

NHS BLOOD AND TRANSPLANT

CARDIOTHORACIC ADVISORY GROUP

GRADING OF RETRIEVED ORGAN FORMS RETURN RATES

SUMMARY

INTRODUCTION

1. The **Grading of Retrieved Donor Heart (FRM5722)** and **Grading of Retrieved Donor Lung(s) (FRM5721)** forms were introduced as a pilot on 18 January 2017 for all hearts and lungs that were retrieved with the intention of transplantation.
2. This report examines the grading form return rates for organs retrieved between 18 January 2017 to 31 December 2018. Also, for the first time, the data within the forms was analysed and comparisons were made between the lead retrieval surgeon and the lead recipient surgeon responses.

RESULTS

3. Between 18 January 2017 and 31 December 2018 (almost two years), there were 395 heart retrievals and 429 lung retrievals. The heart grading form return rate was 85% from retrieval surgeons and 73% from recipient surgeons (excluding those transplanted overseas or not received). The lung grading form return rate was 80% from retrieval surgeons and 65% from recipient surgeons (excluding those transplanted overseas or not received). There was variation in the return rates across teams.
4. On the whole there was agreement between the retrieval and recipient surgeon responses in relations to heart and lung structure, vascular cuffs and airway information. The question with the highest disagreement was the lung structure and whether it was under inflated with atelectasis (11% disagreement). In 90-92% of cases there was no repair or injury reported to the heart or lungs. In 68-69% of cases the communication from the retrieval surgeon to the recipient surgeon was reported to be excellent.

ACTION

5. Members are asked to consider the information in this report and comment on the comparative analysis presented. Cardiothoracic retrieval and recipient teams are asked whether the data collected and questions asked are comprehensive as these have been built into the electronic HTA A forms which are being developed. This data collection can finish once these new electronic HTA A forms have been implemented.

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INTRODUCTION

6. The **Grading of Retrieved Donor Heart (FRM5722)** and **Grading of Retrieved Donor Lung(s) (FRM5721)** forms were introduced as a pilot on 18 January 2017 for all hearts and lungs that were retrieved with the intention of transplantation.
7. One copy of these grading forms should be completed by the lead retrieval surgeon after retrieval, and one copy by the lead recipient (transplant) surgeon on receipt of the organ, prior to implantation. The aim is to collect more detailed data on organ retrieval damage beyond what is captured on the HTA-A and HTA-B forms, in order to provide feedback and improve retrieval standards.
8. The forms, shown in **Appendix A1**, should be completed at the time of retrieval/transplant. They can initially be filled in by hand, but they must be submitted to NHSBT electronically using the submit button on the form, which will automatically return the form as an attachment to CardiothoracicStatistics@nhsbt.nhs.uk.

DATA

9. This report examines the grading form return rates for organs retrieved between 18 January 2017 to 31 December 2018. Chase reports were sent to Organ Grading Form Champions on 23 January 2019 and teams given 2 weeks to return any outstanding forms. Any forms returned after 27 February 2019 were not considered.
10. For the first time the data within the forms have been analysed and a comparative analysis was performed between the responses of the lead retrieval surgeon and the responses of the lead recipient surgeon. For this analysis, only hearts that were retrieved in the UK and received by a UK centre were included. For lungs, only bilateral lung retrievals in the UK were included where bilateral lungs were received by a UK centre.

RESULTS

Form return rates

11. Between 18 January 2017 and 31 December 2018 there were 395 hearts retrieved, of which 374 were transplanted in the UK, 6 were transplanted overseas and 15 were subsequently declined after retrieval. For those not transplanted, it was assumed that they were received by the accepting centre unless there was information in the notes to suggest otherwise. The overall return rate was 85% from retrieval teams and 73% from transplant teams (those transplanted overseas were not considered). See **Table 1a** and **Table 1b** for a breakdown of rates by retrieval team and transplant team, respectively.

Table 1a Grading of Retrieved Donor Heart form return rate by heart retrieval team, for hearts donated between 01 Jan 17 – 31 Dec 18 (inclusive)										
Retrieval Team	18 Jan 17 – 30 Jun 17		01 Jul 17 – 31 Dec 17		01 Jan 18 – 30 Jun 18		01 Jul 18 – 31 Dec 18		TOTAL	
	Retrieved	Returned (%)	Retrieved	Returned (%)	Retrieved	Returned (%)	Retrieved	Returned (%)	Retrieved	Returned (%)
Birmingham	10	9(90)	15	10(67)	13	7(54)	10	5(50)	48	31(65)
Glasgow	5	5(100)	3	3(100)	5	5(100)	5	5(100)	18	18(100)
Harefield	19	19(100)	21	21(100)	26	26(100)	20	20(100)	86	86(100)
Manchester	18	18(100)	16	15(94)	22	22(100)	17	16(94)	73	71(97)
Newcastle	13	8(62)	16	4(25)	17	10(59)	12	9(75)	58	31(53)
Papworth	21	20(95)	37	37(100)	29	28(97)	25	14(56)	112	99(88)
Total	86	79(92)	108	90(83)	112	98(88)	89	69(78)	395	336(85)

Table 1b Grading of Retrieved Donor Heart form return rate by heart transplant team, for hearts donated between 01 Jan 17 – 31 Dec 18 (inclusive)										
Transplant Team	18 Jan 17 – 30 Jun 17		01 Jul 17 – 31 Dec 17		01 Jan 18 – 30 Jun 18		01 Jul 18 – 31 Dec 18		TOTAL	
	Received	Returned (%)	Received	Returned (%)	Received	Returned (%)	Received	Returned (%)	Received	Returned (%)
Birmingham	9	2(22)	12	3(25)	13	3(23)	10	6(60)	44	14(32)
GOSH	3	3(100)	8	8(100)	10	9(90)	6	6(100)	27	26(96)
Glasgow	7	7(100)	4	4(100)	4	4(100)	5	5(100)	20	20(100)
Harefield	16	16(100)	22	22(100)	26	26(100)	18	18(100)	82	82(100)
Manchester	9	9(100)	10	10(100)	12	12(100)	14	14(100)	45	45(100)
Newcastle	13	0(0)	23	7(30)	18	1(6)	16	0(0)	70	8(11)
Papworth	26	25(96)	27	24(89)	26	24(92)	19	13(68)	98	86(88)
Total	83	62(75)	106	78(74)	109	79(72)	88	62(70)	386	281(73)

Note: all but 15 hearts were transplanted and for those that were not it was assumed that they were received by the accepting centre, except in 1 case. 6 of the hearts in Table 1a were transplanted overseas and so are not included in this table as we would not expect a form.

12. There were 429 lung retrievals during the specified time period, which led to 380 lung transplants in the UK, 9 overseas and 54 were subsequently declined after retrieval. For those not transplanted, it was assumed that they were received by the accepting centre unless there was information in the notes to suggest otherwise. The overall return rate was 80% from retrieval teams and 65% from transplant teams (excluding those transplanted overseas or not received). See **Table 2a** and **Table 2b** for a breakdown of rates by retrieval team and transplant team.

Table 2a Grading of Retrieved Donor Lung form return rate by lung retrieval team, for lungs donated between 01 Jan 17 – 31 Dec 18 (inclusive)

Retrieval Team	18 Jan 17 – 30 Jun 17		01 Jul 17 – 31 Dec 17		01 Jan 18 – 30 Jun 18		01 Jul 18 – 31 Dec 18		TOTAL	
	Retrieved	Returned (%)	Retrieved	Returned (%)	Retrieved	Returned (%)	Retrieved	Returned (%)	Retrieved	Returned (%)
Birmingham	18	16(89)	15	14(93)	20	19(95)	16	9(56)	69	58(84)
Glasgow	10	10(100)	7	7(100)	5	4(80)	6	6(100)	28	27(96)
Harefield	22	21(95)	25	24(96)	27	26(96)	27	26(96)	101	97(96)
Manchester	16	15(94)	19	18(95)	21	20(95)	16	15(94)	72	68(94)
Newcastle	19	6(32)	16	3(19)	18	5(28)	9	5(56)	62	19(31)
Papworth	18	18(100)	24	23(96)	27	24(89)	28	8(29)	97	73(75)
Total	103	86(83)	106	89(84)	118	98(83)	102	69(68)	429	342(80)

Table 2b Grading of Retrieved Donor Lung form return rate by lung transplant team, for lungs donated between 01 Jan 17 – 31 Dec 18 (inclusive)

Transplant Team	18 Jan 17 – 30 Jun 17		01 Jul 17 – 31 Dec 17		01 Jan 18 – 30 Jun 18		01 Jul 18 – 31 Dec 18		TOTAL	
	Received	Returned (%)	Received	Returned (%)	Received	Returned (%)	Received	Returned (%)	Received	Returned (%)
Birmingham	8	4(50)	8	5(63)	13	9(69)	9	8(89)	38	26(68)
GOSH	3	3(100)	1	1(100)	2	2(100)	2	2(100)	8	8(100)
Harefield	29	28(97)	33	33(100)	25	24(96)	37	11(30)	124	96(77)
Manchester	14	13(93)	17	15(88)	17	17(100)	9	9(100)	57	54(95)
Newcastle	18	0(0)	27	7(26)	27	4(15)	18	0(0)	90	11(12)
Papworth	27	21(78)	18	15(83)	31	26(84)	25	15(60)	101	77(76)
Total	99	69(70)	104	76(73)	115	82(71)	100	45(45)	418	272(65)

Note: this table counts double lungs accepted for a bilateral lung transplant just once. If both lungs were retrieved and accepted by different centres this is counted once in Table 2a but twice in this table. Lungs transplanted overseas were removed as were those where the notes suggested the lungs were declined before travelling to the accepting centre.

Comparative analysis

HEART

13. **Tables 3a – 5** provide summaries of the data reported via the heart grading form. In 249 (65%) out of 384 retrievals both retrieval and recipient forms were returned and in 224 (90%) of these, there was agreement between the two that there was no repair to the heart required (**Table 3a**). There were 2 cases where both agreed that repair not affecting function was required and 1 case where both agreed that the heart was damaged beyond repair. There were 22 (9%) cases where there was disagreement between what the retrieval surgeon reported and what the recipient surgeon reported.

Retrieval Surgeon	Recipient surgeon					Total
	H0	H1	H2	H3	Missing	
H0 No repair to heart required	224	12	1	0	74	311
H1 Repair required – will not affect function	6	2	2	0	4	14
H2 Repair required – will affect function	0	0	0	1	0	1
H3 Damage beyond repair	0	0	0	1	0	1
Missing	30	1	0	0	26	57
Total	260	15	3	2	104	384

14. **Tables 3b – 3e** compare the retrieval surgeon and the recipient surgeon heart structure suffix data. There were 243 cases where both had reported answers to these questions. In 18 (7%) cases there was disagreement about whether ASD or PFO was present. There were no reports of bicuspid aortic valve or congenital anomaly. There were 4 cases where the retrieval surgeon reported palpable coronary disease but the recipient surgeon did not.

Retrieval Surgeon	Recipient surgeon			Total
	Yes	No	Missing	
Yes	3	13	3	19
No	5	222	79	306
Missing	2	31	26	59
Total	10	266	108	384

Retrieval Surgeon	Recipient surgeon			Total
	Yes	No	Missing	
Yes	0	0	0	0
No	0	243	82	325
Missing	0	33	26	59
Total	0	276	108	384

Retrieval Surgeon	Recipient surgeon			Total
	Yes	No	Missing	
Yes	0	0	0	0
No	0	243	82	325
Missing	0	33	26	59
Total	0	276	108	384

Retrieval Surgeon	Recipient surgeon			Total
	Yes	No	Missing	
Yes	0	4	2	6
No	0	239	80	319
Missing	0	33	26	59
Total	0	276	108	384

15. **Table 4** compares the vascular cuffs grading data for hearts. There were 248 cases where both retrieval and recipient surgeon data were available and of these there was agreement in 235 (95%) cases. In 13 cases there was disagreement, with recipient surgeons reporting in 3 occasions that material was required to bridge anastomosis.

Retrieval Surgeon	Recipient surgeon				Total
	V0	V1	V2	Missing	
V0 Tissue to spare	235	9	1	78	323
V1 No tissue to spare	1	0	2	0	3
V2 Material required to bridge anastomosis	0	0	0	0	0
Missing*	28	4	0	26	58
Total	264	13	3	104	384

*Includes 1 case by Glasgow retrieval team where the form was returned but the field was not populated

16. The communication question is only answered by the recipient surgeon (**Table 5**). Of the 278 cases where the form was returned and the question was answered, 69% of times the recipient surgeon reported that the communication of the retrieval surgeon was excellent, in 18% it was good, 5% average and 1% poor (in the remaining cases not required was answered).

	Communication grade						Missing*	Total
	C0 Excellent	C1 Good	C2 Average	C3 Poor	C4 Omitted	Not required		
Recipient surgeon	193	50	13	2	0	20	106	384

*Includes 2 cases by Harefield where the field was not populated

LUNG

17. **Tables 6a – 9** provide summaries of the data reported via the lung grading form. In 210 (57%) out of 365 retrievals both retrieval and recipient forms were returned and in 194 (92%) of these, there was agreement between the two that there was no lung parenchymal injury (**Table 6a**). There were 2 cases where both agreed that there was lung parenchymal injury requiring repair. There were 14 (7%) cases where there was disagreement between what the retrieval surgeon reported and what the recipient surgeon reported.

Retrieval Surgeon	Recipient surgeon					Total
	L0	L1	L2	L3	Missing	
L0 No lung parenchymal injury	194	5	1	4	87	291
L1 Lung parenchymal injury requiring repair	3	2	0	1	3	9
L2 Lung injury requiring lung resection	0	0	0	0	0	0
L3 Lung untransplantable	0	0	0	0	0	0
Missing	34	1	1	0	29	65
Total	231	8	2	5	119	365

18. **Tables 6b – 6d** compare the retrieval surgeon and the recipient surgeon lung structure suffix data. There were 200 cases where both had reported answers to these questions. In 1 case there was disagreement about whether the lungs were hyper-inflated, in 21 (11%) cases there was disagreement about whether the lungs were under inflated with atelectasis, and in 3 cases there was disagreement about bullous disease.

Retrieval Surgeon	Recipient surgeon			Total
	Yes	No	Missing	
Yes	0	1	2	3
No	0	199	98	297
Missing	0	35	30	65
Total	0	235	130	365

Retrieval Surgeon	Recipient surgeon			Total
	Yes	No	Missing	
Yes	3	6	2	11
No	15	176	98	289
Missing	3	32	30	65
Total	21	214	130	365

Retrieval Surgeon	Recipient surgeon			Total
	Yes	No	Missing	
Yes	0	3	1	4
No	0	197	99	296
Missing	0	35	30	65
Total	0	235	130	365

19. **Tables 7a** and **7b** report the airway data. In 209 out of 210 cases where both forms were completed there was agreement that there was airway to spare. In 1 case the retrieval surgeon reported that there was no airway to spare but the recipient surgeon did not report this. There were no reports of airway denude of surrounding tissues.

Retrieval Surgeon	Recipient surgeon				Total
	A0	A1	A2	Missing	
A0 Airway to spare	209	0	0	90	299
A1 No airway to spare	1	0	0	0	1
A2 Airway repair required	0	0	0	0	0
Missing	36	0	0	29	65
Total	246	0	0	119	365

Retrieval Surgeon	Recipient surgeon			Total
	Yes	No	Missing	
Yes	0	0	0	0
No	0	200	100	300
Missing	0	35	30	65
Total	0	235	130	365

20. In 192 (91%) out of 210 cases where both data were available there was agreement between the vascular cuff responses of the retrieval and recipient surgeons. In the remaining 9% of cases there was disagreement (**Table 8**). Of the 246 cases where the recipient surgeon form was returned and the question was answered, 68% of times the recipient surgeon reported that the communication of the retrieval surgeon was excellent, in 24% it was good, 3% average and 2% poor (in the remaining cases it was either omitted or not required).

Retrieval Surgeon	Recipient surgeon				Total
	V0	V1	V2	Missing	
V0 Tissue to spare	190	6	4	85	285
V1 No tissue to spare	5	2	2	5	14
V2 Material required to bridge anastomosis	0	1	0	0	1
Missing	31	5	0	29	65
Total	226	14	6	119	365

	Communication grade						Missing	Total
	C0 Excellent	C1 Good	C2 Average	C3 Poor	C4 Omitted	Not required		
Recipient surgeon	168	60	7	5	1	5	119	365

CONCLUSIONS

21. The organ grading forms have been in place for 2 years and over that time the form return rates for retrieved hearts were 85% from retrieval surgeons and 73% from recipient surgeons. For retrieved lungs the return rates were lower at 80% from retrieval surgeons and 65% from recipient surgeons. There was variation in the return rates across teams.
22. On the whole there was agreement between the retrieval and recipient surgeon responses in relations to heart and lung structure, vascular cuffs and airway information. The question with the highest disagreement was the lung structure and whether it was under inflated with atelectasis (11% disagreement). In 90-92% of cases there was no repair or injury reported to the heart or lungs. In 68-69% of cases the communication from the retrieval surgeon to the recipient surgeon was reported to be excellent.

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Appendix A1 – screen shots of Grading of Retrieved Donor Heart (FRM5722) and Grading of Retrieved Donor Lung(s) (FRM5721)

Heart

UK TRANSPLANT REGISTRY		Submit form	*Mandatory field	NHS <i>Blood and Transplant</i>
DONOR DETAILS Section 1				
Date donor notified*	<input type="text"/>	Donor hospital	<input type="text"/>	ODT Donor number*
Heart Structure Section 2				
<i>(Please tick ONE of the following options) *</i>				
<input checked="" type="checkbox"/> H0 No repair to heart required	<input type="text"/>			
<input checked="" type="checkbox"/> H1 Repair required – will not affect function (please specify):	<input type="text"/>			
<input checked="" type="checkbox"/> H2 Repair required – will affect function (please specify):	<input type="text"/>			
<input checked="" type="checkbox"/> H3 Damage beyond repair (please specify):	<input type="text"/>			
Suffix: <i>(Please tick all that apply)</i>				
<input type="checkbox"/> a = ASD or PFO present	<input type="text"/>			
<input type="checkbox"/> b = bicuspid aortic valve	<input type="text"/>			
<input type="checkbox"/> c = congenital anomaly (please specify):	<input type="text"/>			
<input type="checkbox"/> p = palpable coronary disease (please specify):	<input type="text"/>			
Vascular Cuffs Section 3				
<i>(Please tick ONE of the following options) *</i>				
<input checked="" type="checkbox"/> V0 Tissue to spare	<input type="text"/>			
<input checked="" type="checkbox"/> V1 No tissue to spare (please specify):	<input type="text"/>			
<input checked="" type="checkbox"/> V2 Material required to bridge anastomosis (please specify):	<input type="text"/>			
Completed by Section 4				
<input checked="" type="checkbox"/> Lead retrieval surgeon* (forename & surname):	<input type="text"/>	NORS team*	<input type="text"/>	
OR				
<input checked="" type="checkbox"/> Lead recipient surgeon* (forename & surname):	<input type="text"/>	Recipient centre*	<input type="text"/>	
Recipient surgeon ONLY, grade communication from retrieval surgeon <i>(Please tick ONE of the following options) *</i>				
<input checked="" type="checkbox"/> C0 Excellent	<input checked="" type="checkbox"/> C1 Good	<input checked="" type="checkbox"/> C2 Average	<input checked="" type="checkbox"/> C3 Poor	<input checked="" type="checkbox"/> C4 Required but omitted
<input checked="" type="checkbox"/> NR Not required				
Comments: <input type="text"/>				
FRM5722/1	Effective: 18/01/2017			

Lung

UK TRANSPLANT REGISTRY		Submit form	*Mandatory field	NHS <i>Blood and Transplant</i>
DONOR DETAILS Section 1				
Date donor notified*	<input type="text"/>	Donor hospital	<input type="text"/>	ODT Donor number*
Lung Structure Section 2				
<i>(Please tick ONE of the following options) *</i>				
<input checked="" type="checkbox"/> L0 No lung parenchymal injury	<input checked="" type="checkbox"/> B Bilateral lungs	<input checked="" type="checkbox"/> LS Left single lung	<input checked="" type="checkbox"/> RS Right single lung	
<input checked="" type="checkbox"/> L1 Lung parenchymal injury requiring repair (please specify):	<input type="text"/>			
<input checked="" type="checkbox"/> L2 Lung injury requiring lung resection (please specify):	<input type="text"/>			
<input checked="" type="checkbox"/> L3 Lung untransplantable (please specify):	<input type="text"/>			
Suffix: <i>(Please tick all that apply)</i>				
<input type="checkbox"/> h = "hyper-inflated"	<input type="text"/>			
<input type="checkbox"/> u = "under inflated with atelectasis"	<input type="text"/>			
<input type="checkbox"/> b = bullous disease (please specify):	<input type="text"/>			
Airway Section 3				
<i>(Please tick ONE of the following options) *</i>				
<input checked="" type="checkbox"/> A0 Airway to spare	<input checked="" type="checkbox"/> A1 No airway to spare			
<input checked="" type="checkbox"/> A2 Airway repair required (please specify):	<input type="text"/>			
Suffix: <i>(Please tick if applic)</i>				
<input type="checkbox"/> d = airway denude of surrounding tissues	<input type="text"/>			
Vascular Cuffs Section 4				
<i>(Please tick ONE of the following options) *</i>				
<input checked="" type="checkbox"/> V0 Tissue to spare	<input type="text"/>			
<input checked="" type="checkbox"/> V1 No tissue to spare (please specify):	<input type="text"/>			
<input checked="" type="checkbox"/> V2 Material required to bridge anastomosis (please specify):	<input type="text"/>			
Completed by Section 5				
<input checked="" type="checkbox"/> Lead retrieval surgeon* (forename & surname):	<input type="text"/>	NORS team*	<input type="text"/>	
OR				
<input checked="" type="checkbox"/> Lead recipient surgeon* (forename & surname):	<input type="text"/>	Recipient centre*	<input type="text"/>	
Recipient surgeon ONLY, grade communication from retrieval surgeon <i>(Please tick ONE of the following options) *</i>				
<input checked="" type="checkbox"/> C0 Excellent	<input checked="" type="checkbox"/> C1 Good	<input checked="" type="checkbox"/> C2 Average	<input checked="" type="checkbox"/> C3 Poor	<input checked="" type="checkbox"/> C4 Required but omitted
<input checked="" type="checkbox"/> NR Not required				
Comments: <input type="text"/>				
FRM5721/1	Effective: 18/01/2017			