

NHS BLOOD AND TRANSPLANT
CARDIOTHORACIC ADVISORY GROUP - HEART

REVIEW OF ALLOCATION ZONES

SUMMARY

INTRODUCTION

- 1 The cardiothoracic allocation zones were split into separate heart and lung allocation zones over two phases, in May 2017 and January 2018. This report is the third annual review of the heart allocation zones since this change.
- 2 This report provides up to date figures on each centre's percentage share of registrations onto the national heart transplant list, for the two-year period 1 August 2018 to 31 July 2020. It also provides numbers of heart donors over the three-year period 1 August 2017 to 31 July 2020 under the current allocation zones implemented 8 January 2018.

RESULTS

Comparison of registrations and donors

- 3 When comparing the proportion of heart registrations made by each centre with the proportion of heart donors in each of the current heart allocation zones, as implemented on 8 January 2018, there were no significant differences observed. Therefore, there is no evidence for a change in the zones at this time.

Donor activity

- 4 The utilisation rate (transplanted out of offered) of donor hearts is variable across zones (highest for donors that appeared in Manchester's allocation zone and lowest for donors that appeared in Glasgow's zone).

Transplant activity

- 5 Although zonal allocation is prioritised in all heart allocation schemes (super-urgent, urgent and non-urgent), more transplants are performed from non-zonal donors than zonal donors (62% vs 38%).

CONCLUSION

- 6 There were no significant differences observed in the percentage share of heart registrations and donors across centres/zones, therefore no changes will be made to zonal boundaries at present.

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BACKGROUND

- 7 During 2017/18, the cardiothoracic allocation zones were split into separate heart and lung allocation zones in order to more appropriately match individual organ supply with the demand at each centre. This split was phased in over a period of eight months to stagger the impact of this change. The first phase was implemented on 18 May 2017 and the second phase on 8 January 2018.
- 8 This report is the third annual review of the heart allocation zones since this change. A similar review of the lung allocation zones was presented at the CTAG-Lung meeting on 17 September 2020. It was agreed at CTAG in October 2017 that any review of allocation zones should use the most up to date period of registration and donor data. Therefore this report analyses:
 - Registrations: 1 August 2018 to 31 July 2020
 - Donors: 1 August 2017 to 31 July 2020
- 9 This report also covers activity data since the zonal boundaries have been stable, for donors and transplants, including the number and utilisation of donors in each zone, and the number of zonal/imported transplants per centre.
- 10 Please see POL228: NHSBT Heart Allocation Policy (online here <https://www.odt.nhs.uk/transplantation/tools-policies-and-guidance/policies-and-guidance/>) for details of how the allocation zones are used in the offering process.

DATA AND METHODS

- 11 Changes to the heart allocation zones are based on a statistically significant difference being observed between the percentage share of registrations and the percentage share of donors for any one allocation zone (at the 5% significant level after adjusting for multiple testing).
- 12 Registrations are defined as:

The total number of UK Group 1 heart or heart-lung registrations in the latest two year period between 1 August 2018 and 31 July 2020 at adult centres, but excluding a) any registrations made by Newcastle of patients < 16 years, and b) any patients with no active waiting time (note that registrations made by Harefield of patients < 16 years are included as agreed at the CTAG Centre Directors meeting in Nov 2017).

Registrations that ended in a domino or live donor transplant, multi-organ registrations and urgent and super-urgent heart registrations are included. Registrations for heart-lung transplantation are included in the number of heart registrations as heart-lung blocks are allocated according to the heart allocation sequence. Retrospective registrations made after an unlisted patient was transplanted are also included. VAD patients listed for transplant are included.

For patients registered more than once in the registration period, the following rules apply:

- If a patient was registered, removed then reregistered, only the first registration is included.
- If a patient was registered, transplanted then reregistered, both registrations are included.
- If a patient was active, suspended then reactivated, only the first activation is included.
- If a patient moved between the non-urgent, urgent or super-urgent lists (without transplantation in between) they will only be counted once.

13 Donors are defined as:

The total number of UK adult (≥ 16 years at time of death) heart donors after brain death over the latest three year period between 1 August 2017 and 31 July 2020. Donors whose heart was not transplanted are excluded. Paediatric donors who donated to adult patients are included, along with adult donors whose organs were transplanted into paediatric patients.

14 Donors are assigned to the zone that they are in now, as opposed to the zone they were in at the time of offering, if the zone for that hospital has changed, this is so that the comparison between registrations and donors reflects the current arrangements.

RESULTS

Comparison of registrations and donors

15 **Table 1** summarises the proportion of heart registrations made by each centre over the two-year period, and compares this with the number of heart donors that arose under each allocation zone as they are currently defined (as at 8 January 2018) over the three-year period. This shows that the proportion of heart registrations and heart donors are reasonably balanced across centres and there is no evidence to adjust the zonal boundaries as all adjusted p-values are greater than 0.05.

Table 1 Number of heart registrations (1 August 2018 – 31 July 2020) and donors (1 August 2017 – 31 July 2020), by registering centre/current allocation zone (since 8 January 2018)					
Centre/zone	Heart registrations		Heart donors in current zone		Adjusted p-value*
	N	%	N	%	
Birmingham	96	18	82	19	1.00
Glasgow	35	7	34	8	1.00
Harefield	101	19	88	20	1.00
Manchester	67	13	55	13	1.00
Newcastle	106	20	89	20	1.00
Papworth	121	23	87	20	1.00
UK	526	100	435	100	-

* Chi-squared test comparison of proportion of registrations with proportion of donors, p-value adjusted for multiple comparisons using Bonferroni correction

Donor Activity

16 In the 31-month period from 8 January 2018 to 31 July 2020 (since the zones have been stable), there were 2,324 adult DBD donors who donated at least one organ. **Table 2** shows the breakdown of these donors by heart zone, with the number of hearts offered, accepted, retrieved, and transplanted. In total, 1340 (58%) hearts were offered, 796 were accepted, 378 were retrieved and 365 were transplanted. The utilisation rate (transplanted out of offered) is highest for donors that appeared in Manchester's allocation zone and lowest for donors that appeared in Glasgow's zone.

Table 2 Adult DBD heart organ donation and retrieval rates in the UK by allocation zone, 8 January 2018 - 31 July 2020

Zone	Number of DBD donors	Offered		Accepted		Retrieved		Transplanted		
		N	(% of donors)	N	(% of offered)	N	(% of accepted)	N	(% of retrieved)	(% of offered)
Birmingham	374	235	(63)	145	(62)	70	(48)	67	(96)	(29)
Glasgow	203	146	(72)	67	(46)	29	(43)	29	(100)	(20)
Harefield	491	248	(51)	153	(62)	75	(49)	72	(96)	(29)
Manchester	324	165	(51)	106	(64)	51	(48)	51	(100)	(31)
Newcastle	496	299	(60)	164	(55)	81	(49)	77	(95)	(26)
Papworth	435	246	(57)	160	(65)	71	(44)	68	(96)	(28)
UK	2324	1340	(58)	796	(59)	378	(47)	365	(97)	(27)

Transplant Activity

17 **Table 3** shows the number of adult heart transplants performed in the 31-month period (since the zones have been stable), by transplanting centre, broken down by whether the heart was from a zonal donor or an imported donor. This only considers transplants from UK adult DBD donors. Overall, 62% of transplants in the time period were performed using imported hearts. This proportion was highest for transplants performed by Harefield (68%) and lowest for Newcastle (53%).

Table 3 Adult heart transplants performed in the UK from UK adult DBD donors, by transplanting centre and zonal status of the donor, 8 January 2018 - 31 July 2020

Centre	Transplants		Zonal		Imported	
	N	N	(%)	N	(%)	
Birmingham	72	24	(33)	48	(67)	
Glasgow	28	12	(43)	16	(57)	
Harefield	59	19	(32)	40	(68)	
Manchester	50	18	(36)	32	(64)	
Newcastle	57	27	(47)	30	(53)	
Papworth	70	27	(39)	43	(61)	
UK	336	127	(38)	209	(62)	

CONCLUSIONS

- 18 There were no significant differences observed in the percentage share of heart registrations and donors across centres/zones, therefore no changes will be made to zonal boundaries at present.

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