

NHS BLOOD AND TRANSPLANT
CARDIOTHORACIC ADVISORY GROUP
URGENT HEART ALLOCATION SCHEMES –
2013/2014 ACTIVITY

SUMMARY

INTRODUCTION

- 1 This paper is a review of the usage of the Adult Urgent Heart Allocation Scheme (AUHAS) and the Paediatric Urgent Heart Allocation Scheme (PUHAS) in their fifteenth year of operation.

DATA

- 2 Data on 213 urgent heart registrations for 203 patients registered between 1 April 2013 and 31 March 2014 were obtained from the UK Transplant Registry and also from manual records kept by the Organ Donation and Transplantation Duty Office.

CONCLUSIONS

- 3 There were 170 adult urgent heart registrations during the 2013/2014 financial year, an increase of 28% compared with registrations in 2012/2013. There were 20 adult urgent patients on the list at the end of August and July 2014 and 25 at the end of June 2014. 73% of adult urgent registrations resulted in transplant. Sadly, six adult patients died awaiting an urgent heart transplant.
- 4 There were 43 paediatric urgent heart registrations, an increase of 23% compared with registrations last year. There were 10 paediatric urgent patients on the list at the end of June and July 2014 and 6 at the end of August 2014. 60% of the paediatric patients listed urgently were transplanted. Sadly, eight paediatric patients died awaiting an urgent heart transplant.
- 4 There were statistically significant differences in 30-day post-transplant patient survival, by urgency status, for both adult and paediatric patients ($p=0.02$ for adults and $p=0.06$ for paediatrics). There was also a statistically significant difference in one year post-transplant survival for paediatrics ($p=0.005$).

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September 2014

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INTRODUCTION

- 1 This paper is a review of the usage of the Adult Urgent Heart Allocation Scheme (AUHAS) and the Paediatric Urgent Heart Allocation Scheme (PUHAS) in their fifteenth year of operation.

METHODS

- 2 Data on 213 urgent heart registrations for 203 patients registered between 1 April 2013 and 31 March 2014 were obtained from the UK Transplant Registry and also from manual records kept by the Organ Donation and Transplantation Duty Office.
- 3 Unadjusted 30 day and one year patient survival estimates for first heart only transplants were calculated using the Kaplan-Meier estimation method and compared for urgent and non-urgent transplants. Patient death was regarded as the outcome event and recipients alive with a functioning graft, at time of analysis, were censored at last known follow-up date.
- 5 Thirty day survival rates were based on data from 566 adult and 153 paediatric transplants performed between 1 April 2009 and 31 March 2014; one year survival rates were based on data from 399 adult and 128 paediatric transplants performed between 1 April 2009 and 31 March 2013.

RESULTS

Patient registration and allocation

- 6 A total of 170 adult urgent heart registrations and 43 paediatric urgent heart registrations were made between 1 April 2013 and 31 March 2014. This represented 48% and 69%, respectively, of all adult and paediatric registrations for heart only transplants. Compared with 2012/2013 activity, the number of adult urgent heart registrations increased by 29%, whilst the number of non-urgent registrations increased by 23%.
- 7 AUHAS and PUHAS usage varied between centres and is summarised in **Table 1**. The number of adult urgent registrations at all centres, apart from Newcastle and Great Ormond St, has increased compared with the 2012/2013 activity. Manchester registered one 15-year old on the PUHAS in 2013/2014.

**Table 1 Heart registrations, by age-group,
1 April 2013 – 31 March 2014 (1 April 2012 – 31 March 2013)**

Transplant centre	Number of heart registrations		% urgent of all registrations
	Urgent	Non-urgent	
Adult			
Birmingham	21 (18)	24 (26)	47% (41%)
Glasgow	21 (12)	14 (8)	60% (60%)
Great Ormond St	2 (2)	3 (1)	40% (67%)
Harefield	33 (20)	39 (37)	46% (35%)
Manchester	30 (20)	25 (18)	55% (53%)
Newcastle	30 (37)	39 (31)	43% (54%)
Papworth	33 (23)	40 (28)	45% (45%)
Total	170 (132)	184 (149)	48% (47%)
Paediatric			
Great Ormond St	17 (15)	16 (10)	52% (60%)
Newcastle	25 (19)	3 (2)	89% (90%)
Glasgow	0 (1)	0 (0)	0% (100%)
Manchester	1 (0)	0 (0)	100% (0%)
Total	43 (35)	19 (12)	69% (74%)
TOTAL	213 (167)	203 (161)	51% (51%)

- 8 Instances where two or more urgent patients from the same centre were registered at the same time had to be agreed in advance with the Chair of CTAG or the Associate Medical Director for Organ Donation and Transplantation.

Patient outcome

- 9 Outcomes of urgent heart registrations are shown in **Table 2**. Of the 170 adult urgent registrations, 124 received a transplant (34 within seven days). Waiting time for adult patients on the urgent list ranged between 1 and 231 days, with eleven patients waiting over 100 days. On average, 14.1 adult patients were on the urgent list at any one time, compared with 11.4 in 2012/2013. There were 20 adult urgent patients on the list at the end of August and July and 25 at the end of June 2014.
- 10 Six adult patients died on the urgent list post-registration. The number of heart offers for these patients ranged between 1 and 34. Adult patients were removed from the list on 38 occasions. Nine of these were removed once implanted with a ventricular assist device (VAD), 6 were removed from the list as they were too ill and 3 were removed because their condition improved and 19 were removed for unknown reasons. Of the 38 patients who were removed from the list, 14 received a VAD at any point post removal from the urgent list.
- 11 Of the 43 paediatric urgent registrations, 26 received a transplant (four within seven days), as shown in **Table 2**. Nine of the 26 transplanted paediatric

patients received hearts from adult donors; six patients were registered at Great Ormond Street and three at Newcastle. Waiting time for paediatric patients ranged between 2 and 246 days, with seven paediatric patients waiting over 100 days. On average, 6.4 paediatric patients were on the list at any one time compared with 5.9 in 2012/2013. There were 10 paediatric urgent patients on the list at the end of June and July 2014 and 6 at the end of August 2014. One paediatric patient received a heart from a donor after circulatory death.

- 12 Eight paediatric patients died on the urgent list after waiting between 1 and 159 days. Four of these patients did not receive any offers of a donor heart while the remaining four received between 1 and 4 offers. Paediatric patients were removed from the list on nine occasions: one as their condition improved, three were removed due to deterioration in their condition, one was removed because they had a VAD implanted and four due to unknown reasons.

Table 2 Registration outcome, as at 1 September 2014, by age-group, 1 April 2013 to 31 March 2014						
Registration outcome	Adult		Paediatric		Total	
	N	%	N	%	N	%
Transplanted	124	73	26	60	150	70
Died	6	4	8	19	14	7
Removed	38	22	9	21	47	22
Still active	2	1	0	0	2	1
TOTAL	170	100	43	100	213	100

- 13 The outcome of those 38 adult registrations and 9 paediatric registrations which were removed from the list are provided in **Tables 3 and 4** respectively. **Table 3** has been further separated depending on whether the patient had received a VAD either upon removal from the list or after. Comprehensive VAD data is not yet available for analysis for paediatric patients, although it is known that one paediatric patient was removed following a VAD.

Table 3 Registration outcome for Adults removed from the list, as at 1 September 2014, 1 April 2013 to 31 March 2014			
Registration outcome	VAD		Total
	No	Yes	
Returned to non-urgent list	1	2	3
Returned to urgent list	2	2	4
Still removed from list	13	6	19
Died	4	2	6
Transplanted	4	2	6
TOTAL	24	14	38

Table 4 Registration outcome for paediatrics removed from the list, as at 1 September 2014, 1 April 2013 to 31 March 2014	
Registration outcome	Total
Returned to non-urgent list	2
Returned to urgent list	0
Still removed from list	4
Died	1
Transplanted	2
TOTAL	9

Urgent and non-urgent patient survival

- 14 Thirty day and one year patient survival estimates are provided in **Table 5** with associated 95% confidence intervals. Also given are p-values for log rank tests to compare the survival times of urgent and non-urgent transplants.
- 15 There were statistically significant differences in 30-day post-transplant patient survival, by urgency status ($p=0.02$ for adults and $p=0.06$ for paediatrics). There was also a statistically significant difference in one year post-transplant survival for paediatrics ($p=0.005$).

Table 5 **Kaplan-Meier patient survival after first heart only transplant in the UK**

	Number analysed	30 day ¹ Patient survival estimate (%)	95% Confidence interval	Number analysed	One year ² Patient survival estimate (%)	95% Confidence interval
Adult						
Urgent	354	91	88 – 94	227	84	78 – 88
Non-urgent	212	85	79 – 89	172	78	72 – 84
Log-rank p-value		0.02			0.18	
Paediatric						
Urgent	128	97	92 – 99	106	92	85 – 96
Non-urgent	26	88	68 – 96	22	73	49 – 87
Log-rank p-value		0.06			0.005	

¹ Transplants between 1 April 2009 and 31 March 2014

² Transplants between 1 April 2009 and 31 March 2013

CONCLUSIONS

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