

NHS BLOOD AND TRANSPLANT

CARDIOTHORACIC ADVISORY GROUP – LUNG

LATEST LUNG ALLOCATION DATA

SUMMARY

INTRODUCTION

1. The super-urgent and urgent lung allocation schemes were introduced on 18 May 2017. This report presents data from the first 20 months, up to 17 January 2019.

DATA

2. Data were extracted from the UK Transplant Registry on 7 February 2019 for all adult (age \geq 16) patients registered for a lung transplant between 18 May 2017 and 17 January 2019. Registration outcomes were analysed as well as median waiting time to transplant. The number of adult lung transplants performed in each urgency group was analysed including one year survival rates, where survival data were extracted on 14 February 2019.

KEY RESULTS

3. There were 425 non-urgent registrations (for 424 patients), 91 urgent registrations (for 90 patients), and 19 super-urgent registrations (for 19 patients). Super-urgent registrations represented 4% of all registrations in the period and all but one patient was on ECMO. Thirty percent of non-urgent registrations ended in transplant compared with 76% for urgent registrations and 63% for super-urgent registrations (**Tables 1-3**).
4. Pulmonary fibrosis represented 37% of non-urgent registrations, 51% of urgent registrations and 42% of super-urgent registrations and in each urgency group these patients had the highest mortality rate on the list. No patients with COPD were registered urgently or super-urgently. The most common primary disease group in the super-urgent group was CF and bronchiectasis (**Tables 4-6**).
5. CF and bronchiectasis patients were younger on average, with a median of 30-33 years. PF patients were older with a median age of 57-58. The overall median age of super-urgent registrations was 35 years (**Table 7**).
6. In this 20 month cohort, median waiting time to transplant was 8 days for super-urgent and 17 days for urgent (**Table 9**). The non-urgent median waiting time couldn't be estimated.
7. Of the 297 lung transplants performed in the period, 73% were non-urgent, 23% urgent and 4% super-urgent. The one year patient survival rates were 85.8%, 82.4% and 73.3%, respectively ($p=0.5$).

CONCLUSION

8. This report provides the latest data on lung allocation in adults since the super-urgent and urgent lung allocation schemes were introduced. All but one centre has registered at least one super-urgent patient and all centres have registered urgent patients, but these remain a small proportion of all patients registered and transplanted.

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INTRODUCTION

9. The super-urgent and urgent lung allocation schemes were introduced on 18 May 2017. Data on registrations, waiting times and survival for the first 10 months, up to 17 March 2018, were presented to the Cardiothoracic Advisory Group in April 2018. This report presents data from the first 20 months, up to 17 January 2019.

DATA AND METHODS

10. Data were extracted from the UK Transplant Registry on 7 February 2019 for all adult (age \geq 16) patients registered for a lung transplant between 18 May 2017 and 17 January 2019. Registrations for heart-lung transplant were excluded, and multiple registrations for the same patient were allowed (so the same patient may appear in different urgency categories if they changed urgency within the time period).
11. Registration outcomes were analysed across urgency groups, by centre and primary disease group. Median age at registration was analysed across primary disease groups and urgency as well as median waiting time to transplant.
12. The number of adult lung transplants performed in each urgency category was analysed as well as short-term survival outcomes, where survival data were extracted on 14 February 2019. Heart-lung transplants were excluded.

RESULTS**Registration data**

13. **Tables 1-3** present the outcomes of non-urgent, urgent and super-urgent registrations during the 20 month period, by centre. Note that those patients registered towards the end of the time period are more likely to be “still waiting”. There were 425 non-urgent registrations (for 424 patients), 91 urgent registrations (for 90 patients), and 19 super-urgent registrations (for 19 patients). Super-urgent registrations represented 4% of all registrations in the period. Thirty percent of non-urgent registrations ended in transplant compared with 76% for urgent registrations and 63% for super-urgent registrations.

Centre	Still waiting		Died		Removed		Became S-U		Transplanted		Became U		Total N
	N	%	N	%	N	%	N	%	N	%	N	%	
Birmingham	30	52	7	12	3	5	1	2	13	22	4	7	58
Harefield	61	46	20	15	7	5	5	4	35	26	5	4	133
Manchester	33	51	5	8	2	3	0	0	21	32	4	6	65
Newcastle	49	56	12	14	1	1	1	1	14	16	11	13	88
Papworth	21	26	2	2	1	1	2	2	45	56	10	12	81
Total	194	46	46	11	14	3	9	2	128	30	34	8	425

Table 2 Outcomes of URGENT lung registrations, 18 May 2017 – 17 Jan 2019, as at 7 Feb 2019, by centre

Centre	Still waiting		Died			Became N-U		Removed		Became S-U		Transplanted		Total N
	N	%	N	%	N	%	N	%	N	%	N	%		
Birmingham	0	0	1	8	0	0	1	8	2	17	8	67	12	
Harefield	0	0	1	6	0	0	1	6	3	19	11	69	16	
Manchester	0	0	0	0	2	22	0	0	0	0	7	78	9	
Newcastle	1	3	3	9	0	0	4	12	1	3	24	73	33	
Papworth	0	0	1	5	0	0	0	0	1	5	19	90	21	
Total	1	1	6	7	2	2	6	7	7	8	69	76	91	

Table 3 Outcomes of SUPER-URGENT lung registrations, 18 May 2017 – 17 Jan 2019, as at 7 Feb 2019, by centre

Centre	Died		Removed		Transplanted		Total N
	N	%	N	%	N	%	
Birmingham	0	0	0	0	2	100	2
Harefield	3	23	2	15	8	62	13
Manchester	0	-	0	-	0	-	0
Newcastle	2	100	0	0	0	0	2
Papworth	0	0	0	0	2	100	2
Total	5	26	2	11	12	63	19

Note: all 19 registrations were under category 91=VV-ECMO, except one patient registered by Papworth who was granted super-urgent listing by the adjudication panel as a special case

14. **Tables 4-6** present the outcomes of non-urgent, urgent and super-urgent registrations during the 20 month period, by disease group. In this time period, pulmonary fibrosis represented 37% of non-urgent registrations, 51% of urgent registrations and 42% of super-urgent registrations and in each urgency group these patients had the highest mortality rate on the list. No patients with COPD listed as their primary disease were registered urgently or super-urgently. The most common primary disease group in the super-urgent group was CF and bronchiectasis.

Table 4 Outcomes of NON-URGENT lung registrations, 18 May 2017 – 17 Jan 2019, as at 7 Feb 2019, by primary disease group

Disease group	Still waiting		Died		Remove d		Becam e S-U		Transplante d		Becam e U		Total N
	N	%	N	%	N	%	N	%	N	%	N	%	
COPD	62	53	6	5	3	3	0	0	46	39	0	0	117
CF and bronchiectasis	41	43	5	5	0	0	4	4	37	39	9	9	96
PF	70	45	29	19	8	5	4	3	25	16	20	13	156
Other	21	38	6	11	3	5	1	2	20	36	5	9	56
Total	194	46	46	11	14	3	9	2	128	30	34	8	425

Table 5 Outcomes of URGENT lung registrations, 18 May 2017 – 17 Jan 2019, as at 7 Feb 2019, by primary disease group

Disease group	Still waiting		Died		Became N-U		Removed		Became S-U		Transplanted		Total N
	N	%	N	%	N	%	N	%	N	%	N	%	
COPD	0	-	0	-	0	-	0	-	0	-	0	-	0
CF and bronchiectasis	1	4	0	0	1	4	2	7	4	14	20	71	28
PF	0	0	6	13	0	0	3	7	2	4	35	76	46
Other	0	0	0	0	1	6	1	6	1	6	14	82	17
Total	1	1	6	7	2	2	6	7	7	8	69	76	91

Table 6 Outcomes of SUPER-URGENT lung registrations, 18 May 2017 – 17 Jan 2019, as at 7 Feb 2019, by primary disease group

Disease group	Died		Removed		Transplanted		Total N
	N	%	N	%	N	%	
COPD	0	-	0	-	0	-	0
CF and bronchiectasis	1	10	0	0	9	90	10
PF	4	50	2	25	2	25	8
Other	0	0	0	0	1	100	1
Total	5	26	2	11	12	63	19

15. **Table 7** presents median age at registration, including the inter quartile range (IQR), by disease group and urgency. CF and bronchiectasis were younger on average, with a median of 30-33 years. PF patients were older with a median age of 57-58. The overall median age of super-urgent registrations was 35 years.

Table 7 Summary statistics for age at registration by disease group and urgency

Disease group	Non-urgent			Urgent			Super-urgent		
	N	Median	IQR	N	Median	IQR	N	Median	IQR
COPD	117	57	52-60	0	-	-	0	-	-
CF and bronchiectasis	96	33	26-41	28	30	27-33	10	33	29-34
PF	156	58	53-63	46	58	50-61	8	57	50-63
Other	56	50	40-56	17	47	36-52	1	23	-
Total	425	54	43-60	91	48	32-58	19	35	30-57

16. **Table 8** presents details of the 19 super-urgent patients registered during the time period, including their primary disease, the super-urgent category they were registered under, their age, their time on the non-urgent and/or urgent waiting list before super-urgent registration, their time spent on the super-urgent waiting list and their super-urgent registration outcome (**removed as patient specific**).
17. **Table 9** presents median waiting time to transplant across urgency groups, including 95% confidence intervals (CI).

Urgency	Number of registrations	Number transplanted as at 7 Feb 2019	Waiting time (days)	
			Median	95% CI
Non-urgent ¹	425	128 (30%)	-	-
Urgent	91	69 (76%)	17	10 - 24
Super-urgent	19	12 (63%)	8	1 - 15
Overall¹	535	209 (39%)	327	-

¹ Not possible to estimate median/confidence interval

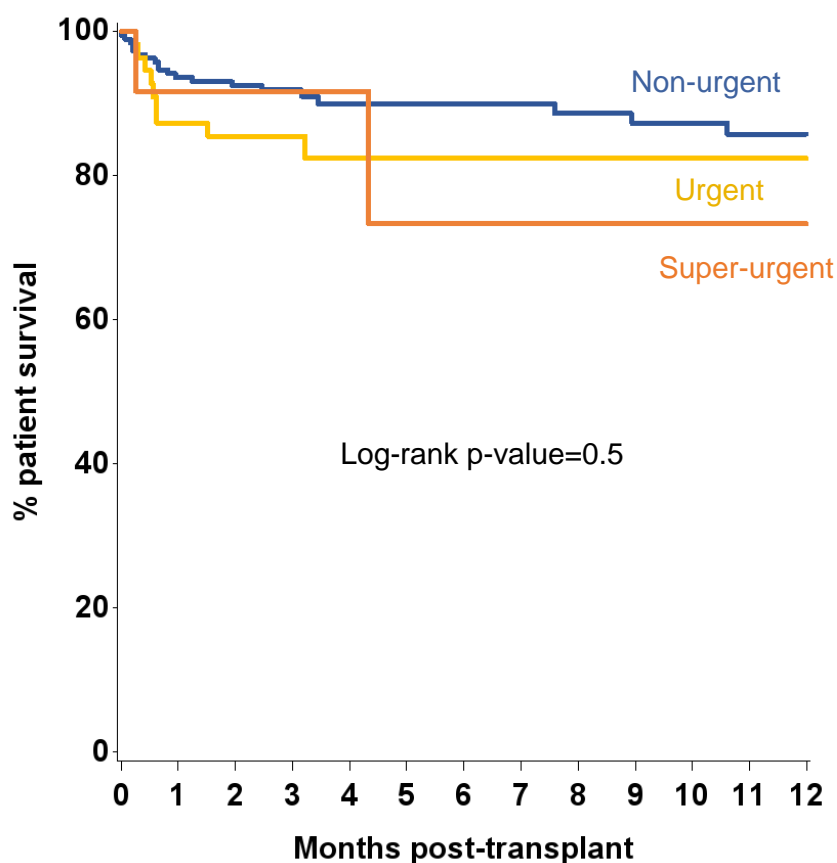
Transplant data

18. **Table 10** presents the number of transplants performed by each centre in each urgency category over the analysis period. Note that some of the patients were registered before the analysis period, so these number will not match up with those transplanted in the previous section.

Centre	Non-urgent		Urgent		Super-urgent		Total N
	N	%	N	%	N	%	
Birmingham	20	67	8	27	2	7	30
Harefield	76	80	11	12	8	8	95
Manchester	33	80	8	20	0	0	41
Newcastle	34	60	23	40	0	0	57
Papworth	54	73	18	24	2	3	74
Total	217	73	68	23	12	4	297

19. **Figure 1** and **Table 11** present one year survival curves by urgency, where re-grafts (N=4) and patients with missing survival data were excluded (26 non-urgent transplants and 13 urgent transplants). Of the 12 super-urgent transplants performed there were 2 deaths recorded post-transplant, however the one year survival rate of 73.3% should be interpreted with caution due to small numbers and short follow-up period (hence the wide confidence interval).

Figure 1 1 year Kaplan-Meier patient survival curves for adult patients transplanted 18 May 2017 – 17 Jan 2019, by urgency



Urgency	Number of transplants	Number of deaths as at 14 Feb 2019	Survival (%)	95% CI
Non-urgent	187	20	85.8	77.8-91.0
Urgent	55	9	82.4	68.4-90.6
Super-urgent	12	2	73.3	24.3-93.4
Overall	254	31	84.5	78.0-89.2

CONCLUSION

20. This report provides the latest data on lung allocation in adults since the super-urgent and urgent lung allocation schemes were introduced. All but one centre has registered at least one super-urgent patient and all centres have registered urgent patients, but these remain a small proportion of all patients registered and transplanted.
21. The chance of transplant is considerably higher for urgent and super-urgent registrations compared with non-urgent registrations, and the median waiting time to transplant is much shorter. Some disease groups have benefitted more than others from the introduction of these schemes.