

INHS BLOOD AND TRANSPLANT

RESEARCH, INNOVATION AND NOVEL TECHNOLOGIES ADVISORY GROUP

DCD HEART ACTIVITY

INTRODUCTION

- 1 DCD heart retrieval began in February 2015 for a 15 month initial evaluation period involving two centres; Harefield and Papworth. Since the end of the evaluation period, activity has continued with a third centre, Manchester, joining the programme in December 2016.
- 2 This paper looks at activity and patient outcomes from 1 February 2015 to 28 February 2018. It evaluates the number of retrievals and transplants performed by each team in the time period, along with the short and medium term outcomes of the recipients. For any donors who had their heart retrieved but not transplanted, the reason for non-use is also documented.
- 3 The outcomes of lung and abdominal organ offers for the DCD heart donors over this period are also considered.
- 4 For each DCD heart retrieval carried out, a Supplementary Record form is sent to NHSBT Statistics and Clinical Studies. The data presented in this paper are therefore a combination of standard data held on the database and additional information from the Supplementary Record forms.

RESULTS

Activity

- 5 In the time period, there have been 65 DCD heart donors, with 57 hearts successfully transplanted. In the initial evaluation period (ending 12 May 2016) there were 25 donations, resulting in 23 transplants and since this ended there have been a further 40 donations with 34 transplants. This activity is shown broken down by centre in **Table 1**. Manchester joined the programme on 5 December 2016 and so are only included after the initial evaluation period.

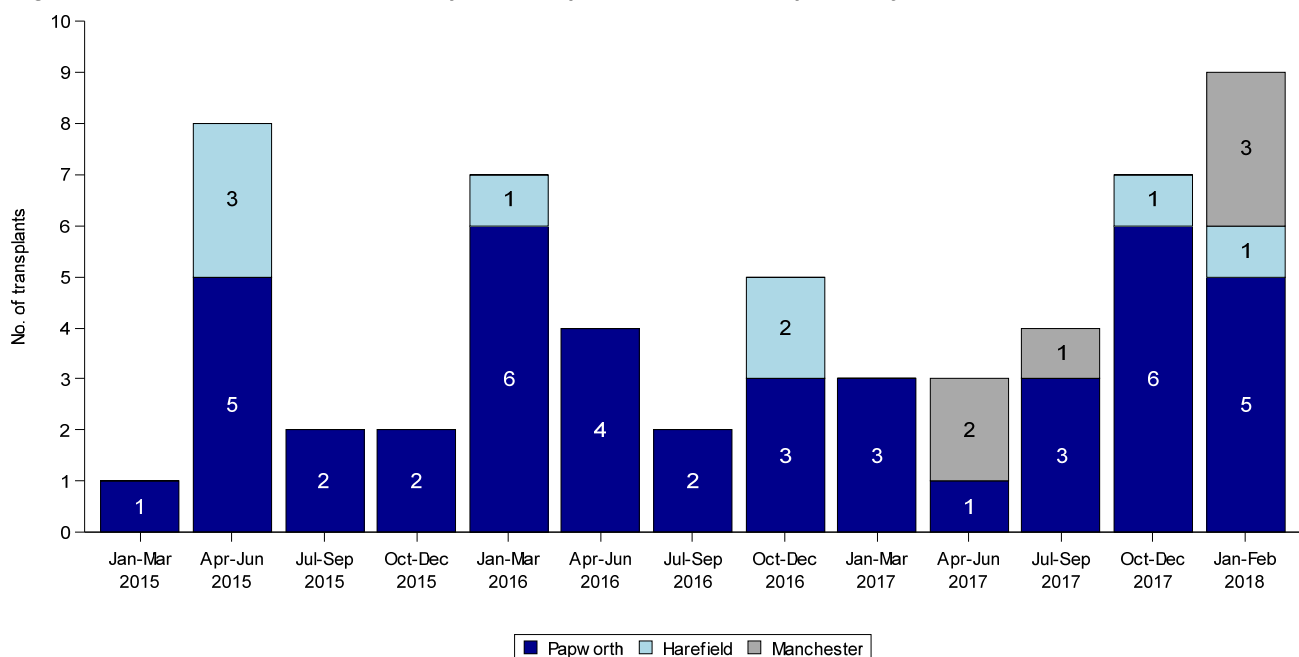
Period	Centre	Retrieved	Transplanted
1 February 2015 – 12 May 2016	Harefield	5	4
	Papworth	20	19
	Total	25	23
13 May 2016 – 28 February 2018	Harefield	5	4
	Papworth	28	24
	Manchester	7	6
	Total	40	34
Total		65	57

6 Across the whole time period, there have been 8 DCD hearts retrieved but not transplanted. The reason for non-use for each is seen below in **Table 2** and is taken from the DCD Heart Transplant Supplementary Record form. Where this is not available, as the form was returned incomplete, the reason was taken from the Hub Operations records.

Centre	Donation Date	Reason for non-use
Harefield	October 2015 December 2017	Continuous ventricular fibrillation after reperfusion on OCS Poor function on OCS
Papworth	July 2015 June 2016 January 2017	Declined for transplantation due to rising lactate level Function Donation ceased at recipient hospital - due to donor pancreatic tumour results from histology
	September 2017 October 2017	Heart hypertrophic enlarged aorta Angio performed coronary artery disease noted
Manchester	June 2017	Function (wall motion abnormality, poor contractility and poor lactate profile)

7 **Figure 1** shows the number of DCD heart transplants by quarter and centre. Activity has been increasing in recent months, with 9 transplants performed in the first two months of 2018. Please note that only two months (January and February) are included in the final bar.

Figure 1 DCD heart transplant activity, 1 January 2015 to 28 February 2018, by quarter and centre



8 Of the 65 DCD heart donors, all but two donated at least one other organ; 11 donated their lungs and at least one abdominal organ, and 52 donated at least one abdominal organ but not their lungs. Three had no consent for lung donation.

Post-transplant survival and support

- 9 The 30 day patient outcome of all 57 heart transplants are summarised in **Table 3**. This information is taken from one of three sources: the DCD Heart Supplementary Record form, the transplant record form, or the three month follow up form. There has only been one death within 30 days, with all other patients alive at that time.

Table 3 DCD heart patient outcomes at 30 days post-transplant, by centre, for transplants performed 1 February 2015 – 28 February 2018

Centre	Alive at 30 days	Died within 30 days
Harefield	7	1
Papworth	43	0
Manchester	6	0
Total	56	1

- 10 **Figure 2** below shows the Kaplan-Meier patient survival function up to one year for all 57 DCD heart recipients, split by perfusion method. The overall one year survival estimate for DCD heart recipients is 84.2% (95% CI: 69.2–92.2) and is comparable with DBD heart recipients (82.4% survival in 2016/2017 NHSBT Cardiothoracic Annual Report). 17 of the 57 transplants (30%) used NRP for perfusion and there have been no reported deaths, giving the 100% survival estimate. **Table 4** shows the one year survival estimates by group. Please note the low numbers in the NRP cohort.
- 11 As at 9 April 2018, there have been 8 recorded deaths of DCD heart recipients. **Table 5** gives a breakdown of the recorded causes of deaths for these patients.

Figure 2 Kaplan-Meier patient survival function for DCD heart transplant recipients by perfusion method, 1 February 2015 – 28 February 2018

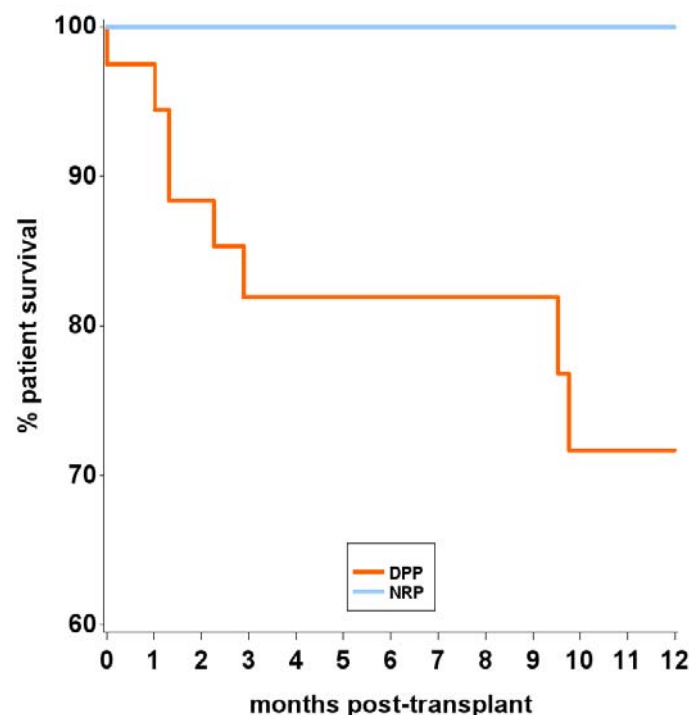


Table 4 1 year patient survival rates after DCD heart transplant, by perfusion method, 1 February 2015 – 28 February 2018

Perfusion method	Number of transplants	Number of deaths	1 year survival (95% CI)
DPP	40	8	71.7 (49.8–85.3)
NRP	17	0	100 (–)
Total	57	8	81.7 (66.1–90.6)

Table 5 Causes of death of 8 patients who have died post DCD heart transplant, 1 February 2015 – 28 February 2018

Cause of death	Number of patients
Sudden unexplained cardiac death	1
Cerebro-vascular accident	1
Septicaemia	1
Multi-system failure	1
Donor organ failure	1
End-stage heart failure	1
Other (no further information provided)	2

- 12 The need for post-transplant mechanical support within 30 days is shown in **Table 6** along with the devices used. Out of the 57 patients, 22 (39%) required mechanical support; most of which were IABP only.

Table 6 Use of mechanical support within 30 days post-transplant, for DCD heart transplants performed 1 February 2015 – 28 February 2018

Mechanical support post-transplant	Number of patients
Yes	22
- IABP only	10
- ECMO only	7
- ECMO and IABP	3
- ST VAD and ECMO	2
No	35

Offering of other organs

- 13 **Table 7** below shows the outcomes of lung and abdominal organ offers for the 65 DCD heart donors.

Outcome	Lungs¹	Kidney¹	Liver	Pancreas
Offered	49	65	63	58
Retrieved	11	62	52	33
Transplanted (% of offered)	11 (22%)	56 (86%)	38 (73%)	23 (70%)
National DCD organ transplant rate (% of offered) ²	7%	84%	36%	22%

¹ at least one
² As reported in the 2016/17 NHSBT annual activity report

- 14 18 of the 38 donor lungs that were not used were declined due to poor function. Donor related issues were generally the reasons provided for the livers and kidneys that were not used. For the 35 pancreases that were not used, a range of reasons for non-use were provided including insufficient islet yields, donor history and prolonged cold ischaemia time.

SUMMARY

- 15 This paper is for information only and is to provide the national picture on DCD heart activity. Numbers of transplants have now reached more than 50 and unadjusted survival outcomes are comparable to that of DBD transplants.
- 16 The first meeting of the RINTAG DCD Heart Working Group will meet on 20 June 2018.

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April 2018