

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 fourth 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 and each centre's percentage share of heart donors that arose in their zone. The time periods analysed are 1 March 2019 to 28 February 2022 for registrations, and 1 March 2018 to 28 February 2022 for donors.
- 3 The time period 1 April 2020 to 31 March 2021 is excluded from the analysis due to the impact of the pandemic on donor and registration activity.

RESULTS

Comparison of registrations and donors

- 4 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, there were no significant differences observed. Therefore, there is no evidence to change the zones at this time.

Donor activity

- 5 The national utilisation rate (transplanted out of offered) of adult DBD donor hearts was 26% during the time period.

Transplant activity

- 6 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 (63% vs 37%).

CONCLUSION

- 7 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 heart zonal boundaries at present.

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March 2022

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BACKGROUND

- 8 During 2017/18, the cardiothoracic allocation zones were split into separate heart and lung allocation zones in order to more appropriately match the supply of each organ with the demand at each centre. This split was phased in over a period of eight months to stagger the impact of the change. The first phase was implemented on 18 May 2017 and the second phase on 8 January 2018.
- 9 This report is the fourth 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 in April, with highlighted a need to alter the lung zones.
- 10 It was agreed by CTAG in October 2017 that any review of allocation zones should use the most up to date period of registration and donor data. The time period covers 2 years for registrations and 3 years for donors, however it was agreed by Cardiothoracic Centre Directors in June 2021 that the financial year 2020/21 should be removed from future analyses due to the impact of the COVID-19 pandemic on donation and registration activity. Therefore this report analyses:
 - Registrations: 1 March 2019 to 28 February 2022 (excluding 1 April 2020 to 31 March 2021)
 - Donors: 1 March 2018 to 28 February 2022 (excluding 1 April 2020 to 31 March 2021)
- 11 This report also covers activity data since 1 March 2018, for donors and transplants, including the number and utilisation of donors in each zone, and the number of zonal/imported transplants per centre.
- 12 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

13 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 centre/allocation zone (at the 5% significant level). It was agreed by CTAG in 2021 that the previously applied Bonferroni correction will be removed in future, in order to increase the sensitivity of the tests.

14 Registrations are defined as:

The total number of UK Group 1 heart or heart-lung registrations in the latest two year period 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 all 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.

15 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. 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.

RESULTS

Comparison of registrations and donors

16 **Figure 1** summarises the number of heart donors and registrations between 1 March 2019 and 28 February 2022. We note that there was a slight reduction in registrations following March 2020, with a second drop following January 2021. Due to this reduction in activity, the time-period 1 April 2020 – 31 March 2021 is excluded from the zonal assessment analysis.

Figure 1 Number of Heart donors and registrations, 1 March 2019 – 28 February 2022



17 **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 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 of a need to adjust the zonal boundaries as all p-values are greater than 0.05.

Table 1 Number of heart registrations (1 March 2019 – 28 February 2022)¹ and donors (1 March 2018 – 28 February 2022)¹, by registering centre/current allocation zone (since 8 January 2018)					
Centre/zone	Heart registrations		Heart donors in current zone		p-value ²
	N	%	N	%	
Birmingham	74	15	72	18	0.22
Glasgow	45	9	31	8	0.47
Harefield	108	22	86 ³	21	0.91
Manchester	58	12	55	14	0.36
Newcastle	105	21	87	22	0.85
Papworth	106	21	70	17	0.14
UK	496	100	401	100	-

¹ Donations and registrations between 1 April 2020 and 31 March 2021 have been excluded from the analysis due to the reduction in cardiothoracic activity caused by the pandemic.

² Chi-squared test comparisons of proportion of registrations with proportion of donors, please note that the p-value has not been adjusted for multiple comparisons

³ One donor has been allocated to Harefield, but did not have an allocation zone at the time of offering

Donor Activity

18 In the period from 1 March 2018 to 28 February 2022 (excluding 1 April 2020 – 31 March 2021), there were 2665 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, 1499 (56%) hearts were offered, 888 were accepted (59% of those offered), 411 were retrieved (46% of those accepted) and 397 were transplanted (97% of those retrieved). The utilisation rate (transplanted out of offered) was 26% nationally.

Table 2 Adult DBD heart organ donation and retrieval rates in the UK by allocation zone, 1 March 2018 – 28 February 2022 (excluding 1 April 2020 – 31 March 2021)										
Zone	Number of DBD donors	Offered		Accepted		Retrieved		Transplanted		
		N	(% of donors)	N	(% of offered)	N	(% of accepted)	N	(% of retrieved)	(% of offered)
Birmingham	419	257	(61)	150	(58)	74	(49)	71	(96)	(28)
Glasgow	221	149	(67)	71	(48)	30	(42)	30	(100)	(20)
Harefield	575	286	(50)	183	(64)	89	(49)	86	(97)	(30)
Manchester	357	180	(50)	117	(65)	54	(46)	54	(100)	(30)
Newcastle	589	342	(58)	194	(57)	91	(47)	86	(95)	(25)
Papworth	504	285	(57)	173	(61)	73	(42)	70	(96)	(25)
UK	2665	1499	(56)	888	(59)	411	(46)	397	(97)	(26)

Transplant Activity

19 **Table 3** shows the number of adult heart transplants performed in the period using UK adult donors, by transplanting centre, broken down by whether the heart was from a zonal donor or imported from outside the zone. Overall, 63% of transplants in the time period were performed using imported hearts.

Table 3 Adult heart transplants performed in the UK from UK adult DBD donors, by transplanting centre and zonal status of the donor, 1 March 2018 - 28 February 2022 (excluding 1 April 2020 – 31 March 2021)						
Centre	Transplants		Zonal		Imported	
	N	N	(%)	N	(%)	
Birmingham	69	23	(33)	46	(67)	
Glasgow	38	13	(34)	25	(66)	
Harefield	61	23	(38)	38	(62)	
Manchester	55	20	(36)	35	(64)	
Newcastle	65	30	(46)	35	(54)	
Papworth	77	25	(32)	52	(68)	
UK	365	134	(37)	231	(63)	

CONCLUSIONS

20 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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