NHS BLOOD AND TRANSPLANT

MULTI-VISCERAL AND COMPOSITE TISSUE ADVISORY GROUP

ALIGNING TRANSPLANT TYPE DEFINITIONS WITH THE INTERNATIONAL REGISTRY: PATIENT SURVIVAL OUTCOMES

INTRODUCTION

1. It has been noted that the current transplant type definitions used in data collection within the UK differ to those used in the International Registry. This can pose challenges when presenting patient survival outcomes and comparing outcomes following intestinal transplantation in the UK compared to other countries. This paper reports on patient survival following deceased donor intestinal transplantation, using the International Registry transplant type definitions.

DATA ANALYSIS

2. Data on 291 first elective intestinal transplants involving a deceased donor after brain death (DBD) performed in the UK between 1 January 2009 to 31 December 2024 were extracted from the UK Transplant Registry (UKTR) and analysed. Follow-up data were available on the UKTR as at 10 June 2025 for 291 (100%) patients. Please note this report includes six NHS group 2 patients and seven patients where NHS group was not reported.

3. Transplant types were assigned based on the definitions outlined in **Table 1**.

Table 1 **Transplant type definitions applied**

Transplant type	Mandatory organs	Optional organs
Small bowel	Small bowel	+ one or more of kidney, spleen, abdominal wall, colon, pancreas
Liver small bowel	Small bowel, liver	+ one or more of kidney, spleen, abdominal wall, colon, pancreas
Multivisceral	Small bowel, pancreas, liver, stomach	+ one or more of kidney, spleen, abdominal wall, colon
Modified multivisceral	Small bowel, pancreas, stomach	+ one or more of kidney, spleen, abdominal wall, colon

4. Kaplan-Meier patient survival curves were produced for first elective intestinal transplants and analysed by age group and transplant type. Patient survival is defined as the time from first transplant to death or last known survival reported to NHSBT irrespective of whether the patient received a retransplant after their first transplant. It should be noted that the results are based on small numbers and are not risk-adjusted so should be treated as guidance only.

5. The key messages are:
   - **Table 2** shows the 90 day, 1 year, 3 year, and 5 year survival rate estimates for paediatric recipients. There were no significant differences in outcome at 1 year between the transplant types. The survival rates at 3 and 5 years post-transplant should be interpreted with caution due to the low number of patients entering the interval alive, which may produce unstable estimates. Please note that there were too few paediatric modified multivisceral transplants to be included in the full transplant type breakdown in **Table 2** and **Figure 1**; modified multivisceral transplants are included in the breakdown by liver containing.
   - **Table 3** shows the 90 day, 1 year, 3 year, and 5 year survival rate estimates for adult recipients. In the adult analysis, when analysed up to 90 days, one year and three years post-transplant, there were significant differences in outcomes between the transplant types. At 90

days, small bowel transplants appear to have superior outcomes compared with the other transplant types. At three years post-transplant, multivisceral transplants appear to have worse outcomes.

- Non liver containing intestinal transplants patient survival outcomes appear to be significantly better than liver containing intestinal transplants at 3 years and 5 year for both adult and paediatric patients and a 90 days for adults, but there is no statically significant difference in patient survival outcomes at 1 year post-transplant (**Table 2, Table 3**).

ACTION

6. Members are asked to note the contents of this paper. Timely provision of three-month and annual follow-up data to NHSBT will aid more accurate estimation of outcomes following intestinal transplantation.

7. Members are asked to consider how to take this data forwards.

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PAEDIATRIC PATIENTS

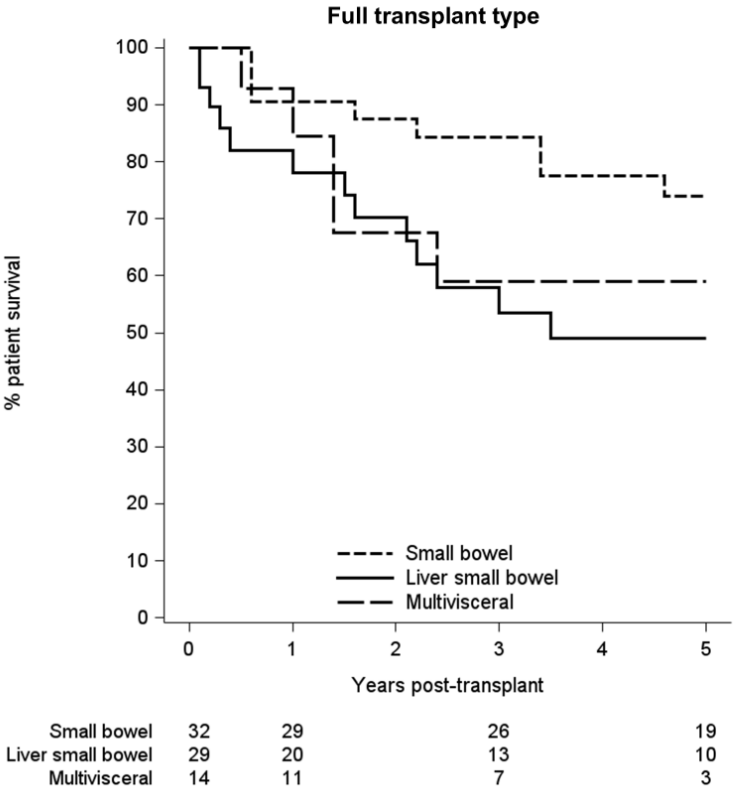
Table 2 **Unadjusted patient survival for first paediatric intestinal transplants between 1 January 2009 and 31 December 2024, by transplant type**

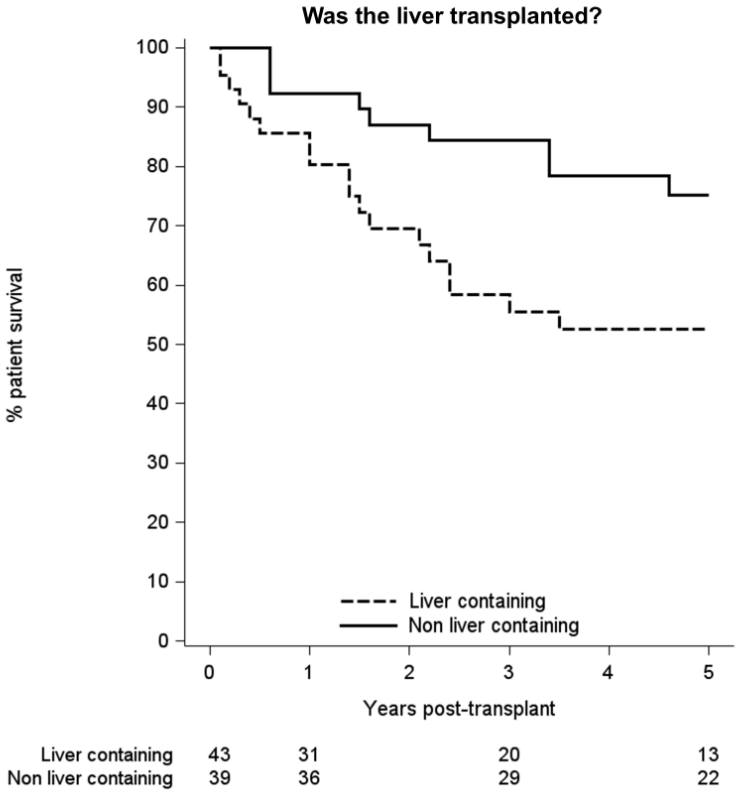
	No. of patients	% patient survival (95% CI) 90 day		1 year		3 year [2]		5 year [2]	
A. Full transplant type									
Small bowel	32	100	-	90.6	73.7 – 96.9	84.4	66.5 – 93.2	73.9	54.4 – 86.1
Liver small bowel	29	89.7	71.3 – 96.5	78.1	57.5 – 89.6	57.9	36.7 – 74.2	49.0	28.5 – 66.7
Multivisceral	14	100	-	92.9	59.1 – 99.0	59.1	27.7 – 80.6	59.1	27.7 – 80.6
Modified multivisceral[1]	7	-	-	-	-	-	-	-	-
Log-rank p-value		0.09		0.22		0.06		0.10	
B. Was the liver transplanted?									
Liver containing	43	93.0	79.9 – 97.7	83.0	67.5 – 91.5	58.4	41.2 – 72.2	52.6	35.5 – 67.1
Non liver containing	39	100	-	92.3	78.0 – 97.5	84.4	68.5 – 92.7	75.1	57.4 – 86.3
Log-rank p-value		0.10		0.18		0.01		0.02	
Overall	**82**	**96.3**	**89.1 – 98.8**	**87.5**	**77.9 – 93.1**	71.5	59.9 – 80.2	63.8	51.6 – 73.7

[1] Survival estimates not presented due to small numbers at risk

[2] Survival rates at 3 and 5 years should be interpreted with caution due to the low number of patients entering the interval alive, which may produce unstable estimates.

Figure 1 **Unadjusted 5 year paediatric patient survival after first intestinal transplantation from deceased donor after brain death (DBD), by transplant type, 1 January 2009 to 31 December 2024**





ADULT PATIENTS

Table 3 **Unadjusted patient survival for first adult intestinal transplants between 1 January 2009 and 31 December 2024, by transplant type**

	No. of patients	% patient survival (95% CI) 90 day		1 year		3 year [2]		5 year [2]	
A. Full transplant type									
Small bowel	110	97.3	91.8 – 99.1	87.9	80.0 – 92.8	78.7	69.1 – 85.6	71.6	60.8 – 79.9
Liver small bowel	35	94.3	79.0 – 98.5	85.3	68.2 – 93.6	68.6	49.3 – 81.8	54.4	33.6 – 71.2
Multivisceral	36	80.6	63.5 – 90.2	72.2	54.5 – 84.0	50.6	32.9 – 65.9	35.0	18.7 – 51.9
Modified multivisceral	28	85.7	66.3 – 94.4	70.7	49.8 – 84.2	70.7	49.8 – 84.2	58.8	35.5 – 76.1
Log-rank p-value		**0.003**		**0.03**		**0.007**		**0.001**	
B. Was the liver transplanted?									
Liver containing	71	87.3	77.1 - 93.2	78.7	67.2 – 86.6	59.4	46.5 – 70.2	44.4	31.1 – 56.9
Non liver containing	138	94.9	89.7 – 97.5	84.4	77.1 – 89.6	77.0	68.4 – 83.5	68.9	59.3 – 76.8
Log-rank p-value		**0.04**		0.24		**0.01**		**0.002**	
Overall	209	92.3	87.8 – 95.2	82.5	76.6 – 87.0	70.8	63.7 – 76.8	60.3	52.3 – 67.4

[2] Survival rates at 5 years should be interpreted with caution due to the low number of patients entering the interval alive, which may produce unstable estimates.

Figure 2 **Unadjusted 5 year adult patient survival after first intestinal transplantation from deceased donor after brain death (DBD), by transplant type, 1 January 2009 to 31 December 2024**