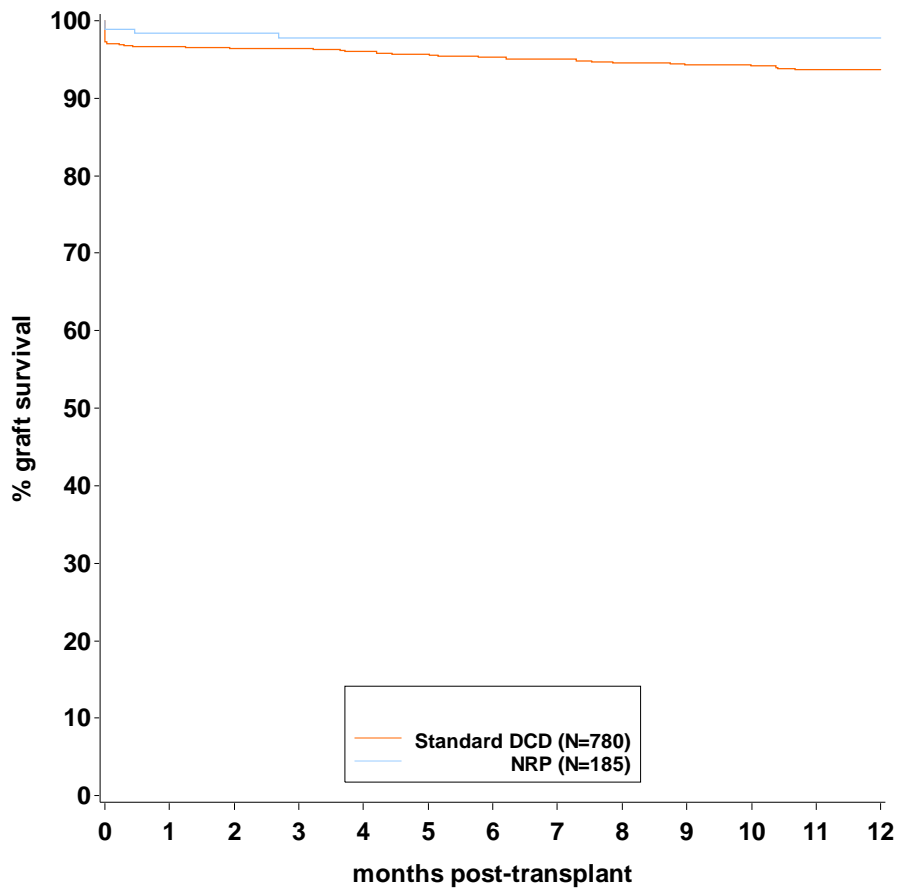
Method	Number of txs	30 day survival (95% CI)		90 day survival (95% CI)		1 year survival (95% CI)	
NRP	79	97.5	(90.3 - 99.4)	96.2	(88.7 - 98.8)	93.6	(85.4 - 97.3)
Standard DCD	149	91.3	(85.4 - 94.8)	88.6	(82.3 - 92.7)	87.2	(80.6 - 91.6)
Log-rank p-value		0.07		0.05		0.12	
Total	228	93.4	(89.3 - 96)	91.2	(86.7 - 94.2)	89.4	(84.6 - 92.8)

Kidney outcomes

Table 7 Delayed graft function rates following kidney transplantation, 1 April 2015 - 31 March 2021

Graft function	NRP		Non-NRP		Total	
	N	%	N	%	N	%
Immediate function	184	54.3	541	52.8	725	53.2
Delayed graft function	63	18.6	292	28.5	355	26.0
Primary non-function	2	0.6	24	2.3	26	1.9
Not reported	90	26.5	168	16.4	258	18.9
Total	339	100	1025	100	1364	100

Figure 3 Kaplan-Meier graft survival function for DCD first kidney only transplant recipients by NRP status, 1 April 2015 - 31 March 2020



**Table 8 Graft survival rates following DCD first kidney only transplant by NRP status,
1 April 2015 - 31 March 2020**

Method	Number of txs	30 day survival (95% CI)		90 day survival (95% CI)		1 year survival (95% CI)	
NRP	185	98.4	(95.1 - 99.5)	97.8	(94.3 - 99.2)	97.8	(94.3 - 99.2)
Standard DCD	780	96.7	(95.1 - 97.7)	96.4	(94.8 - 97.5)	93.7	(91.7 - 95.2)
Log-rank p-value		0.22		0.33		0.04	
Total	965	97.0	(95.7 - 97.9)	96.7	(95.3 - 97.6)	94.5	(92.8 - 95.8)

Figure 4 Kaplan-Meier transplant survival function for DCD first kidney only transplant recipients by NRP status, 1 April 2015 - 31 March 2020

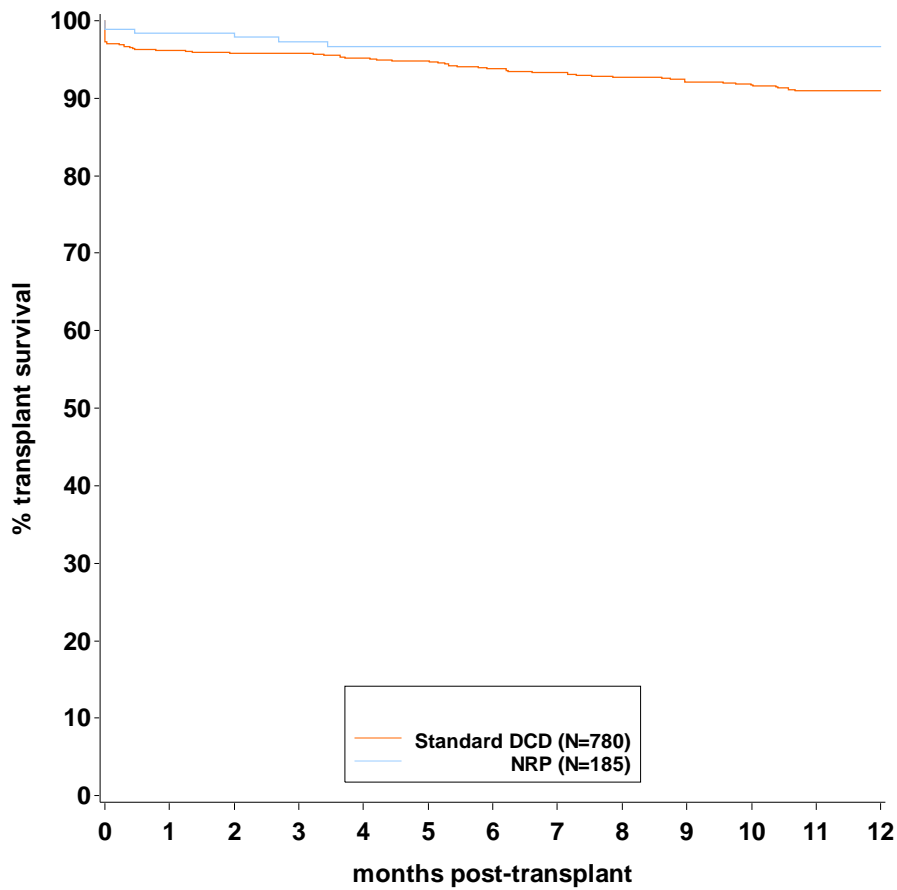


Table 9 Transplant survival rates following DCD first kidney only transplant by NRP status, 1 April 2015 - 31 March 2020

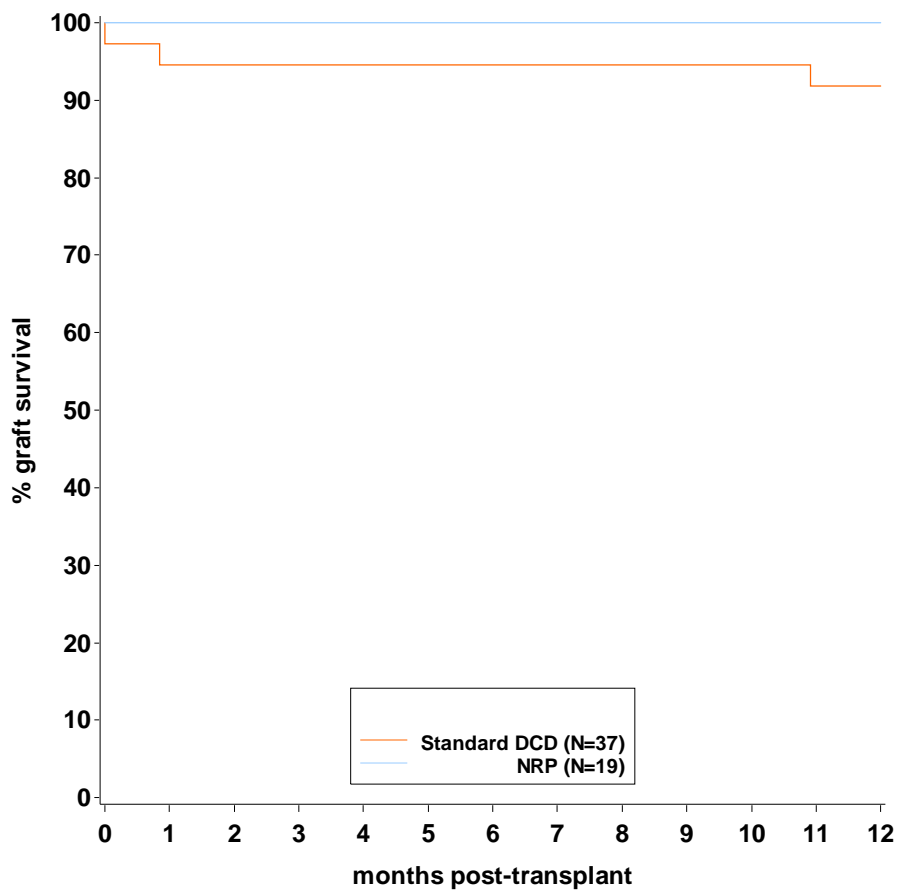
Method	Number of txs	30 day survival (95% CI)		90 day survival (95% CI)		1 year survival (95% CI)	
NRP	185	98.4	(95.1 - 99.5)	97.3	(93.6 - 98.9)	96.7	(92.8 - 98.5)
Standard DCD	780	96.2	(94.5 - 97.3)	95.8	(94.1 - 97.0)	91.0	(88.7 - 92.9)
Log-rank p-value		0.13		0.33		0.02	
Total	965	96.6	(95.2 - 97.6)	96.1	(94.6 - 97.1)	92.1	(90.1 - 93.6)

Pancreas outcomes

Table 10 Delayed graft function rates following pancreas transplantation, 1 April 2015 - 31 March 2021

Graft function	NRP		Non-NRP		Total	
	N	%	N	%	N	%
Immediate function	19	70.4	37	72.5	56	71.8
Partial function	1	3.7	3	5.9	4	5.1
Primary non-function	1	3.7	1	2.0	2	2.6
Not reported	6	22.2	10	19.6	16	20.5
Total	27	100	51	100	78	100

Figure 5 Kaplan-Meier graft survival function for DCD first SPK transplant recipients by NRP status, 1 April 2015 - 31 March 2020



**Table 11 Graft survival rates following DCD first SPK transplant by NRP status,
1 April 2015 - 31 March 2020**

Method	Number of txs	30 day survival (95% CI)		90 day survival (95% CI)		1 year survival (95% CI)	
NRP	19	100	-	100	-	100	-
Standard DCD	37	94.6	(80.1 - 98.6)	94.6	(80.1 - 98.6)	91.8	(76.7 - 97.3)
Log-rank p-value		0.31		0.31		0.21	
Total	56	96.4	(86.5 - 99.1)	96.4	(86.5 - 99.1)	94.5	(84.0 - 98.2)

Figure 6 Kaplan-Meier transplant survival function for DCD first SPK transplant recipients by NRP status, 1 April 2015 - 31 March 2020

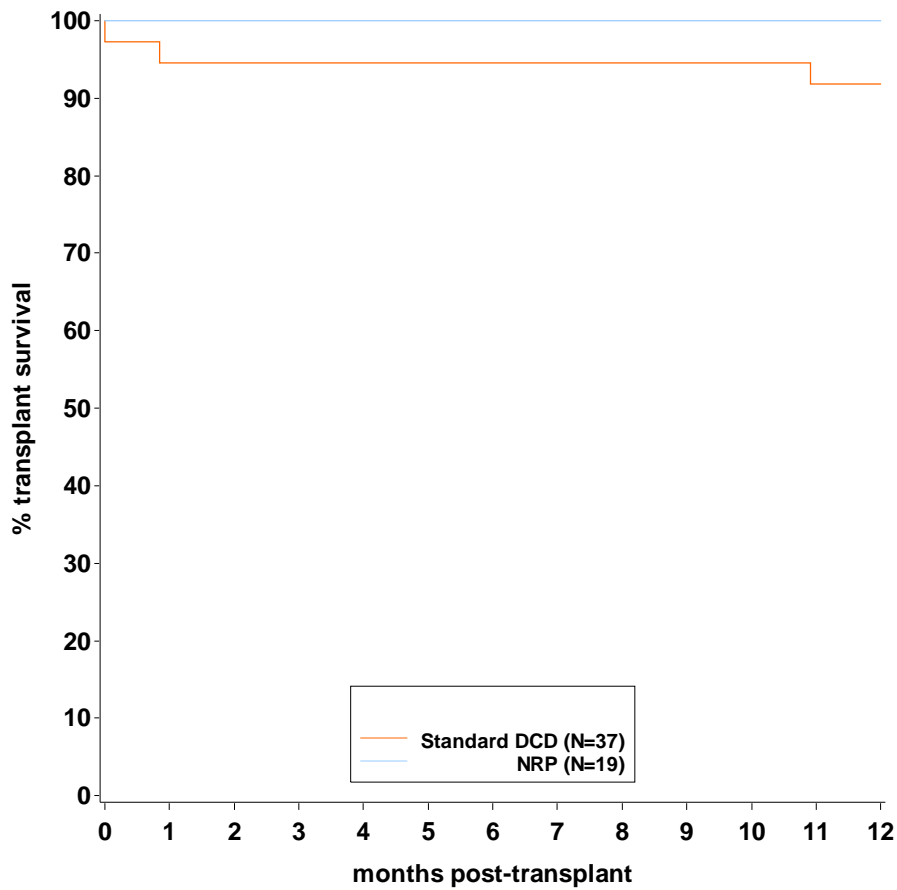


Table 12 Transplant survival rates following DCD first SPK transplant by NRP status, 1 April 2015 - 31 March 2020

Method	Number of txs	30 day survival (95% CI)		90 day survival (95% CI)		1 year survival (95% CI)	
NRP	19	100	-	100	-	100	-
Standard DCD	37	94.6	(80.1 - 98.6)	94.6	(80.1 - 98.6)	91.8	(76.7 - 97.3)
Log-rank p-value		0.31		0.31		0.21	
Total	56	96.4	(86.5 - 99.1)	96.4	(86.5 - 99.1)	94.5	(84.0 - 98.2)