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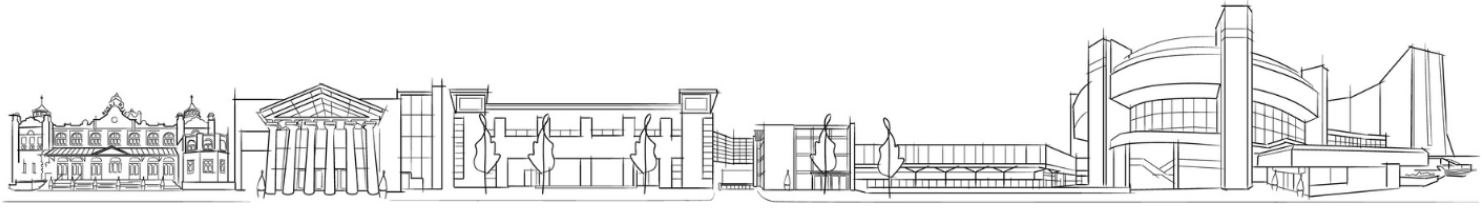
ABSTRACT BOOK

BTS Annual Congress 2024

5-8 March 2024 | HCC, Harrogate



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MEDAWAR
MEDAL PRESENTATIONS

BTS Annual Congress 2024

5-8 March 2024 | HCC, Harrogate

M1: Altered intestinal barrier and immunoregulatory gut-derived metabolites contribute to acute rejection in renal transplantation.

Mr Fernando Yuen Chang[1,2,3], Dr Amber Vaitkute[1,3], Miss Meryl H Attrill[1,4], Dr Stephanie Chong[2], Miss Hibo Mahdi[2], Professor Alan Salama[1,2], Professor Simon Eaton[4], Dr Hannah Bradford[1], Dr Chris Piper[1], Dr Mona Bajaj-Elliott[4], Professor Claudia Mauri[1], Dr Anne M Pesenacker[1], Professor Reza Motallebzadeh[1,3,2]

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Introduction: Long-term graft survival in renal transplantation remains a challenge. Gastrointestinal microbiota can impact extra-intestinal health. We aim to identify the interplay between the gut microbiota and recipient immunity in renal transplantation. Our hypothesis is that increased gut permeability and reduced availability of bacterial-derived metabolites associated with immunoregulation e.g. short chain fatty acids (SCFAs) and indole derivates, promotes a less tolerogenic environment that increases the risk of acute rejection (AR).

Methods: Transplant recipients (n=92) and live-donors (n=23) were recruited into a longitudinal study, with urine, stool and blood samples collected at baseline and up to 12-months after surgery. Flow cytometry was used to assess B-regs ($CD45^+CD19^+IL10^+$). Gut permeability was assessed by measuring plasma intestinal fatty acid binding protein (i-FABP). 16s rRNA sequencing of the faecal metagenome isolated from stool samples was used to determine the diversity, composition, and relative abundance of gut bacteria. Faecal SCFAs and indole-derivatives were identified by mass spectroscopy.

Results: Recipients with biopsy-proven AR had evidence of increased i-FABP before transplantation (figure 1a) and decreased indole derivatives, despite an increase in tryptophan availability after transplantation (figure 1b & c). Additionally, in AR, a decreased IL-10:TNF ratio in $CD19^+$ B-cells was observed, particularly within the transitional B-cell compartment ($CD45^+CD19^+CD24^{hi}CD38^{hi}IL10^+$), at 3-months (0.14±0.107 vs 0.08±0.04; $p<0.05$) and 6-months (0.11±0.05 vs 0.07±0.05; $p<0.05$. Figure 2a) compared to non-rejectors. Furthermore, we observed an increased frequency of B-regs in non-rejectors after transplantation when compared to baseline (2.66%±1.86% vs 4.62%±1.99%; $p=0.01$), and at 6-months when compared to rejectors (2.96%±1.69% vs 1.75%±1.25%; $p<0.05$. Figure 2).

Discussion: Increased gut permeability and reduced immunoregulatory metabolites are associated with reduction in IL-10+ B-regs, predisposing patients to AR. We postulate that decreased responsiveness or availability of indoles and SCFAs may impact B-reg generation and maintenance resulting in reduced immunological tolerance that contributes to AR.

Figure 1. Increased pre-transplant gut permeability and decreased immunoregulatory gut-derived metabolites in recipients that develop biopsy-proven acute rejection

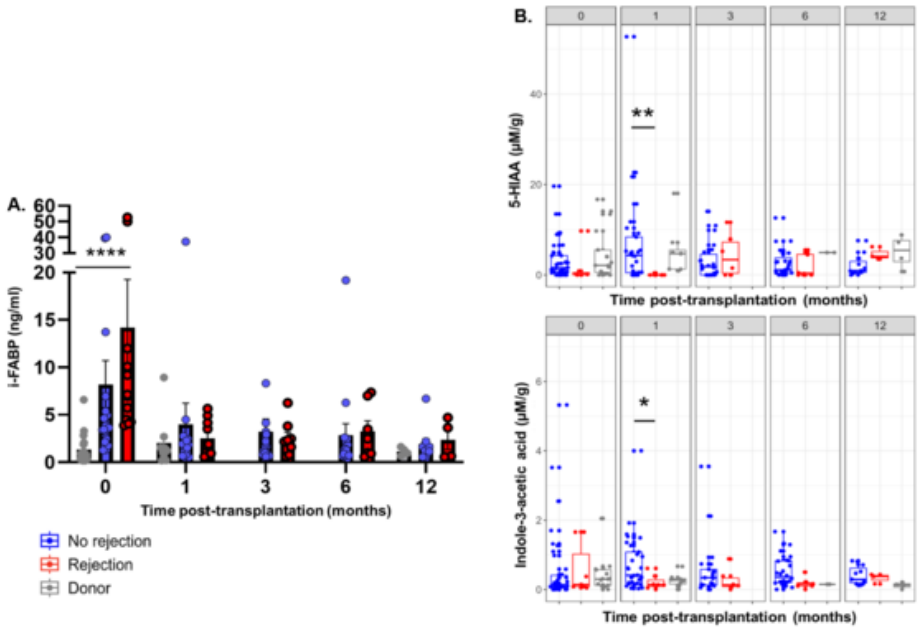

Figure 1. Concentrations of intestinal fatty-acid binding protein (I-FABP), 5-hydroxyindoleacetic acid (5-HIAA) and indole-3-acetic acid (3-IAA) in serum of live-donors (n=20), recipients without BPAR (n=21) and recipients with BPAR (n=13) by ELISA and mass spectrometry. Recipients without BPAR subselected from cohort and match with recipients with BPAR based on age, gender, level of sensitisation and HLA mismatch level. ** - p<0.0005, ** -p<0.005, * - p<0.05**

A. Overall transplant recipients have higher baseline levels of I-FABP compared to live-donors. Transplant recipients with BPAR have higher levels of I-FABP when compared with recipients without BPAR (3.64ng/ml IQR[2.29-6.16] vs 7.14ng/ml IQR[4.37-31]; p=0.007) pretransplant. Levels of I-FAPB decrease to normal after transplantation.

B. Overall recipients with BPAR have lower levels of immunoregulatory metabolites such as 5-HIAA and 3-IAA particularly at 1-month post transplantation compared to recipients without BPAR.

Figure 2. Decreased levels of IL-10+ B-regs observed in renal transplant recipients who developed acute rejection

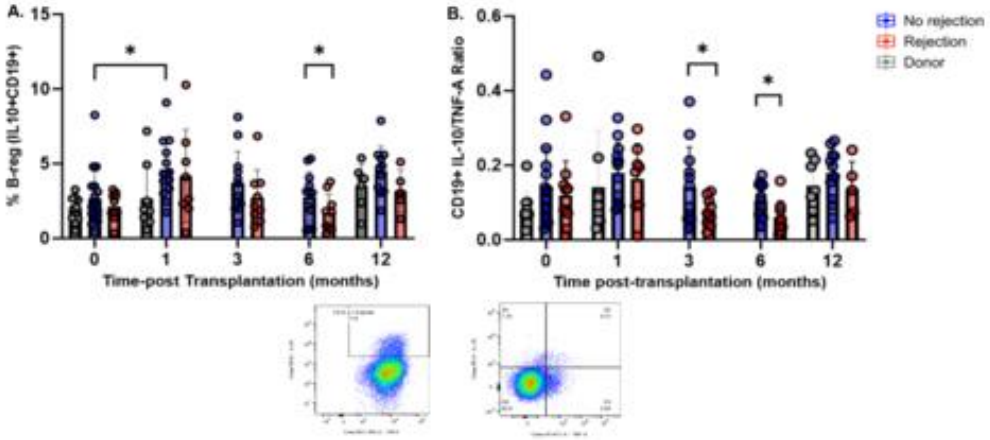

Figure 2. IL-10+ B-regs frequencies in live-donors (n=20), recipients without BPAR (n=21) and recipients with BPAR (n=13) by flow cytometry. Recipients without BPAR subselected from cohort and matched with recipients with BPAR based on age, gender, level of sensitisation and HLA mismatch level. * - p<0.05

A. Frequency of IL-10+ B-regs increases after transplantation in individuals with no rejection but not in individuals with rejection (2.66%±1.86% vs 4.62%±1.99%; p=0.0141); with a significant difference at 6-month post transplant between the two groups (2.96%±1.69% vs 1.75%±1.25%; p<0.05).

B. A higher IL-10+/TNF ratio is observed in individuals with no rejection particularly at 3- (0.141±0.107 vs 0.076±0.039; p<0.05) and 6-months (0.109±0.047 vs 0.066±0.049; p<0.05) compared to individuals who developed acute rejection.

Category: Basic and translational science (as per category - all science)

M2: The Kidney Transplantation in Older People (KTOP) Study: Impact of frailty on outcomes

Dr Amarpreet Thind[1], Professor Edwina Brown[1,2], Dr Michelle Willicombe[1,2]

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Introduction: Older people with end stage kidney disease (ESKD) are vulnerable to frailty. In older people with ESKD the quality of life (QoL) benefits afforded by kidney transplantation (KTx) may be a greater consideration than survival. Longitudinal QoL assessment on the waitlist (WL) through to post KTx, and variations by frailty are under reported in older people. Understanding these experiences is integral to shared decision making.

Methods: KTOP, a prospective, mixed methods, observational study, recruited KTx candidates aged ≥60. Questionnaires assessed frailty (Edmonton Frail Scale) and QoL (Short-Form 12, symptom burden, depression, illness intrusion, treatment satisfaction) on the WL (12, 24 months) and following KTx (3,12 months). The study was powered for QoL differences. Mixed-effect and comparative analysis determined frailty variations.

Results: 210 patients were recruited, with 120 transplanted. At recruitment 63.4%(118) were not frail, 19.4%(36) vulnerable, and 17.2%(32) frail. Frailty status remained unchanged in most WL participants, whilst 22.2% became increasingly frail. After KTx an initial decline occurred followed by 49.2% maintaining their pre-KTx frailty status, 24.6% improving, and 26.2% worsening.

Poorer clinical outcomes in the vulnerable/frail WL and KTx participants were observed (table 1). WL QoL showed stable physical component scores (PCS) in not frail candidates, and declining scores in vulnerable/frail (figure 1). Post-KTx not frail PCS declined before recovering, whilst PCS stabilised in vulnerable/frail. WL mental component scores (MCS) improved in both groups. Post-KTx MCS declined then improved in not frail recipients and worsened in vulnerable/frail (figure 1). Symptom burden, depression, illness intrusion and treatment satisfaction also varied by frailty.

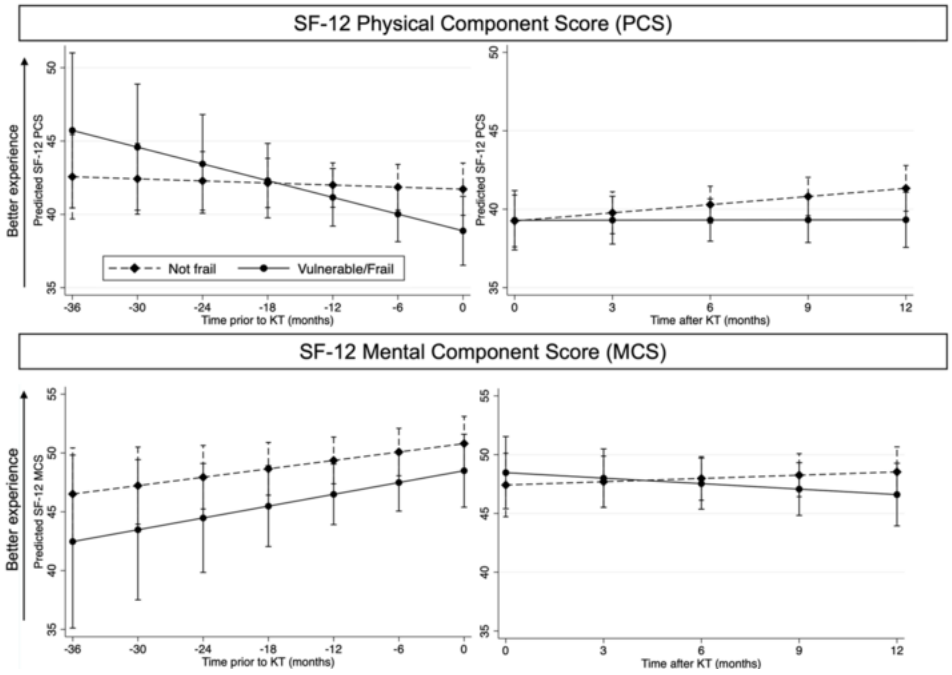
Discussion: Frail/vulnerable older people had worse clinical outcomes. KTx did not change QoL drastically for either group, and experiences varied by frailty. Assessing frailty is therefore crucial to older peoples' care, enabling tailored risk assessment, counselling, and targeted interventions.

Table 1. Waitlist and transplant outcomes by frailty status

Clinical Outcome	Not Frail	Vulnerable/Frail	p value
WL mortality	13 (23.2)	11 (33.3)	0.32
WL major infection episode	13 (23.6)	24 (72.7)	<0.001
WL single suspension episode	38 (61.3)	30 (83.3)	0.03
WL multiple suspension episodes	24 (38.7)	6 (16.7)	
WL total time suspended (days) (mean, ±SD)	307 (244)	434 (295)	0.03
Transplanted	62 (53)	36 (52.2)	0.914
KTx mortality	7 (11.1)	4 (11.1)	1.0
Delayed graft function	12 (19.1)	14 (38.9)	0.03
All cause graft loss	11 (17.5)	4 (11.1)	0.06
Graft function at 12 months (ml/min/1.73m^2) (mean, ±SD)	49.9 (18.8)	39.1 (17)	0.01
KTx major infection episode	34 (54)	26 (72.2)	0.07
Hospitalised in 1st year after KTx	38 (61.3)	23 (65.7)	0.67
Total LoS in 1st year after KTx (days) (mean, ±SD)	30.6 (33.8)	25.3 (24)	0.51

Data presented as n (%) unless otherwise specified. LoS-length of stay.

Figure 1. Predicted quality of life changes on the waitlist and following kidney transplantation.



Category: Basic and translational science (as per category - all science)

M3: Profiling immune cell responses in chronic rejection after lung transplantation using imaging mass cytometry

Saskia Bos[1,2], Bethany Hunter[3], David McDonald[3], George Merces[4], Georgia Sheldon[5], Pauline Pradère[1,6], Joaquim Majo[7], Julian Pulle[7], Arno Vanstapel[8], Bart M Vanaudenaerde[9], Robin Vos[9,10], Andrew J Filby[3], Andrew J Fisher[1,2]

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Introduction: Chronic rejection or Chronic Lung Allograft Dysfunction (CLAD) severely limits long-term survival after lung transplantation. CLAD has two phenotypes, bronchiolitis obliterans syndrome (BOS) and restrictive allograft syndrome (RAS), characterised by airway-centred or parenchymal fibrosis, respectively. The effector immune cell response driving CLAD phenotypes is poorly understood. Imaging mass cytometry (IMC) allows a large bespoke panel of immune and structural markers to be simultaneously localised at single-cell resolution in tissue.

Methods: Lung tissue from 20 recipients with CLAD, obtained during re-transplantation or post-mortem, and 3 recipients who died with healthy grafts was sectioned and stained with a 40-plex antibody panel. Eighty-one pathologist-guided regions of interest from airways, blood vessels and parenchyma were laser ablated using IMC. 190,851 cells across 41 mm2 tissue were captured allowing 26 distinct immune and structural cells to be identified. Cell numbers and % were compared across BOS, RAS and non-CLAD groups.

Results: IMC revealed classical cellular and humoral immune responses in CLAD, including cytotoxic T cells and plasma cells, but additionally eosinophil infiltration. Novel findings showed more M2 macrophage polarisation and expansion of Th1 cells in RAS and increased γδ T cells in BOS. There were common cell profiles in evolving fibrosis in both parenchyma and airways, involving both adaptive and innate cells as well as epithelial-to-mesenchymal transition. (Fig.) However, different profiles in RAS (M2 macrophages, Th1 cells) and in BOS (γδ T cells) were also identified.

Discussion: In-depth immunophenotyping of cells in their native tissue microenvironment identified major differences in CLAD versus non-CLAD and between BOS and RAS. Our findings in fibrotic progression of CLAD suggest γδ T cells and M2 macrophages merit further investigation. IMC provides powerful immunological insights that may be important across all organ transplants.

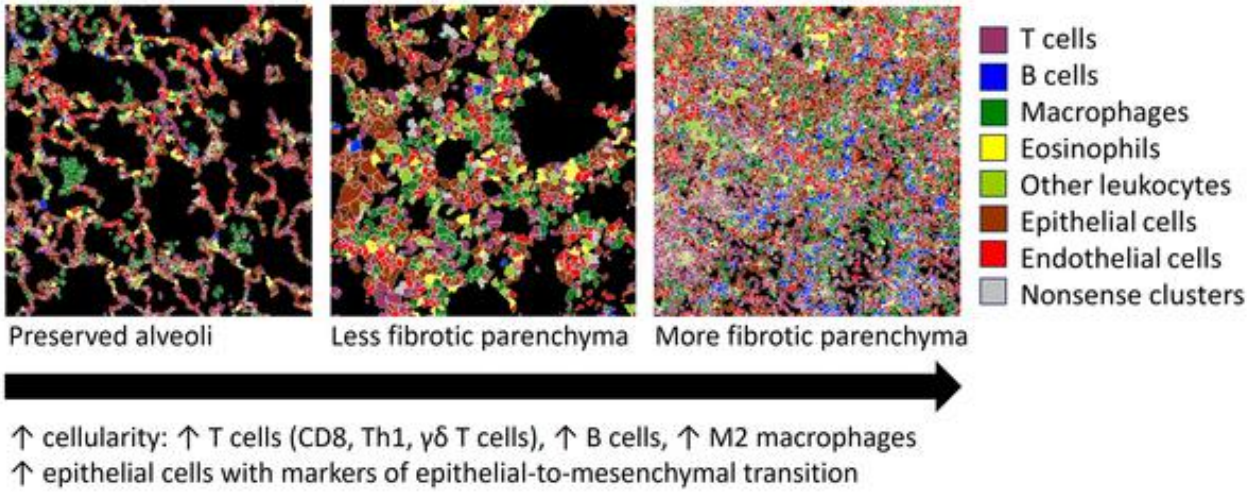


Fig. Temporal evolution of parenchymal fibrosis

Category: Basic and translational science (as per category - all science)

M4: Machine perfusion and liver transplantation outcomes; a Cochrane review and meta-analysis

Mr Samuel Tingle, Dr Joseph Dobbins, Miss Emily Thompson, Mr Rodrigo Figueiredo, Mr Balaji Mahendran, Mr Steve White, Mr Sanjay Pandanaboyana, Prof Colin Wilson

Institute of Transplantation, Newcastle upon Tyne, United Kingdom

Introduction: Several novel machine perfusion technologies have been developed which attempt to improve outcomes compared with ice-box static cold storage (SCS). We aimed to evaluate the effects of different methods of machine perfusion liver transplantation.

Methods: We used standard, extensive Cochrane search methods to identify randomised machine perfusion trials. Data extraction was performed independently by two authors. Pairwise random-effects meta-analysis was performed. We assessed bias using Risk of Bias 2 and used GRADE to assess certainty of evidence.

Results: We included seven randomised trials (1024 transplant recipients from 1301 randomised/included livers); four compared end-ischaemic hypothermic oxygenated perfusion (HOPE) with SCS, and three compared normothermic machine perfusion (NMP) with SCS. When compared with SCS, HOPE was associated with improvement in the following clinically relevant outcomes: graft survival (Figure 1; HR=0.45, 95% CI=0.23-0.87; P=0.02; high-certainty evidence), serious adverse events (OR=0.45, 0.22-0.91; P=0.03; moderate-certainty evidence) and clinically significant ischaemic cholangiopathy (OR=0.31, 0.11-0.92; P=0.03; high-certainty evidence). NMP was not associated with improvement in any of these clinically relevant outcomes, although evidence for these outcomes was low certainty. NMP was associated with improved utilisation compared with SCS (one trial found a 50% lower rate of organ discard; P = 0.008).

Discussion: Where the decision has been made to transplant a DCD or marginal DBD liver, HOPE will provide superior clinically relevant outcomes compared with SCS alone (graft survival, adverse events, cholangiopathy). NMP appears to improve utilisation of grafts that would otherwise be discarded, but well-powered trials specifically designed to assess utilisation are required.

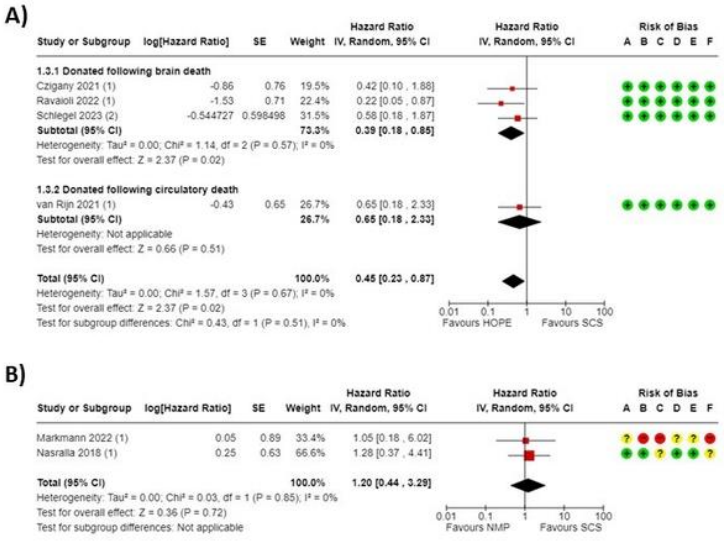


Figure 1 – meta-analysis of 1 year graft survival for trials comparing HOPE (A) with SCS, or NMP (B) with SCS.

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

M5: Composition of the neutralising antibody response predicts risk of BK virus viraemia in renal transplant recipients

Dr Stephanie Chong[1], Dr Claire Atkinson[2,1], Dr Fernando Chang[1], Dr Ciara Magee[1], Prof Mark Harber[1], Prof Alan Salama[1], Dr Matthew Reeves[1]

[1]UCL, London, United Kingdom. [2]London South Bank University, London, United Kingdom

Introduction: BK polyomavirus (BKV) viraemia occurs in 10% of kidney transplantation recipients potentially resulting in premature allograft failure. Evidence suggests disease is donor derived – hypothetically infection of the recipient with a different BKV serotype increases risk due to poorer immunological control. Thus we reasoned understanding the composition and activity of the humoral response against BKV in D/R pairs would address this question.

Methods: Paired pre-transplant donor/ recipient serum samples were obtained from the QUOD organ donor biobank and the Anthony Nolan laboratories. BKV VP1 genotype specific pseudoviruses were employed to define the breadth of the antibody response against different serotypes (ELISA) and, to characterise specific neutralising activity defined as the 50% inhibitory concentration (LogIC50). A mismatch score for each pair was calculated using the ratio of mismatches between ELISA and neutralised serotypes and the number of serotypes exposed to from the donor. BKV viraemia was defined as >1000 viral copies/ml.

Findings: >70% of both donors and recipients were BKV seropositive pre-transplant with viraemia observed in 28/224 transplant recipients. Recipients who developed BKV viraemia had lower nAb titres against all the serotypes, compared to controllers. Neutralisation assay D/R MM ratios >0.66 associated with significantly higher risk of BKV viraemia, with an adjusted odd ratio of 6.72 (95% CI 2.76 to 16.37; $p < 0.001$). Notably[MR4] , a mismatch against donor serotype Ic and II associated with adjusted odds ratios of 6.75 (95% CI 1.81 to 25.16; $p = 0.004$) and 3.52 (95% CI 1.09 to 11.33; $p = 0.035$) respectively. In contrast, there was poor concordance with PsV specific ELISA data that quantified the total antibody response against different serotypes.

Conclusion: We demonstrate that pre-transplant donor/recipient BKV serotype nAb mismatch predicts post-transplant BKV viraemia and that specific mismatches in neutralising activity, rather than total activity, are key indicators of risk BKV post-transplant.

Category: Basic and translational science (as per category - all science)

M6: Improved survival prediction for kidney transplant outcome prediction using Artificial Intelligence-based models: Development of a UK Deceased Donor Kidney Transplant Outcome Prediction (UK-DTOP) tool

Dr Hatem Ali[1], Prof David Briggs[2], Professor Nithya Krishnan[3]

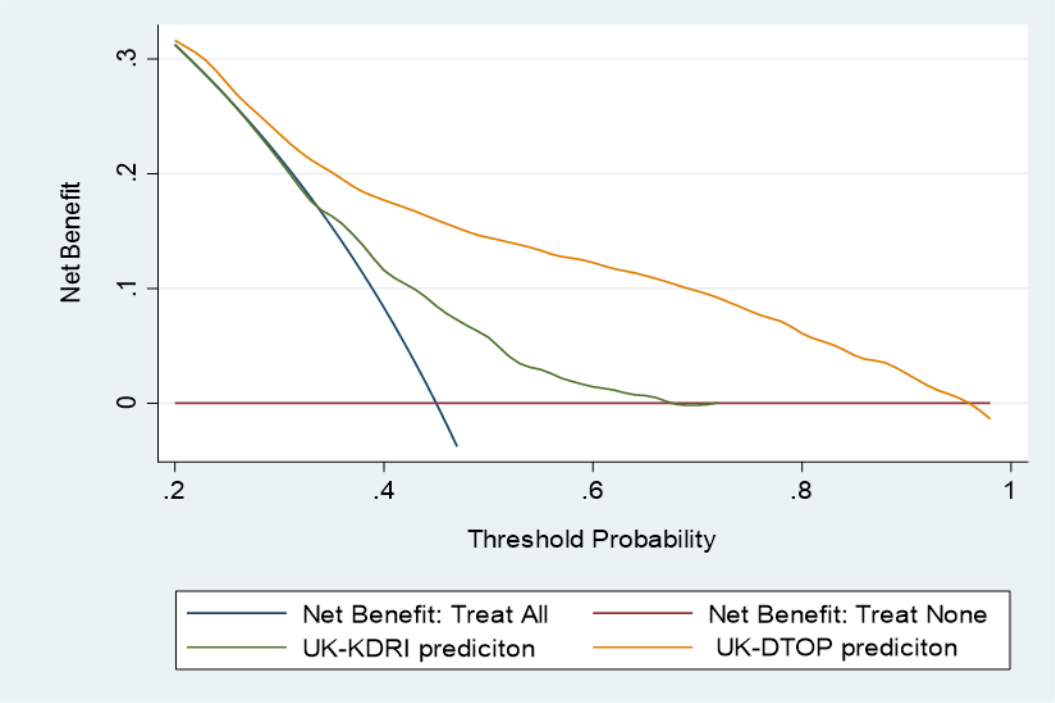
[1]University Hospitals of Coventry and Warwickshire, Coventry, United Kingdom. [2]NHSBT, Birmingham, United Kingdom. [3]University Hospitals of Coventry and Warwickshire, Coventry, United Kingdom

Introduction: The ability to predict future outcomes of deceased-donor kidney grafts improves allocation decision-making for transplant clinicians, as well as the life expectancy and quality of life for potential recipients. However, capacity of existing prediction models to discriminate or calibrate is constrained by the limitations of computing technology during the era of development. To improve the UK transplant selection process, we set out to utilize novel artificial intelligence (AI) algorithms to develop improved risk stratification.

Methodology: The United Kingdom Transplant Registry (UKTR) database was used to analyse pre-transplant variables from 29,714 deceased-donor kidney transplants carried out between 2008 and 2022. The kidney transplants were separated into training (80%) and test (20%) sets randomly. 10-fold cross-validation was performed. Overall graft survival served as the primary performance metric. We tested four machine learning models that were evaluated for calibration and discrimination using the integrated Brier score (IBS) and Harrell's concordance index. We assessed the potential clinical utility using decision curve analysis.

Results: The IBS score of the XGBoost model was 0.14, demonstrating accurate calibration. At 3, 5, 7, and 9 years after transplant, among all the involved AI algorithms, XGBoost gave the best discriminative performance for survival (AUC=0.74, 0.75, 0.76, and 0.75, respectively) along with a concordance index of 0.74. When applied to the same cohort, the UK kidney donor risk index (KDRI) had a concordance of only 0.62, with AUC scores 0.61 at 3 years post-transplant, 0.60 at 5 years, 0.62 at 7 and 9 years. Our results were consistent among subgroups of different deprivation scores.

Conclusion: In summary, the AI-based XGBoost model outperformed the existing prediction tool, UK-KDRI. This novel model, termed the United Kingdom Deceased-Donor Kidney Transplant Outcome Prediction (D-TOP), can potentially optimize deceased donor selection with a better prediction of overall-graft survival and improving the effectiveness of kidney allocation schemes.



Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

M7: HLA Epitope Electrostatics - a novel methodology to compare HLA epitope electrostatic potential and predict HLA-DQ immunogenicity

Dr Hannah Charlotte Copley[1,2,3], Dr Jon Jin Kim[1,4], Mr Eloy Felix[2], Dr Andrew Leach[2], Dr Vasilis Kosmoliaptsis[1,3]

[1]Department of Surgery, University of Cambridge, Cambridge, United Kingdom. [2]European Molecular Biology Laboratory - European Bioinformatics Institute (EMBL-EBI), Wellcome Trust Genome Campus,, Hinxton, United Kingdom. [3]National Institute for Health and Care Research Blood and Transplant Research Unit in Organ Donation and Transplantation, University of Cambridge, Cambridge, United Kingdom. [4]Department of Paediatric Nephrology, Nottingham University Hospital, Nottingham, United Kingdom

Introduction: Structural and physicochemical comparison of HLA epitopes may enable greater understanding of immunogenicity and antigenicity in the transplant setting. Our previously developed Electrostatic Mismatch Score 3D (EMS3D) enables surface electrostatic potential (EP) comparisons of entire HLA molecules, but cannot be used to quantify EP differences at defined regions (epitopes) of the HLA molecular surface.

Methods: The EMS3D algorithm was adapted to compare EP at specific regions (epitopes) between HLA molecules. An experimental HLA sensitisation model (patients subjected to standardised donor lymphocyte injections, mismatched HLA-DQ n=230) was used to examine the relationship between donor HLA epitope electrostatics and donor-specific-antibody (DSA) formation (assessed using single-antigen-beads). Highly polymorphic residues within the extracellular HLA-DQ domain (genotypes identified in the BeTheMatch registry for all major ethnic groups) were identified (Shannon Entropy ≥1) and used to define 9 potential epitope regions on HLA-DQ with variable amino acids grouped together by mathematical proximity. Donor-Recipient EP differences were calculated for HLA-DQ regions and machine learning methods were utilised to identify epitope(s) features associated with DSA.

Results: HLA Epitope Electrostatics is a novel implementation of the EMS3D algorithm which can visualise and compare electrostatics on the HLA surface, enabling tertiary-level EP assessment of any region of interest. Four HLA-DQ regions/epitopes were highly associated with DSA development (AUC:0.75-0.78) indicating high potential immunogenicity of these regions. Following splitting the dataset into train:test parts (66%:33%, x10 repeats), machine learning models (Support Vector Machines, Gaussian Naïve Bayes, Linear Discriminant Analysis, Logistic Regression) identified combinations of EP differences in these epitopes that outperformed EMS3D whole-molecule scores alone (average accuracy: 0.77-0.79).

Discussion: We describe a novel methodology to investigate EP differences at the epitope level and demonstrate a clear relationship to HLA-DQ immunogenicity. This approach may enable improved identification of highly immunogenic, conserved epitopes across multiple HLA molecules.

Category: H&I (HLA typing - crossmatching - immunologically complex recipients)

M8: Duration of asystole does not affect liver graft outcomes when recovered using normothermic regional perfusion

Mr Subhankar Paul, Mr Rohit Gaurav, Professor Christopher J.E. Watson, Mr Jack Martin, Lisa Swift, Corrina Fear, Rachel Webster, Mr Andrew Butler

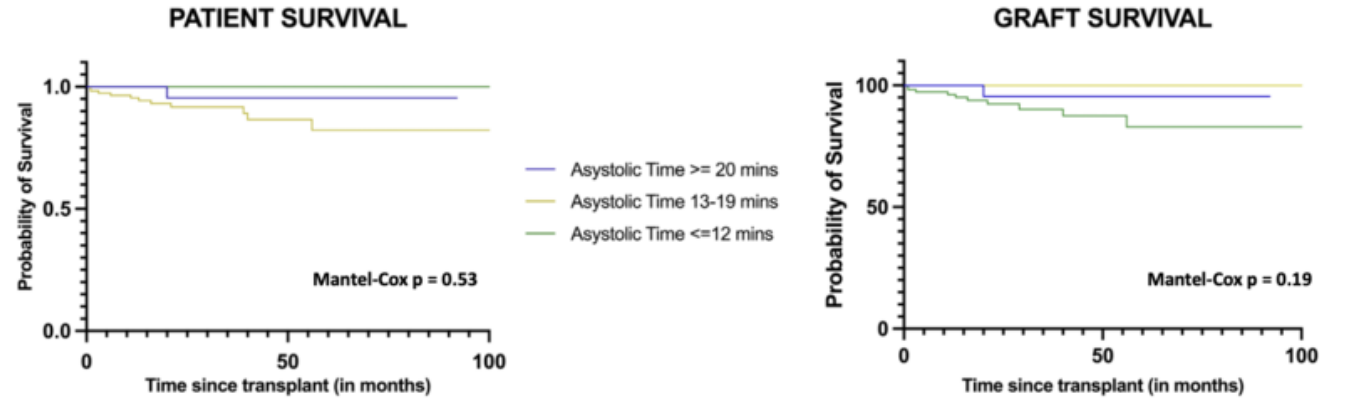
Cambridge University Hospitals NHS Foundation Trust, Cambridge, United Kingdom

Introduction: More than one-quarter of the liver transplants performed in the UK are from donation after circulatory death (DCD) donors. Recent studies demonstrate that there is no significant difference in the outcomes of DCD livers with extended agonal phase if Normothermic Regional Perfusion (NRP) is used as an adjunct. This study explores the effect of the asystolic period on outcomes of liver transplantation from DCD donors using NRP in a single centre in the UK.

Methods: This is a retrospective analysis of prospectively collected data on consecutive patients undergoing adult liver transplantation between 31 March 2011 and 2 November 2023, from controlled DCD donors undergoing NRP.

Results: A total of 183 liver transplants performed from DCD-NRP donors during the study period were included in the analysis. The mean and median asystolic periods were both 17 minutes (range of 7-32 mins). The asystolic periods were divided into three groups <=12 mins (which is the target for Standard DCD retrievals in our centre), 13-19 mins (which include the median asystolic period), and >=20 mins. There was no significant difference in patient or graft survival amongst the groups Fig.1 (p= 0.53 and p=0.19 respectively). There was no significant correlation between asystolic period and Model for Early Allograft Function (MEAF) score, Fig.2 (p=0.16). There was no difference in cholangiopathy between groups, which was low (Table 1).

Discussion: This study demonstrates that asystolic periods currently encountered are not a significant driver for poor outcomes in patients receiving livers recovered from DCD donors using NRP. The benefits of using NRP to assess liver viability avoids the need to use arbitrary time cut-offs for agonal phase and asystolic periods. This has the benefit of allowing more time for the safe establishment of NRP, removing the haste from DCD retrievals.



No at risk. months

Asystolic Time	0	6	12	18	24	30	36	42	48	54	60
<=12 mins	19	17	15	15	13	13	11	11	10	9	7
13-19 mins	119	103	90	72	54	41	38	33	25	21	17
>=20 mins	40	37	32	27	15	9	8	6	6	6	5

No at risk. months

Asystolic Time	0	6	12	18	24	30	36	42	48	54	60
<=12 mins	19	17	15	15	13	13	11	11	10	9	7
13-19 mins	119	99	87	71	53	39	36	32	24	20	16
>=20 mins	40	36	32	27	15	9	8	6	6	6	5

Fig.1 Outcomes compared by asystolic time. Kaplan-Meier curve showing patient and graft survival.

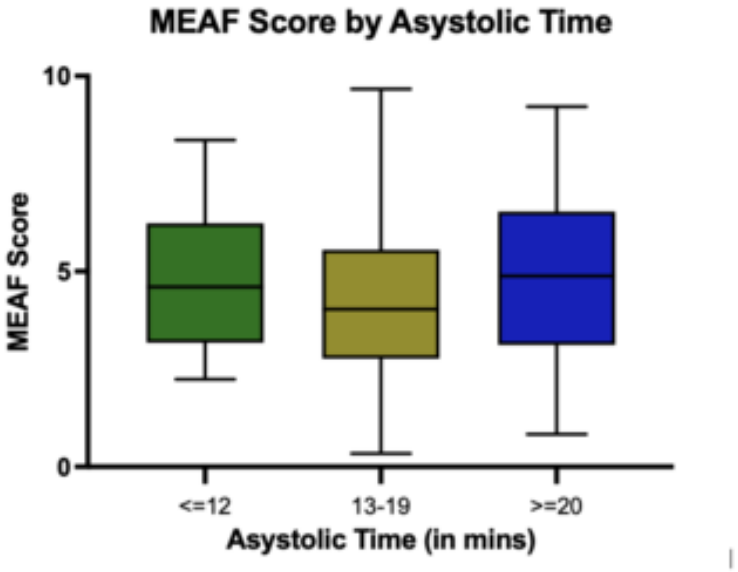


Fig.2 Box-and-whisker graph showing Model for Early Allograft Function (MEAF) scores. Median (bold line), i.q.r. (box), and range (whiskers) are shown; p = 0.16 (ordinary one-way ANOVA)

Table 1. Evidence of Ischaemic cholangiopathy in the three groups (5 cases had missing data)

Asystolic Time Group	Grafts without Ischaemic Cholangiopathy	Grafts with Ischaemic Cholangiopathy	Equivocal
<=12 mins	17	1	1
13-19 mins	109	7	3
>=20 mins	39	1	0

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

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MEDAL PRESENTATIONS

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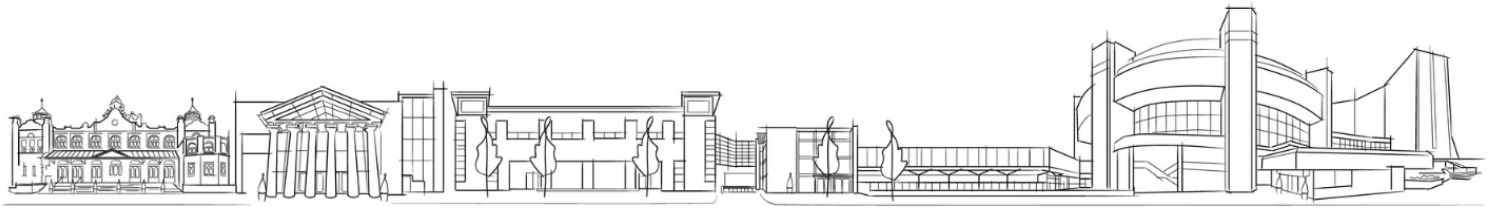

CW1: Organ Quality Assessment for Livers (OrQA-L): Real-time visual assessment of steatosis during retrieval using machine learning models

Mr Georgios Kourounis[1,2], Dr Ali Elmahmudi[3], Dr Brian Thomson[3], Dr Robin Nandi[2], Mr Samuel Tingle[1,2], Ms Emily Thompson[1,2], Prof James Hunter[4], Prof Hassan Ugail[3], Prof Colin Wilson[1,2]

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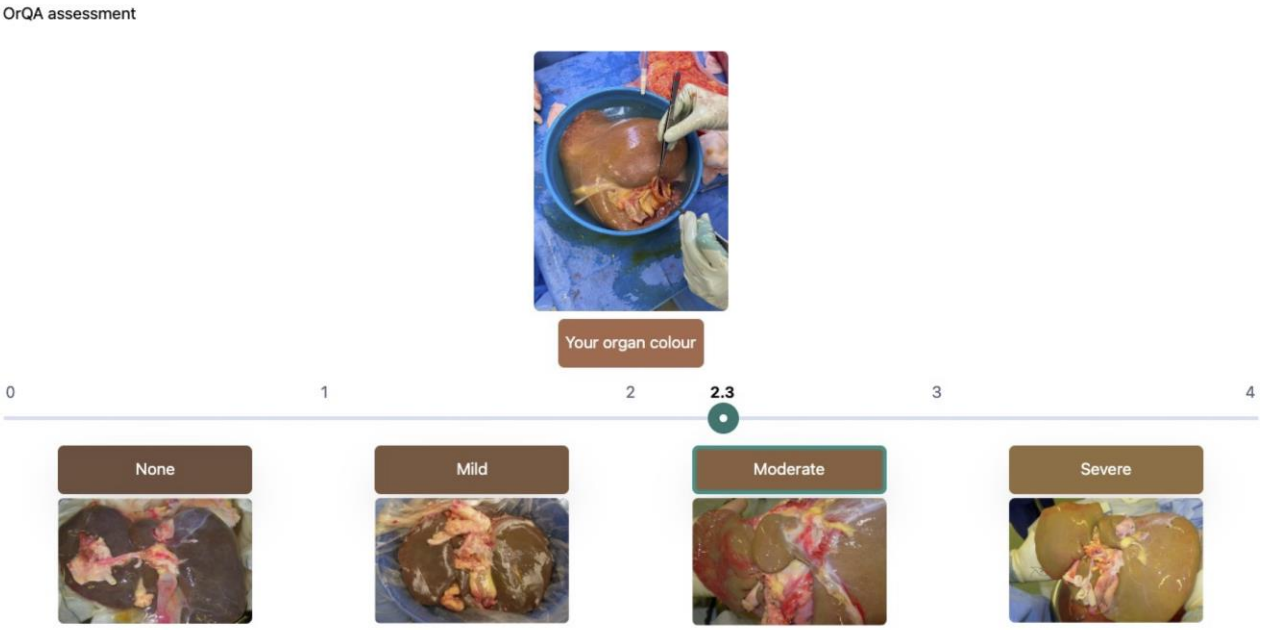
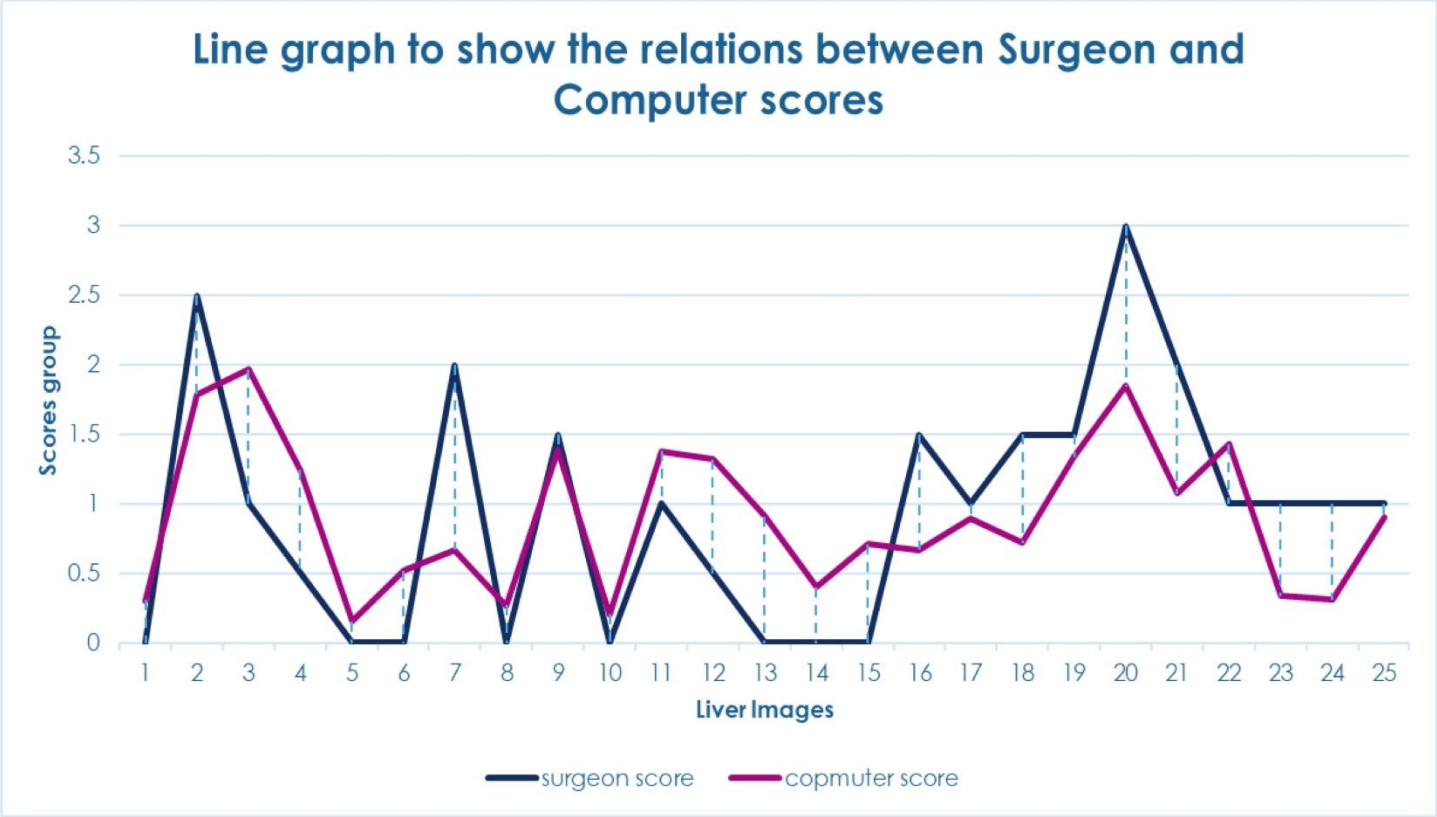
Introduction: Macroscopic assessment of liver steatosis during transplant retrieval is currently subjective and reliant on surgeons' experience. Inter-rater variability may lead to unwarranted discard of livers. In view of the rising incidence of fatty liver disease, developing an objective, reliable, and point of care assessment tool is crucial. Our aim was to develop a machine-learning-based (ML) decision aid to objectively assess hepatic steatosis using photographs at time of retrieval.

Methods: Liver transplant surgeons scored 226 images on a 0-3 steatosis scale (≤1 - None, ≤2 - Mild, ≤3 - Moderate, >3 - Severe). Post image augmentation, 404 images were split into 342 for training and 62 for testing. An additional 25 images from a separate collection were used for validation. The model aimed to predict these steatosis scores/categories and was benchmarked against surgeon scores. All assessments were done via a web portal.

Results: Among the 62 testing images, Pearson's correlation coefficient between the model's predictions and surgeon scores was 0.705 ($p < 0.001$), with a mean-absolute-error (MAE) of 0.551 (SD 0.350), and AUROC of 0.66. For the 25 validation images, the Pearson's correlation coefficient was 0.606 ($p = 0.0013$), with a MAE of 0.575 (SD 0.398), and AUROC of 0.74. All images underwent processing and scoring in under 10 seconds.

Discussion: The model demonstrates a consistent level of agreement with experienced liver transplant surgeons in the assessment of liver steatosis, highlighted by the small MAE between the model's predictions and the actual surgeon scores. Larger validation sets are required for formal performance assessment. The quick processing time indicates its potential as a point-of-care tool.





Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

CW2: Donor alcohol history and liver transplant outcomes: National cohort study

Mr Kin Ng[1], Miss Ruth Colino Blanco[1], Dr Utsah Bhattacharya[1], Ms Susanna Madden[2], Ms Rhiannon Taylor[2], Mr Ahmed Sherif[3], Mr Rodrigo Figueiredo[4], Miss Rebecca Mateos[5], Mr David Nasralla[6], Miss Miriam Cortes Cerisuelo[7], Mr Parthi Srinivasan[7], Prof Thamara Perera[5], Mr Andrew Butler[8], Miss Anya Adair[3], Mr Abdul Rahman Hakeem[1]

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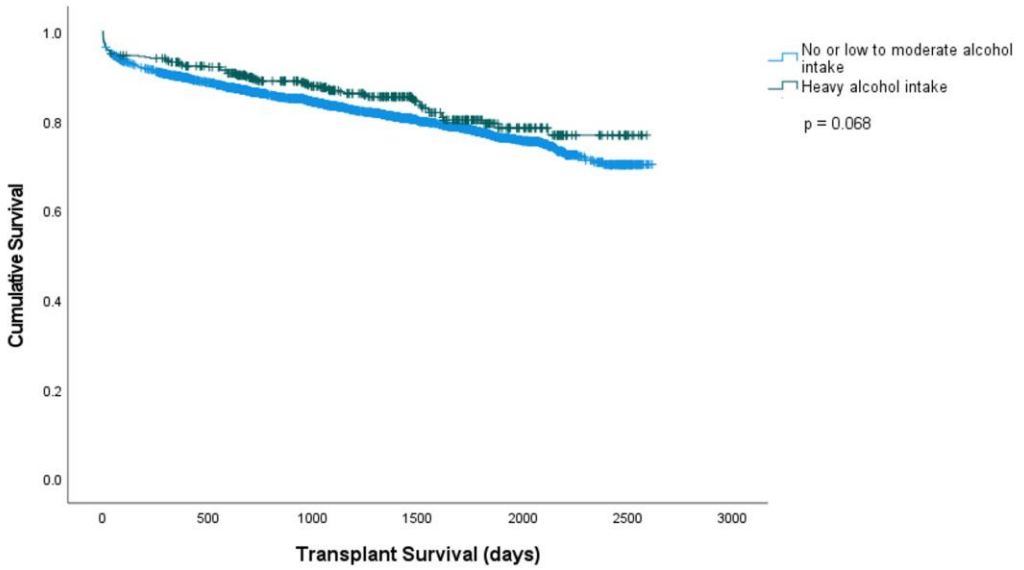
Introduction: Prolonged alcohol use is acknowledged for its harmful effects on the liver, leading to steatosis, fibrosis, and eventually cirrhosis. Deceased donors with a significant history of heavy alcohol use (>7 units per day) are often deemed unsuitable for donation. This study aims to explore the influence of donor's alcohol history on liver transplant outcomes.

Methods: Retrospective analysis of NHS Blood and Transplant data on adult deceased donor liver transplantation from 2016 to 2021. Data were stratified by no or low alcohol intake (≤ 6 units per day) and heavy alcohol intake. Regression models were used to assess the effect of donor alcohol history on outcomes.

Results: Of the 4465 LTs over the study period, 3989 (89.3%) livers were from donors with no or low-moderate alcohol intake and 476 (10.7%) from heavy alcohol intake donors. Heavy alcohol intake is positively associated with male gender (68.0% vs. 50.8%; p<0.001), younger age (49.2 vs. 50.8 years; p<0.001), smoking (88.2% vs. 58.5%; p<0.001), history of drug abuse (42.0% vs. 18.6%; p<0.001), high serum GGT (91 vs. 65 IU/L; p<0.001), steatotic liver on assessment (58.6% vs. 44.9%; p<0.001) and higher degree of steatosis (moderate 30.2% vs. 26.8%; severe 2.9% vs. 1.5%). There was no difference between the two groups in terms of recipient demographics, type of graft (DBD/DCD), or immediate post-operative complications. Unadjusted one- and five-year transplant survival for no or low-moderate alcohol drinker were 89.8% and 77.1% respectively; compared to 92.8% and 79.3% for heavy alcohol drinker (p=0.068). On Multivariate analysis, donor heavy alcohol history was not associated with transplant survival [Hazard Ratio 0.792 (0.621-1.011) p=0.061], graft survival, or patient survival.

Discussion: Transplant outcomes were not influenced by utilising liver from donor with significant alcohol consumption. This study suggests that liver from donors with heavy alcohol intake should not be excluded given other factors are favorable.

Unadjusted Kaplan-Meier survival curve comparing no/low to moderate alcohol intake to heavy alcohol intake



Transplant survival Cox regression analysis

		Univariate		Multivariate	
		HR (95% CI)	**P value**	**HR (95% CI)**	**P value**
Alcohol amount					
	Non-drinker	-	0.186		
	Drinks rarely	1.073 (0.750 – 1.537)	0.699		
	1-2 units/d	1.091 (0.776 – 1.533)	0.618		
	3-6 units/d	1.179 (0.826 – 1.683)	0.365		
	7-9 units/d	0.957 (0.662 – 1.383)	0.816		
	>9 units/d	0.768 (0.488 – 1.207)	0.253		
Heavy alcohol		0.802 (0.633 – 1.017)	0.069	0.792 (0.621 – 1.011)	0.061

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

CW3: Outcomes of donation after circulatory death livers treated with thrombolysis on ex situ normothermic machine perfusion

Mr Rohit Gaurav, Mr Andrew Butler, Ms Lisa Swift, Ms Corrina Fear, Ms Rachel Webster, Prof Chris Watson
Roy Calne Transplant Unit, Addenbrookes Hospital, Cambridge, United Kingdom

Introduction: Ex-situ normothermic machine perfusion (NMP) of donation after circulatory death (DCD) livers has superior outcomes compared to standard cold stored DCD liver transplants. However, they still suffer from biliary complications, especially non anastomotic biliary stricture (NAS), which has been attributed to peribiliary vascular fibrin microthrombi. In the present study, we discuss our experience of DCD liver transplants treated with thrombolysis during NMP (tNMP) as compared to NRP and NMP without thrombolysis (sNMP).

Methods: Retrospective analysis of DCD liver transplants in our institute from January 2019 till April 2023. The outcomes of tNMP were compared with sNMP and NRP. Livers undergoing sequential NRP and NMP were excluded from the analysis. All transplants had minimum 6-months follow up.

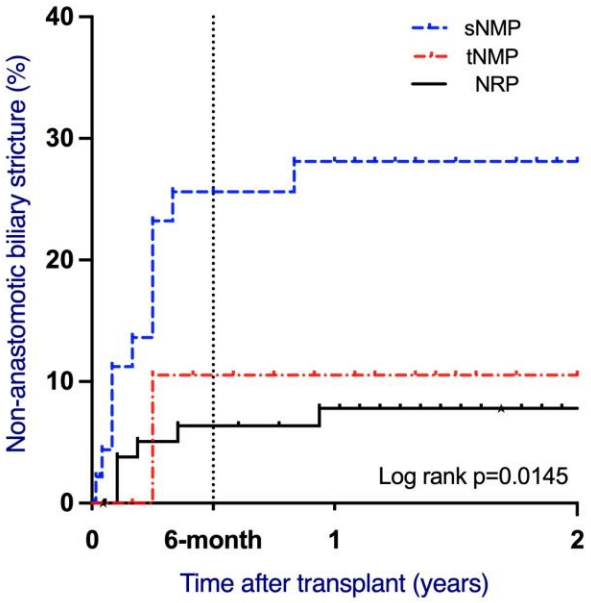
Results: There were 155 NRP-DCD donors and 152 DCD-NMP liver perfusions during the study duration leading to 183 (72% usage) liver transplants. After excluding 34 liver transplants with sequential NRP and NMP, the analysis included 82 NRP, 47 sNMP and 20 tNMP.

Cold ischaemia time was significantly longer in the NRP group, median 457 minutes (IQR 389 – 540). Both sNMP and tNMP were suitable for mitigating ischaemia reperfusion injury with low peak alanine transaminase levels in first seven days and lower Model for Early Allograft Function Score (Table 1).

NAS were more common in the sNMP livers compared to the NRP and tNMP groups (Figure 1). Similarly, two liver grafts were lost to NAS in sNMP group compared to none in the other two groups.

Discussion: This experience suggests that thrombolysis of livers on NMP is safe with comparable outcomes to NRP liver transplant.

Parameters	NRP (n=82)	sNMP (n=47)	tNMP (n=20)	p-value
DRI (Feng et al, AJT2006)	2.4 (2.1 – 2.6)	2.2 (2.0 – 2.7)	2.8 (2.2 – 3.0)	0.023
UK DLI	2.0 (1.8 – 2.3)	1.8 (1.6 – 2.0)	2.0 (1.8 – 2.4)	0.024
Cold ischaemia time, min	457 (389 – 540)	404 (347 – 456)	405 (375 - 440)	0.003
NMP duration, hrs	-	536 (454 – 662)	627 (491 – 734)	0.226
UKELD	54 (52 – 58)	54 (51 – 57)	54 (51 – 56)	0.554
Peak ALT in first week	542 (305 – 879)	360 (201 – 530)	414 (188 – 886)	0.002
MEAF score	4.5 (3.0 – 6.3)	3.2 (2.0 – 4.3)	3.6 (2.1 – 5.6)	0.007
AS requiring intervention (%)	14 (17)	9 (19)	3 (15)	0.911
NAS (%)	7 (8.5)	13 (27.7)	2 (10)	0.011
Graft loss (%)	1 (1.2)	4 (8.5)	0	0.058
Values are medians (interquartile range) or number (percentage) Donor risk index (DRI); Alanine transaminase (ALT); Model for early allograft function (MEAF); Anastomotic stricture (AS); Non anastomotic biliary stricture (NAS)				



At risk				
NRP	82	74	61	28
sNMP	47	31	29	15
tNMP	20	17	13	2

Category: Clinical - liver and intestinal (liver - small bowel - surgery - transplant hepatology - recipient clinical care and management)

CW4: The impact of ischaemic type biliary lesions on healthcare costs after liver transplantation with grafts from donors after circulatory death

Mr James Halle-Smith[1,2], Dr Marta Burak[1], Mr George Clarke[1,2], Mr Angus Hann[1,2], Mr Arul Suthananthan[1], Professor Keith Roberts[1,2]

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Introduction: Liver grafts from donors after circulatory death (DCD) are at a higher risk of developing ischaemic type biliary lesions (ITBL) which put recipients at higher risk of infection and often requires retransplantation. There are new technologies which seek to reduce the rate of ITBL after DCD liver transplantation but these incur extra costs to health service providers. Therefore, the aim of this study was to investigate the cost of ITBL to the health service so that potential savings with new technology could be explored.

Methods: Consecutive DCD liver transplants between 2016-2018 were reviewed from our institutional database. To compare healthcare costs between patients who developed ITBL and the standard DCD cohort, ITBL patients were matched to patients who received a DCD static cold storage (SCS) graft during the same period. Matching was based on age, indication for transplant and UKELD at listing. For ITBL and matched patients, all hospital episodes after discharge from index transplant were reviewed. Cost codes for each procedure or episode were obtained from the NHS tariffs.

Results: There were 115 patients included in the study, of which 19 developed ITBL (16.5%). Graft survival was significantly lower in the ITBL group (23.4 months vs. 72.8 months; p=0.001), with 9 (47%) of the patients requiring retransplantation. Matching of the ITBL and DCD SCS controls was satisfactory on the specified parameters. The total hospital costs were significantly higher amongst the ITBL group, with an average cost per patient of £97,304 (£3,116-£271,278) compared to £16,802 (£3,982 - £93,171) in the matched control group.

Discussion: The development of ITBL after DCD liver transplantation leads to significantly increased healthcare costs compared to matched controls. These costs should be taken into account by health service providers when deciding whether to fund technologies that may reduce the ITBL rate in DCD grafts, such as NRP and HOPE.

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

CW5: Early allograft dysfunction and ischaemic cholangiopathy in liver transplants after normothermic machine perfusion

Mr Ioannis Kostakis, Mr Carlo Ceresa, Mr David Nasralla, Mr James Richards, Mr Dinesh Sharma, Professor Brian-Richie Davidson, Mr Charles Imber, Miss Pascale Tinguely, Mr Andrej Grajn, Miss Keziah Crick, Miss Jenecia Brathwaite, Miss Sharayne Robinson, Miss Rinu Thomas, Professor Joerg-Matthias Pollok, Mr Satheesh Iype

Royal Free London NHS Foundation Trust, London, United Kingdom

Introduction: Our aim was to assess the rates of early allograft dysfunction (EAD) and ischaemic cholangiopathy (IC) after normothermic machine perfusion (NMP) and identify ex situ liver function parameters predictive for these two conditions.

Methods: Liver grafts perfused on the Organox metra device at our centre between April 2019 and September 2022 were reviewed from our prospectively maintained database. Data pertaining donor and recipient characteristics, ex situ functional parameters in perfusate and bile, as well as primary non-function (PNF), EAD and IC (at least 6 months after liver transplantation) were collected.

Results: One-hundred-and-forty-seven liver grafts [82 (55.8%) from donors after brain death (DBD), 65 (44.2%) from donors after circulatory death (DCD)] were perfused, out of which 123 (83.7%) were transplanted [71 (86.6%) DBDs, 52 (80%) DCDs]. There were 2 cases (1.6%) of PNF and 44 cases (35.8%) of EAD. IC was detected in 11 liver transplants (8.9%). IC rate was 4.2% (3/71) for DBD and 15.4% (8/52) for DCD liver transplants. After multivariable analysis, the following ex situ liver function parameters were independent risk factors for EAD: perfusate pH at 1hr ≤7.314 (OR: 5.3, p=0.002), lactate at 4hr ≥1.08 mmol/L (OR: 4.7, p=0.004), ALT at 4hr ≥1977 U/L (OR: 11.1, p=0.008), difference between perfusate and bile glucose levels at 4hr ≤6.9 mmol/L (OR: 8.7, p=0.007). Regarding prediction of IC in DCD grafts, a bile pH at 3hr ≤7.705 yielded sensitivity of 100% and specificity of 89.5%, and a difference between perfusate and bile glucose levels at 3hr ≤4.4 mmol/L yielded sensitivity of 100% and specificity of 78.9%.

Conclusions: Ex situ liver function during NMP can be used to predict the risk of developing EAD and IC. These criteria should be considered to assist in recipient selection or indeed overall decision to transplant the graft.

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

CW6: Balancing access to liver transplantation whilst minimising donor liver travel: a national allocation modelling study

Miss Katie Connor, Dr Mhairi Donnelly, Dr Zareena Khan-Orakzai, Mr Ian Currie, Mr Ben Stutchfield

Edinburgh Transplant Centre, Edinburgh, United Kingdom

Introduction: In 2018, DBD liver allocation changed from a regional to national liver offering scheme (NLOS). Currently, no allocation points are given for proximity between the donor liver and recipient, meaning donor livers may travel further for recipients with minimal differences in disease severity. This study explores the effect of awarding location points for 'in zone' transplantation on donor liver travel, balanced against recipient waiting time.

Methods: Liver travel was first calculated for adult elective DBD OLTs performed in a geographically isolated centre (March 2013- 2023). Utilising this data combined with UK transplant activity data, we generated simulated donor and recipient pools, and modelled five years of UK liver transplant activity incorporating multiple simulations (>85000 transplants). NHSBT liver allocation zones were utilised, and allocation points added for 'same zone' donors and recipients (0, 100, 250, 500 points tested). Subsequent liver travel time, distance, flight usage, carbon emissions (CO_2e), cost (~£8000 per flight) and recipient waiting list duration were studied.

Results: In this centre, NLOS implementation was associated with increased liver travel (127 vs. 231 straight-line miles; $p<0.001$), proportion of flights needed (31% vs. 63.6%; $p<0.001$) and CO_2e per transplant (420.2 vs. 838.5 kg; $p<0.001$) (Figure 1). There was no association between disease severity and increased travel. Upon simulation, additional location points incrementally increased 'in zone' transplantation, resulting in a reduction in: distance travelled, travel time, flight requirement and CO_2e per donor liver across all centres (Figure 2A-B). Modelling demonstrated that over 5 years £1,032,000 could be saved in flight costs by adding 100 points. Adding 100-250 location points did not increase waiting time for the sickest patients, or alter distribution of transplants between centres.

Discussion: National allocation has increased donor liver travel. Awarding points for donor-recipient location may reduce travel time, carbon footprint and costs, without compromising time to transplant for the sickest patients.

Figure 1

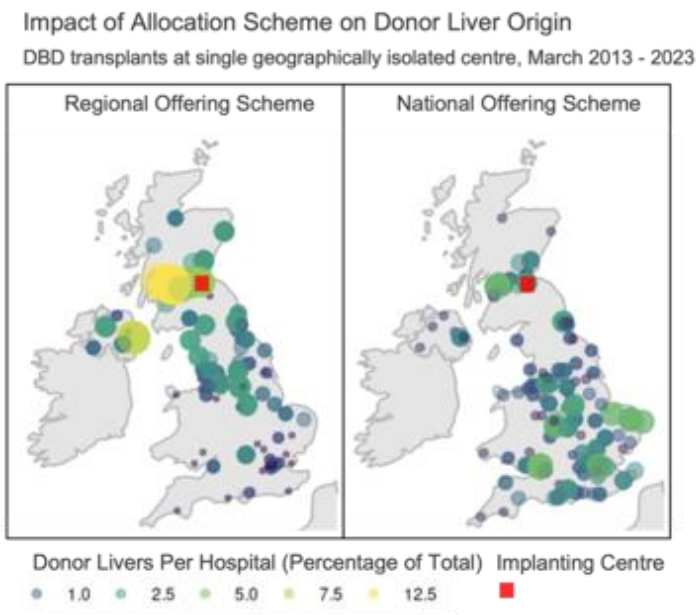
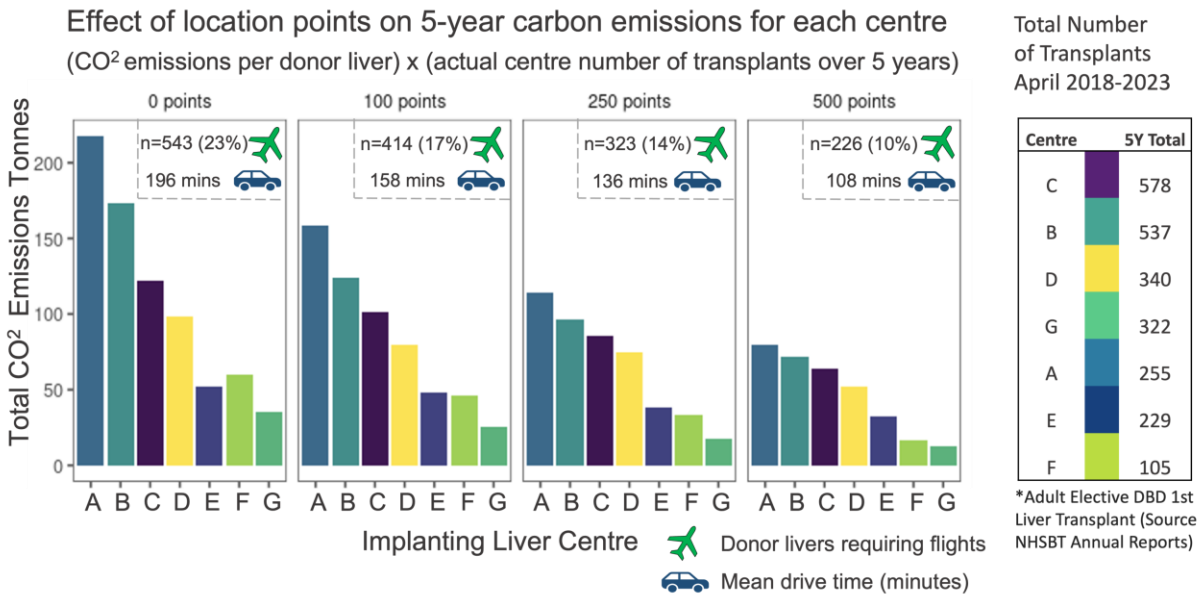


Figure 2



Category: Clinical - liver and intestinal (liver - small bowel - surgery - transplant hepatology - recipient clinical care and management)

PODIUM ORAL PRESENTATIONS

BTS Annual Congress 2024

5-8 March 2024 | HCC, Harrogate

O01: Equitable access and clinical outcomes in organ transplantation: The NHS value-based funding model outperforms international peers

Mr Hemant Sharma[1,2], Prof Abhishek Sharma[3], Mr Sanjay Mehra[1]

[1]Royal Liverpool University Hospital, Liverpool, United Kingdom. [2]University of Western Ontario, London, Canada. [3]Loyola University Chicago, Chicago, United Kingdom

Introduction: Value-based practice is gaining traction as a way to control costs, improve patient satisfaction, and increase provider accountability. The rising prevalence of end-stage organ disease contrasts with limited donor organs, necessitating maximising equitable access, clinical outcomes, and appropriate cost control. We compare key kidney transplant metrics across the UK, US, and Canada.

Methods: Parameters analysed from the 2010–2022 national registries include: (1) Policy-components, (2) Transplant rates per million population; (3) 1, 5 year survival, (4) Median waiting times, (5) Average cost per patient. Inequality was assessed using the Gini-index and concentration-curves.

Results: The UK NHS funded >1000 kidney transplants in 2021 under standardised pricing and coordinated care. This enabled 98% one-year patient survival, 7 percentage points higher than in the US and Canada. The median kidney waiting time is 54% lower than in Canada. The UK transplantation rate per million increased by 25% over the decade, versus a 3% rise in the US and Canada. The Gini index is 0.03 in the UK, indicating highly equitable access, versus 0.11 in the US. Average transplant costs per patient are nearly 85% lower in the UK ($130,000) than in the US ($830,000).

Conclusions: The integrated funding and oversight model has facilitated access, survival, and sustainability gains on kidney transplantation for the UK NHS system versus lagging peer countries. Continued value optimisation remains necessary to tackle trade-offs.

Table 1: High-Level Value-Based Care Components Matrix

Country	Pricing Model	Use of Quality-Metrics	Care-Coordination Policies	Financial Protection for Patients
United Kingdom	Yes	Yes	Yes	Yes
United States	Partial	Partial	Partial	Partial
Canada	Partial	In Progress	Partial	Yes

Table 2: High-Level Structural Comparison

Parameter	United-Kingdom	United States	Canada
Key Payer(s)	Single: NHS	Multiple: Medicare, Medicaid, Private	Single: Provincial Plans
Use of Quality Metrics	Yes	Partial	In Progress
Pricing Model	National Tariff	Fragmented	Provincial
Regulatory Oversight	Centralized	Variable	Provincial

Category: Ethics, law and public policy (legislation, changes to legislation)

O02: Hypothermic and normothermic machine perfusion in deceased-donor kidney transplantation: Cochrane review and meta-analysis

Mr Samuel Tingle, Miss Emily Thompson, Mr Rodrigo Figueiredo, Mr John Moir, Dr Michael Goodfellow, Prof David Talbot, Prof Colin Wilson

Institute of Transplantation, Newcastle upon Tyne, United Kingdom

Background: Several novel machine perfusion technologies have been developed which aim to improve kidney transplant outcomes compared with ice-box static cold storage (SCS). These machine perfusion technologies can be applied "continuous" from donor centre, or only at the recipient centre ("end-ischaemic"). We aimed to compare machine perfusion technologies with each other and with SCS.

Methods: We searched the Cochrane Kidney and Transplant Register of Studies to 20 June 2023. Two independent authors screened articles and extracted data. Pairwise random-effects meta-analysis was performed, with additional indirect comparisons performed.

Main results: 22 studies (4007 participants) were included. "Continuous" non-oxygenated hypothermic machine perfusion (HMP) versus SCS improves graft-survival (Figure 1; follow-up=1-10 years, HR=0.55, 95% confidence interval=0.40-0.77, P=0.0005, GRADE: high-certainty evidence), reduces delayed graft function (RR 0.78, 0.64-0.96, P=0.02; high-certainty evidence) and is cost-saving. Beneficial effects persist when cold ischaemic times were short, but were only seen when HMP was "continuous"; End-ischaemic oxygenated HMP (median 4.6hours) does not improve outcomes. Addition of oxygen to continuous HMP further improves graft-survival in DCD donors. End-ischaemic normothermic machine perfusion (NMP) does not improve outcomes versus SCS; indirect comparison revealed that continuous non-oxygenated HMP was associated with improved graft survival compared with end-ischaemic NMP (HR=0.31, 0.11-0.92, P=0.03).

Discussion: Continuous HMP (initiated in donor hospital) is superior to SCS in deceased-donor kidney transplantation. Timing of HMP is important, and benefits have not been demonstrated with end-ischaemic HMP. Whilst end-ischaemic NMP is inferior to continuous HMP on indirect comparisons, further studies assessing NMP for viability assessment and therapeutic delivery are in progress.

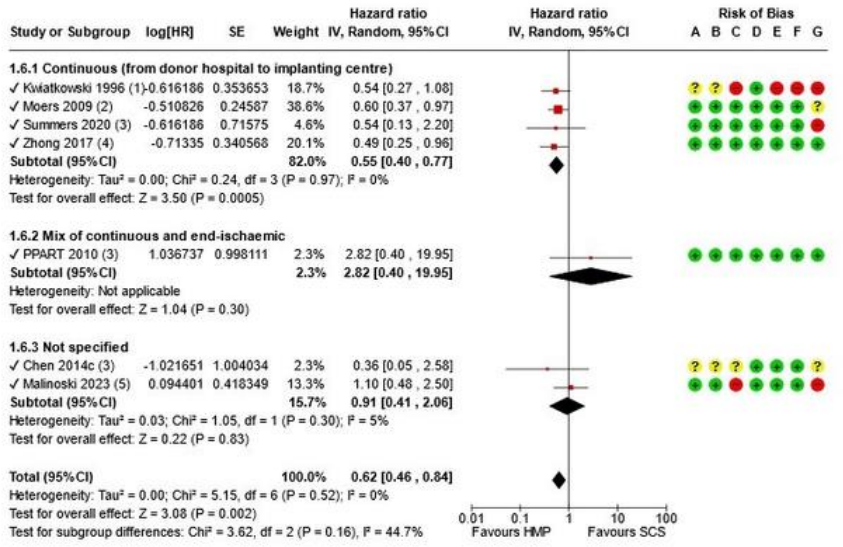


Figure 1 – meta-analysis of graft survival for trials comparing non-oxygenated hypothermic machine perfusion with static cold storage.

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

O03: It is safe to perform non-lung solid organ transplantation from donors with SARS-CoV-2 RNA positivity in the respiratory tract – UK experience

Dr Ines Ushiro-Lumb[1], Ms Suzie Phillips[2], Ms Christie Geoghegan[1], Ms Rhiannon Taylor[2], Dr Rommel Ravanan[2], Professor Derek Manas[2], Professor Douglas Thorburn[1], Mr Chris Callaghan[1]

[1]NHSBT, London, United Kingdom. [2]NHSBT, Bristol, United Kingdom

Introduction: Testing for SARS-CoV-2 RNA in upper and lower respiratory tract samples is a prerequisite for deceased organ donation in the UK. Screen-positive donors with no Coronavirus disease 2019 (COVID-19) are assessed for suitability for organ donation. International experience supports careful utilisation of these organs. We present UK data on organs transplanted from these donors.

Methods: Donor and recipient characteristics plus their SARS-CoV-2 RNA results were accessed through national databases. Recipient outcome reports were received by NHSBT at set intervals. Patients who received organs from screen-positive donors (51 liver, 167 kidney/simultaneous kidney and pancreas, {SPK}) were compared to a control group (1755 liver, 6768 kidney/SPK, respectively) whose donors were screen-negative during the same period.

Results: Between March 2020 and June 2023, 6090 potential deceased donors were assessed; 161 tested positive, of whom 94 donated 250 organs which were transplanted into 236 recipients (153 kidney, 14 SPK, 60 whole liver, 10 split liver, 2 isolated pancreas, 11 heart, 3 bilateral lungs). Recipients were screened for SARS-CoV-2 pre- and post-transplant as per routine local protocol, with no demonstrable cases of donor-derived transmission. As of 22nd November 2023, and after exclusions (e.g., paediatric, and super urgent cases, cases with missing information), analysis of data from 51 adult liver recipients and 167 adult kidney/SPK recipients was showed no differences in outcomes when compared to the control group (Table 1).

Discussion: Our national experience indicates that organs, other than lungs, from SARS-CoV-2 RNA-positive deceased donors should be characterised and considered for transplantation in the same way as screen-negative donors. Thus far, there is no apparent evidence of graft-related transmission of infection or of increased risks associated with the use of non-lung organs. It is hoped that these data will be used to consolidate guidance and practice, increasing utilisation of organs from these donors.

Table 1: Survival estimates for patient and death censored graft survival at 30 days, 90 days and 1 year for first UK adult elective deceased donor liver only or kidney/kidney and pancreas only transplants, by whether the donor was SARS-CoV-2 RNA positive at point of donation (June 2020 to June 2023)

	Liver				Kidney or Simultaneous Kidney and Pancreas		
	SARS-CoV-2 positive donors %(CI)	SARS-CoV-2 negative donors %(CI)	Log-rank p -value		SARS-CoV-2 positive donors %(CI)	SARS-CoV-2 negative donors %(CI)	Log-rank p -value
Patient				Patient			
30 days	98.0 (86.6 - 99.7)	98.7 (98.0 - 99.1)	0.69	30 days	100 (-)	99.5 (99.2 - 99.6)	0.42
90 days	95.6 (83.5 - 98.9)	97.5 (96.7 - 98.2)	0.5	90 days	100 (-)	98.7 (98.4 - 99.0)	0.22
1 year	92.7 (78.8 - 97.6)	95.0 (93.8 - 96.0)	0.5	1 year	98.3 (88.4 - 99.8)	96.0 (95.3 - 96.5)	0.23
Graft				Graft			
30 days	98.0 (86.6 - 99.7)	97.6 (96.8 - 98.3)	0.85	30 days	98.1 (94.1 - 99.4)	97.9 (97.5 - 98.2)	0.86
90 days	98.0 (86.6 - 99.7)	96.5 (95.5 - 97.3)	0.57	90 days	97.4 (93.3 - 99.0)	97.4 (97.0 - 97.7)	0.98
1 year	92.2 (77.5 - 97.5)	94.7 (93.4 - 95.7)	0.67	1 year	97.4 (93.3 - 99.0)	95.9 (95.4 - 96.4)	0.60
Transplant				Transplant			
30 days	98.0 (86.6 - 99.7)	96.9 (96.0 - 97.7)	0.65	30 days	98.1 (94.1 - 99.4)	97.5 (97.1 - 97.8)	0.65
90 days	95.6 (83.5 - 98.9)	95.4 (94.3 - 96.3)	0.82	90 days	96.8 (92.4 - 98.6)	96.4 (95.9 - 96.8)	0.82
1 year	90.0 (75.2 - 96.2)	92.2 (90.7 - 93.5)	0.73	1 year	93.0 (86.0 - 96.6)	93.0 (92.2 - 93.6)	0.92

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

O04: Plasma-Lyte-148 versus standard intravenous fluid in children receiving kidney transplants (PLUTO): A pragmatic, open-label, randomised controlled trial

Dr Wesley Hayes[1], Dr Fotini Kaloyirou[2], Ms Emma Laing[3], Dr Rosie Brown[4], Ms Laura Silsby[4], Ms Laura Smith[4], Ms Helen Thomas[4], Ms Rupa Sharma[2], Mr James Griffiths[5], Dr Helen Hume-Smith[1], Prof Stephen Marks[1,6], Mr Nicos Kessaris[7], Dr Martin Christian[8], Dr Jan Dudley[9], Dr Mohan Shenoy[10], Dr Michal Malina[11], Dr Mordi Mourah[12], Dr Nick Ware[13], Dr Pallavi Yadav[14], Dr Ben Reynolds[15], Dr William Bryant[1], Dr Anastassia Spiridou[1], Prof Jo Wray[1], Prof Mark Peters[6,1]

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Introduction: In paediatric kidney transplant recipients, acute electrolyte and acid base abnormalities occur frequently, which, when severe, can result in seizures, cerebral oedema and death. The PLUTO trial investigated whether Plasma-Lyte-148 affected the prevalence of clinically significant plasma electrolyte and acid-base abnormalities in this population.

Methods: PLUTO was a pragmatic, open-label, randomised controlled trial, recruiting kidney-only transplant recipients aged <18 years at 9 UK centres. Participants were randomised 1:1 to receive Plasma-Lyte-148 intra- and postoperatively, or standard fluids. The primary outcome was acute hyponatraemia (plasma sodium <135mmol/L) in the first 72 hours. Other clinically important electrolyte imbalances, kidney function, time to discharge, symptoms of acute hyponatraemia, proportional weight increase, blood pressure, and number of IV fluid changes were secondary outcomes.

Results: Of 144 participants randomised between June 22, 2020 and August 9, 2022, 138 were transplanted, with a median age 11 (IQR 6-14) years. For acute hyponatraemia, no significant difference between the two arms was found (Plasma-Lyte-148: 36/68 (53%), standard care: 40/69 (58%); OR 0.77 (0.34-1.75), p=0.53). Fewer participants randomised to Plasma-Lyte-148 experienced hyperchloraemia (OR 0.17 (0.07-0.40), p<0.0001), non-anion gap acidosis (OR 0.09 (0.04-0.22), p<0.0001), and hypomagnesaemia (OR 0.21 (0.08-0.50) p=0.0001). Those randomised to Plasma-Lyte-148 had fewer IV fluid changes (RR 0.52 (0.40-0.67), p<0.0001), although more experienced hypernatraemia (OR 3.47 (1.12-10.74), p=0.0223). No significant differences were found for all other outcomes. Twenty-four participants (35%) in the standard care arm and 18 participants (26%) in the Plasma-Lyte-148 arm experienced at least one SAE.

Discussion: Perioperative Plasma-Lyte-148 did not reduce the prevalence of acute hyponatraemia in paediatric kidney transplant recipients compared to standard fluids. Nevertheless, Plasma-Lyte-148 should be considered due to clinically important reductions in hyperchloraemia and metabolic acidosis and reductions in numbers of fluid changes required.

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

O05: Is tissue donation possible in the setting of Respiratory Care Unit (RCU) in a district general hospital - 9 month QI project

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Introduction: An informal survey of majority of Hospitals in Yorkshire Deanery in 2020, revealed that none of the RCU's were involved in a tissue donation programme.

Tissue donation is a precious gift that improves thousands of people's quality of life. Each deceased tissue donor can improve quality of life of up to 50 recipients, as tissues like cornea, bone, cartilage, heart valve and skin are used.

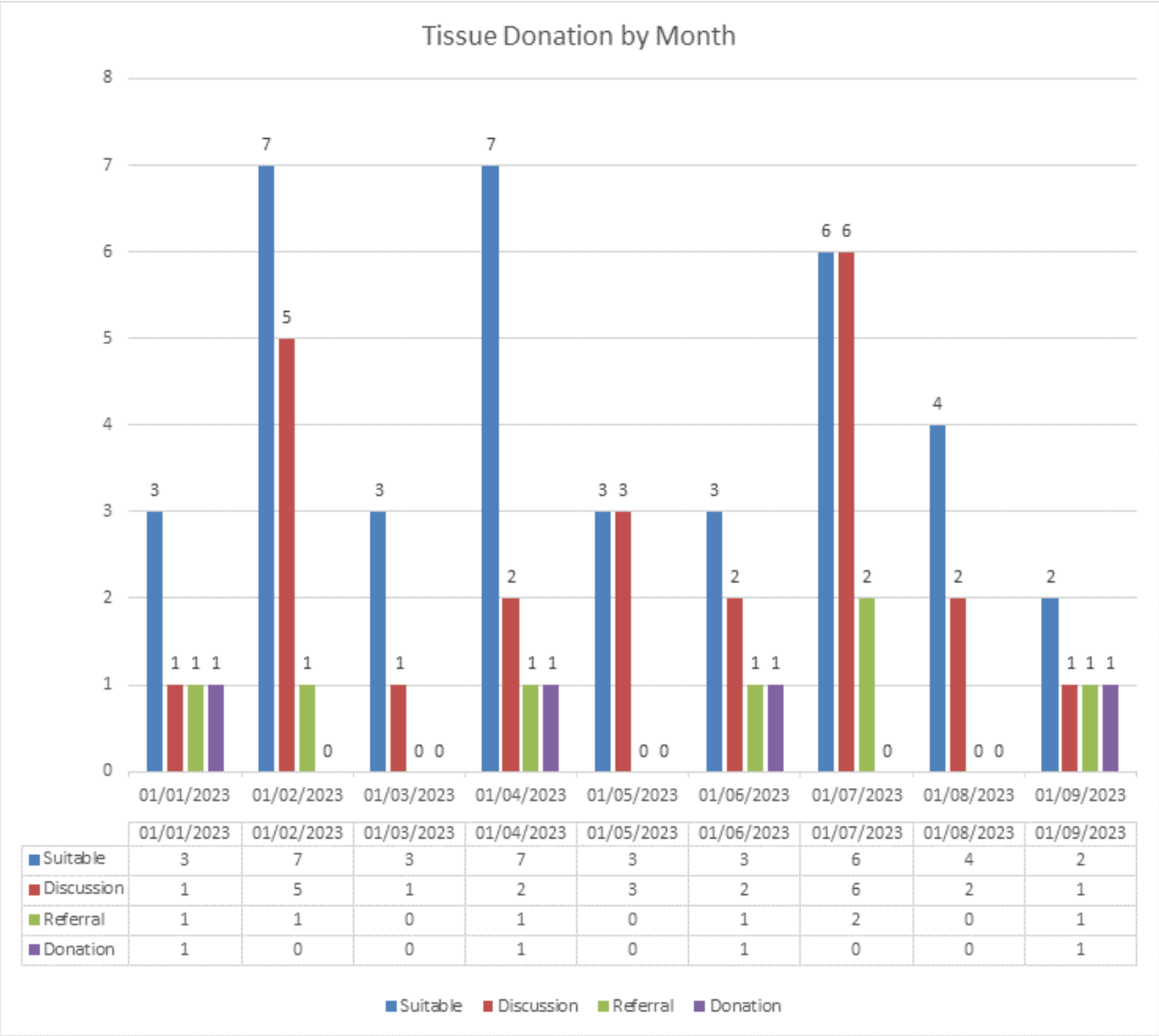
However, it has been recognised that it is very difficult to approach a loved one for tissue donation during the most difficult time and staff unsure of what to do if families were keen for tissue donation. This is reflected that none of the RCUs in local hospitals do provide this valuable service.

Method:
July 2022 - NHS Blood and Transplant (NHSBT) contacted
Aug 2022 –Project Group formed (Nurses, mortuary team, Palliative Care, Medical Examiner and Lead Respiratory Consultant). First education session.
Sept 2022 – Ongoing education and presentation to the Organ Donation Committee who approved initiative.
Oct -Dec 2022 - Visit from the Regional Manager of Tissue Donation and Medical Director Signed off the memorandum of understanding to commit for the project
2nd Jan 2023 – QI project

Results: Number of Deaths on the Respiratory Care Unit

Count of Death on a weekday (WD) or weekend (WE)? Weekend data shows 9 Families – staff unable to approach families at Weekend as No Medical Examiner available – so these are missed opportunities	Suitable for Tissue Donation - Y/N			
	No -	Yes		Grand Total
Row Labels	Weekday	Weekday	Weekend	
January	3	3		6
February	1	5	2	8
March		3		3
April		4	3	7
May	1	3		4
June		2	1	3
July	1	6		7
August	3	2	2	7
September		1	1	2
Grand Total	**9**	**29**	**9**	**47**

Outcomes of Discussions with Families



	01/01/2023	01/02/2023	01/03/2023	01/04/2023	01/05/2023	01/06/2023	01/07/2023	01/08/2023	01/09/2023
Suitable	3	7	3	7	3	3	6	4	2
Discussion	1	5	1	2	3	2	6	2	1
Referral	1	1	0	1	0	1	2	0	1
Donation	1	0	0	1	0	1	0	0	1

Out of the 23 families approached, 7(30%) consented to donation, and 7(30%) were unsure of their loved ones wishes

Discussions: With the right training and support from NHSBT, this pilot study has been successful. In our Unit, tissue donation programme is now established and the possibility of tissue donation has become part of post End of Life care. Furthermore, knowledge of the deceased wishes in life is a positive factor in Tissue Donation.

Category: Tissue donation & transplantation (tissue donors, recipients & retrieval, e.g: corneas, skin, heart valves)

O06: National survey results on a proposed National Transplant Surgery Mentorship Programme (NTSMP) in the United Kingdom

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Introduction: Despite growing evidence that highlight the advantages of mentorship for surgical trainees, there is no formal mentorship programme nor a contemporary national survey of UK transplant trainees that investigate the need for one. The aim of this survey was to explore the views of prospective mentees and mentors regarding mentorship and the proposed National Transplant Surgery Mentorship Programme (NTSMP) endorsed by a UK transplant surgery trainee society (Herrick Society).

Methods: A comprehensive electronic survey was designed and disseminated among UK doctors interested in or working in transplant surgery to explore the prevalence and impact of mentorship among prospective mentees and mentors as well as their views on a formal mentorship programme.

Results: Of 75 responses received, 94.6% (n=71) agreed that a NTSMP would be beneficial. 50.7% of respondents were surgical trainees including 17.3% academic trainees. 65% of respondents represented surgical grades ST1-6 or equivalent whereas only 12% represented ST7/8, post-CCT fellow or consultant. Majority (37.3%) were interested in kidney transplantation. 76% of respondents did not have a mentor whilst 21.3% had existing mentors. Only 8% agreed that their mentorship expectations were being met. 40% had some previous experience of mentoring but only 10.7% had formal mentor training. Half of the respondents preferred virtual meetings held once every 4 months. The lack of an established mentorship programme was highlighted by 48% as the main reason for not having a mentor.

Discussion: This survey established the need for a formal UK mentorship programme in transplant surgery and showed a clear interest among junior trainees to be mentored. Inadequate engagement by senior surgeons could be a limitation of the survey rather than a reluctance to be a mentor. The survey highlighted existing challenges to mentorship which can be overcome with the appropriate roadmap, resource allocation and standardisation of mentorship which the NTSMP is expected to deliver.

Category: Education and promotion (education: patient - public - healthcare professional; promotion: public - donation)

O07: What drives age-associated chronic kidney disease in older donors? Investigating the role of TNF

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Introduction*:* Organ shortage has led to increasing use of kidneys from older donors. Some have excellent post-transplant function and others age-associated chronic kidney disease (CKD). Therefore, there is a need to consider the biological age of transplanted organs rather than chronological age, and to understand the molecular processes underpinning biological organ ageing that might enable therapeutic interventions. Human ageing is associated with an increase in circulating pro-inflammatory cytokines, such as tumour necrosis factor (TNF), and high TNF is also associated with CKD. Here we sought to understand the molecular changes occurring in ageing renal tissue, and assess the extent to which these might be driven by TNF.

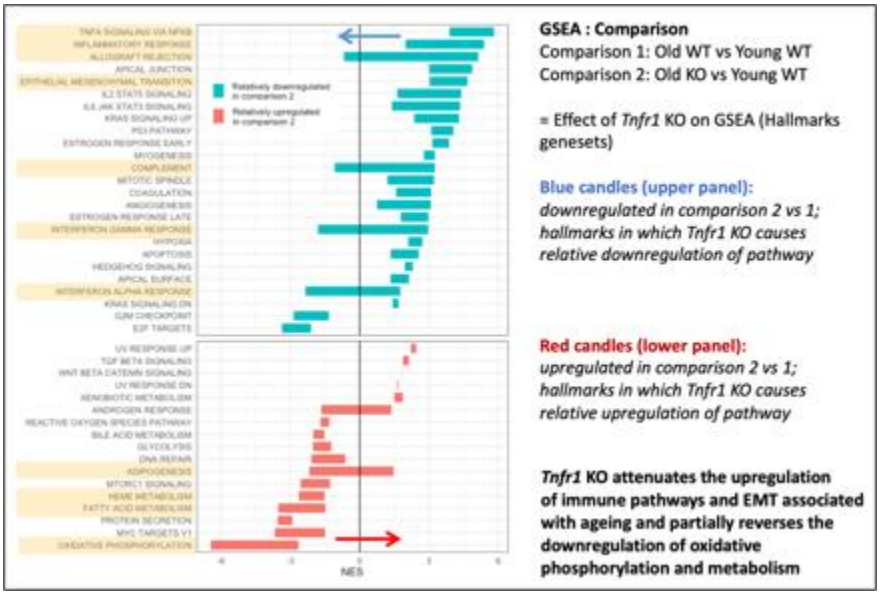
Methods*:* N=12 murine kidneys were analysed using bulk RNA sequencing. These samples were classified into "young" or "old" age groups, where "old" kidneys were the equivalent of a human octogenarian. These samples included wild-type and TNF receptor 1 (Tnfr1)-knockout kidneys. Differential gene expression and gene-set enrichment analyses were performed. Age-associated transcriptional changes were further validated using single cell RNA sequencing of "young" and "old" mouse kidneys and confocal imaging.

Results*:* Old murine kidneys demonstrated an upregulation of immune-related pathways, including TNF-alpha and cytokine-mediated signalling, as well as epithelial mesenchymal transition genes, compared with young kidneys, the latter consistent with the presence of age-associated fibrosis (Fig. 1). These findings were validated using confocal imaging of kidney samples. There was also downregulation of blood pressure control and metabolic pathways with increasing age. Many of these age-associated transcriptional changes were substantially attenuated in Tnfr1-deficient mice (Fig. 2), suggesting that TNF signalling is an important driver of biological ageing in the kidney.

Discussion*:* Our study highlights the importance of 'inflammageing' as a feature of age-associated CKD and identifies TNF signalling as an important driver of biological ageing.

Figure 1: Significant Gene Set Enrichment Analysis (GSEA) hallmarks

Figure 2: GSEA Comparisons



Category: Basic and translational science (as per category - all science)

O08: Mortality in diabetes: Simultaneous islet and kidney transplantation is associated with significant survival benefit

Miss Rebecca Varley[1,2], Mr David Leiberman[2], Miss Yuthika Jeyashuresh[1], Mr Daniel Doherty[1,2], Ms Linda Birtles[2], Mr Malcolm Greenwood-Morgan[2], Mr Marcus Russell-Lowe[2], Mr Zia Moinuddin[1,2], Mr Giuseppe Giuffrida[2], Dr Shazli Azmi[2], Mr Hussein Khambalia[1,2], Mr David van Dellen[1,2]

[1]Faculty of Biology, Medicine & Health, University of Manchester, Manchester, United Kingdom. [2]Department of Renal & Pancreatic Transplantation, Manchester University Hospitals NHS Foundation Trust, Manchester, United Kingdom

Introduction: Simultaneous Islet cell and kidney (SIK) transplantation provides a treatment alternative for patients with end-stage renal failure (ESRF) secondary to type I diabetes mellitus (T1DM) who lack the physiological reserve to undergo solid organ transplantation. We aim to assess whether islet cell transplantation provides significant survival benefits compared to best medical therapy in these patients.

Methods: Retrospective analysis was performed on survival for all patients activated on the waiting list for pancreatic islet cell transplantation in a single centre from 2009 to 2022, with outcomes of transplanted patients compared to a control group (waiting list). Patients suspended due to ill health were excluded to minimise confounders. Data collected included demographic variables, burden of diabetic, cardiovascular and renal disease. Descriptive statistics, Fisher's exact and Kaplan-Meier analyses were performed.

Results: 69 patients were listed. Median age at listing was 56, M:F 1.08:1. 31 underwent islet cell transplantation (22 SIK, 9 islet alone). Median waiting time to transplantation was 308 (41-1101) days. 15 patients received kidney-only transplants (due to poor quality islets, not included for survival analysis). 23 patients remained on the waiting list, with no significant analysed differences in this control group.

Waiting list mortality was 60.9% compared to 30.5% following transplantation (p=0.02), with median survival improved 4.4-fold (figure 1; 3427 vs 777 days; p<0.0001, logrank, hazard ratio 0.22, CI 0.076-0.659 – relative risk reduction of 78% for transplanted group) and significant improvements in the SIK group (figure 2). No significant differences were elicited in islet cell transplant vs kidney-alone or SIK versus islet transplant alone survival.

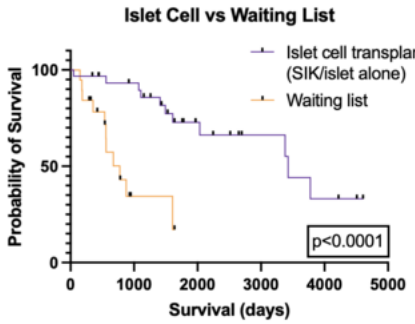


Figure 1

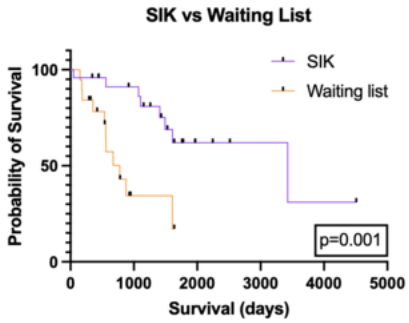


Figure 2

Discussion: Islet cell transplantation provides significant survival advantage compared to medical therapy in T1DM and ESRF. These patients have a high mortality risk on the waiting list. Patients eligible for islet cell transplantation require prioritisation for transplantation, with particular increased focus on SIK transplantation as an evolving treatment.

Category: Clinical - pancreas and islet (pancreatic transplant (all types) - surgery - recipient clinical care and management)

O09: Artificial intelligence assisted risk prediction in organ transplantation: A UK Live-Donor Kidney Transplant Outcome Prediction (UK-LTOP) tool

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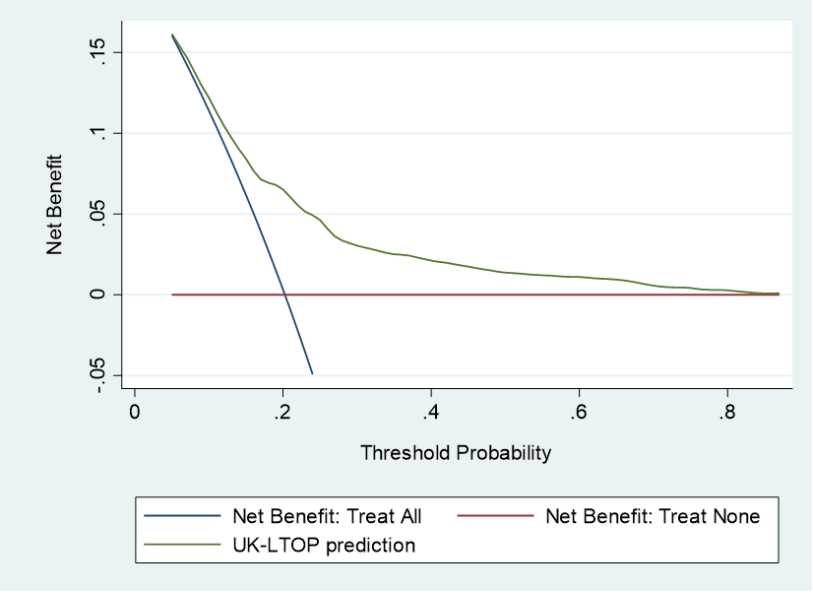
Introduction: Predicting the outcome of a kidney transplant involving a living donor advances donor decision-making donors for clinicians and patients. However, the discriminative or calibration capacity of the currently employed models are limited. We set out to apply Artificial Intelligence (AI) algorithms to create a highly predictive risk stratification indicator, applicable to the United Kingdom's transplant selection process.

Methodology: Pre-transplant characteristics from 12,661 live-donor kidney transplants (performed between 2007 and 2022) from the United Kingdom Transplant Registry (UKTR) database were analysed. The transplants were randomly divided into training (70%) and validation (30%) sets. Death-censored graft survival was the primary performance indicator. We experimented with four machine learning models assessed for calibration and discrimination (integrated Brier score (IBS), and Harrell's concordance index). We assessed the potential clinical utility using decision curve analysis. Subgroup analysis was performed on patients with lower and higher deprivation scores.

Results: XGBoost demonstrated the best discriminative performance for survival (AUC=0.73, 0.74, and 0.75 at 3, 7, and 10 years post-transplant, respectively). The concordance index was 0.72. The calibration process was adequate, as evidenced by the IBS score of 0.09. By evaluating possible donor – recipient pairs based on graft survival, the AI-based UK-LTOP has the potential to enhance choices for the best live-donor selection. Subgroup analysis showed consistency of the results among patients with lower and higher deprivation scores.

Discussion: This methodology can improve the outcomes of kidney paired exchange schemes and accurately predict survival probability. In general terms we show how the new AI and machine learning tools can have a role in developing effective and equitable healthcare.



Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

O10: Mortality risk for kidney transplant candidates with diabetes on the waiting list: Glass half full or empty?

Dr Raja Rashid[1], Dr Daoud Chaudhry[2], Miss Felicity Evison[1], Dr Adnan Sharif[1,3]

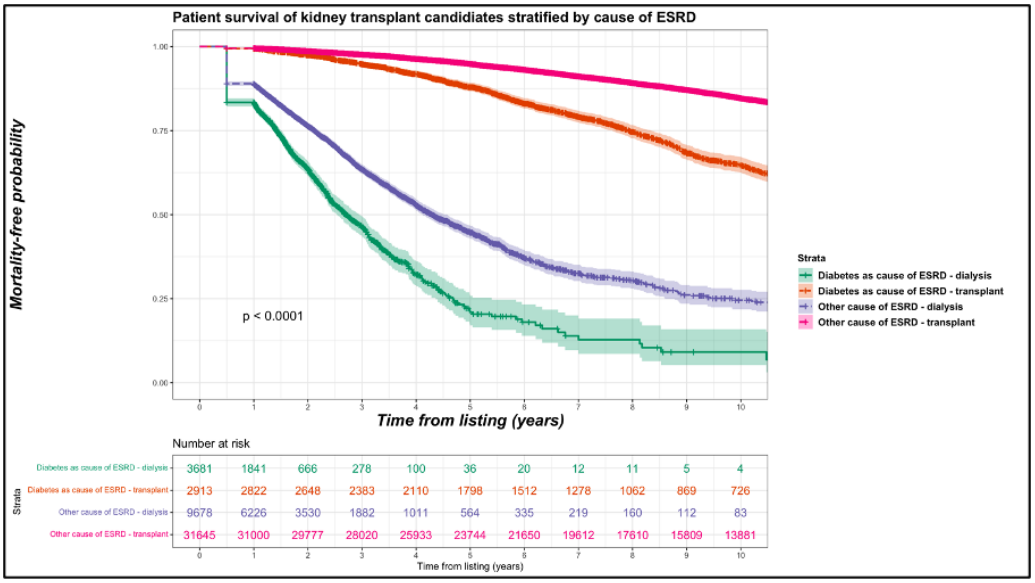
[1]University Hospitals Birmingham, Birmingham, United Kingdom. [2]University Hospital of North Midlands, Stoke On Trent, United Kingdom. [3]University of Birmingham, Birmingham, United Kingdom

Background: Whether kidney failure patients with diabetes as their cause of end-stage renal disease (ESRD) have the same transplantation opportunities after waitlisting compared to patients without diabetes is unclear.

Methodology: A retrospective cohort study was undertaken of prospectively collected registry data of all waitlisted kidney failure patients receiving dialysis in the United Kingdom. From January 1, 2000 until September 30, 2019 inclusive, all patients listed for their first kidney-only transplant were included. The primary outcome was all-cause mortality, with survival analysis conducted according to the intention-to-treat principle. Time-to-death from listing was analysed using adjusted nonproportional hazard Cox regression models, with transplantation handled as a time-dependent covariate. All analyses were done using R (version 4.2.2).

Results: A total of 47,917 waitlisted kidney failure patients formed the study cohort, of whom 6,594 (13.8%) had diabetes as their ESRD. Kidney transplant candidates with versus without diabetes had greater mortality after waitlisting (31.1% versus 20.9% respectively, p<0.001). After waitlisting, a greater proportion of kidney transplant candidates with diabetes remained un-transplanted (55.8%, n=3,681) versus being transplanted (44.2%, n=2,913), compared to every other ESRD cohort more likely to be transplanted. Mortality risk was similar for kidney failure patients with diabetes waitlisted then transplanted (30.2%) and waitlisted but not transplanted (31.8%). Recipients with diabetes as their ESRD had different baseline demographics compared to those who do not receive transplants. In a time-dependent regression model, compared to remaining on dialysis any kidney transplant provided survival benefit for waitlisted kidney transplant candidates (HR 0.259, 95% CI 0.250-0.269, p<0.001) after adjustment for diabetes status.

Discussion: Waitlisted kidney transplant candidates with diabetes as their ESRD have better survival after kidney transplantation versus remaining on dialysis. However, the data suggest kidney failure patients with diabetes face barriers as they are the only ESRD cohort with a greater likelihood to remain without a transplant after waitlisting.



Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

O11: Donor Cystatin-C association with post-transplant graft function

Mr Ioannis Michelakis[1,2], Dr Sarah Fawaz[1], Dr Rebecca Vaughan[1,3], Dr Ivan Hartling[4], Dr Philip Charles[4], Dr Edward Sharples[5], Prof Smaragdi Marinaki[2], Prof Ioannis Boletis[2], Prof Rutger Ploeg[1], Dr Maria Kaisar[1,3]

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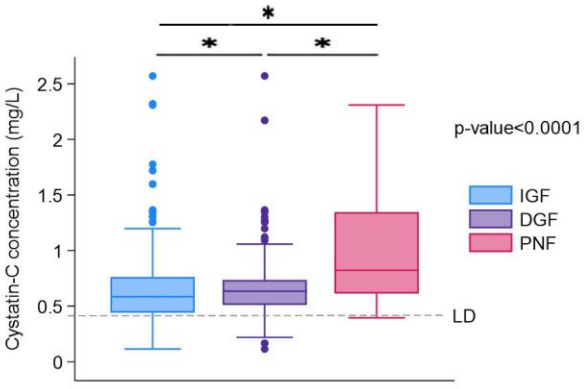


Figure 1. Donor plasma Cystatin-C levels associate with DGF, PNF or Immediate function. Dotted lines indicate baseline levels (LD).

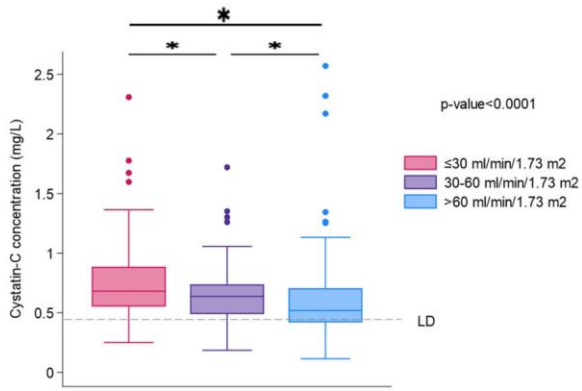


Figure 2. Donor plasma Cystatin-C levels associate with 12-month post-transplant function (eGFR). Dotted lines indicate baseline levels (LD).

Introduction: Cystatin-C is an established biomarker of kidney function and has been associated with unfavourable outcomes in critically ill patients. Our aim was to evaluate whether Cystatin-C levels in donors after brain (DBD) and circulatory death (DCD) associate with posttransplant outcomes.

Methods: Plasma samples (n=303) collected prior to cross clamp (DBD=157) or withdrawal of support (DCD=126) were obtained from the Quality in Organ Donor (QUOD) biobank. Plasma samples from Living donors (LD; n=20) were also included as a control cohort, to establish baseline levels. Circulatory levels of Cystatin-C levels were quantified using Luminex assay. We performed descriptive statistics and multivariate logistic and survival analysis using COX [MK1] regression models to determine the association between Cystatin-C, primary non-function (PNF), delayed graft function (DGF), acute rejection (AR), 12-month posttransplant graft function and graft survival.

Results: DCDs had significantly higher levels of Cystatin-C, compared to DBDs (p-value=0.02).
High levels of donor plasma Cystatin-C levels significantly associated with DGF and PNF; p-value<0.0001 (Figure 1). No association was found between AR and Cystatin-C.
Cystatin-C levels were significantly lower (p-value<0.0001) in donors who offered concordant grafts with optimal 12-month post-transplant function (eGFR>60 ml/min), compared with grafts with intermediate function (GFR 30-60 ml/min) or eGFR<30ml/min (Figure 2).

We constructed three different multivariate models to adjust for donor, recipient and transplant characteristics and donor Cystatin-C levels were an independent risk factor for inferior 12-month paired graft function (eGFR<30ml/min). Lastly, there was a trend between increased levels of donor Cystatin-C with reduced early and overall graft survival (HR:1.53, p-value=0.09).

Discussion: In our study, Cystatin-C levels were significantly higher in donors with grafts that developed PNF or suboptimal 12-month posttransplant graft function. Our findings suggest that Cystatin-C may have a role in identifying higher-risk donors and offer an opportunity for granular assessment of kidney quality prior to transplantation.

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

O12: Geographical inequity of access to renal transplantation: centre practice or demographic differences in wait-listed populations?

Dr Rebecca Roberts[1], Dr John OO Ayorinde[2], Professor Gavin Pettigrew[3], Dr Dominic Summers[3]

[1]Health Education England, Cambridge, United Kingdom. [2]Health Education England, London, United Kingdom. [3]University of Cambridge, Cambridge, United Kingdom

Introduction: Recommendation 1 of the Organ Utilisation Group states that 'patients who are being considered for transplantation… must… have equal access to services'. We assess the extent to which biological, ethnic, socio-economic, healthcare and geographical factors determine access to renal transplantation for UK wait-listed patients.

Methods: Using 2010-2022 data from the UK Blood and Transplant, 23360 wait-listed patients' biological (sex, age, blood group, calculated reaction frequency, HLA homozygosity, diabetes, primary renal disease), ethnic, socio-economic (index of multiple deprivation of home postcode), healthcare (dialysis modality, year of transplant) and geographic (listing centre) data were incorporated into a multivariable-adjusted cox proportional hazard model for kidney transplantation, censoring for 'still waiting', 'death', 'suspension' or 'removal from the waiting list'.

Results: After adjusting for all other factors, patient's tissue match had the largest effect on kidney transplantation, with a hazard ratio for transplantation of 2.44 (95% CI 2.35-2.53, $p<0.001$) for blood group A and 4.95 (4.58-5.35, $p<0.001$) for blood group AB, compared to blood group O patients. HLA sensitisation carried a reduced hazard of transplantation, with a hazard ratio of 0.12 (0.10-0.13, $p<0.001$) for highly sensitised patients (100% calculated reaction frequency) when compared to non-sensitised patients.
The second largest effect was due to listing transplant centre. Compared to the largest centre, the hazard ratio of transplantation ranged from 0.69 (0.64-0.75, $p<0.001$) at one centre to 2.31 (2.13-2.51, $p<0.001$) at another. In contrast, Black and Asian ethnicity compared to White had a much more modest effect and after full adjustment, patient's sex and IMD had no significant effect.

Discussion: Our analysis shows that UK listing centre is one of the greatest determinants of transplantation and that this centre effect is not explained by biological, ethnic or socio-economic differences in centre's catchment populations. Improving equity of access to kidney transplantation requires better understanding of differences in practice between different centres.

Category: Education and promotion (education: patient - public - healthcare professional; promotion: public - donation)

O13: Circulating TNFα, TNFR1 and TNFR2 levels in deceased donors negatively associate with post-transplant kidney function

Dr Sarah Fawaz, Dr Ivan Hartling, Miss Rebecca Vaughan, Mr Ioannis Michelakis, Dr Edward Sharples, Dr Philip Charles, Dr Rutger Ploeg, Dr Maria Kaisar

University of Oxford, Oxford, United Kingdom

Introduction: Deceased donation has an adverse impact on graft quality and posttransplant function, and experimental and clinical studies have indicated that biological alterations related to inflammation may predispose grafts to suboptimal function. We evaluated donor inflammatory levels by measuring plasma TNFα, TNFR1, TNFR2 levels and computed associations with 12-month posttransplant function. We analysed pre-transplant biopsies from donors with high TNFα plasma levels to assess the degree of kidney injury. Finally, and to establish a causal relationship between circulatory inflammation and graft injury we used an in-vitro model of human immortalised podocytes.

Methods: Plasma samples were obtained from 254 deceased donors (B4 timepoint DBD=134, B3 timepoint DCD=120) and provided by the Quality in Organ Donation (QUOD) biobank. We quantified plasma TNFα and receptors by Luminex assay. Pretransplant biopsies from a donor sub-cohort with high TNFα were also analysed by Western Blotting and immunostaining for markers of injury. Podocytes were treated with donor plasma and analysed for expression of TNF receptors.

Results: High plasma TNFα, TNFR1 and TNFR2 levels were associated with inferior 12-month posttransplant function (eGFR <40ml/min; $p<0.05$) only in DBDs but not in DCDs in multivariate analysis (Fig 1). Kidneys of DBD donors with high plasma TNFα levels had significantly higher tissue protein expression of TNFR1 and TNFR2 (Fig 2A). Treatment of podocytes with DBD plasma with high TNFα levels induced significant increased mRNA and protein expression of TNFR1 and TNFR2 compared to donors with low inflammatory levels (Fig 2B).

Conclusion: Our data show that brain death associates with higher circulatory inflammatory levels during donor management, higher expression of kidney tissue injury markers and significant association with inferior transplant outcomes. Finally, exposure of human podocytes to higher levels of donor plasma TNFα provided novel data to support the need to ameliorate inflammation during donor management.

Fig 1

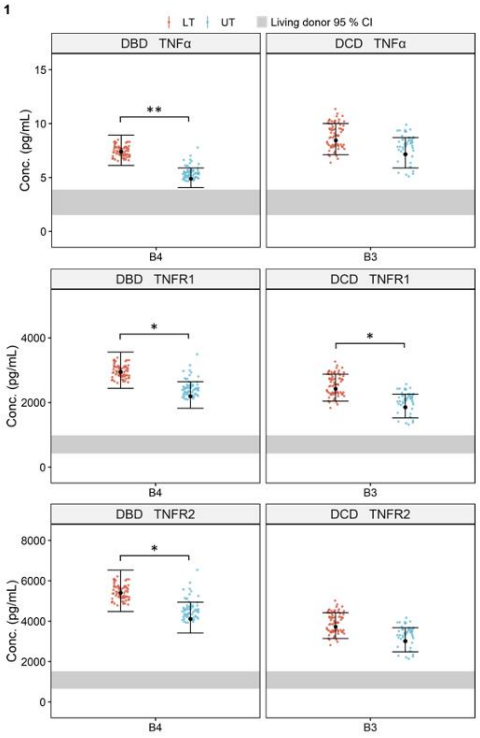


Fig 2A

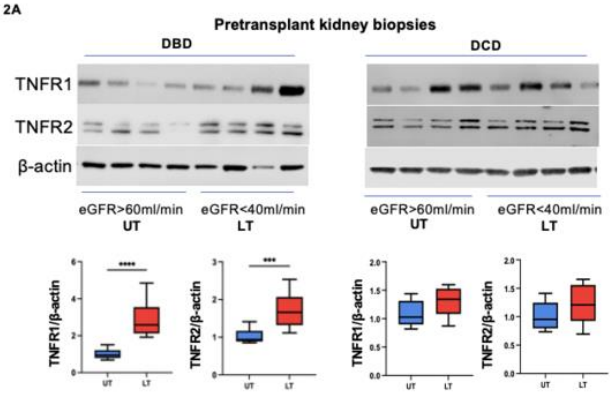
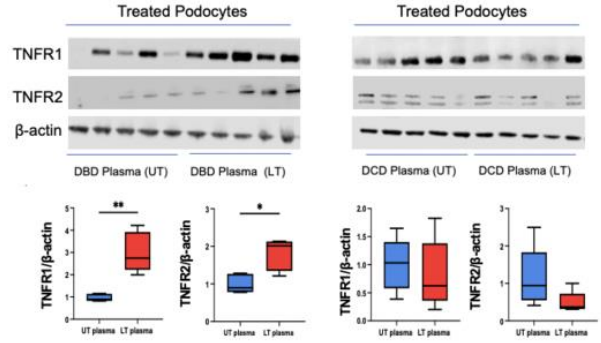


Fig 2B



Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

O14: Novel methods for testing small bowel viability under different preservation conditions by ex vivo machine perfusion (MP) in a large animal model

Mr Jake Bastian[1], Dr Dylan Barnett[1], Mr Rohan Bhattacharjya[1], Mr David Daniel[1], Mr Akshay Kanhere[1], A/Prof Andrew Ruszkiewicz[2], A/Prof Shantanu Bhattacharjya[1]

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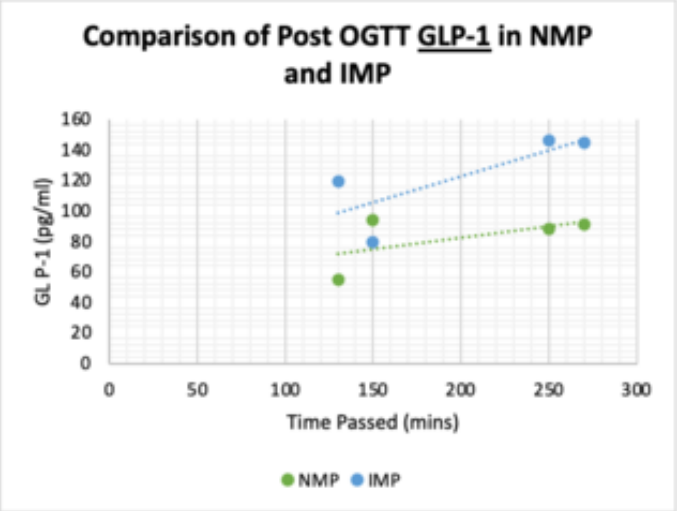
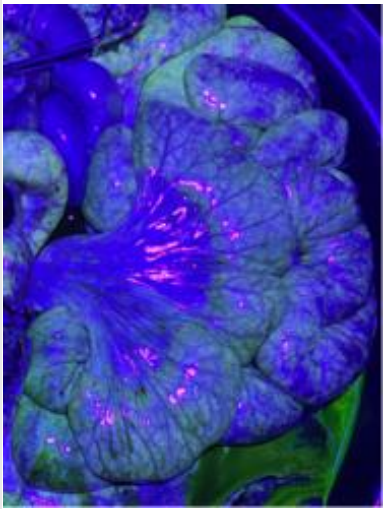
Introduction: Maintenance of physiology is the best assessment for organ viability. For the small bowel, practical models for ex vivo preservation by oxygenated MP with blood at normothermia are established using GLP-1 as a marker of secretory function. As part of an abdominal en-bloc MP model, the glucose tolerance test can be modified to assess the hormonal interplay between small bowel and pancreas, providing indication of organ viability. Fluorescein angiography (FA) can be used as a qualitative adjunct to demonstrate vascular integrity following preservation.

Methods: Eight large white pigs were procured ethically before random assignment to either normothermic blood MP (n = 4) or isothermic acellular MP (n = 4) groups. Abdominal blocks were surgically removed and integrated into the MP rig. The proximal small bowel lumen was cannulated and a glucose bolus injected at two and four hours into preservation. Serial venous glucose, GLP-1 and insulin readings were taken following stimulation. After five hours of preservation, fluorescein dye was injected into the circuit.

Results: A temporal response to glucose stimulation was achieved, demonstrating active entero-insular axis physiology throughout the preservation period. Mean GLP-1 post infusion for isothermic acellular MP was 122.4 pg/ml compared to normothermic blood MP at 82.14 pg/ml. Insulin responded appropriately following stimulation, with evidence of GLP-1-mediated secretion. FA substantiated the viability assessment by showing adequate perfusion to the small bowel (see below).





Discussion: This novel study provides a feasible method for assessing small bowel viability during ex vivo preservation. Bench testing the entero-insular axis via a modified glucose tolerance test also has ethical benefits of reduction in large animal research. Future analysis should increase the preservation time beyond five hours to identify metabolic and vascular limitations of the small bowel under different MP conditions.

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

O15: De novo donor specific antibody (DSA) development is preceded by specific loss of regulation of B-dependent Th1 CD4+ T cell responses to the DSA Human Leucocyte Antigen (HLA) but not to other mismatched donor HLA

Dr Sumoyee Basu[1], Dominic Stringer[1], El Li Tham[1], Chloe Martin[2], On Behalf of the Outsmart Investigators Team[3], Dr Olivia Shaw[2], Professor Anthony Dorling[1]

[1]Kings College London, London, United Kingdom. [2]Clinical Transplantation Laboratory at Guy's Hospital, London, United Kingdom. [3]13, UK Transplant Centres, United Kingdom

Introduction: While de novo DSA was associated with graft loss in the OuTSMART trial, optimised immunosuppression post-DSA failed to improve transplant survival. To better understand these results, we evaluated concomitant changes in regulatory cells and IFNy and IL17 production, which knowingly associate with adverse transplant outcomes and may pre-empt DSA formation.

Methods: Peripheral blood mononuclear cells were available from multiple time points (Figure 1) prior to time of DSA development (t0) from 52/82 patients who were initially DSA- but developed DSA during the trial (Figure 1). HLA *Pure Proteins* (PP) representing **DSA** or **control** donor mismatches were used to stimulate CD8 depleted PBMC to evaluate indirect allo-responses. Using FluoroSpot, antigen specific IFNγ and IL17 CD4+ production (ASR) was then compared, including conditions with additional depletion of CD19+ and CD25high cells.

Results: Antigen specific responses (ASR) were detectable to either control or DSA PP in 60.4% (75/124) experiments for IFNy and 15.3% (19/124) for IL17 even up to 32 months prior to t0. Table 2a demonstrates that overall ASR to control tended to be more regulated (44.8%, 26/58) than to DSA protein (16%, 19/66) but this was not statistically significant. However, Figure 2b indicates that the proportion of regulated IFNy responses to both were similar until 8 months prior to t0, at which point, it became obvious that there was a progressive loss of regulation of responses to DSA but not to control protein. No similar patterns were discernible in responses to IL-17.

Discussion: This is the first systematic study of clinical samples prior to DSA development. This shows detectable T cell sensitisation long before DSA development and differential loss of regulation to DSA antigens vs control. Ongoing deep phenotyping flow cytometry analyses will reveal the regulatory cells responsible and predict those who develop DSA enabling a crucial window for targeted immunosuppression or cell therapy.

Figure 1: Outline of OuTSMART participants becoming DSA+ recruited from >2000 patients from 13 UK Transplant centres. 82 patients became DSA+ during trial, 52 had PBMC and pure protein available for experiments to be conducted. Flow cytometry enabled deep phenotyping and functional analyses reviewed IFNγ and IL17 cytokine production in FluoroSpot to HLA PP.

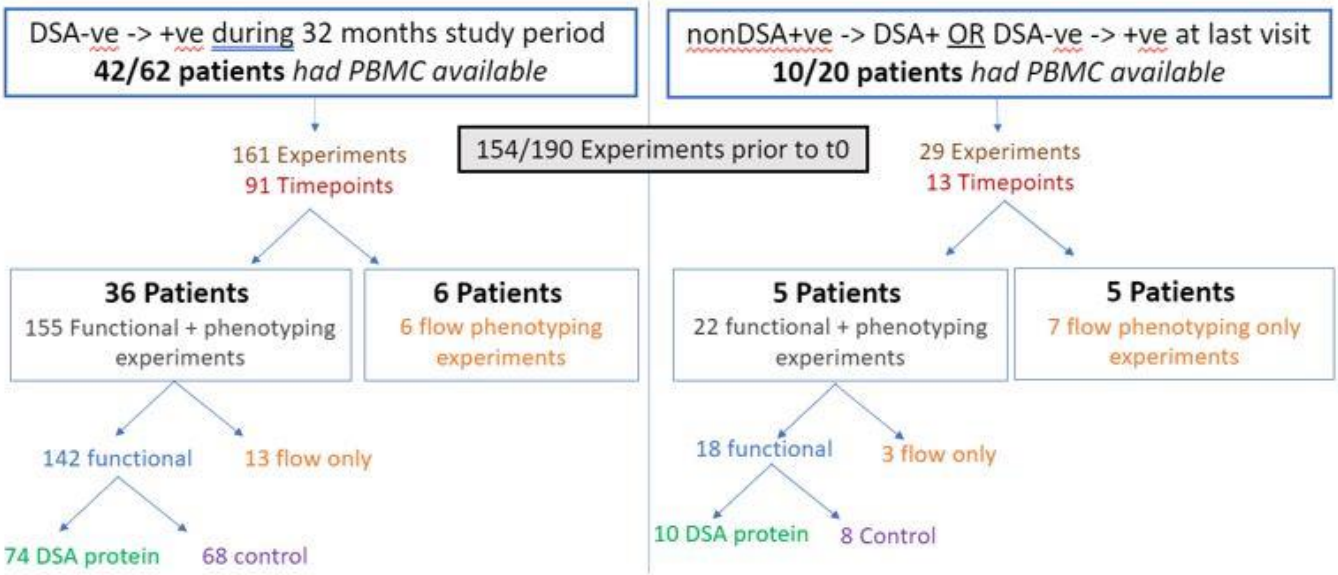
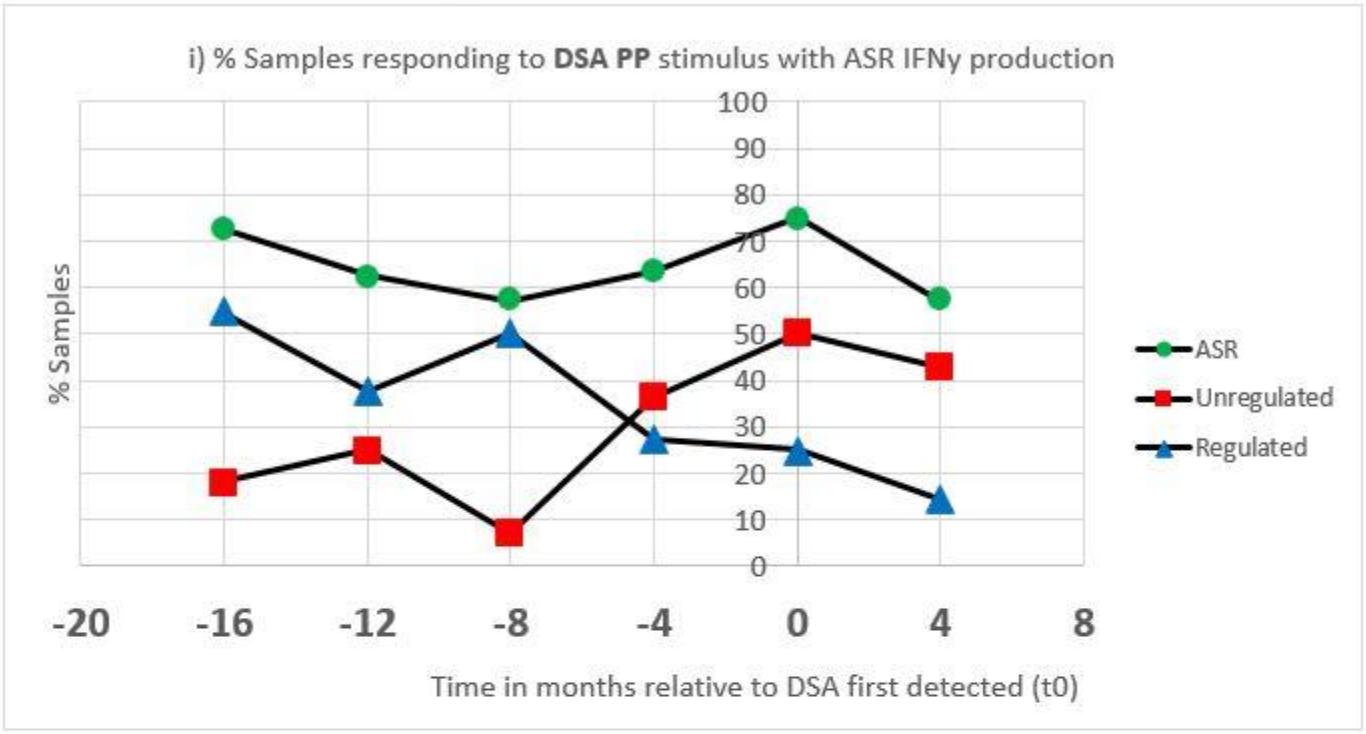
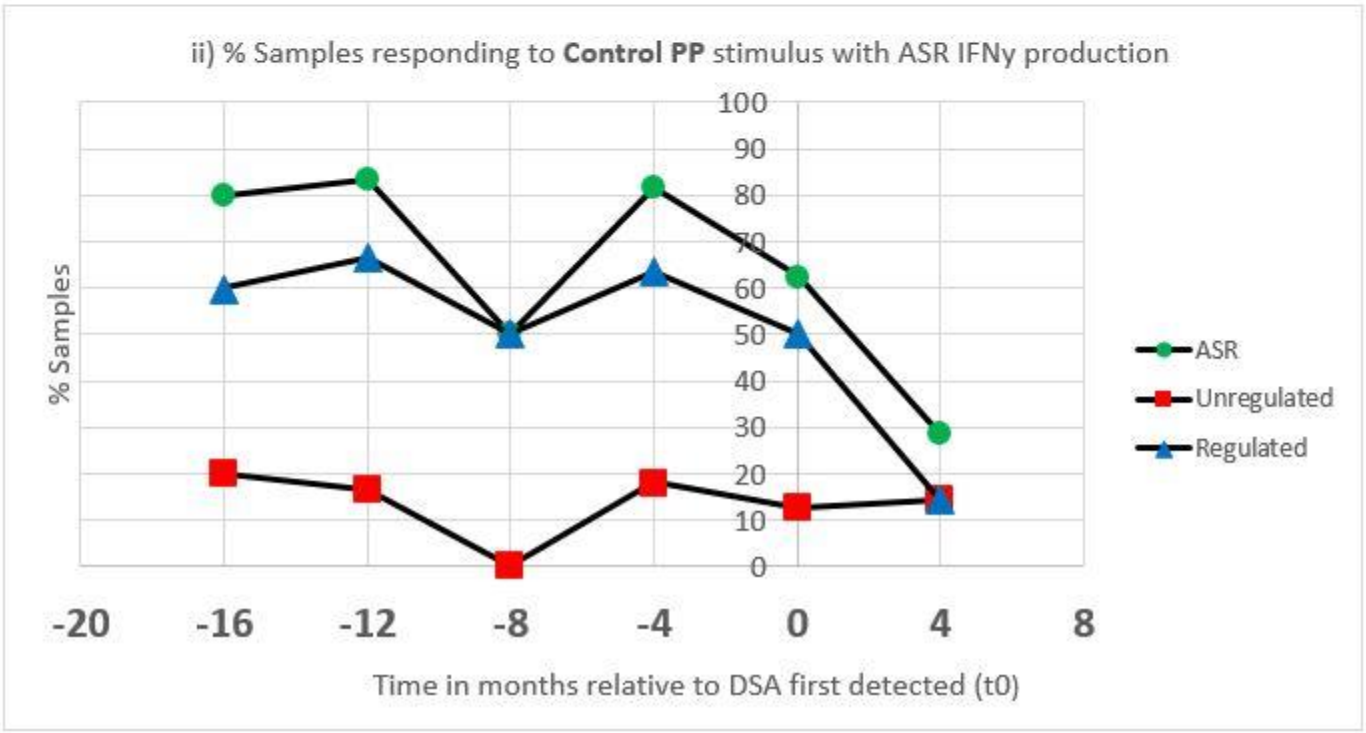


Figure 2: Table 2a) demonstrating antigen specific IFNγ responses above threshold to HLA pure proteins with DSA specificity or control prior to appearance of DSA (t0) out of 124 functional experiments.

Pure Protein stimulus	No IFNγ response from CD8-depleted PBMC (NDSR)		IFNγ response from CD8-depleted PBMC (DSR)		
	No ASR after depletion of CD19 or CD25hi (a)	ASR after depletion of CD19 or CD25hi (b) (regulated responses)	No evidence of T or B cell regulation after depletion of CD19 or CD25hi (c)	Evidence of regulation after depletion of CD19 or CD25hi (d)	Evidence of regulation regardless of CD8-response (b) + (d)
Control PP (58 total)	19/37 (51.3%)	18/37 (48.6%)	13/21 (61.9%)	8/21 (38.1%)	**26/58 (44.8%)**
DSA PP (66 total)	30/46 (65.2%)	16/46 (34.7%)	17/20 (85%)	3/20 (15%)	**19/66 (16%)** p=0.09 (two tailed Fischer exact 2x2 test)

Figure 2b) Longitudinal analysis of samples producing IFNy in response to pure protein in relation to time of DSA first appearing (t0). i) DSA PP ii) Control PP





Category: Basic and translational science (as per category - all science)

O16: Chaotropic disruption - a potential enabler to HLA incompatible transplantation?

Ms Victoria Wood[1,2], Dr Brendan Clark[1], Dr Sunil Daga[1], Dr Eric Hewitt[2]

[1]Leeds Teaching Hospitals NHS Trust, Leeds, United Kingdom. [2]University of Leeds, Leeds, United Kingdom

Introduction: A core aspect of a renal Transplant Immunology service is the detection of HLA antibodies in the context of prospective donors. The presence of HLA-antibodies is detrimental to both chances of transplant and, as donor-specific antibodies (DSA), to graft outcomes. With growing numbers of highly sensitised patients requiring renal transplant across HLA-antibody barriers, an increased understanding of antibody functional characteristics could lead to more informed donor choices. The avidity of an antibody-antigen interaction provides insight into the antibody's capability to induce antibody-mediated changes, such as intracellular signalling, leading to tissue remodelling and graft damage.

Methods: Chaotropic agents reduce protein stability and have been previously used within ELISA protocols to estimate the avidity of antibody-antigen interactions through a process called chaotropic disruption (CD). Modification of our standard One Lambda LABScreen Single Antigen bead (SAB) protocol to include a chaotropic agent has demonstrated technical viability of applying chaotropic disruption to a solid-phase assay. Firstly, a maximum molarity of chaotropic agent was established which is not detrimental to bead surface antigen integrity. This was verified using flow cytometric analysis with HCA2 monoclonal, which binds to both native and denatured HLA-Class I, in comparison with HLA-A, B, C monoclonal which binds to native HLA-Class I only (figure 1).

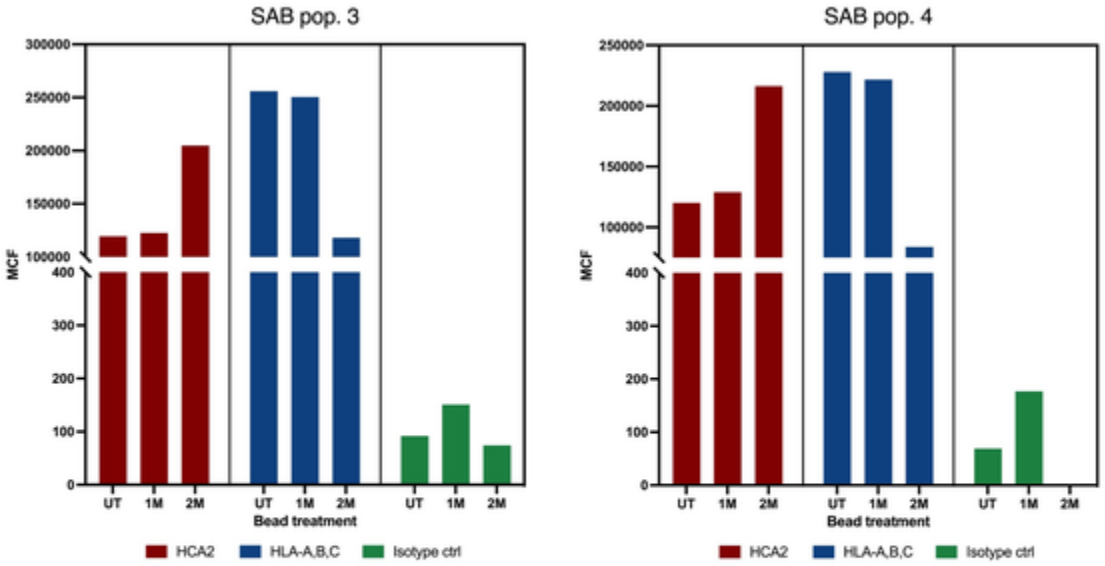


Figure 1: Verification of SAB surface antigen integrity after exposure to chaotropic agent. HCA2 binds to native and denatured HLA-Class I. HLA-A, B, C monoclonal binds to native HLA-Class I only. UT = untreated beads, 1M = SAB exposed to 1 molar chaotropic agent, 2M = SAB exposed to 2 molar chaotropic agent. MCF = median channel fluorescence.

Sera samples with known HLA-antibody profiles were re-tested as per standard protocol in addition to with the CD methodology (within validated range of GuHCL molarities).

Results

Antibody-specific patterns of binding and disassociation were found, an example shown in figure 2.

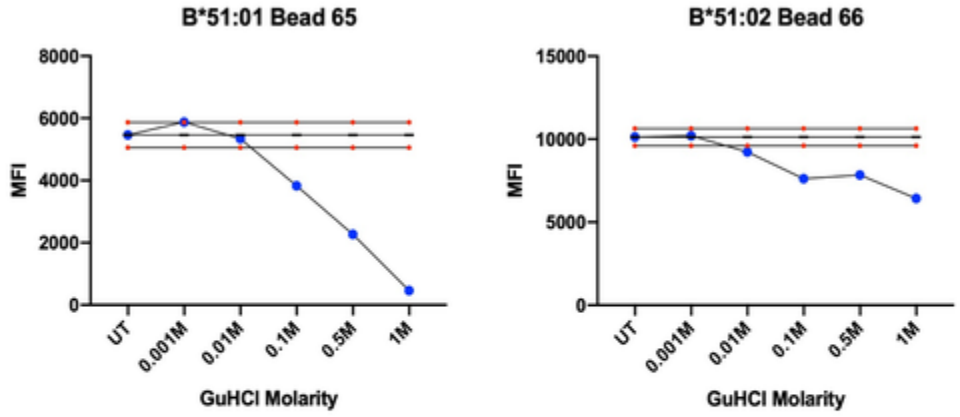


Figure 2: Chaotropic disruption of HLA-B*51:01 and B*51:02 antibodies showing differential avidity. Red points represent assay uncertainty of measurement. Black dashes indicate untreated antibody MFI. UT=untreated (standard protocol). M = molar concentration. MFI = mean fluorescent intensity. GuHCL = Guanidine Hydrochloride.

Discussion: This novel assay represents a potential accessible method of testing HLA-antibody avidity in an NHS laboratory setting, thereby supportive of programmes where risk stratification of prospective HLA incompatible transplants is required. Further validation through comparison with recognised methods of measuring avidity, such as surface plasmon resonance, is ongoing.

Category: H&I (HLA typing - crossmatching - immunologically complex recipients)

O17: Targeting sphingosine-1-phosphate receptor-1 protects vascular endothelial integrity during human *ex vivo* lung perfusion

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Introduction: Ischaemia reperfusion injury (IRI) after lung transplantation is characterised by severe pulmonary oedema due to inflammatory pulmonary vascular leak. Normothermic *ex-vivo* lung perfusion (EVLP) provides a platform for administration of therapies prior to transplantation. Sphingosine-1-phosphate (S1P) reduces vascular endothelial permeability via activation of S1P-receptor 1 (S1PR1). We hypothesised that agonism of S1PR1 would improve vascular endothelial integrity, limiting pulmonary oedema formation in human donor lungs declined for transplantation.

Methods: An optimal dose of the S1PR1 agonist, CYM5442, was established in human pulmonary microvascular endothelial cells *in-vitro* using trans-endothelial electrical resistance. CYM5442 was administered to declined human donor lungs in our paired split-lung model, which allows one lung to be treated and the other to act as an internal control, removing inter-donor variation. Lung pairs were surgically divided and added to separate identical EVLP circuits and ventilators. CYM5442 and vehicle treated lungs were exposed to 6 hours of EVLP. Lung weight, endothelial permeability to Evan's blue dye, wet/dry ratio and direct lung ultrasound evaluation (CLUE) score was assessed.

Results: *In-vitro*, 0.05 µM CYM5442 optimally improved monolayer integrity at baseline and during injury. During EVLP (n=5 lung pairs), both groups maintained stable perfusate flow rates and left atrial pressures. CYM5442 significantly reduced Evan's blue accumulation in bronchoalveolar lavage (p=0.0107; Figure 1A) and lung tissue (p=0.0077; Figure 1B) compared to vehicle. Lung weights were significantly lower in the CYM5442-treated group at the end of EVLP (p=0.0136). Additionally, there was a trend towards a reduced wet/dry ratio and improved CLUE score post-EVLP.

Conclusion: Use of CYM5442 protects vascular endothelial barrier integrity and limits pulmonary oedema formation during EVLP. Targeting S1PR1 may be a viable treatment option for donor-lungs prior to transplantation to reduce the risk of IRI.

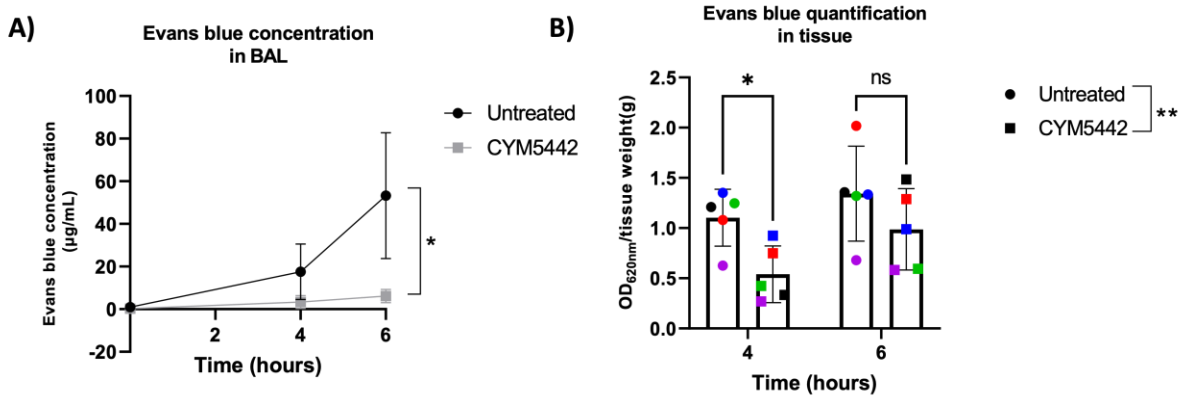


Figure 1. Quantification of endothelial permeability to Evan's blue during EVLP. **A)** Evan's blue concentration in Bronchoalveolar lavage fluid. **B)** Quantification of Evan's blue per g of tissue during EVLP.

Category: Basic and translational science (as per category - all science)

O18: UK Experience of direct procurement of lungs with ongoing abdominal normothermic regional perfusion from controlled DCD donors

Dr Luke Williams[1,2], Ms Rachel Hogg[1], Sarah Beale[1], Mr Pradeep Kaul[2], Mr Phil Curry[3], Mr Simon Messer[3], Mr Prashant Mohite[3], Mr Rajamiyer Venkateswaran[4], Mr Vipin Mehta[4], Dr Gerard Meachery[5], Mr Jerome Jungschleger[5], Mr Jorge Mascaro[6], Mr David Quinn[6], Mr John Dunning[7], Mr Bart Zych[7], Mr Anand Jothidasan[7], Mr Mubassher Hussain[7], Mr Chris Johnson[8], Professor Gavin Pettigrew[9], Professor Anne Olland[10], Mr Andrew Butler[9], Ms Gillian Hardman[4], Mr Chris Watson[9], Mr Ian Currie[8]

[1]NHS Blood and Transplant, Bristol, United Kingdom. [2]Royal Papworth Hospital NHS Foundation Trust, Cambridge, United Kingdom. [3]Golden Jubilee University National Hospital, Glasgow, United Kingdom. [4]Manchester University NHS Foundation Trust, Manchester, United Kingdom. [5]The Newcastle Upon Tyne Hospitals NHS Foundation Trust, Newcastle, United Kingdom. [6]University Hospitals Birmingham NHS Foundation Trust, Birmingham, United Kingdom. [7]Royal Brompton and Harefield Hospitals NHS Foundation Trust, London, United Kingdom. [8]NHS Lothian, Edinburgh, United Kingdom. [9]Cambridge University Hospitals NHS Foundation Trust, Cambridge, United Kingdom. [10]University Hospital Strasbourg, Strasbourg, France

Introduction: We describe the UK experience of direct procurement (DRP) of lungs for transplantation alongside abdominal normothermic regional perfusion (A-NRP), with an analysis of early outcomes for lungs transplanted with this method compared to standard retrieval after circulatory death (DCD).

Methods: Lung utilisation and 90-data survival data from DCD lung transplants between 1 January 2015 and 31 December 2022 were obtained from the NHSBT registry. Case notes from all DCD lung recipients in this cohort were analysed to define primary graft dysfunction (PGD) grade using ISHLT criteria. 90-day survival rates were compared for standard DCD retrieval and DRP with A-NRP using the log-rank test. Grade 3 PGD rates at 72 hours after transplant were compared using Fisher's exact test.

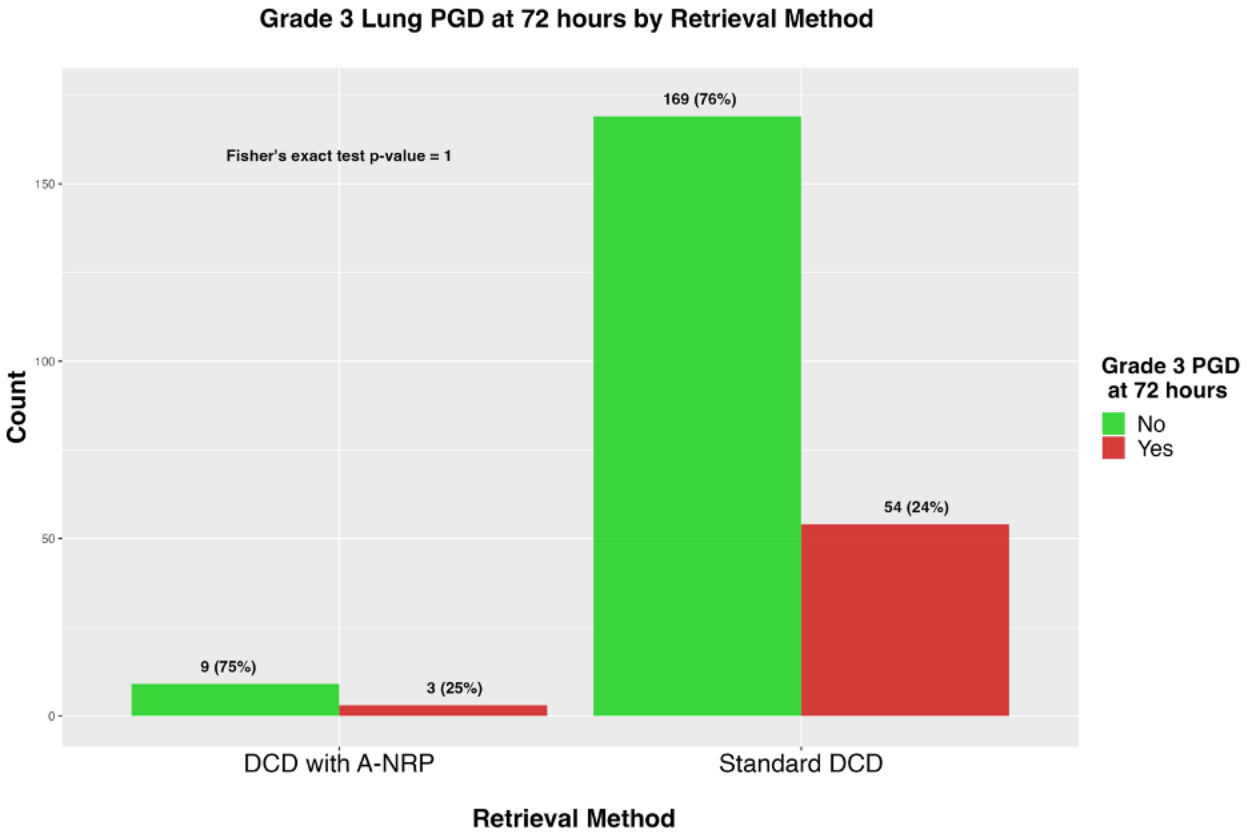
Results:

Lung utilisation
There were 307 DCD lung donors in this cohort; 3 underwent thoraco-abdominal normothermic regional perfusion (TA-NRP), 18 DRP with A-NRP and 289 standard DCD retrieval. 13 (72%) A-NRP donors and 236 (82%) standard DCD resulted in transplants. There was no significant difference in utilisation between the two methods (p=0.50).

Lung Outcomes
90-day survival rate for standard DCD lung transplant recipients was 87.3% (95% CI: 82.3-91.0%). 90-day survival rate for lung transplant recipients who received DCD lungs procured with concomitant A-NRP was 92.3% (95% CI: 56.6-98.9%, log rank p-value = 0.59).

After the exclusion of transplants with key data missing and retransplants, 238 transplants were included in the PGD analysis (12 A-NRP with DRP, 223 standard DCD). The rate of Grade 3 PGD at 72 hours after transplant for standard DCD lungs without A-NRP was 24.2% (95% CI: 18.7-30.4%) versus 25.0% (95% CI: 5.5-57.2%) with concomitant A-NRP (Fisher's exact test p-value >0.99).

Discussion: Direct procurement of lungs with A-NRP is feasible and has comparable organ utilisation, 90-day mortality and severe PGD rates, whilst improving outcomes for abdominal organ recipients from DCD donors.



Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

O19: Predicting determinants of successful transplantation using Supra-Marginal (DRI-Donor Risk Index >1.5) deceased donor kidneys

Mr Zaid Al-Amiedy[1,2], Dr Varun Vijayan[1], Mr Sanjay Mehra[1], Mr Hemant Sharma[1,2]
[1]Royal Liverpool University Hospital, Liverpool, United Kingdom. [2]University of Liverpool, Liverpool, United Kingdom

Objective: To develop machine-learning-models with national registry data to predict factors associated with favorable outcomes using supra-marginal (DRI -Donor Risk Index >1,5) deceased donor kidneys

Design: A retrospective cohort study using UK Transplant Registry data from 2000-2019

Setting: National registry administered by NHS Blood and Transplant in the United Kingdom.

Participants: Adult recipients (n = 6254) of first kidney-alone transplants from very supra-marginal deceased-donors (DRI≥1.5)

Main Outcome Measures: Death-censored graft failure and patient mortality

Predictors: Comprehensive recipient, donor, and transplant characteristics.

Statistical Analysis: Bayesian neural networks, gradient boosting machines, random forest, and SMOTE-balanced bagging classifiers tuned using Bayesian optimisation Cox regression, competing risk analysis, and calibration plots.

Results: Overall, 5-year graft survival was 81%. The random forest model had excellent predictive performance for graft failure (AUC 0.88, 95% CI 0.87-0.89; RMSE 0.29). recipient age > 75-years (SHR 1.02, 95% CI 1.01-1.03), recipient-BMI >30 (SHR 1.04, 95% CI 1.02-1.07), HLA mismatches >4 (SHR 1.09, 95% CI 1.01-1.17), donor-creatinine >120mmol/L (SHR 1.002, 95% CI 1.001-1.003), and rejection- within 3-months (SHR 1.56, 95% CI 1.32-1.85) were key determinants. Prolonged cold-ischemia-time >14hrs (SHR 1.01, 95% CI 1.007-1.015) was detrimental.

Conclusions: Supra-marginal deceased-donor kidneys can achieve excellent 5-year outcomes with careful recipient selection. Machine learning accurately predicted factors associated with success.

Table 1: Adjusted predictors of graft failure

Variable	SHR	95% CI	p-value
Recipient age > 75 years	1.02	1.01-1.03	<0.001
Recipient BMI >30	1.04	1.02-1.07	0.002
HLA mismatches >4	1.09	1.01-1.17	0.03
Creatinine at offer >120 mmol/L/ 1.4 mg/dl	1.002	1.001-1.003	<0.001
Rejection at 3 month	1.56	1.32-1.85	<0.001
Cold ischemia time >14 hrs	1.01	1.007-1.015	<0.001

SHR: subdistribution-hazard-ratio; CI: confidence-interval

Table 2: Machine-learning-model performance

Model	AUC-ROC (95% CI)	RMSE
Random forest	0.88 (0.87-0.89)	0.29
Neural network	0.85 (0.83-0.87)	0.31
Gradient boosting	0.82 (0.80-0.84)	0.34
SMOTE Bagging	0.84 (0.82-0.86)	0.32

Fig 1: MLA-Models

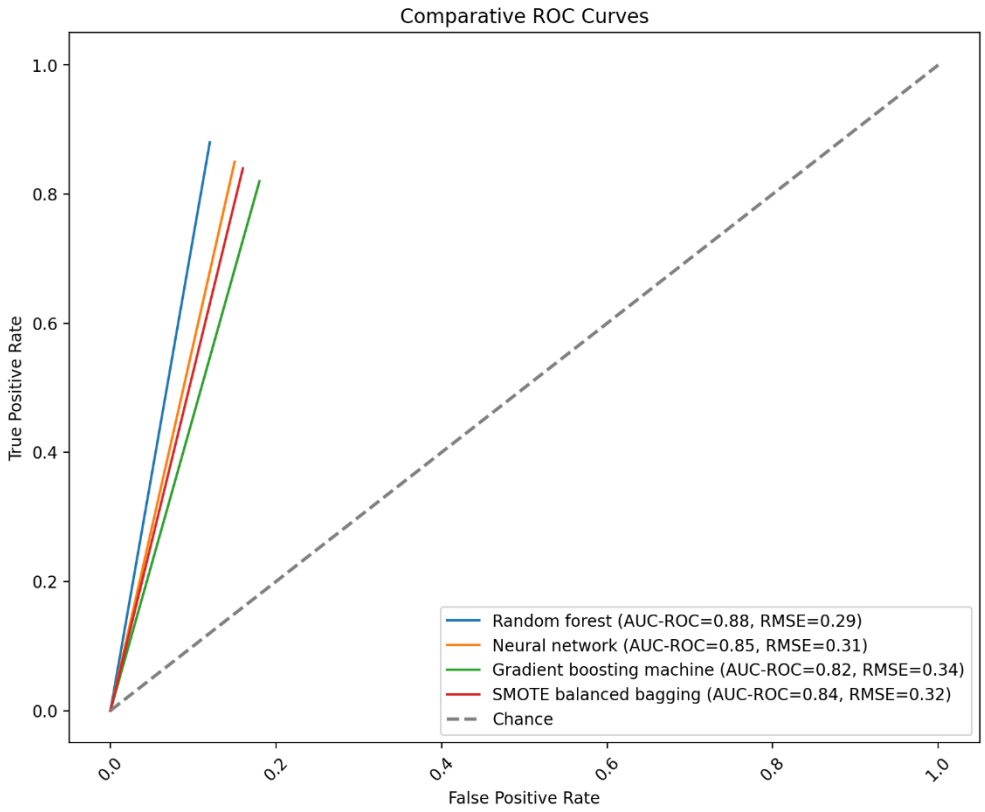


Fig 2: Calibration-Plots

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

O20: The ASK trial: A feasibility randomised controlled trial investigating strategies to improve AccesS to Kidney transplantation ISRCTN Registry ISRCTN10989132

https://doi.org/10.1186/ISRCTN10989132

Assoc Prof Pippa Bailey[1,2], Prof Fergus Caskey[1,2], Dr Stephanie MacNeill[1], Ms Rachel Ashford[1], Ms Lindsay Pryce[1], Dr Adarsh Babu[3], Prof Liise Kayler[4], Prof Yoav Ben-Shlomo[1]

[1]University of Bristol, Bristol, United Kingdom. [2]North Bristol NHS Trust, Bristol, United Kingdom. [3]Gloucestershire Hospitals NHS Foundation Trust, Gloucester, United Kingdom. [4]Erie County Medical Center, Buffalo, New York, USA

Introduction: The UK's living-donor kidney transplant (LDKT) activity falls behind that of many other countries: less than 20% of those eligible receive a LDKT each year. There is socioeconomic and ethnic inequity in LDKT access. We have developed a multicomponent patient and family outreach service combining approaches used in other countries (Norway/The Netherlands/USA). Existing randomised controlled trials (RCTs) of home-based family engagement were underpowered to demonstrate effectiveness at increasing LDKTs. We aimed to determine the feasibility of intervention delivery in the UK, and of undertaking a definitive effectiveness RCT.

Methods: The intervention comprised:

- a meeting with a LDKT educator to discuss LDKTs, living kidney donation and potential donors.
- written outreach to a candidate's potential donors
- home-based family education and engagement delivered by a nurse LDKT educator and a living donor.

The trial was based at two hospitals. Adult transplant candidates were eligible. Participants were randomised with concealed allocation 1:1 intervention: usual care, stratified by site. Minimisation was used to ensure balance in sex, age, and socioeconomic strata. Primary outcomes were recruitment and retention.

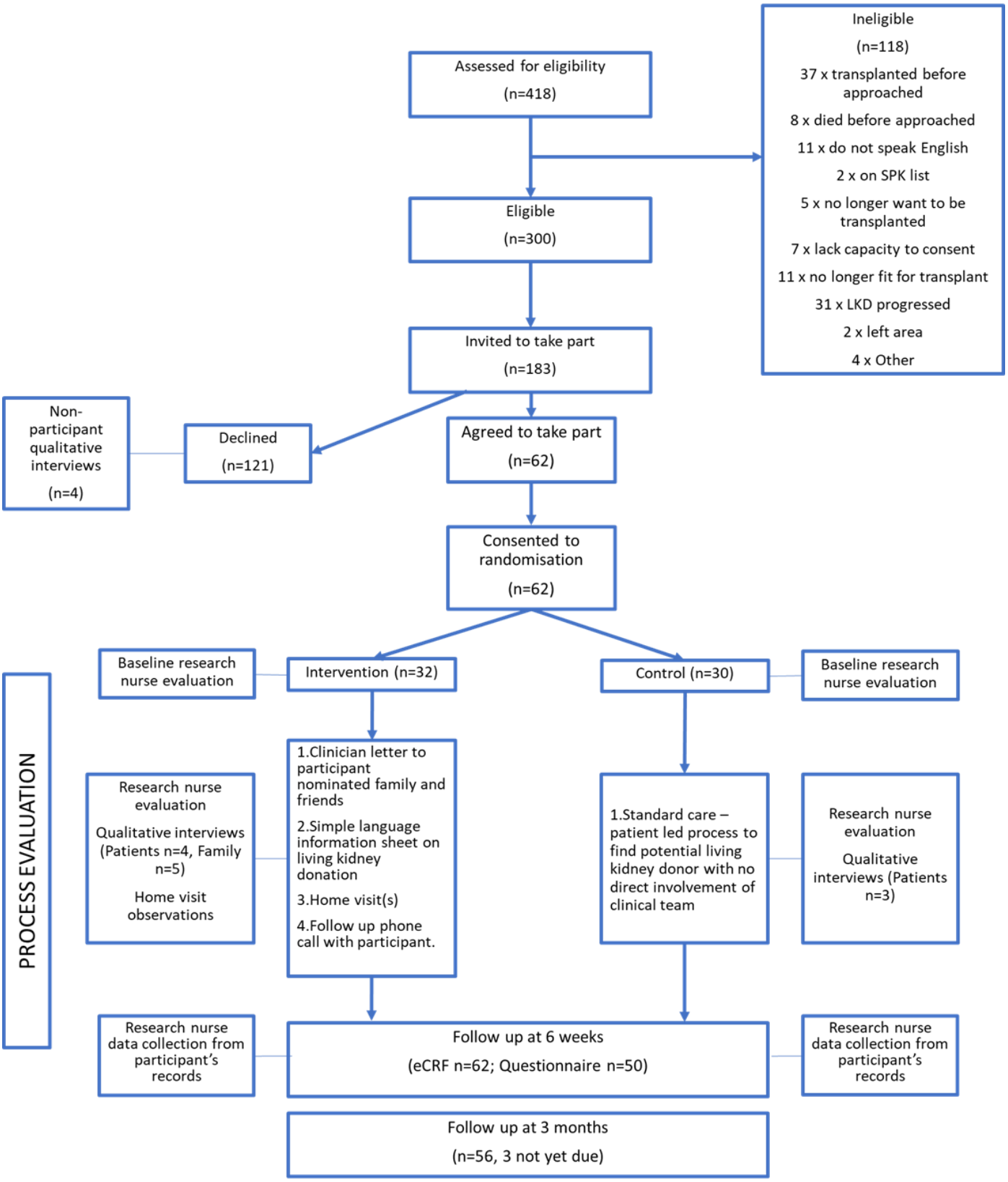
Results: Recruitment was 34% (62/183) (Figure 1). We over-recruited individuals of UK minority ethnicity, and achieved a population representative sample with respect to sex, age and socioeconomic status (Table 1). 100% of participants completed nurse-assessed follow-up. 81% of participants completed follow-up questionnaires. The feasibility trial was not powered to determine intervention effectiveness, but findings will inform the sample-size calculation for the effectiveness RCT. At time of submission, 28% (9/32) of intervention participants had people undergoing donor assessment, compared to 10% (3/30) receiving usual care. 6% (2/32) of intervention participants have received a LDKT, compared to 0% receiving usual care.

Discussion: This feasibility trial demonstrated population reach, and determined the parameters required to design an RCT to evaluate the effectiveness of the intervention at improving access to living-donor kidney transplantation.

Table 1. Equality and Diversity: Participants versus non-participants

Variable	Eligible n=300	Invited n=183	Participants n=62	Non-participants n=121
Sex - number female (%)	95 (32)	56 (31)	18 (29)	38 (31)
Age group n (%)				
≤25 years	4 (1)	1 (1)	0	1 (1)
26-45 years	74 (25)	43 (23)	16 (26)	27 (22)
46-65 years	163 (54)	102 (56)	32 (52)	70 (60)
>65 years	59 (20)	37 (20)	14 (23)	23 (19)
Socioeconomic position				
EIMD decile ≤ 5 (most deprived) n (%)	154 (51)	97 (53)	30 (48)	67 (55)
Ethnicity - Participants from Black, Asian, Other ethnic groups n (%)	66 (22)	43 (23)	17 (27)	26 (21)

Figure 1. CONSORT flow diagram



Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

O21: Medium-term outcomes of en-bloc kidney transplantation from donors under 18kg in a single centre

Ms Imeshi Wijetunga, Ms Clare Ecuyer, Ms Sonsoles Martinez-Lopez, Mr Stuart Falconer, Mr Omar Masood, Dr Richard Baker, Dr Matthew Welberry Smith, Dr Adrienne Seitz, Mr Niaz Ahmad, Mr Adam Barlow

Leeds Teaching Hospitals NHS Trust, Leeds, United Kingdom

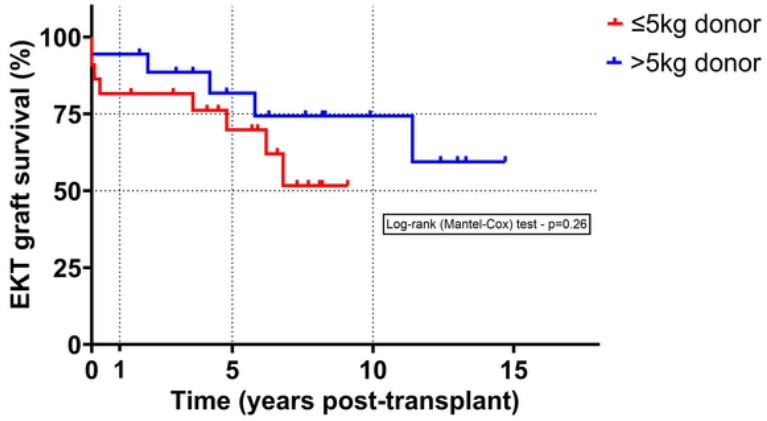
Background: We previously reported our initial experience of en-bloc kidney transplantation (EKT) from infant and neonatal donors. The primary aim of this follow-up study was to investigate the medium-term graft survival outcomes. Secondary aim was to explore the current status of EKT from this donor pool in the UK.

Methods: Data on EKT performed since 2005 at our centre were retrieved from a prospectively completed database. Kaplan-Meier method was used for survival analyses. Statistics on EKT performed in the UK were obtained from the NHSBT statistics enquiries service.

Results: Of 40 EKT performed, 55% were from donors ≤5kg with majority DCD donors (77.3%).

	≤5kg (n=22)	>5kg (n=18)
Donor age	26 days	17.5 months
DCD:DBD	17:5	10:8
Donor weight (kg)	3.6	12
Recipient age (yrs)	31	30.5
Recipient weight (kg) (BMI)	54.7 (21.3)	62.4 (22.2)
Graft loss (<90d)	2	1
PNF	3	0
DGF	4	0
1yr Graft survival	81.6%	94.4%
5yr Graft survival	69.8%	81.7%
10yr Graft survival	-	74.3%

A trend towards improved EKT graft survival was seen in those from donors >5kg, although this was not statistically significant (p=0.26).



Of 54 en-bloc kidney offers over the past 5 years from donors under 5 years of age, only 31 EKT (48% DBD) have been performed. There were 9 donors under 6 months with no DBD donors. Three transplant centres performed more than 3 EKT in this period.

Conclusion: As previously reported, good outcomes can be achieved from EKT from this donor pool, especially from donors over 5kg. Despite this, only 31 have been performed in 5 years across 10 UK transplant centres. The 2030 strategic plan to increase paediatric and neonatal donation does not appear to have had a positive impact on donor numbers. More targeted strategies may be required to expand this donor pool and centralise transplantation from this uncommon donor pool.

Category: Clinical - renal surgical (kidney - transplant and living donor surgery - novel techniques)

O22: UK donor heart focused echocardiography assessment working group: Current practice and strategy for improving donor heart utilisation

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Introduction: We looked to establish the role of focused echocardiography to improve heart utilisation through a national working group.

Methods: A mixture of methodologies were used to establish baseline activity in the United Kingdom (UK).

Results: The national survey demonstrated per ICU that there were 3.61 consultants and 1.44 registrars with focused echo accreditation. Time taken to acquire an echo within 6 hours was 60% for focused scans and 48% for full scans in hours, falling to 20% for focused scans and 10% for full scans out of hours.

The retrospective London analysis found 19 suitable donors out of 49 offers. Scans were performed by sonographers in 47%, intensivists in 37% and cardiologists in 16% of cases. 37% of scanners were found to have full accreditation, 5% focused accreditation and 58% were unknown.

The national specialist nurses donor audit revealed the median time delay between requesting a scan and it being carried out was 17.9 hours (IQR 13.9, 33.2). 30% (9/30) of scanners were fully accredited, 13% (4/30) focused accredited, 33% (10/30) had no accreditation and 23% (7/30) were unknown. Only 50% (15/30) of images were transferred for assessment by the transplant centre. Image transfer in the cohort of 15 was with 27% (4/15) via a freeware instant messaging platform and 67% (10/15) via email and 3% (1/30) via PACS transfer.

The national transplant centre audit revealed 21% of donors had inadequate echocardiography for review by transplant centres. Overall, only 52% potential donors had images available for review by the transplant centre. In 17% of cases if good quality imaging had been available the decision on retrieval may have been different.

Discussion:
We propose 3 key recommendations:

1. Using focused echocardiography for screening heart donors.
2. A minimum focused echocardiography dataset protocol (Figure 1).
3. Ensuring image transfer to transplant centres.

Approved v2.0 Oct 23

Donor Heart Transthoracic Echo Assessment

If you are fully accredited please scan & report the echo as per BSE standards.

If you are focused echo accredited (i.e. Fusic Heart or Level I BSE), please scan and report as per your accreditation standards, consider recording the following 18 views is possible and transfer images to transplant centre.

Remote Image review is essential in all cases.

Parasternal long axis

1) 2D
2) Colour over aortic valve*
3) Colour over mitral valve*
4) Measure*: Intraventricular septum thickness
Posterior wall thickness,
End diastolic LV diameter

Parasternal short axis

5) 2D Aortic level
6) Colour over tricuspid*
7) Colour over pulmonary valve*
8) 2D Mitral level
9) 2D Papillary muscle level
10) 2D Apical level

Apical 4 Chamber

11) 2D
12) Colour over mitral valve*
13) Colour over tricuspid valve*
14) Measure*: RV basal diameter

Apical 5 Chamber

15) 2D
16) Colour over aortic valve*

Subcostal

17) 2D
18) Colour over inter-atrial septum*

Reporting

If you feel able please comment on following:

Inotrope/vasopressor level:
PEEP on ventilator:

LV function: normal/impaired/severely impaired/NA
RV function: normal/impaired/severely impaired/NA
Aortic valve: normal/stenotic/regurgitant/NA
Mitral valve: normal/stenotic/regurgitant/NA
Tricuspid valve: normal/stenotic/regurgitant/NA
Pulmonary valve: normal/stenotic/regurgitant/NA
Other (eg VSD/effusions):

LV diameter (cm):
LV septal wall thickness (cm):
LV posterior wall thickness (cm):
RV basal diameter (cm):

Please transfer images to transplant center

Advanced

If you are able to perform a complete BSE Level 2 Echo this would be ideal.

Please record LVEF, regional wall abormalities, RV function and any valvular abnormalities with quantification.

Many changes occur at end of life and do not necessarily preclude transplantation e.g RWMA

* See overleaf for how to make measurements

NHS Blood and Transplant

O23: Implementing a values-driven policy in a complex system: What happened when the soft opt-out system of organ donation was implemented in England?

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Introduction: In 2020 England implemented a 'soft' opt-out system of consent to organ donation, assuming that switching the default to one more closely aligned with the preferences of citizens would make donation easier.

Methods: A mixed-methods evaluation comprising: review of Parliamentary debates and feedback from legislators; surveys and interviews with healthcare professionals; analyses of representative public attitude surveys; interviews with family members approached about organ donation and the public, analysis of donor audit data and patient and public involvement.

Results: Implementing a 'soft' opt-out system into a well-established and complex opt-in system has been challenging. Consent forms, procedures and audits have become more complicated. Professionals frequently have to move between scenarios with families where opt-out applies, and others where family consent (opt-in) is still required. Bereaved families have no idea when this is required and continue to believe they are the decision makers. There is an (increasing) mismatch between establishing one's wishes on the organ donor register and what the family are asked after death by staff. Support for organ donation continues to vary between subgroups of the population. The opt-out system appears to have had little impact so far on these differences. Nonetheless, implementation created a context for mis/disinformation to spread, especially among minority ethnic and faith groups. Disruptions from COVID-19 mean any impact of the law change on consent rates remain unclear.

Discussion: COVID-19 has hampered the ability to identify the effectiveness of the law change. At the same time, the legacy of informed consent has made it difficult to adapt fully to the opt-out system. This has prevented the principle behind the Act that everybody is a potential donor being realised in practice. Rather than presuming that the opt-out system will work as intended, it is likely to be more effective to improve the organ donation system in other ways.

Category: Ethics, law and public policy (legislation, changes to legislation)

N1: The Development of a nurse-led journal club, placing nurse research at the forefront of research education

Mr Tim Owen Jones

NHS Blood Blood and Transplant, London, United Kingdom

Introduction: A team of specialist nurses in organ donation have just celebrated the first birthday of their journal and research group, taking advantage of their shared passion for nurse-led research. Starting life as a *conventional journal club*, it now commits to quarterly day-long sessions where attendees generate their own content and discussion. Its intention is for peer-to-peer knowledge sharing, with many participants having current, past or future plans to study at a higher level.

Case Presentation: A diverse team of specialist nurses brings a variety of experience and expertise. They often, however, travel long distances between hospitals to support proceeding organ donations and face-to-face interactions with colleagues can be rare. The opportunity was created to share recent research experiences and intentions, as well as to generate new ideas. It also, very quickly, developed to incorporate protected time for writing; a busy clinical environment is often not conducive to the production of quality written work.

Outcome: Initiated and led by one team member, the *journal breakfast club* is now attended by over a third of the specialist nurse team. After its first year of meet-ups, hearing from international speakers and with a growing portfolio of abstract titles, the team have agreed unanimously to continue with the extended meeting format.

Discussion: Despite NHS Blood and Transplant's commitment to education and research (*NHSBT*, *2021*) and the Chief Nursing Officer's Strategic Research Plan (*NHS England*, *2021*), nurse-led research still remains under-represented. In line with the CNO's aim to develop more diverse ways for nurses to be more active in research, the club has created a space where nurses can demonstrate their ability to save and enhance lives, in a new way. With '*research vital to a high-performing health system'* and as an ever-important aspect of nursing practice, it may yet still become '*business as usual*' (*NHS England*, *2021)*.

Category: Education and promotion (education: patient - public - healthcare professional; promotion: public - donation).

N2: Early post-transplant ureteric stent removal reduces the incidence of UTIs

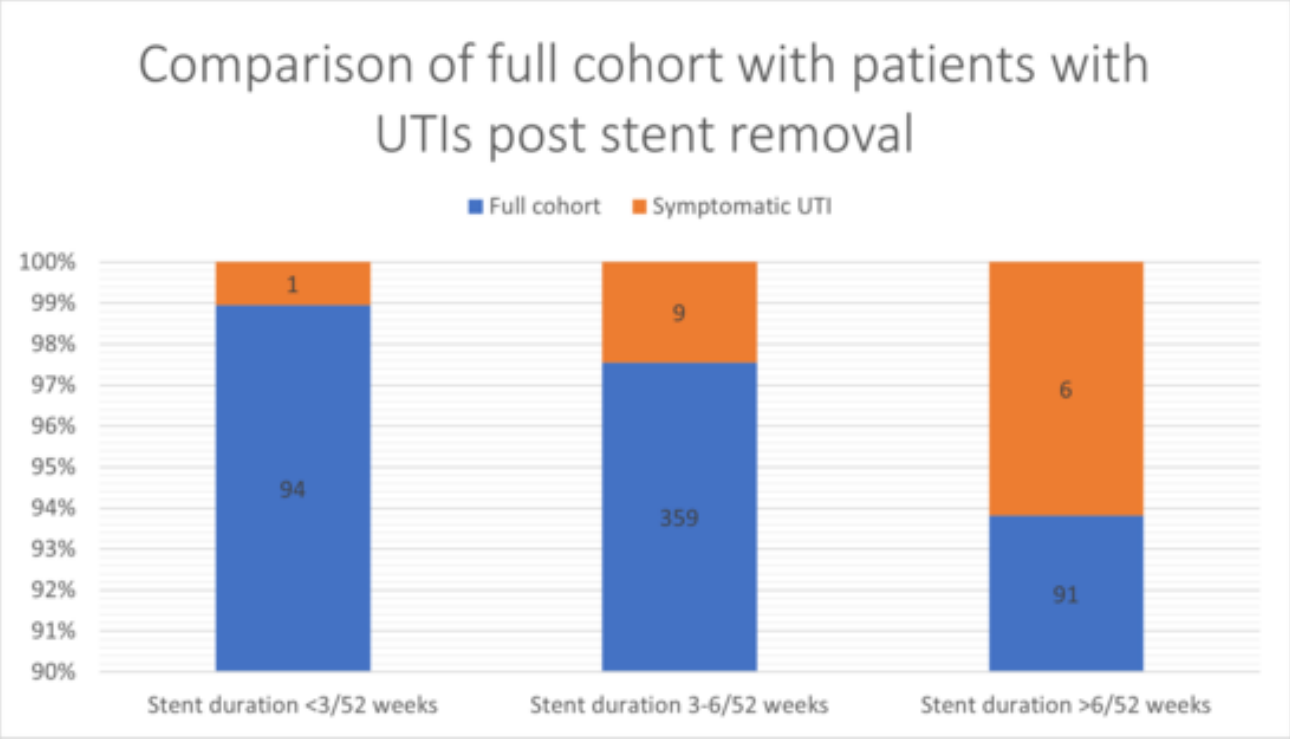
Emma-Louise Kent, Sophie Emmerson, Mr Fernando Yuen Chang, Mr Reza Motallebzadeh, Ms Fiona McCaig
Royal Free London Foundation NHS trust, London, United Kingdom

Introduction: Early ureteric transplant stent removal has been shown to be associated with lower rates of urinary tract infections (UTIs). Our centre runs a nurse-led transplant ureteric stent removal clinic and aims to remove stents at 2-3 weeks post-transplant. We completed a cumulative audit to monitor the rate of UTIs post-stent removal and the length of time transplant ureteric stents remain in-situ.

Methods: We undertook a prospective study from October 2018 to August 2023 and collected clinical data for all transplant patients having stents removed, including duration of the ureteric stent and number of patients with mid-stream urine (MSU) positive UTIs within 2 weeks of stent removal. We have compared the incidence of UTIs for patients with a stent duration of <3 weeks, 3-6 weeks and >6 weeks.

Results: Only 95 of 544 patients (17.5%) had stent removal within the 3-week target. Of 544 patients, 16 (2.9%) developed UTI within 2 weeks of stent removal, including 2 admissions for urosepsis. Rates of UTI increased with stent duration. Only 1.1% of patients with stents removed within the 3-week target developed UTI, compared to 2.4% of those with stent removed at 3-6 weeks and 6.2% of the patients with stents removed >6 weeks (figure 1). No patient with UTI and stent removal >6 weeks had end-stage renal failure related to reflux or bladder issues which are recognised predisposing factors to UTIs. The median duration of the stent removal is 30 days for the full cohort, compared to 33 days for patients who developed UTI.

Figure 1:



Discussion: Our data shows that we are not meeting our 2-3 week stent removal target and delaying stent removal beyond 3 weeks can markedly increase the risk of UTIs.

Category: Clinical - renal surgical (kidney - transplant and living donor surgery - novel techniques)

N3: Evaluation of DCD assessment tool

Miss Cara Murdoch, Mrs Aileen Labram, Mrs Alison Mitchell, Miss Julie Booth, Mrs Susan Hannah, Mrs Kathryn Puxty

NHSBT, Scotland, United Kingdom

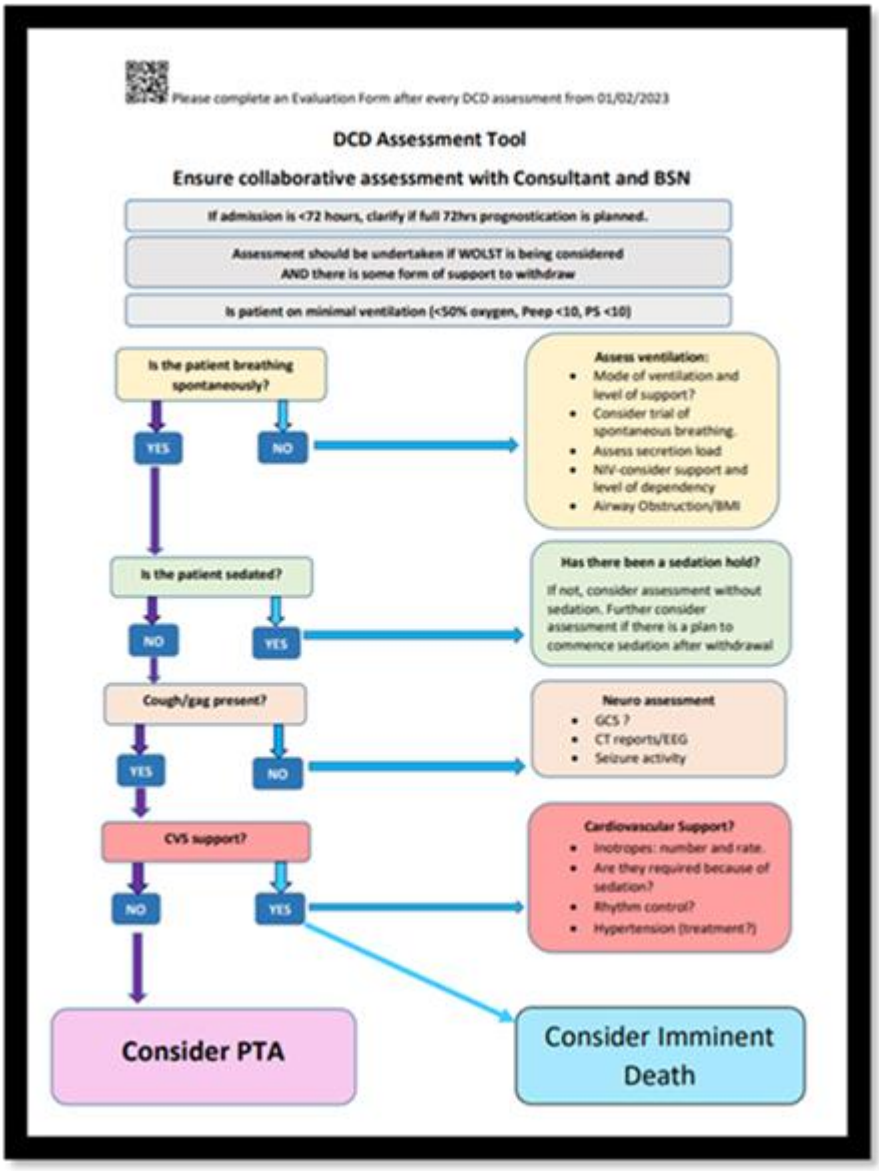
Introduction: Facilitating Donation After Circulatory Death (DCD) requires identification of patients who are likely to become asystolic within a set time period following withdrawal of life sustaining therapies (WLST). However, identification of imminent death is challenging with no formal assessment tool available. The Scotland Organ Donation Team of Specialist Nurses developed a DCD assessment tool to help facilitate collaborative discussion regarding DCD potential. Feedback on this tool was sought via survey.

Methods: Over an 8-week period from 1st Feb 2023, the Specialist Nurses were asked to complete a survey following every DCD assessment. They were asked whether the tool was used and to feedback on utility.

Results: The survey was completed by 26 Specialist Nurses. When assessing DCD potential, the majority (25) collaborated with medical staff, 20 did this in person on the critical care unit. The DCD assessment tool was used by 22 (85%) and was rated helpful by 20 (91%). The main themes from the survey results were generally positive. A structured approach and helpful prompt were a common response. The Specialist Nurses felt the tool helped to back up their decision making. Consultant opinion was influential regardless of use of the tool and the tool was not helpful in some clear-cut cases.

The evaluation found the assessment tool was positively received by critical care clinical staff with utility from important collaboration within the team. Suggestions given to improve the assessment tool include future engagement from NHSBT and the Scottish Intensive Care Society (SICS) to help raise awareness about the assessment tool supporting its use in clinical practice.

Discussion: The Scotland DCD assessment tool has been received positively by staff and has been perceived to improve the collaborative assessment of the potential DCD patient.



Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

N4: Increasing complexity and collaboration requirements in renal transplantation – a case study

Ms Katie Cunningham, Mrs Sian Fothergill, Dr Paramit Chowdhury

Guy's and St.Thomas' NHS Foundation Trust, London, United Kingdom

Introduction: Kidney transplantation is the best treatment of choice for CKD stage 5.
Due to medical treatment advances, we are now seeing more patients with highly complex needs, particularly children surviving into adulthood being put forward for transplantation. This case study considers the importance of an MDT approach to develop a bespoke protocol for positive patient outcome, thus paving the way for future complex transplants.

Case Presentation: A 19-year-old female patient with Methylmalonic acidaemia, chronic kidney disease stage 5 established on peritoneal dialysis for 9 years, PEG fed, severe learning disabilities unable to verbalise her needs, wheelchair bound, short stature, and lacking capacity was referred for a living donor kidney transplant. Her mother was her main carer and potential donor.

The main challenges were:

- Rare and complex medical condition
- Patient lacked capacity
- Geographically, patient was out of area, logistics of coming to appointments and nephrology care under a different local team
- Patient did not transition in the traditional sense as transfer happened during the COVID pandemic
- Coordinating and involvement of multiple different teams across different specialities and hospitals
- Consideration of pharmacological effects of immunosuppression with a rare disease

Outcome: Due to the complexities of the case, involvement of an MDT with multiple meetings was needed in order to devise a bespoke protocol of admission, anaesthesia, pre, peri and post-operative case.

Discussion: This case study considers the challenges and responsibilities the team faced when developing the protocol and highlights the importance of a multi-disciplinary approach with nominated leads to support the process. Furthermore, this case leads the way for future patients with rare and complex needs to be directed to expert centres where the resources and knowledge are available to support successful transplantation.

Category: Case study submission (may include individual cases or shared learning experiences)

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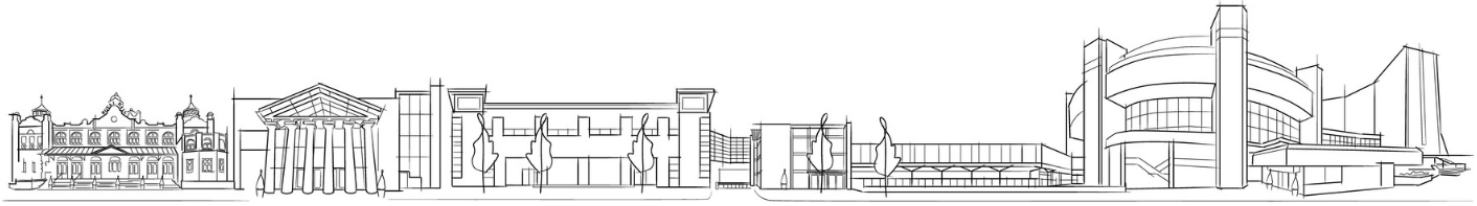

MP001: Noninvasive diagnosis of renal allograft acute cellular rejection through active Granzyme B in urine using a novel probe: a potential point of care test

Dr Jamie Scott[1], Miss Andrea Gonzalez Ciscar[2], Ms Emma Aitken[2], Mr John Asher[2], Mr Marc Clancy[2], Prof Colin Geddes[2], Dr Mike Dalrymple[3], Prof Marc Vendrell[1], Mr Stephen Knight[2]

[1]Centre for Inflammation Research, University of Edinburgh, Edinburgh, United Kingdom. [2]QEUH, Glasgow, United Kingdom. [3]Edinburgh Innovations, Edinburgh, United Kingdom

Introduction
Acute rejection is a frequent complication of renal transplantation, requiring invasive allograft biopsy for diagnosis. Previous methods to develop a non-invasive test rely on amplification methods or have limited clinical utility beyond highly specialised laboratories. No point of care test for acute cellular rejection currently exists, which could reduce treatment delays and improve transplant outcomes.

Methods
As part of an ongoing study, we recruited 55 consecutive patients undergoing investigation for acute allograft dysfunction. All patients had previously demonstrated stable transplant function. Urine specimens were collected from each patient, with active Granzyme B (GzmB) measurements performed using a patented fluorescent probe. Total GzmB activity was correlated with allograft status. Ethical approval was gained (GN22RE301).

Results
Overall, 17 patients (30.9%) had biopsy-confirmed acute cellular rejection. No GzmB activity was measured in patients with BK nephropathy, urinary tract infection, or recurrent primary disease. Analysis demonstrated that acute cellular rejection could be predicted with a sensitivity of 76.4% and specificity of 89.5%, with a corresponding PPV of 76.5 and NPV of 89.5%. Accuracy was 85.5%. In patients with acute cellular rejection, probe GzmB measurements correlated with rejection severity in biopsy samples (Figure 1) and GzmB activity results were available within two hours.

Discussion
Our patented technology is able to identify acute cellular rejection with high specificity from patient urine samples and can quickly measure GzmB activity. Patient recruitment during this pilot study will conclude at 100 patients. We demonstrate the potential of a future point of care test to non-invasively diagnose acute rejection of renal allografts.

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

MP002: Patients with multi-solid organ transplants have excellent clinical outcomes and quality of life: Results from 'UNIQUE' – A 20-year NHSBT study

Dr Alicia Paessler[1], Ms Miriam Cortes[2], Dr Jacob Simmonds[1], Dr Yincent Tse[3], Dr Maduri Raja[4], Dr Mordi Muorah[4], Ms Hannah Maple[5], Mr Nicos Kessaris[1,5], Dr Jelena Stojanovic[1,6]

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Introduction: Advances in modern medicine allow children with previously fatal conditions to survive longer and present as transplant candidates; some requiring multiple different solid-organ transplants (MSOT). There is limited data on clinical outcomes and no data on their quality of life (QoL); 'UNIQUE' is the first study that reports these.

Methods: Clinical outcomes from the NHS Blood and Transplant (NHSBT) registry were analysed for all patients who received a kidney and one other solid-organ transplant as a child in 2000-2021 in the UK. Outcomes included patient and graft survival, graft function and post-operative complications. Prospective QoL was measured using the PedsQL 3.0 Transplant Module questionnaire which underwent quantitative and qualitative analysis.

Results: 92 children had MSOTs (heart/heart-lung and kidney n=15, liver and kidney n=72, pancreas and kidney n=4 and multivisceral n=1) in the UK in 2000-2021. Results showed excellent patient and graft survival (Figure 1) that was comparable to single-organ transplant recipients as reported in the literature, with MSOT recipients having comparatively fewer episodes of rejection.

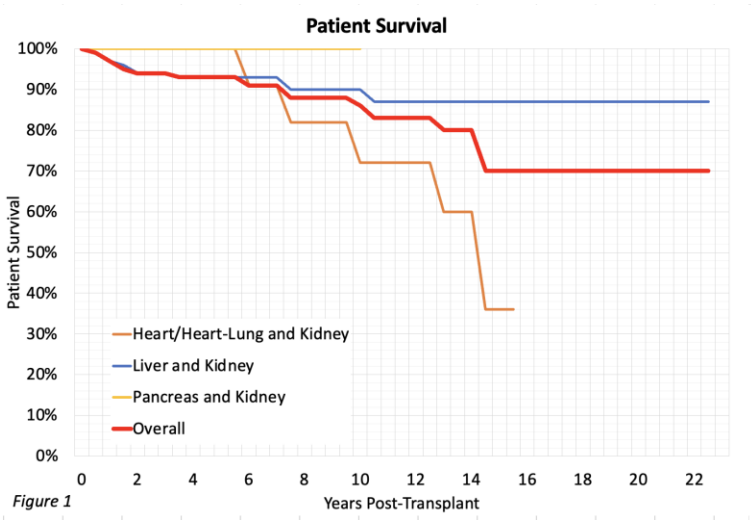
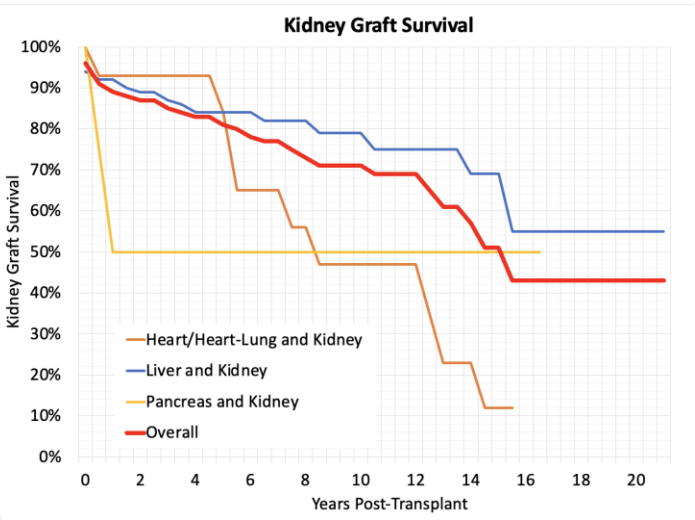


Figure 1



Outcomes were significantly better in patients with simultaneous liver and kidney transplants compared to patients with sequential liver and kidney transplants. QoL was reported as excellent with a mean score of 74% (Figure 2).

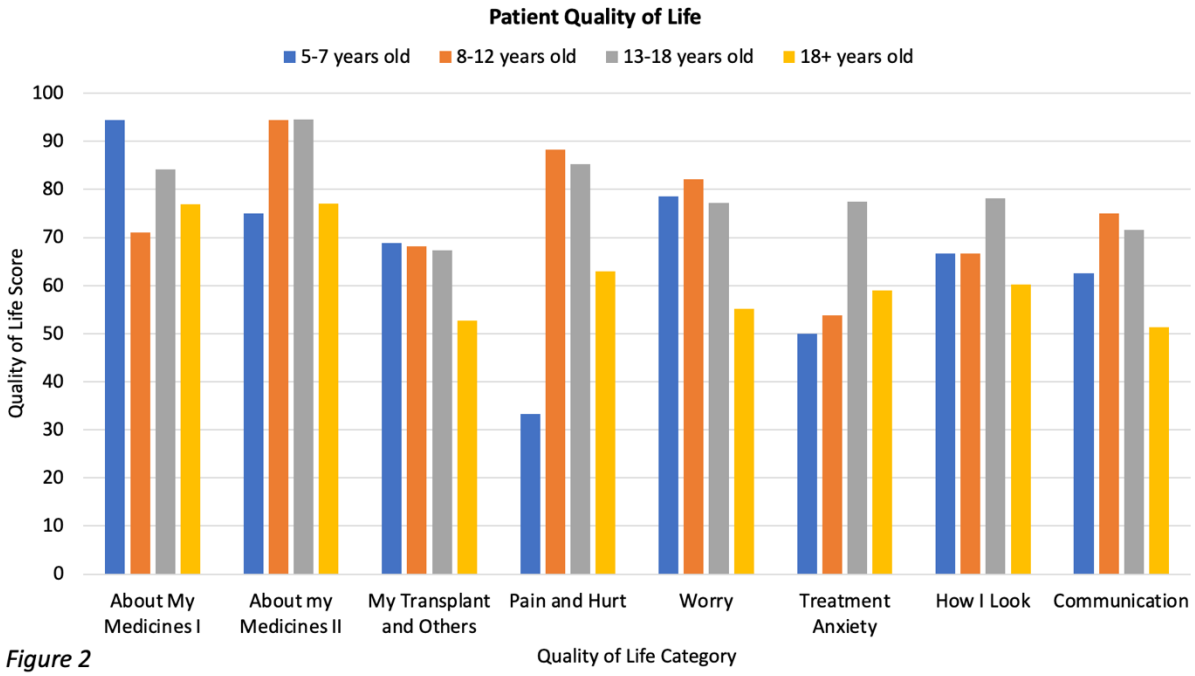


Figure 2

Key findings from qualitative analyses were that QoL significantly improved post-transplant, MSOTs allow patients to "live a normal life", and patients worried about the longevity of their transplants and what that might mean for their future with concerns about equal opportunities in employment.

Discussion: This is the first study to look at clinical and QoL outcomes in MSOT recipients; results show excellent long-term clinical outcomes, all comparable or better than single-organ transplant recipients. Patient-reported quality of life is excellent with support from the multidisciplinary team. All children born with conditions leading to end-stage disease in multiple solid-organs should be assessed as transplant candidates.

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

MP003: The impact of pancreas transplantation on secondary diabetic complications: A systematic review

Gayathri Giri[1], Daniel Doherty[1,2], Shazli Azmi[2], Hussein Khambalia[1,2], David Van Dellen[1,2]

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Introduction: Pancreas transplantation (PT) provides diabetic cure for patients with complicated Type 1 Diabetes Mellitus (T1DM). We aimed to examine the impact of PT on secondary diabetic complications, including retinopathy, neuropathy, and cardiovascular disease.

Method: A database search using MedLINE for publications up to April 2023 was conducted employing MeSH terms 'Pancreas Transplantation' AND 'Diabetes Mellitus, Type 1' AND 'Diabetic Retinopathy' OR 'Heart Disease' OR 'Cardiovascular Diseases' OR 'Peripheral Vascular Disease' OR "Amputation' OR 'Neuropathy."

Results: 223 articles were screened, with 172 excluded as per study design (total included 51). 64.7% (n=33) of studies were retrospective case control studies, 35.3% (n=18) of studies were retrospective cohort studies. A total of 5616 patients with a mean of 99.1 (SD± 262.4) simultaneous kidney transplant (SPK) patients and 48.2 (SD± 262.4) pancreas transplant alone (PTA) patients per article were studied. All articles examining diabetic retinopathy concluded that retinopathy improved or stabilized after SPK and PTA. 69% (n=11) of papers demonstrated no significant change to visual acuity. An equal number of articles (n=4) demonstrated increased peripheral nerve conduction velocity after SPK and PTA. 40% (n=2) of articles examining vibration perception studies demonstrated an increase post-transplantation, correlated to improvements in sensory symptoms. Improvements in cardiac events incidence, metabolic factors, and heart structure were seen in 79% (n=15) of cardiovascular articles. Of the 7 studies assessing survival, 5 demonstrated a reduction in cardiac death after SPK. All studies (n=4) investigating heart structure demonstrated an increase in left ventricular ejection fraction after SPK and PTA.

Discussion: Despite significant heterogeneity in outcome measures observed, PT provides benefits in mitigating the complication profile of T1DM. Standardised outcome measurement should be adopted to allow assessment of the impact of beta-cell replacement with the potential for objective evidence reversibility of secondary complications.

Category: Clinical - pancreas and islet (pancreatic transplant (all types) - surgery - recipient clinical care and management)

MP005: Kidney transplant failure, acute and chronic kidney disease before initiation of dialysis in the UK: Linking routinely collected secondary care data to the UK Renal Registry

Dr Barnaby Hole[1,2], Dr Matthew Beresford[1], Dr Maria Casula[2], Dr Sian Griffin[3], Dr Maria Pippias[1], Dr Rachel Hilton[4], Dr Sherry Masoud[2], Dr George Greenhall[5], Miss Winnie Magadi[2], Dr Shalini Santhakumaran[2], Professor James Medcalf[2], Professor Dorothea Nitsch[2]

[1]University of Bristol, Bristol, United Kingdom. [2]UK Renal Registry, Bristol, United Kingdom. [3]University of Cardiff, Cardiff, United Kingdom. [4]Guys and St Thomas, London, United Kingdom. [5]Barts Health, London, United Kingdom

Introduction: Preparatory care helps to ensure people start dialysis in a planned manner. Little is known about how dialysis initiation differs between individuals with native and transplant kidney failure. We used UK Renal Registry data to compare these groups.

Methods: This was a retrospective observational study using registry data, Hospital Episodes Statistics, and laboratory-identified acute kidney injury (AKI). We identified adults in England who initiated dialysis between 1st Jan 2018 and 31st December 2019. Dialysis initiations were described by eGFR at start, location of first dialysis, and AKI before initiation. Analyses were descriptive. Approval to conduct this work was granted by the UKRR's Research Methods Study Group.

Results: 16,550 patients started dialysis in the study period, including 1,670 (10.1%) with transplant failure, and 14,880 (89.9%) with native kidney failure. The median eGFR at initiation was lower in those with native (7.8 ml/min/1.73 m2) compared with transplant failure (10.9 ml/min/1.73 m2). Dialysis was initiated as an inpatient by 46.5% of those with transplants and 50.6% of those with native failure. The prevalence of AKI in the year before dialysis initiation was similar for those with transplant (63.9%) and native kidney failure (65.4%). AKI was associated with inpatient starts amongst those with native kidney failure (44.7% with vs 19.6% without). This was not the case for those with transplant failure (48.3% with vs. 48.7% without).

Discussion: Those starting dialysis with a failing transplant do so with higher residual kidney function, and more commonly in the community than others with native kidney failure. However, once individuals with AKI are excluded, those with transplant failure appear more likely to start dialysis as an inpatient than those with native kidney disease. Preparation for dialysis initiation may be suboptimal for people with transplant failure. Further work is required to ascertain the mechanisms underlying these novel findings.

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

MP006: Islet allo-autotransplant 12 years following simultaneous kidney-pancreas transplant

Miss Katie Connor[1], Miss Kirsty Duncan[1], Miss Lora Irvine[2], Mr Alan Timpson[2], Dr Sharon Zahra[2], Professor John Plevris[3], Dr Chris Fraser[3], Mr Avinash Sewpaul[1], Dr Shareen Forbes[2,4], Mr Jon Casey[1], Mr Andrew Sutherland[1]
[1]Edinburgh Transplant Centre, Edinburgh, United Kingdom. [2]Islet Cell Laboratory, Scottish National Blood

Transfusion Service, Edinburgh, United Kingdom. [3]Department of Gastroenterology, Royal Infirmary of Edinburgh, Edinburgh, United Kingdom. [4]BHF Centre for Cardiovascular Sciences, University of Edinburgh, Edinburgh, United Kingdom

Introduction: When a patient with an allogenic pancreas graft requires a pancreatectomy, the pancreas is usually discarded. There has only been one published case where the pancreas graft underwent islet cell isolation and subsequent allo-autotransplant, and this was in the early period after transplant. In this case report, our patient received an islet allo-autotransplant 12 years following his simultaneous kidney pancreas transplant (SPK).

Case presentation: A 49 year-old man with Type 1 diabetes received an SPK transplant in 2011. He had primary graft function of both grafts and recovered well. In 2020, he developed post-transplant lymphoproliferative disease (PTLD) which was complicated by a small bowel obstruction. Following immunosuppression reduction and R-CHOP treatment he achieved complete remission, although he required therapeutic anticoagulation for a DVT. He maintained excellent kidney and pancreas function following his PTLD, but in December 2021 presented with massive gastrointestinal (GI) tract bleeding, requiring multiple transfusions and tranexamic acid. No bleeding points were identified on upper and lower GI endoscopies or on CT angiogram. He had further smaller bleeds before re-presenting in June 2023 with major haemorrhage, requiring a 6-unit blood transfusion. Capsule endoscopy and double balloon enteroscopy identified an arterio-venous malformation affecting the duodenal-jejunal anastomosis. At surgery, it was not possible to re-site this anastomosis and graft pancreatectomy was performed. Islets were isolated from the pancreas allograft and 190,000 islet equivalents were infused into the portal vein. Islet viability was 90% and the purity was 43%.

Outcome: The patient recovered fully and 6 weeks post procedure, had a stimulated c-peptide of 132pmol/L and an HbA1c of 48, while taking 25 units of insulin per day. He is currently being listed for a second islet allotransplant.

Discussion: This case demonstrates that, even after a long period post-transplant, islet allo-autotransplant is a treatment option for patients requiring a graft pancreatectomy.

Category: Case study submission (may include individual cases or shared learning experiences)

MP007: Survey of current anaesthetic practice in renal transplant

Dr Elliott Lonsdale[1], Dr Jon Silversides[2], Dr Adam Glass[2], Dr Jonathan Bannard-Smith[3], Dr Neal Beckett[4], Dr Tim Brown[4], Dr John Strange[1]

[1]Belfast City Hospital, Belfast, United Kingdom. [2]Queen's University, Belfast, United Kingdom. [3]Manchester University, Manchester, United Kingdom. [4]BHSCT, Belfast, United Kingdom

Introduction: Over 3,000 adult renal transplants were performed across the UK's 23 transplant centres in 2022-23. We surveyed anaesthetists in UK renal transplant centres to identify areas of consensus and heterogeneity in current UK perioperative practice, and to explore interest in undertaking multi-centre clinical trials.

Methods: The survey comprised 8 multi-part questions including two clinical vignettes designed to assess current self-reported practice focusing on intraoperative monitoring, drug therapies to improve graft function, and outcome measures. The survey was distributed through established perioperative and renal anaesthesia networks, personal contacts, and social media.

Results: Completed surveys were received from 18/23 (78%) transplant centres, comprising 63 individual anaesthetists.

Arterial lines and cardiac output monitoring were always/usually used by 15/52 (29%) and 10/52 (19%) anaesthetists respectively. Central venous catheters were always/usually used by 32/52 (62%) respondents while 13/51 (25%) reported using central venous pressure to guide fluid therapy. Responses to the clinical vignettes were concordant with self-reported practice.

Mannitol was the most frequently used agent for enhancing graft function (27/63, 43%), followed by furosemide (6/63, 10%). Dexmedetomidine was not used by any respondents for this purpose.

The most important transplant outcome measures were deemed to be quality of life, with 47/48 (98%) reporting as extremely/very important, and need for dialysis at 30 days (46/48, 96%) or 6 months (46/48, 96%). Length of hospital stay (29/48, 60%) and graft oedema (22/46, 46%) were viewed as less important.

There was overwhelming enthusiasm to undertake multi-centre perioperative trials in renal transplant from 46/48 (96%) anaesthetists, specifically to investigate dexmedetomidine, mannitol or furosemide vs placebo (71-76%), and alternative strategies to guide fluid management (90%).

Discussion: The responses revealed marked heterogeneity in the perioperative care of renal transplant patients. This survey demonstrates enthusiasm among renal transplant anaesthetists to conduct clinical trials of perioperative interventions to improve patient and graft outcomes.

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

MP008: Renal transplant outcomes in plasma cell dyscrasias and AL amyloidosis after treatment with daratumumab

Dr Amy Needleman, Dr Barian Mohidin, Raymond Fernando, Dr David Lowe, Professor Ashu Wechalekar, Professor Alan Salama, Dr Gareth Jones

Royal Free Hospital, London, United Kingdom

Introduction: Plasma cell dyscrasias can lead to end-stage renal failure but transplantation is often contraindicated. Daratumumab has improved patient survival and maintenance of clonal remission but induces significant hypogamaglobulinaemia and interferes with crossmatching. We report our experience of transplanting four patients treated with daratumumab to maintain clonal remission for their plasma cell dyscrasia.

Case Presentation (Table1):
1: 45 year male on haemodialysis for 18 months received a kidney from his brother, HLA mismatch 0-1-1.
2: 59 year male on haemodialysis for 3 years received a DBD kidney, HLA mismatch 2-2-2.
3: 61 year female on haemodialysis for 7 months received a kidney from her son, HLA mismatch 1-1-0.
4: 62 year woman on haemodialysis for 7 years received a DBD kidney, HLA mismatch 2-1-0.
All received basiliximab, tacrolimus, Mycophenolate mofetil and immunoglobulin for secondary hypogammaglobulinemia. Three remain on Daratumumab.

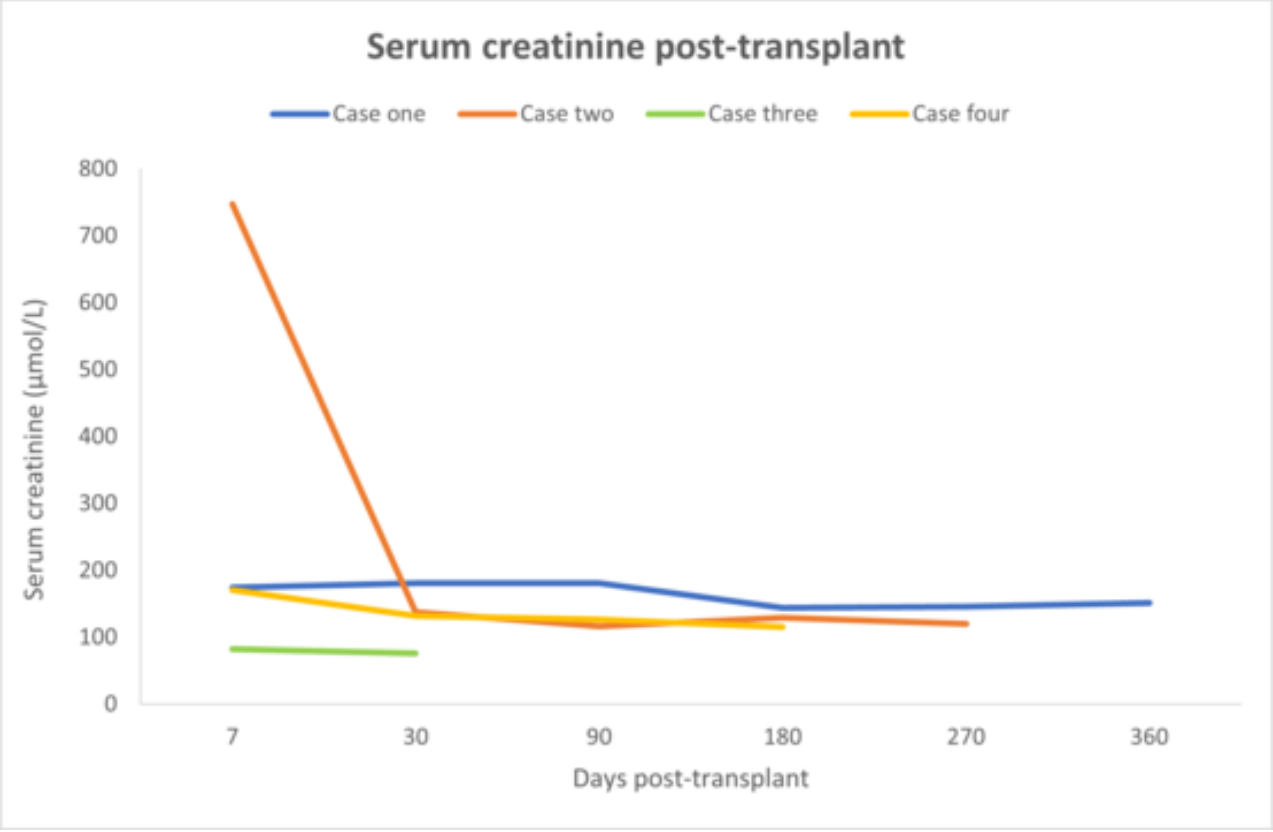
Outcome: The median follow-up post-transplant was 228. All achieved excellent renal function (Figure1). There was no acute rejection. Three patients remained in remission, the fourth with minimal residual disease is due to undergo a planned autologous stem cell transplant. One patient had a superficial wound infection, and two developed a UTI, all requiring oral antibiotics. Three patients had asymptomatic CMV and BK viraemia which resolved on reduction of antiproliferative. All had positive blood group crossmatches, but no alloantibodies identified using specific techniques such as dithiothreitol on the indirect antiglobin test. One case had a lymphocyte positive crossmatch, using Luminex HLA antibody specificity identification kits no HLA DSAs were identified on the day of transplant.

Discussion: This series demonstrates the feasibility of transplanting patients with ESRF due to plasma cell dyscrasias who have achieved complete or near complete remission while managed with daratumumab. We were also able to manage the specific infectious and immunological challenges related to the use of daratumumab pre-transplant.

Table1:

Case	Demographic	Diganosis	Treatment	Dialysis	Transplant Donor	HLA Mismatch CRF/Blood Group	Infection	Rejection	Relapse	Creatinine u/mmol
1	45M	2018: Lambda light chain AL Amyloidosis	1st: Bortezomib cyclophosphamide and dexamethasone 2nd: 2018 Daratumumab	HD 2021	2022: Living donor brother	HLA 011 BG positive no alloantibodies	Superfical wound infection Influenza Asymptomatic CMV Klebsiella pneumonia UTI	None	Off Daratumumab Low level minimal residual disease	12Mo: 151
2	59M	2019: IgG Kappa plasma cell dyscrasia AL amyloidosis	1st: Bortezomib cyclophosphamide and dexamethasone 2nd: 2020 Daratumumab	HD 2019	2023: 41F Deceased (donation after brainstem death)	HLA 222 BG positive no alloantibodies	Asymptomatic CMV and BK viraemia.	D8 biopsy borderline, recovered w/o treatment	None	9mo: 120
3	61F	2021: Lambda light chain AL amyloidosis	1st: Bortezomib cyclophosphamide and dexamethasone 2nd: 2021 Daratumumab	HD 2021	2022: Living donor son	HLA 110 BG positive no alloantibodies	Asymptomatic CMV and BK viraemia.	None	None	1mo: 76
4	62F	2016: Lambda light chain AL Amyloidosis	1st: Bortezomib cyclophosphamide and dexamethasone 2nd: 2019 Daratumumab	PD 2016-2018 HD 2018	2023: 70F Deceased (donation after brainstem death)	HLA 210 CrF 93% BG positive no alloantibodies	Streptoccus galloyticus UTI IVIG pre transplantation	None	None	6mo: 115

Figure 1:



Category: Case study submission (may include individual cases or shared learning experiences)

MP009: Use of Uromune vaccine to prevent recurrent UTIs in kidney transplant recipients

Ms Emma-Louise Kent, Ms Denise Cunningham, Ms Ingrid Bruno-snelling, Dr Mark Harber, Ms Fiona McCaig, Prof Alan Salama

Royal Free Hospital, London, United Kingdom

Introduction: In kidney transplant recipients (KTRs), UTIs are common with the highest incidence in the first year. Patients are often given prolonged and repeated courses of antibiotics, which contributes to antimicrobial resistance. Recurrent episodes of UTIs are associated with up to 50% graft loss at 5 years, comparable to an episode of biopsy proven rejection.

Although attempts at modifying reversible risk factors for UTI are undertaken, a cohort of KTR with recurrent UTI remain, despite treatment with non-anti-microbial and antibiotic prophylaxis.

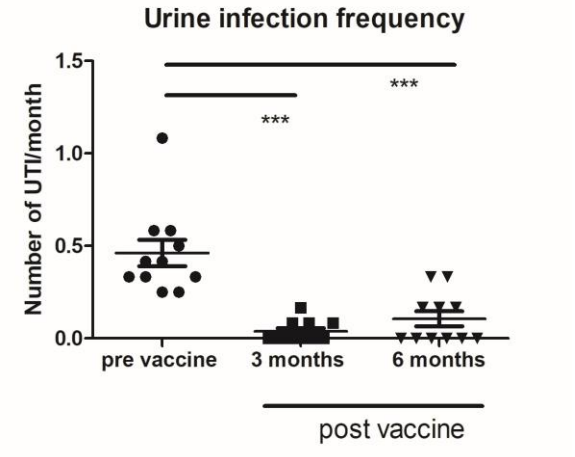
Methods: We have instituted an MDT-approved use of Uromune vaccination in KTR with at least 3 infections per year (or 2 in 6 months) with any of Klebsiella, Proteus, Enterococcus or E. coli (covered by vaccine). We have collected data on infections, antibiotic use, hospital admission, and drug tolerability.

Results: To date we have 15 patients dosed with vaccine, 2 discontinued due to adverse symptoms (palpitations, abnormal taste), one died of longstanding metastatic cancer. We report our pilot data on 11, 8 who have completed 6 months of follow up, and 3 reaching 4 months.

All were women, median age 54 years (range 37-77) with transplant age of 52 months (12-149). All were immunosuppressed with tacrolimus, 1 as monotherapy, 2 with additional prednisolone, 4 with additional MMF and 4 with both.

Number (median (IQR)) of UTI/month pre-vaccine was 0.42 (0.25-1.1), in the first 3 months post vaccine 0 (0-0.17), and within 6 months 0 (0-0.33) ($p<0.0001$, one way ANOVA). Antibiotic prescriptions/month were also significantly reduced, 0.25 (0.08-0.6) pre-vaccine to 0(0-0.33) at 6 months ($p=0.005$).

Discussion: The vaccine was generally well tolerated and successfully reduced the incidence of UTI in the majority of patients. Longer follow up is required to understand durability and economic impact of vaccination. Future analysis of changes in urinary microbiome and immune responses is planned.



Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

MP010: Dual kidney transplantation: Two good or double trouble?

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Introduction: Extended criteria donors (ECD) are increasingly used to address the organ shortage. Transplanting two ECD kidneys into the same recipient can result in increased nephron mass, potentially better function and reduced discard rates. However, consensus on Dual Kidney Transplant (DKT) allocation is lacking. We aim to assess the effectiveness of the current DKT allocation protocol, and compare outcomes compared with ECD Single Kidney Transplants (SKT).

Methods: All deceased donor kidneys biopsied (i.e. ECD) between January 2015 and October 2022 were reviewed (scored with the New Zealand Kidney Score, a modified Ramuzzi Schema). Clinical outcomes and survival were compared between DKT and SKT groups. A subgroup analysis was undertaken with an SKT group propensity score matched to the DKT donor characteristics.

Results/outcome: 140 ECD deceased donor kidney pairs were biopsied. 113 pairs transplanted as Singles (225 kidneys, 1 discarded); 19 pairs transplanted as Duals (36); 9 pairs 'not transplanted' (18 + 1 SKT = 19).
Surgical approach to DKT was consistent.
Donor characteristics: pre-matching, donors in the DKT group were significantly older (mean 66.3yrs DKT vs 60.2yrs SKT, p=.002), had higher terminal creatinine (mean 101.47mmol/dL DKT vs 85.1mmol/dL SKT, p=023) and higher biopsy scores (2.4 DKT vs 1.0 SKT, p<.001). After matching the only difference was biopsy score (2.4 DKT vs 1.4 SKT, p=.021). Recipient characteristic: no significant differences between groups.
Recipient outcomes after matching: Non-significant superior renal function in DKT group at 1 month (eGFR 49.9ml/min/1.73m2 DKT vs 39.6 ml/min/1.73m2 SKT, p=.068), no difference at 1 year (eGFR 44.9ml/min/1.73m2 DKT vs 45.8 ml/min/1.73m2 SKT, p=.808). No difference in length of stay, comprehensive complications index, predicted graft survival or patient survival between groups.

Discussion: The current DKT allocation protocol is effective and safe. Surgical approach is consistent and results in similar outcomes in DKTs and SKTs.

Category: Clinical - renal surgical (kidney - transplant and living donor surgery - novel techniques)

MP011: Outcomes of kidney transplantation in older recipients: Is age just a number?

Mr Vikrant Thakur, Miss Ruth Owen, Dr Muhammad Abdullah, Dr Shiv Bhutani, Mr David Van Dellen, Mr Zia Moinuddin, Professor Titus Augustine, Mr Raman Dhanda

Manchester Royal Infirmary, Manchester, United Kingdom

Introduction: Increased patient survival and technological advances in renal replacement therapy, have resulted in patients over 70 years of age forming a significant cohort of patients listed for kidney transplantation. The study aims to analyse recipient profiles and clinical outcomes after kidney transplantation in recipients over the age of 70 in a single centre.

Methods: We performed a single centre retrospective analysis reviewing kidney transplant recipients aged ≥70 years between February 2013 and Feb 2023, across a spectrum of clinical characteristics and transplant outcomes.

Results: The over 70 cohort, comprised of 256 patients. Of this group 249 (97.3%) underwent kidney transplant alone, 6 (2.3%) SIK and one a dual kidney transplant. Donors included 120 DBD donors, 103 DCD donors and 33 living donors. The mean age of recipients was 73.8 years (SD+/-2 yr7mon) with oldest recipient being 81.5yrs. One third of the cohort (n=86) were pre-emptively transplanted. The BMI was 27.9 (19-39) kg/m2. Postoperatively 12 patients (4.7%) required re-exploration within 7 days for various indications. 84 patients (32%) had delayed graft function. Five patients (1.9%) had primary non function. Eighty-two recipients (32%) were admitted within 1 year of transplant, with UTI (n=27) being most common cause, followed by decreased renal function (n=13) and CMV viremia (n=6). 24 (9.3%) patients died within 1 year of transplant. Twenty patients (7.8%) had graft loss within 1 year of transplant.

Discussion: This single centre 10-year analysis demonstrates that readmission, primary non function, delayed graft function and graft survival rates in recipients over 70 years of age are comparable to recipients below the age of 70. To the best of our knowledge this is one of the largest experiences with transplanting the over 70s in the UK. Detailed long-term evaluation of the cohort will be required to assess overall survival and quality of life benefits post-transplant.

Category: Clinical - renal surgical (kidney - transplant and living donor surgery - novel techniques)

MP012: Obesity in kidney transplant recipients – prevalence and outcomes in patients receiving a steroid sparing immunosuppression protocol.

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Introduction: Kidney transplantation in obese patients remains a relatively controversial area. Shared decision making with patients and optimal management is hampered by lack of evidence. The use of steroid sparing immunosuppression protocols could minimise metabolic and infection complications, and may be considered an attractive immunotherapeutic regimen for obese patients.

Methods: Herein we report the kidney transplant outcomes of obese patients receiving a steroid sparing immunosuppression protocol with a median follow up of 4.5 (2.3-6.8) years. Data was obtained from a prospectively maintained database.

Results: 1859 patients were analysed; 432(27.2%) were obese, 612(38.5%) were overweight, 527(33.2%) had a normal BMI and 18 (1.1%) were underweight. Obese patients were older (median 56(47-64) years, p<0.001), more likely to be of non-white ethnicity (p=0.019), have diabetes (p<0.001), receiving a deceased donor kidney (p=0.005) and a primary transplant (p<0.001). On multivariate analysis, obesity was independently associated with all cause graft loss, death censored allograft loss, rejection and de novo DSA, Table 1.

Table 1.

	HR (95% CI)	P value
All cause allograft loss	1.38 (1.10-1.73)	0.0056
Death censored allograft loss	1.55 (1.15-2.10)	0.0046
Rejection	1.42 (1.10-1.83)	0.0072
De novo DSA	1.41 (1.07-1.85)	0.0136

Of the obese patients, 286(66.2%) had class I, 104(24.1%) class II and 42(9.7%) class III obesity. Comparatively, patients with class III obesity were more likely to be female (p=0.009), younger (p=0.006) and of white ethnicity (p=0.019). Despite careful selection of candidates, allograft outcomes incrementally deteriorated by obesity class, with patients with class III obesity having inferior all cause allograft loss (p=0.007), death censored allograft loss (p=0.005), rejection (p=0.006) but not de novo DSA (p=0.19).

Discussion: Obesity is independently associated with poor allograft outcomes in patients receiving a steroid sparing protocol. Comparison with steroid inclusion protocols required. Obesity is common and rather than avoidance, proactive efforts are needed to establish data in these patients to improve outcomes, whether it be realistic pre-transplant optimisation strategies or bespoke post-transplant support or both.

Category: Clinical - renal surgical (kidney - transplant and living donor surgery - novel techniques)

MP013: Transplant renal artery stenosis (TRAS): Characteristics and long term follow up of a single centre experience

Mr Manujaya Godakandage, Mr Michael Moneke, Mr Suresh Hanji, Mr Reza Motallebzadeh, Mr Ammar AlMidani

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Introduction: TRAS with an incidence of 1-23% has a complex aetiology. We studied kidney transplants with TRAS and their outcome at Royal Free Hospital.

Methods: All transplant renal artery angiograms (01.06.2009 to 31.12.2022) which had TRAS were included and followed up. Dialysis initiation or death were the endpoints. Site of TRAS was categorized as at anastomotic level, proximal (anastomosis to branching at hilum level), distal (after branching at hilar level) or a combination of these according to the angiogram.

Results: Of the 113 angiograms for suspected stenosis, 63 had TRAS. Mean follow up was 52 months (2.9- 170.5) Recipients' median age was 59(20-78) and male predominant (43, 68.3%). Forty-eight (77.4%) were on haemodialysis. Fifty-two (86.7%) were first kidney transplants. Donor age ranged 6-77 (median 56). Majority of kidneys were donation after brain death (32, 50.8%) followed by circulatory death (19, 30.2%) and live donors (10, 15.9%). Sites of stenosis was proximal (39, 61.9%), anastomotic (16, 25.4%), anastomotic & proximal (6,9.5%) and distal (2,3.2%) All interventions were percutaneous balloon angioplasties, and none had stents. These were done after a median of 4.99months (0.89-344.48) after transplantation. Fifteen had repeat interventions. 7 had 2nd and 3 had the 3rd recurrences. All the recurrences were at same site.

Serum creatinine improvement was significant till 3 years except at 12months ($p= 0.008, 0.042, 0.021, 0.029$).
Systolic blood pressures improved at 1, 24, 48, and 60 months ($p= 0.04, 0.1, 0.38, 0.005$)
Renal artery patch use was associated with proximal TRAS ($p= 0.027$) and this was irrespective of the side of donor kidney (left /right) ($p>0.05$)

Discussion: Percutaneous angioplasty is an effective minimally invasive, safe intervention for TRAS with satisfactory outcomes. Paradoxical finding of proximal TRAS with patch use could be due to the altered haemodynamics of the transplant renal artery leading to intimal hyperplasia.

Category: Clinical - renal surgical (kidney - transplant and living donor surgery - novel techniques)

MP014: Does TIVA affect renal transplant outcomes?

Mr Tom Harris[1], Ms Nihal Sogandji[1], Dr Timothy Baker[2], Ms Anna Paterson[2], Mr Dominic Summers[2]

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Introduction
Maintenance of anaesthesia during Renal Transplantation (RTx) in our centre has become heterogeneous; total intravenous anaesthesia (TIVA) is increasingly used instead of volatiles. In other surgeries TIVA has described benefits over volatile anaesthesia, including reduced rates of post-operative nausea (PON) and lessened environmental damage. The impact of TIVA on the function and survival of transplanted organs is unknown. Propofol demonstrates free radical scavenging activity which mitigates ischaemic reperfusion injury (a positive) but also downregulates Hypoxia Inducible Factor-1α and thus reduces neovascularisation; a process likely to be important for graft survival (a negative). In light of this contradiction, we evaluated the impact of TIVA on early RTx outcomes.

Method
This was a single centre, retrospective cohort study and all adult recipients of kidney-alone transplants from April 2019-August 2023 were included for analysis. Analysis was conducted in SAS 9.4. Endpoints included delayed graft function, length of stay, 3 month eGFR or biopsy-proven acute rejection. Perioperative nausea was assessed using antiemetic dose data.

Results
620 RTx recipients received volatiles vs 88 with TIVA. There were no differences in donor/recipient age, cold ischaemia time, HLA mismatch between groups. Rates of TIVA were higher in living donor recipients compared to both DBD and DCD recipients (20/97(20.6%) vs 21/251(8.3%) vs 38/351(10.8%) p=0.005, respectively). Patients who received TIVA required fewer total dose of anti-emetics, compared to volatiles (0 (IQR 0-3) vs 1 (IQR 0-3) p=0.04). There were no differences in length of stay, delayed graft function, 3 month eGFR or acute rejection episodes within 3 months post-transplant.

Conclusion
TIVA increased in prevalence during the reviewed period. Patients who received TIVA had a lower incidence of PON. There was no evidence that TIVA negatively impacted transplant outcomes. Our observations provide an early signal that TIVA use is safe, and a randomised trial could be considered.

Category: Clinical - renal surgical (kidney - transplant and living donor surgery - novel techniques)

MP015: Technical considerations for small (<15kg) paediatric allograft transplantation: A UK experience with an exclusive extraperitoneal approach and iliac anastomosis

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Manchester Royal Infirmary, Manchester, United Kingdom

Introduction: Paediatric transplantation is the gold standard for renal replacement therapy. However paediatric allograft transplantation is technically challenging and even more so in those recipients that are under 15kg. An extraperitoneal approach is more technically demanding. However, it does preserve the peritoneal cavity, limits potential gastrointestinal complications and allows the confinement of potential surgical complications, such as bleeding and urinary leakage. This approach over intraperitoneal has shown comparable results with fewer nonvascular accidents. Both approaches described in the literature for small children anastomose onto the distal aorta and IVC, not the iliacs as in adult transplantation. This aids in curbing operative difficulty. However future transplants will increasingly become more challenging.

Methods: A retrospective review at 42 patients over a ten-year period (2012 to 2022) was conducted. Small recipients were focused on weighing less than 15kg. An exclusively extraperitoneal approach was employed with an external or common iliac anastomoses being the standardised method. To aid in this approach all patients were subject to pre-operative imaging of their iliac vessels.

Results: 38 patients under live donor transplantation and 4 cadaveric. Median age of recipients was 4 (2-9yrs). Cold ischemic time ranged from 34mins to 78mins in the live donors and 8hrs to 19hrs in the cadaveric group, this mainly related to non-operative causes. 92.9% (n=39) had the adult kidney anastomosed onto their external iliac, with the remaining having a common iliac or aortic anastomosis. Patient survival was 95.3% with graft survival at 85.2%. 2 vascular thrombotic complications were recorded. The other 7% of surgical complications related to a ureteric anastomosis and wound infections.
Conclusions: We recommend that extraperitoneal renal engraftment with iliac anastomoses should become routine in children weighing less than 15 kg.

Category: Clinical - renal surgical (kidney - transplant and living donor surgery - novel techniques)

MP016: Transplant ureteric stent removal using Isiris® in an ambulatory outpatient setting

Dr Holly Strachan[1], Dr Megan Stephens[1], Ms Rebecca Varley[1,2], Mr Daniel Doherty[1,2], Ms Elizabeth Solomon[1], Mr Zia Moinuddin[1,2], Mr David van Dellen[1,2]

[1]Department of Renal and Pancreatic Transplantation, Manchester University Hospitals NHS Foundation Trust, Manchester, United Kingdom. [2]Faculty of Biology, Medicine and Health, University of Manchester, Manchester, United Kingdom

Introduction: The risk of urological complications following kidney transplantation is reduced by intraoperative ureteric stent insertion, although prolonged dwell times can increase infective complications. Transplant ureteric stent removal (TUSR) is traditionally performed in a theatre setting using flexible cystoscopy with timely removal critical to offset secondary complication risk. Isiris® is a single-use flexible cystoscope with integrated grasper. We aimed to analyse the acceptability, efficacy and cost-effectiveness of Isiris® TUSR in an ambulatory setting.

Method: A retrospective analysis of a contemporaneously maintained database was performed at a high-volume kidney transplant centre (01/2021 – 06/2022). Data collected included clinico-demographic, operative and stent removal details including time to removal, and patient refusal rates. A cost analysis was performed based on equipment costs and NHS tariffs. TUSR was performed using Isiris® in an outpatient advanced nurse practitioner (ANP)-led clinic or on the ward by both surgical trainees and ANP's.

Results: 345 consecutive patients were included in analysis with a median age of 54 (19-81), 280 (81.16%) having undergone their first transplant. 99.13% had a single ureteric anastomosis with 348 stents removed. The M:F ratio was 1.32:1. 98.85% of stents were removed using Isiris® (with a refusal rate of 1.15%) with 86.34% (n=297) performed in clinic. Median dwell time was 34 days, IQR 17.25 (25.75-43). 73.84% of stents were removed within 6 weeks. Savings per stent removal were calculated at £545.00 (including theatre expenses for failed Isiris® TUSR.) This amounted to a total saving of £154,021.20 with 86 theatre sessions released for capacity allowing other surgical activity.

Discussion: Use of Isiris® was acceptable and effective for TUSR. There were demonstrable savings compared to traditional removal methods with an associated theatre capacity increase. Transfer of TUSR processes to an ambulatory setting reduces theatre demand and reduces resource burden on healthcare providers.

Category: Clinical - renal surgical (kidney - transplant and living donor surgery - novel techniques)

MP017: Simultaneous islet cell and kidney transplantation: An initial single centre experience

Yuthika Jeyasuresh[1], Daniel T Doherty[1,2], Linda Birtles[2], Malcolm Greenwood-Morgan[2], Marcus Lowe[2], Shazli Azmi[1,2], Hussein Khambalia[1,2], David van Dellen[1,2]

[1]Faculty of Biology, Medicine & Health, University of Manchester, Manchester, United Kingdom. [2]Department of Renal & Pancreatic Transplantation, Manchester University Hospitals NHS Foundation Trust, Manchester, United Kingdom

Introduction
Simultaneous Islet and Kidney (SIK) transplantation aims to improve glycemic control and renal function by combining an islet transplant with a renal allograft for patients with Type 1 Diabetes Mellitus (T1DM) and renal failure. This provides diabetic improvement and removal from dialysis burden, with reduced peri-operative risk compared to solid organ simultaneous pancreas and kidney transplantation. We aimed to evaluate the outcomes of the United Kingdom's initial cohort.

Methods
A retrospective analysis of SIK recipients was performed between 03/2017 and 04/2023 at our hospital.

Results:
22 SIK transplants were performed (72.7% donors after brain death). The mean recipient age was 56 with 54.5% female. The median diabetes duration was 42 years (IQR 22) with median post-SIK follow-up of 361 days (IQR 783). There was a median 1 infusion per recipient (median IQR 1) with median islet equivalence (IEQ) of 323,500 IEQ (IQR 141,250). HbA1c and exogenous insulin requirements were significantly lower after transplant (HbA1c: 62.7 vs 51.6 mmol/mol, $p<0.001$; IU: 40 vs 23 units/day, $p<0.001$) while C-peptide significantly increased (15.9 vs 535.8 pmol/l, $p<0.001$). Hypoglycaemic episodes/patient/year reduced (7 pre-transplant, vs 1.5 post-transplant). Median islet graft survival was 4.9 years. Lgls functional classification at the end of follow-up was satisfactory (7 Optimal, 1 Good, 10 Marginal and 4 Failure). eGFR significantly increased post-SIK (15.4 vs 49 mL/min/1.73m2, $p<0.001$).

Discussion
SIK ameliorates renal failure whilst improving glycaemic control with a satisfactory complication profile. Larger and longer cohort analysis is required to fully understand the benefits of SIK for patients with complicated T1DM.

Category: Clinical - renal surgical (kidney - transplant and living donor surgery - novel techniques)

MP018: The evolution of late liver retransplantation: A large UK single centre experience

Ms Anisa Nutu, Mr Angus Hann, Mr Hanns Lembach, Mr Jameel Alfarah, Dr Graham Caine, Ms Rebeca Mateos, Professor Ye Oo, Mr Bobby Dasari, Dr Matthew Armstrong, Mr David Bartlett, Dr James Ferguson, Dr Nick Murphy, Dr Davinia Bennett, Dr Neil Rajoriya, Dr John Isaac, Professor Darius Mirza, Professor Keith Roberts, Dr John Isaac, Professor Dhiraj Tripathi, Professor Thamara Perera

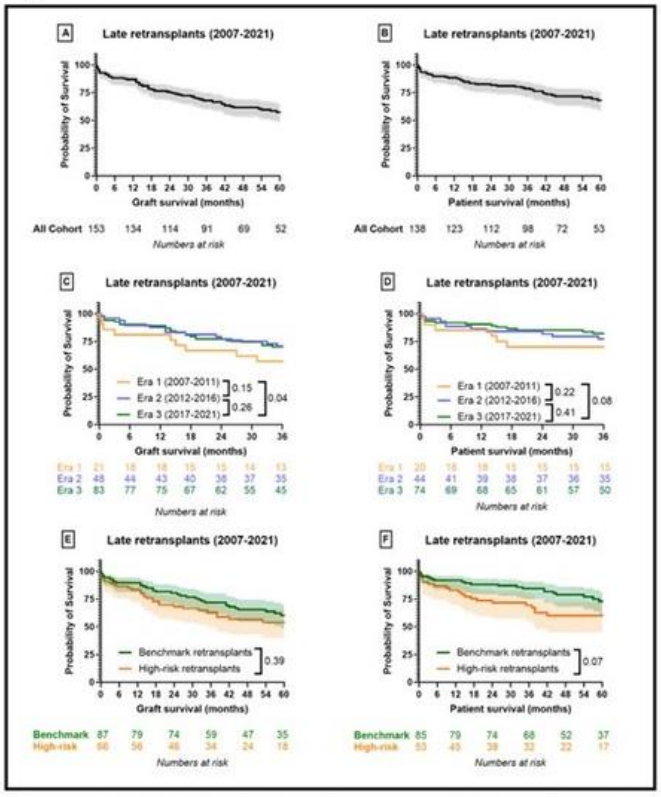
The Liver Unit, Queen Elizabeth Hospital, Birmingham, United Kingdom

Introduction: Liver re-transplantation is indicated following late graft failure, however outcomes are reported to be inferior to primary liver transplant. Based on the 'transplant benefit' principle, allocating deceased donor grafts to these recipients is often controversial. Our aim was to describe how the practice and outcomes of late retransplant have evolved over the last 15 years and the factors associated with poor outcomes.
Methods: A single centre retrospective study of patients that underwent late liver retransplant (>21days) with a graft from a deceased donor between 2007 and 2021. The study period was divided into three eras (Era 1:2007-2011, Era 2:2012-2016, Era 3:2017-2021). Recipients were classified as either benchmark or high-risk based on published benchmarking criteria. Patients with portal vein thrombosis, MELD ≥25, pre-transplant mechanical ventilation, receiving a DCD graft or undergoing repeat retransplant were considered high risk. The primary outcome was 1-year graft and patient survival. A multivariate analysis was performed to identify factors associated with graft loss within 1-year.

Results: Among 153 late retransplants, the 1-year graft and patient survival for the cohort was 133/153 (87%) and 121/135 (90%) respectively (Figure 1A & B). Overall, the 1-year patient survival has increased from 17/20 (85%) in era-1 to 67/74 (91%) in era-3 (Log rank p=0.08) (Figure 1D). Patient survival for benchmark retransplants improved over the 3 eras [Era-1:9/11(82%) vs. Era-2:24/28(86%) vs. Era-3:45/46(98%); p=0.01 (log rank)] (Figure 2B), but not in high-risk retransplants (Figure 2D). On multivariate analysis, split grafts (OR: 9.99, 95% CI: 2.02-49.46, P=0.005) and portal vein conduits (OR: 5.480, 95% CI:1.657-18.130, P=0.005) were associated with graft loss within 1-year of regraft.

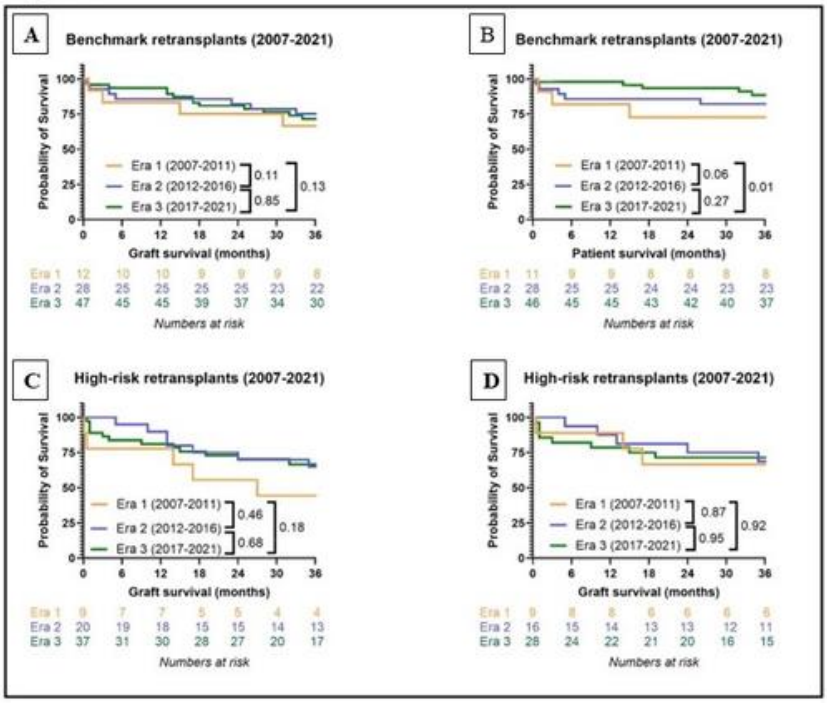
Conclusion: Excellent graft and patient survival can be achieved with late retransplant in the modern era. In benchmark recipients, graft utility is comparable to many indications for primary transplant.

Figure 1



Legend: Graft and patient survival curves for the entire cohort (A&B), based on era (C&D) row) and risk category (E&F). Log-rank test P values displayed.

Figure 2



Legend: Survival curves for benchmark (A & B) and high risk (C & D) performed during each time era. Log-rank test P values displayed.

Category: Clinical - liver and intestinal (liver - small bowel - surgery - transplant hepatology - recipient clinical care and management)

MP019: Impact of Bariatric surgery on Steatotic liver disease and liver transplant patients: An umbrella review with Meta-Meta-analysis

Mr Abdul Rahman Hakeem[1], Miss Aarathi Vijayashanker[2], Miss Giulia Vitali[2], Niloufar Safinia[2], Dr Varuna Aluvihare[2], Professor Raj Prasad[3], Professor Julie Heimbach[4], Professor Krishna Menon[2]

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Introduction: Bariatric surgery (BS) is a common, effective treatment for obesity, improving metabolic profiles and reducing mortality risk. However, its impact on patients with liver disease is unclear, with inconsistent results. In this umbrella review and meta-meta-analysis (MMA), we assessed existing literature on BS in such patients.

Methods: A systematic search from January 2013 to March 2023 was conducted. Two independent reviewers selected articles, assessed quality, and evaluated bias in the included systematic reviews. We examined BS effects on patients with liver disease, including those with metabolic dysfunction-associated steatotic liver disease (MASLD), metabolic dysfunction-associated steatohepatitis (MASH), compensated and decompensated cirrhosis, and liver transplant (LT) recipients. MMA were performed with a random-effects model. The protocol was registered with PROSPERO (CRD42023410190).

Results: Nineteen systematic reviews were analysed, with six included for MMA. MMA revealed benefits of BS on MASLD/MASH patients with ALT and AST decreasing by 13 U/L and 6 U/L, respectively. Steatosis, steatohepatitis, and fibrosis resolved completely in 53%, 45%, and 25% of patients, respectively. Fibrosis stage reduced by 0.76, and MASLD activity score (MAS) decreased by 2 points (range 1-3). Complications following BS in compensated cirrhotics were 18%, with 5% experiencing liver decompensation, and 1% early mortality. However, decompensated cirrhotics had a higher mortality of 16-22% post-BS mortality. BS before-LT resulted in higher excess weight loss percentage but increased 1-year graft loss (12.5% vs. 3.1%). Immediate complications were fewer compared to BS during- or after-LT.

Discussion: Our umbrella review and MMA highlights BS benefits in MASLD, MASH, and compensated cirrhotics but caution against it in decompensated cirrhosis. Further research is needed to elucidate optimal timing and long-term effects of BS in LT patients.

Figure 1: PRISMA Flowchart depicting the search strategy and selection of articles for the umbrella review and meta-meta-analysis.

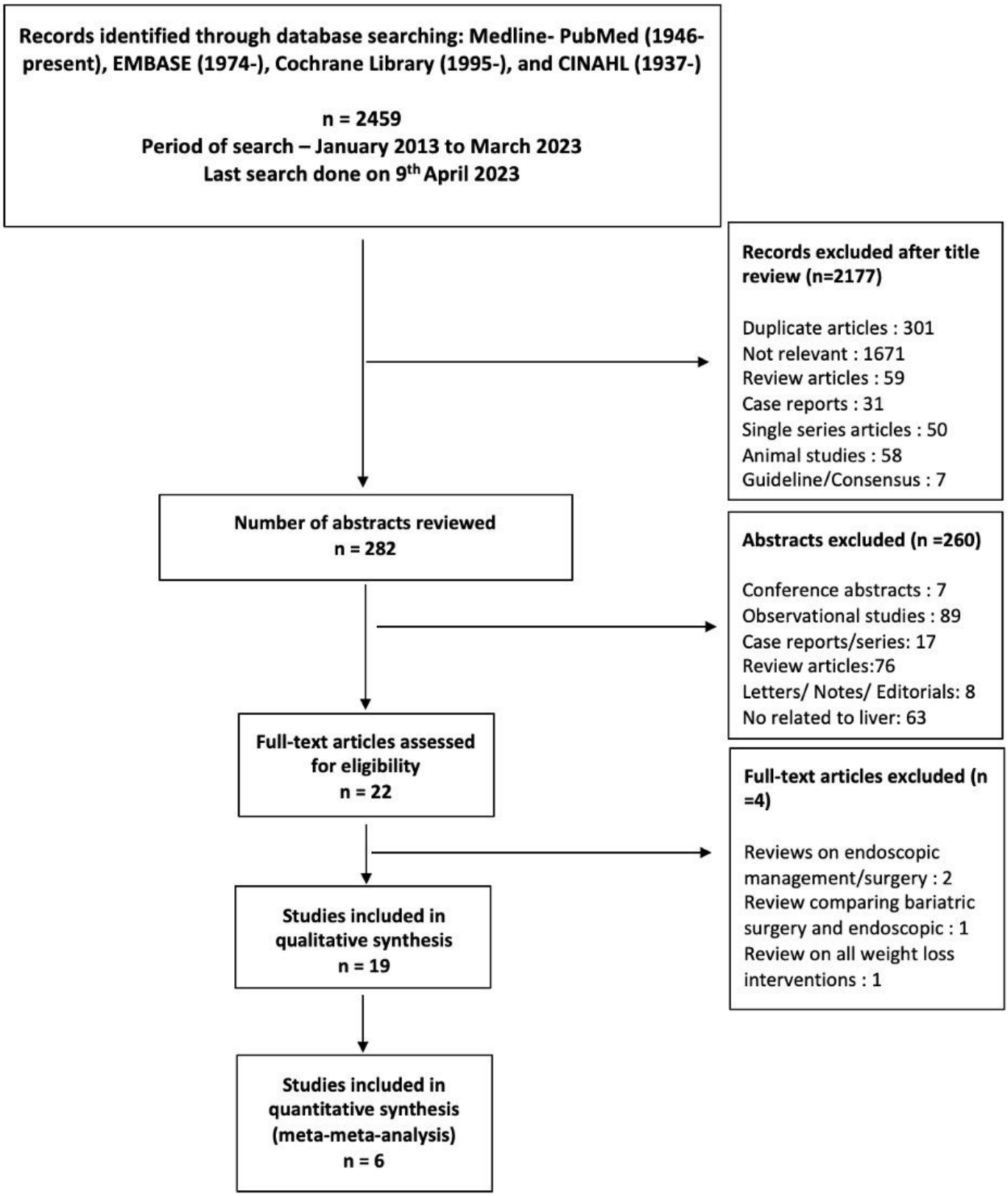
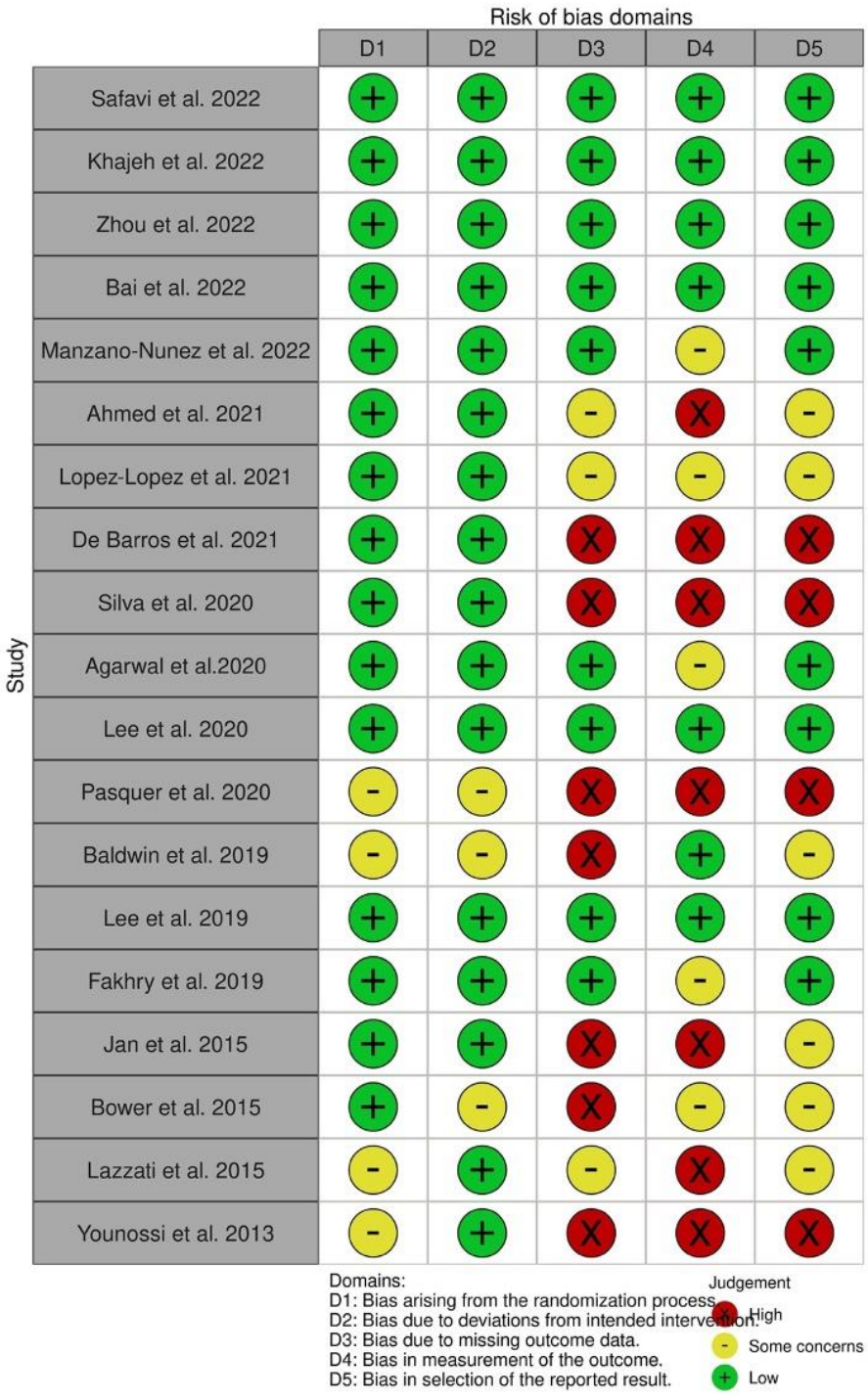


Figure 2: Risk of Bias in the included Systematic Reviews with the ROBIS scale



Category: Clinical - liver and intestinal (liver - small bowel - surgery - transplant hepatology - recipient clinical care and management)

MP020: Localised liver injury during normothermic machine perfusion has no impact on short term liver transplant outcomes

Mr Jack Martin[1], Dr Freya Rhodes[2], Dr Sara Upponi[1], Dr Yagazie Udeaja[1], Lisa Swift[1], Corrina Fear[1], Rachel Webster[1], Dr Gwilym Webb[1], Dr Michael Allison[1], Dr Anna Paterson[1], Mr Rohit Gaurav[1], Mr Andrew Butler[1], Professor Christopher Watson[1]

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Introduction
Normothermic machine perfusion (NMP) has the potential to increase organ utilisation. In liver transplantation, radiological evidence of localised liver injury due to compression at the time of NMP, termed cradle compression, is a recognised phenomenon but is poorly characterised.

Methods
A retrospective analysis of a prospectively collected database was performed of transplanted livers that underwent NMP and subsequently had a CT performed within the first 14 days post-transplant. The primary study outcome was 1 year graft survival.

Results
70 (63%) livers were included in the analysis. Radiological evidence of cradle compression was observed in 21/70 (30%). There was no difference in rate of cradle compression between DCD and DBD donors ($p = 0.37$) or with duration of NMP. Univariate analysis demonstrated younger (AUROC 0.68, p 0.008 (95% CI 0.55-0.82)) and heavier (AUROC 0.80, $p < 0.001$ (95% CI 0.69-0.91)) livers to be at risk of cradle compression (Table 1). Only liver weight was associated with cradle compression on multivariate analysis (OR 1.003, $p = 0.005$ (95% CI 1.001-1.005). There was no difference in 1 year graft-survival (16/17 (94.1%) vs 44/48 (91.6%) OR 0.69, $p = 0.75$ 95% CI 0.07-6.62) (Figure 1).

Discussion
This is the first study assessing the impact of cradle compression on outcome. We have identified increased donor liver weight and younger age as risk factors for the development of this phenomenon. Increasing utilisation of NMP will result in the increased incidence of cradle compression but the apparent absence of long-term sequelae is reassuring. Routine post operative axial imaging may be warranted.

Category: Clinical - liver and intestinal (liver - small bowel - surgery - transplant hepatology - recipient clinical care and management)

MP021: Pregnancy outcomes in liver transplant recipients

Dr Yooyun Chung[1], Dr Mary Cannon[1], Dr Enoka Gonsalkorala[2], Dr Tiong Yem Lim[3], Miss Lisa Long[1], Professor Michael Heneghan[1]

[1]King's College London, London, United Kingdom. [2]Royal Brisbane & Women's Hospital, Brisbane, Australia. [3]Royal London Hospital, London, United Kingdom

Maternal characteristics	
Women, n	118
Conception, n - 1987-1998 - 1999-2010 - 2011-2022	204 - 30 - 88 - 86
Age at conception, years	30 (IQR 25 – 35)
Age at liver transplantation, years	23 (IQR 15 – 29)
Time from transplant to conception, months	70 (IQR 29 – 147)
Ethnicity, % - White - Black - Asian - Other	 78 (n=92) 5 (n=6) 11 (n=13) 6 (n=7)
Aetiology, n - (Sub)acute liver failure - Autoimmune hepatitis - Biliary atresia - Budd Chiari - Wilson's disease - Cholestatic genetic disease - Primary sclerosing cholangitis - Alpha 1 antitrypsin - Primary biliary cholangitis - Viral hepatitis - Other*	 53 24 20 18 16 10 8 8 4 5 38
Pregnancy outcomes (excluding termination of pregnancy n=190)	
Live birth, % (excluding termination of pregnancy)	79 (n=151)
Miscarriage, % (excluding termination of pregnancy)	19 (n=37)
Stillbirth, % (excluding termination of pregnancy)	1 (n=2)
Termination of pregnancy, %	7 (n=14)
Maternal complications (n=204)	
Pre-eclampsia, %	11 (n=23)
Gestational diabetes, %	5 (n=10)
Intrahepatic cholestasis, %	4 (n=8)
Gestational hypertension, %	3 (n=7)
Post-partum haemorrhage, %	3 (n=6)
Pregnancy <12 months of LT, % - Live birth, n - Late preterm births, n - Very preterm births, n - Preeclampsia, n - Miscarriage, n - Termination of pregnancy, n	7 (n=15) - 11 - 3 - 2 - 3 (all associated with PTB) - 2 - 2
Delivery	
Caesarean, % of live births	39 (n=59)
Vaginal delivery, % of live births	52 (n=79)
Missing mode of delivery, % of live births	9 (n=13)
Foetal outcomes	
Gestational age, weeks	38 (IQR 36 – 40)

Birth weight, grams	2835 (IQR 2400 – 3180)
Available data on gestation: missing data, n	130:21
Preterm births - Late preterm births, % of available live births - Very preterm births, % of available live births - Extreme preterm births, % of available live births	 - 28 (n=37) - 5 (n=7) - 2 (n=3)
Liver related complications	
Rejection - Preconception, % - During pregnancy, % - Post-partum, %	 - 4 (n=8) - 5 (n=11) - 8 (n=17)
Re-transplantation <24 months post-partum, %	4 (n=8)
Immunosuppression during pregnancy	
Tacrolimus, n	160
Cyclosporin, n	30
Azathioprine, n	38
Prednisolone, n	67
Sirolimus, n	3 - 1 switched to tacrolimus -
Mycophenolate mofetil - Successful pregnancy, n - Miscarriage, n - Termination of pregnancy, n	9 - 3 (1 term, 1 late PTB, 1 very PTB) - 3 - 3

* Alcohol related liver disease, congenital hepatic fibrosis, Glycogen Storage Disease, fibrolamellar liver tumour, Crigler-najjar syndrome, secondary biliary cirrhosis, hepatoblastoma, epithelioid haemangioendothelioma, hyperoxaluria, cryptogenic cirrhosis

Abbreviations: IQR interquartile range, n number, LT liver transplantation, PTB preterm birth

Definitions: Late preterm births (32-37 weeks), very preterm births (28-32 weeks), extreme preterm births (<28 weeks)

Introduction: The prevalence of liver transplantation (LT) in women of reproductive age is increasing. Preconception risk stratification and personalised management strategies are desirable.

Method: Pregnancy outcomes in LT recipients at King's College Hospital were gathered from a prospective database of self-reported pregnancies. Clinical data were gathered from medical records.

Results: There were 118 women with 204 pregnancies between 1987 to 2022. The median age at conception was 30 years (IQR 25-35) and at LT 23 years (IQR 15-29). The commonest aetiology for LT was (sub)acute liver failure (Table 1).

The live birth rate was 79% (n=151) and of these 36% (n=47/130 available data) were preterm births. The rate of miscarriage was 19% (n=37) and for stillbirth 1% (n=2). The commonest maternal complication was preeclampsia affecting 11% which is higher than the population data followed by gestational diabetes occurring in 5%. Preeclampsia was strongly associated with preterm births (p=0.0003). The preconception creatinine and MELD score predicted preterm births with area under curve 0.682 (p=0.003) and 0.668 (p=0.008) respectively but not the live birth rate.

Tacrolimus and corticosteroid were the most widely used immunosuppression regimen followed by Azathioprine and cyclosporin. Two women on sirolimus were switched to tacrolimus during pregnancy and had successful deliveries whilst one women on sirolimus had a miscarriage. Three women exposed to mycophenolate had a miscarriage, another three decided to undergo a termination and three women had successful delivery of which 2 were preterm and 1 was small for gestational age. There were no congenital malformations or pregnancy related maternal deaths.

Discussion: Overall, women post LT can expect favourable pregnancy outcomes. Aspirin for preeclampsia prophylaxis at 12 weeks gestation should be considered especially those with renal dysfunction. LT recipients should also be screened for gestational diabetes. Immunosuppression should be optimised at preconception for the best outcome.

Category: Clinical - liver and intestinal (liver - small bowel - surgery - transplant hepatology - recipient clinical care and management)

MP022: Predicting risk of death at transplant assessment for patients with primary sclerosing cholangitis

Miss Beatrice Lofthouse[1], Miss Katie Connor[2], Mr Michael Williams[2], Mr Ben Stutchfield[2]

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Introduction: Primary sclerosing cholangitis (PSC) is a chronic cholestatic liver disease that may require liver transplantation. Multiple scoring algorithms exist for risk prediction in PSC. The current UK liver transplantation allocation algorithm includes 5-year survival prediction from listing for transplantation (TBS M1). Using risk predictions tools at the time of assessment, prior to addition to the waiting list, can aid decision making for patients and clinicians. However, the predictive ability of scores in this setting is uncertain. This study aims to assess survival from assessment, regardless of whether a patient is added to the waiting list.

Methods: The first liver transplant assessment episode for patients with PSC at a single UK centre between 2002 and 2023 was identified. Survival from assessment to death (transplant censored) and transplant free survival (assessment to death or transplant) were calculated. The predictive value of TBS M1, UKELD, Mayo risk score and age were estimated using receiver operator characteristic curves.

Results: 190 patients (mean age 47.8 years, SD=14) with PSC had their first assessment within the time period. Mean (SD) TBS M1 = 819 (446), UKELD = 57 (5.2) and Mayo risk score = 2.6 (1.0). 74% were listed for transplantation at first assessment (n=141), 56% were transplanted within one year (n=107) and 73% transplanted within 5 years (n= 139) (Figure 1). 6% were alive at 5 years without transplant (n=11), 14% died without transplant (n=26) and 7% were alive but did not complete 5 years (n=14). Figure 2 shows the receiver operator characteristic curves for TBS M1, age, UKELD and the Mayo risk score.

Discussion: TBS M1 showed superior predictive ability, although this was similar to age alone. 5-year survival prediction is limited by the high rate of censoring as patients are selected for transplantation. Further work is required to understand reasons for death following assessment for transplantation.

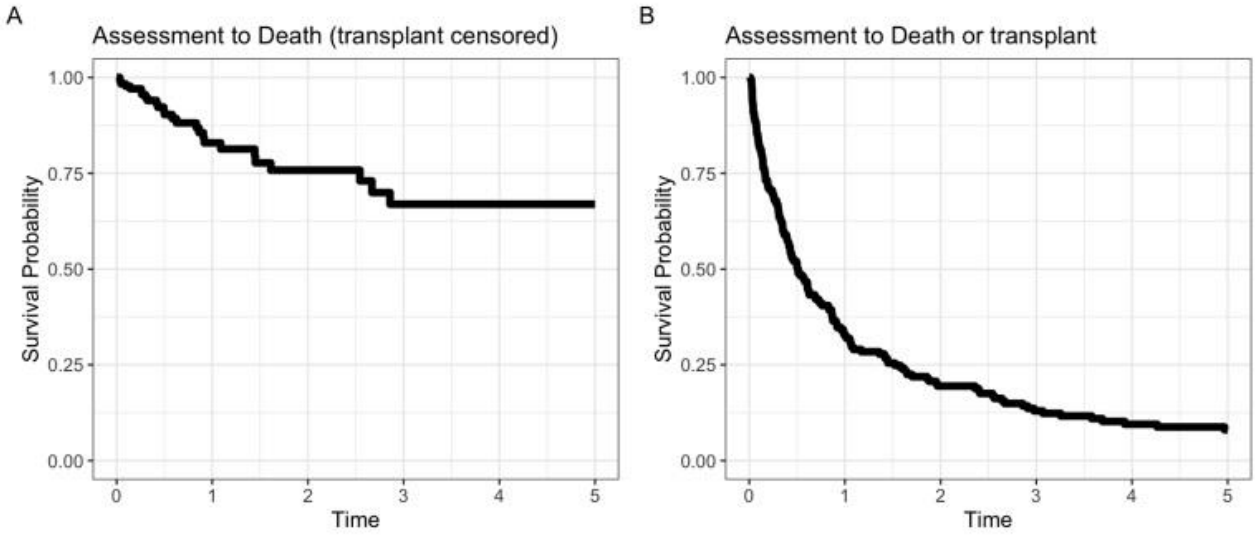


Figure 1: Kaplan-Meier survival curves for patients with primary sclerosing cholangitis following first assessment for transplantation: A) Assessment to death with censoring for transplantation; B) Assessment to death or transplant (transplant free survival).

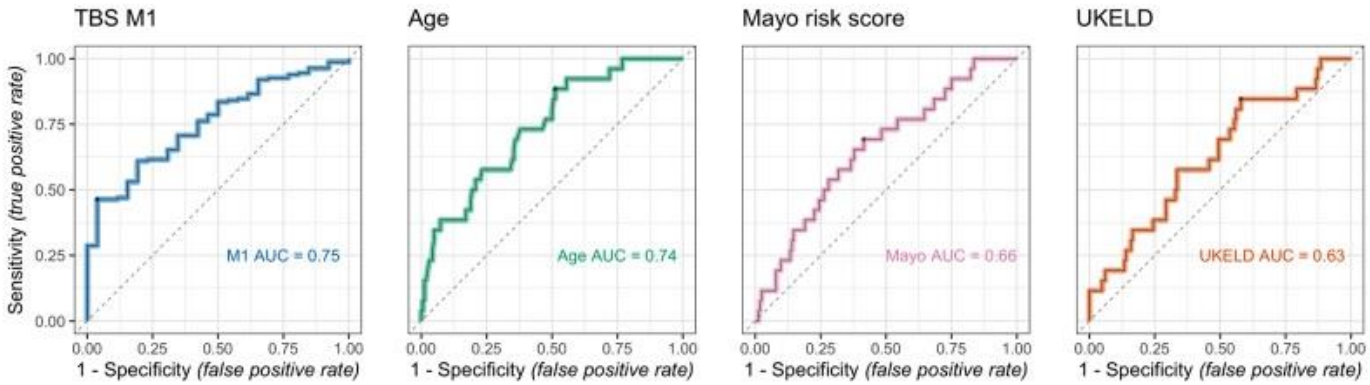


Figure 2: Receiver operator characteristic curves for TBS M1 (survival prediction without transplant), Age, Mayo PSC risk score and UKELD in predicting 5 year survival following assessment for transplantation (AUC – Area under the receiver characteristic curve: 0.5= no predictive value; 1= perfect predictor).

Category: Clinical - liver and intestinal (liver - small bowel - surgery - transplant hepatology - recipient clinical care and management)

MP023: Liver transplantation for Primary Sclerosing Cholangitis with Normothermic regional perfusion

Mr Rohit Gaurav, Mr Andrew Butler, Mr Paul Gibbs, Ms Lisa Swift, Ms Corrina Fear, Ms Rachel Webster, Prof Chris Watson

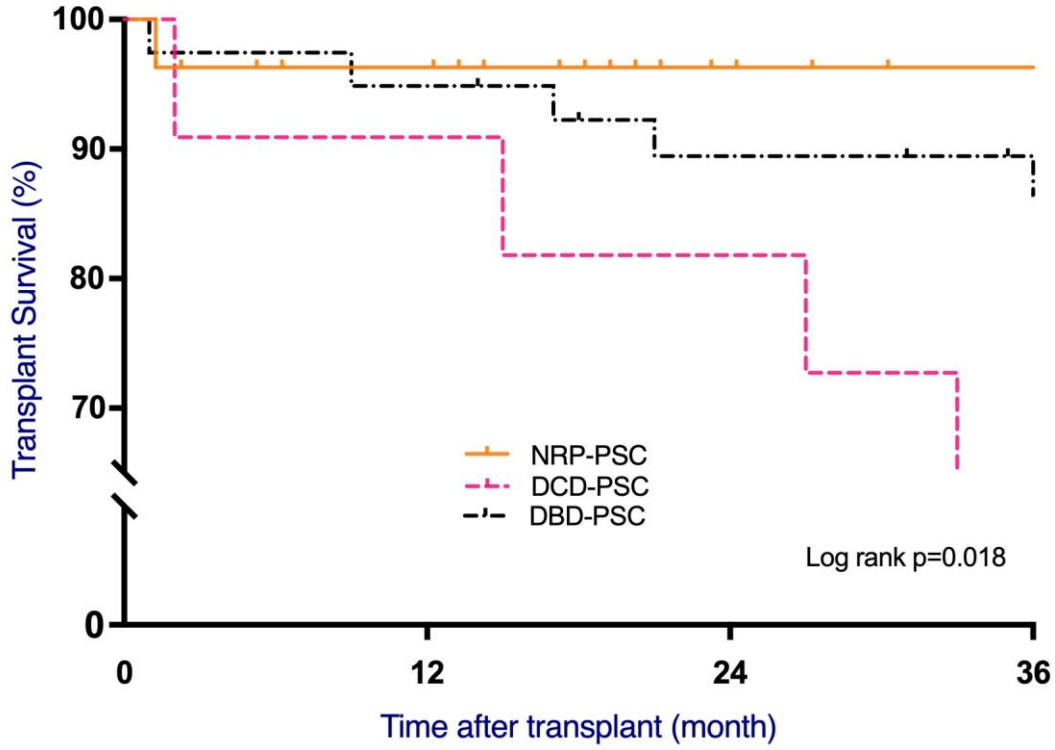
Roy Calne Transplant Unit, Addenbrookes Hospital, Cambridge, United Kingdom

Introduction: Liver transplantation in primary sclerosing cholangitis (PSC) is fraught with peril due to disease recurrence and higher risk of biliary and arterial complications affecting graft survival. This led to apprehension in using donation after circulatory death (DCD) livers in PSC patients. Transplantation outcomes of Normothermic regional perfusion (NRP) livers are excellent and comparable to donation after brain death (DBD). In this study, we share our experience of liver transplant in PSC patients with NRP livers.

Methods: Retrospective analysis of liver transplantation in PSC patients at our institute from January 2015 till August 2023. The liver transplantation outcomes in PSC recipients with NRP livers (NRP-PSC group) were compared to the standard DCD (DCD-PSC group).

Results: There were 171 NRP liver transplants during the study duration. PSC was indication in 27 (16%) of the patients and two of them were for recurrent PSC. During the same period, 12 PSC patients were transplanted with standard DCD livers.
The donors in the NRP-PSC group were younger (median age 44 years vs 52 years) with lower donor risk index (median DRI, 2.1 vs 2.6). The warm ischaemia (median 28 mins vs 27 mins) and cold ischaemia times (median 484 mins vs 424 mins) were comparable. Ischaemic cholangiopathy (IC) was significantly higher in the DCD-PSC group (50% vs 20%) with no hepatic artery thrombosis in either of the groups. There were four graft losses in the DCD-PSC group: one primary nonfunction, two IC and one disease recurrence. None of the grafts failed in the NRP-PSC group.

Discussion: Livers recovered from DCD donors using NRP appear to be an excellent source of livers for PSC patients with favourable outcomes.



At risk				
NRP-PSC	27	21	10	7
DCD-PSC	12	11	10	8
DBD-PSC	39	38	33	30

Category: Clinical - liver and intestinal (liver - small bowel - surgery - transplant hepatology - recipient clinical care and management)

MP024: Impact of donor transaminases on liver transplant utilisation and unnecessary organ discard: National registry cohort study

Dr Joseph Dobbins[1], Mr Samuel Tingle[2], Dr Jennifer Mehew[3], Miss Emily Thompson[1], Mr Georgios Kourounis[2], Dr Stuart McPherson[1], Prof Steven White[1], Mr Colin Wilson[1]

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Introduction: Donor liver transaminases (ALT and AST) have been used to decline livers for transplant, despite evidence that they do not influence transplant outcomes. This study assesses the effect that raised donor transaminases currently have on the unnecessary decline of livers.

Methods: This retrospective cohort study used the National Health Service registry on adult liver transplantation (2016-2019). Logistic regression models were built to assess the impact of donor transaminases on the utilisation of organs donated following brain stem death (DBD) and circulatory death (DCD). A further model was used to predict the impact on liver decline if raised donor ALT was not used to make utilisation decisions.

Results: 5424 adult livers were offered for transplant, of which 3605 were utilised (2842 DBD, 764 DCD). In multivariable analysis, adjusted for key factors, increasing peak donor ALT independently increased the odds of liver decline (DBD aOR = 1.396, 1.305-1.494, $p<0.001$, DCD aOR = 1.162, 1.084-1.246, $p<0.001$). AST was also a significant predictor of liver decline. 18.5% of livers from DBD donors with ALT>40U/L (n=1683) were declined for transplantation. In this group, our model predicted a 48% (38% - 58%) decrease in decline if donor ALT was excluded from these decisions. This represents an additional 37 (30-45) livers every year that could be safely accepted and transplanted.

Discussion: Raised donor ALT increases the likelihood of liver decline, despite previous evidence that it does not influence transplant outcome. Avoiding donor ALT-based organ decline is an immediate and effective way to expand the donor pool.

Category: Clinical - liver and intestinal (liver - small bowel - surgery - transplant hepatology - recipient clinical care and management)

MP025: Early glucose concentration during ex situ normothermic machine perfusion predicts liver outcomes

Prof Chris Watson[1,2], Mr Andrew Butler[1,2], Ms Lisa Swift[2], Mrs Rachel Webster[2], Ms Corrina Fear[2], Mr Subhanker PAUL[2], Mr Adam PHILIPOFF[2], Mr Jack MARTIN[2], Mr Rohit Gaurav[2]

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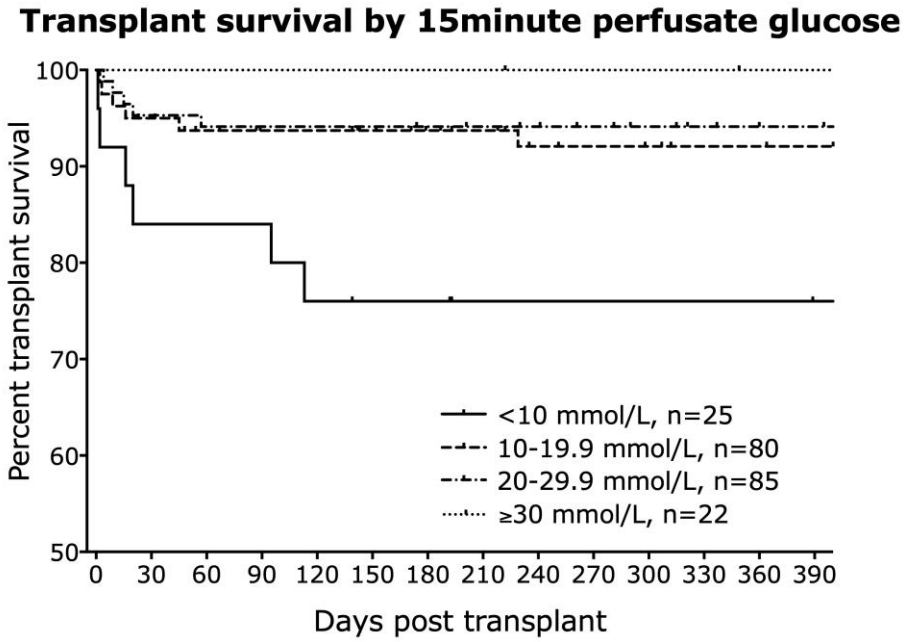
Introduction: During ischaemia, cells are wholly dependent on glucose for the anaerobic generation of the ATP required to preserve cell function during cold storage. During normothermic perfusion (NMP) adequate intracellular glucose/glycogen reserves manifest as hyperglycaemia at the start of perfusion. We examined the results of livers undergoing NMP according to the perfusate glucose concentration at 15 minutes.

Methods: Livers were divided according to the perfusate glucose concentration measured after 15 minutes of NMP and transplant outcomes calculated.

Results: 291 livers underwent NMP between 1/2/2018 and 7/10/23, of which 212 were transplanted. 37 (13%) livers had a 15min glucose (15G) <10mmol/L and these were more likely to be DCD (89% DCD vs 11% DBD, p=0.0001), and less likely to be transplanted (68% vs 74%) than livers with a 15min glucose ≥10mmol/L. One-year transplant survival was significantly poorer (76% vs. ≥92%, logrank p=0.0003, see figure) with poorer early allograft dysfunction if the 15min glucose <10mmol/L (average model for early allograft function (MEAF) score 5.2 compared to 4.2 for livers with a 15minute glucose ≥10mmol/L).
Causes of transplant failure included 2 cases of PNF, 2 arterial thromboses, 1 multiorgan failure and 2 (8%) from cholangiopathy. Only 2 (1%) of the 187 livers with a 15G>10mmol/L needed retransplantation for cholangiopathy.



Discussion: Glucose in the liver is derived from glycogen, and these data suggest that a significant proportion of donor livers are glycogen deplete at the time of donation, such that they tolerate cold storage poorly. Current ITU practice is to withhold parental nutrition in donors in whom enteral feed is not tolerated, and this may explain this finding. This work suggests more research needs to be done on the effects of donor nutrition and graft outcomes, and centres undertaking liver NMP need to be aware of the implications of a low perfusate glucose at 15 minutes.

Category: Clinical - liver and intestinal (liver - small bowel - surgery - transplant hepatology - recipient clinical care and management)

MP026: The role of Normothermic Regional Perfusion (NRP) in recovering untranslatable DCD livers

Dafydd Locker, Laszlo Szabo, Al Croose, Adam Ewart, Elijah Ablorsu

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Introduction: Normothermic Regional Perfusion (NRP) has emerged as a transformative approach in liver transplantation from donors after circulatory death (DCD). This innovative technology not only facilitates the repair of ischaemic injuries in marginal livers post-circulatory arrest but also provides a real-time evaluation of graft function during retrieval. Consequently, NRP has been instrumental in utilising DCD liver grafts initially deemed unsuitable for transplantation, thereby improving transplant outcomes in addition to expanding the donor pool.

Methods: We conducted a retrospective analysis at a single centre, examining the outcomes of DCD liver transplants retrieved by the Cardiff retrieval team using NRP technology. We performed 20 NRP retrievals between May 2022 and October 2023. On four occasions the liver grafts were declined prior to retrieval due to non-conformance with existing donor selection criteria. During NRP, these four livers displayed satisfactory function and were subsequently re-offered. Three of these were accepted and transplanted successfully.

Results: Four donors aged 58-69 were included. Table 1 shows the donor past medical history and baseline liver function pre-donation. All donors underwent successful NRP for at least 120 minutes with significant improvements blood gas parameters, pH, lactate, glucose and liver function tests which allowed all four livers to be re-offered (table 1). Three livers were successfully transplanted with recipient data shown in table 2. One liver was later not transplanted due to logistical reasons.

Discussion: NRP offers a robust assessment for marginal DCD liver grafts, including those previously excluded based on existing criteria, effectively discerning viable organs for transplantation. The integration of NRP into the organ evaluation process can significantly enhance the utilisation of marginal liver grafts and refine the overall outcomes for DCD liver transplants. The current donor selection protocols may need re-evaluation to incorporate NRP assessments, potentially expanding the donor liver pool.

Table 1

Patient	Donor 1	Donor 2	Donor 3	Donor 4
Donor age	62	58	62	69
PMHx	Previous EtOH excess Ex-smoker Hysterectomy Gastric bypass	Smoker 30/day Heavy drinker Drug use Anxiety / depression	Moderate drinker COPD 20-year smoking Hx HTN Hypercholesterolaemia Subclinical hypothyroidism	Smoker – 57 years Social drinker Inguinal hernia
Baseline LFTs	ALP 114 ALT 20 Bili 8	ALP 162 ALT 115 Bili 8	ALP 36 ALT 47 Bili 6	ALP 88 ALT 15 Bili 14
NRP Data				
NRP duration	140 minutes	150 minutes	120 minutes	150 minutes
Starting pH (arterial)	7.21	6.92	7.3	7.17
Final pH (arterial)	7.36	7.41	7.39	7.45
Starting Lactate	15.4	14.2	12.4	11.2
Final Lactate	6.4 (58% drop)	1.9 (86.6% drop)	4.7 (62.1% drop)	3.6 (68% drop)
Starting ALT	17	81	47	41
Final ALT	18	107	47	110
Starting Glucose	28.2	15.9	12.1	9.7
Final Glucose	15	13.2	8.2	9

Table 2

Patient (recipient)	1 (Donor 1)	2 (Donor 2)	Not transplanted (Donor 3)	4 (Donor 4)
Age	**46**	**32**		**46**
Peak ALT first week	189	1824		2233
ITU Stay (days)	11	6		2
Hospital stay (days)	27	39		14
30-day outcomes:				
Surgical complications	Re-laparotomy for suspected pneumatosis intestinalis, post op collection, asymptomatic Covid-19 infection	Wound dehiscence requiring re-laparotomy and repair		No
Graft survival (Y/N)	Y	Y		Y
Patient Survival (Y/N)	Y	Y		Y

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

MP027: Reviewing data monthly to identify modifiable factors in length of process to establish why targets are consistently not met in the London region

Miss Georgina Hobbiger, Mrs Sonia Fernandez Lopez

NHSBT, London, United Kingdom

Introduction: Length of Process (LoP) is a recognised factor for family decline, for withdrawal of consent and an influencing factor for donation hospital support of the process. With increasing complexity and quantity of donors and recipients, LoP is increasing, with London not meeting the stated DBD/DCD target set by NHSBT. An in-depth review of month-by-month data is completed to identify modifiable/non modifiable factors impacting LoP. Further exploring if in the current climate this target is not achievable.

Case Presentation: LOP data released monthly by NHSBT was reviewed in depth for each proceeding Organ Donor. Data collated included approach and consent timings, characterisation key markers e.g. tissue typing bloods sent, coroner contact, organ acceptance and NORS mobilisation/start time. Appreciating there are both modifiable and non-modifiable factors we aimed to identify those we can modify.

Outcome: A large amount of LoP time was influenced by non-modifiable factors mainly Theatre availability, NORs availability and offering times. Modifiable factors identified are discussed in monthly team meetings as well at Specialist Requestor meetings. This to ensure Specialist Nurses (SN) are aware of these factors and can adapt practice. Inconsistent practice amongst SN was identified as a key modifiable factor particularly with Opt In Donors and allowed characterisation pre consent not being completed as per policy. If policy had been followed, LOP would have been reduced however, this still may not have met defined targets.

Discussion: The donation process is complex and has many different moving parts many of which are not modifiable by SN at the time of donation. However, identifying modifiable factors and sharing these with the team allows us to prioritise our donors/families, recipients, and donor hospitals to ensure a good outcome for all.

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

MP028: Parallel pathways - A case study demonstrating how parallel pathways can improve outcome

Miss Debbie Walford, Mrs Natalie Ashley, Mr George Thundiyl Joseph

OTDT, Cambridge, United Kingdom

Introduction: Historically and in line with NICE Guidelines 2011, referral for Organ donation (OD) has been triggered when:

- "Absence of one or more cranial nerve reflexes and GCS of 4 or less"
- "Decision has been made to Withdraw Life Sustaining Therapy (WLST) …which will, or is expected to, result in circulatory death".

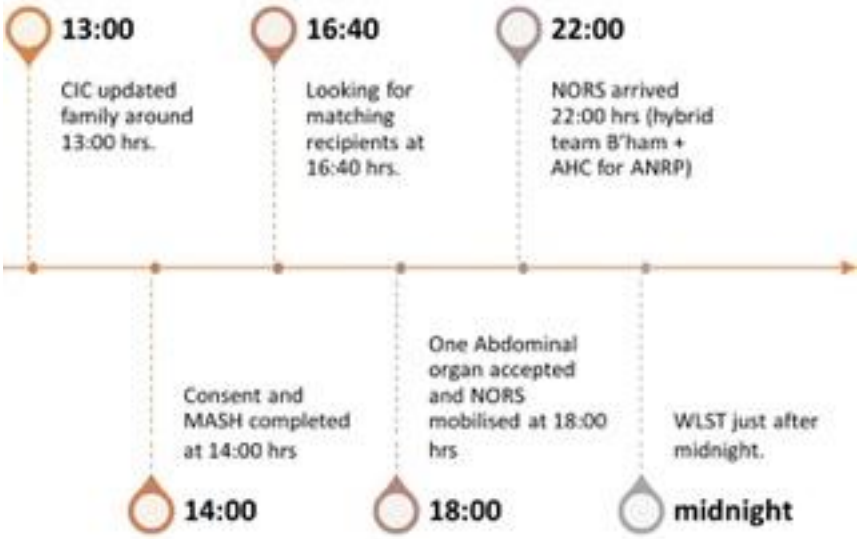
Although for many families this is the most appropriate time to consider end of life care (EOLC) options, in some instances earlier EOLC planning, including OD has considerable benefits. Involvement of the SNOD can take place earlier – ie when EOLC is being considered, but not yet decided.
For families who are accepting futility, or when a patient is deteriorating, broaching OD seems logical whilst maintaining and protecting the donation potential of the patient.

Case Presentation:

- 64M, OOHCA, DT 33mins
- Poor prognosis discussed on admission
- Admission CT Head – NAD
- Day 3 CT – HBI, Palliative Care and SNOD referral
- Day 4 – treat for another 24hrs, SNOD attendance declined, family raised donation.
- SNOD met with family – understood futility and frustrated treatment was continuing. Clinicians and family in agreement to set up OD process to point of offering despite no current plans to withdraw treatment.

Outcome: The open, honest nature of the conversations with this family meant they felt heard. By commencing full characterisation on day4, before formal decision to WLST, we were able to act quickly when that decision was made with organs accepted within 4hours – significantly shorter than the average length of process (LOP). This met the needs of this family to which they have provided positive feedback.

Discussion: In our region in the last 6months 9 families have declined donation based on LOP alone. Earlier consideration of donation can help to shorten the LOP, potentially reducing the number of refusals as well as the loss of potentially transplantable organs in a deteriorating patient.



Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

MP029: A Network approach to specialist nursing recruitment in non-transplanting centres to improve access to transplantation

Dr Kerry Tomlinson[1], Dr Elizabeth Wallin[2], Mr Alastair Tallis[3], Mrs Marie Atkins[3]
[1]University Hospitals of North Midlands NHS Trust, Stoke on Trent, United Kingdom. [2]University Hospitals

Birmingham NHS Foundation Trust, Birmingham, United Kingdom. [3]University Hospital Coventry and Warwickshire NHS Trust, Coventry, United Kingdom

Introduction: There is unwarranted variation in access to pre-emptive transplant listing and living donor transplantation. The Access to Transplantation and Transplant Outcome Measure (ATTOM 2016) provided qualitative evidence of the importance of specialist nurses. The Renal Getting it Right First Time report recommended that renal centres should have a dedicated transplant nurse specialist workforce.

Methods: Our regional network was invited to apply for funding as part of the NHSE annual project proposals. Our proposal detailed opportunities to improve transplant access alongside patient experience and sustainability. Project costs were estimated at £200,000 per annum (4.5 WTE nurses)

Dialysis costs conservatively £10,000 more than transplant per annum. Each additional living donor transplant therefore saves £10,000 per annum for the life of the transplant. Each listing brought forward by 6 months saves £5,000 and possibly more given the cost of surgical procedures to initiate dialysis. Using the renal registry report 2019 we estimated numbers of patients moving to best practice care if units moved to the national average (20%) or regional best (26%) for pre-emptive listing. Estimating £7,500 per additional patient potential savings amounted to £226K-£653K per annum.

Results/outcomes: The project was approved, and all non-transplanting centres were asked for expressions of interest. The network supported recruitment by developing job descriptions, person specifications and monitored timescales.

Six nurses were recruited between November 2022 and June 2023. They have been supported by an education webinar programme from across the region, links with transplant centres and support from KQUIP.

Discussion: We have shown that a network can successfully make the case to appoint specialist nurses where individual Trusts have been unable to do so. Over the next 2 years we will review the impact of these posts using qualitative outcome and patient experience measures

Category: Living donation (living donor and recipient selection (all organs) options for donation - donor care - outcomes)

MP030: Successful bivalirudin use in a patient with heparin-induced thrombocytopenia undergoing heart after liver domino transplantation (HALT-D) using modified ultrafiltration

Dr. Ramanish Ravishankar[1], Dr. Karanpreet Dhaliwal[2], Ms. Trang Bodtke[2], Dr. Maziar Khorsandi[2], Dr. Ioannis Dimarakis[2], Dr. Jay Pal[2]

[1]Castle Hill Hospital, Hull, United Kingdom. [2]University of Washington, Seattle, USA

Introduction: Heparin-induced thrombocytopenia (HIT) is a rare condition which poses challenges to cardiopulmonary bypass (CPB) where heparin is the mainstay of anticoagulation. Alternative strategies have been successfully utilized and described in literature such as bivalirudin, a direct thrombin inhibitor. However, unlike heparin, there is no direct reversible agent, and its breakdown relies on proteolytic activity. In order to optimize bivalirudin clearance, modified ultrafiltration (MUF) was used; this method has previously been shown to effective during cardiopulmonary bypass but has never been used in the case of heart after liver domino transplantation (HALT-D) where there is a huge risk of bleeding.

Case presentation: A 30-year-old female presented with a post-partum associated spontaneous coronary artery dissection (SCAD) of the right coronary artery and subsequent post-partum cardiomyopathy. She was initially placed on an intra-aortic balloon pump (IABP) for 24 hours. Following further decompensation refractory to vasopressor and inotropic support, she was placed on Tandem Heart and subsequent VA-ECMO. She was listed for status 1 heart transplant. Duplex doppler confirmed a right radial arterial clot despite being on heparin; HIT was confirmed following serotonin receptor antibody screening tests.

Bivalirudin was used as a heparin alternative. Her activated clotting time (ACT) was higher than expected. MUF was utlilised in the last 20 minutes of the case prior to coming off CPB, which brought down the ACT levels to baseline post-operatively (Figure 1). Direct thrombin inhibitor time was also normal. No post-operative bleeding was noted and the patient was discharged on Day 31.

Discussion: This patient had HIT and underwent the world's first HALT-D with high senisitisation as the primary indication. MUF was successfully used to reduce bivalirudin levels in a scenario with a high-risk of bleeding in a HIT patient and no subsequent post-operative bleeding.

Category: Case study submission (may include individual cases or shared learning experiences)

MP031: Impact of donor obesity on graft and recipient survival outcomes following liver transplantation: A systematic review and meta-analysis

Mr Amr Alnagar[1], Mr Shahab Hajibandeh[2], Mr Shahin Hajibandeh[3], Mr Abdul R Hakeem[4], Mr Bobby Dasari[1]

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Introduction: The effect of donor body mass index (BMI) on outcomes of liver transplantation (LT) remains unclear.

Methods: A systematic search of MEDLINE, CENTRAL and Web of Science and bibliographic reference lists were conducted. All comparative studies evaluating outcomes of LT concerning obese (BMI> 30 kg/m2) and non-obese donors (BMI< 30 kg/m2) were included and their risk of bias was assessed using ROBINS-I assessment tool. Patient and graft survival, acute rejection, and graft failure requiring re-transplantation were evaluated as the outcome parameters. The random-effects model was used for outcome synthesis.

Results: We included 6 comparative studies reporting a total of 5,071 liver transplant recipients from 708 obese and 4363 non-obese donors (Figure 1)

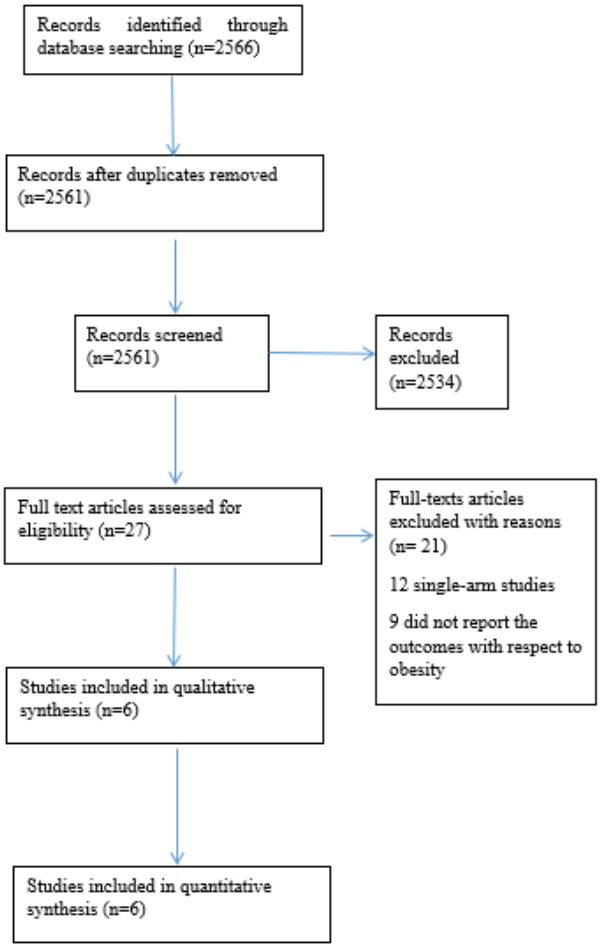


Figure 1. Study Flow diagram

There was no significant difference in 1-year (89.1% versus 84.0%, OR 1.58; 95% CI 0.63-3.94, p=0.33), 5-year (74.2%% versus 73.5%, OR 1.12; 95% CI 0.45-2.80, p=0.81) graft-survival, and 1-year (87.1% versus 90.3%, OR 0.71; 95% CI 0.43-1.15, p=0.17), 5-year (64.5% versus 71.6%, OR 0.71; 95% CI 0.49-1.05, p=0.08) patient-survival between the two groups. Furthermore, recipients from obese and non-obese donors had a comparable risk of graft failure requiring re-transplantation (OR 0.92; 95% CI 0.33-2.60, p=0.88) or acute graft rejection (OR 0.70; 95% CI 0.45-1.11, p=0.13).

Discussion: Meta-analysis of the best available evidence (level 2a) demonstrates that donor obesity does not seem to have a negative impact on graft or patient outcomes. Future research is needed to evaluate the impact of donors sub-grouped to various higher BMI on graft and patient-related outcomes.

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

MP032: Exploring the feasibility of multi-visceral organ retrieval for ex vivo machine perfusion in a large animal model

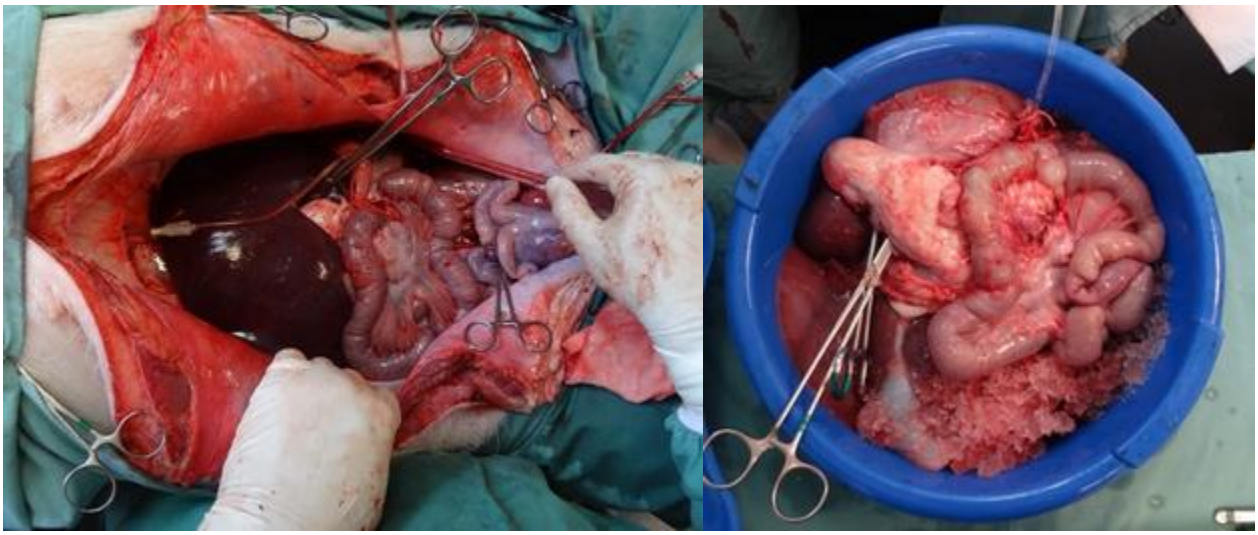
Mr Jake Bastian[1], Dr Dylan Barnett[1], Mr Rohan Bhattacharjya[1], Mr David Daniel[1], Mr Akshay Kanhere[1], A/Prof Andrew Ruszkiewicz[2], A/Prof Shantanu Bhattacharjya[1]

[1]University of Adelaide, Adelaide, Australia. [2]University of South Australia, Adelaide, Australia

Introduction: Multi-visceral transplantation can be lifesaving in the setting of slow growing mesenteric root tumours, complete porto-mesenteric thrombosis or multi-system organ failure. In organ preservation, ex vivo large animal models offer useful experimental data with clinical translation to human transplants. While models for ex vivo machine perfusion of individual organs are well established, there are currently limited models for investigating preservation of multi-visceral abdominal blocks. En bloc preservation allows for the study of composite organ function and assessment of viability.

Methods: Twelve Yorkshire pigs were procured and randomly assigned to one of three preservation groups: static cold storage, normothermic machine perfusion with blood and isothermic machine perfusion with an acellular perfusate (n = 4 for all groups). Following induction of anaesthesia, midline laparotomy gained access to the animals' abdomen. Multi-visceral blocks composed of the liver, both kidneys, pancreas and proximal 100 centimetres of small bowel were surgically retrieved, with complete thoraco-abdominal mobilisation of the aorta and vena cava. Four units of autologous blood was collected from the supra-hepatic vena cava, prior to cross clamping of the aorta.

Results: Successful short term preservation was achieved, with en bloc organ function outcomes comparable in respective techniques. Measures of composite organ function, including assessment of the entero-insular axis via luminal glucose stimulation, acid-base analysis and arterial blood gas data found no statistical differences between groups. The surgical en bloc retrieval method was both feasible and replicable.



Discussion: This study provides proof of concept that multi-visceral blocks can be preserved for five hours by ex vivomachine perfusion under different conditions. The benefit in this experimental model is the ability to bench test for viability through assessment of liver, kidney, pancreas and small bowel function in real time. There is also the ethical benefit relating to reduction in the number of large animals required to investigate organ preservation.

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

MP033: Can therapeutic agents prevent primary graft dysfunction after lung transplantation?

Miss Andréa Poupard

University of Birmingham, Birmingham, United Kingdom

Introduction: The primary complication faced by patients post lung transplantation (LTx) is Primary Graft Dysfunction (PGD). PGD greatly impacts short and long-term survival and carries a 42% mortality rate. Preventing and treating PGD is paramount to the development of LTx. Drug therapeutics offers many advantages, such as their low-invasiveness, safe and simple use, potential systematization compared to recommended ECMO. A literature review was performed to identify RCTs evaluating efficacy of drugs in the prevention and treatment of PGD.

Method: Pubmed and Cochrane Library were searched for RCTs testing the efficacy of drugs in PGD prevention or treatment measured by chest X-ray imaging and/or PaO2/FiO2 ratio in an adult population who received a LTx. Primary outcome was PGD outcome and resolution.

Results: Out of 1324 papers post-deduplication, 16 papers were included, regrouping 757 patients. iNO use did not exhibit statistically significant results in 5 papers ($P>0.05$). Similar negative results were obtained with complement inhibition, platelet-activating factor antagonists, aprotinin, inhaled AP301, a-1-antitrypsin, azithromycin and adenosine A2A. receptor antagonist. Surfactants use showed significant better oxygenation and PGD grade lowering but remain very expensive.

Discussion: The multi-dimensional origin of PGD, involving the innate and adaptive immune systems, multiplies the potential therapeutic targets theoretically, but translation to clinically effective therapies has been limited. Most trials failed to attain statistical significance. Main limitations of the studies are differences in PGD measurement, single-center set-up, small sample size and unblinding.

Conclusion: Despite eliciting promising effects in animal models, none of the molecules used in trials reached statistically significant results, except surfactants in one trial. Larger trials are warranted to gather more reliable evidence.

Category: Clinical - heart and lung (heart and lung transplant - surgery - recipient clinical care and management)

MP034: Time to death and graft outcome in DCD simultaneous pancreas-kidney transplantation

Mr Abdullah Malik[1,2], Mr Samuel Tingle[2], Dr Nicholas Chung[2], Dr Ruth Owen[3], Mr Balaji Mahendran[2], Miss Claire Counter[4], Mr Sanjay Sinha[5], Mr Anand Muthasamy[6], Mr Andrew Sutherland[7], Mr John Casey[7], Mr Martin Drage[8], Mr David van Dellen[3], Mr Chris Callaghan[4,8], Mr Doruk Elker[9], Professor Derek Manas[1,2,4], Professor Gavin Pettigrew[10,11], Professor Colin Wilson[1,2], Professor Steven White[1,2,4]

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Background: Time to arrest following withdrawal of life-supporting treatment in potential donors after circulatory death is unpredictable and can vary. This leads to variable periods of warm ischaemic damage prior to pancreas transplantation. Currently there is little evidence supporting procurement team stand-down times based on donor time to death (TTD). We examined what impact TTD had on pancreas transplant outcomes following DCD SPK transplantation.

Methods: Data were extracted from the UK transplant registry from 2014 to 2022. TTD was defined as withdrawal of life-sustaining treatment to donor asystole; asystolic time was the time from asystole to aortic perfusion. Predictors of graft loss were evaluated by a Cox proportional hazards model. Adjusted restricted cubic spline (RCS) models were generated to further delineate the relationship between TTD and outcome. Statistical significance was set at $P<0.05$.

Results: 375 DCD simultaneous kidney-pancreas transplant recipients were included. Median TTD was 13-minutes (IQR 10 to 16-minutes), median asystolic time was 13-minutes (IQR 11 to 15-minutes). Increasing TTD was not associated with poorer graft survival (aHR 0.98, 95% CI 0.68-1.41, P=0.901). Increasing asystolic time was significantly associated with worse graft survival in the TTD model (aHR 2.51, 95%CI 1.16-5.43, P=0.020). RCS modelling confirmed there was no relationship between TTD and graft survival (figure 1), however a non-linear relationship was demonstrated between asystolic time and graft survival (figure 2).

Conclusion: We found no evidence that TTD impacts on pancreas graft survival after DCD SPK transplantation, however increasing asystolic time was a significant predictor of graft loss. Procurement teams should attempt to minimise asystolic time in order to optimize pancreas graft survival rather than focus on the duration of TTD.

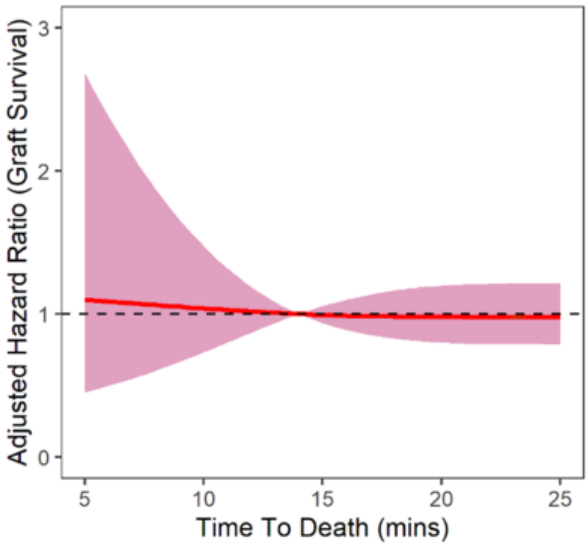

Figure 1 - RCS modelling adjusted hazard ratio of graft survival as a function of time to death

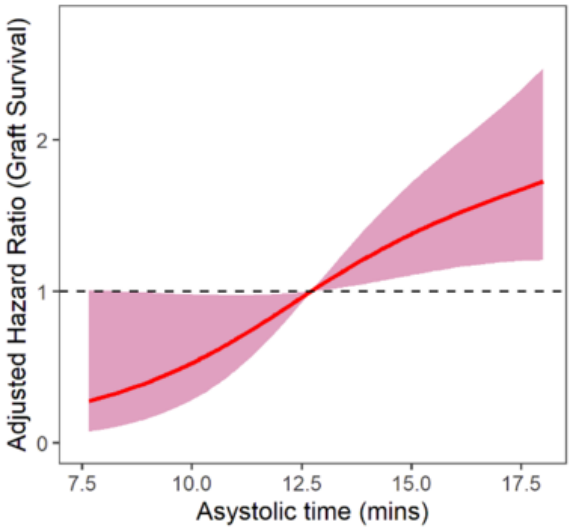

Figure 2 - RCS of adjusted hazard ratio of graft survival as a function of asystolic time

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

MP035: The variation in practice of the Living Donor Kidney Transplant Pathway in the UK

Dr Katie Nightingale[1], Mr Tim Brown[2], Mr Nicholas Inston[3], Mr Ahmed Hamsho[3], Dr Rommel Ravanan[4], Professor Michael Nicholson[5], Professor Argiris Asderakis[6], Dr Sarah Browne[6], Mr James Hunter[7], Professor Lorna Marson[8], Miss Katie Connor[8], Dr Mortimer Kelleher[8], Mr Andrew Sutherland[8], Mr William Norton[9], Ms Hannah Maple[10], Mr Francis Calder[10], Mr Adam Barlow[11], Ms Imeshi Wijetunga[11], Ms Rachel Youngs[11], Dr Victoria Boardman[11], Dr Matthew Welberry Smith[11], Mr Atul Bagul[12], Mr Hemant Sharma[13], Mr Sanjay Mehra[13], Mr Zia Moinuddin[1], Mr Tunde Campbell[1], Mr David Van Dellen[1], Mr Alistair Rogers[14], Mr Kamran Haq[15], Mr James Yates[15], Mr Sanjay Sinha[16], Mr Shahzar Malik[17], Dr Imran Saif[17], Mr Paul Gibbs[18], Miss Kashuf Khan[18], Mr Rafique Harvitkar[18], Mr Badri Shrestha[19], Mr Abbas Ghazanfar[20], Mr Abul Siddiky[20], Professor Reza Motallebzadeh[21], Mr Michael Moneke[21], Mr Rajesh Sivaprakasam[22], Dr Josh Stephenson[22], Ms Lisa Burnapp[23], Dr Kailash Bhatia[1], Professor Titus Augustine[1]

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Introduction: Living donor transplantation forms 28% of kidney transplant activity in the UK and is undertaken by 23 transplant centres. Annual NHSBT living donor transplant reports showcase excellent outcomes with no statistical differences in outcomes between centres. The UK transplantation strategy for 2030, recognises that although there has been significant progress, increase in numbers of living donation and transplantion are required to meet demand.

This UK audit aims to explore the living donor pathway and understand variation in practice. Identifying areas for streamlining the pathway could potentially increase living donor transplant numbers.

Methods: A multidisciplinary collaborative approach was employed to design a 47-question online form. It addressed the entire LDN pathway, from pre-operative assessments through peri-operative interventions to post-operative care. The survey was disseminated across all 23 transplant centres. Responses were received from 22 centres (95%) and collated.

Results: Variation was seen in the workup period ranging from 6 to 36 weeks (mean 12). There was variation in the donor acceptance criteria including BMI (17-35) and accepted age ranges (18-86 years). Other areas of variation included MDT discussion, decision on laterality, pain management, ERAS usage and catheter time. 12 centres offered laparoscopic hand-assisted, 8 totally laparoscopic, 2 hand-assisted retroperitoneal, and 2 totally retroperitoneal approaches. In the majority of centres, donor nephrectomy and implantation was carried out sequentially, whereas in 6 centres, the procedure was done in parallel. There was some variation in methods of donor follow-up.

Discussion: This comprehensive analysis demonstrates variation in the living donor pathway and provides a reference of current practice. Aspects could be adopted by centres and included in future UK guidelines to enhance the overall quality of care further.
While most of these areas constitute small changes, if the principle of aggregation of marginal gains is applied, it could significantly improve donor experience and increase numbers of LD transplants.

Category: Living donation (living donor and recipient selection (all organs) options for donation - donor care - outcomes)

MP036: Hypomagnesaemia in kidney transplant recipients prescribed tacrolimus & proton pump inhibitors

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Introduction: The UK Kidney Association (UKKA) conducted a review after the tragic death of a Kidney Transplant Recipient (KTR) which was linked to hypomagnesemia and hypocalcaemia due to combined use of calcineurin inhibitors (CNIs) and proton pump inhibitors (PPIs). While their findings did not warrant widespread practice changes, they recommended regular electrolyte monitoring and consideration of changing from PPI to a H2-receptor antagonist (Famotidine or Ranitidine) and/or magnesium supplementation. This study aims to evaluate current patient management in context of this UKKA guidance.

Methods: 305 KTR were identified with 257 included for analysis. Exclusions were applied to those not prescribed tacrolimus, PPI or H2-receptor antagonist, died during the study period, or were transplanted later than the study period. We assessed serum magnesium levels and reviewed medications from August 2022-August 2023.

Results: 252 patients were taking a PPI (98%), 2 were taking Famotidine (0.8%), 2 were taking Ranitidine (0.8%) and 1 was taking both PPI and Famotidine (0.4%). 193 of patients taking PPI (76%) had at least one episode of hypomagnesaemia (as defined by serum Mg level <0.7mmol/L). The mean serum Mg in this group was 0.69mmol/L (0.44-1.18mmol/L). During the observation period, only five patients transitioned from PPI to Famotidine. This shift resulted in a small increase of 0.01mmol/L in the mean serum magnesium for these patients. 5 patients (1.9%) were admitted for IV magnesium replacement and a further 14 (5.4%) received oral magnesium supplementation.

Discussion: In our local KTR population, hypomagnesemia is prevalent in those receiving both CNI and PPI. Despite a high incidence of hypomagnesaemia (76%), few (6.3%) received treatment, and even fewer (1.9%) changed from PPI to Famotidine. The observed increase in serum magnesium levels in those who switched suggests a potential trend worth exploring with a larger sample size.

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

MP037: Outcomes in sensitised patients undergoing kidney transplantation with non-depleting antibody induction therapy

Dr Ria Nagpal[1], Ms Abby Hobill[1], Dr Alice Gage[1], Dr Maryam Javed[1], Dr Felix Karst[1], Dr Azhar Ali Khan[1], Dr Amy Needleman[1], Dr Graham Shirling[2], Dr Ray Fernando[2], Dr Rhys Evans[3]

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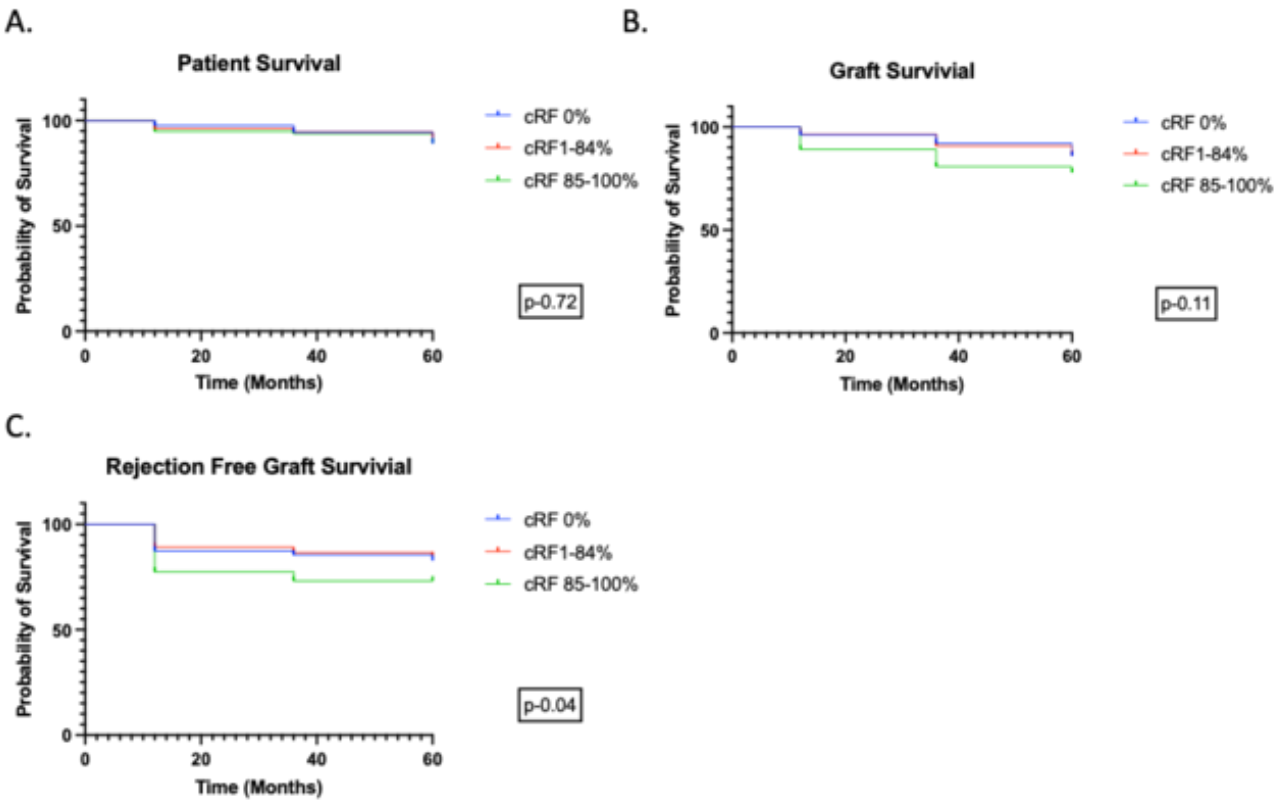
Introduction: Lymphocyte depleting antibody induction therapy is recommended for kidney transplant recipients (KTRs) at high immunological risk, which includes sensitised patients with detectable anti-HLA antibodies prior to transplantation. Data to support improved long-term outcomes with this approach are sparse. We investigated outcomes in sensitised KTRs undergoing transplantation with non-depleting induction.

Methods: Adult patients who underwent kidney alone transplantation with basiliximab induction at a single centre between 2012-2023 were included. We determined rejection rates, patient, and allograft survival at 1-, 3- and 5-years post-transplant. We compared patients who were unsensitised (cRF 0%), sensitised (cRF 1-84%), and highly sensitised (cRF 85-100%) at the time of transplantation.

Results: 1348 KTRs were included; of these 859 (63.7%) were unsensitised, 344 (25.5%) were sensitised, and 145 (10.8%) were highly sensitised. Highly sensitised patients were more commonly female, of black ethnicity, a higher proportion had undergone transplant previously, and fewer had a living donor transplant. Patient and allograft survival were not different between sensitisation groups (**Figure a-b**). Rejection in the first year occurred in 17 (15.2%) highly sensitised patients, 22 (8.0%) sensitised patients, and 55 (8.5%) unsensitised patients (p=0.07). BK and CMV viremia rates were not different between groups. Rejection free allograft survival over 5 years was worse in the highly sensitised group (**Figure c**). In multivariable analyses, highly sensitised patients had an increased risk of rejection (HR 1.73, 95% CI 1.02-2.83) but this was not the case for sensitised patients nor did any degree of sensitisation impact patient or allograft survival over 5 years.

Discussion: Sensitisation at the time of transplant did not impact patient or allograft survival in KTRs undergoing induction with basiliximab. This supports the use of non-depleting antibody induction in sensitised KTRs.
Figure: Patient survival (**a**), allograft survival censored for patient death (**b**), and rejection free allograft survival (**c**) in unsensitised, sensitised, and highly sensitised KTRs.



Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

MP038: Risk factors and outcomes for developing recurrent IgA nephropathy after kidney transplantation – single centre cohort study

Dr. Vivienne Ralph, Dr. Lydia Isted, Dr. Sapna Shah

King's College Hospital, London, United Kingdom

Introduction: Up to 60% of kidney transplant patients with IgA nephropathy (IgAN) develop recurrent IgAN (rIgAN) after kidney transplantation and 32% of these patients lose their transplant within 8 years. To understand potential risk factors for developing rIgAN we conducted a descriptive analysis of our kidney transplant recipients with end stage kidney disease (ESKD) due to IgAN.

Methods: A retrospective single centre cohort study in a tertiary renal centre of patients receiving a kidney transplant between 1994 and 2023 was undertaken. Demographic and clinical variables were analysed. Continuous variables were compared by independent-samples t tests, and categorical variables were compared using Chi squared tests. Patient and transplant survival rates were analysed using Kaplan Meier methods. A P-value <0.05 was considered statistically significant.

Results: Our cohort included 90 patients who received a kidney transplant between 1994-2023. There were a total of 97 renal transplants as 7 patients had 2 kidney transplants. 26% of this cohort developed rIgAN during the mean follow-up period of 9.5 years. Median time to diagnosis was 5.3 years after transplantation and 27% presented with nephrotic range proteinuria (urine protein-creatinine ratio > 300 mg/mmol). Patients who received a living donor kidney transplant, a transplant with fewer HLA mismatches, ciclosporin and prednisolone as part of their immunosuppression regimen and a transplant after starting dialysis were significantly more likely to develop rIgAN (Table 1). Patients with rIgAN had significantly increased risk of graft failure and reduced patient survival at 10 years (Table 1, Figure 1).

Conclusion: Our data highlights potential risk factors for developing rIgAN and that rIgAN leads to inferior patient and graft survival. However small cohort studies are subject to bias. We therefore plan to examine the effect of these risk factors in a UK based cohort of patients with IgAN. Further analysis of histological data is ongoing at the moment.

Table 1 Clinical and demographic KTR variables with IgAN as the cause of ESKD

	No rIgA nephropathy n=72	rIgA nephropathy n=25	P value
Age at time of transplantation/ median/years (range)	44 (22-71)	33 (17-65)	0.27
Sex % Male	68	77	0.25
Ethnicity % White % Black % Asian % Other	54 8 13 25	68 0 24 8	0.86
Type of Transplant %Living %Deceased	38 62	76 24	<0.01
HLA MM % 000 % 110,100,010 % Other % Unknown	4 15 73 8	13 3 57 27	<0.01
% Pre-emptive transplant	18	0	<0.01
Immunosuppression % Tacrolimus % Ciclosporin % Prednisolone	78 5 70	52 43 100	<0.01 <0.01
% Acute rejection in first years after transplantation	25	39	0.52
%Transplant failure at 10 years Yes No	 8 92	 26 74	<0.01
%Patient death at 10 years Yes No	 9 91	 5 95	0.04

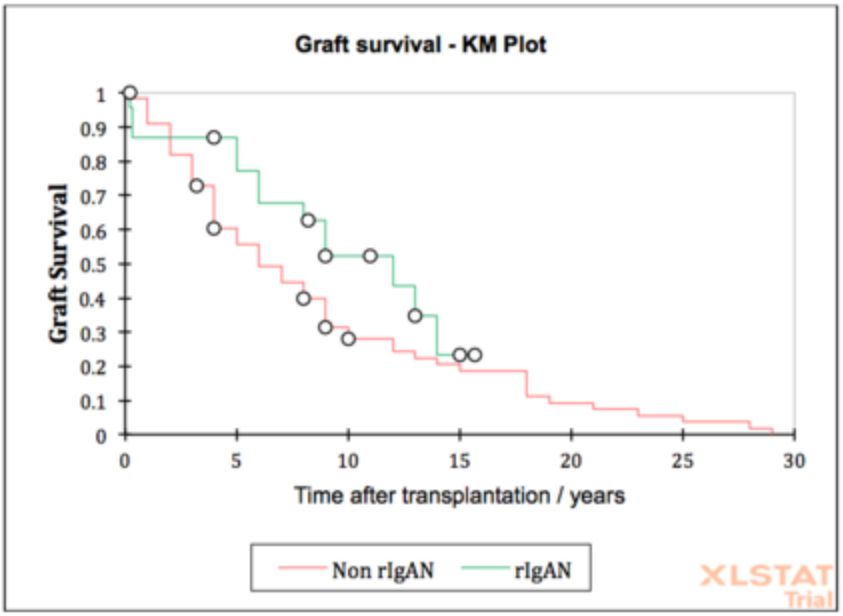


Figure 1: Transplant Survival Kaplan Meier Plot

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

MP039: Outcomes of kidney transplant recipients classified as high risk

Mr Harry Spiers[1,2,3], Miss Bhumi Shah[2], Mr Reece Patel[2], Miss Juliet Thornton[2], Mr Thomas Quarrell[1], Mr Alex Ribbits[1], Mr Tushar Hari[1], Mr Dominic Summers[1,2,3]

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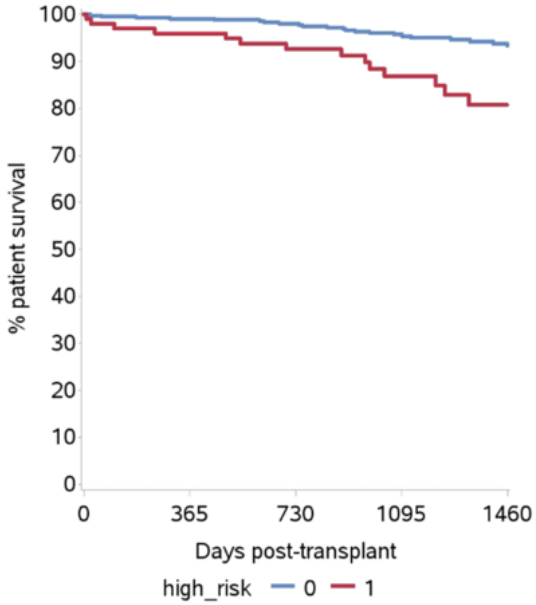
Introduction: Kidney transplantation (KT) is increasingly offered to older more comorbid patients: 'high risk recipients' (HRR). The UK allocation scheme preferentially allocates kidneys from expanded criteria donors to these patients, with associated increased risk of graft failure and poor graft function. This study established outcomes of HRRs and their predictors in a contemporary dataset to quantify potential risks and benefits of KT for this cohort.

Methods: This single-centre cohort study of patients receiving deceased donor KT between 01/10/2014-31/12/2019, captured data about previous co-morbidity, biochemical and haematological markers of frailty for use in multivariate models of graft and patient outcome.

Results: 645 patients were included of which 111 were HRR. HRR were older (60 yrs vs 51.5 yrs ,p<0.001), predominantly male (69.4%vs61.6%,p=0.12) with a higher incidence of diabetes (32.4%vs6.3%,p<0.001), ischaemic heart disease (27.9%vs3.9%,p=0.0001) and peripheral vascular disease (8.1%vs0.5%,p<0.001). There were no significant differences in donor demographics, cold ischaemia time, or brain/circulatory death donors. HRR had higher rate of abnormal red-cell distribution width (RDW) pre-operatively (57.7%vs39.7% ,p=0.0005). Post-operative complication rate did not differ between groups, however, HRR had higher incidence of post-operative myocardial infarction or stroke (6.4% vs 1.5%,p=0.002). EGFR at 3 (47.5 vs 49,p=0.36) and 12 months (46vs51,p=0.13) was no different between groups. Death-censored graft survival was no different at 1 year (94.5% vs 95.2%) and 3 years (93.2% vs 88.8%; p=0.16). However, HRR patient survival was significantly lower at 1 (95.9% vs 99.6%) and 3 years (86.8% vs 95.7%;p=0.007;figure 1). Cox proportional hazards survival analysis showed recipient age (1.74, 95% CI 1.4-2.3,p=0.0001), RDW (1.8, 95% CI 1.06-3.07,p=0.03) and previous stroke (6.7, 95% CI 1.6-29.9,p=0.01) to be independent predictors of survival post-transplant.

Conclusion: HRR are older and more co-morbid than standard risk recipients. Whilst there is no difference in eGFR or graft survival in this cohort, they suffer a survival disadvantage post-transplant.



Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

MP040: Improving access to transplantation: The effect of a Dedicated New Starter Haemodialysis Clinic

Dr Joseph Cairns[1], Dr Kostas Koutroutsos[2], Dr Clare Castledine[2]

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Introduction: In the UK, it is recommended that all patients with stage 5 chronic kidney disease are assessed and placed on a waiting list for kidney transplantation within six months of their anticipated dialysis start date. However, a significant number of patients start haemodialysis without having been assessed regarding their suitability for kidney transplantation.

Methods: We evaluated a Dedicated New Starter Haemodialysis Clinic with input from patients and the renal MDT. The Clinic was designed so that it would be focused on symptom burden, modality choice, social history, co-morbidities, and suitability for transplantation.

Results: Between November 2022 and September 2023, 97 patients were reviewed in the New Starter clinic. Local audit of new starters on dialysis between October 2021 and March 2022 showed a median time to first clinic of 51 days (IQR 30-69), increasing to 55 days for patients with unplanned starts. In those with no transplant status on starting dialysis, it was a median of 127 days before a status was set. 30% of patients had an unplanned start.
Following introduction of the New Starter clinic the time to clinic was reduced from a median of 51 days to 18 days. 17 patients had no transplant status on starting dialysis. Time to first transplant status was a median of 21 days in the New Starter clinic, compared to 127 days in the baseline audit. We made 11 new referrals for transplant work-up, and 6 “re-referrals”.

Discussion: Reviewing transplant prospect soon after starting haemodialysis leads to quicker referrals for transplant workup for patients previously unknown to specialist nephrology services and gives an opportunity to inject momentum into transplant work-up for medically complex patients. A Dedicated New Starter Haemodialysis Clinic can help improve access to transplantation for Dialysis patients, especially those with an unplanned start.

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

MP041: Post-operative wound complications and morbidity in renal transplants - comparing obesity and high risk patient group outcomes

Dr Tushar Hari[1,2], Mr Harry Spiers[2], Mr Dominic Summers[2], Mr Bhumi Shah[3], Mr Reece Patel[3], Mr Thomas Quarrell[3], Mr Alex Ribbits[3]

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Introduction: Obesity is increasing in prevalence in end-stage renal disease patients and has been linked to higher post-operative infection risk. In addition, the past decade has seen a growing number of 'high-risk' kidney transplant recipients, older and/or with co-morbidities. We hypothesise that obese, high-risk patients may be harmed by proceeding with transplantation, and should be counselled and selected appropriately.

Methods: This single centre, retrospective cohort study identified 741 kidney-alone transplants between 2015-19. Obesity for this study was defined as BMI>30. ‘High-risk’ recipients are defined pre-operatively by assessing clinicians and asked to sign a ‘high-risk’ consent form. Outcomes assessed were post-operative wound complications, length of stay, graft and patients survival and function.

Results: Out of the 741 patients we included, 203 (27.3%) were obese and 118 (15.9%) were deemed ‘high-risk’. Obese and non-obese patients were similar in age, sex, and high-risk demographics. However, the prevalence of diabetes pre-operatively was almost twice as common in obese recipients compared to non-obese patients (14.5%, 8.18%, p=0.013). Wound complications were much more common in the obese compared to the non-obese, including superficial dehiscence (11.33%, 2.59%, p<0.0001), deep dehiscence (3.94%, 1.11%, p=0.028) and incisional hernias (5.91%, 2.59%, p=0.041). Endovac devices were used more in obese patients as well to manage dehiscence (8.37%, 2.04%, p=0.0003).

High risk patients were more likely to die within the first year post-transplant, but there was no evidence that high risk, obese patients were particularly affected (BMI<30/standard risk vs BMI>30/standard risk vs BMI<30/high risk vs BMI>30/high risk). 1 year patient survival was 98.8% vs 99.2% vs 93.9% vs 100% p<0.0001 respectively.

Discussion: Patients with obesity are at higher risk of significant wound problems, compared to patients with a BMI<30. However, there is no evidence that high-risk obese patients have particularly poor outcomes and should not be denied access to transplantation on the grounds of obesity.

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

MP043: Assessing quality of life in solid organ transplant recipients: A systematic review of the development, content, and quality of available condition- and transplant-specific patient-reported outcome measures

Mr Ben Rimmer[1], Dr Rebeka Jenkins[1,2], Dr Siân Russell[1], Professor Dawn Craig[1], Professor Linda Sharp[1], Professor Catherine Exley[1]

[1]Newcastle University, Newcastle upon Tyne, United Kingdom. [2]NHS Blood and Transplant, Bristol, United Kingdom

Introduction: We aimed to identify the condition- and transplant-specific patient-reported outcome measures (PROMs) available to measure quality-of-life (QoL) in solid organ transplant recipients, examine their development and content, and critically appraise the quality of their measurement properties, to inform recommendations for clinical and research use.

Methods: We systematically searched MEDLINE, Embase, CINAHL, PsycINFO, Cochrane CENTRAL, and Scopus from inception to 27th January 2023. Search hits were screened for eligibility by two independent reviewers; papers reporting the development and/or validation of condition- and transplant-specific PROMs measuring QoL in adult solid organ transplant recipients were considered eligible. We abstracted and synthesised data on PROM characteristics, development (item generation/reduction), and content (QoL dimensions). Quality appraisal and synthesis were informed by the Consensus-based Standards for the Selection of Health Measurement Instruments (COSMIN) guidelines, and included methodological and quality assessment of measurement properties, GRADE levels of evidence, feasibility and interpretability.

Results: We identified 33 papers reporting 26 QoL PROMs validated in solid organ transplant recipients (kidney n=10 PROMs; liver n=6; lung n=3; heart n=2; pancreas n=1; multiple organs n=4). Patient discussions (n=17 PROMs) and factor analysis (n=11) were the most common item generation and reduction techniques used, respectively. All PROMs measured ≥3 of nine QoL dimensions (all measured emotional functioning). Methodological quality was variable; no PROM had at least low evidence for all measurement properties. All PROMs were COSMIN recommendation category ‘B’, primarily because none had sufficient content validity.

Discussion: There are many condition- and transplant-specific QoL PROMs validated in solid organ transplant recipients, particularly kidney. These findings can help inform PROM selection for clinicians and researchers. However, caution is required when adopting, due to the substantial heterogeneity in PROM development, content, and quality. Each PROM has potential but requires further research to be recommendable; greater consideration of patient and professional involvement in PROM development is required.

Category: Psycho-social aspects (recipient - donor - family care- MDT (exclude clinical management)

MP044: '*A greener gift of life*' - assessing the environmental impact of patient travel to a liver transplant clinic. Can we make the liver transplant outpatient service more sustainable?

Dr Mhairi Donnelly, Ms Kelsey Pearson, Ms Lisa Norman, Ms Katie Connor, Dr Zareena Khan-Orakzai, Mr Ben Stutchfield

Royal Infirmary of Edinburgh, Edinburgh, United Kingdom

Introduction: The Scottish Liver Transplant Unit (SLTU) is the single referral centre in Scotland for liver transplantation. Patients travel long distances to attend the transplant clinic. Our specialty is increasingly aware of the need to reduce our carbon footprint. This study aimed to assess the carbon footprint of patient travel to the SLTU clinic (a suspected carbon hotspot), and the potential carbon savings offered by virtual consultations and outreach services.

Methods: A one year period was studied, 09/06/2022-08/06/2023. A travel questionnaire was distributed to patients attending one in-person SLTU clinic to provide an accurate snapshot of travel-related emissions. A carbon footprint calculator for (avoided) patient travel produced by the Centre for Sustainable Healthcare was used for virtual and outreach consultations.

Results:

- The carbon footprint of patient travel to one SLTU clinic (calculated using questionnaire data) was 753kg CO_2e. Extrapolated to 102 clinics per year, patient-related travel created 76,806kg CO_2e (equivalent to 22 economy class return flights from London to Hong Kong).
- 218 virtual consultations were delivered via SLTU over this year, saving 7080kg CO_2e and 29,762 miles travelled.
- Patients seen in outreach clinics do not travel to SLTU; outreach appointments resulted in 164,761 avoided miles, and 43,965kg CO_2e saved compared with travel to SLTU. These patients still travelled to their outreach centre however, so overall the total saving was 130,670 avoided miles and 34,634kg CO_2e.
- Patients seen in outreach clinics are well and may be suitable for virtual consultations. If all outreach appointments were delivered virtually, instead of patients attending their local centre, this would avoid 34,091 patient miles travelled and save 9331kg CO_2e.

Discussion: Delivery of an in-person clinic in the transplanting centre is associated with a significant carbon footprint through patient travel. Patient travel is a carbon hotspot, which could be addressed by using novel technology to deliver more virtual appointments.

Category: Clinical - liver and intestinal (liver - small bowel - surgery - transplant hepatology - recipient clinical care and management)

MP045: A qualitative exploratory study: Demand and resource factors experienced by NHS National Organ Retrieval Service staff

Ms Fiona Cox[1], Mr Hugh Richards[1], Dr Amanda Martindale[1], Mr Ian Currie[1,2]

[1]The University of Edinburgh, Edinburgh, United Kingdom. [2]NHS Lothian, Edinburgh, United Kingdom

Introduction: The objective of this study was to identify organisational, practical, socio-emotional, and psychological factors associated with load in NORS perioperative staff. Understanding factors can inform actions to alleviate demands and capitalize on resources to support NORS practitioners, reduce attrition and promote well-being.

Methods: This is a sequential design using two qualitative methods; survey and interviews.
Survey data were collected via anonymous electronic survey (NORS Workforce Survey, 2021), emailed to staff. Participants were asked to identify the top 3 most challenging and top 3 most enjoyable aspects of being part of NORS.

Interview data were collected through semi-structured interviews with NORS perioperative staff with integration occurring during the presentation of results. Both sets of data were analysed using inductive manifest content analysis, in which descriptive Category are created to represent staff experiences.

Results:
Table 1: Respondents.

	n=	*Sampling*	*Staff represented*
Survey	89	Anonymous survey link emailed	Abdominal and cardiothoracic retrieval practitioners; 13 UK hospitals; NHS bands 3-7
Interview	15	Purposive sampling	Abdominal retrieval theatre practitioners; four UK hospitals; NHS bands 5-8; mean 8.75 years NORS service

Survey data generated 5 challenge and 4 enjoyable Category. Headline challenges were categorised as practical difficulties; poor organisation and communication; and people. Variety of people and place; pride; and teamwork were categorised as the most enjoyable aspects of the role.

Interview data generated 6 demand Category and 7 resource Category. Headline demands were communication and conflict; uncertainty; and staffing. Effective communication and leadership; variety; and good teamwork, relationships and rapport were among Category providing resource.

Discussion: This study advances understanding of the psychological impact of the organ retrieval process. Practical recommendations are made to improve staff experience, as are suggestions to enhance the work engagement and mental wellbeing of practitioners. This provides an evidential basis for organisational change and a platform from which to simultaneously address demands and capitalise on enjoyable or protective aspects of the role. There is potential for these results to enhance performance, aid retention, and change policy and practice.

Category: Psycho-social aspects (recipient - donor - family care- MDT (exclude clinical management)

MP046: Organ donor registration behaviour: Moving from opt in to opt out in England and impact on decision making in the Black African and Caribbean population

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NHS Blood and Transplant, Bournemouth, United Kingdom

Introduction: In 2017, England announced a public consultation to move from an 'opt in' organ donation registration system to 'soft opt out'. This became law in March 2020. Following this announcement there was a change in donor behaviour (an increase in opt ins and opt outs), particularly within the Asian and Black English population. The aim of this study is to identify the drivers of behaviour related to organ donation registration within the Black African and Black Caribbean population during a period of significant legislative change.
Methods: 12 Black African and Black Caribbean individuals who had registered a decision on donor register post announcement of the legislative change were recruited via purposeful and snowball sampling. 1-2-1 semi structured interviews were conducted, transcribed and analysed using Thematic Analysis.

Results: Five main themes that contribute to behaviour and decision making were identified: (1) Autonomy, (2) Altruism, (3) Religion and Beliefs, (4) Trust/Distrust and (5) Knowledge. These were interpreted using well-known behavioural theories (Theory of Reasoned Action, Planned Behaviour and Terror Management Theory). Control is highlighted as an important concept underpinning all the themes. The findings of this study offer a unique view from a historically unrepresented group in health care and social research as well as reinforcing limited existing literature on behaviours and decision making related to health within a Black population.

Discussion: The findings help understand the rationale behind decision making processes within a Black community and the role they play in organ donation registration behaviour. When supported by established behavioural theories they may be used to inform future healthcare polices, campaigns and training. Improving communication and engagement methods may lead to more Black organ donor registrations and donors which in turn, through matching of donors to patients waiting for a transplant, could lead to a reduction in transplant waiting time for Black patients.

Category: Psycho-social aspects (recipient - donor - family care- MDT (exclude clinical management)

MP047: Weighing the impact of The British Transplantation Society (BTS) against global peers

Dr Chameera Bandara[1], Dr Kunal Kapoor[2], Dr Alex Millward[1], Mr Bahvesh Devkaran[1], Mr Hemant Sharma[1,3]

[1]Royal Liverpool University Hospital, Liverpool, United Kingdom. [2]University of North Carolina, Chapel Hill, USA. [3]University of Western Ontario, London, Canada

Background: The BTS serves a key leadership role in setting standards, education, and policy advocacy for organ transplantation in the UK. However, its capacity is small relative to multinational peer societies. This abstract summarises findings from a comparative analysis.

Methods: Publicly available organisational metrics and activities for the BTS were benchmarked against two larger peer societies: the American Society of Transplantation (AST) and The Transplantation Society (TTS). Dimensions compared included budgets, membership, events hosted, academic publishing, global-outreach, political-influence, workforce-training, and more.

Results: The analysis determined that BTS operates on a smaller budget compared to the multimillion-dollar budgets for AST and TTS. It has a few hundred members versus >7,000 for peer groups. While BTS coordinates UK consensus-statements, AST and TTS sponsor dozens of academic programmes annually, publish leading journals, and run global educational exchanges. With international membership spanning healthcare sectors, they also exhibit greater policy influence and industry engagement. There is a limited influence of BTS on the transplant surgeon/physician certification process.

Conclusion: The BTS performs indispensable functions in stewarding transplantation in the UK but is constrained by domestic scale, minimal influence on transplant training/certification, and resourcing limitations. Analytics on performance indicators, like registry outcomes, could enrich head-to-head comparisons. Global groups also face challenges balancing interests across regions.

Table 1: Comparative Analysis of BTS versus Peers:

Headquarters Location	BTS(UK)	USA(AST)	TTS(Canada)
Membership Size	Hundreds	~10,000	>7,500
Annual Budget	£100Ks	>$13 million	$11-15 million
Conferences Hosted Annually	1 major	1 major, several minor	1 major (>5K attendees)
Academic Journals Published	0	1 (AJT)	1 (TTS Journal)
Industry Sponsors Accepted	Very limited	Broad sponsorships/grants	Some corporate support
Global Outreach Programmes	0	dozen	dozen
Lobbying Influence	UK policy	US legislative input	WHO, Vatican and UN engagement
Owned Transplant Registry	No	No	No
Workforce Training Programmes	None	Hundreds annually	Partners >250 centres

Category: Education and promotion (education: patient - public - healthcare professional; promotion: public - donation).

MP048: *'No donation without conversation!'* NHS partnership with Gift of Living Donation charity offers community led peer support and galvanises living kidney donor conversations in a reproducible multi-site model

Dr Sumoyee Basu[1], Dr Kathryn Griffiths[2], Ms Dela Idowu[3], Ms Wendy Brown[4], Dr Anamika Adwaney[5], Dr Paul Martin[5], Ms Lisa Silas[1], Dr Sapna Shah[2], Ms Hannah Maple[1], Mr Frank Dor[5]

[1]Guy's and St Thomas' NHS Foundation Trust, London, United Kingdom. [2]Kings College Hospital, London, United Kingdom. [3]Gift of Living Donation Charity, London, United Kingdom. [4]London Kidney Network, London, United Kingdom. [5]Imperial College Healthcare NHS Trust, London, United Kingdom

Introduction: Despite pre-emptive living donation offering the best survival and quality of life for ESKD patients, there is an enormous disparity between rates in Black patients compared to other ethnicities. One strategy to help redress this is via tailored peer support. The GOLD charity offers phone buddy support from those with lived experience to Black patients and potential donors.

Methods: We developed a reproducible NHS and community partnership model at 3 London trusts consisting of embedded clinical staff, data team (QIP experienced trainees) and GOLD (~70 trained and DBS-cleared phone buddies). This QIP has been iteratively adapted to address barriers; e.g. defining the eligible population for referral, embedding AKCC referrals and adopting multimodal signposting methods to promote equity of access and self-sign up such as written materials, community events and bespoke patient approved SMS via *Accurx*.

Results: Evaluation focused on implementation metrics (Figure 1) and patient experience (Figure 2). Since February there have been 108 referrals and over 150 conversations about living kidney donation. 11 potential living donors have been identified and 6 have contacted their local team. A mixed methods service evaluation questionnaire has a current response rate of 18.5% (20/108). All patients would recommend GOLD to others, 17/20 felt their views on transplantation and their health had changed and 15/19 were now able to discuss this with their loved ones. Recurrent themes centred around feeling more informed, gaining confidence, support and shared community. Clinicians felt more confident citing an improved patient rapport and understanding of cultural nuances.

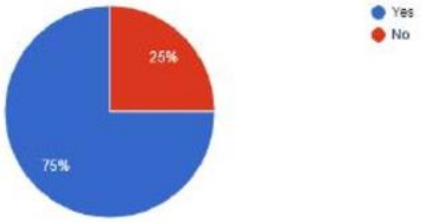
Discussion: Whilst many factors influence whether living donor transplantation goes ahead, our long-term aim is to increase these rates in the Black community, acknowledging shifts in behaviour and culture take time. Nevertheless, this is an effective working model of NHS-community partnership that patients hugely value and can be easily implemented at different sites or settings.

Figure 1: Table of measured implementation metrics

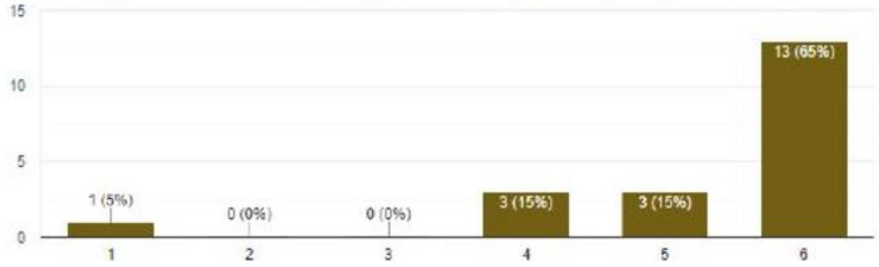
Total Referrals Referral by Centre	**108** • WLRTC 29 • GSTT 29 • KCH 40 • Self referrals 10
Patients uncontactable after 3 attempts	21
Patients speaking to GOLD	86
Further number matched with Phone Buddy	24
Total Estimated Conversations	**158** • 24 x 4 speaking to phone buddy • 62 initial conversation with GOLD but not matched
Identified living donor through GOLD conversation	11
Living Donor contacted living donor team	4 GSTT 2 WLRTC

Figure 2: Selected questions and quotes representing the patient perspective from mixed methods service evaluation questionnaire n=20 out of 108 referrals

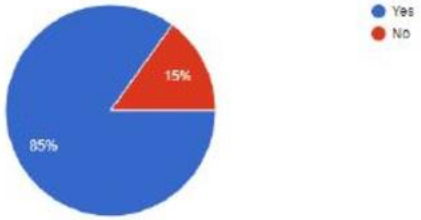
a) Since talking to GOLD have you managed to discuss living kidney donation with friends or family?



b) To what degree was the information you received specific to your personal culture?



b) Has your interaction with GOLD changed the way you discuss living donation or kidney transplantation with your friends/family/other potential donors?



d) Direct patient quotes

'I'm not embarrassed to share my illness with my friends and family. And can openly discuss my future which may involve a living donor.'

'I was coached in how not to make a direct approach to family and friends and how to go about having that conversation which I refused to have before'

'As a black person i dont like to talk about my health issues to others as it may be used to stigmatize me within my community. To ask someone to give me a kidney is a big ask and before GOLD I would not even be able to discuss this with my family'

Category: Education and promotion (education: patient - public - healthcare professional; promotion: public - donation).

MP049: “I am in favour of organ donation, but I feel you should opt-in” – qualitative analysis of the NHS staff #options 2020 survey

Miss Natalie Clark[1], Dr Dorothy Coe[2], Dr Natasha Newell[3], Mr Mark Jones[4], Dr Matthew Robb[4], Dr David Reaich[1], Professor Caroline Wroe[2]

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Introduction: In May 2020, England moved to an opt-out organ donation system, aiming to improve organ donation rates following brain or circulatory death. NHS staff support organ donation, however, alongside the public, they have raised concerns regarding the change. The #options survey, completed by NHS organisations, aimed to understand awareness of, support for and educational needs around this change. This paper thematically analysed the free-text responses from the survey.

Methods: The #options survey was registered as an NIHR portfolio trial [IRAS 275992] and completed between July-December 2020 by NHS organisations in the North-East and North Cumbria, and North Thames. The 16-question survey collected: demographic details, place of work, and if the respondent had contact with/worked in an area offering support to donors and recipients. Three of the questions filtered to a free-text response.

Results: The #options survey received 5789 responses with 1404 individuals leaving 1657 free-text responses for analysis. The family discussion question elicited the largest number of responses (66%), followed by those explaining why they were against the legislation (19%), and those requiring more information (15%). Analysis revealed six main themes with 22 sub-themes (Table 1).

Discussion: Overall, results indicated high levels of NHS staff support for the legislative change, interestingly the largest number against the change was found in those working in a transplanting centre. Analysis of the free-text responses found staff reasons against the change reflected similar reasons, misconceptions, and misunderstandings of the public. Additional concerns included the rationale for the change, informed decision making, easy access to information and information regarding organ donation processes. Educational materials and interventions need to be developed for NHS staff to address the concepts of autonomy and consent, organ donation processes, and support family conversations. Wider public awareness campaigns should continue to promote the positives and refute the negatives thus reducing misconceptions and misunderstandings.

Table 1: Themes and sub-themes per question

Question	Theme	Sub-theme	Example [ID]
I am against the legislation – Can you help us understand why you are against this legislation?	Loss of autonomy	Informed consent	I do not believe that consent can be said to have been obtained just because someone hasn't recorded their wish to opt-out. [R1908]
		Access	Personally I think it was easier when people carried organ donation cards and was a definite visual and personal choice. Not everyone has the access to the internet or is able to cope with technology in order to opt-out... [R958]
		Lack of awareness	I was unaware of these changes and I do not wish to donate my organs when I die. Not a lot of people will know about these changes and our choices will be taken away from us when we die. [R868]
		State ownership	I don't believe the State should have default rights over a person's organs upon their death. [R2055]
	Consequences	Mistakes	There may be people who forget to opt-out and their wishes then not carried out. [R2121]
		Loss of trust	Don't trust doctors in regards to organ donation. [R3010]
		Family distress	If the person did not decide to be an organ donor nor not to be, this will leave a huge burden on next of kin/family to make that decision. [R1652]
	Legislation	Evidence-base & rationale	Research shows that this measure doesn't significantly improve "donation" rates. [R2493]
		Organ choice	I feel you should have the right to pick what you want to donate. [R3956]
	Religion	Bodily integrity	I would like my body to be treated with dignity and not to have any organs removed. [R1839]
		Brain death	As a practicing Roman Catholic, it's wrong to take a person's life. Although a patient might be on life support with no hope of recovery, they are still alive at the point of organ retrieval. "Brain dead" is diagnosed even though the heart is still beating, therefore the patient is still alive. [R45]
		Against	Against my religion. [R5185]
I need more information to decide – What information would you like to help you decide?	Everything	Family influence	How relatives are informed and how they can opt-out of it on behalf of their loved ones. [R459]
		Process(es) of donation	What is the process for having organs taken following death? Who needs to be consulted and what's the procedure? [R200]
		Publicity	What has been communicated to the general public, and to our patients? As it seems totally lacking. People can't make an informed decision if they weren't informed. [R5377]
		Systems	Where are my details stored if I opt out and can mistakes be made in relation to my choices? [R1287]
		Evidence-base	Further understanding of the issue and the background to the change. [R2524]
I need more information to decide – What information would you like to help you decide?	Priority and relevance	Autonomy	I decided to be an organ donor as it is my decision and didn't feel the need to discuss it. [R482]
		Too difficult	It has just never come up in conversation and no-one likes to talk about death do they. [R3788]
		Agreement	The topic has not arisen but I am confident there would be no objections from my family. [R1898]
		No family	I'm a single parent and my children are too young to discuss this with. [R93]
		No decision	The topic hasn't come up in conversation and I am still undecided as to what I will do. [R1623]

Category: Ethics, law and public policy (legislation, changes to legislation)

MP050: Exploring the attitudes of solid organ transplant recipients towards Covid-19 shielding communications and the language of 'clinically extremely vulnerable': A qualitative study investigating lessons for the future

Miss Abbie Greig[1], Dr Kirsten L Rennie[1], Mr Jason Ali[2], Mr Dominic Summers[3,1]

[1]University of Cambridge, Cambridge, United Kingdom. [2]Royal Papworth NHS Foundation Trust, Cambridge, United Kingdom. [3]Cambridge University Hospitals NHS Foundation Trust, Cambridge, United Kingdom

Introduction: Solid organ transplant (SOT) recipients were among the first individuals in the UK identified as 'clinically extremely vulnerable' (CEV) to Covid-19 and asked to 'shield' at the beginning of the pandemic in March 2020. This qualitative study explores the attitudes of SOT recipients towards Covid-19 shielding communications and the language used.

Methods: Semi-structured interviews were conducted with forty-three adult heart, liver and kidney transplant recipients in England between January 2022 and May 2023. Open-ended questions enabled participants to fully explore their experiences of the pandemic and how they felt towards the shielding advice they received. Interviews were transcribed, anonymised, and thematically analysed and coded using NVivo 12.

Results: Communications about shielding evoked significant fear and anxiety amongst participants. These communications were perceived as implying that death was probable, or even inevitable, should one leave their home or fail to follow the official advice. Participants expressed widespread dislike for the term 'CEV', with the word 'vulnerable' being particularly difficult for participants to accept owing to its connotations of weakness and the reminder that participants were not as 'normal' as they typically felt. While shielding restrictions have come to an end, longer-term impacts were highlighted by participants who expressed ongoing anxiety, with many still choosing to shield and wear a mask if in public.

Discussion: This study suggests that governments and health authorities should carefully consider how they communicate with individuals with underlying health conditions in future public health emergencies. We have developed recommendations for how to improve shielding communications in the future, including replacing the phrase 'CEV' with that of 'higher risk', avoiding using those at higher risk as a national benchmark for risk of illness and death, and providing more balanced and engaged communication and advice that takes into consideration the importance of mental wellbeing.

Category: Psycho-social aspects (recipient - donor - family care- MDT (exclude clinical management)

BTS
British Transplantation Society

POSTER PRESENTATIONS

BTS Annual Congress 2024

5-8 March 2024 | HCC, Harrogate

P0001: A review of current HLA typing methodologies supporting kidney transplantation across the United Kingdom

Mr Isaac Kim[1], Mr Luke Foster[2], Mr Tom Nieto[3,1], Professor Andrew Beggs[1,3]

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Introduction: HLA typing is essential to support kidney transplantation, allowing for the assessment of HLA match as well as avoidance of donor specific antibodies (DSAs). Different HLA typing methodologies exist offering varying levels of resolution, cost pressures and turnaround times (TAT). High resolution typing provides the greatest level of data to allow for avoidance of DSAs and facilitate HLA compatibility assessment, however technologies employed in clinical practice are thought to be currently limited to living donation.

The aim of this study was to understand current practice across the twenty histocompatibility and immunogenetics (H&I) laboratories providing HLA typing for kidney transplantation.

Methods: Twenty H&I laboratories were surveyed between May and August 2023. Nine questions were asked evaluating HLA typing approaches for deceased and living donation, TAT, resolution and volume of patients and donors.

Results: Nineteen of the twenty H&I laboratories responded (95%). All laboratories employed molecular based (PCR) methods for both living and deceased donation. Eleven centres (58%) performed high resolution typing for living donation with five centres indicating their intention to transition to high resolution typing. Currently no centre performs high resolution typing for deceased donation due to the TAT of high-resolution methodologies in use.

Discussion: Current practice demonstrates that high resolution typing is the method of choice where time is not limited, such as living donation. Potential benefits of high-resolution data include avoidance of allele-specific antibodies, improved epitope matching, and maximising the use of virtual crossmatching. The enhanced time restriction for HLA typing in the deceased donor scenario makes high resolution typing challenging and is reflected by the fact that none of the laboratories currently perform high resolution typing of deceased donors. An accurate, cost and time effective high resolution HLA typing platform would therefore be of benefit to further enhance deceased donor kidney transplantation.

Category: H&I (HLA typing - crossmatching - immunologically complex recipients)

P0002: Assessing of reliability of rapid frozen section histology of pre-transplant kidney biopsy in DCD donors with correlation with clinico-pathological data: A pilot study

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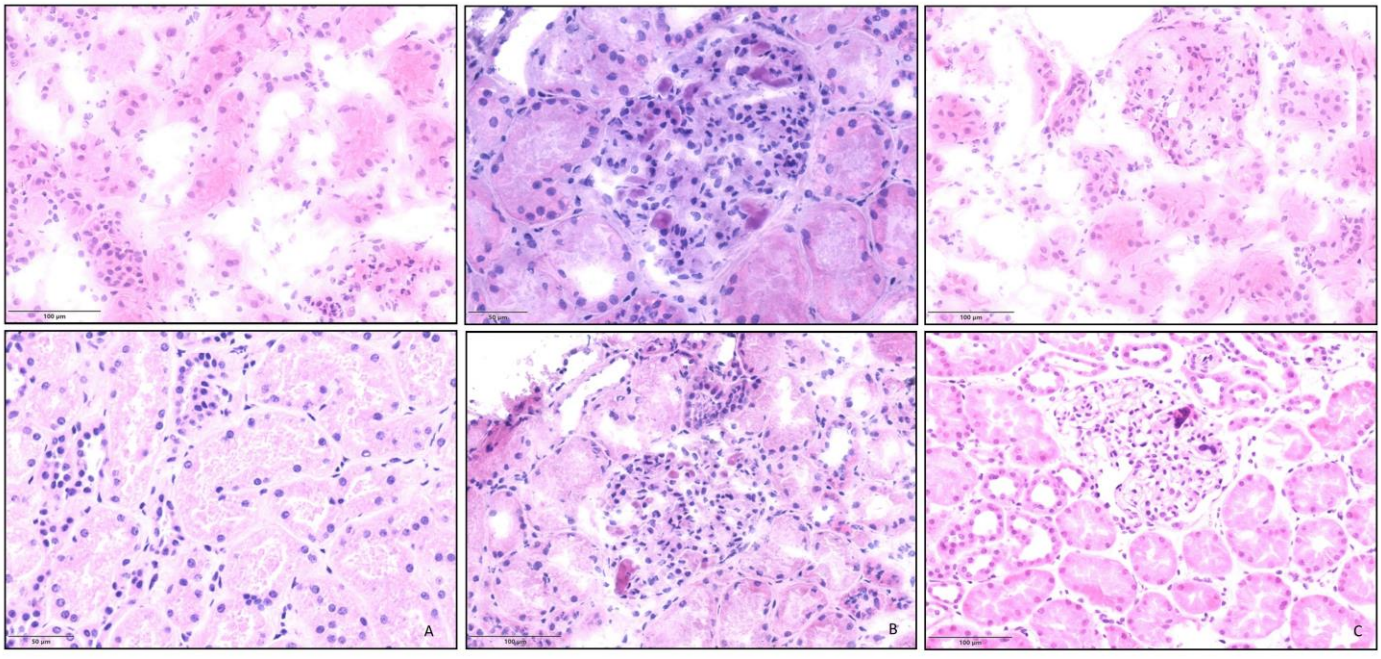
Introduction: The objective of this study was to review pre-transplant kidney biopsies from donors after circulatory death (DCD), with both frozen section and paraffin-embedded section (FFPE) examination. Morphological alterations have been evaluated and results compared to test agreement between the two procedures. The results obtained on the FFPE sections have been correlated with functional data.

Methods: In this study 22 biopsies from our institution have been evaluated: 12 with both frozen section and paraffin-embedded section, 10 with paraffin-embedded section only. Main histopathological lesions associated with ischemia-reperfusion injury (IRI) have been analysed: glomerular elements with pleomorphic nuclear morphology, acute tubular injury (ATI) and its extension in percentage quantification, glomerular thrombi and massive cortical necrosis.

Results: Comparison between evaluation of biopsies in frozen sections and those in paraffin-embedded sections demonstrated a perfect agreement for the evaluation of ATI and its extension (k=1), a substantial agreement for the presence of glomerular thrombi (k=0.75) and a slight agreement for elements with pleomorphic nuclear morphology, (k=0.15) which were found to be megakaryocytes by immunohistochemistry (Figure 1A, 1B and 1C respectively, above: frozen sections; below: FFPE). Massive cortical necrosis was not found. The extent of ATI showed linear correlation with higher levels of terminal serum creatinine (tsCr) (r=0.49; p=0.01). A tsCr value greater than 1.1 mg/dL predicted the presence of glomerular thrombi (AUC=0,96; p<0,0001) while a normothermic regional perfusion time greater than 205 minutes predicts the presence of glomerular megakaryocytes (AUC=0.76; p=0.02).



Discussion: The assessment of the specific histopathological lesions of IRI in DCD biopsies obtained from frozen sections proved to be a valid alternative to those FFPE sections. This allows to obtain in a very short time an excellent evaluation of the quality of the potential graft. Biopsy can also be a useful tool for predicting post-transplant renal function through the correlation between histopathological alterations and clinical parameters.

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

P0003: Renal arterial anatomy: Implications for Normothermic Machine Perfusion

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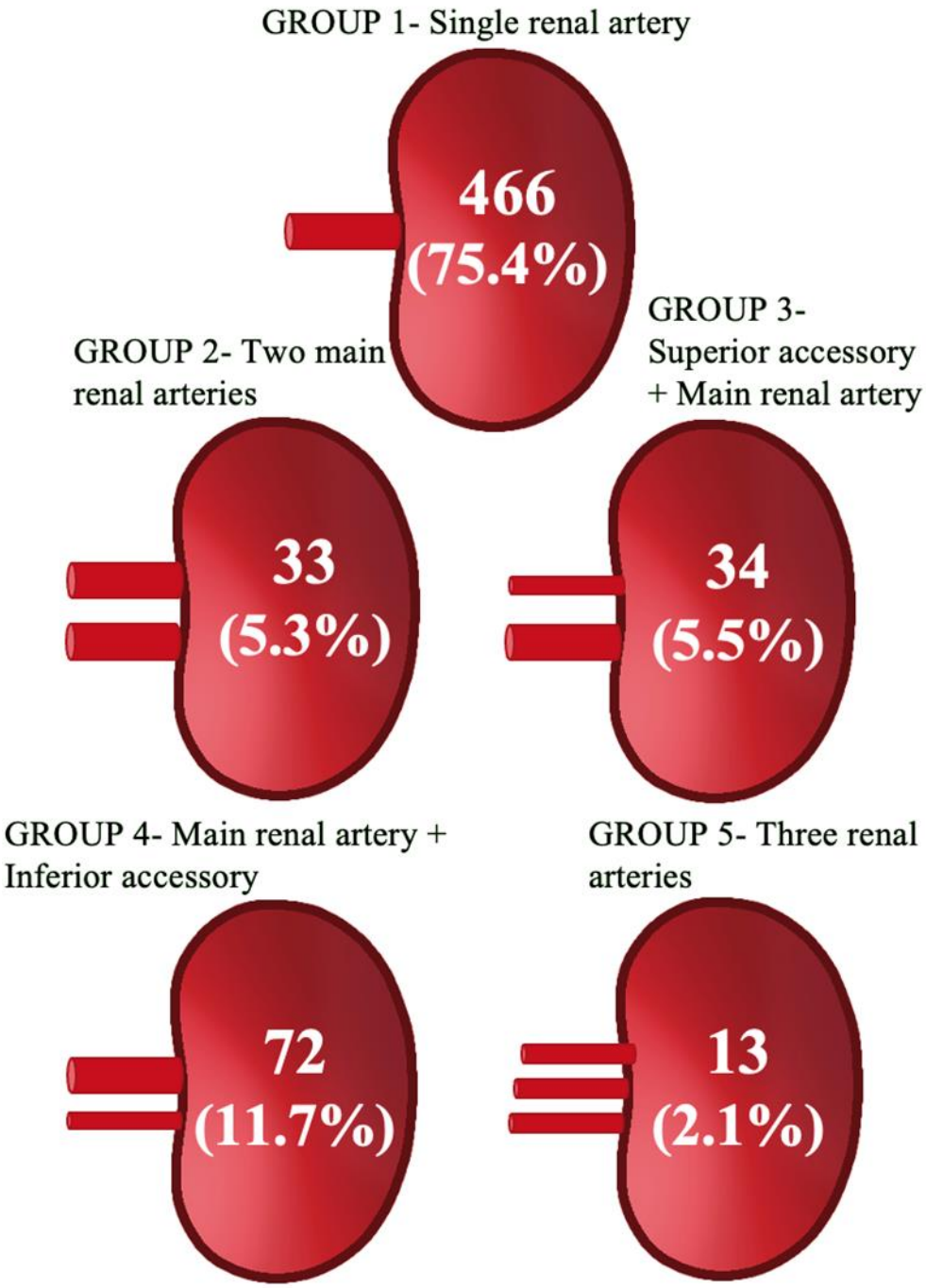
Introduction: Normothermic machine perfusion (NMP) is a novel technology that has shown potential in viability assessment and reconditioning of donor organs. NMP is technically more challenging in kidneys with multiple renal arteries (RAs). This study characterised anatomical variation in RAs to highlight the difficulties and promote development of optimal equipment for NMP cannulation.

Methods: PACS 3D with vessel analysis was used to evaluate the magnetic resonance angiograms of all potential living donors at our centre between 2018-2022. Three independent reviewers measured RA characteristics (number, cross-sectional area, diameter, distance, angulation). Kidneys were categorised into 5 groups based on the anatomical configuration of arteries.

Results: 618 kidneys were included for analysis. 75.4% had a single RA (group 1). Of the 139 kidneys with multiple RAs: 5.3% had two equal sized RAs (group 2), 5.5% had a superior accessory artery (group 3), and 11.7% an inferior accessory artery (group 4) (Figure1). Left RAs were of larger diameter, but right RAs were longer ($p<0.001$). No significant correlation was found between number of left RAs and either age, sex, or gender.
23.7% of kidneys with 2 RAs and 30.8% with 3 RAs had distances between vessels greater than the length of the current clamp used for perfusion (28mm).
0.9% of main RAs originated from the aorta at an acute angle (<90°). 19.1% of main RAs had angles ^{3}135°, 3% of which were ^{3}150°.
Interobserver and intraobserver agreement was strong (κ=0.95-0.99, 0.91-0.99) ($p<0.001$).

Discussion: A quarter of kidneys had multiple RAs, with inferior accessory arteries the commonest variation. Left RAs were larger, and right were longer. 1 in 4 kidneys with multiple RAs would not fit on the current NMP clamp. Creating a larger clamp may facilitate perfusion of more kidneys. The wide range in angulation of RA origin highlights the need for soft, flexible cannulae to permit trauma-free perfusion.



Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

P0004: Post-Operative pain management in laparoscopic donor nephrectomy: A single centre experience

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Introduction: Postoperative pain is an essential factor affecting recovery and functional outcomes in laparoscopic donor nephrectomy patients. Traditionally, opioid analgesics have been the mainstay in the pain management of these patients. However, their adverse effects such as dependence and constipation have prompted researchers to explore alternative options.

Patients and methods: This single-center, retrospective study included all patients that underwent LDN at UHCW during the past three years. A total of 44 patients (54.5% females, 45.5% males) with an average age of 47 years were included in the study.

Results: The average morphine PCA used in these patients post-operatively was 46.35mg. 77.3% of patients received opioids post-PCA with half of them requiring stronger opioids i.e., morphine/oxycodone. 18.2% of patients were also prescribed other non-opioid analgesics. 15.9% of patients were on chronic analgesia pre-operatively. Constipation was a common side effect resulting in 18.2% receiving suppositories or enema but only 54% of patients were prescribed double laxatives while 59% of patients were given antiemetics. 77% patients were discharged on regular paracetamol and PRN tramadol/codeine. 36.4% patients were prescribed paracetamol >14 days while 46.7% and 73.7% patients were prescribed tramadol and codeine > 7 days PRN respectively. Only 1 patient was readmitted with post-op pain. The mean operating time was 231.5 min with a mean LOS of 3.5 days. There was no correlation between the operating time and the dose of PCA required ($p=0.21$). The effect of opioids vs non-opioids on the difference in LOS was not significant ($p=0.078$). There was no significant difference in anti-emetic requirement due to Opioid administration ($p=0.95$), while there was no significant difference in suppositories/enemas administration due to double laxative administration ($p=0.825$).

Conclusion: This study emphasizes the need to limit the excessive use of opioids and develop effective standardized postoperative pain management guidelines to optimize recovery in LDN patients.

Category: Living donation (living donor and recipient selection (all organs) options for donation - donor care - outcomes)

P0005: Corneal donation: Why are we not achieving?

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Introduction: A case note review of 100 adult deaths at our large tertiary hospital demonstrated that up to 65% of patients were potentially eligible to donate their corneas. However, last year only 24 eye donations took place (approx. 1% of all adult deaths). I wanted to explore the possible reasons for such low referral rates.
Method: A 9 item questionnaire was emailed to all doctors in training working at the hospital. A reminder email was sent 2 weeks later and the questionnaire was closed after 1 month.

Results: There were 95 respondents across all grades and specialities. Only 10 had ever raised the topic with patients and/or relatives and, of these, only 3 felt they knew enough to be confident discussing it (and were the only ones who had received previous training). There was a general lack of awareness about the procedure – only 32 respondents knew that the time limit was 24 hours. Doctors were unsure as to the contra-indications for corneal donation – 26 thought a history of solid organ cancer would exclude the patient whilst 60 thought previous cataract surgery was a contra-indication. Only 8 knew that dementia would prevent donation. The corneal donation consent process was also poorly understood. It was, however, reassuring that the vast majority (80 doctors) were interested in receiving training.

Discussion: This survey has shown that there is an enthusiasm for learning about corneal donation amongst most doctors in training, which I hope will then translate in more patients being referred. I have produced some organisational wide learning which will be emailed out to all healthcare professionals working in the Trust. Alongside the Bereavement Services team and Specialist Nurses in Organ Donation, I will focus on providing additional face-to-face teaching to those working on wards where most eligible patients die.

Category: Education and promotion (education: patient - public - healthcare professional; promotion: public - donation).

P0006: Can the PREDICATA score assess length of survival post heart transplant?

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Introduction: The PREDICTA score was designed to assess the development of primary graft dysfunction (PGD) post heart transplantation (PHT). The variables included in the model were recipient diabetes mellitus, preoperative mechanical circulatory support (short-term ventricular assist devices/extracorporeal membrane oxygenation), implant time, donor age, and bypass time >180 minutes. The aim of this study was to assess if there was any correlation with length of survival PHT.

Methods: The database was interrogated for demographic details, donor and recipient characteristics alongside post-operative outcomes 2019 2023. Patients were defined as having PGD as per the ISHLT 2014 criteria (newly placed IABP – moderate PGD, postoperative MCS- severe PGD) in the absence of secondary causes to enable calculation of the PREDICTA score. We then performed a Cox survival analysis to determine the relationship of the PREDICTA score against duration survival. Data was analysed using Unistat. Results are expressed as median (inter-quartile range) and n (%).

Results: 92 patients were included in the study period. The recipient age was 52 (15), donor age 42 (17), 16 (18%) had preoperative MCS with a PREDICTA score of 5 (3). Mortality was thirty day 3 (3.3%), 90 day 5 (5.4%) and 1 year 8 (8.7%). Survival till close follow up was 565 (737) days. The incidence of PGD was 10 (11%). Cox regression p =0.02

Discussion: The low rate of PGD could be a result of the elimination of the warm ischaemic time during implantation by the use of antegrade cold blood cardioplegia bolus followed by continuous aortic antegrade cold blood perfusion during the heart implantation procedure until the release of the recipient aortic cross clamp after completion of the aortic anastomosis. Our findings suggest that the PREDICTA score may also be a good predictor of heart transplant survival.

Category: Clinical - heart and lung (heart and lung transplant - surgery - recipient clinical care and management)

P0007: Defatting of donor transplant livers during normothermic perfusion – a randomised clinical trial: Study protocol for the DeFat study

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Introduction: Liver disease is the third leading cause of premature death in the UK. Transplantation is the only successful treatment for end-stage liver disease but is limited by a shortage of suitable donor organs. A third of donated livers are not suitable for transplant, often due to hepatic steatosis (HS). HS, which affects 33% of the UK population, is strongly associated with obesity, an increasing problem in the potential donor pool. We tested defatting interventions during normothermic machine perfusion (NMP) in discarded steatotic human livers that were not transplanted. A combination of therapies including forskolin (NKH477) and L-carnitine to defat liver cells and lipoprotein apheresis filtration were investigated. These interventions resulted in functional improvement during perfusion and reduced the intrahepatocellular triglyceride content. We hypothesise that defatting during NMP will allow more steatotic livers to be transplanted with improved outcomes.

Methods: In this multi-centre clinical trial, we will randomly assign 60 livers from donors with a high-risk of HS to either NMP alone or NMP with defatting interventions. We aim to test the safety and feasibility of the defatting intervention, and will explore efficacy by comparing ex-situ and post-reperfusion liver function between the groups. The primary endpoint will be the proportion of livers that achieve predefined functional criteria during perfusion which indicate potential suitability for transplantation. These criteria reflect hepatic metabolism/injury and include: lactate clearance; perfusate pH; glucose metabolism; bile composition; vascular flows; transaminase levels, Table 1. Clinical secondary endpoints will include: proportion of livers transplanted, graft function; cell-free DNA at follow-up visits; patient and graft survival; HDU/ITU stay; evidence of ischemia-reperfusion injury; non-anastomotic biliary strictures; recurrence of steatosis (determined on 6-month study MRI), Figure 1.

Discussion: If the intervention proves effective, it will allow the safe transplantation of livers that are currently very likely to be discarded, thereby reducing waiting list deaths.

Table 1. Primary endpoint - the proportion of livers that achieve all of the following functional criteria at 6 hours of perfusion

Lactate	Clearance of lactate to a level < 2.5mmol/L
pH	Perfusate pH ≥ 7.20 Minimum bile pH ≥ 7.5 (if bile produced)
Glucose	Evidence of glucose metabolism (spontaneous fall in perfusate glucose) Bile glucose concentration ≤3 mmol/L or ≥10 mmol less than perfusate glucose
Hepatic and portal flow rate	Hepatic arterial flow ≥ 100ml/min Portal venous flow ≥ 500ml/min
Hepatocellular injury	Perfusate alanine aminotransferase (ALT) < 6000U/L at 6 hours

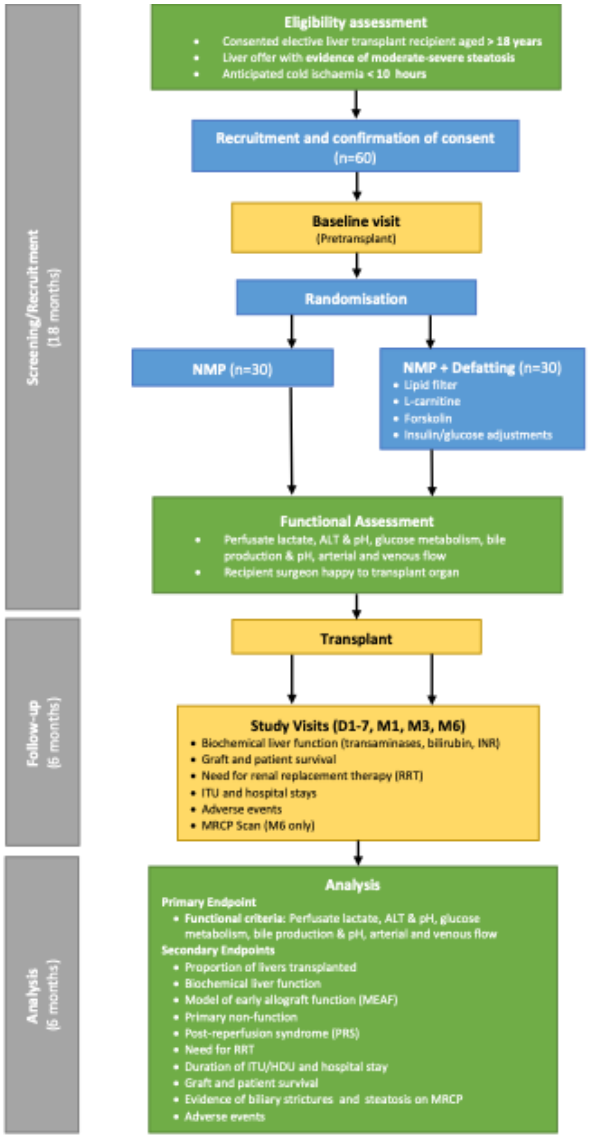

Figure 1. Flow of participants through the study. NMP – Normothermic machine perfusion; MRCP – Magnetic Resonance CholangioPancreatography, ALT – Alanine Transaminase

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

P0008: Prevalence and clinical outcomes associated with de novo Post Transplant Diabetes Mellitus (PTDM) in a steroid avoidance regimen: retrospective cohort study over 11 years

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Introduction: Metabolic complications such as post-transplant diabetes mellitus (PTDM) have been associated with increased risk of mortality and death censored graft survival. However, research focuses mainly on outcomes associated with steroid based immunosuppression therapy. The purpose of this study is to explore the survival outcomes with the onset of PTDM in recipients of a kidney transplant, in the context of complete steroid avoidance regimen from the outset in a real-life setting over 11-year period.

Methods: We undertook a retrospective cohort study using routinely collected data including relevant demographic, clinical data, laboratory variables, medications and mortality information, from a single centre in the UK. We included all recipients of a first kidney transplant between 01/01/2020 to 31/12/2021 who were over 18 years old and remained under the care of the renal service for the duration of follow up. Logistic regression models and Cox proportional hazards models were used to investigate associations between survival and PTDM. Statistical analyses were performed using R version 4.2.3 and p value <0.05 was considered statistically significant. Information governance approval and ethics was obtained from the trust and university.

Results: Of 577 individuals, 10% (n=55) developed PTDM over a median follow up of 7.1 years (range: 0.9-13.8). BMI following [KD1] transplantation and non-white ethnicity were positively associated (OR:0.45; OR:1.01) with PTDM.

Patient survival (figure 1) and death centred graft failure (figure 2) were not significantly different in those with PTDM, pre-existing DM or no diagnosis of DM.

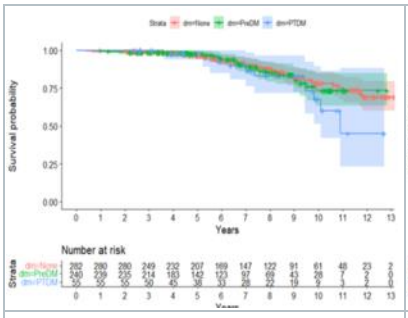

Figure 1

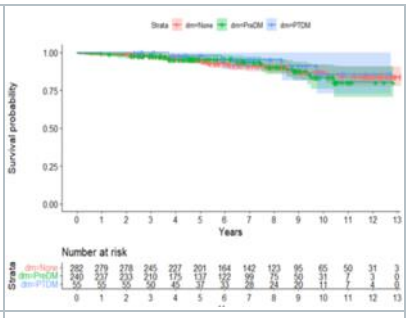

Figure 2

Discussion: In our experience PTDM diagnosis can be reduced by steroid avoidance regimen over 7 years follow-up with no difference in patients outcome. We have identified modifiable risks for PTDM with focus on early post-transplant weight management, particularly in ethnic minority groups. The dietetic services should implement and prospectively establish improvement in care.

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

P0009: A proactive approach in identifying psychosocial distress in kidney transplant recipients – A single centre experience

Ananda Valli Manoj, Charmagne Agustin, Carole Gallagher, Alison Danbury-Lee, Dr Gayathri Rajakaruna, Charlotte Mallindine, Sandra Cruickshank, Maria Da Silva-Gane, Professor Ken Farrington, Dr Sarah Fluck

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Introduction: Psychosocial wellbeing generally improves after kidney transplantation; however, research has shown that a percentage of patients experience psychosocial distress post transplantation.
At East & North Hertfordshire NHS Trust (ENHT) we introduced the Distress Thermometer (DT), a simple and validated tool to measure distress in patients with chronic kidney disease.

Method: Following transfer from the transplant centre, transplant recipients completed the DT and Tacrolimus Adherence Questionnaire (TAQ) at the first ENHT clinic. Overall distress and individual emotional domains such as Anxiety, Depression and Anger were measured (scale 0-10)-score ≥4 indicated elevated levels of distress. Score ≥7 triggered psychosocial referral according to local trust policy.

Results: 35 patients completed questionnaires; seen from 3 months to just over 13 years after transplant (Table 1 & Table 2). 14 % were taking antidepressants.

46% experienced distress, of which, a significant proportion reported anxiety (40%) (Figure1). 81% of men reported distress compared to 19% of women. White ethnicity (56%) compared to black and minority ethnic patients (44%). 20% sought psychosocial support whilst a substantial proportion (40%) chose self-management (Table 3). Young (26-50 years) White Caucasian men with transplant age >180 but <365 (days) chose self-management whereas patients with similar demographics from BAME background with transplant age <180 days sought psychosocial referral. Practical and emotional problems were comparable, yet significant at 43% and 74% reported physical symptoms (Figure 2).

Conclusion: Distress due to anxiety was common in this group during the transition phase, the causes are multifactorial. Whilst most patients opted to self-manage, a small proportion accessed psychosocial support. Physical problems were very common; however, it would be useful to explore its association with kidney function, medications and psychosocial well-being. DT is a simple screening tool with the potential to identify support needs in patients with kidney transplants including those transferring from tertiary transplant care to more local renal services.

Table 1

Overall Patient Characteristics	Number	Percentage
Total participants	35	
Male	28	80.00%
Female	7	20.00%
18-25 years	1	2.86%
26-50 years	18	51.43%
51-69 years	15	42.86%
>=70 years	1	2.86%
White	18	51.43%
Black and minority ethnic	17	48.57%
< 180 days post transplant	15	42.86%
180 to <365 days post transplant	12	34.29%
> 365 days post transplant	8	22.86%

Table 2

Outcome	Statistics	Score
Transplant Age (Days)	Median	212
Overall Distress Score	Minimum	0
Overall Distress Score	Maximum	10
Overall Distress Score	Mean	3.5
Overall Distress Score	Median	3

Table 3

Referral Outcome	Number	Percentage
Renal psychological services	4	11.43%
Renal Social services	3	8.57%
Self-management	14	40.00%
None	13	37.14%
Other	1	2.86%

Figure 1

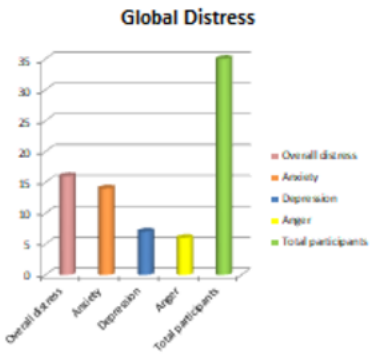
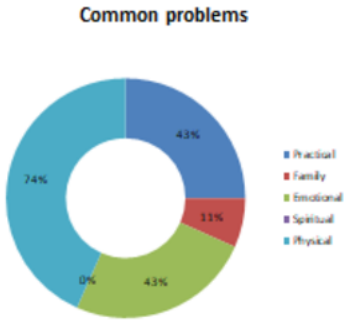


Figure 2



Category: Psycho-social aspects (recipient - donor - family care- MDT (exclude clinical management)

P0010: A retrospective single-centre study comparing HTK and UW perfusion solution in simultaneous pancreas and kidney transplantation outcomes. Graft pancreatitis a recent trend?

Mr. Rajkiran K. Deshpande, Mr. Zia Moinuddin, Mr. David Van Dellen, Mr. Hussein Khambalia, Mr. Giuseppe Giuffrida, Mr. Raman Dhanda

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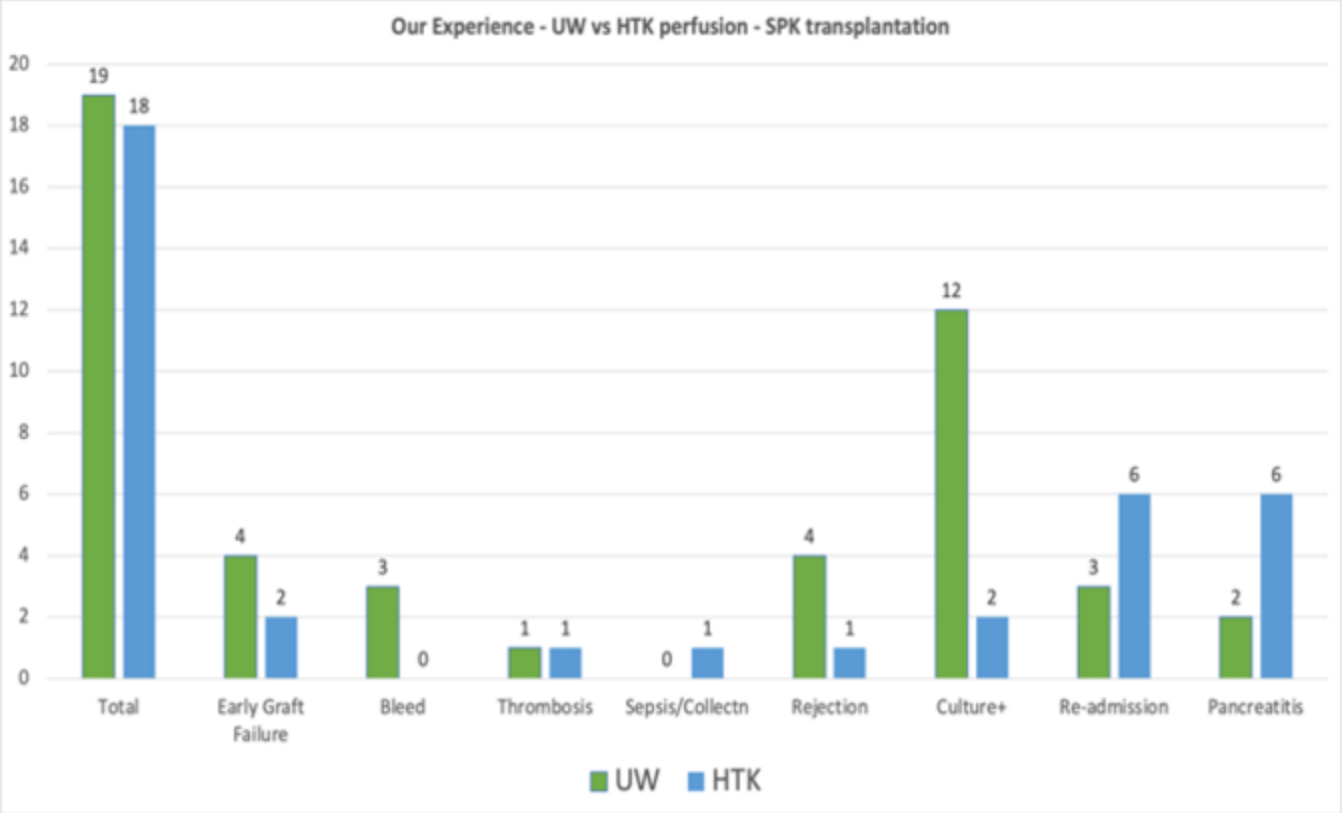
Introduction: University of Wisconsin (UW) was withdrawn and replaced with Histidine-Tryptophan-Ketoglutarate (HTK) as a solution for organ preservation, due to contamination risk and particulate matter. HTK has been highlighted as a risk factor for graft pancreatitis development. This study aimed to compare graft function and outcome in simultaneous pancreas and kidney transplantation (SPKT) performed with the preservation solutions.

Methods: We performed a retrospective analysis of all SPKT at a single centre between January 2022 and November 2023. Data collected included perfusion fluid, donor and recipient demographics, and graft outcomes, including the incidence of pancreatitis.

Result: 37 SPKT were performed from 12 (5 UW and 7 HTK perfused) donors after circulatory death (DCD), and 25 (14 UW and 11 HTK perfused) donors after brain death (DBD) donors. The median ages of the donor and recipient were 27±11 and 39±9 years, respectively. Despite similar cold ischaemia times (CIT), a higher incidence of symptomatic graft pancreatitis (6/18, 33%- 4 DBD and 2 DCD) was observed in the HTK group compared to none in the UW group (2/19, 10.5%- asymptomatic pancreatitis). Readmission rate was 15% (3/19) in the UW group. All for treatment of rejection. Symptomatic pancreatitis resulted in more hospital re-admissions in the HTK group 33% (6/18) with 50% (3/6) requiring multiple readmissions. Perfusion fluid culture was positive in 12 (63%) patients in the UW group and in 2(11%) patients in the HTK group.

Discussion: Our limited sample found no significant differences between the two solutions regarding early failure, and overall graft survival. Unsurprisingly, perfusion fluid microbial contamination was higher in the UW group. Symptomatic graft pancreatitis was more prevalent with HTK perfusion with donor type having no effect. This has resulted in increased morbidity and readmission, which may ultimately impact the long-term graft survival based on previous data.



Category: Clinical - pancreas and islet (pancreatic transplant (all types) - surgery - recipient clinical care and management)

P0011: Evolution of morphological changes in donor livers undergoing normothermic machine perfusion

Dr Anna Paterson, Mr Rohit Gaurav, Ms Lisa Swift, Mrs Rachel Webster, Ms Corrina Fear, Mr Andrew Butler, Professor Christopher Watson

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Introduction: Normothermic machine perfusion (NMP) of donor livers allows dynamic assessment of, and interventions to improve, organ quality. Current literature describes the predictive value of biochemical measures of hepatocyte and cholangiocyte viability; minimal data outlines morphological changes encountered.
Methods: The cohort comprised 25 livers, 19 DCD and 6 DBD, which had undergone NMP; 21 were transplanted. Ninety-one biopsies were retrospectively reviewed, 25 pre-perfusion, 21 after four-hours of perfusion, 24 end-perfusion and 21 post-transplant baselines.

Results: Donor-related macrovesicular steatosis was seen in 10 (40%) livers, developing into lipopeliosis during perfusion in some with an associated sinusoidal-obstruction risk. A distinct pattern of persistent and often widespread small-droplet steatosis was observed in 10 (40%) livers, typically arising pre-perfusion however also developing and/or progressing during perfusion suggestive of acute preservation-related changes. 18 (72%) cases had persistent sinusoidal dilation, with 12 (67%) in the pre-perfusion biopsy, consistent with peri-donation related changes supported by occurrence in 16 (84%) DCD versus 2 (33%) DBD organs.

Hepatocyte necrosis was rare and minimal pre-NMP, however arose from 4 hours in 20 (80%) livers ranging from focal single-cell dropout to areas of confluent loss indicative of preservation-related injury. 5 (20%) cases showed no, 3 (12%) minimal, 8 (32%) mild, 5 (20%) moderate, and 4 (16%) severe necrosis in the most affected biopsy. The extent of hepatocyte cell necrosis varied over time however was not consistently progressive, increasing in 8 (40%) livers with 4-hour and end-perfusion biopsies. Necrosis was also less extensive in the post-transplant reperfusion biopsy in 11 (79%) transplanted cases showing at least mild necrosis during the perfusion, consistent with effective preservation. Bile duct injury was inconspicuous, focal degenerative-type changes were only identified in five biopsies from four organs consistent with good small-duct preservation.

Discussion: The morphological changes associated with NMP were varied, predominantly mild and typically non-progressive consistent with effective preservation.

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

P0012: QI project to reduce waiting times for kidney transplant assessment by implementing a transplant referral checklist

Miss Gemma Wellman, Mrs Tirion Honey, Mr Richard Powell

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Introduction: Variability in the completeness of referrals to our unit in recent years has often led to delays in kidney transplant assessment, with a median waiting time of 144 days from initial referral to transplant listing. As part of the regional KQUIP programme (April 2022-24) we aimed to streamline the transplant referral process by creating a standardised referral checklist to ensure that all the required information is available at the point of referral.

Methods/ case presentation: We developed a SMART aim to improve the completeness of referrals from 45% to 90% by the end of the project. QI methodology including driver diagram and PDSA cycles were utilised and shared with the team. Data was entered into a regional dashboard which each referring unit could access in real-time. This included the number of referrals received and transplant listing per quarter (and proportion of pre-emptive patients), as well as the percentage of complete referrals, median eGFR at referral and the timeframe from referral to transplant assessment clinic and listing.

Results/ outcome: We have seen an overall improvement in the completeness of transplant referrals, with a reduction in discrepancy between centres from 40% to just 10%. The median waiting time from referral to listing has halved (79 days). Overall pre-emptive referral and transplant listing rates have improved to around 70% across the three referring centres to our transplant unit.

Discussion: The introduction of a transplant referral checklist has led to a significant improvement in the completeness of transplant referrals to our unit, leading to improved waiting times and pre-emptive listing rates. This project has highlighted the improvement in communication and collaboration between renal units by using a standardised referral checklist, which could be adopted by other transplant centres in the UK.

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

P0013: Official survey of provision of end of life tissue donation in respiratory care units in the 15 hospitals in Yorkshire Deanery

Dr Imran Hamigi, Dr Salim Meghjee, Mrs Paula Barber

Barnsley Hospital NHSFT, Barnsley, United Kingdom

Introduction: Tissue donation is a precious gift that improves thousands of people's quality of lives. Each deceased tissue donor can improve quality of life of up to 50 donors as tissues like cornea, bone, cartilage, heart valve and skin can be used.

Since January 2023, Barnsley District Hospital NHSFT has piloted and implemented end of life tissue donation as a service in our Respiratory Care Unit (RCU). Over 9 months, total of 12 families were approached of which 25% were referred for tissue donation of which 16% had successful retrievals.

We performed a survey of the 15 hospitals in Yorkshire Deanery which are involved in Training Specialist Registrars in Respiratory Medicine.

Method: We did an official email survey by discussing with the Respiratory Clinical Lead with a standard 4 questions outlined below.

1. *Does your RCU have a programme for after death tissue donation?*
2. *If Yes, when was it started.*
3. *If no, does your department have any immediate plans to implement tissue donation programme?*
4. *Will your Department be interested in developing this service and will be willing to attend a workshop run at Barnsley DGHNHS Foundation Trust in association with NHS Blood and Transplant?*

Results: 1 hospital did not respond. Of the 14 hospitals which responded, 2 hospitals did not have RCUs. The 12 hospitals which does has RCU, none of them had a dedicated tissue donation programme and no plans to develop the service in the immediate future. All the 14 trust who had responded were interested in the workshop.

Discussions: With the planned workshop in collaboration with NHS Blood and Transplant in the new year, we are confident that more RCUs in other Yorkshire Hospitals will be able to do what we have established. This will raise more awareness with the ultimate goal of more tissue donations.

Category: Education and promotion (education: patient - public - healthcare professional; promotion: public - donation).

P0014: 10 years of the Professional Development Specialist Team designing, developing and delivering donation education

Mrs Sally Holmes

NHSBT, Exeter, United Kingdom

Introduction: The Professional development specialist team (PDST) was the inspiration of Olive McGowan now Chief Nurse OTDT within NHSBT. Her initial vision was to capture the knowledge, skills, passion and expertise of the workforce. Providing education and development of Specialist Nurse's (SN) within the field of Donation. We have come a long way since then.

Case Presentation: The PDST was born in January 2013 and aspired to achieve Olive's aspirational vision. We embraced the challenge to inspire the SN workforce to be the best they could be, by creating credible, innovative educational resources and training. We knew we wanted to innovate and empower our colleagues to achieve their maximum potential, enabling more lives to be saved and improved but where to begin...?

Trial and error, fear, blue sky thinking, tears and laughter are a few of the words that spring to mind when thinking of the journey we have traveled. Through it all has been determination, friendship, a drive to share learning with those around us and ultimately to make an impact on improving donation and transplantation.

Outcome: From redesigning our award-winning SN training to supporting training for our medical colleagues and organ retrieval surgeons and so much more in between. The PDST have grown not only in size, but also in course design, delivery, and expertise. The desire to educated and develop is intrinsic within the PDST reflected in their clinical and academic experience.

Discussion: This desire of the PDST to educate and develop creates great foundations for the Organ and Tissue Donation, Retrieval and Transplantation Academy to build upon. Showcasing that our education is world class. The future aspiration of our education and training portfolio is to be world leading. The future is bright, the future is education!

Category: Education and promotion (education: patient - public - healthcare professional; promotion: public - donation).

P0016: Prophylactic peri-nephric drain placement in renal transplant surgery: A systematic review and meta-analysis

Dr Adil Siraj Lakha[1], Dr Shahzaib Ahmed[2], Prof James Hunter[3,4], Mr John O'Callaghan[5,4]

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Introduction: Renal transplantation is a common operation in the UK, with almost 3000 procedures performed during 2021 -22. Post-operative peri-nephric fluid collections are common, and these often require percutaneous drainage. Usage of prophylactic drains is variable in renal transplantation, drains are associated with risks, and there is lack of consensus as to the relative benefit of placing a drain intraoperatively in this patient cohort. This meta-analysis assessed whether prophylactic perinephric drainage reduced the need for postoperative reintervention to manage collections.

Methods: This systematic review and meta-analysis was carried out using the Preferred Reporting Items in Systematic Reviews and Meta-Analysis (PRISMA), and was prospectively registered on the publicly available registry PROSPERO (CRD42021255795). A literature search of Embase, Medline, Cochrane Trials and Reviews, and Transplant Library, was carried out in June 2023, and titles and abstracts were screened against our pre-defined inclusion criteria. Quality assessment was performed using the Newcastle-Ottawa Scale. Summary statistics for outcomes of interest underwent meta-analyses to a confidence interval (CI) of 95% and are presented as Forest Plots for Odds Ratio (OR).

Results: Literature search revealed 1540 unique titles and abstracts across all four databases. Of these, 4 retrospective cohort studies were selected. Meta-analysis of 3 studies showed no evidence of a significant reduction in reintervention rate with drain placement, OR=0.59 (95%CI: 0.16-2.23, p=0.44). Meta-analysis did not show a significant reduction in perinephric collections with prophylactic drain insertion OR=0.55 (95%CI: 0.13-2.37, p=0.42). Finally, there is not good evidence that drain placement reduces superficial wound complications or improves 12-month graft survival.

Discussion: Given the lack of current evidence basis supporting the practice of prophylactic perinephric drainage in renal transplantation, we advocate for a drain-free strategy in this patient cohort. Further work is needed in this area, including well-designed, prospective studies to assess the risks and benefits of intraoperative drain placement in these patients.

Category: Clinical - renal surgical (kidney - transplant and living donor surgery - novel techniques)

P0017: A case study of Parvovirus in transplant patient

Ms Kate Onyett

Oxford University Hospitals NHS Foundation Trust, Oxford, United Kingdom

Introduction: Parvovirus is rare in adults, and also rare in the transplant population. In the 5 years I have been in position, our unit has had 2 confirmed cases in transplant recipients.

Methods/case presentation: A case study of the care and support of a bowel transplant recipient who was discovered to have parvovirus.

A year following transplant, Mr A was found to have intractable anaemia, and tested positive for parvovirus. Supportive measures were used to combat symptoms of anaemia, including blood transfusions, IVIg and erythropoietin injections.

Haematology advice was sought, and it was suggested that immunosuppression medication be stopped to allow Mr A's body to repress and overcome the virus. However, this would have meant an explantation of the bowel transplant as it would have rejected. The transplant itself was working well, and there was no other clinical indication for sacrificing it.

This would have risked possible surgical complications and increased the antibody profile in Mr A that would have made further transplantation much harder to achieve. There was also with no certain guarantee that the parvovirus might not return on a second transplant.

Results/outcome: Immunosuppression was lowered as far as practicable, and Mr A was supported symptomatically for a total of 4 years. After a minor surgical procedure, the virus went into a spontaneous remission, resulting in normative Hb levels and no further therapies being required.

Discussion: This showcased a lack of formalised protocol for treatment of parvovirus in adults, let alone among transplant recipients. Treatment was done on an ad hoc basis based on formal laboratory results and symptomatic load in the patient. This could be down to the rarity of infection in adults, especially one of such long duration.

Category: Case study submission (may include individual cases or shared learning experiences)

P0018: Hepatitis C Positive organ donation and direct acting antivirals in pancreas transplantation: A systematic review

Laila Stephanie Siran[1], Daniel Doherty[1,2], Zia Moinuddin[1,2], Hussein Khambalia[1,2], David van Dellen[1,2]

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Background: Pancreas transplantation (PT) provides diabetic cure for patients with complicated diabetes mellitus. However, there is a paucity of suitable donor organs to fulfil requirements resulting in deaths on the waiting list. Organs from otherwise suitable hepatitis C virus positive (HCV+) donors alongside direct-acting antiviral agents (DAAs) have been used in kidney and liver transplants in small trials. We aimed to review this strategy in PT.

Methods: A literature search was conducted on OVID MedLINE, PubMed and EMBASE to evaluate evidence on the use of HCV+ organ donors for PT in HCV- recipients alongside DAA therapy.
Results: Database analysis produced 5 articles (4 single centre retrospective, 1 case report). This included a total of 65 patients, 15 of which received PT. Two studies examined multiple organ transplants whilst 3 evaluated PT alone. Three studies employed prophylactic perioperative therapy, while 2 examined treatment post-transplantation. 100% of patients achieved a sustained virological response (SVR) at 12 weeks across all 5 studies. There were no episodes of acute rejection or complications directly associated with DAA therapy or HCV infection. HCV transmission occurred in only 1 of 15 patients, which was successfully treated. Pancreatic graft function and outcome after 7-12 months was good.

Conclusion: The use of DAA therapy is safe and effective for HCV+ donors to HCV- transplant in early reported studies. This approach could facilitate the successful utilisation of HCV+ organs for transplantation thereby minimising impact on supply and demand disparities. Pancreas transplantation specific studies are required to further analyse outcomes.

Category: Tissue donation & transplantation (tissue donors, recipients & retrieval, e.g: corneas, skin, heart valves)

P0019: A Blue Peter approach to machine perfusion for organ preservation

Mr Rohan Bhattacharjya[1], Dr Dylan Barnett[1,2], Mr Akshay Kanhere[1], Mr Jake Bastian[1], Mr David Daniel[1], Dr Andrew Ruszkiewizc[3,4], Mr Shantanu Bhattacharjya[2,1]

[1]University of Adelaide, Adelaide, Australia. [2]Central Adelaide Local Health Network, Adelaide, Australia. [3]University of South Australia, Adelaide, Australia. [4]SA Pathology, Adelaide, Australia

Introduction: The widespread uptake of machine perfusion for organ preservation has been hampered due to barriers of cost, complexity, and competency. Dialysis machines are simple to use, ubiquitous in intensive care units worldwide and already have available operators trained in their use. Modification of these machines may reduce the barriers to the adoption of machine perfusion and may offer new opportunities for correcting organ dysfunction.

Methods: Composite abdominal organ blocks were retrieved from 12 beating heart porcine donors. Autologous whole blood was also collected.Following a cold ischaemic period of 30 minutes, organ blocks were cannulated and connected to a Baxter PrismaflexTM Dialysis System and preserved for 5 hours. Oxygenated dialysate was pumped through the dialysate cartridge at 1500ml/hr and blood at 395ml/min. Serial blood gas samples were taken for assessment of blood oxygenation, oxygen consumption, carbon dioxide production and arterial pH maintenance. Plasma samples were taken for measurement of platelet-activating factor to assess reperfusion injury and hyperoxia.

Results: Oxygenation over the dialysis cartridge membrane achieved significantly higher PaO2 as compared to room air oxygenation ($p<0.05$). Evidence of oxygen consumption and carbon dioxide production was observed, with a baseline approximately three times that of normal resting tissue oxygen consumption. The ability to control metabolic homeostasis was displayed through maintenance of arterial pH, and correction of venous pH abrogation. Quantitative platelet-activating factor measurement showed no statistically significant difference ($p>0.05$) as compared to the reference standard of static cold storage after 5 hours of preservation.

Discussion: The successful conversion of a dialysis machine for the purpose of organ preservation breaks down barriers to machine perfusion. A novel ability to dynamically control and correct homeostatic conditions was displayed. This opens the door to possibly improving the condition of organs ex vivo and to new therapeutic approaches.

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

P0020: Functional and histological comparison of pancreas preserved by isothermic (room temperature) machine perfusion as compared to static cold storage and normothermic machine preservation

Mr David Daniel[1], Mr Rohan Bhattacharjya[1], Mr Jake Bastian[1], Mr Akshay Kanhere[1], Dr Dylan Barnett[2,1], Assoc Prof Andrew Ruszkiewicz[3,4], Assoc Prof Shantanu Bhattacharjya[1,2,5,6]

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Introduction: The growing shortage of donor pancreata for transplant has led to the usage of extended criteria donor organs (ECD). Static Cold Storage (SCS) is the gold standard for pancreas preservation; however, it is suboptimal for preservation of ECD organs. Normothermic Machine Preservation (MP) proposes a method which addresses SCS shortcomings. The authors present a novel technique of isothermic machine preservation (IMP) that is simpler to normothermic (NMP), with equal efficacy.

Aims: To assess beta cell integrity and histology of SCS, NMP and IMP preserved porcine pancreata.

Methods: Following ethics approval in a large animal pig model, 4 multiorgan blocks were preserved using SCS, 3 NMP and 4 IMP. Ex-vivo preservation was for maintained for 5 hours, during which tissue samples were taken at retrieval (A), post preservation (F) and post reperfusion (H). Core biopsy samples were stored in formalin. Blinded histological analysis was conducted for each sample and they were scored based off an objective scoring system. Insulin response to enteral glucose was assessed at 2 hrs and 4 hrs where the organs were machine preserved (NMP; IMP)

Results: Each tissue sample was scored in the following Category: acinar cell autolysis, fat necrosis, duct epithelium and islet damage. Total scores were averaged for each organ at each time point (A, F and H) and compared using a two- way ANOVA test, with significance set at $p<0.05$. Comparison of the total averages and a P value of 0.22 represented no statistical difference between all 3 groups. Both NMP and IMP demonstrated a comparable insulin response to enteral glucose stimulation.

Discussion: Despite the pancreas being traditionally labelled a low flow organ, MP of porcine pancreata is feasible in an ‘en bloc’ 5 hour ex-vivo preservation. Furthermore, IMP was found to be non-inferior in preserving pancreas cellular architecture in comparison to NMP and SCS.

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

P0021: Ultra-long survivors of kidney transplantation: Forty years and more of graft function

Dr Michelle Madden, Dr Gavin Comerford, Dr Liam O'Neill, Dr Elhussein Elhassan, Mr Patrick O'Kelly, Ms Anne Cooney, Dr Alaeldin Abdalla, Ms Dilly Little, Dr Carol Traynor, Professor Peter Conlon

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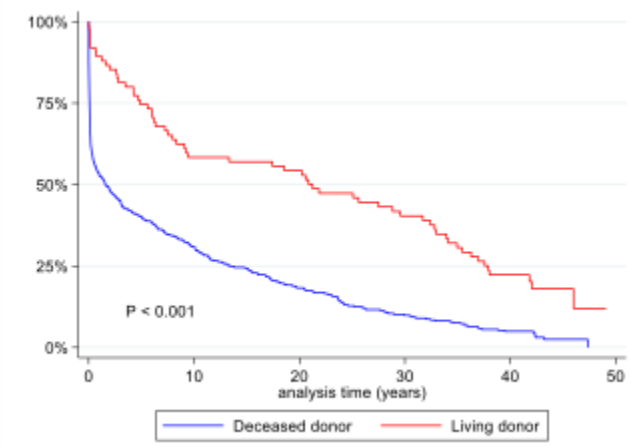
Introduction: It is sixty years since the first kidney transplant in Ireland in 1964. We sought to identify clinical factors associated with allograft function for more than forty years in the Irish cohort and to describe the clinical features of these patients.

Methods: We conducted an analysis of the Irish National Kidney Transplant Registry and included all kidney transplants performed in Ireland between January 1, 1970 and March 31st, 1983. Follow-up analysis was until 31st March, 2023.

Results: We included 428 transplants in 394 patients. There were 32 (8.1%) patients with graft function for 40 years or more, of whom 24 were functioning at date of follow-up. 4 patients (1%) were lost to follow-up. Kaplan – Meier estimated survival at 10, 20, 30 & 40 years was 36%, 25%, 15% & 8% respectively for all grafts.



Multivariate analysis identified age at transplant (HR 1.02, CI 1.00–1.04), male recipient (HR 1.39, CI 1.04–1.45) and transplant type - living donor vs. deceased donor (HR 0.42, CI 0.27–0.67) as associated with long-term graft loss. The commonest causes of death were cardiovascular disease and malignancy. The major causes of graft loss were death with a functioning graft and interstitial fibrosis/tubular atrophy(IFTA).
Eight grafts failed beyond 40 years, four secondary to IFTA and four due to death with a functioning graft. The median creatinine of the twenty-four patients with surviving transplants was 107 µmol/L (range 66-322 mmol/L). Most (61%) patients were on a combination of Azathioprine and Prednisolone. Comorbidities included non-melanoma skin cancer (67%), coronary artery disease (24%) and invasive malignancies (30%). There were 93 incidences of non-melanoma skin cancer in 22 patients.
Discussion: Of those who survive to forty years, graft function is excellent maintained on low-level of immunosuppression. Recipient younger age, female sex and living donor kidney transplantation are associated with improved graft survival.

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

P0023: Shared cadaver Donor-Husband HLA Class I mismatches as risk factor for renal graft rejection in a previously pregnant women: A case report

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[1]Centro Hospitalar Universitário do Algarve, Faro, Portugal. [2]Hospital Curry Cabral, Lisboa, Portugal

Introduction: Acute antibody-mediated rejection (AMR) is a major cause of premature graft loss in kidney transplant recipients. Cases of accelerated graft rejection due to occult sensitization through pregnancy are documented.

Case presentation: We report a case of a 49-year-old female, with early acute AMR after pancreas-kidney transplant with undetectable preformed donor-specific antibodies (DSA).

Results: Prior sensitization events included, four pregnancies. No detectable preformed DSAs were identified, CDC-PRA was 0% and CDC and flow cytometry crossmatch were negative. Induction immunosuppression included, corticosteroids and thymoglobulin 10.5mg/Kg. Maintenance immunosuppression, included prednisolone, tacrolimus and mycophenolic acid. Post operatory period was uneventful with SCr of 0.9 mg/dl and insulin independence on the fourth day. At day 11, a kidney graft impairment was observed (SCr 1.67 mg/dl). Due to de novo anemia, a CT-scan with contrast was requested, which showed partial thrombosis of the splenic vein. Therapeutic anticoagulation was initiated. Protocol single bead assays on day 7 revealed “de novo” DSA: anti-B44 (8294 MFI). Given the suspicion of early acute AMR, the patient started methylprednisolone pulses, plasmapheresis, immunoglobulin and rituximab. No biopsy was performed due to high clinical suspicion and risks associated with delayed treatment. Due to early AMR manifestation without preformed DSA, consistent with a memory cell reaction, we considered pre-sensitization through previously pregnancies. High resolution typing of both husband and donor showed shared several class I mismatches, although antibodies are only found against two epletes in class B. Follow-up anti-HLA measurement showed progressive lowering of DSA MFI values over 2 weeks with undetectable circulating DSA after 1 month. Kidney graft function recovered to baseline. Post treatment kidney biopsy was normal.

Discussion: Latent sensitization can be clinically relevant in women with previous history of pregnancy. High level of clinical suspicion and vigilance should be maintained in women with previous pregnancies.

Category: Case study submission (may include individual cases or shared learning experiences)

P0024: Liver machine preservation at room temperature using an oxygenated, acellular perfusate: A pilot study

Mr. Akshay Kanhere[1], Mr. Jake Bastian[1], Mr. David Daniel[1], Mr. Rohan Bhattacharjya[1], Dr. Dylan Barnett[1,2], A/Prof. Shantanu Bhattacharjya[3,2,1], A/Prof Andrew Ruszkiewicz[4]

[1]University of Adelaide, Adelaide, Australia. [2]Central Adelaide Local Health Network, Adelaide, Australia. [3]Royal Australian College of Surgeons, Adelaide, Australia. [4]Royal College of Pathologists of Australasia, Adelaide, Australia

Introduction: Static Cold Storage (SCS) is the simple and cost-effective gold standard of liver preservation. Normothermic Machine Preservation (NMP) is emerging, but it is not widely used due to complexity and lack of long-term data. Oxygenated, acellular, machine perfusion at room temperature (IMP) is a novel method that aims to overcome the limitations of both its predecessors.
The aim of this pilot study was to determine if IMP was feasible and non-inferior to SCS and NMP for deceased donor porcine livers.

Methods: Organs were retrieved from 12 pigs (mean weight 74.6kg) following ethics approval. Pigs were randomised into three preservation groups (n=4) and preserved for 5 hours. Metabolic activity was assessed by comparing arterial blood glucose (AGL) with hepatic venous glucose (VGL), and monitoring tissue ATP levels. Histology was scored by a blinded histopathologist, using a composite injury score derived from various hepatocellular characteristics.

Results and Discussion:

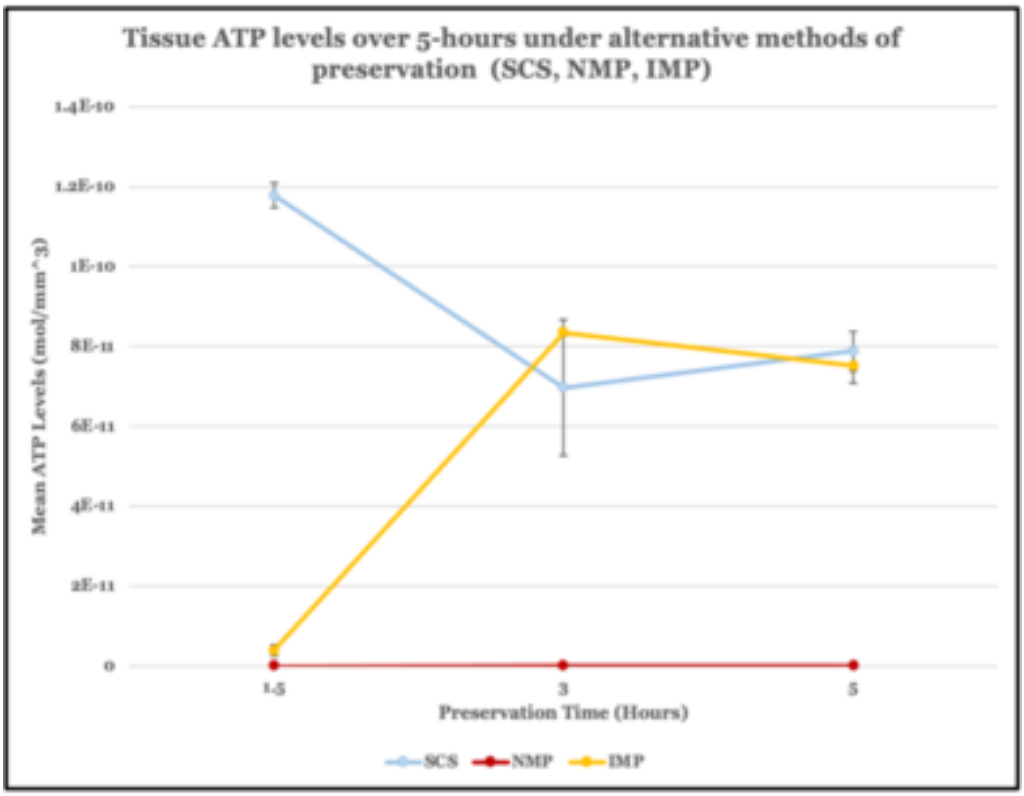

Figure 1: Biopsies were taken at regular intervals and frozen for ATP analysis. The graph shows that mean SCS ATP decreased from hours 1.5 to 5 of preservation, whilst increasing in IMP. A two-way ANOVA analysis yielded a P-value of 0.966 ($p>0.05$), suggesting no statistically significant difference.

Mean Arterial Glucose (AGL) vs Mean Hepatic Venous Glucose (VGL) in IMP vs. NMP			
Hours (Preservation)	**Mean IMP AGL (mmol/L)**	**Mean IMP VG (mmol/L)**	**Difference (AGL - VGL)**
1.0	8.425	12.525	-4.1
5.0	22.15	22.05	0.1
Hours (Preservation)	**Mean NMP AGL (mmol/L)**	**Mean NMP VG (mmol/L)**	**Difference (AGL - VGL)**
1.0	17.65	34.95	-17.3
5.0	17.75	31.3	-13.55

Figure 2: The change from VGL exceeding AGL at 1-hour compared to AGL being higher than VGL at 5-hours suggests conversion from glycolytic to glycogenotic pathways in the liver. In NMP, there was persistent anaerobic metabolism indicated by higher VGL throughout. No statistically significant difference was observed with p=0.33. For the H&E histology, a score of 0-2 was considered mild damage, 3-5 moderate, and >6 severe. All three groups had a composite score between 0-2, suggesting mild damage at end-preservation. Once again, two-way ANOVA suggested no statistically significant difference between groups.
These results indicate that IMP is indeed possible and appears non-inferior to SCS and NMP in liver preservation.

Category: Clinical - liver and intestinal (liver - small bowel - surgery - transplant hepatology - recipient clinical care and management)

P0025: Breaking down the barriers for deaf and hard of hearing donor families

Mrs Katja O'Neill

NHSBT, Luton, United Kingdom

Introduction: There are over 100 million people in the UK who have some degree of hearing loss. 100,000 of these use British Sign Language as their first and preferred language and lip reading is very common among them. The increased use of face masks during pandemic, for example, is a huge barrier for the 1:6 people who have hearing loss and rely on lip reading to varying degrees.
It is a little-known fact that BSL users are not comfortable with written English.
This hidden disability causes huge emotional stress especially in hospital settings, when communication barriers add to the pressure of dealing with any health issues.
The NHS AIC. (Accessible Information Standard 2016) sets out clear standards to establish better access to communication, information and support from healthcare providers, yet in a survey, 37% of staff stated that they had not received any training to support this.
When dealing with bereaved families during the Organ Donation process, it is especially important to ensure understanding, empathy and rapport with all members of the family.

Methods: Specialist Nurses in Bedfordshire NHS Trust are hoping to introduce the following simple measures:

- Basic Deaf awareness training for health care professionals as part of their induction
- Basic downloadable communication aids
- Staff to learn basic signs to bridge the gap until an interpreter is available
- Introduction of clear face masks for dealing with Deaf and Hard of hearing service users.

Results: A simple tool to measure confidence of staff in using basic BSL signs to communicate with Deaf service users will be designed. Following each Deaf Donor family, the use of basic BSL signs, masks and usefulness of the poster will be measured.

Discussion: to follow implementation

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

P0026: Understanding Prolonged Time to Asystole (PTA): Northern team data analysis

Miss Sonya Paterson, Ms Jacqueline Newby

NHS Blood and Transplant, Newcastle Upon Tyne, United Kingdom

Introduction: There is a need to learn more about why some consented DCD donors do not proceed to donation.

Methods: 26 non proceeding (NP) DCD donors, and 43 proceeding DCD donors were reviewed to find themes that would assist predicting death. Times from extubation ranged from 0 to 180 minutes with 81% of proceeding donors dying within 30mins.

Discussion:

Ventilation
Of the 26 NP donors 11 were receiving ventilated breaths. 16 of 43 proceeding donors were taking own breaths.
Oxygen (O2) Requirement
From 43 proceeding donors only 13 were on O2 >50%. From the NP donors only 2 were on O2 >50%. There was also no evidence that PEEP influences PTA.

Inotropes
1 NP donor had high level of inotropes. 3 of the proceeding donors had high levels of inotropes.
Mode of Injury
61% NP donors had HBI compared to 46.5% proceeding donors. 27% NP donors had ICH compared to 24% proceeding donors.

Fixed Pupils
19% NP donors had fixed pupils. 51% of proceeding donors had fixed pupils. This maybe higher as 3 donors had NO documentation about pupils. Pupil reaction may be significant however this is not conclusive.
Seizure activity
50% of NP donors were given anti-epileptics Compared to 37% of proceeding donors.

Results/Outcome: This was not conclusive as documentation was difficult to analyse and often missing. Further study required to obtain statistical review especially as the process is multi-faceted.
Recommendations:

- Bedside assessment at time of donation – currently developing 5 questions which should aid predicting death.
- Review of pupil response – unclear it is checked as regularly as thought.
- Improved documentation on key indicators (such as the ability to breath, pupil response and ventilation).

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

P0027: The outcomes and Cost-Benefit Analysis of Cell-Free DNA (cfDNA) testing for organ transplant rejection

Dr Hemant Sharma[1,2], Dr Shiv Bhutani[3], Mr Zaid Al-amiedy[2], Prof Alp Sener[1], Prof Patrick Luke[1], Prof Abhishek Sharma[4]

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Introduction: cfDNA assessment emerges as a non-invasive technology for detecting transplant injury but requires health economic profiling.

Methods: Multivariable logistic regression analysis evaluated the incremental benefit of incorporating cfDNA testing versus standard monitoring alone for diagnosing rejection across 7 studies (n=421) spanning renal, liver, pancreas, cardiac, and lung recipients. Cox-modeling quantified graft survival benefit over 3-5 year follow-up in programs adopting cfDNA surveillance. Decision curve analysis determined threshold probabilities of rejection where cfDNA testing would provide clinical net benefit.

Results: Adding cfDNA increased transplant rejection detection by a mean 17.6% over standard assessment (OR 2.41, 95% CI 1.27-4.15, p=0.013) after adjusting for confounders. The probability threshold for net benefit with cfDNA was 9.8%-15% above individual pretest rejection risk based on recipient characteristics. Centers utilizing cfDNA testing demonstrated a 6.2–11.7% absolute increase in 3-5 year survival (adjusted HR 0.79, 0.64-0.90; P<0.01). In the first year post-transplant, substituting 1-2 biopsies with cfDNA testing could yield projected savings of $3250–$8650 per patient in the USA setting. There was paucity of evidence for cost analysis for liver and pancreas transplant.

Conclusion: Findings indicate cfDNA significantly improves non-invasive detection of rejection risk and outcomes if the pre-test probability exceeds 10%, supporting value to guide management. Additional economic analyses are merited. Current evidence suggests that cfDNA cannot replace formal transplant biopsy as a golden diagnostic test to diagnose transplant rejection

Table 1: Potential for significant cost savings by reducing invasive biopsies through cfDNA monitoring across the major organ types

Organ	Standard Testing	Cost	cfDNA Testing	Cost	Potential Cost Benefit
Kidney	3-4 biopsies in year 1	~$15,000	Replace 1 biopsy	~$2500	Save $12,500+ per patient
Heart	10-15 EMBs in year 1	~$42,000	Replace 5 EMBs	~$18,500	Save $23,500+ per patient
Lung	4 transbronchial biopsies in year 1	~$14,000	Replace with blood or saliva cfDNA	~$3000-$5000	Save $9000-$11,000 per patient

Category: Basic and translational science (as per category - all science)

P0028: Outcomes after de-novo DSA development correlate with persistence and MFI of DSA

Dr Aneesa Jaffer[1], Dr Olivia Shaw[2], Professor Anthony Dorling[2], Dr Sapna Shah[1]

[1]Kings College London, London, United Kingdom. [2]Guys and St Thomas Hospital, London, United Kingdom

Introduction: The OuTSMART trial confirmed that de novo DSA were associated with an increased risk of graft loss and rejection. In this post-hoc analysis, we looked in detail at the 135 patients who entered the trial with a DSA, to explore factors associated with worse outcomes.

Methods: Serial samples were collected from all recruits until 2016. A 2018 protocol amendment allowed repeat HLA antibody testing in all participants at their final visit, which was at least 32 months post-randomisation. Therefore 113/135 DSA+ patients had 2 or more samples available for analysis.

Results: 40 (36%) of the 113 patients were DSA+ for the duration of the study (median 3.9 years). These form the DSA+/+ group. 73 (64%) had DSA detected at the start of the study but DSA became undetectable thereafter and were the DSA+/- group. Both groups were well matched in age, gender and ethnicity (Table 1).
Significantly higher rates of antibody mediated rejection (ABMR), were detected in the DSA+/+ group compared to the DSA+/- group (15% v 2.74%, $p=0.04$). Total mean fluorescence intensity (MFI) was significantly higher in the DSA+/+ group (12860 v 6815, $p<0.01$) with a predominance of class II HLAs.

There was no difference in eGFR, but patients from the DSA +/+ group had significantly higher urine protein-creatinine ratios (UPCR) at the beginning and end of the study. Although there were higher graft failure rates in the DSA+/+ patients, this was not statistically significant.

Discussion: This study shows that patients with persistent DSA are more likely to have class II HLA with higher MFIs and are at higher risk of ABMR. We are currently investigating the role of cellular immunity and persistent DSA.

Table 1

Total 113	DSA +/+ n=40	DSA+/- n=73	P value
Age years (range)	54.0 (27-78)	57.4 (30-80)	0.21
% Male	77.5	76.1	1.00
Study Arm %(n) Biomarker led Standard care	 57.5 (23) 42.5 (17)	 49.3 (36) 50.7 (37)	0.525
Ethnicity (%) White Black Asian Other	 73 15 10 2	 69 19 11 1	0.82
Total MFI start	12860	6815	<0.01
HLA Class	Class I (5) Class II (16) Both (3)	Class I (21) Class II (23) Both (1)	0.04
Acute antibody mediated rejection n (%)	6 (15)	2 (2.74)	0.04
End of study eGFR ml/min/1.73m^2 (range)	43.5 (13-79)	45.4 (9-90)	0.58
Start of study UPCR mg/mmol (range)	74.2 (3-607)	32.2(5-240)	0.01
End of study UPCR mg/mmol (range)	170 (3-726)	88.9 (7-1172)	0.02
% Graft failure at end of study (median 3.9 years)	20	6.8	0.07

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

P0029: Qualitative review of reasons families withdrew consent / authorisation for deceased organ donation

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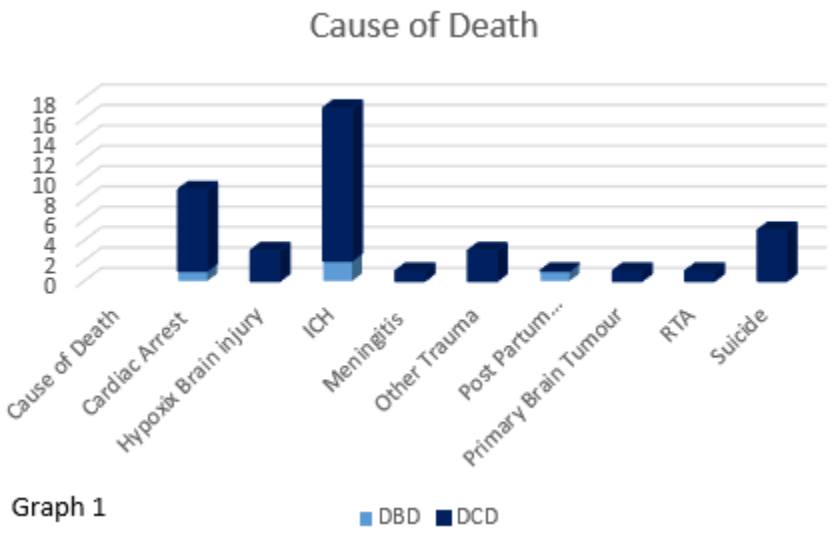
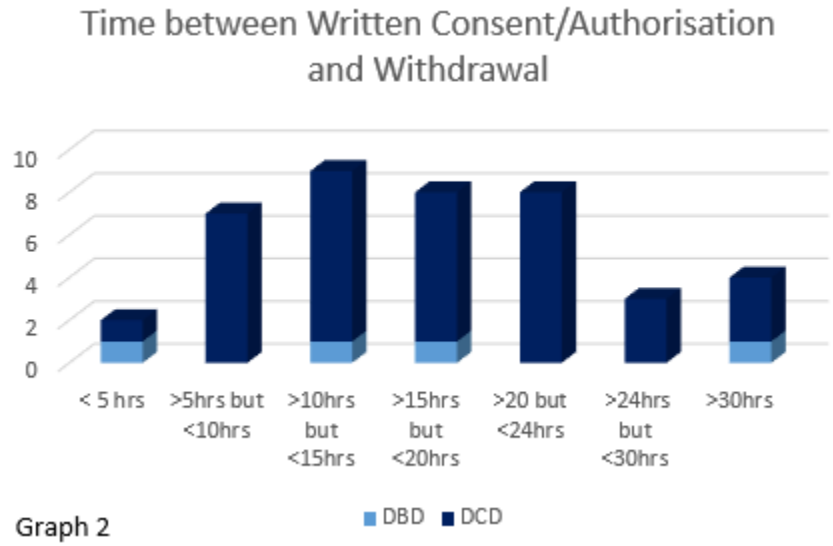
Introduction: In the 18-month period between 1st April 2022 – 30th September 2023, 41 families withdrew consent/authorisation for organ donation prior to organs being retrieved for transplant. A qualitative review was undertaken to establish themes which may be more likely to result in withdrawal prior to organ retrieval.

Methods: Each individual donor file was examined to identify the type of donor (Donation following Brain Death (DBD) / Donation after Circulatory Death (DCD)), mode of consent (expressed opt-in / deemed / other) and cause of death (Graph 1). Reasons for withdrawal were themed including time between written consent/authorisation and withdrawal (Graph 2), and factors influencing the decision to withdraw.



Graph 1



Graph 2

Results: 61% of cases where families had withdrawn consent/authorisation were when there was an expressed opt-in decision by the donor (25/41). In 34% of cases, deemed legislation applied (14/41). Collectively 95% of consent/authorisation withdrawals were in circumstances where legislation indicates a presumptive approach regarding organ donation (39/41).

Only 4/41 cases (10%) were DBD, on two occasions withdrawal was as a result of new clinical information that had inevitably delayed the donation process. 37/41 cases (90%) were DCD confirming the complexities around the family's understanding of futility, and the correlation with the eventual time of the patient being at peace from any perceived suffering.

Discussion: From the data available it is evident that families are more likely to withdraw consent/authorisation when there is a presumption that donation will occur either due to an expressed opt-in decision or application of the deemed legislation. Learning must focus on how we can best support timelines in these circumstances, particularly when it is evident from the outset that family members may not be fully on board with the individual's decision to donate or application of the legislation but opt to honour their loved one's decision or the law.

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

P0030: Pancreas transplantation for severe Trypanophobia: When only insulin independence is enough

Dr Tjun Wei Leow[1,2], Mr Daniel Doherty[1,2], Mr Hussein Khambalia[1], Mr Raman Dhanda[1], Mr David Van Dellen[1]

[1]Department of Renal and Pancreas Transplantation, Manchester University NHS Foundation Trust, Manchester, United Kingdom. [2]University of Manchester, Manchester, United Kingdom

Introduction: Pancreas transplant alone (PTA) for patients with complicated Type 1 Diabetes Mellitus (T1DM), offers improved glycaemic control, insulin independence and prevention or mitigation of diabetic sequelae. It has strict eligibility criteria which include severe hyperglycaemia, hypoglycaemic unawareness, or psychological instability due to T1DM. We describe a case fulfilling the latter criteria.

Case-presentation: A 53 year old woman with T1DM of 46 years duration and severe trypanophobia underwent a successful pancreas transplant alone (PTA), following exceptional listing. She could not tolerate capillary blood glucose testing and exogenous insulin injections, resulting in inadequate glycaemic control (HBA1C – 60mmol/mol) and extensive diabetic complications (neuropathy, retinopathy, and angina). Psychological interventions were exhausted to manage trypanophobia before consideration of alternatives to improving glycaemic control, including pump technology and islet transplantation, but pancreas transplant was considered the preferred option to overcome this. This was discussed internationally due to absence of conventional indications for a pancreas transplant with a final recommendation to proceed with PTA due to her debilitating condition.

Outcome: A PTA from DBD donor was performed in February 2015 without complication. Post-operatively, she developed hospital acquired pneumonia, treated with intravenous antibiotics and discharged after 16 days. She had an episode of tacrolimus toxicity in 2019 which was managed with dose adjustments. In 2022, she was diagnosed with anal cancer (T2N0M0) and has successfully completed combined chemo-radiotherapy. At 8 years follow-up, she has good glycaemic control (HBA1c 40mmol/mol), remains insulin independent (Igls Function Status: optimal) with stable renal function (eGFR-83mL/min).

Conclusion: PTA is conventionally performed to improve glycaemic control and mitigate against complications of T1DM with the aim of insulin independence. PTA was performed in this case to achieve insulin independence to facilitate needle freedom and improved glycaemic control. Long term risks of immunosuppression must still be considered after successful PTA but provide a valuable alternative to psychological limitations.

Category: Clinical - pancreas and islet (pancreatic transplant (all types) - surgery - recipient clinical care and management)

P0031: iMacs as a reliable model system for Allogeneic Mixed Lymphocyte reaction assessment

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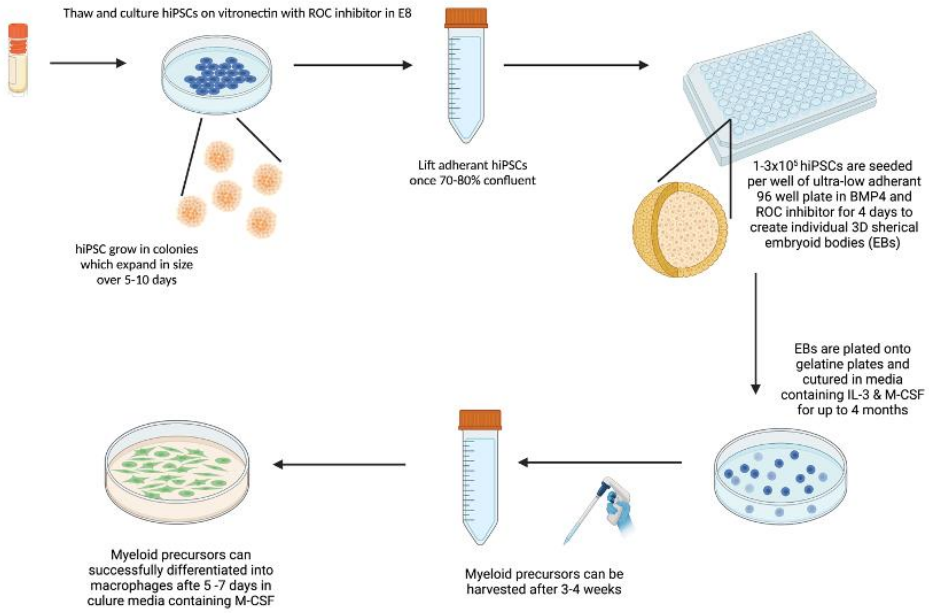
[1]KCH, London, United Kingdom. [2]KCL, London, United Kingdom. [3]NIH, Washington, USA

Introduction: This work is the first example of the novel use of iMacs: macrophages differentiated from human induced Pluripotent Stem Cells (hiPSCs), as a model tool to examine allo-antigen presentation and subsequent allo-specific T cell responses.

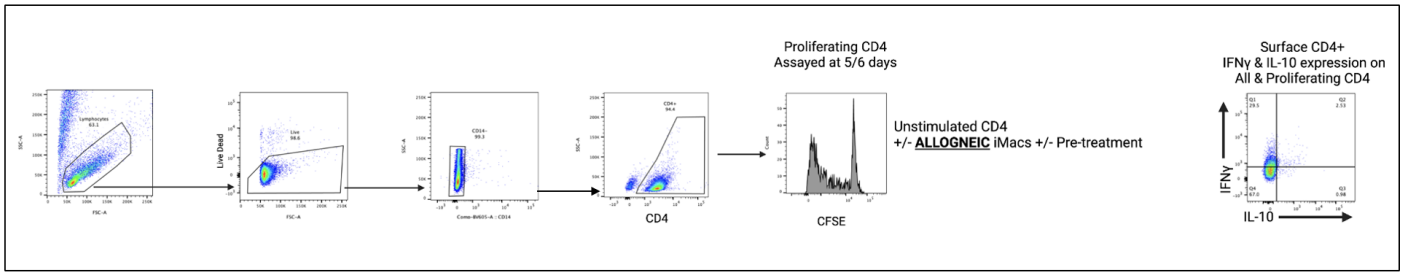
Modelling macrophage phenotype & function is ethically and logistically challenging; implementing human primary monocyte-derived macrophages (MDMs) requires large volumes of blood to be venesected from donors repeatedly, owing to limited availability & capacity for expansion. Moreover, MDMs exhibit high variability and resistance to genetic manipulation, while leukaemia-derived cell lines often lack full phenotypic and functional representation of human MDMs. iMacs offer a transformative alternative, boasting nearly unlimited availability, superior representation of MDM characteristics, and amenability to genetic manipulation.
While primary MDMs and dendritic cells differentiated from hiPSC have been used in co-culture with T cells as a mixed lymphocyte reaction (MLR) to examine allo-antigen response, there has been very little research into the antigen processing and presenting capabilities of iMacs.

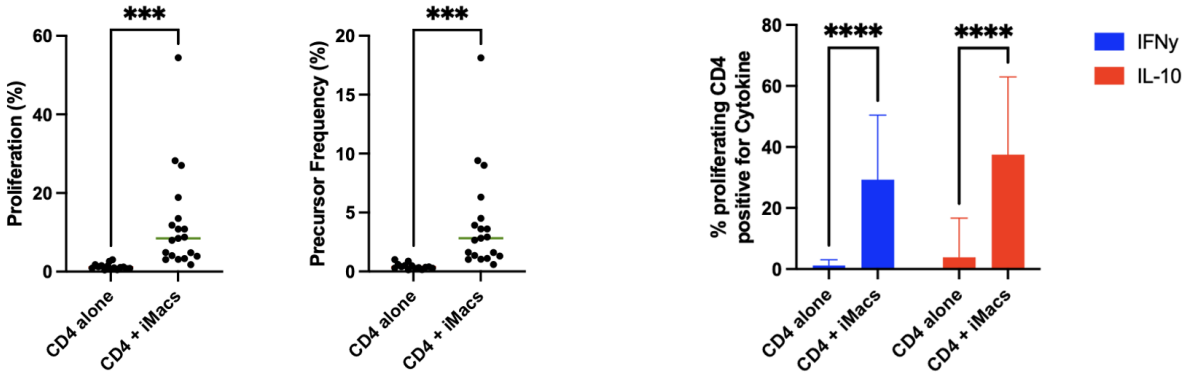
Methods: This project developed and optimised a new multi-step protocol to consistently generate high yields of terminally differentiated iMacs.



Subsequently, we evaluated the impact of iMacs as "allogeneic stimuli" in an MLR setting. We quantified Th1 cell proliferation through CFSE dilution (% CFSElow cells) at 6 days in co-culture, analysing samples via flow cytometry to ascertain the percentage of CFSE positive and CD4 cells that underwent division. Additionally, Th1 cytokine expression was examined.

Results:
CD4+ proliferation, six days post-co-culture with allogeneic iMacs, aligned closely with previously reported proliferation and precursor frequency values following MLR.





Discussion: To the best of our knowledge this is the first use of iMacs in an MLR as a tool to investigate & demonstrate allo-antigen processing and presentation to T effector cells. iMacs are an ideal flexible, genetically tractable, physiologically relevant model system to study fundamental macrophage phenotype, function, including antigen presentation & processing.

Category: Basic and translational science (as per category - all science)

P0032: Tacrolimus profiles provide proof of concept of the utility of once-daily formulations to reduce adverse effects

Dr Tina Thomson[1,2], Dr Michelle Willicombe[1,2], Dr Janet Lee[2]

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Introduction: Tacrolimus is an effective immunosuppression agent, but has a narrow therapeutic window and is associated with nephrotoxicity in the long term. Doses are commonly adjusted to target a pre-defined trough level, however, the metabolism of doses varies significantly between patients. Once daily formulations are increasingly used, but less is known about their metabolism or how they compare with twice-daily preparations.

Methods: Analysis of all tacrolimus profiles performed over 5 years were analysed. Tacrolimus profiles involved the serial measure of tacrolimus levels over eight hours, starting pre-dose, then at 0.5, 1, 1.5, 2, 3, 4, 6 and 8 hours post. From that area under the curve were calculated (AUC ug.h/l). Other data analysed included time to peak level and dose of tacrolimus.

Results: 180 individual levels were analysed, and the majority 157(87.2%) were performed in patients taking immediate-release tacrolimus. 13 patients had profiles performed, before and after switching from immediate-release (IR) to extended-release (ER) preparations. The median age was 53 (40-62) years, the majority were male 112(62.2%) and only 38(21.1%) were white; there were no differences in characteristics between the IR and ER groups.

There was no statistical significance in the total daily dose, time to peak level, peak level or AUC in patients prescribed IR compared with ER overall, Table 1. However, paired analysis of the measured parameters before and after switching from IR to ER, showed significant reductions in median peak level and clinically meaningful reduction in AUC, Table 2.

Discussion: This study has shown significant reductions in the peak level of tacrolimus and total AUC when using once-daily formulations compared with twice-daily immediate release. As well as being a simple regimen, reduction in peak levels and AUC may reduce complications such as BK virus and nephrotoxicity without compromising efficacy.

Table 1.

		IR	ER	
Total Cases	N	157	23	*p-value*
Peak Levels (ng/ml)	Median(IQR)	22.4(15.5-30.7)	18.5 (15.3-23.8)	0.11
Time to peak levels (hrs)	Median(IQR)	1.82 (1.0-3.0)	2.0 (1.0-4.0)	0.15
Total Dose (mg/day)	Median(IQR)	12(6-18)	15 (9-20)	0.30
AUC (microgram. h/lit)	Median(IQR)	98 (78-122)	88 (74-104)	0.20

Table 2.

		IR-FK	ER-FK	
Total Cases	N	13	13	*p-value*
Total Dose (mg/day)	Median(IQR)	16 (12-22)	15 (9-18)	0.11
Peak level ng/ml	Median(IQR)	29 (25-40)	17 (15-24)	0.0019
AUC (microgram. h/lit)	Median(IQR)	124 (95-152)	86 (60-101)	0.05

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

P0033: BKV viraemia in renal and renal/pancreas transplant recipients: Does the type of induction therapy influence outcomes?

Dr Rafia Waheed, Dr Zobaid Hoque, Ms Sharon Warlow, Ms Bethan Travers, Dr Sarah Browne, Dr Pramod Nagaraja

University Hospital of Wales, Cardiff, United Kingdom

Introduction: BK Virus associated nephropathy (BKVN) is a significant complication of renal transplantation. Here, we present the results of a BKV screening programme involving blood BKV-PCR testing monthly for the first 6-months post-transplantation, and then every 3-months until 1-year.

Methods: 283 patients who received a kidney (n=267) or SPK transplant (n=16) between December 2020 and October 2023 with at least 30-days follow-up are included in this retrospective analysis. Induction was primarily with ATG or Alemtuzumab with Tacrolimus and Mycophenolate maintenance. We analysed the incidence of BKV viraemia, rejection and graft outcomes.

Results: Median follow-up was 17.5 months (range 1.5-35.5). Overall, 42/283 recipients (15%) tested positive for BKV after a median post-transplantation time of 2.5 months (range 1.5-9 months); 3/16 with SPK and 39/267 with a kidney transplant, p=0.56.

The incidence of viraemia was numerically higher in those who received Alemtuzumab (18%, ATG 11%, p=0.14). Of the 42 BKV-positive patients, those who received Alemtuzumab (n=29) had a numerically shorter time to diagnosis (median 2.3 months) compared to those who received ATG (n=13, median 3.5 months, p=0.12). Clearance of viraemia was similar between the two groups after immunosuppression modification (ATG 77% vs Alemtuzumab 86%, p=0.48).

By logistic regression, a significant risk-factor for BKV-viraemia in kidney-recipients was increasing age (OR 1.04, p=0.04) while the type of induction, gender and re-transplantation were not statistically significant.
The incidence of biopsy-proven acute rejection was similar in BKV-positive and BKV-negative patients (11% vs 8%, p=0.42). There was one death-censored graft loss in the BKV-negative group and none in the positive group.

Discussion: The incidence of BKV viraemia was 15% which is similar to previous reports when using lymphocyte-depleting agents and Tac-MMF combination. Early immunosuppression reduction appeared safe in the short-term. There was a trend towards an earlier and higher incidence of viraemia with Alemtuzumab but viraemic clearance was similar to ATG.

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

P0034: Outcomes of BK virus infection in kidney and kidney/pancreas transplant recipients – results from a screening programme

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University Hospital of Wales, Cardiff, United Kingdom

Introduction: Outcomes from routine screening for BKV viraemia in kidney and kidney/pancreas recipients have not been widely reported in the UK. Here, we present the outcomes of BKV infection detected during a screening programme started in December 2020.

Methods: Screening involved blood BKV PCR testing monthly for the first 6-months post-transplantation, and then every 3-months until 1-year. Monitoring of BKV-positive patients and pre-emptive immunosuppression (IS) reduction was done according to departmental protocol. In this retrospective study, viraemia trends and graft outcomes were analysed in 42 of 283 recipients who became viraemic.

Results: Mean recipient age was 53±13 years; incidence was 11% amongst women, 17% amongst men (p=0.14). First BKV positivity occurred after a median time from transplantation of 2.5 months (range 1.5-9 months). Viraemia at initial diagnosis was <4 log10copies/ml in 24 recipients, 4-5 log10copies/ml in 11 and >5 log10copies/ml in 7 recipients. Mean log10copies/ml at diagnosis was 4.06±0.93 and the mean peak was 4.5±0.93.

IS reduction was done in 31 recipients - 27 with a peak log10copies/ml of >4 and 4 with a log10 of <4. Four patients received Leflunomide. Clearance of viraemia has occurred in 36/42 (83%) recipients after a median duration of 2.4 months (range 0.5-6.3), including in 11 patients in whom IS was unchanged.

Mean S. creatinine level at 12-months post-transplantation was lower compared to the level at BKV-viraemia diagnosis (mean 115±44 vs 131±68 µmol/l, p=0.05). There was no correlation between the initial or peak viraemia level and 12-month S. creatinine level.

Nine recipients underwent a graft biopsy – 4 had BKVN, 1 ATN, 3 acute cell-mediated rejection and 1 combined BKVN and rejection. All rejection episodes were steroid-responsive.

Discussion: Despite the high incidence of BKV-viraemia, early immunosuppression reduction or observation alone resulted in clearance of viraemia in most recipients with preservation of graft function.

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

P0035: Oxygenated machine preservation of multi-visceral blocks for transplantation in a large animal model

Mr Rohan Bhattacharjya[1], Dr Dylan Barnett[1,2], Mr Akshay Kanhere[1], Mr Jake Bastian[1], Mr David Daniel[1], Dr Andrew Ruszkiewicz[3], Mr Shantanu Bhattacharjya[2,1]

[1]University of Adelaide, Adelaide, Australia. [2]Central Adelaide Local Health Network, Adelaide, Australia. [3]University of South Australia, Adelaide, Australia

Introduction: The current practice of organ preservation relies on either hypoxic or oxygenated static cold storage using hypertonic solutions, or normothermic preservation with blood in a modified ECMO device.
In nature, both prokaryotic and eukaryotic cells derive oxygen and nutrients from their surrounding fluid medium at temperatures from 4 to 39°C.

This pilot study investigates whether a multi-visceral block can be preserved in an acellular, oxygen-enriched balanced buffered electrolyte solution at ambient temperature less than 39°C.

Methods: A multi-visceral block comprising of the liver, pancreas, small bowel, and kidneys was retrieved from four 80kg Yorkshire pigs with an in-situ flush of cold saline and UW solution. The block was then perfused with an oxygen-enriched, balanced buffered electrolyte solution (Table 1) with albumin at a concentration of 4g/dl and TPN (BaxterTM) @25ml/kg. 10mg/dL of creatinine was added. The mean PaO2 achieved was 265mmHG.
The block was perfused using a peristaltic pump at a pressure of 30 to 40mmHg. Reperfusion was on a normothermic preservation rig as a surrogate to transplantation with whole blood at 60mmHg.

Results: All blocks demonstrated oxygen consumption accompanied by glucose utilization, ATP production, a physiological response to enteral glucose and renal creatinine clearance. Histological examination and comparison of the blocks from before retrieval to end of preservation and after reperfusion by a blinded senior histopathologist showed no significant change.

Discussion: The study demonstrates the feasibility of preserving a multi-visceral block with an oxygenated simple buffered electrolyte solution at ambient temperature. The advantage of not being constrained by temperature allows for the creation of simpler, more cost-effective preservation for transplantation.

Table 1:

Electrolyte	**Concentration (mmol/L)**	**Electrolyte**	**Concentration (mmol/L)**
Na^+	138.00	Ca^{2+}	1.25
HCO_3	32.00	K^+	3.00
Mg^{2+}	0.50	CH_3COO^-	3.00
Cl^-	109.50	$C_6H_{12}O_6$	5.6
Osmolarity	293 mosmol/L		

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

P0036: Boiling water ATP tissue extraction: A novel benchmarking technique for organ viability assessment

Mr David Daniel[1], Mr Rohan Bhattacharjya[1], Mr Jake Bastian[1], Mr Akshay Kanhere[1], Dr Dylan Barnett[1,2], Assoc Prof Shantanu Bhattacharjya[1,2,3,4]

[1]University of Adelaide, Adelaide, Australia. [2]Discipline of General Surgery, Central Adelaide Local Health Network (CAHLN), Adelaide, Australia. [3]Discipline of Transplantation Surgery, Royal Adelaide Hospital, Adelaide, Australia. [4]Preclinical, Imaging, and Research Laboratories, SAHMRI, Adelaide, Australia

Introduction: ATP is a fundamental and universal molecule, functioning as the primary energy source in biological cells, tissues, and organ systems. Therefore, measurement of ATP is a quantitative, objective test of cell efficiency, health and overall viability. We propose a novel method of ATP measurement from tissue samples, which can be completed simultaneously with organ preservation. In the context of machine perfusion and organ resuscitation, this can allow for real time assessment of viability, reversibility and greater insight in selecting marginal organs for transplant.

Methods: Tissue samples from 24 porcine kidneys and 12 livers, were collected at 4 time points before and during a multi-organ block ex-vivo machine preservation. Core biopsy guns standardised tissue sample radius, and length was recorded using callipers. Tissue samples were snap frozen using liquid nitrogen on preprepared cork bases, and immediately stored at -20°C. After 6 hours, the samples were transferred to a -80°C freezer to prevent ATP degradation. Later, tissue samples were placed in boiling distilled water, lysed using a sonicator machine and centrifuged. The homogenised lysed tissue sample was mixed with a luciferase ATP assay mix and placed in a luminometer. Bioluminescence ATP measurement was completed 5 times for each homogenised tissue sample and results were averaged.

Results: The ATP assays were repeated 5 times, and the five values showed stable results upon luminometry, implying successful homogenisation and extraction of ATP from the tissue cores using the boiling water method.

Intuitively, one would expect that ATP levels would drop during the anoxic period post retrieval, until perfusion, and then increase. This was reflected in the results.

Discussion: The novel method was successful in demonstrating an efficient means of tissue sample ATP measurement. We anticipate this as highly useful in real-time assessment of organ viability, especially in marginal organ donors being preserved for transplant.

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

P0037: Pharmacokinetics of Envarsus in paediatric kidney transplant recipients: Phase 1 pilot conversion study

Dr Jon Jin Kim[1], Ms Laura Lawless[1], Dr David Marshall[2], Dr Andrew Maxted[1], Dr Andrew Lunn[1], Dr Meeta Mallik[1], Mr Alun Williams[1]

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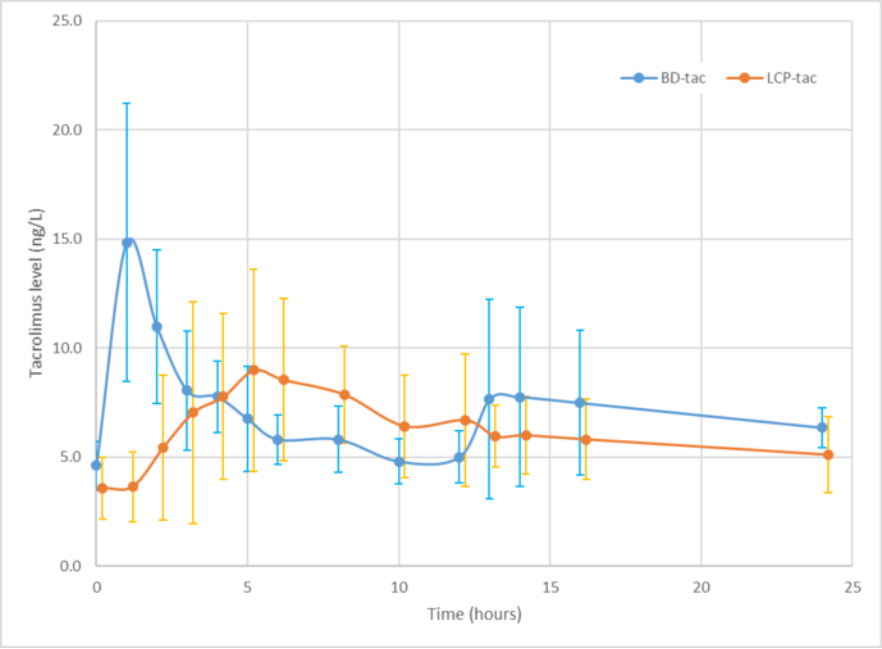
Introduction: Tacrolimus is the standard immunosuppressant for paediatric kidney transplants and is routinely administered twice daily (BD-tac). Envarsus (LCP-tac), an extended-release formulation, is approved for adults but not in paediatrics.

Methods: We conducted a pilot open-label phase 1 study in stable paediatric kidney transplant recipients (age <18 at the time of study). Our primary objective was to compare the pharmacokinetics (Pk) of LCP-tac versus BD-tac. We conducted two 24-hour Pk studies: pre-conversion (BD-tac) and four weeks post-conversion to LCP-tac. Patients were followed for six months, with the option to continue LCP-tac.

Results: Five patients completed the study, with no returns to BD-tac. Median age was 15 years (range 11-17). LCP-tac exhibited an extended release profile versus the bimodal profile of BD-tac [Figure 1]. Time to maximum concentration was delayed (5 hrs vs. 1 hr), and maximum concentration was lower (9.9 ug/L vs. 14.4 ug/L). Tacrolimus area under the curve (24 hr) was comparable (141 ±46.5 ug/L vs. 164 ±27.8 ug/L). No new safety concerns arose. There was no rejections and no difference in eGFR at the study's end (1.5 ml/min/1.73m2, range -1.7 to 2.3 ml/min/1.73m2). Concentration/dose ratio was higher in LCP-tac (1.8 ±0.64 vs. 0.8 ±0.39). The final conversion ratio was 0.6 (BD-tac:LCP-tac).

Conclusion: Our pilot study confirms the extended-release Pk profile and improved absorption of LCP-tac compared to BD-tac. A larger study is needed to further evaluate the population Pk characteristics in the children.



Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

P0038: It isn't all about the organ: A single centre patient perspective on social and psychological support through the transplant journey

Mr Stephen Bond, Miss Liz Mowlem, Ms Kim Carey, Mrs Aimee Cousins, Miss Ellie Pinkney

Cambridge University Hospitals, Cambridge, United Kingdom

Introduction: Recent national events have pushed the UK into a socio-economic crisis. Anecdotally, this has left many transplant patients facing increased financial and mental health challenges. We wanted to gain a wider understanding of our patient experiences of social and psychological support provided throughout their transplant journey.

Methods: We conducted an anonymised patient survey exploring patient experiences of social and psychological care at our centre. 600 questionnaires were posted out to a randomized cohort of patients who had received a transplant at our centre within the last 5 years. 161 (26%) responses were included in the analysis, with responses from 76 liver, 66 kidney, 9 pancreas and 10 bowel recipients.

Results: A total of 40% of patients felt they would have benefited from provision of social support, with a similar number (41%) identifying they received adequate social support. The types of social support patients felt would have benefited them included: hospital transport 61%, personal independence payment 56%, cost of living support 49%, housing 15%, and child/dependent allowance 6%.

Whilst 53% of patients felt they would have benefitted from provision of psychological support, only 36% felt they actually received adequate psychological support. The types of psychological support patients felt they required included: counselling 80%, patient/peer support 35%, post-ICU support 33%, psychological therapies 32%, and spiritual support 11%.

Individual quotes that highlighted the patient experience included "the process is driven by the medical model. Patients should be treated holistically" and "I struggled mentally, had feelings of guilt, I had to wait a long time for support".

Discussion: A significant number of patients felt that both social and psychological care/support is important to them. Our current provision is something that may be lacking in the care model we have. Results have given focus for future service improvements in providing a holistic care model.

Category: Psycho-social aspects (recipient - donor - family care- MDT (exclude clinical management)

P0039: Short-term machine preservation with acellular oxygenated perfusate at room temperature is not inferior to static cold storage for deceased donor kidneys

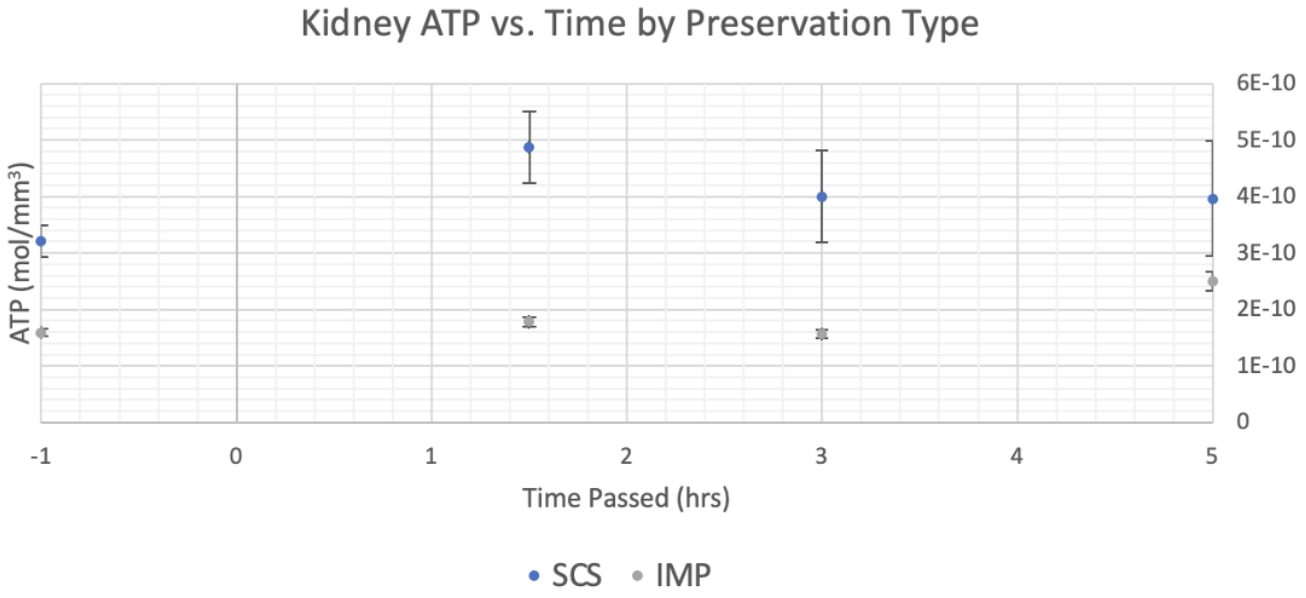
Dr Dylan Barnett[1,2], Mr Rohan Bhattacharjya[2], Mr Jake Bastian[2], Mr Akshay Kanhere[2], Mr David Daniel[2], A/Prof. Shantanu Bhattacharjya[1,2]

[1]Royal Adelaide Hospital, Adelaide, Australia. [2]The University of Adelaide, Adelaide, Australia

Introduction: Preservation of organs using oxygenated machine perfusion (MP) offers the ability for graft assessment, resuscitation and addressing the cumulative oxygen debt that occurs prior to transplantation. Static cold storage (SCS) remains the benchmark in renal preservation. Normothermic preservation while feasible, has not gained widespread popularity due to technical complexity and cost barriers. Tissue ATP measurement mirrors mitochondrial function in an allograft and can be used to assess preservation quality. This study aimed to establish whether short-term machine preservation with acellular oxygenated perfusate at room temperature, termed isothermic machine perfusion (IMP), is non-inferior to SCS for deceased donor kidneys in a large animal model.

Methods: Following local ethics approval, organs were retrieved from 10 adult female large white pigs (mean weight 74.6kg). 8 kidneys were preserved with SCS and 8 with IMP for 5 hours. Core biopsies were taken at beginning of retrieval then at 90-minute intervals during preservation, snap frozen and stored at -80°C. ATP from core biopsies was extracted using a validated boiling water extraction method and measured using a luciferase bioluminescent assay (FLAA, Sigma-Aldrich) with a TD-20/20 luminometer (Turner Designs). A two-way ANOVA test was conducted with significance set at $p<0.05$.

Results: Baseline ATP levels were 3.21 x 10^{-10} mol in the SCS group, compared to 1.58 x 10^{-10} mol for IMP. During preservation, the ATP concentration rose in the IMP group to 2.49 x 10^{-10} mol. The ATP levels in SCS remained relatively stable during preservation reaching 3.96 x 10^{-10} mol after 5 hours. A two-way ANOVA test of ATP levels after preservation was conducted, yielding a P-value of 0.37, indicating no significant statistical difference, thus implying non-inferiority.



Discussion: IMP is non-inferior in preserving cellular ATP levels compared with SCS. More work is required to demonstrate if this finding correlates to improved organ function during preservation and following transplant.

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

P0040: Liver transplant recipients with an ileostomy have higher rates of chronic kidney disease at 1-year

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Introduction: Ileostomy formation predisposes to volume depletion, acute kidney injury (AKI) and chronic kidney disease (CKD). CKD is common post-liver transplantation (LT), with an approximate prevalence of 40% at 1-year. This single-centre cohort study investigated post-LT renal function in LT recipients with ileostomies.

Methods: All patients undergoing LT at our institution from 01/09/2012 to 01/09/2022 with ileostomies (n=19) were compared to those with an ileal pouch-anal anastomosis (IPAA) (reference group) (n=15). Data was collected retrospectively from electronic patient records. Post-operative CKD was defined based on a sustained eGFR <60 mL/min/1.73m2 at 1-year.

Results: Patient characteristics and LT details are shown in **Table 1**. There was no difference in sex, age, creatinine or MELD at time of LT between the two groups. Renal-sparing induction therapy with an interleukin 2 receptor antibody (IL2Ra) was employed in 26% and 27% of the ileostomy and IPAA group, respectively (p=0.98). AKI rates were similar in the ileostomy and IPAA groups (37% vs 40%, p=0.85 and 16% vs 20%, p=0.75 at 48 hours and 7-days post- LT, respectively). 2 patients with ileostomies, and 1 with an IPAA, required RRT immediately post-LT. No patients required long-term RRT. At 1-year 61% of the ileostomy group were on a calcineurin inhibitor (CNI) sparing regimen with mycophenolate mofetil compared to 23% of the IPAA group (p=0.03). At 1-year 75% of the ileostomy group had developed CKD (42% CKD Stage 3a, 33% CKD Stage 3b) compared to 31% (15% CKD Stage 3a, 15% CKD Stage 3b) of the IPAA group (p=0.03).

Discussion: Post-LT CKD is more common in patients with ileostomies. Peri-operative aggressive stoma management and fluid replacement should be employed. Renal-sparing induction therapy and early use of a CNI-sparing regimen should be considered in this patient cohort independent of pre-LT eGFR.

Variable	A: Ileostomy group (n=19)	B: IPAA group (n=15)
Age (years)	53 (39-54)	43 (31-62)
Male sex	13 (68%)	12 (80%)
Reason for colorectal surgery	12 (63%): UC 4 (21%): Crohn's disease 2 (11%): Ischaemic bowel 1 (5%): Intraoperative bowel perforation	13 (87%): UC 2 (13%): Colorectal cancer in UC
Aetiology of liver disease	12 (63%): PSC 4 (21%): Re-do LT 1 (5%): Budd-Chiari syndrome 1 (5%): MASLD 1 (5%): AIH	8 (53%): PSC 3 (20%): Re-do LT 2 (13%): AISC 1 (7%): PSC/AIH overlap 1 (7%): Seronegative ALF
Pre-LT CKD (eGFR <60mL/min/1.73m^2)	1 (5%)	1 (7%)
Pre-LT diabetes	2 (11%)	2 (13%)
Creatinine (µmol/L) at LT	86 (74 -109)	74 (67-100)
MELD at LT	20 (14-24)	19 (10-29)
RRT at LT	3 (16%)	0 (0%)
DCD organ	3 (16%)	2 (13%)
EBL (mL) at LT	4500 (1750-10000)	2600 (2000-7500)

Table 1. Patient Characteristics. Data presented as median (interquartile range) or number (percentage).

Category: Clinical - liver and intestinal (liver - small bowel - surgery - transplant hepatology - recipient clinical care and management)

P0041: Novel antibody response against the HCMV glycoprotein B vaccine could elicit cross-herpesvirus immunity to HSV-1

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Introduction: Human cytomegalovirus (HCMV) belongs to the family of human herpesviruses (HHV) -ubiquitous pathogens characterised by their ability to establish latency within the host, as well as the associated clinical burden in immunocompromised and immunonaïve populations. Glycoprotein B (gB) is a fusogenic envelope protein present within the repertoire of all HHV, sharing high levels of structural, functional and immunogenic homology. Three separate Phase II trials of a recombinant gB HCMV vaccine have demonstrated 43-50% protection with total gB antibody titre representing the correlate of protection in solid organ transplant recipients. However, the mechanism of protection remained unclear but it was clear we could not explain protection via classic antibody neutralisation.

Methods: We have combined studies of human sera from vaccine recipients with an analysis of an AD-6 antibody generated in rabbit for anti-viral activity in vitro and combined this with in silico approaches to define AD-6 in multiple HHVs

Results: Epitope mapping of the antibody response in gB vaccinated transplant recipients identified a component to the humoral immune response in gB vaccinees which is directed against a novel antigenic domain (AD) we have termed AD-6. Importantly, AD-6 responses were a correlate of protection post-transplant. A rabbit polyclonal AD-6 antibody was shown to be non-neutralising against cell-free HCMV but potently blocked the cell-to-cell spread of HCMV. Using in silico approaches we have identified potential AD-6s in other HHVs based on high conservation of structure and physicochemical properties, despite only relatively low amino acid similarity. Interestingly, we provide evidence that the rabbit-derived HCMV-specific AD-6 polyclonal antibody recognises AD-6 in other HHVs, and limits cell-to-cell spread of other HHVs in vitro.

Conclusions: We have identified a novel vaccine-induced response in HCMV gB vaccinated transplant patients which targets a structurally conserved region of gB within HHVs with the potential for cross-herpes virus activity.

Category: Basic and translational science (as per category - all science)

P0042: Investigating the impact of ethnicity on outcomes in kidney transplantation

Dr Alice Gage[1], Dr Amy Needleman[1], Ms Abby Hobill[1], Dr Maryam Javed[1], Dr Felix Karst[1], Dr Azhar Ali Khan[1], Dr Ria Nagpal[1], Dr Graham Shirling[2], Dr Ray Fernando[2], Dr Rhys Evans[3]

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Introduction: Ethnicity has been shown to impact access to kidney transplantation (KT). However, the reasons for this and outcomes post KT in different ethnic groups are less well explored. We investigated the clinical characteristics and outcomes from KT at a centre where black and minority ethnic (BAME) groups constitute the majority of the kidney replacement therapy population.

Methods: Patients undergoing kidney alone transplantation at a single UK centre between 2012 and 2023 were included. Demographic and clinical data were recorded prospectively. We compared variables between White, Asian, and Black recipients, and determined patient and allograft survival over 5 years of follow-up.

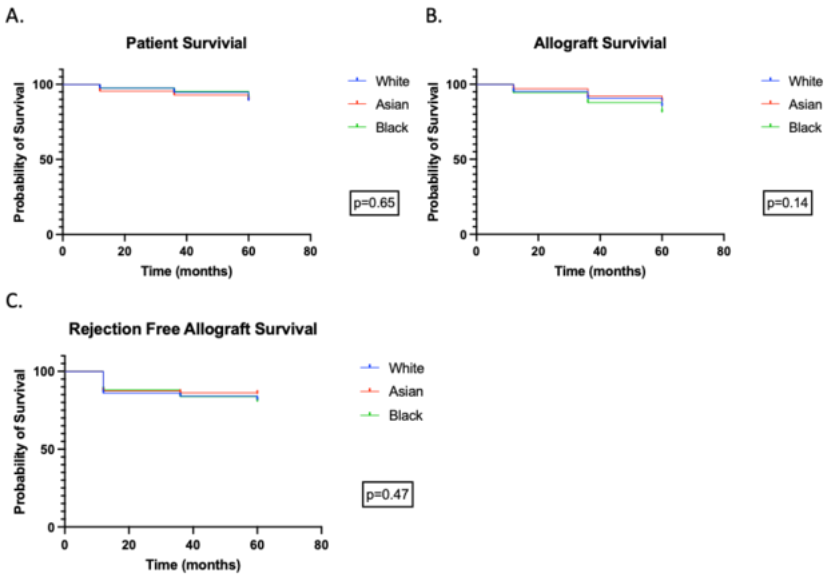
Results: 1348 patients were included; of these 624 (45.3%) were White, 414 (30.0%) Asian and 340 (24.7%) Black. Blood group distribution was different between groups. BAME patients waited longer for KT and less commonly underwent pre-emptive, living donor, or ethnicity matched KT (**Table**). These variables were worst in Black recipients, who also had a higher proportion of highly sensitised recipients. Black recipients had a higher creatinine at a 1-, 3- and 5-years post KT. Whilst tacrolimus intrapatient variability was greater in Black recipients, there was no difference in rejection rates between the groups at any of these timepoints. Moreover, ethnicity did not impact patient and allograft survival in either univariable or multivariable analyses (**Figure**).

Discussion: BAME patients, in particular black recipients, waited longer for KT and were less likely to undergo pre-emptive or living donor KT. Creatinine was higher during follow-up in black recipients, but patient and allograft survival were not different between ethnic groups.

Table: Demographic and baseline clinical characteristics in White, Asian, and Black kidney transplant recipients

Clinical Variable	White	Asian	Black	p value
	n = 624	n = 414	n = 340	
Age at KT (median, IQR)	51 (39-60)	54 (40-62)	51 (42-58)	0.83
Sex (male; n, %)	425 (68.2%)	250 (60.2%)	200 (59.2%)	**0.0048**
Blood group (n, %):				
A	294 (47.1%)	113 (27.2)	97 (28.5)	**<0.0001**
AB	36 (5.8%)	33 (9.8%)	13 (3.1)	
B	61 (9.8%)	103 (25.1)	56 (16.8)	
O	233 (37.5%)	165 (39.8)	173 (48.2)	
Time to KT (days; median, IQR)	629 (334-1056)	731 (420-1313)	1151 (605-1766)	**0.05**
Time to KT after 2019 (days; median, IQR)	637 (313-1054)	927 (515-1297)	1113 (699-1660)	0.68
Pre-emptive KT (n; %)	192 (30.8%)	84 (20.2%)	46 (13.5%)	**<0.0001**
Type of KT (n; %):				
Live	223 (35.7%)	103 (24.8)	19 (5.5%)	**<0.0001**
DBD	254 (40.7%)	186 (44.9%)	196 (57.6%)	
DCD	148 (23.7)	126 (30.4%)	125 (36.7%)	
Ethnicity matched KT (n, %)	539 (86.4%)	100 (24.1%)	55 (16.1%)	**<0.0001**
cRF >85% (n; %)	53 (8.5%)	47 (11.3%)	54 (15.8%)	**0.0023**

Figure: Patient survival (**a**), allograft survival censored for patient death (**b**), and rejection free allograft survival (**c**) in White, Asian, and Black kidney transplant recipients.



Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

P0043: Association between delayed graft function and BK virus infection after kidney transplantation

Dr Thidarat Kitrungphaiboon[1], Miss Felicity Evison[2], Miss Suzy Galier[2], Dr Adnan Sharif[2,3]

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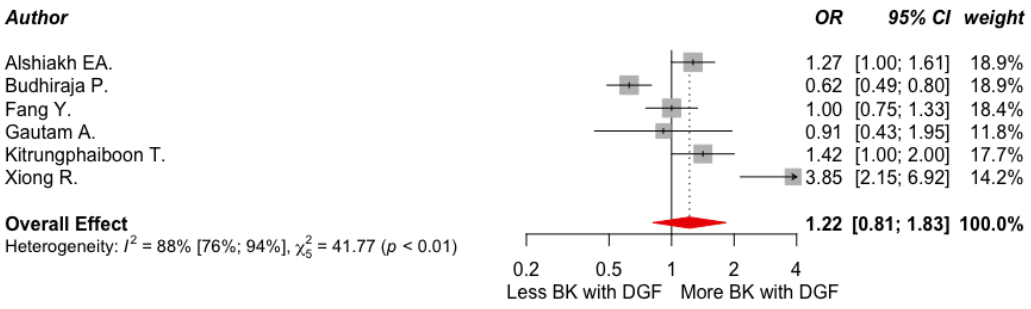
Background: An association between delayed graft function (DGF) and BK infection is controversial. We investigated this by; (1) a retrospective review of a single-centre cohort, and (2) a systematic review and meta-analysis of published studies.

Methods: Firstly, data was extracted from hospital informatics systems for all kidney allograft recipients transplanted at our centre between 01/01/2007 and 30/06/2018. Positive BK virus results were defined as >200 copies/ml, while DGF was defined as need for dialysis within the first post-operative week. Univariate analysis was undertaken, with any variable with p-value <0.15 inputted into a multivariate logistic regression model. We then undertook a systematic review of published studies in MEDLINE. Meta-analysis was performed using the DerSimonian-Laird random effects model using R (version 4.3.2).

Results: In our single-centre analysis, data was analysed for 1,770 kidney transplant recipients with median follow up 5.3 years (IQR 2.7-8.7 years). BK virus was associated with (versus without); male sex (8.3% versus 5.3% respectively, p=0.010), ABO-incompatible transplantation (12.7% versus 5.9% respectively, p=0.021) and DGF (9.0% versus 6.3% respectively, p=0.032). In a multivariate analysis, only recipient male sex (OR 2.051 [95% CI 1.196-3.519], p=0.009 and ABO-incompatible transplantation (OR 4.087 (95% CI 1.847-9.042], p=0.001) had an association with BK infection. In a systematic review of published literature, we identified 5 studies meeting our search criteria and performed a meta-analysis of empirical data including and excluding our Birmingham cohort data. No significant association was observed between DGF rates and BK infection either including (see Figure below) or excluding Birmingham data (HR 1.19, 95% CI 0.74-1.91).

Conclusion: We did not identify any association between DGF and subsequent BK infection. However, limitations in our single-centre (e.g., confounders, missing data) and significant heterogeneity in published studies may limit data interpretation. Prospective studies exploring DGF outcomes should ensure inclusion of BK infection as a secondary outcome for further clarity.



Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

P0044: Retrospective evaluation of kidney donor risk indices in renal transplantation at St George's Hospital

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Introduction: End-stage kidney disease (ESKD) represents a rising global health concern, associated with impaired quality of life and high mortality rates. Renal transplantation is the cost-effective treatment for ESRD. Decline rates for standard criteria DCD offers at St Georges (April2020-March 2023) ~50% while UK DCD decline rates approach 62%. We recognized the need of analysing existing scoring systems to optimise graft allocation and improve transplant outcome.

Methods: This is a retrospective audit. Data was extracted from historic donor forms acquired from NHSBT. It included all deceased donor transplants at St Georges from 01-01-2018 to 31-12-2018.Exclusion criteria: Incomplete donor details, missed follow-ups, Brighton patients. All the deceased donors were scored on two scoring systems; KDPI and UK KDRI. Primary outcome was kidney transplant survival at 1 and 3 years in comparison to the predictive value of the two scoring systems.

Results: Our study included 76 transplants. Mean age of our recipients was 52 years with 60% of the patients being males. RRT modality in 80% of our patients was HD. Mean KDRI for our donor cohort was 1.302 and mean KDPI was 58.8%. r-value for KDPI v/s creatinine at 1 mo, 1 yr and 3 yrs were 0.073, 0.048, 0.157 respectively; r-values for KDRI v/s creatinine at 1 m0, 1 yr and 3 yrs were 0.137, 0.056 and 0.076 respectively. We failed to find any correlation between the donor scoring systems and kidney graft survival at 1 and 3 years' time.

Discussion: KDPI/KDRI is designed only to capture the donor factors that are predictive of graft outcome. Transplant outcomes are also affected by other factors not included in these scoring systems, such as recipient age, diagnosis and transplant program performance. We also analysed these scoring systems by selecting the donors who scored more than 70% and found no difference.

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

P0046: Use of Campath (alemtuzumab) for treatment of steroid resistant rejection after kidney transplantation: A single-centre experience

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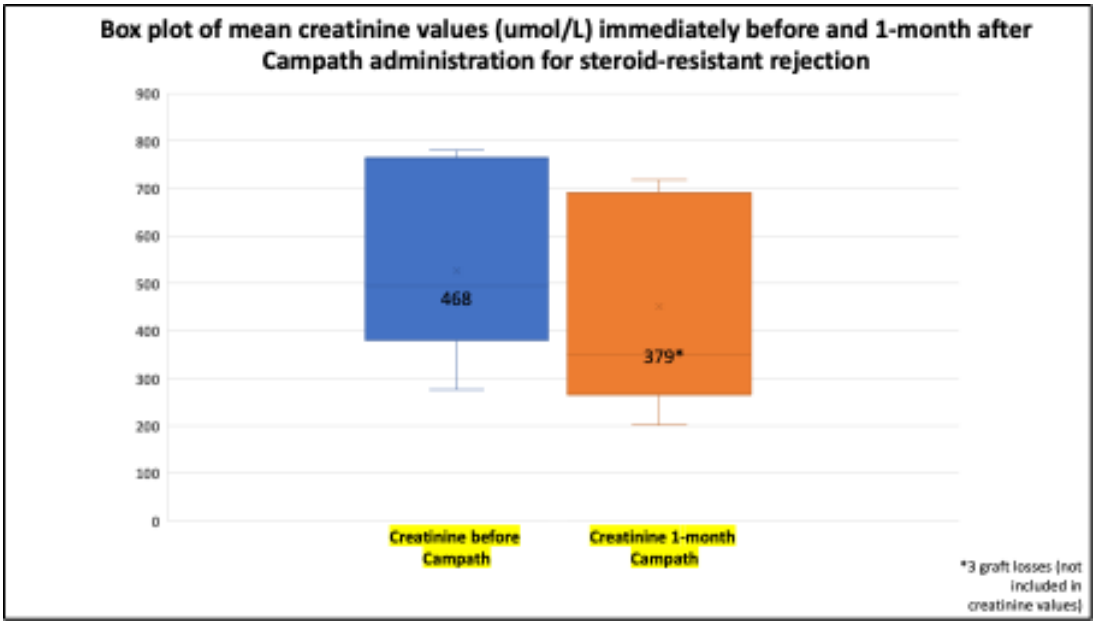
Background: Steroid-resistant rejection is a serious complication after kidney transplantation which requires treatment with lymphocyte depletion. Anti-thymocyte globulin (ATG) most used in clinical practice. However, a decade ago van den Hoogen et al. (Am J Transplant 2013;13(1):192-6) reported their experience using Campath (alemtuzumab) for treatment of steroid-resistant rejection which led to a change in our unit. In this abstract, we present our single-centre case series for the last decade.

Methods: Data was extracted from hospital pharmacy systems for all Campath prescriptions between 2013 and 2023, with exclusion of all induction cases or non-kidney allograft use, and descriptive analyses undertaken.

Results: Between 2013 and 2023, we identified 29 kidney transplant recipients who received Campath as treatment for steroid-resistant rejection (n=3 were ABO-incompatible). Prior to Campath administration, histological data showed: no Banff grading (n=2), Banff 1a (n=3), Banff 1b (n=7), Banff 2a (n=9), Banff 2b (n=4) and Banff 3 (n=2). Evidence of antibody-mediated rejection was observed in 55.2% of cases (n=16), of which 14 were concomitant with cellular rejection. Donor-specific antibodies were observed in 10 patients. The time difference between date of transplant and date of Campath was 489 days (n=19 occurred within first-year post-transplant). The majority of Campath use was during an inpatient episode (93.1%; n=27), with 2 cases administered as outpatient. Mean creatinine (umol/L) dropped from 468 to 379 before and 1-month after Campath respectively (excluding 3 graft losses) as per Figure below. Mean creatinine at 6-months after Campath was 369 (excluding 5 graft losses). From a long-term outcome perspective, with follow up to 13th September 2023, patient survival was 86.2% (n=25) and overall graft survival was 34.5% (n=10).

Conclusion: Due to efficacy, low cost, and ease of administration, we believe Campath (alemtuzumab) is an effective treatment for steroid-resistant rejection compared to ATG (although a direct comparison has not been undertaken).



Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

P0047: The impact of monkeypox (Mpox) on a kidney transplant recipient: A case study

Mrs Jane Chappell

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Introduction: Mpox is a zoonotic illness caused by the monkeypox virus. In July 2022 the WHO declared Mpox a public health emergency of international concern. It is important to understand the impact of immunosuppression related to solid organ transplantation on the clinical features and outcomes of Mpox as there are only a handful of reported cases.

Case presentation: Male patient in his 40's. 6 months post DCD kidney transplant. Lower polar infarct to the transplanted kidney with a baseline creatinine of 320 umol/L. Maintenance immunosuppression of once daily tacrolimus, prednisolone and anti-proliferative. Cause of renal failure was reflux nephropathy.
Day 0: Attended a local Pride event.
Day 9: Onset of symptoms, night sweats.
Day 16: First spot appeared in groin.
Day 25: Presented to sexual health clinic. Mpox confirmed.
Day 30: Contacted Transplant Coordinators- anti-proliferative stopped. Asked to isolate at home and referred to Infectious Diseases.
Day 31: Patient profoundly unwell. Transplant Coordinator admitted patient directly to Infectious Diseases ward (CRP 38, creatinine 361 umol/L).
Day 33: 50-60 lesions noted, mostly genital and oropharyngeal. Commenced oral Tecovirimat for 2 weeks. Tacrolimus switched to twice daily preparation to allow for better dose control, subsequently held 5 days after commencement of Tecovirimat as levels high.
Additional management whilst admitted included IV antibiotics, IV fluids, NG feeding, pain relief, and catheterisation due to dysuria. Creatinine peaked at 377 umol/L with a peak CRP of 126 mg/L.
Day 40: Clinical picture improves (creatinine 341 umol/L, CRP 94 mg/L).
Day 47: Discharged home (creatinine 288 umol/L, CRP 8mg/L).

Outcome: Doing well. All lesions have healed, scarring has become less noticeable. Latest creatinine 275 umol/L.

Discussion: This case highlights the need for post-transplant education, including discussions around sexual health and the importance of making early contact with the transplant team when unwell.

Category: Case study submission (may include individual cases or shared learning experiences)

P0048: delayed graft function of kidney transplant predicts primary non-function and Ischemic Cholangiopathy in liver recipients from donation after circulatory death donors

Mr Hemant Sharma[1,2], Dr Mauro Tun-Abraham[2], Dr Ibrahim Al-Hasan[2], Dr Omar Isam M Ali[2], Prof Anton Skaro[2], Prof Alp Sener[2], Prof Patrick Luke[2]

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Objective: To examine the association between delayed graft function (DGF) in kidney recipients and complications of primary non-function (PNF) or ischemic cholangiopathy (IC) in liver recipients from the same donation after circulatory death (DCD) donor.

Design: Retrospective, single-center, cohort study.

Setting: Liver and kidney transplant center at an academic hospital (2015–2017).

Participants: 40 liver recipients and 69 kidney recipients from 39 DCD donors.

Main Outcome Measures: Development of PNF or IC in liver recipients.

Methods: Retrospective cohort study of 40 liver and 69 kidney recipients from 39 DCD donors between 2006-2015. Multivariate logistic regression analyzed impact of renal DGF and severity of dialysis requirement on liver PNF/IC adjusted for 13 donor, preservation and recipient confounders.

Results: Liver PNF/IC rate was 18%. Renal DGF independently predicted 4.3-fold higher odds of liver complications (95% CI 1.5-12.0). DGF with prolonged dialysis had sensitivity of 75% and specificity of 78% for liver PNF/IC (AUC 0.83, 95% CI 0.68-0.92).

Conclusions: Renal dysfunction after DCD identifies donors at elevated risk for generating liver grafts with PNF/IC. Severity of injury correlates with poorer hepatic outcomes, providing dynamic risk prediction based on renal replacement duration.

Table 1. Univariate logistic regression analysis of risk factors for liver PNF/IC

Variable	OR	95% CI	p-value
Donor Age >40 years	2.4	0.5-12.5	0.311
Male sex	1.6	0.3-7.9	0.583
BMI >25 kg/m2	6.0	1.1-33.9	0.043
Hypertension	4.2	0.7-26.7	0.128
Diabetes	5.0	0.5-54.1	0.190
Smoking	0.8	0.2-3.7	0.728
Functional WIT >20 min	3.0	0.6-15.4	0.190
Terminal WIT >25 min	2.4	0.5-12.5	0.311
Liver CIT >8 hrs	13.0	1.6-108.0	0.018
Kidney DGF	22.0	2.3-213.9	0.009

Table 2. Multivariate logistic regression analysis of predictors of liver PNF/IC

Variable	Adjusted OR	95% CI	p-value
Donor BMI >25 kg/m2	3.2	0.5-12.1	0.235
Liver CIT >8 hrs	8.3	0.8-22.4	0.071
Renal DGF	19.7	1.7-26.9	0.019

Category: Clinical - liver and intestinal (liver - small bowel - surgery - transplant hepatology - recipient clinical care and management)

P0049: Checkpoint inhibitors and kidney transplant rejection

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Background: Checkpoint inhibitor immunotherapy has become a critical treatment for advanced cancers but poses a major risk of rejection among kidney transplant recipients. By stimulating anti-graft immunity, these drugs can lead to acute rejection and graft loss. The aim of this review is to examine the evidence on checkpoint inhibitors and kidney transplant rejection.

Methods: A narrative review was performed on the published literature regarding checkpoint inhibitors and kidney transplantation. Relevant studies on the incidence, mechanisms, risk factors, and management strategies for immunotherapy-associated rejection were analysed.

Results: Checkpoint inhibitors are believed to trigger rejection by disrupting peripheral tolerance and regulatory T cell function, enabling uncontrolled proliferation of graft-reactive T cells. Case reports and retrospective analyses have found rejection rates as high as 90% with checkpoint inhibitor therapy in kidney recipients. Rejection risk is highest with combined PD-1 and CTLA-4 blockade and with a shorter time from transplant. Augmented immunosuppression, plasmapheresis, close monitoring, and desensitization protocols are potential strategies to reduce rejection risk, but optimal management remains uncertain.

Conclusion: Checkpoint inhibitor use leads to markedly high rates of acute rejection among kidney transplant patients, posing a major barrier to immunotherapy in this population. Further research is urgently needed to clarify the safest approaches for mitigating rejection risk and facilitating cautious checkpoint inhibitor use in select kidney recipients with malignancy. Anti-tumour efficacy and rejection risk balance is required to optimize outcomes in these extremely high-risk patients.

Table 1. Mechanisms of checkpoint inhibitor-induced kidney transplant rejection

Mechanism	Effect
Blockade of PD-1	- Removes peripheral tolerance - Enables alloreactive T cell infiltration
Expansion of memory T cells	- Increases cells with direct anti-donor reactivity
CTLA-4 inhibition	- Activates graft-reactive CD4+ T cells
Loss of Treg suppression	- Removes brakes on effector T cell proliferation

Category: Basic and translational science (as per category - all science)

P0050: When two may be better than one; a tale of two extremes in kidney transplant. Initial report from a 'new' deceased donor transplant programme in the United Arab Emirates

Dr Salwa Al Remeithi[1], Dr Mohammad Abd Hamad[1], Dr Mohammed Al Seiari[2], Dr Mohammad Zaman[1], Dr Niaz Ahmad[1]

[1]Department of Surgery, Division of Transplantation, Sheikh Khalifa Medical City, Abu Dhabi, UAE. [2]SEHA Transplant Unit, Corporate Office, SEHA, Abu Dhabi, UAE

Introduction: Deceased donor availability is a limiting factor for meeting the demands for kidney transplant. Advanced age and a high Kidney Donor Profile Index (KDPI) predicts an inferior medium-long term graft survival. Kidneys from small paediatric donors, particularly those under two years of age are not widely utilized because of the increased risk of vascular complications and premature graft failure. Meticulous assessment of each deceased donor at these extremes of ages and innovative techniques such as dual and en bloc kidney transplant (DKT and EKT) result in transplanting these kidneys with acceptable outcome and expanding the donor pool.

Methods: Deceased donor program was started in the United Arab Emirates in 2017 following the approval of deceased donor legislation. After a slow start and then the negative impact of Covid 19, the program is beginning to accelerate. We report our initial experience of DKT and EKT over one year (Dec 2022-Nov 2023) utilizing donor kidneys that were declined by multiple centres.

Results: Five patients underwent kidney transplant from deceased donors that were declined by multiple centres in the UAE, 2 EKT, 3 DKT & are described below (table 1). All patients have shown acceptable graft function at a variable follow up periods (3w-10m).

Table 1. Donor and recipient characteristics and post-transplant function following EKT and DKT.

EKT/DKT		Age mo/yr	**Sex** M/F	Weight Kg	KDPI	S Cr (3 mo) umol/L	eGFR (3 mo) ml/min	**Basis for EKT/DKT**
EKT1	Donor	9 mo	M	4.8	NA	-	-	Technical
	Recipient	32 yr	F	45	-	111	57	
EKT2	Donor	10 mo	F	8.5	63%	-	-	Technical
	Recipient	49 yr	F	49	-	88	67	
DKT1	Donor	57 yr	M	71	94%	-	-	High KDPI Histology
	Recipient	55 yr	M	78	-	113	63	
DKT2	Donor	59 yr	F	60	98%	-	-	High KDPI
	Recipient	60 yr	M	101	-	107	65	
DKT3	Donor	48 yr	F	61	80%	-	-	High KDPI Polycystic kidneys
	Recipient	54 yr	M	76	-	*158	*42	

* Results at 3 weeks post-transplant

Conclusion: With careful assessment kidneys from donors at extremes of age & high KDPI can be transplanted into suitable recipients with acceptable outcome. Both kidneys from a single donor are transplanted in to one recipient to provide adequate nephron mass (age and KDPI) and to avoid vascular complications (small paediatric donors). In this context, no age or a KDPI value should be regarded as an absolute contraindication to kidney transplant. This is the first report of EKT and DKT in the UAE.

Category: Clinical - renal surgical (kidney - transplant and living donor surgery - novel techniques)

P0051: Attitude to Risk in Transplantation and Increasing Solid organ use by modifying risk Tolerance (ARTIST): project outline

Miss Anna Brotherton[1], Mrs Laura Bedford[1], Mrs Amalia Di Girolamo[2], Dr Adnan Sharif[1,2]

[1]University Hospitals Birmingham, Birmingham, United Kingdom. [2]University of Birmingham, Birmingham, United Kingdom

Background: Findings from the Organ Utilisation Group (OUG) were published in February 2023, with an Implementation Group tasked with clinical implementation. Many complex interplaying aspects contribute to the decision to accept or decline organs including clinical (e.g., donor- or recipient-related) factors and/or structural (e.g., staffing, capacity and/or infrastructure) restraints. However, an underappreciated factor is the behavioural component of decision making under risk (or specifically ambiguity). Variation in decision making between and within transplant units are influenced by human factors and lead to inequity of access for patients waiting for life saving or life enhancing transplants. The human factor of how individuals make decisions (both transplant professionals and patients) has not been studied in transplantation but has in the field of behavioural economics.

Project aims: The aim of this project is to; 1) understand decision making when considering organ offers for transplantation, 2) explore the important and inter-play of risk elicitation, ambiguity elicitation, uncertainty elicitation etc. for transplant professionals and patients when considering organ offers, and 3) study possible interventions to try and improve organ utilisation, to ultimately reduce organ wastage and improve equity of access to transplantation opportunities.

Methods: Attitude to Risk in Transplantation and Increasing Solid organ use by modifying risk Tolerance (ARTIST) will be divided into four work packages (WP) as outlined in the Table below and is scheduled to start in 2024.

Discussion: ARTIST is the first study to empirically study decision making for organ offers and aims to translate expertise from the field of behavioural economics to clinical transplantation, with the aim of improving organ utilisation by increasing our understanding of the human component in organ offer decision making. For further information, or if you wish to collaborate, please contact Adnan.Sharif@uhb.nhs.uk.

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

P0052: Retrospective analysis of indication, selection criteria and outcomes of dual kidney transplant at St George's Hospital from 2012 to 2023

Ms Tabinda Aslam[1,2], Mr Abbas Ghazanfar[3]

[1]St Georges University Hospital, London, United Kingdom. [2]University Hospital Lewisham, London, United Kingdom. [3] St Goerges University Hospital, London, United Kingdom

Introduction: With disparities in organ supply and demand and increasing donor age, availability of age matched donors and standard criteria kidneys is becoming increasingly difficult. Significant numbers of organs are routinely discarded from expanded criteria donors. Dual kidneys, from expanded criteria donors, can help bridge the ever-increasing gap between organ demand and availability.

Methods: We, retrospectively, reviewed dual kidney transplant cases between 2012 and 2023 at St George's Hospital for: Donor and recipient characteristics, peri-operative significant complications, hospital stay, creatinine and eGFR at 1 month, 3 months and 1 year post-transplant and graft survival at 1 yr.

Results: There were 22 dual kidney transplants at St George's hospital between 2012 and 2023. Most of the donors were DCD and the mean age of donor was 71.9 years with hypertension and IHD being the two most prevalent co-morbidities. Recipient's mean age was 66yrs with 16 males. Mean waiting time was 828 days while mean time on dialysis was 21.5months. Mean cold ischemic times for kidney 1 and 2 were 708 and 740 minutes respectively. Average hospital stay was 6.9 days. Post-op complications included explantation of upper kidney due to venous thrombosis in one patient and bilateral renal artery angioplasty in another case. There was 0 periop mortality and 2 deaths more than 6 months post-transplant, both with functioning allografts. 1-year mean graft survival in our study was 90%. 1-year mean creatinine was 136 and eGFR was 48.35.

Discussion: Graft function from our study was comparable to UK transplant registry 2005-2017. The average cold ischemic time for second kidney was less than the national average cold ischemic time for a single kidney transplant. Most of our patients recovered without any major complications. Dual kidney transplant is a safe and effective way to enhance organ utilization and bridge the supply and demand gap.

Category: Clinical - renal surgical (kidney - transplant and living donor surgery - novel techniques)

P0054: Exploring behavioural barriers to reducing Prolonged Time to Asystole in consented/authorised DCD donor

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[1]NHSBT, Swansea, United Kingdom. [2]NHSBT, London, United Kingdom

Introduction: The Sustainability and Certainty in Organ Retrieval (SCORE) program has been established to investigate whether a systematic change to the way organ retrieval is organised and can instil more certainty in donation. Complementary to this overarching program are serval workstreams, including the donation workstream, which aims to ascertain whether enhancements can be made in Donation after Cardiac Death (DCD) assessment to ascertain imminent death, improved death prediction, resulting in a reduction of consented donors non proceeding, due to Prolonged Time to Asystole (PTA).

Data from August 2020 to August 2023 reveals that PTA is the primary cause for non-proceeding DCD at 48%. These are cases where the donor family has supported donation, but the potential donor did not die within the required timeframe for donation to proceed.

Results:
Table 1:

Aug 2020-Aug 2023	Number
Consented / Authorised DCD donor and proceeded to PTA	447 (48%)
Consented / Authorised DCD donor and SN / ITU stood down after re-evaluation	3

Discussion: In November 2023, members of the SCORE program team visited all 12 Organ Donation regional collaboratives to introduce the rationale for change and to gather feedback on why there is such a disparity between consented/authorised donors proceeding to PTA and those where the SN or ITU team decided that the potential donor is unlikely to pass away within the ideal timeframe, thus halting the donation process before a National Organ Retrieval (NORS) team is mobilised.
Responses to this question vary, encompassing wilful blindness, inconsistent practices, fear of missed opportunities, and a reluctance to be perceived as undermining colleagues' clinical judgment. The barriers are multifactorial, but what is evident is that families are unnecessarily given false hope, SN’s resources and resilience are stretched and tested, and NORS teams are deployed at considerable expense, and return empty-handed.

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

P0055: Using extended normothermic liver machine perfusion to evaluate a novel pharmaceutical defatting therapy for marginal donor organs

Mr George Clarke[1,2], Ms Jingwen Mao[2], Mr Angus Hann[1], Dr Yiyu Fan[2], Miss Anisa Nutu[1], Mr Erwin Buckel[1], Mr Kayani Kayani[1], Dr Nicholas Murphy[1], Dr Mansoor Bangash[1], Dr Anna Casey[1], Dr Isla Wooton[1], Dr Alexander Lawson[1], Mr Bobby Dasari[1], Professor Thamara Perera[1], Mr Hynek Mergental[1], Professor Simon Afford[2]

[1]Queen Elizabeth Hospital Birmingham, Birmingham, United Kingdom. [2]University of Birmingham, Birmingham, United Kingdom

Introduction: Mortality on the waiting list for liver transplantation has required novel strategies to address and increase the safe utilisation of marginal donor organs, including those with elevated levels of macrosteatosis. We aimed to evaluate the efficacy of a novel pharmacological therapy to improve the metabolic functioning and promote defatting of steatotic livers using an extended normothermic machine perfusion (NMP) model.

Methods: Seven human livers, retrieved with the intention of transplantation, rejected by all UK centres were subjected to 72 hours of NMP using a Liver Assist device (XVIVO, Sweden) with custom perfusion kits and haemofiltration in circuit. Inclusion criteria for acceptance were (2 out of 3): rejected for steatosis; liver weight >2 kg; donor BMI 30 kg/m2. Each liver received our novel defatting therapy on initiation of perfusion (consisting of ibuprofen, liraglutide, testosterone, phenobarbital, levocarnitine, and NKH477). In addition to the defatting therapy, four perfusions had a lipoprotein apheresis filter in circuit to remove circulating free fatty acids, triglycerides, and cholesterol. Retrospective extended NMPs were used as controls (n=5).

Results: All twelve human livers successfully cleared lactate following initiation of NMP, median time to clear was 3 hours in controls, and 4 hours in defatting cohort ($p = 0.755$). The defat cohort showed increased lactate clearing capacity ($p < 0.001$), with increased P450 enzymatic activity (as assessed by LiMAx, $p < 0.001$) (**Figure 1**). Histological assessment showed reduction in macrosteatosis in the defat cohort. Perfusate triglycerides and cholesterol in the defat cohort (without lipoprotein apheresis filter) were elevated compared to controls, however did not reach statistical significance (**Figure 2**).

Discussion: Our preliminary findings require further work and prove that augmentation of marginal organs utilising extended NMP is achievable. Livers administered our pharmacological therapy showed evidence of increased metabolic function (as assessed using exogenous lactate and LiMAx), however histological improvement was inconclusive.

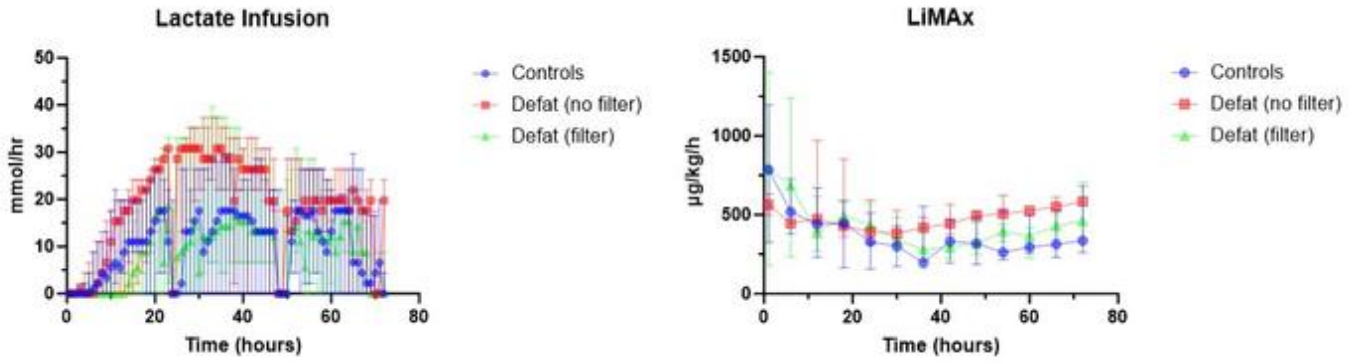


Figure 1

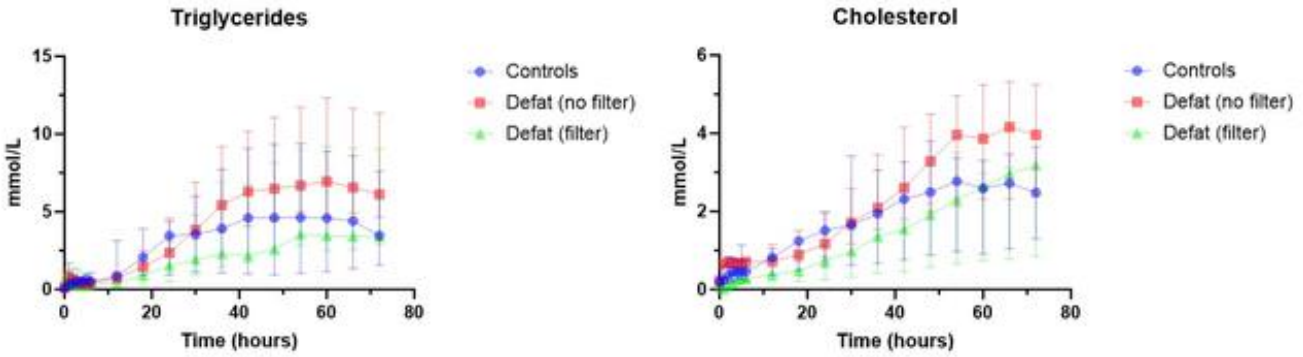


Figure 2

Category: Basic and translational science (as per category - all science)

P0056: Development of an extended normothermic machine liver protocol: Development and learnings

Mr George Clarke[1,2], Ms Jingwen Mao[2], Dr Yiyu Fan[2], Mr Angus Hann[1], Ms Amita Gupta[3], Miss Anisa Nutu[1], Mr Erwin Buckel-Schaffner[1], Mr Kayani Kayani[1], Dr Nicholas Murphy[1], Dr Mansoor Bangash[1], Dr Anna Casey[1], Dr Isla Wooton[1], Dr Alexander Lawson[1], Mr Bobby Dasari[1], Professor Thamara Perera[1], Mr Hynek Mergental[1], Professor Simon Afford[2]

[1]Queen Elizabeth Hospital Birmingham, Birmingham, United Kingdom. [2]University of Birmingham, Birmingham, United Kingdom. [3]Ochre-Bio, Oxford, United Kingdom

Introduction: Normothermic machine perfusion (NMP) offers the opportunity to use human livers as a vehicle for potential resuscitative and reconditioning therapies in the clinical setting, and as a research technique to investigate drug pharmacokinetics, immune modulation, and observation of liver injury, metabolic and regenerative pathways. In order to achieve this, it is essential to reproducibly perfuse livers up to and in excess of five days.

Here we describe our substantially amended extended perfusion protocol and it's success in preserving liver functional integrity.

Methods: Five consecutive human livers rejected for transplantation were subjected to 121 – 184 hours of NMP using a blood-based perfusate, using a modified Liver Assist machine perfusion device with continuous veno-venous haemofiltration in circuit. All five livers were perfused using an identical perfusion protocol, aiming for 120 hours perfusion time. Hepatocyte viability was determined by monitoring vascular flows, lactate clearance, and transaminase trends. Cholangiocyte viability was assessed by monitoring bile production, biliary pH and glucose.

Results: Livers enrolled in this study consisted of 3 organs donated after brainstem death (DBD), and 2 following cardiac death (DCD). Median cold ischaemia time was 626 (586 – 867) minutes. The median NMP time was 168 (121 – 184) hours. Four out of five livers reached transplant viability within the first 6 hours of perfusion. All five livers show evidence of preserved hepatocyte and cholangiocyte function to 120 hours and beyond of perfusion time. This is evidenced by controlled vascular flows (75-80 ml/min/100g and 25-30 ml/min/100g through the portal vein and hepatic artery, respectively), adequate lactate clearance and ALT trend (Figure 1), and good bile production with preserved alkalotic, hypoglycaemic bile (Figure 2).

Discussion: Human livers can be preserved using NMP, with a widely available perfusion device, using a uniform protocol, with evidence of preserved hepatocyte and cholangiocyte function beyond 5 days.

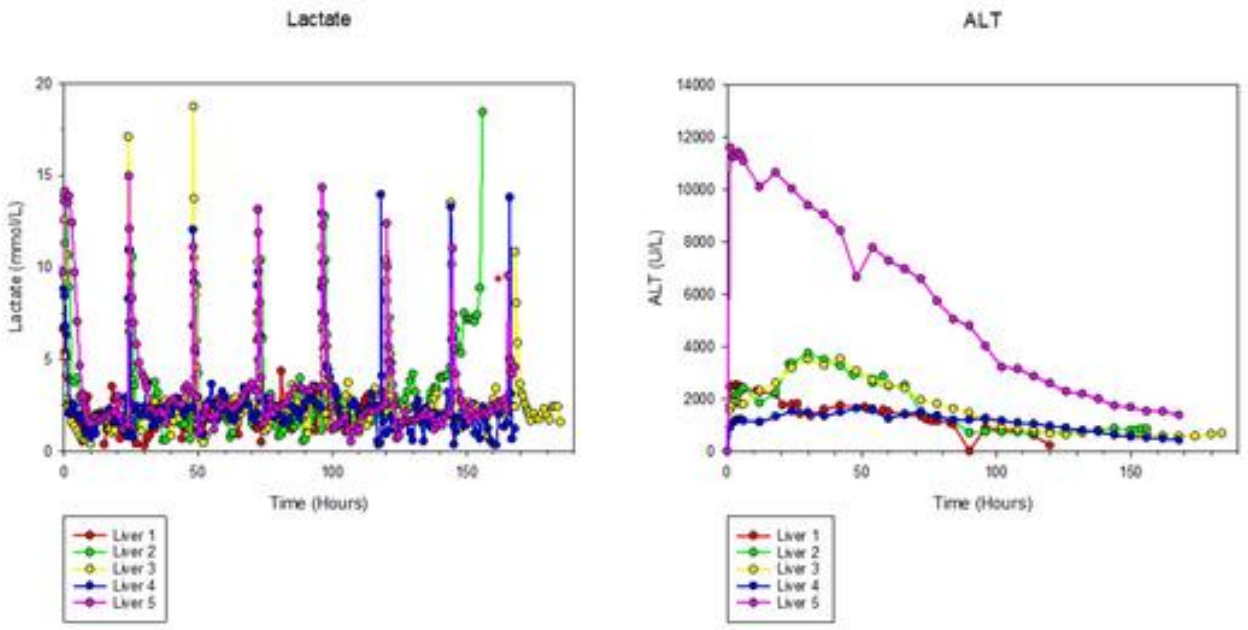


Figure 1

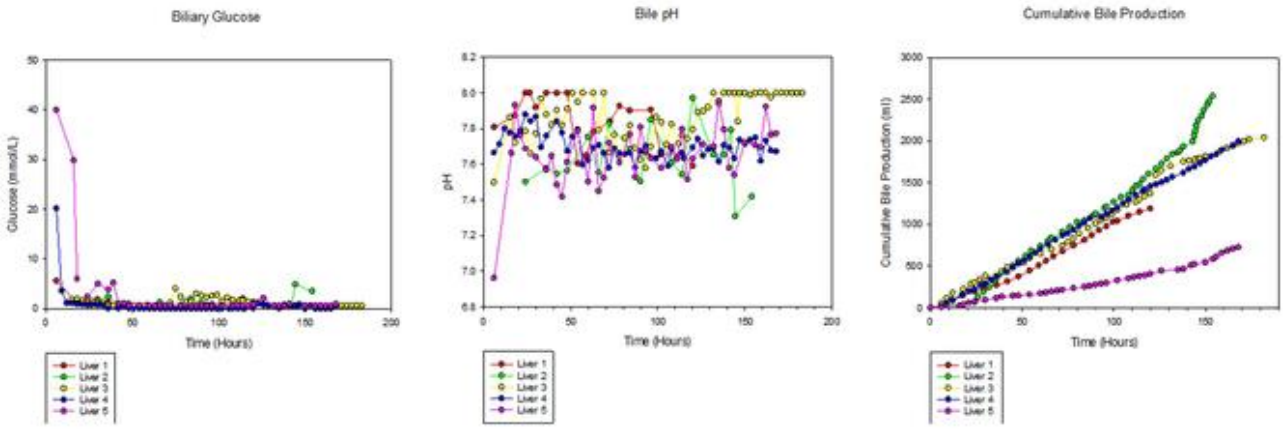


Figure 2

Category: Basic and translational science (as per category - all science)

P0057: Improving communication between transplant recipient and donor pairs with structured consent

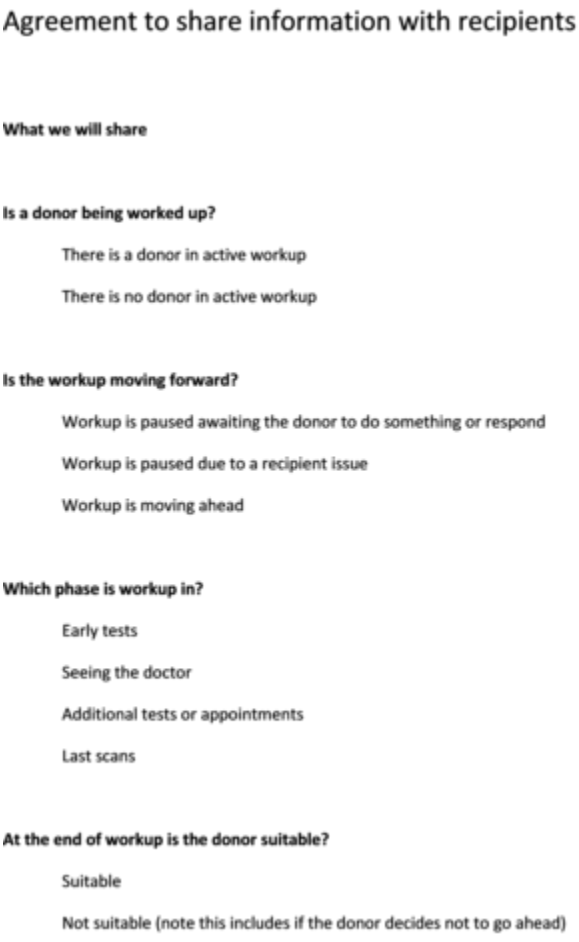
Miss Sheila Juba, Miss Kay Dimmick, Miss Camille Santos, Dr Kerry Tomlinson

University Hospitals North Midlands, Stoke-on-Trent, United Kingdom

Introduction: The workup for living kidney donation can be a very stressful time for both donors and the recipients. Communication is often hindered by the need to keep the donor and recipient process confidential from each other. Members of the MDT are often concerned about how much information it is reasonable to share directly with a recipient. Here we present our work to improve communication and therefore transplant recipient and donor workup experience.

Methods: The local transplant team have been undertaking a quality improvement programme to improve access to transplantation and reviewed all elements of the transplant workup pathway. Patient experience was an important part of this project. It was identified that a significant number of complaints to the living donor team were due to communication breakdown. A generic email was introduced so that all communication could be documented and followed up by any member of the team.

A consent information leaflet was devised outlining what information could be shared between donor and recipient pairs and donors were asked to agree to this at the beginning of the workup process (fig 1). This process was introduced in the second half of 2022.



Agreement to share information with recipients

What we will share

Is a donor being worked up?

- There is a donor in active workup
- There is no donor in active workup

Is the workup moving forward?

- Workup is paused awaiting the donor to do something or respond
- Workup is paused due to a recipient issue
- Workup is moving ahead

Which phase is workup in?

- Early tests
- Seeing the doctor
- Additional tests or appointments
- Last scans

At the end of workup is the donor suitable?

- Suitable
- Not suitable (note this includes if the donor decides not to go ahead)

Fig 1

Results: Donors readily accepted the information given and the request to consent for information sharing.
In 2022 we had 17 complaints relating to donor workup. In 2023 so far we have only had 2.
MDT members and the specialist nurses felt empowered to share defined information and reported that they were more comfortable.

Discussion: We believe this intervention has improved communication between the transplant MDT and donor recipient pairs. We continue to evaluate our service using patient reported experience monitoring and will make further adjustments in response to feed back.

Category: Psycho-social aspects (recipient - donor - family care- MDT (exclude clinical management)

P0058: A greener gift of life: Reducing our carbon footprint by recycling in kidney transplantation

Dr Zareena Khan-Orakzai, Ms Kerrin Henry, Mr Steven Littlewood, Miss Katherine Connor, Mr Ben Stutchfield, Dr Mhairi Donnelly

Royal Infirmary Edinburgh, Edinburgh, United Kingdom

Introduction: With a climate emergency declared, surgical teams have a responsibility to pursue greener practices. Operating theatres contribute disproportionately to hospital waste; around one third of perioperative waste is clinical waste. Disposal of clinical waste has the largest carbon footprint, approximately ten times greater than domestic waste and up to 50 times greater than recyclable waste. Furthermore, financial savings have been shown to mirror reduction of the carbon footprint.

This quality improvement project aims to examine the feasibility of introducing a recyclable waste stream into the transplant theatre, in order to reduce both carbon footprint and financial costs.

Methods: Building upon work already carried out in the theatre complex, three different waste streams were identified: Clinical, domestic and recyclable. Posters explaining the three different waste streams were displayed in the theatre suite, along with education of theatre staff and acquisition of correct waste bags for the different waste streams. The number and weight of the different bags was recorded at the end of each kidney transplant.

Results: Data was collected from 8 kidney transplants. The total amount of waste collected was consistent between transplants. The greatest proportion of waste produced was clinical waste accounting for three quarters of the total waste by weight; the remainder was similar proportions of domestic and recyclable waste (fig 1).

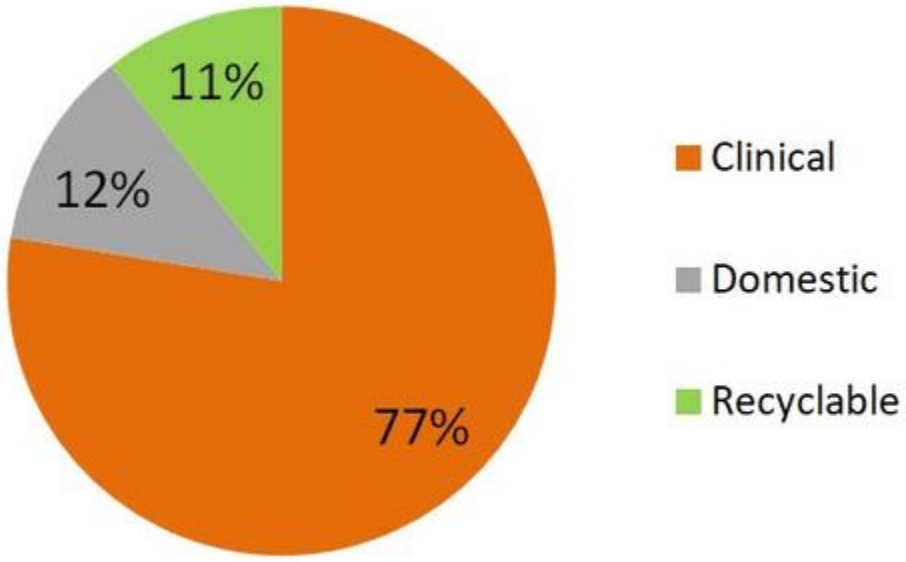


Fig 1. Proportions of waste by weight

Comparing this data to that collected prior to the introduction of recycling, the amount of clinical waste was comparable. The biggest change was seen comparing domestic and recyclable waste: Following the introduction of recycling, the amount of domestic waste was halved. (fig 2).

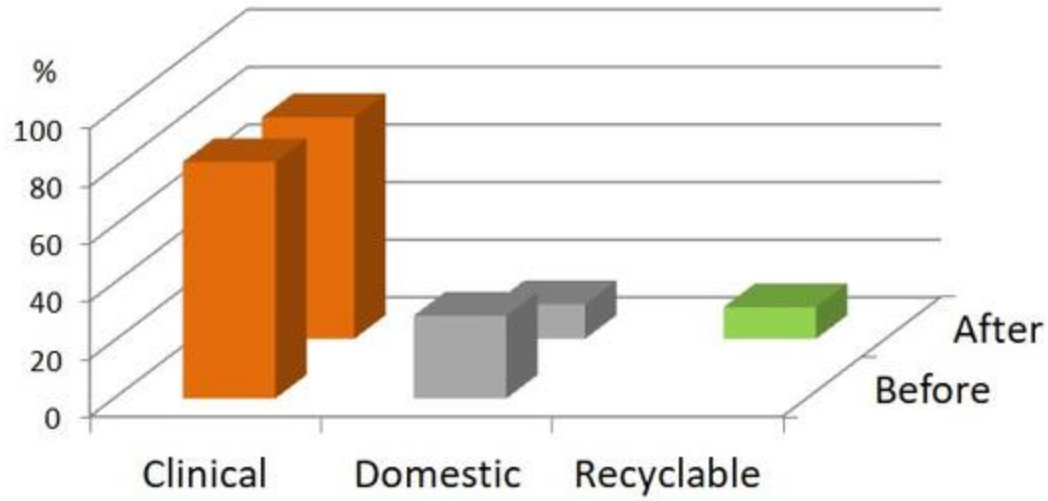


Fig 2. Proportions of waste by weight before and after introduction of recycling

Discussion: The most efficient and safe way to segregate waste is at source. We have demonstrated it is possible to introduce a recyclable waste stream into transplant theatres. Further work is required to identify and implement strategies to increase the proportion of recyclable waste.

Category: Clinical - renal surgical (kidney - transplant and living donor surgery - novel techniques)

P0059: N-acetylcysteine: A novel approach to methaemoglobinaemia in normothermic liver machine perfusion

Mr George Clarke[1,2], Ms Jingwen Mao[2], Dr Yiyu Fan[2], Mr Angus Hann[1], Ms Amita Gupta[3], Miss Anisa Nutu[1], Mr Erwin Buckel-Schaffner[1], Mr Kayani Kayani[1], Dr Nicholas Murphy[1], Dr Mansoor Bangash[1], Dr Anna Casey[1], Dr Isla Wooton[1], Dr Alexander Lawson[1], Mr Bobby Dasari[1], Professor Thamara Perera[1], Mr Hynek Mergental[1], Professor Simon Afford[1]

[1]Queen Elizabeth Hospital Birmingham, Birmingham, United Kingdom. [2]University of Birmingham, Birmingham, United Kingdom. [3]Ochre-Bio, Oxford, United Kingdom

Background: Methaemoglobin has been shown to be a complication in both the perfusion of suboptimal donor livers and in extended normothermic machine perfusion (NMP) (24 hours). It results from the oxidation of iron within haemoglobin (Fe2+ to Fe3+), thereby reducing in its oxygen binding capacity. There is considerable interest in using NMP as a vehicle for bioengineering, investigating drug pharmacokinetics and efficacy, and potential resuscitative and reconditioning therapies requiring the extended perfusion of livers.
We describe the effects of adding the anti-oxidant, N-acetylcysteine, to the perfusion protocol and its impact on the accumulation of methaemoglobin.

Methods: Normothermic machine perfusion of nine discarded human livers rejected for transplantation was completed using the Liver Assist machine perfusion device. Three control livers were perfused with vehicle alone without inclusion of N-acetylcysteine. Six livers were perfused with an initial bolus (200mg), followed by a continuous infusion of N-acetylcysteine (200 mg/hr). Perfusate methaemoglobin was measured hourly during each perfusion.

Results: Livers 1-3 (no-NAC group) were perfused for an average of 96 hours. All three livers developed methaemoglobinaemia (2%), with an average time to develop of 45 hours, with subsequent steep rise. Livers 4-9 were perfused for an average of 148 (range 90–184) hours, with the inclusion of a continuous infusion of 200 mg/hr N-acetylcysteine. Only 2 (33%) livers developed methaemoglobinaemia (Figure 1). Statistical difference between both groups was noted at 24 hours, 48 hours, 72 hours, and 84 hours ($p<0.01$, $p<0.01$, $p<0.01$, $p<0.01$, respectively).

Discussion: Methaemoglobin is an unavoidable side effect of using blood as an oxygen carrier in extended NMP. It occurs within 24 hours of perfusion time and can accumulate leading to significant impairment in oxygen carriage and tissue damage. N-acetylcysteine is a safe and inexpensive anti-oxidant which has the ability to limit and prevent the accumulation of methaemoglobin during extended NMP.

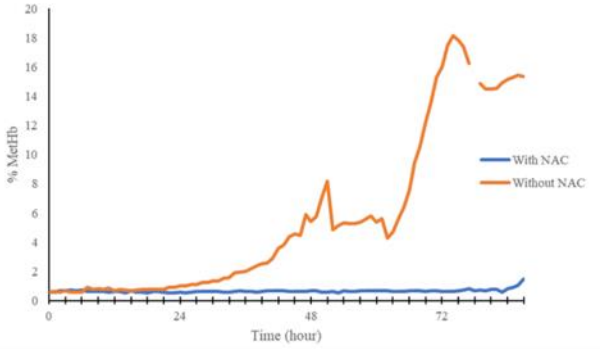


Figure 1

Category: Basic and translational science (as per category - all science)

P0060: Inclusion of organ donation and transplantation into the curriculum of third and fifth year medical students at University of Glasgow -our experience from 2018-2023

Dr Radha Sundaram[1], Dr Laura Barry[2]

[1]NHS Greater Glasgow and Clyde, Glasgow, United Kingdom. [2]NHS GGC, Glasgow, United Kingdom

Introduction: Every day, 3 people die in the UK, waiting for a lifesaving transplant. With the introduction of the "opt out" legislation in 2021, all patients are deemed to support donation if they have not opted out. It is imperative that medical students are aware of the need for life saving transplants and the current ethical and legal framework (Human Tissue Act Scotland 2019) for donation.

Methods: We introduced a lecture for final year MBChB students in University of Glasgow on organ donation in 2019 and have run the 1hour lecture in their "preparation for Practice" section for the last 5 years. We then included organ donation in the curriculum of third year students doing their Anaesthesia and Surgery rotations, with Module Evaluation Questionnaire (4 questions on knowledge) and a three hour session on donation from the perspective of the ICU doctor, Specialist Nurse in Organ Donation and a donor family in 2021. We have also included a section on diversity in donation.

Results: We have had 5 Preparation for Practice sessions with 4 online and 1 face to face. There has been consistently good feedback from the attendees with scores of 7 on 10 for overall value and satisfaction. However, in the last year, we have received some free text comments on the topic being repetitive and that the importance of donation has been heavily emphasized in clinical teaching. We have had feedback from our three sessions for third year students and these have also been consistently rated as excellent or good by 70% of the students who have completed feedback. Free text comments have included a request for discussion on determination of death.

Discussion: By including donation in the curriculum, there has been an increase in awareness amongst medical students.

Category: Education and promotion (education: patient - public - healthcare professional; promotion: public - donation).

P0061: Normothermic regional perfusion changes the molecular profile of donation after circulatory death livers

Ms Carrie Shi[1], Mr Colin Lee[2], Dr Kasra Bahadori[2], Ms Mia Cabantous[2], Professor Christopher J.E. Watson[3], Professor Menna R. Clatworthy[2]

[1]University of Cambridge, Cambridge, United Kingdom. [2]Molecular Immunity Unit, Department of Medicine, Medical Research Council Laboratory of Molecular Biology, University of Cambridge, Cambridge, United Kingdom. [3]University of Cambridge Department of Surgery, Cambridge, United Kingdom

Background: Liver transplantation is the only curative treatment for end-stage liver disease but is limited by organ shortage. Donation after circulatory death (DCD) livers variably experience warm ischaemia and have worse outcomes compared to donation after brain death (DBD) organs. Normothermic regional perfusion (NRP) may improve viability and outcomes of DCD organs, but the underlying molecular mechanisms remain unclear.

Methods: We performed bulk RNA-sequencing of n=72 liver biopsies obtained at retrieval via the Quality in Organ Donation (QUOD) Biobank, including DBD, DCD, and DCD+ NRP livers (Figure 1). Following correction for clinical characteristics, we performed differential gene expression and pathway analysis, and weighted gene co-expression network analysis (WGCNA) to identify the molecular features that differed between DBD and DCD livers, and in DCD livers +/- NRP.

Results: When comparing DBD (n=47) and DCD (-NRP, n=16) livers, we found increased expression of heat shock proteins (e.g. HSPA1B, HSPA1A and BAG3) in DCD livers, consistent with cellular responses to warm ischaemia. 'Interferon gamma response' and 'complement' genesets were among those significantly enriched in DCD versus DBD livers (Figure 2). To assess the effect of NRP on DCD livers we compared the transcriptomes of n=16 DCD-NRP with n=8 DCD+NRP. Notably, various immune-related/damage response pathways were enriched within the DCD+NRP allografts versus DCD-NRP, including "Angiogenesis" and "Inflammatory response", along with specific genes associated with liver regeneration, angiogenesis, and immunoregulation including AREG, MYC, F3RL2, KLF6, IL10. Comparison of the DCD+NRP transcriptomes to livers that underwent ex situ normothermic perfusion (ESNP) revealed that similar genes and pathways were enriched post-perfusion versus controls, suggesting that both interventions induce similar protective mechanisms.

Conclusions: We identified molecular pathways that differed between DCD and DBD livers, and delineated how these transcriptional features were modified by NRP, informing the rational selection of interventions to improve outcomes in DCD liver transplants.

Figure 1

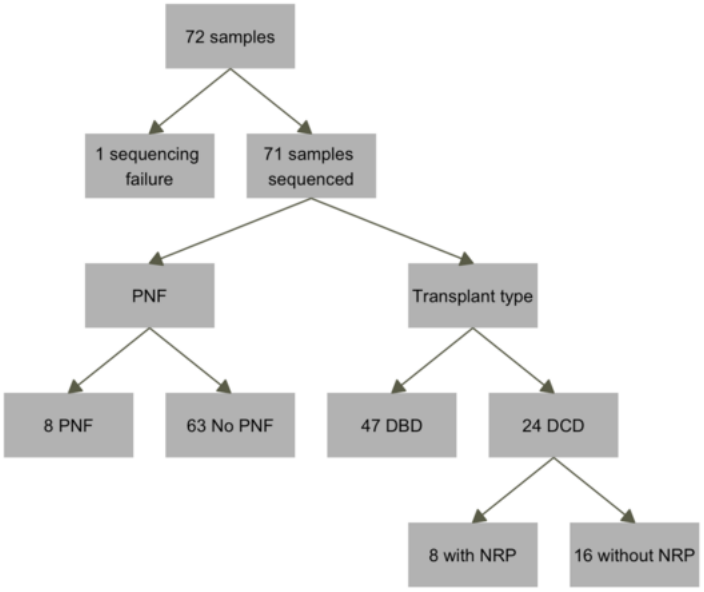
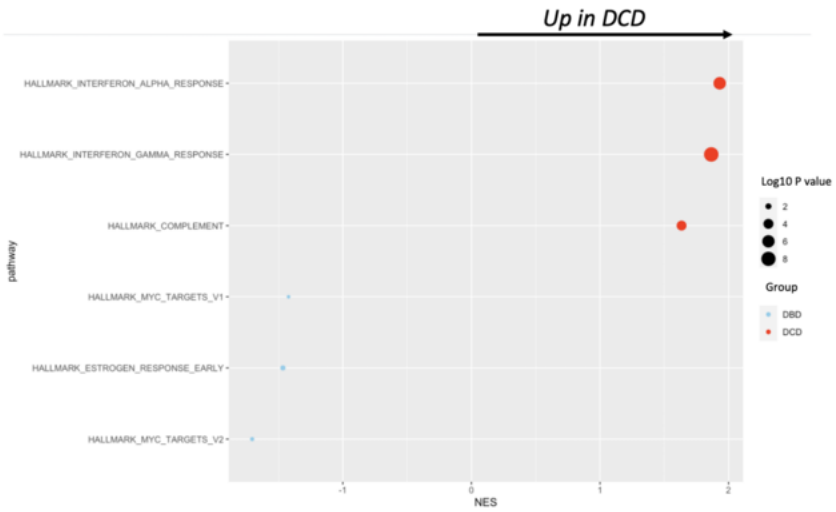


Figure 2



Category: Basic and translational science (as per category - all science)

P0063: Evaluation of Liver Maximum Capacity (LiMAx) measurements to monitor hepatocellular function during extended normothermic machine perfusion

Mr George Clarke[1,2], Ms Jingwen Mao[2], Dr Yiyu Fan[2], Mr Angus Hann[1], Ms Amita Gupta[3], Miss Anisa Nutu[1], Mr Erwin Buckel-Schaffner[1], Mr Kayani Kayani[1], Dr Nicholas Murphy[1], Dr Mansoor Bangash[1], Dr Anna Casey[1], Dr Isla Wooton[1], Dr Alexander Lawson[1], Professor Thamara Perera[1], Mr Bobby Dasari[1], Mr Hynek Mergental[1], Professor Simon Afford[2]

[1]Queen Elizabeth Hospital Birmingham, Birmingham, United Kingdom. [2]University of Birmingham, Birmingham, United Kingdom. [3]Ochre-Bio, Oxford, United Kingdom

Background: Lactate clearance provides important information regarding hepatocellular function during normothermic machine perfusion (NMP). Liver Maximum Capacity (LiMAx) measurements, using C13-Methacetin, are used to assess liver function prior to major oncologic resections. We evaluated the use of LiMAx to monitor liver function during long-term resuscitation using NMP and correlated it with the liver's lactate clearing capacity.

Methods: Seven discarded donor livers were subjected to 87 to 184 hours of NMP using blood-based perfusate, in a modified Liver Assist device with haemofiltration in circuit. Liver function was initially assessed by the perfusate lactate clearance criteria, in combination with 6-hourly sequential LiMAx measurements using fixed boluses of C13-Methacetin and recording the delta over baseline. In addition to this, every 24 hours we assessed the livers' abilities to clear lactate following a bolus of sodium lactate solution to achieve perfusate lactate levels of 10 mmol/L.

Results: The initial time to clear lactate below 2.5 mmol/L took 1.75 – 7.75 hours, and the median LiMAx value was 829 (range 325 – 3130 µg/kg/h. In well-functioning livers (defined as lactate clearance time <4 hours; Fig 1A) we observed a steep curve with high peak delta over baseline (DoB) (Fig 1B), whilst in poorly functioning livers (lactate clearance >4 hours, Fig 1C) they displayed a flat curve with low DoB peak (Fig 1D). Sequential LiMAx curves with similar character and amplitude throughout the 80-hour perfusion was consistent with preserved hepatocellular functioning (Fig 1E). In contrast, livers with declining LiMAx amplitudes and progressively flattening curves was associated with worsening hepatocellular function and eventual organ failure (Fig 1F).

Discussion: This is the first study demonstrating the use of LiMAx measurements to assess hepatocyte function and showing qualitative differences in the curve character during longitudinal monitoring of liver metabolic activity during long-term liver resuscitation using NMP.

Category: Basic and translational science (as per category - all science)

P0064: Renal transplantation from Hepatitis C Virus positive donors: The Oxford Kidney Unit (OKU)/Oxford Transplant Centre (OTC) 2-year experience

Miss Lisa Snelling[1], Dr Ben Storey[1], Mrs Andrea Devaney[1], Mrs Clare Snelgrove[1], Mr Georgios Paleokostas[2]

[1]Oxford University Hospitals NHS Foundation Trust, Oxford, United Kingdom. [2]Reading University School of Pharmacy, Reading, United Kingdom

Introduction: Most organs from hepatitis C (HCV) infected donors have previously been considered unsuitable for transplant due to the high risk of transmission to recipient. The development of direct acting antiviral (DAA) therapy achieves cure in more than 95% of HCV infected patients. Following the publication of a UK wide framework for the appropriate use of organs from HCV infected donors, OTC expanded the renal donor pool, considering organs from HCV positive donors for transplantation.

Method: A guideline was developed which included recipient selection, workup, and post-transplant management. Potentially eligible patients were given a covering letter, patient information leaflet, and preliminary consent form. They were screened using the Fibrosis-4 (Fib-4) screening tool. Post-transplant, recipients were tested for HCV by polymerase chain reaction (PCR) as per the BTS recommended schedule, and where indicated, treated with pangenotypic DAA regime.

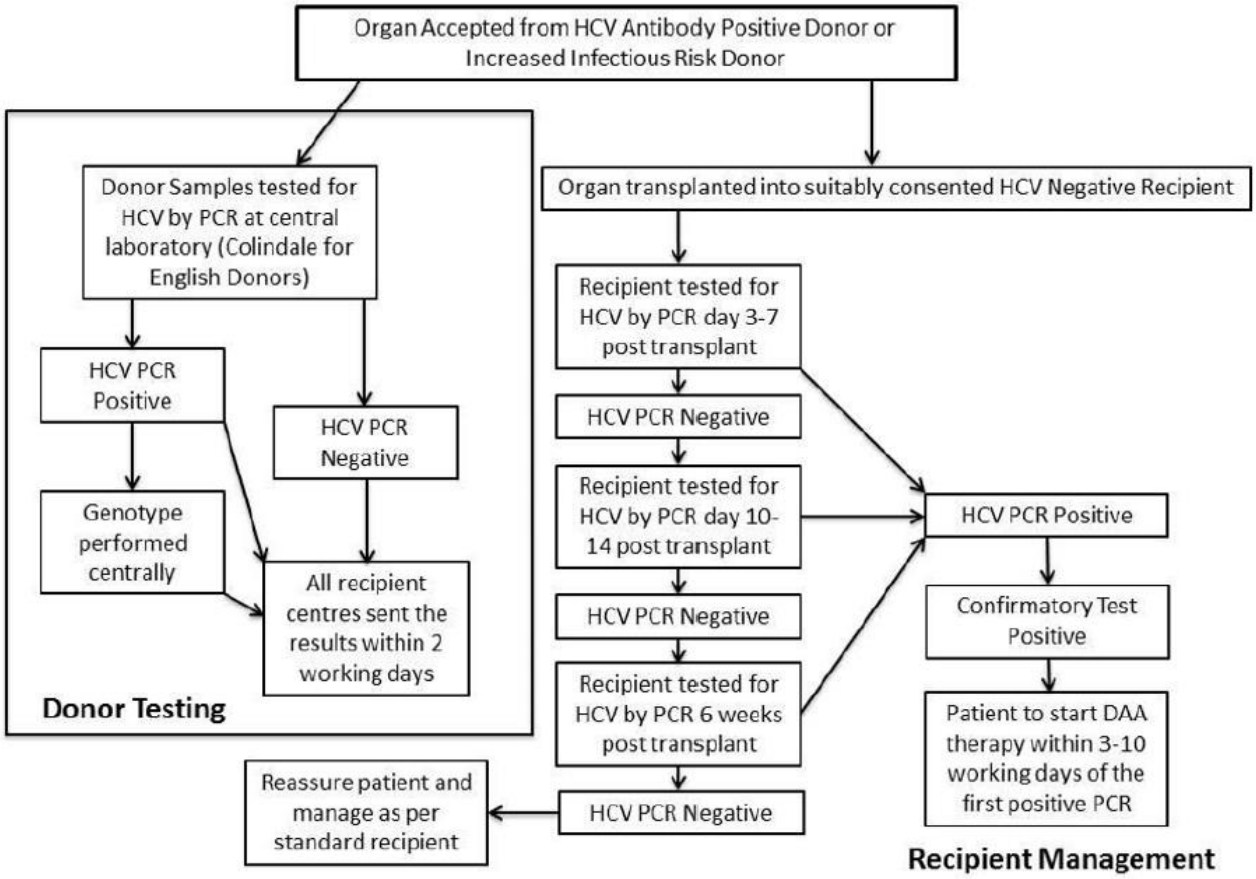


Figure 1: Recipient management

Results: 10 HCV negative recipients have received HCV positive renal transplants. 100% of patients had HCV PCRs taken according to the recommended schedule. Of these, 33.3% subsequently had a positive HCV PCR and received treatment. All grafts are functioning, 5 at less than 1 year and 5 at greater than one-year post-transplant.

Table 1: Summary of HCV treatment in positive recipients

HCV positive post Tx	Organ	Time since Tx (months)	Induction Antibody	DAA Regimen	DAA duration (weeks)	Sustained virologic response	Most recent eGFR mL/min/1.73m3
Patient 1	DBD Kidney	16	Basiliximab	Sofosbuvir/ velpatasvir	12	Yes	37
Patient 2	DCD Kidney	7	Basiliximab	Glecaprevir/ pibrenatasvir	8	Yes	75
Patient 3	DCD Kidney	7	Alemtuzumab	Glecaprevir/ pibrenatasvir	8	Yes	35

Conclusion: These cases suggest successful implementation of HCV positive donor to negative recipient renal transplantation in our centre. The use of these organs therefore has the potential to further increase the number of donor organs available, with expansion to our pancreas programme the next step.

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

P0065: Transplant Patient Report Experience Measure (TPREM); how units can review patients' experience of the transplant workup pathway

Dr Kerry Tomlinson[1], Mrs Catherine Stannard[2], Ms Ranjit Klare[2], Mr Alastair Tallis[3]

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Introduction: Patient reported experience measures (PREM) are a vital part of monitoring services.
KQIP (Kidney Quality Improvement Partnership) have worked with regions undertaking the Transplant First QI project to produce a TPREM.

Methods: In 2019 the KQIP Transplant First team adapted the UKKA/KCUK national Kidney PREM and sought feedback from patients. Post – covid a revised version was piloted in our region. Each renal unit collected 4-5 responses from donors and recipients at the end of their workup. Participants fedback on survey usability and content. 23 responses were returned from three transplanting and three referral centres.
A final version was agreed and rolled out using the network structure.
Individual units distribute the TPREM. Responses are returned to the network team. These are collated quarterly into a regional overview, with feedback of average scores and ad hoc comments to units who have submitted more than 5 responses.

Results:
The pilot showed lowest scores for:-

- When you attend the centre, how would you grade your levels of comfort (5.93/7)
- Thinking about how the kidney team treats you, do you feel any concerns you have are taken seriously? (5.96/7)
- Were you given any support to discuss living kidney donation with friends and family? (6.16/7)

Highest scores for:-
Did you feel you were given enough information about the possibility of Living Kidney Donation (6.83/7)
Potential transplant recipients had information but may benefit from support discussing living kidney donation with friends and family.

Discussion:
We have a TPREM in use in our region which has undergone cycles of testing in patients and is now informing us as part of our QI project.
The OUG has recommended the routine use of PREMS and our TPREM is well placed for further evaluation and wider adoption.

Category: Living donation (living donor and recipient selection (all organs) options for donation - donor care - outcomes)

P0066: Impact of schools engagement sessions on organ donation and the law change in secondary schools in Glasgow

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Introduction: Around 500 people are waiting for a lifesaving transplant in Scotland. The law has changed in Scotland in 2021. All individuals over the age of 16 are presumed to support organ donation unless they have opted out. The Scottish Government sends out letters to all Scottish young people before their 16th birthday. Methods: The Scottish Government along with their partners NHS Blood and Transplant and Kidney Research UK have developed a comprehensive web-based resource. This resource contains information about organ and tissue donation and transplantation, with a key focus around the choices young people have around making a decision about donation as they reach their 16th birthday in line with the opt out system of organ and tissue donation. They also contain a range of videos and classroom activities.

Results: We undertook a series of schools engagement sessions in September 2022 and September 2023 during donation and transplantation week, offering schools workshops or lecture style presentations. We had doctors in Intensive Care Medicine, Specialist nurses in Organ Donation and our partners from Kidney Research UK delivering the content and encouraging them to think about it and make a choice. We conducted 11 sessions in 10 schools with one school, having two separate sessions for their fifth and sixth year students. A total of approximately 560 students attended the sessions. There were many interesting insights offered by the students particularly on the topics of reciprocity, equity and fairness.

Discussion: Whilst the sessions were rewarding and stimulating, we were unable to assess the quantitative impact of the education on awareness. Further work should include the inclusion of an optional questionnaire assessing impact on organ donor register sign up and confidence in family discussion. It would also be valuable to study the impact of ethnicity and deprivation on the above-mentioned outcomes.

Category: Education and promotion (education: patient - public - healthcare professional; promotion: public - donation).

P0067: Outcomes for patients undergoing simultaneous pancreas and kidney (SPK) transplantation during the first wave of the Covid-19 pandemic in the UK

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Introduction: The Covid-19 pandemic had far-reaching impact on the transplant community worldwide and, in the UK, all transplanting centres temporarily ceased performing simultaneous pancreas and kidney (SPK) transplants during the first wave and lockdown due to Covid-19. We were the first transplant centre to resume SPK transplantation during the pandemic, and we present the outcomes for patients transplanted at this time.

Methods: A retrospective comparison of transplant outcomes for patients receiving an SPK during the first year of the COVID-19 pandemic (COVID cohort: March 2020 – March 2021) compared to similar numbers of patients transplanted during an earlier time-period (comparator cohort: November 2017 – March 2019).

Results: 30 patients received a SPK transplant in each time-period (one patient received a pancreas after SPK in the COVID cohort). They were no significant differences in gender, age at transplant, duration of diabetes, or dialysis pre-transplant. Ten patients (33%) in each cohort received donation after circulatory death (DCD) donor organs, and the HLA mismatch and donor age were not significantly different.

Two patients in the COVID cohort died within the first-year post-transplant, both from cardiovascular causes. One patient in the comparator cohort died at 33 months post-SPK from lung damage related to Pneumocystis jirovecii pneumonia (PJP) and COVID infection.

There were similar rates of rejection within the first year (2/30; 6.7%) observed in each cohort, and a non-significant higher rate of death-censored pancreas graft survival at one year in the COVID cohort (97% COVID cohort vs.93% comparator cohort). Renal allograft survival at 1- and 3-years post-transplant (death-censored) was 100% in both cohorts.

Conclusion: SPK transplantation during the peak of the COVID-19 pandemic was associated with good patient and graft survival and no excess of morbidity or mortality associated with COVID infection.

Category: Clinical - pancreas and islet (pancreatic transplant (all types) - surgery - recipient clinical care and management)

P0068: COMFRT at the end of life in critical care

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Background/aims: Around 15-20% of patients die in ICU. We undertook a quality improvement project to improve end of life (EOL) care for our patients in ICU. We had introduced a COMFRT tool to improve EOL care in our ICU across physical, spiritual and psychosocial domains and make discussions around organ donation a routine part of EOL care.

Methods: We undertook a case note survey of all our patients in our 11 bedded district general hospital(Royal Alexandra Hospital, Paisley) in Scotland who were at end of life in our ICU in Scotland between 31st March 2021 and 31st March 2023 to assess if the inclusion of our COMFRT tool (C onsensus decision, organ Donation considered, Medical documentation such as EOL pathway and DNACPR, Family considerations , Religious considerations and Tasks for e.g. death certificate and keepsakes) had improved referrals to the organ donation service and documentation of the discussion.

Results: 168 patients were at end of life with an additional 7 who died in another setting after discharge. The mean age was 59 years and there were 103 males and 65 females. We used the COMFRT tool in 116/168 (69%) of patients and documented organ documentation decision in 154/168 (91%) of patients and approached families regarding tissues and corneas in 98/168 (58%) of patients independently of the referral for solid organs. The COMFRT tool was completed fully in 109 /116 patients.

Conclusions: There has been an increase in the referral for consideration of solid organs and tissues in our ICU with an improvement in documentation. It is difficult to attribute this improvement entirely to the tool, albeit that it acts as a prompt for consideration at end of life.

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

P0069: Short-term results of Alemtuzumab (Campath) induction protocol change in simultaneous pancreas kidney transplantation following the COVID-19 pandemic

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Introduction: Alemtuzumab (Campath) is a potent humanized rat monoclonal antibody directed against CD 52 antigen, causing profound T-cell depletion. Prior to the COVID-19 pandemic, induction protocols for simultaneous pancreas and kidney transplantation (SPKT) comprised 2 doses, (30 mg subcutaneously, 24 hours apart). Due to concerns regarding long term T-cell depletion during the pandemic, the induction protocol was modified to a single dose with the aim of reducing long term immunosuppression. We aimed to compare immunological, patient and graft outcomes following this induction protocol alteration in SPKT.

Methods: A single center retrospective, sequential analysis was performed of patients receiving SPKT after the COVID-19 pandemic (single Campath dose; Group 1) compared to a group receiving double dose prior to the pandemic (Group 2). Patients with immediate technical complications were excluded from analysis. Retrospective data was analyzed for patient/graft survival, hematological sequelae, acute rejection, readmission rate and associated cost considerations with a median follow-up of 6 months.

Results: 42 patients were included in both study groups. 5 (3 group 1, 2 group 2) were excluded from analysis due to early graft pancreatectomy. Maintenance immunosuppressive regimen consisted of mycophenolate mofetil and tacrolimus in both the groups. Six-month patient survival was 100% in both groups with graft survival 100% and 97.7% (41/42) respectively.9.5% (n=4) patients had leucopenia within 6 months in group 1 compared to 26% (p value <.05) in group 2. Subsequently, 1 patient in group 1 (2.3%) required treatment with granulocyte colony stimulating factor (GCSF) compared to 4 (9.5%) in group 2. No patient required hospital readmission for treatment in group 1 compared to 2 (4.75%) in group 2.

Discussion: Modification of induction protocol to use single dose of 30 mg alemtuzumab achieved excellent short-term patient and graft survival following SPKT with lower incidence of leucopenia without increasing acute rejection rates thereby reducing opportunistic infection risks

Category: Clinical - pancreas and islet (pancreatic transplant (all types) - surgery - recipient clinical care and management)

P0070: The impact of establishing a living donor coordinator (LDC) post in a non-surgical UK renal centre

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Introduction: The MDT transplant workforce was previously stretched with no designated individual responsibility for assessment of potential living kidney donors (LKDs), consequently the LKD pathway was fragmented.

Methods/case presentation: A business case for a Living Donor Coordinator (LDC) included local, regional and national activity metrics from NHSBT and additional supportive evidence from NBTA, the NKF All Party Parliamentary Kidney Group Transplantation Manifesto, the UK Living Donor Network, GIRFT, Kidney Care UK and the Living Donor Kidney Transplantation 2020 Strategy, referencing inequity to transplantation from ATTOM and other studies. From GIRFT data, the percentage of patients starting RRT with a LD transplant in our centre was below the 95th confidence interval. The incident LD transplant rates PMP were also low (9.7 PMP) despite the higher-than-average dialysis take-on rate, recognising that LD rates are adversely impacted upon by deprivation and high ethnic diversity. GIRFT supported a LDC appointment, working in close collaboration with the AKC team and the regional transplant centre. The NHSBT Living Donor Coordination Workforce Calculator was used to confirm the service requirement.

Results/outcome: In the first full year after establishing a LDC post, there were 10 living donor transplants, 5 of which were pre-emptive (well above previous LKD activity). The median time from initiation of potential LKD work-up to actual donation or pathway discontinuation because of donor unsuitability was significantly reduced. There was increased patient participation in the UKLKSS. A community video to support potential living donors was produced in collaboration with our cultural and health improvement officer and the hospital production team.

Discussion: A dedicated LDC role can have a significant positive impact on living donation activity within a non-surgical UK centre, both in terms of LD transplants and also promotion of living donation within the local community.

Category: Living donation (living donor and recipient selection (all organs) options for donation - donor care - outcomes)

P0071: International Practice Sharing: A Singapore experience visiting South West and South Wales organ donation teams

Transplant Coordinator Stella Agustin[1], Regional Head of Nursing Joanna Chalker[2], Lead Nurse Elaine Clarke[3], Transplant Coordinator Joyce Valereine[1]

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Introduction: The Commonwealth Tribute to Life project provided an opportunity for international networking, learning and sharing solutions for common challenges. Following the 2022 launch, an opportunity for networking with Singapore was initiated with plans for a 10-day attachment.

Opportunities for international collaboration are in their infancy and learning from this attachment will help to further develop such collaborations.

Case Presentation: The National Organ Transplant Unit (NOTU) oversees organ donation and transplantation in Singapore. Singapore has an established living and deceased donor transplantation programme with an opt-out legislation for deceased donation since 1987, and UK recently adopted the latter in 2020.

UK has a model for hospital engagement and structured educational packages for specialist nurses in organ donation. NOTU aims to learn from the successes of UK's model and referral system for donation and to foster learning opportunities between NHSBT and NOTU.

With a population size comparable to Singapore, the South West and South Wales teams were selected to host two transplant coordinators from NOTU. Planning meetings took place over Teams to share learning objectives, expectations and sorting out logistics. There was a clear timetable covering living and deceased donor activities, including shadowing on-call donation activation. They also attended national education and stakeholder engagement sessions.

Logistics such as accommodation and international travel were handled by the visitors. The host teams organised the contracts, uniforms, name badges and internal transportation when activated for on-call activities.
Upon return to Singapore, the NOTU coordinators will share with their colleagues what they have learnt from UK and consider incorporating some of the best practices.

Outcome: The attachment allowed two-way learning and practice sharing and is a valuable networking opportunity for two similar organisations across the globe.

Discussion: We will continue such exchanges to nurture relationships and opportunities for sharing practices and experiences between colleagues in Singapore and UK.

Category: Case study submission (may include individual cases or shared learning experiences)

P0072: Measuring functional effects of HLA antibody: NK cell activation assay

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Introduction: Single antigen bead (SAB) testing enables monitoring of HLA-specific antibody, but does not assess the antibody's effector functions mediated by IgG binding to Fc receptors (FcgRs). Natural Killer cells express FcgRIII (CD16) and have been implicated in the pathogenesis of antibody mediated rejection (AMR). To profile the functional, immune activating effects of HLA antibody, we have developed an NK cell activation assay. Using single HLA expressing 'reporter cells' as an antibody capture tool, we aimed to measure HLA antibody-dependent NK cell activation, evidenced by downregulation of CD16, and expression of an NK cell degranulation marker (CD107a).

Methods: Single HLA expressing reporter cells (Class 1 A*01:01, A*02:01, A*03:01, A*24:02, B*07:02, B*15:01, B*27:05, B*35:01, B*44:02, B*57:01) were coated with highly sensitized patient sera (cRF 100%, HLA A2 negative), and incubated with NK cells in PBMC of n=3 HLA-typed healthy volunteers. CD16 and CD107a expression on NK cells (indicative of activation and degranulation) were measured by flow cytometry. Plate coated anti-CD16 ab or PMA/ionomycin and serum coated A2-HLA expressing cells were used as positive and negative control stimuli respectively. A 2-way ANOVA was used to adjust for donor-dependent variability.

Results: Following stimulation with positive controls or HLA reporter cells (B57, pooled Class 1 - positive) coated with sensitised serum, NK cell activation was evident, with significant downregulation of CD16 at 16 hours (Fig 1A), and upregulation of CD107a within 2 hours (Fig 1B), compared to the negative control ($p<0.005$).

Conclusion: We have shown that HLA-expressing cells, coated with the HLA antibodies contained in sensitised patient serum, can activate NK cells, and this is measurable using our assay. This provides a readout of an HLA antibody's capacity to stimulate NK cell cytotoxicity, with the potential to better identify pathologically significant HLA antibody.

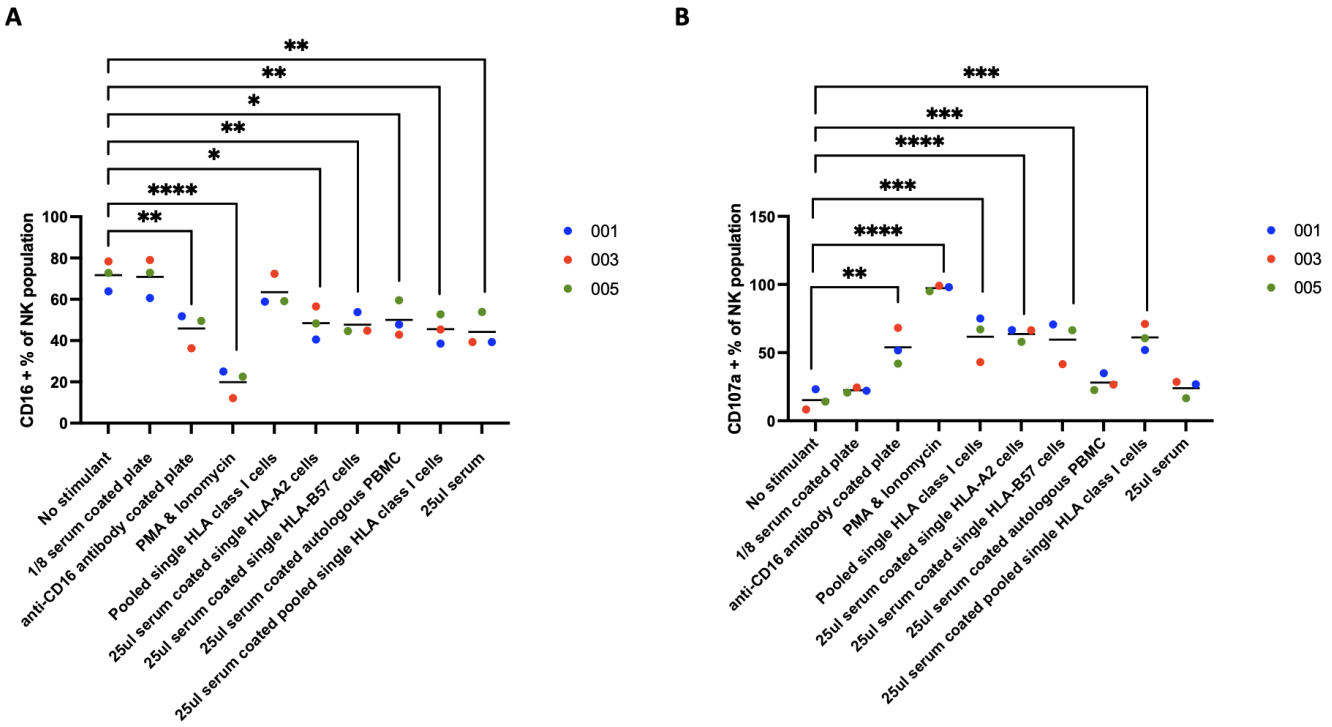

Figure 1. Activation of NK cells from PBMC stimulation (n = 3) A. CD16 down regulation at 16 hours. and B. Upregulation of CD107a at 2hours. Flow cytometry gating on NK cells (CD3- CD56+). Comparison made using 2 way ANOVA, Dunnett's multiple comparison test. * = p<0.05, ** p = <0.005, ***p = <0.0005**** p =<0.0001

Category: Basic and translational science (as per category - all science)

P0073: Access and barriers to renal transplantation in Nottingham; the negative impact of lengthening waiting lists of hospital appointments

Dr Ismet Boral, Dr Shabaz Kiani, Dr Catherine Byrne

Nottingham University Hospitals NHS Trust, Nottingham, United Kingdom

Introduction: Transplantation is the gold standard treatment for kidney replacement therapy (KRT). All patients should have a pre-emptive decision regarding transplant suitability and be waitlisted prior to starting dialysis. Last year we presented our 2021 single-centre experience on timeliness to transplant listing and reasons for delays. After making process changes, we reassessed our performance in 2023.

Methods: Using our electronic system, we identified 817 eligible patients (508 males, 309 females) with eGFR ≤15 with or without previous transplantation, or currently on dialysis on 11th April 2023. Data collected included demographics, previous transplantation, dialysis start date, date of referral to transplant surgeons and subsequent activation on the national waiting list, with reasons for any delays.

Results: 336 patients had chronic kidney disease G5, 16 had a failing kidney transplant (eGFR≤15), 86 were currently on peritoneal dialysis and 379 current haemodialysis patients.

Of those referred to see a transplant surgeon, 68% were referred pre-emptively before starting KRT and 80 patients after starting dialysis. 69 (86%) of these late referrals were due to unavoidable reasons beyond our control.

On average the waiting time to see a surgeon improved by two weeks to 71 days. The commonest delays to transplant listing decisions remain waiting for another speciality review (26%, previously 11%) and waiting for imaging (16%, previously 25%)

Our electronic documentation of transplant status has improved as 11% of patients had a documented decision on their electronic records compared to 18% in 2021.

Discussion: We made process changes within the department to improve our performance from 2021 including employing an extra transplant surgeon and renal psychologist and starting a multi-disciplinary weight loss programme for those patients with obesity. However, the proportion of patients waiting for another specialist's opinion has more than doubled. This effect could be due to COVID backlog, industrial actions or understaffing in other departments.

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

P0074: Donor management and optimisation: The role of the respiratory physiotherapist

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Introduction: A gentleman in his fifties, was admitted to ICU following an intracranial thrombosis, with a past medical history of type 2 diabetes, retinopathy, hypertension and hyperlipidaemia. Death by neurological criteria was confirmed on day 4 of the admission. The patient's family were supportive of organ donation and deemed consent for organ and tissue donation gained. During offering, organs accepted were lungs, liver and kidneys (Heart had coroners' restriction in place, pancreas not offered due to type 2 diabetes).

Case Presentation: Theatres was planned for the evening of day 5 due recipient centre requests. Specialist Nurses – Organ Donation made an A-E assessment.

Auscultation: minimal crackles, quiet bases
Suction: minimal to scant
Arterial blood gas: PaO2 45kPa. All others normal.
Respiratory physiotherapists: Attended as routine care for optimisation of the consented DBD donor.
On initial A-E assessment, there were no significant indicators to escalate bedside care and involve the respiratory physiotherapist. The patient showed little indication for further respiratory intervention. However, the input of the respiratory physiotherapists was invaluable.

Outcome: The respiratory physiotherapists attended four times throughout their shift, with one planned visit from the on-call physio prior to planned theatres.
Cough assist was used to promote secretion clearance. At first there was copious amounts of thick green secretions, which reduced throughout the day. Regular inspiratory holds following physiotherapy sessions to promote bi-basal lung recruitment. Two doses of intravenous antibiotics (co-amoxiclav 1.2g TDS) were administered. Sputum MC&S sent (results received following donation/transplantation). The lungs were donated and transplanted, as were the liver and kidneys.

Discussion: The role of the respiratory physiotherapist and MDT planning for the multiorgan donor can have potential impact on donation and transplantation outcomes. Physiotherapy interventions for lung optimisation such as airway clearance using mechanical insufflation-exsufflation (MI-E) in the neurologically deceased should be considered for this cohort of patients.

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

P0075: The Live Donor Kidney Transplant Collaborative working model (COxNet), between University Hospital Coventry & Warwickshire and Oxford University Hospitals

Dr Hamza Ahmad[1], Dr Farhan Ahmad[1], Jane Reid[1], Laura Fraiser[1], Nicki Hayward-Priest[2], Prof Christopher Imray[1], Mr Keno Mentor[1], Mr Debabrata Roy[1], Mr John O'Callaghan[1]

[1]University Hospital Coventry and Warwickshire NHS Trust, Coventry, United Kingdom. [2]Oxford University Hospital, Oxford, United Kingdom

Introduction: Pre-emptive Live donor kidney transplant yields the best transplant outcomes. A delay in the transplant surgery due to long elective waiting times can affect patients' quality of life, and result in the commencement of renal replacement therapy, mitigating the protective effects of pre-emptive transplantation. A surgical collaborative working model aims to reduce the waiting times while maintaining patient experience and quality of care.

Method: This is a retrospective service evaluation study from Jan 2021 to Oct 2023. Consisting of OUH registered patients who underwent Live donor kidney transplant at UHCW. The study included 15 recipients (60% males, 40% females) with a mean age of 37.1+/- 11.5 years and 14 Donors (60% females, 40% males) with a mean age of 38.2 +/- 11.0 years.

Results: 40% of the recipients were predialysis. The median Length of stay was 5 days, mean cold ischemic time 198.8 +/- 97.1 min. None of the patients had any intra-operative complications, delayed graft function or were returned to theatre within 90 days, 1 patient had suspected Malignant hyperthermia requiring ITU admission. Mean Creatinine at discharge was 135.7 +/- 62.9 mmol/L and 3-month mean Creatinine was 120.7 +/- 35.9 mmol/L. The median length of stay of donors was 4 days, with no intra-operative or post-operative in-hospital complications recorded.

Discussion: The LD kidney transplant Collaborative model, through the Coventry Oxford Transplant network (COxNet), has proved to be an effective working model providing timely and safe surgery to the patients, reducing waiting times, avoiding the need for extra procedures and dialysis. This has been achieved without affecting the quality of patient care, patient experience or waiting time for UHCW patients. With adequate counselling patients were open to the idea of being operated at a different centre.

Similar transplant resource collaboratives can be helpful in reducing post-covid long elective waiting times without impacting patient care.

Category: Clinical - renal surgical (kidney - transplant and living donor surgery - novel techniques)

P0076: Live Donor Nephrectomy: Patient experience and COVID-19

Doctor Natalie Edwards, Doctor Anu Philips

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Introduction: Covid-19 had an unprecedented effect on donation services, with all types of organ donation falling in the year 2020-21. The latest NHSBT activity report shows live donation numbers have not yet recovered to pre-pandemic levels. The potential benefits of live versus deceased donation are many; increased graft longevity, reduced waiting times (reducing dialysis requirements) and easier local service planning. Therefore, it seems increasingly important to ensure the live donation experience is positive, such that the word-of-mouth message helps to recruit potential donors.

Methods: Scores and comments of patient experience about various steps in their donation journeys were collected for the years 2015-2022. Both quantitative and qualitative data from these questionnaires were analysed for trends, with an interim presentation of findings in 2019.

Results: Overall, standards of care remained impressively high despite pressures of the pandemic. However, notably there were no live kidney donations at all in our centre in 2020. In 2021/2022, patient experience scores fell as they did not feel involved in the timing of their surgery and had no peri-operative access to the patient hotel (previously a very well-reviewed element). In contrast, following poor feedback regarding ward stay presented in 2019, post-operative care was moved from a general surgical to a specialist ward and scores in this domain improved for 2021-22.

Discussion: Donor feedback is hugely valuable as pressures on the transplant service remain very high post-pandemic and live donors are a significant, and often more successful, part of the organ donation population. The live donor service relies on the beneficence of healthy individuals to put themselves through a not insignificant procedure. Of note, donor demographics at our centre appear to have changed post-pandemic with a significantly smaller portion of donors not knowing their recipient. It is therefore paramount to act on feedback, improve donor experience and inspire more live donations.

Category: Living donation (living donor and recipient selection (all organs) options for donation - donor care - outcomes)

P0077: Specialist nurses attitude to Organ Donation Consent legislation change

Mrs Lucy Dames

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Introduction: All countries of the United Kingdom and all Crown dependencies except one (Isle of Man) are now operating an Opt-Out legislation for consent. All Specialist Nurses (SNs) in organ donation have undergone extensive training to operate under the consent model of the areas they work in. Despite the change in legislation consent rates are not improving and this has an impact on those waiting for a life-saving organ transplants. It was felt it would be beneficial to gain an insight into the views of SNs in relation to the legislation to ascertain if there were any obvious barriers to consent.

Methods: A Microsoft forms questionnaire with a total of 9 questions and both a mixture of quantitative and qualitive questions was sent to the entire Specialist nurse workforce via email. All SNs were encouraged to complete the questionnaire and provide opinions on the legislation change. The initial email request was followed up with a reminder one week later.

Results: Out of approximately 300 SNs working currently in the UK responses were received from 141. All 12 Regional organ donation teams were represented in the responses and the majority of respondents had been in role over 5 years. All but one respondent had reported to have undergone specialist training in speaking to families about the legislation. The majority of respondents (61%) felt the legislation had not aided conversations with potential donor families and only 12 respondents (8%) felt the legislation had improved consent rates. Qualitative thematic analysis was applied to review responses to open ended questions to group into positive, neutral and negative thoughts relating to the legislation.

Discussion: It appears evident SNs feel there is a need for public education. There are many nuanced challenges in organ donation and it seems legislative change alone is not sufficient to positively impact consent rates.

Category: Ethics, law and public policy (legislation, changes to legislation)

P0078: Solitary hilar strictures following normothermic liver perfusion are related to bile duct cannulation timing and can be prevented by delayed cannulation

Mr M Saeed Qureshi[1], Mr Rohit Gaurav[1], Mr Andrew Butler[1], Miss Lisa Swift[1], Miss Rachel Webster[1], Miss Corrina Fear[1], Miss Sara Upponi[2], Prof Chris Watson[1]

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Introduction: A higher incidence of solitary hilar biliary strictures has been noted following normothermic machine perfusion of livers, particular those donated after circulatory death. We reasoned that these may be related to ligation of the bile duct around the cannula before the onset of perfusion, which might compromise blood flow to the distal duct. We therefore changed our technique to delayed cannulation, whereby the cannula was tied in after 30 to 60 minutes of perfusion. At the same time many livers were involved in a study of TPA to prevent non-anastomotic biliary strictures. This abstract reviews the practice of delayed cannulation.

Methods: A retrospective note review was conducted of prospectively collected data of livers transplanted between 1/2/2018 and 30/9/2023. Biliary complications were recorded; cases with arterial thrombosis (4 before and 2 after) were ignored. Follow up is from 1 month to 67 months.

Results: The table depicts the results. The incidence of isolated hilar strictures before the change was 2% in DBD and 10% in DCD; after the change none were seen in 29 DBD and 34 DCD livers. However, the use of TPA confounds these data, being used in 6% of livers before the change in cannulation technique and 53% after the change.

Conclusion: Isolated hilar biliary strictures have not been seen since the canulation technique changed, although this practice coincided to our increased use of TPA which may have contributed to this effect.

	Pre-cannulation change		Post cannulation change	
	DBD	DCD	DBD	DCD
N	97	89	29	34
TPA treated	1	11	21	12
Solitary hilar strictures	2 (2.1%)	9 (10.1%)	0	0
Other non-anastomotic strictures	2 (2.1%)	7 (7.9%)	0	2 (5.9%)
Anastomotic leaks	4 (4.1%)	6 (6.7%)	1 (3.4%)	0

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

P0079: The failing kidney transplant: A single centre experience

Mrs Joanne Stacey, Dr Catherine Byrne

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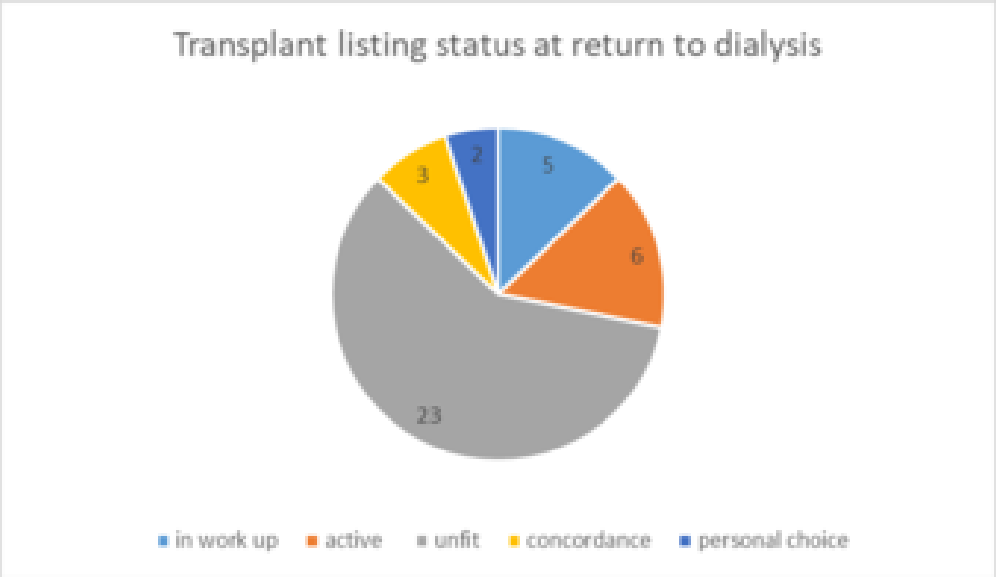
Introduction: Nottingham has 827 patients with a functioning renal transplant, 57 of whom have an eGFR <25mls/min. Since 2008, quarterly meetings review these patients to ensure a smooth optimised transition to dialysis, and timely transplant relisting. We present our data from the last 2 years.

Methods: Quarterly we extract patients with a functioning renal transplant whose eGFR is <25mls/min from the renal IT system. We assess the rate of change in kidney function to exclude reversible causes and ensure suitability for redo renal transplantation has been addressed, relevant investigations have been organised and a dialysis plan is in place. We ensure there is a vascular access plan, when appropriate, and address biochemical and haematological parameters along with blood pressure (BP) control. The data for 2021 and 2022 are presented.

Results/outcome: In 2021, 21 patients returned to dialysis and 18 in 2022; 4.7% of the transplant cohort. Ages ranged from 20-80 years, mean 54. 18% had experienced rejection in the six months prior to starting dialysis. Although 15% were active on the transplant waiting list prior to starting dialysis, none received a redo kidney transplant. 11 patients (28 %) started a home based therapy (2 home haemodialysis, 9 peritoneal dialysis) and 13 (33%) had died by November 2023. 11 patients started haemodialysis with temporary access, only 1 of these was avoidable.



Haemoglobin readings averaged 89.5g/l (range 62-126g/l), BP control was ≤130/80 in 20% of patients who took an average of two antihypertensive agents. PTH levels averaged 459ng/l (range 40-1746ng/l), mean calcium 2.21mmol/l (range 1.8-2.65mmol/l), mean phosphate 1.96 mmol/l (range 0.56-7.39mmol/l).

Discussion: Significant numbers of patients die within 2 years of graft loss. Regular review of patients with declining transplant function helps ensure a smooth transition to dialysis and timely transplant relisting, but BP and anaemia management require more focus

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

P0080: The process of living kidney donor (LKD) evaluation at The Royal London Hospital (RLH)

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Introduction: Living kidney donation plays a crucial role in addressing the growing demand for kidney transplantation globally. A robust and efficient pathway for evaluating potential donors is crucial to improving living donation rates. This project evaluates the LKD pathway at RLH to pinpoint potential areas of improvement and to establish outcomes for all potential LKDs in 2022.

Methods: We conducted a single-centre retrospective analysis of all potential LKDs who were booked into the January-December 2022 worklist at RLH, excluding those who were being worked up abroad. Data from each stage of the LKD pathway was collected using various sources: a shared LKD email inbox for first contact dates, an electronic patient record for outpatient clinic details, and a second electronic patient record for investigation and inpatient information.

Results: Among the 139 potential LKDs in our 2022 cohort, 36 (25.9%) proceeded to or were scheduled for donation, 32 (23%) were deemed medically unfit, 29 (20.8%) withdrew, 19 (13.6%) became backup donors, 14 (10.1%) did not proceed due to recipient factors, 5 (3.5%) had ongoing assessments, and 4 (2.8%) entered the shared pool. Of the 36 proceeding to donation, 56% were pre-emptive transplants.

Key areas for improvement included; high non-attendance rates, delays in accessing nuclear medicine, stress echo, and CT appointments - along with prolonged CT reporting times.

Discussion: RLH's conversion rate (assessment to donation) has improved from 13% in 2015 to 26% in 2022, demonstrating consistent improvement. However, the total number of potential LKDs decreased by 15% from 2015 to 2022, emphasising the need for heightened awareness and access to our LKD service. This, with improvements to our pathway such as dedicated investigation slots, should help to sustain the positive trend shown in our conversion rate.

Category: Living donation (living donor and recipient selection (all organs) options for donation - donor care - outcomes)

P0081: Is the duration of ureteric stenting really a risk factor for pre- and post-stent removal UTIs in kidney transplant recipients? Intuition is not always right

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Introduction: Studies have shown that the timing of ureteric stent removal post kidney transplant is associated with the number of UTIs. We routinely remove stents at 6 weeks. During the Covid-19 pandemic, there were delays in removing them. Our aim was to study the impact of delayed stent removal on UTIs in the pre and post-stent removal period, and identify factors affecting repeated UTI's.

Methods: All kidney transplants between January 2019 and December 2022 were included. Data was collected on UTIs during the stented period and until three months after stent removal. A UTI was defined as a positive urine culture or urine microscopy WCC ≥100x10^6/L cells. All positive cultures/microscopies caused by the same organism within a two-week period were attributed to a single infection. Binary logistic regression was performed to assess the relationship between stent duration and post-stent removal UTIs, whilst accounting for other predictors.

Results: There were 347 transplants with full stent and UTI data during this period. Median stent duration was 57 days. 184 patients prior and 106 post stent removal had at least one UTI (31 had 2 or more UTI's post removal). UTI's prior to the stent removal were associated with female gender (p=0.001) but not the duration of stenting. On binary regression the stent duration was not a significant risk factor for post-stent removal UTIs (p=0.2), whereas the strongest predictor for repeat post stent UTI's was a pre-stent removal UTI (p<0.001, OR 5.8, 95% CI 3.3-9) and female gender (p=0.002, OR 2.37).

Discussion: In this kidney transplant population, delayed stent removal after 6 weeks was not a risk factor for developing more UTIs either in the pre or in the three-month post-stent removal period. However, even a single UTI during the stented period and female gender of the recipient increased the chance of post-stent removal UTIs.

Category: Clinical - renal surgical (kidney - transplant and living donor surgery - novel techniques)

P0082: Factors that influence cold ischaemia time in deceased donor simultaneous pancreas and kidney transplants: Results of a National Transplant ACcess to Theatre (NTACT) study

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Introduction: Various factors prolong cold ischaemia time (CIT) during simultaneous deceased donor pancreas and kidney (SPK) utilisation across the UK which impacts graft survival. However, there is a lack of data on these obstacles; therefore, this multicentre national audit aims to identify the delays that occur in between the organs' arrival to the implanting centre and transplantation.

Methods: We conducted a multicentre, prospective study of adult deceased donor SPK transplants across 5 UK transplant centres between February and September 2022. Data collected includes time intervals between significant checkpoints before transplantation and perceived reasons for delays after arrival at implanting centre. Data was recorded on RedCap and analysed for delays using descriptive statistics.

Results: In total, data on 29 SPK transplants was collected, of which 5 were excluded due to incomplete/incorrect data. There were 12 donations after brainstem death (DBD) organs and 12 donations after circulatory death organs. The median CIT for DBD kidneys and pancreases were 12:08 (IQR: 10:45-12:59) and 10:13 (IQR: 8:28-10:33) respectively, while for DCD organs they were 10:30 (IQR: 09:13-12:17) and 07:44 (IQR:07:12-09:37). The national CIT recommendations were surpassed by 17% of DCD and 0% of DBD organs, and by 17% DCD and 4% DBD kidneys and pancreases respectively. The median time between the organ's arrival at implanting centre and the knife to skin was 03:17 (IQR: 03:00-03:48). The median warm ischemia (WIT) for pancreases was 00:38 (IQR 00:31-00:43). The median time between the organ's arrival at implanting centre and the patient's arrival at the theatre was 01:41 (IQR: 00:52-01:57). Of In 96% of transplants, delays were reported.

Discussion: A significant proportion of kidneys and pancreas were implanted beyond nationally accepted CIT cut-off. We identified various delays to organ utilisation, and the major delays arose due to, theatre, surgical and anaesthetic team availability.

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

P0083: Barriers for deceased donor kidney organ utilisation: Results of a National Transplant ACcess to Theatre (NTACT) study

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Background: Various barriers to deceased donor kidney utilisation exist and prolong cold ischaemia time (CIT) impacting graft survival. However, there is a lack of data on these obstacles; therefore, we aim to identify barriers to kidney utilisation after arrival at the implanting centre.

Methodology: We conducted a multicentre, prospective audit of adult deceased donor kidney-only transplants across 14 UK transplant centres between February and September 2022. Data collected includes time intervals between significant checkpoints before transplantation and perceived reasons for delays after arrival at implanting centre. Data was recorded on RedCap and analysed using descriptive statistics.

Results: In total, data on 476 kidney-only transplants were collected (29 excluded for incomplete/incorrect data). There were 230 donations after brainstem death (DBD) organs and 202 donation after circulatory death (DCD) organs. The median CIT was 10:55 (IQR: 08:11-15:13) for DBD organs, and 11:19 (IQR:08:31-15:10) for DCD organs. The national CIT recommendations were exceeded by 42% of DCD and 15% of DBD organs. The median time between the organ's arrival at implanting centre and the knife to skin was 04:02 (IQR: 02:35-07:35) . The median delay from anaesthetic induction to knife to skin was 00:55 (IQR: 00:39-01:10). There were 35% full and 65% virtual crossmatches. In 34% of transplants, delays were reported. Availability of the surgical team, anaesthetic team, porters, and the operating theatre were the most common causes of delay.

Conclusions: We identified various barriers to kidney utilisation and identified the timings between each stage of the organ arrival procedure. We aim to use this to set realistic targets for optimisation of these processes in the future.

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

P0084: Perioperative practices and early post-transplant outcomes in deceased donor Simultaneous Kidney Pancreas Transplants (SPK): Results of a National Transplant ACcess to Theatre (NTACT) study

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Introduction: The outcomes of deceased donor simultaneous kidney-pancreas transplants (SPK) are mainly affected by donor and recipient factors. There is little data on the standard perioperative practices across the UK and the outcomes associated with them. This multicentre national audit aims to identify current perioperative practices and outcomes in SPK transplants.

Methods: We conducted a multicentre, prospective audit of adult deceased donor kidney-only transplants across 5 UK transplant centres between February and September 2022. Data was collected on a variety of perioperative practices and outcomes. Data was recorded on RedCap and analysed using descriptive statistics.

Results: In total, 29 SPK transplants were recorded, five were excluded, leaving 24 transplants. In 100% of transplants, patients received antibiotics pre-operatively. All operations were led by a consultant surgeon. However, only 62.5% of cases were led by consultant anaesthetists. Central lines and arterial lines were used in all cases and 42% (n=10/24) were monitored with advanced haemodynamic monitoring. All cases received goal-directed fluid therapy, of which 62.5% (n=15) were done using static parameters. The most common post-operative destination was ITU (75%). The overall 30-day mortality was 0%. The primary graft function rate was 83% and 92% for kidney and pancreas respectively. The median length of hospital stay was 12 days (IQR: 11-18). The overall readmission rate was 29%. The overall re-operation rate was 33%. The most common indications for reoperations were bleeding 50% (n=4), transplant pancreatectomy 25% (n=2), and other 25% (n=2). We noted a difference in rates of readmission between DCD and DBD organs, 17% and 41% respectively.

Discussion: We identified a variety of perioperative practices and high rates of early post-operative complications. Given the sample size of simultaneous transplants it is statistically unfeasible to assess associations between the practices and outcomes. However, a larger study assessing this association would be interesting for the future.

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

P0085: The clinical relevance of non-human leucocyte antigen (Non HLA) antibodies in kidney transplantation

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Introduction: Donor-specific antibodies (DSA) against human leukocyte antigens (HLA) can cause humoral rejection and affect the outcome of kidney transplantation. However, rejection can still occur due to Non-HLA antibodies, which can shorten the graft survival.

Methodology: We conducted a retrospective observational cohort study of 850 adult patients who underwent kidney transplants alone at Manchester Royal Infirmary between 01/01/2010 and 31/12/2020. All transplant patients were ABO and HLA compatible, matched at the A, B, and DR loci (Mismatch 0:0:0) with a calculated Reacted Frequency (cRF=0%). Patients experiencing early rejection (<1 month, n=12) were included as early rejectors, and a cohort of n=18 patients who did not experience rejection within 3 months were randomly selected as controls. The samples in each group were tested for non-HLA antibodies using One-Lambda, LABScreen assay, and Immucor, LIFECODES assay (using Luminex bead technology). The LABScreen kit contains 39 targets, while the LIFECODES kit covers 60 non-HLA antigens. The demographic parameters, primary diagnosis, renal replacement therapy (RRT) modality, dialysis vintage, type of transplant, and rejection type were also collected.

Results: Of the 850 kidney transplantations screened, 30 patients were selected for further analysis per inclusion criteria. The majority received a deceased donor kidney allograft (77%), and the mean age of the cohort was 52 years, with a predominance of males (70%) and white ethnicity (77%). Our study found no correlation between the total burden of non-HLA antibodies (Pre/ Post-transplant) and early rejection. However, a sub-analysis revealed that specific pre-transplant high-frequency non-HLA antibodies, such as GSTT, CXCL11, CXCL10 & HNRNPK, detected by One-Lambda Labscreen assay, were associated with rejection ($p<0.001$).

Discussion: Although our study did not identify a clear correlation between the burden of non-HLA antibodies and rejection episodes, there were some signals with high-frequency antibodies. Further longitudinal studies with a larger sample size may be able to tease out these differences.

Category: H&I (HLA typing - crossmatching - immunologically complex recipients)

P0086: A UK-wide audit on peri-operative practices during deceased donor kidney transplantation: Results from a prospective National Transplant Access to Theatre (NTACT) audit

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Introduction: The outcomes of deceased donor kidney transplants are mainly affected by donor and recipient factors. There is little data on whether variations in perioperative practices could also affect the outcomes and there is also little data on the standard perioperative practices across the UK. This study aims to identify current perioperative practices from a prospective National Transplant Access to Theatre (NTACT) audit.

Methods: We conducted a multicentre, prospective audit of adult deceased donor kidney-only transplants across 14 UK transplant centres between February and September 2022. Data was collected on pre-operative antibiotic use, the surgeon's grade, post-operative destination, crossmatch and haemodynamic monitoring use. Data was recorded on RedCap and analysed using descriptive statistics.

Results: In total, 476 kidney-only transplants were recorded, of which 29 were excluded due to incomplete/incorrect data, leaving a total of 446 transplants. In 98.4% of transplants, patients received antibiotics pre-operatively. A wide range of antibiotics were given; the three most used were co-amoxiclav (n=147), ciprofloxacin (n=92) and amikacin (n=69). Most of the operations were led by a consultant surgeon (91.7% n=409). However, only 61.4% of cases were led by consultant anaesthetists. Central lines were used in over half of the patients (67.7% n=302), 44.2% (197) had an arterial line in situ, and 27.6% (123) were monitored with advanced haemodynamic monitoring. A total of 320 cases (71.7%) received goal-directed fluid therapy, of which 71.6% (229/320) were done using static parameters. Finally, the most common post-operative destination was a transplant ward (76.9% n=343), but a significant number were sent to the intensive care unit and the high dependency unit, 9.4% (n=42) and 10.8% (n=48), respectively.

Discussion: We identified wide variations in certain perioperative practices. In the future, we would like to assess whether there is any relationship between the variations in practice and postoperative outcomes, such as graft function and mortality.

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

P0087: Early deceased donor kidney transplant outcomes: Results from a Prospective National Transplant Access to Theatre (NTACT) audit

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Introduction: The occurrence of renal transplantation is increasing, yet there is a paucity of data describing the post-operative complications. Therefore, this multicentre national audit aims to identify the incidence of common early complications that impact patient outcomes and increase transplant-related costs.

Methods: We conducted a multicentre, prospective audit of adult deceased donor kidney-only transplants across 14 UK transplant centres between February and September 2022. Data was collected on significant checkpoints pre, intra and post-operatively. The main outcomes assessed were overall complications and 30-day mortality rates. Data was recorded on RedCap and analysed using descriptive statistics.

Results: In total 476 kidney-only transplants were recorded, of which 29 were excluded due to incomplete/incorrect data. Out of 446, 230 were donation after brainstem death (DBD) organs and 216 were donation after circulatory death (DCD) organs. The overall 30-day mortality was 0.90% (n=4/446).
The primary graft function rate was 80%. The median length of hospital stay was 8 days (IQR: 7- 15). The overall readmission rate was 18%, the median number of readmissions was 1 (IQR 1-3). Of the recipients that were readmitted, 92% were readmitted once and 8% were readmitted more than once in the 30 days after operation. The overall re-operation rate was 11%, the median number of reoperations was 1 (IQR 1-2). Of these, 92% had 1 reoperation and 8% had more than 1 reoperation in the 30 days after operation. The most common indications for reoperations were bleeding 48% (n=26), assessment of graft perfusion 19% (n=10), and wound dehiscence 11% (n=6). There was no significant difference in the readmission, re-operation and mortality rate between DBD and DCD organs.

Discussion: We found that the overall early postoperative complication rates and 30-day mortality following deceased donor kidney transplantation are low.

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

P0088: Changed perceptions about living kidney donation in the Jain community: A positive launch of peer-support initiative by Vanik Council UK

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Background: Living kidney donation has been shown to have superior outcomes for kidney transplant recipients. However, certain communities in the UK have much lower rates of living kidney donation, which can be attributed to reduced engagement, cultural and religious beliefs and logistical challenges if family members live abroad. The overall aim was to evaluate attitudes towards living kidney donation after an educational event in the Jain and Hindu community.

Methods: A questionnaire was circulated at a community engagement event funded by the NHSBT, hosted by the Vanik Council (a community composed primarily of individuals of Jain and Hindu faith). Speakers were key members from the local transplant team who included case studies individuals could relate to. Pre- and post-event surveys were collected to gather feedback about ideas relating to living donation before and after the event.

Results: 65 participants completed the pre-programme questionnaire and 60 participants completed the post-programme questionnaire. Participants' ages ranged from 15 to 75 years, with 57% males and 43% females. Prior to the event, 60% of participants felt unsure or would not consider kidney donation. The most common concerns were complications (29.2%, n=19) and a reduced quality/expectancy of life (32%, n=21). Barriers to kidney donation included religious/cultural beliefs (16.9%, n=11) and family pressure (44.6%, n=29). Following the programme, the percentage of participants who felt unsure or would not donate a kidney decreased to 30% (n=20). Additionally, 90% (n=54) of participants reported a reduced fear of donating after the programme.

Discussion: The programme demonstrated the positive impact of community-targeted education in enhancing living kidney donation rates across the UK. A collaborative approach involving healthcare providers and the community is essential to achieve this goal. Following this educational event, peer support initiative was launched to convert the readiness in actual living kidney donation. This is currently ongoing in the region.

Category: Living donation (living donor and recipient selection (all organs) options for donation - donor care - outcomes)

P0089: De novo donor specific antibodies developing > 1 year post renal transplantation are poorly predictive of clinical rejection episodes

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Introduction & Methods: The OuTSMART trial, which recruited >2000 recipients >1 year post-renal transplant from 13 UK centres, confirmed that de novo DSA associated with increased graft loss risk, but optimising immunosuppression post-DSA did not prevent transplant failure. Post-hoc we analysed rejection in the 62 DSA-negative patients who then developed a DSA during the 8 monthly screening.

Results: 14/62 had a clinically indicated biopsy with 11 showing either borderline change (n=2), TCMR (n=4), ABMR (n=3) or mixed ABMR/TCMR (n=2). Thus, the rate of combined borderline/rejection (B/R) was 17.7%. This was significantly higher than in the 1023 patients remaining Ab-negative (3%) or those developing NDSA (3.8%). [X^2=34.14, p<0.001].

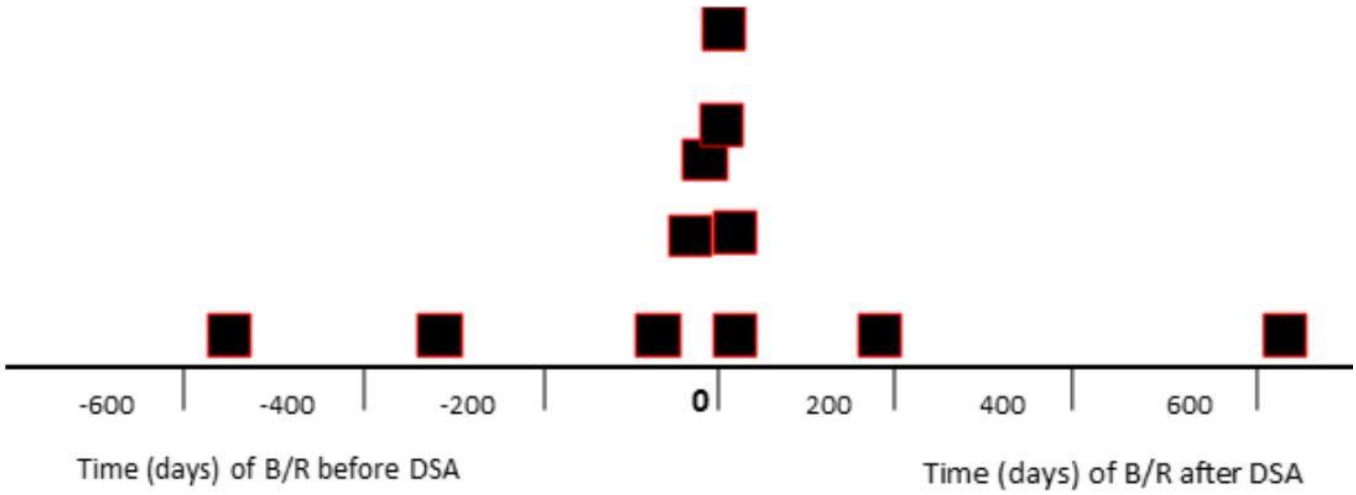
The 11 with B/R had broadly similar demographics to the 51 non-B/R including immunosuppression regimes, as were their DSA results (Table 1). Strikingly, despite similar creatinines and eGFRs at randomisation, the mean creatinine was significantly higher and mean eGFR significantly lower in the B/R group (p<0.001 for both) at DSA development. The cause was apparent when the temporal relationship between B/R and DSA was examined. In 9/11 DSA either came after, or occurred simultaneously with B/R. Conversely, B/R occurred after DSA in only 2/11 (Figure 1). Thus the rejection rate following DSA development was 3.2%, similar to DSA- and non-DSA+ groups. The graft failure rate was significantly higher in the B/R group 10/11 (90.9%) compared to 6/51 (11.8%) in the non B/R group.

Discussion: There was a high rate of clinically significant graft dysfunction due to B/R in patients who developed de novo DSA but mainly (9/11), this preceded or accompanied the DSA development. The clinical rejection rate following DSA development (3.2%) was no different to the DSA-negative patients. Thus, monitoring DSA in this cohort did not identify those at higher risk of future clinical rejection.

Table 1: Comparison of immunosuppression regimes and HLA antibody results in borderline or rejection (B/R) and non BR groups

	B/R (N=11)	Non B/R (N=51)	p value
Taking Prednisolone at Randomisation (N)	8/11 (72.7%)	31/51 (60.9%)	p=0.52
Mean Prednisolone Dose [mg (SD)]	4.3 (1.3)	5.7 (2.8)	p=0.045
Taking mycophenylate mofetil (MMF) at randomisation (N)	10/11 (90%)	35/51 (68.5)	p=0.26
Mean MMF Dose [mg (SD)]	930 (178)	1194 (446)	p=0.09
Taking Tacrolimus at randomisation (N)	9/11 (81.8)	37/51 (72.5)	p=0.25
Mean Tac trough Levels	6.0 (2.2)	6.9 (2.1)	p=0.08
Type of DSA:			
HLA class I (N)	4/11	20/51	
MFI (median (IQR))	7390, (5963-13608)	4092, (2354-6480)	P=0.07
HLA class II (N)	7/11	28/51	P=0.5
MFI (median (IQR))	5418 (3558-8768)	3835 (2727-7246)	
Both (N)	0/11	3/11	-
MFI (median (IQR))	-	5630 (5396-18673)	

Figure 2: Episodes of borderline or rejection in 11/14 clinically indicated renal transplant biopsies shown relative to appearance of donor specific antibody demonstrating 9/11 were prior or concomitant to DSA development



Category: Basic and translational science (as per category - all science)

P0090: Precision in prognosis: Revolutionizing post-kidney transplant Diabetes prediction for timely intervention

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Introduction: In response to the critical challenge of post-transplant diabetes in kidney transplantation, this study seeks to develop a predictive model. The objective is to enhance early identification and intervention for individuals at risk of developing diabetes following kidney transplantation.

Methodology: An extensive cohort of 85,600 patients in the USA from 2007 to 2017 forms the basis of this study. Exclusion criteria were implemented to ensure a focused analysis, specifically excluding individuals with pre-existing diabetes and those below 18 years old. The dataset underwent meticulous division into training and test subsets. Employing decision-based models, the study evaluated the predictive model's performance using key metrics, including concordance, cumulative AUC, and integrated Brier score. The comprehensive five-year follow-up period post-transplant provided a robust foundation for assessing the model's predictive capabilities.

Results: The developed prediction model exhibited promising outcomes, with a concordance of 0.67 in the test dataset, a cumulative AUC of 0.68, and an integrated Brier score of 0.09. These metrics attest to the model's discriminative power, overall predictive performance, and calibration, respectively. The findings underscore the model's potential as a valuable tool for identifying patients at risk of post-transplant diabetes.

Discussion: The implications of the results are profound, offering clinicians a means to proactively identify and monitor high-risk individuals. Early detection enables targeted interventions, ultimately mitigating the risk and complications associated with post-transplant diabetes. The study's comprehensive approach, spanning a significant patient cohort and a five-year post-transplant period, enhances the generalizability and applicability of the findings. Future directions may involve external validation and prospective implementation, further solidifying the model's clinical utility in enhancing patient outcomes post-kidney transplantation.

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

P0091: Assessment of living kidney donors: do we routinely need isotopic GFR measurements?

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Introduction: When assessing potential living kidney donors there is variability in how kidney function is assessed internationally. UK guidelines currently mandate eGFR, followed by isotopic measurement of GFR. In other countries, donors routinely proceed to donation based on eGFR alone. We set out to identify which method of pre-donation GFR measurement had the strongest correlation to post-donation renal function.

Methods: All potential living kidney donors in a single UK centre between 2012 and 2018 were identified. Data were extracted from prospectively recorded living donor database and patients' electronic health records. During this timeframe, all isotopic GFR measurements followed a consistent methodology with Cr-EDTA. Pearson's correlation coefficient between variables was calculated at 1yr, 3yr, and 5yrs following donation.

Results: During this period 317 potential donors completed medical assessment, of whom 151 proceeded to donation, 24 were excluded on isotope GFR alone and a further 8 donated with borderline isotope GFR. Follow-up data was available for 115/136 donors under follow up in region, these were included in the final analysis. Fifty-nine donors were female (51%). The median age was 50yrs. (range 26 – 77 yrs.)
Pre-donation normalised isotope GFR had a moderate positive correlation with post donation eGFR at 1yr, 3yrs, and 5yrs. Estimation of pre-donation GFR using CKD-EPI and MDRD had a strong positive correlation with post-donation eGFR at each timepoint. (Table 1)

Discussion: Within this cohort of selected donors, pre-donation estimations of GFR using MDRD and CKD-EPI were more strongly correlated with post-donation renal function than isotopic measurements of GFR. Given this, clarity is required to identify what benefits isotopic GFR measurement adds in the decision-making process. Reducing the investigative burden for potential donors has potential efficiency and cost savings. Further work is required to assess the safety of relying on estimations of GFR alone for those who were subsequently excluded based on isotopic GFR.

Table 1:
Correlation between baseline renal function test and eGFR (measured by CKD EPI) at 1yr., 3yr., and 5yr.

Baseline test	eGFR (CKD EPI) at 1yr	eGFR (CKD EPI) at 3yr.	eGFR (CKD EPI) at 5yr
Normalised isotope GFR (Cr- EDTA)	0.511	0.507	0.480
eGFR (MDRD)	0.593	0.668	0.623
eGFR (CKD-EPI)	0.634	0.677	0.600

Category: Living donation (living donor and recipient selection (all organs) options for donation - donor care - outcomes)

P0092: The outcome of deceased donor renal transplant in recipients aged 70 and above: Is it the right use of resources?

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Introduction: Within the UK, renal replacement therapy has seen the greatest increase in the over-75 age group, these patients constitute 25% of the recent dialysis recipients. The purpose of this study is to compare the safety and outcome of renal transplantation in patients aged 70 and above to determine the impact of age on the success of transplantation.

Methods: We retrospectively analysed data of transplant activity within our hospital from 2001 to 2019. We studied the outcomes of recipients over 70 years of age [study group] and compared them with recipients aged 60 to 69 years [control group]. We analysed their basic demographics and creatinine at 1 year [Table 1], as well as graft and patient survival at 1 year.

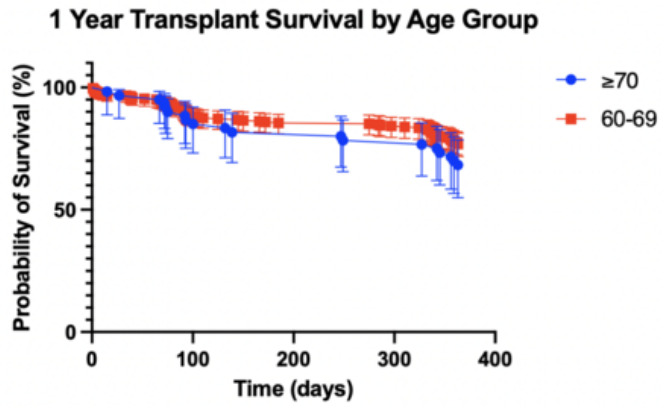
Results: Our results showed no statistically significant difference in transplant survival time for the ≥70 group in comparison to the 60-69 group (p = 0.191) [Figure 1].

Discussion: The present study demonstrates good outcomes of renal transplant in recipients aged 70 years and above. We believe that it is an effective use of a national resource and in all suitable patients over 70, renal transplantation should be considered a gold standard treatment.

Table 1: Donor and recipient demographics.

	Control group [Age: 60 – 69]	Study group [Age: ≥70]	Significance [p-value]
No of recipients	309	61	
Recipient age	64 (± 3 SD)	72 (± 2 SD)	< 0.0001
Recipient gender	37% F , 63% M	31% F, 69% M	0.479
Donor age	57 (± 13 SD)	62 (± 12 SD)	0.0054
Donor type	66% DBD; 34% DCD	67% DBD; 33% DCD	0.974
Donor retrieval creatinine	78 (± 39.76 SD)	71 (± 24.45 SD)	0.072
CIT (mins)	806.3 (± 316.4 SD)	749.6 (± 230.5 SD)	0.104
Recipient Creatinine at 12 months	139 (± 70 SD)	137 (± 47 SD)	0.8290

Figure 1: Kaplan Meier Survival Graph



Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

P0093: Learning from death in a referring centre - recurrent PR bloods loss in a dialysis patient with a failed SPK

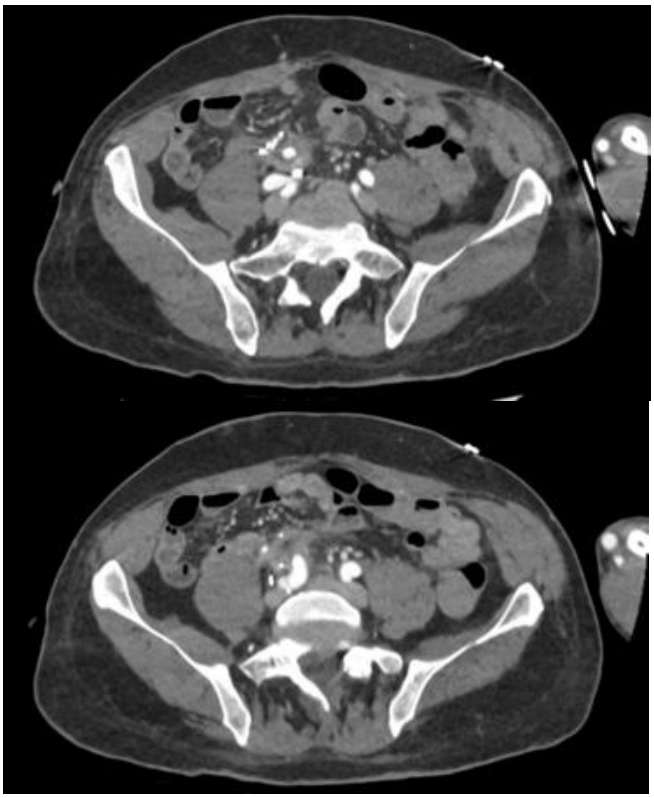
Dr Sourabh Chand

Shrewsbury and Telford NHS Trust, Shrewsbury, United Kingdom

Introduction: 57 year old gentleman with a SPK for type 1 diabetes in 2009; his kidney graft failed 10 years later. The following year his pancreas graft failed after an intensive care episode with severe stroke and thus placed on long-term clopidogrel. 2 months later he had developed diarrhoea with a normal CT abdomen with contrast and non specific colitis on sigmoidoscopy. Over the next 6 months he made a strong recovery from his stroke and was being considered for a living donor kidney transplant at his original transplant centre. His diarrhoea returned the following month and had a normal colonoscopy 3 weeks prior to presenting with his first fresh PR blood loss.

Case presentation: On first colorectal presentation he had 2 large fresh PR blood losses with associated anaemia but was self limiting and discharged. Next dialysis session he was noted to have malaena, a drop in haemoglobin to 65g/l with a plan for an OGD but if no bleeding source was found for a CT angiogram. His OGD had shown no active bleeding, but reported as 'multiple antral erosions that could account for the patient's GI bleeding'. As he had no further bleeding and discharged 4 days later, representing the following day with brisk PR blood loss. Post surgical review, the working diagnosis was internal haemorrhoids. On a third presentation 2 weeks later to ED with PR blood loss he was discharged with tranexamic acid for a confirmation bias diagnosis of internal haemorrhoids.

Outcome: 10 days later with PR blood loss, with a CT angiogram (images 1 and 2) showing fistula formation between the right internal iliac artery and distal jejunum at the site of previous pancreatic transplant likely from a pseudoaneurysm and he died.



Discussion: Main learning point is to consider a CT angiogram even if the pancreatic graft has failed.

Category: Case study submission (may include individual cases or shared learning experiences)

P0094: Progressive graft dysfunction and renal graft loss after development of de novo donor specific antibody (DSA) associates with DSA persistence and median fluorescence intensity (MFI)

Dr Sumoyee Basu[1], Dominic Stringer[1], El Li Tham[1], Chloe Martin[2], On Behalf of the Outsmart Investigators Team[3], Dr Olivia Shaw[2], Professor Anthony Dorling[1]

[1]Kings College London, London, United Kingdom. [2]Clinical Transplantation Laboratory at Guy's Hospital, London, United Kingdom. [3]13, UK Transplant Centres, United Kingdom

Introduction & Methods: The OuTSMART trial confirmed that de-novo DSA associated with increased graft loss. Post-hoc we analysed graft loss in 62 DSA-negative patients who developed DSA during the 8-monthly screening.

Results: 24 patients had HLA class I specific antibodies, 35 class II (24/35 HLA-DQ mismatches), and 3 had both but without differences between their median MFIs (p=0.78).

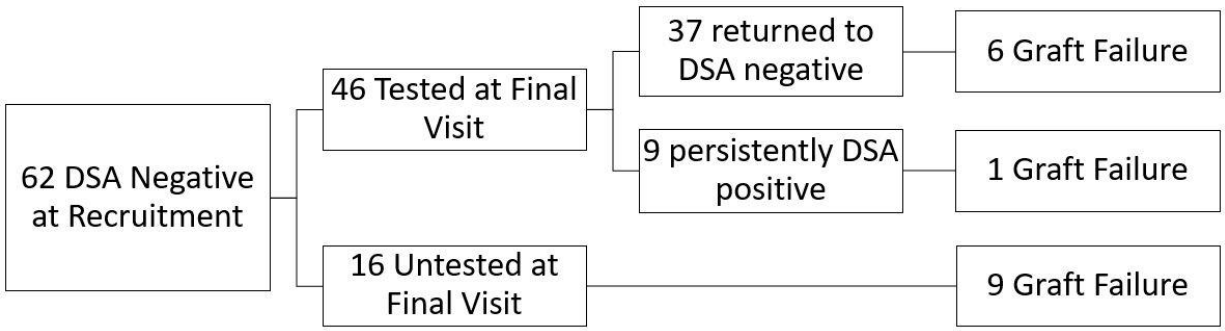
Once DSA developed, the original protocol terminated antibody testing. However, a 2018 amendment included final visit testing (Figure 1). 37/46 tested were DSA-negative and 6 had graft failure. 9 of 46 were persistently DSA+ with 1 graft failure. There were no clinically significant differences between these, but a trend towards higher MFI (p=0.06).

When eGFR was normalised at first DSA detection, persistently DSA+ patients had statistically significant different eGFR at 24 months (meanΔ eGFR-7.5±3.2mls/min/1.73m^2) versus those becoming DSA-negative (meanΔ eGFR+3.0±1.4mls/min/1.73m^2).

9 graft losses occurred in the 16/62 patients untested at the end. Thus, a total of 16/62 patients lost their transplant before the primary endpoint at a median time of 502 (187-998) days post-DSA. MFIs trended higher in those with graft failure (p=0.058) but without DSA class difference in those maintaining transplant vs. losing function. 7 patients had ≤1 measured creatinine/eGFRs after developing DSA with median time to graft failure of 104 (28-208) days. The remaining 9 had ≥2 creatinines/eGFRs beyond DSA development and these had a statistically significantly greater rate of eGFR loss vs. the 46 maintaining graft function. In these 9, graft failure occurred at a median of 959 (604-1365) days post DSA.

Discussion: 26% lost their transplants within 3 years of de-novo DSA development and in these, who trended towards DSA with higher MFIs, graft failure was preceded by faster declines in eGFR, compared to those who maintained transplant function. In this latter group, eGFR decline associated with DSA persistence.

Figure 1: Flowchart of 62 DSA negative patients indicating final visit testing status and graft failure incidence



Category: Basic and translational science (as per category - all science)

P0095: Kidney biopsies in potential living kidney donors: A single centre experience

Dr Thomas Grant, Dr Konstantinos Koutroutsos

University Hospitals Sussex, Brighton, United Kingdom

Introduction: Current UK guidelines suggest that potential donors with persistent asymptomatic non-visible haematuria require thorough assessment and a renal biopsy is suggested to exclude glomerular pathology if no other cause is found. We present our findings in a single centre cohort of potential kidney donors who underwent a kidney biopsy as part of their workup to donate.

Methods: We reviewed retrospectively all living kidney donors who underwent a kidney biopsy as part of their pre-donation workup, between 2014 and 2023 in our Department. Histology included light microscopy, immunostaining and electron microscopy.

Results: 20 potential kidney donors had a biopsy during the study period. 19/20 biopsies were indicated due to microscopic haematuria and one due to proteinuria in a patient who did not proceed to donate. In total 9/19 proceeded with further workup and / or donation (7/19 donors donated while 2/19 are still in workup). 2/19 patients had biopsy related complications, one perinephric haematoma and one with a vasovagal episode. 11/19 potential donors biopsies showed thin basement membrane nephropathy (TBMN), 1 glomerular sclerosis, 1 hypertensive changes, while 6/19 biopsies were normal. In 6/20 potential donors, biopsy results directly contributed to decision to avoid being renal donor. Of the 11 donors with a definite or potential diagnosis of TBMN, 1 patient was lost to follow up and 10 have shown no significant decline in renal function or proteinuria whether they donated (4/10) or not (6/10) (median follow-up time 6 (1-7) years).

Conclusion: In our cohort of potential kidney donors with microscopic haematuria, TBMN appears to be the most prevalent diagnosis. Our data show that TBMN did not appear to carry an increased risk for renal function decline or proteinuria in the short to medium term.

Category: Living donation (living donor and recipient selection (all organs) options for donation - donor care - outcomes)

P0096: Redefining boundaries: Exploring the ethical and operational complexities of Maastricht 4 DCD donations

Mr. Joao Pedro Nunes, Mr. Ahmed Al-Adhami

Royal Papworth Hospital, Cambridge, United Kingdom

Introduction: In the financial year 2022-2023, Donation after Circulatory Death (DCD) retrievals represented 45.9% of retrieval in the UK. DCD retrievals, in the UK, are primarily Maastricht 3, or controlled cardiac arrest following withdrawal of life sustaining treatment (WOLST). Yet, throughout the financial year of 2023-2024, the NORS team at Royal Papworth Hospital has been involved in a small, but growing number of Maastricht 4 donors (controlled cardiac arrest in brain-dead donor), posing a variety of questions. This abstract will focus on family wishes and period from WOLST to transfer to theatres.

Methods/Case Presentation:

The RPH NORS team has been involved in at least 6 Maastricht 4 DCDs from April to October 2023. These retrievals add an extra level of complexity, as each retrieval raised a variety of concerns. Clear communication and education of all involved in the donation process was key.
We identified 3 main points,

1. Can we do pre-mortem interventions in Maastricht 4 donors?
2. Respecting family wishes regarding being present until asystole
3. After asystole is the 5 minute no-touch period necessary?

Results/Outcomes: We attempted to approach the Statistics team at NHSBT requesting information on all Maastricht 4 DCDs, currently the information is not available, but the team is working on compiling the information.All these retrievals were handled on a case by case scenario and all of them proceeded in a way that allowed the family wishes to be followed, as a primary concern.

Discussion: Given the rise in Maastricht 4 DCD retrievals, there are crucial points to explore. Firstly, why are DBD donors following DCD pathways. Secondly, a review and addendum following consensus to the UK National Protocol for DCD retrievals is required to clarify how to proceed with these retrievals from WOLST to patient being transferred to theatres, as well as all pre-mortem interventions allowed.

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

P0097: Identifying patients at high risk of acute kidney transplant rejection using full blood count data

Mr Stanley Dale[1,2,3], Mr Daniel Kreuter[4,3], Dr Michael Roberts[4], Professor Nicholas Gleadall[5], Professor Menna R Clatworthy[2,3]

[1]Cambridge School of Clinical Medicine, Cambridge, United Kingdom. [2]Cambridge Institute for Therapeutic Immunology and Infectious Diseases and Molecular Immunity Unit, University of Cambridge Department of Medicine, MRC Laboratory of Molecular Biology, Cambridge, UK, Cambridge, United Kingdom. [3]NIHR Blood and Transplant Research Unity in Organ Donation, Cambridge, United Kingdom. [4]Cambridge Department of Applied Mathematics and Theoretical Physics, Cambridge, United Kingdom. [5]Cambridge School of Clinical Medicine, Department of Haematology, Cambridge, United Kingdom

Introduction: Kidney transplantation may be complicated by acute rejection, requiring a diagnostic biopsy. Non-invasive biomarkers that predict rejection have clinical utility, for example, blood transcriptomic signatures such as K-sort1. However, the use of these biomarkers is limited by cost. Full blood count (FBC) is routinely used to monitor patients post-transplant. This generates 16 variables that are reported clinically (1), with longitudinal measurements and more complex data also accessible when considering the raw data/distribution of each parameter. Largescale FBC data can produce accurate diagnostic predictions for infectious diseases (2). Here we trained statistical learning models on longitudinal FBC data from kidney transplant recipients to investigate their predictive power for acute rejection.

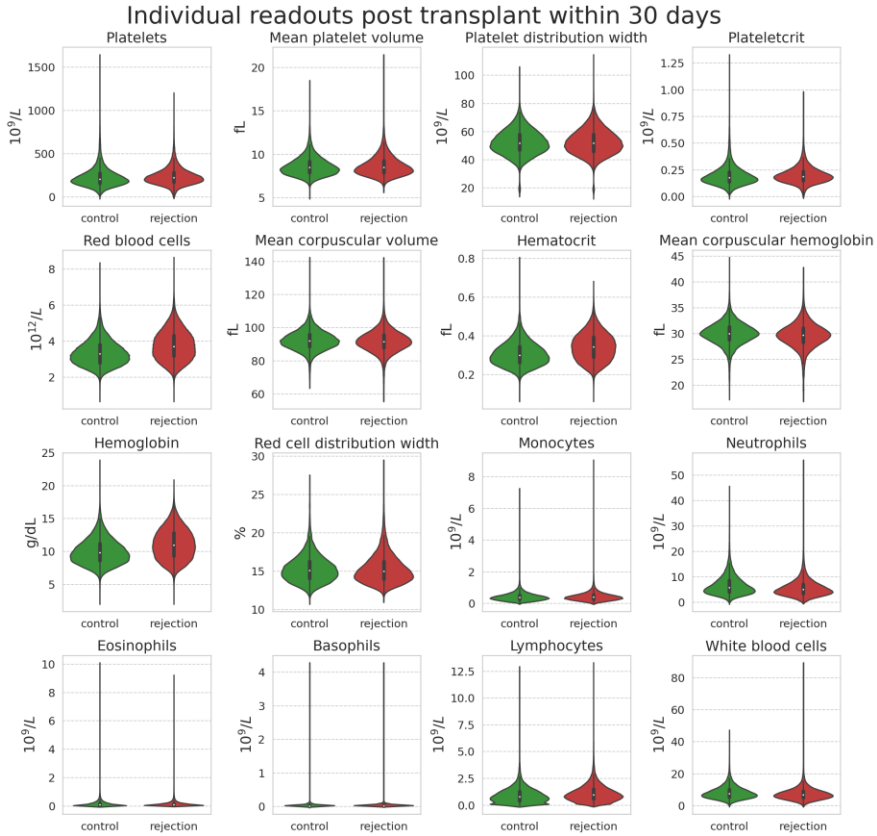
Methods: Data from n=2343 kidney transplant recipients without rejection and n=200 patients with rejection were obtained from the electronic health records at Cambridge University Hospital NHS Foundation Trust between 2014-2022. This included ~200 FBC measurements per patient. Samples were split into 'training' and 'test' data and models trained on the n=16 clinically reported FBC variables, as well a broader set of 75 variables produced by ADVIA flow cytometers. Regression, support-vector-machine, neural network, and tree-based models were trained, and evaluated on their test-data accuracy.

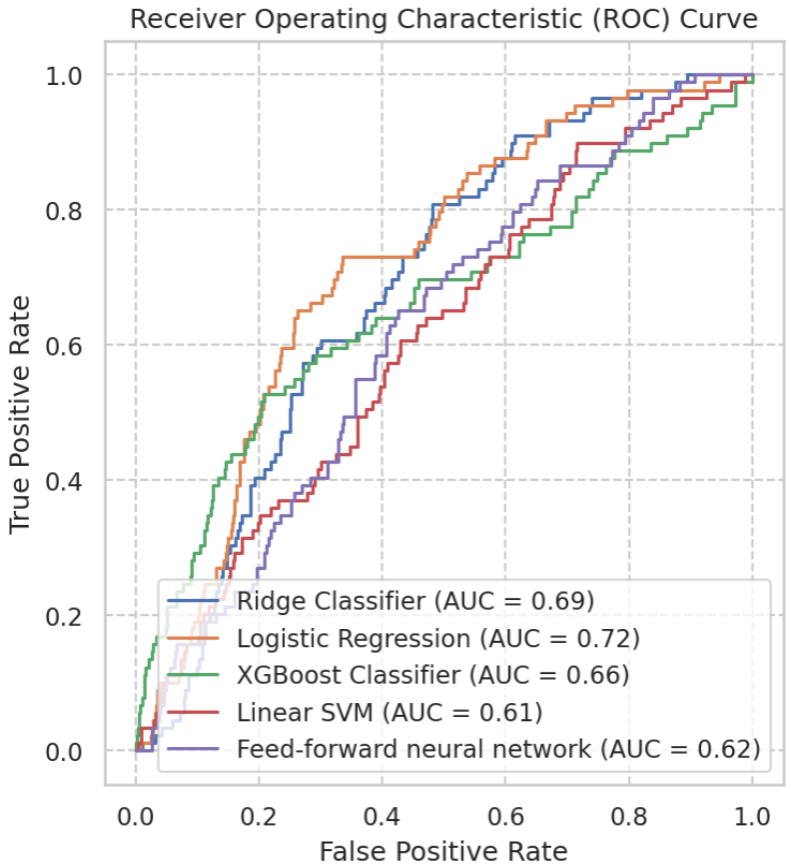
Results: In the initial analysis, we used information from all FBC measurements in the first 30 days post-transplant (Figure 1). Logistic regression provided the best predictive value for subsequent rejection (AUC 0.72, Figure 2). Inspection of the feature-importance for the logistic regression revealed 'white blood cell count' as the most meaningful predictor.

Discussion: Our results represent a first exploration of this dataset, and the first assessment of the predictive value of FBC in the context of kidney transplantation. Work is on-going to investigate different rejection types and the optimal time-window for predictive FBC data relative to the time of rejection.

References

1.Roedder.PLoS Med 11, e1001759(2014).
2.Zuin.Commun Med (Lond)2,72(2022).





Category: Basic and translational science (as per category - all science)

P0098: Revolutionizing organ transplantation: The Introduction of XVIVO heart preservation system in the UK

Mr. Joao Pedro Nunes, Ms. Rebecca Mullen, Ms. Lu Wang, Mr. Ahmed Al-Adhami, Mr. Paul Lincoln, Mr. Marius Berman

Royal Papworth Hospital, Cambridge, United Kingdom

Introduction: The National Health Service (NHS) and the National Health Service Blood and Transplant (NHSBT) are focused on supporting novel research in organ preservation and transport. Seeking to support international research and supporting achievement of this goal, the Multidisciplinary Team at Royal Papworth Hospital, partnered with XVIVO to support the NIHP2019 trial and development of XVIVO Heart Preservation system, a novel non-ischaemic preservation medical device, permitting safe transport of hearts at a temperature controlled, oxygen and nutrient rich environment.

Methods/Case Presentation: Through a 6-month period the team had 2 site visits by XVIVO, and multiple internal training sessions in order to ensure both transplant coordinators and National Organ Retrieval Services (NORS) team were aware of their roles and responsibilities within the study. Furthermore, given the extent of the XVIVO heart box manual, the team put together a new manual in order to ensure XVIVO operators had simplified, clear and the most relevant information easily accessible.

Results/Outcomes: Thanks to the efforts of the team at Royal Papworth Hospital and with the support of XVIVO we were the first center in the UK to successfully randomise a patient to the trial.
The team was also eager to participate and support such an important research project with such a big impact at an international level and for the future of organ transplantation and donation.

Discussion: Novel technologies like the XVIVO heart box offer a glimpse towards the bright future of organ donation and transplantation. With novel technologies and therapeutic appearing every day, and the team at Royal Papworth Hospital are always happy and excited to support projects in partnership with world leaders in the field. We look forward to see the published results of the NIHP2019 trial and how the XVIVO heart preservation system adds to the medical devices for organ preservation and transportation.

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

P0099: Thank you for my gift - a how to guide on writing to your donor family

Mrs Katie Abbott, Mr Joao Pedro Nunes

Royal Papworth Hospital, Cambridge, United Kingdom

Introduction: Writing to a donor family can be a difficult and overwhelming prospect for many recipients after transplantation. As part of the donor letter team, at Royal Papworth Hospital, I have spoken with multiple recipients who are very keen to write to their donor family but are unsure of the letter-writing process, what to write in their letter, and whom they can reach out to for support or advice. This is why I created the “writing to your donor family” leaflet for our recipients and their families.

Case presentation: The leaflet is designed to guide a recipient through the different aspects of the letter-writing process. It begins with information on what donor families are told after organ donation, how recipients can find out about their donor details, advice on when to write a letter, what can and cannot be included in the letter, examples of letters, what happens once we receive a letter and how to contact the team at Royal Papworth for further advice or support.

Outcomes: I have received very positive feedback from colleagues surveyed, reporting they understood the letter writing process in more depth and felt they could help contribute to supporting recipients when they express an interest in writing to their donor family. I have also had recipients who have used the leaflet to assist in writing their first letter and found it to be a great resource, particularly the examples as a way to start a first draft.

Discussion: My aim in creating this leaflet was to help our recipients at Royal Papworth Hospital, gain more insight into the letter writing process and encourage more recipients to write to their donor families and thus increase recipient and donor family correspondence. Moving forward, I would like to explore the potential for including this leaflet in our transplant patient discharge paperwork.

Category: Psycho-social aspects (recipient - donor - family care- MDT (exclude clinical management)

P0100: The implementation and evaluation of an education programme including information leaflets for the advance kidney care nurses, to improve education and knowledge in the live donor process to increase early referrals to the service

Miss Kay Dimmick

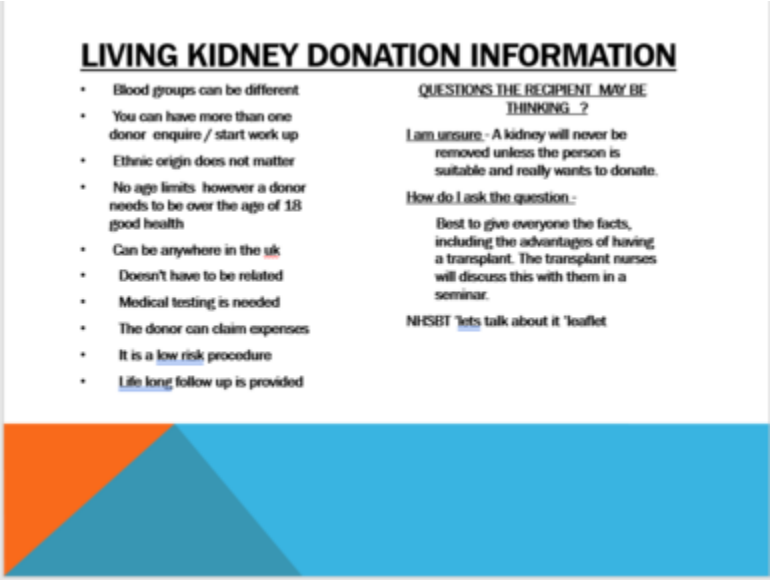
Royal Stoke UHNM, Stoke on Trent, United Kingdom

Methods: Engaging with the advanced kidney care nurses was key in gathering in-formation on the discussion points that the potential recipients and their families receive during the treatment options process. The feedback from the nurses was that this was an area that was discussed briefly however they often lacked confidence to answer the questions asked by the potential recipient and family members. This was due to lack of knowledge and understanding of the live donor process.

This triggered a myth busting discussion and we discussed what would assist the nurses in these situations to gain confidence and enable future learning.

This time with the family members being preset is essential to discuss live kidney donation during this in depth and lengthy discussion especially covering treatment options such as transplantation first. This would encourage early referrals to the service and maximise donation potential. The main aim of this implementation was to increase pre-emptive transplant rates for our recipients under the care of Royal Stoke UHNM trust.

Results: An education leaflet was formulated with key point to aid the nurses' discussion and any queries the potential donors have. The main key points were formatted from the myth busting questions. Time was arranged to educate the nurses and we discussed possible questions that they would be asked. This ensured the nurses were able to be prepared to deal with any questions asked.



The metric from data collected below shows an increase in early access to living donation numbers following this education.

Discussion: The feedback from the training was that they have utilised the leaflet in the discussion with family members and have gained confidence and knowledge when discussing live kidney donation. It is important to continue education with the Advanced Kidney care team to continue with the optimisation of living kidney donation numbers for the future.

Category: Living donation (living donor and recipient selection (all organs) options for donation - donor care - outcomes)

P0101: Facilitating change in the UK National Organ Retrieval Service: Context, training needs & staff perceptions of NRP

Dr Gala Morozova[1], Dr Amanda Martindale[1], Mr Hugh Richards[1], Mr Ian Currie[1,2,3]

[1]The University of Edinburgh, Edinburgh, United Kingdom. [2]NHS Blood & Transplant, Edinburgh, United Kingdom. [3]NHS Lothian, Edinburgh, United Kingdom

Introduction: UK organ retrieval is in the midst of large-scale technical transformation, driven by persistent organ shortage and attempts to improve organ quality for transplant recipients. To inform future innovation efforts in organ retrieval, this study explored the context, structures, and NRP implementation experience of a UK-based abdominal organ retrieval team.

Methods: Thorough familiarisation with context and settings of organ retrieval was gained through field visits, informal conversations, observation, and attendance at local and national NORS meetings. A qualitative description methodology was employed, and data were obtained through the means of semi-structured interviews and analysed thematically in a NORS abdominal centre.

Results: The sample (n=6) comprised of senior surgeons (NORS lead surgeons; n=3), a junior surgeon (n=1), and theatre practitioners (n=2). Descriptive data revealed a unique combination of procedural, psychological, and practical demands placed on organ retrieval staff. Results demonstrated that uncertainty (e.g., callouts, training opportunities, team composition, location, local team support, delays) was one of the key context factors and challenges for staff, and highlighted the critical role of psychological factors for successful innovation in organ retrieval. In addition, the study identified team's training needs and challenges, alongside practice and research-led potential solutions to improve training for new and existing staff.

Discussion: The data demonstrate that alongside efforts to advance technological aspects of organ preservation, maximise efficiency of the service and refine surgical techniques, development in organ retrieval requires close attention to psychological context for successful implementation of new practice. Although the small sample size limits the ability to generalise the findings, it enabled the views and experiences of participants to be studied more in-depth, resulting in a rich dataset with high information power, established through prolonged engagement and rigorous analysis.

Category: Organ preservation and retrieval (novel technologies - NORS - donor surgery)

P0102: Urgency of outpatient immunosuppression resupply requests considering tele-clinics as a barrier in a large abdominal transplant centre

Claire Bullen

Cambridge University Hospitals NHS Foundation Trust, Cambridge, United Kingdom

Introduction: Due to the Covid-19 pandemic, many outpatient transplant follow-up clinic reviews moved to tele-reviews. Post pandemic a hybrid approach is used with a blend of face to face (70%) and tele-clinics (30%). Transplant pharmacy (TP) provide an urgent prescribing service for patients running out of immunosuppression (IS) in-between clinics. We wanted to review urgency of requests and whether tele-clinics are a barrier to patients requesting or clinicians re-prescribing IS during the clinic review.

Method: Data-analysis of IS resupply requests over two periods in 2019 and 2023. These were categorised by days of medication remaining. Critical and urgent requests were analysed to review if the last clinic review was within 4 weeks prior, or if the last review was a tele-review.

Results: Around 10% of requests are critical each month, 90% of requests to the service have a degree of urgency. Between 2019 and 2023 data there is a small trend to reduction in number not urgent and an increase in not specified, numbers are small.

Graph 1.

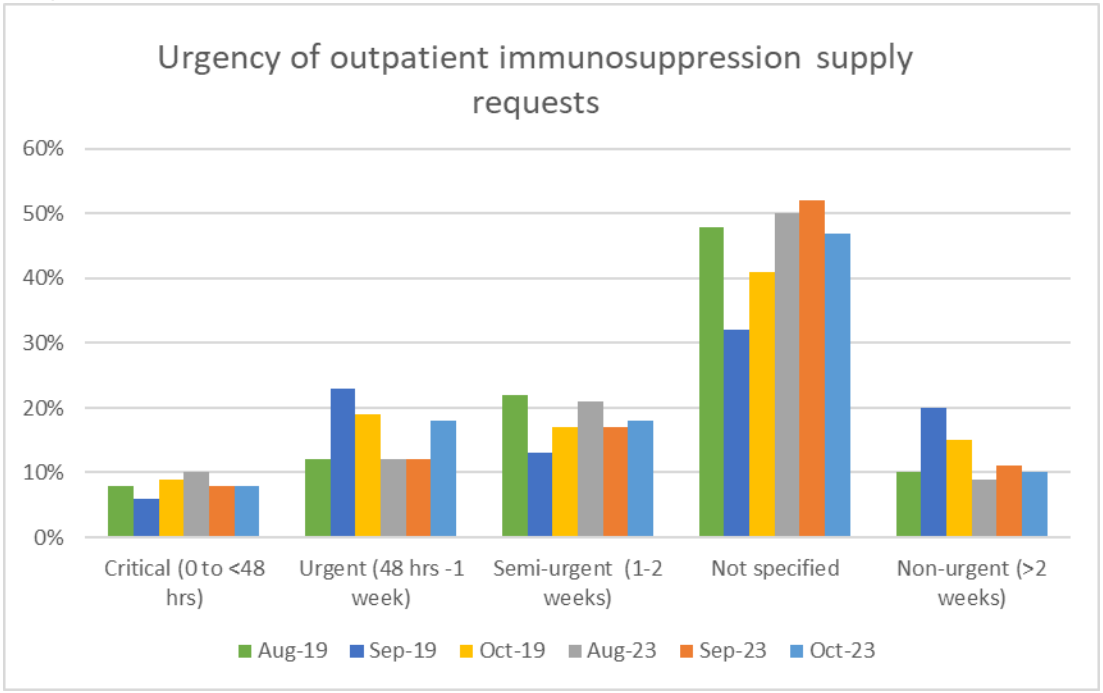


Table 1.

Month/Year	Aug-23	Sep-23	Oct-23
Critical or urgent supply request (number)	44	48	58
Telereview at last appointment (%)	30%	31%	21%
Clinic appointment 0-4 weeks ago (%)	39%	29%	36%
Telereview 0-4 weeks ago (%)	18%	21%	14%

Discussion: Tele-clinics do not appear to be a barrier to medication re-ordering for patients who contact the TP service when their IS supplies are critically or urgently low. Patients with a critical or urgent supply need within 4 weeks of a clinic review had a lower than average proportion of tele-reviews.
Investigation is planned to elucidate barriers to re-ordering IS at clinic review. Reduction of urgent IS requests is important to enable consideration of other systems such as homecare.

Category: Education and promotion (education: patient - public - healthcare professional; promotion: public - donation).

P0103: Proven resistant CMV refractory to single course of Maribavir

Dr Nithin Bodapati, Dr Jack Galliford, Robert Brown, Dr Mat Donati, Dr Peter Muir, Sara Perkins

Southmead Hospital, Bristol, United Kingdom

Introduction: In spite of new and non-nephrotoxic treatment options, CMV disease remains a challenging viral infection after renal transplantation.

Case presentation: A 60 year old gentleman on haemodialysis due to ANCA-PR3 associated vasculitis underwent CMV D+/R- deceased donor renal transplantation using Basiliximab induction with maintenance immunosuppression using Prednisolone, Azathioprine and Tacrolimus (trough target 5-8 ug/L) with Valganciclovir for three months (and Cotrimoxazole for 6 months). Postoperatively renal function settled at an eGFR of 30. Azathioprine was reduced for anemia and leucopenia.

The clinical decision was made at 1, 2 and 4 months to give 3 x 500mg Methyl Prednisolone for concerns over allograft function (without histology).

4 months post-transplant, he became unwell and renal function deteriorated from eGFR of 30 to 20 (figure1) concomitant with significant CMV (figure2), BK and EBV viremia. Allograft biopsy stained positive for CMV and BK viruses. He was initiated on oral Valganciclovir. Azathioprine was stopped and Tacrolimus dose was reduced.

Figure 1

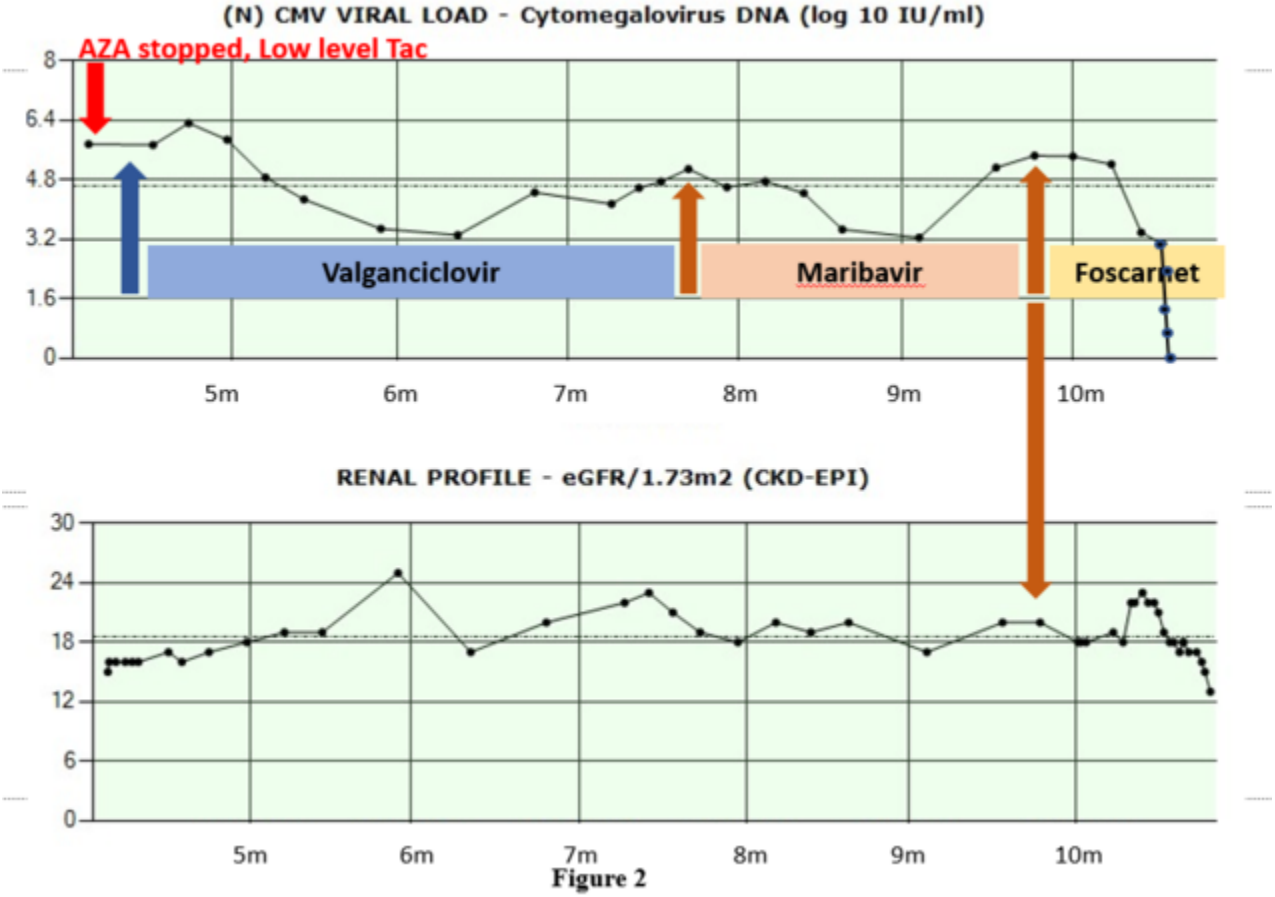


Figure 2

Outcome: Viremia persisted despite oral Valganciclovir. CMV resistance testing by CMV UL97 and UL54 gene sequencing detected drug resistance mutations at de1599-603, L595LS conferring resistance to Ganciclovir. Maribavir, a UL97 protein kinase inhibitor was started.

After 8 weeks of Maribavir he remained CMV disease positive and had evidence of CMV encephalitis with weakly positive CSF CMV-PCR.

Foscarnet was initiated and CMV was undetectable after 3 weeks.

Discussion: This case demonstrates the challenges involved in balancing undirected immunosuppression and infection risk. NICE supports only 8 weeks of treatment with Maribavir in resistant or refractory CMV infection although an extended course or second course can be beneficial. Whilst there are no known Maribavir-associated mutations in UL97 there is the possibility of resistant mutations in UL27, a gene which is not currently sequenced in the reference laboratory. Despite concerns of nephrotoxicity, Foscarnet remains a useful antiviral in such a setting.

Category: Clinical - renal medical (kidney - transplant nephrology - recipient clinical care and management)

P0104: Legal documentation of immunosuppression dose changes by clinical nurse specialist non-prescribers utilising an electronic prescribing system in a large abdominal transplant centre

Claire Bullen, Stephen Bond

Cambridge University Hospital NHS foundation trust, Cambridge, United Kingdom

Introduction: Accuracy of outpatient immunosuppression documentation is essential for safe medication management of transplant recipients (TR). Optimisation of the skill mix utilising clinical nurse specialist non-prescribers (CNSNP) to undertake 'well persons clinics' for stable TR; and support clinicians with documentation of immunosuppression changes post clinic, is essential to safely manage an expanding cohort of TR outpatients. Following an initial review of individual CNSNP practice we identified that there was no consistent way of safely recording medication changes.

Methods: We wanted to identify a legal way for CNSNP to update clinician directed medication changes in our electronic patient record (EPR). We reviewed the definitions assigned when signing an outpatient prescription within an EPR. We elicited it is possible for CNSNPs to be assigned as the 'ordering user' if a 'co-sign box' is ticked and authorising prescriber's name entered. The legality of this approach was confirmed as "a co-sign is not prescribing if the prescription is not sent to pharmacy for supply". This was incorporated into a new hospital guideline for a CNSNP 'well persons clinic'. Training sessions with the CNSNP were undertaken to implement these changes to ensure consistency and legality of practice as a non-prescriber and improve the accuracy of the immunosuppression record in the EPR. We then implemented a 'spot-check' review of compliance with the transplant pharmacy team.

Results: 100% of CNSNP involved in documenting clinic immunosuppression changes attended training with 87.5% reporting this training was useful. Despite bespoke training only 50% have adopted this new process. Discussion: It is legally possible for CNSNP to sign for clinic directed outpatient transplant immunosuppression changes, if not linked with a medication supply. This allows optimisation of our skill mix and improved accuracy of the TR immunosuppression record. This may lead to a reduction in immunosuppression errors through improved communication. Further training of non-adopters is planned.

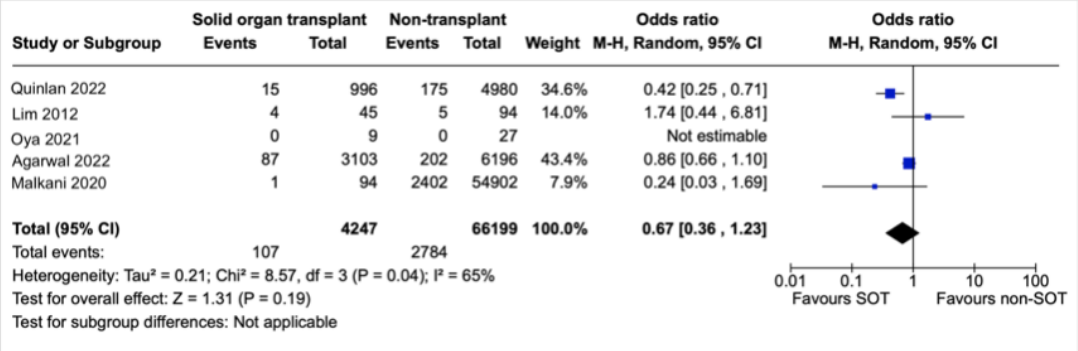
Category: Education and promotion (education: patient - public - healthcare professional; promotion: public - donation).

P0105: Is primary total hip arthroplasty safe in recipients of solid organ transplants? A systematic review

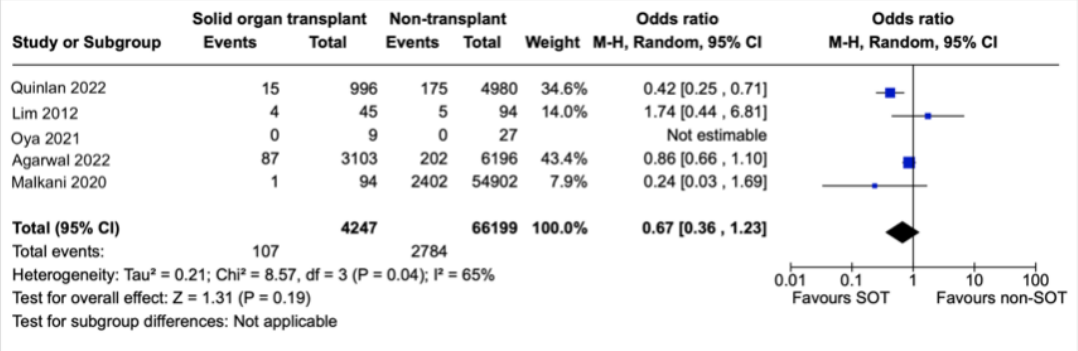
Mr Shahzaib Ahmed[1], Mr Adil Lakha[2], Mr Mohammedabbas Remtulla[3], Dr Shafi Malik[3], Mr John O'Callaghan[2,3]

[1]Southmead Hospital, North Bristol NHS Trust, Bristol, United Kingdom. [2]John Radcliffe Hospital, Oxford University Hospitals, Oxford, United Kingdom. [3]University Hospitals Coventry and Warwickshire, Coventry, United Kingdom

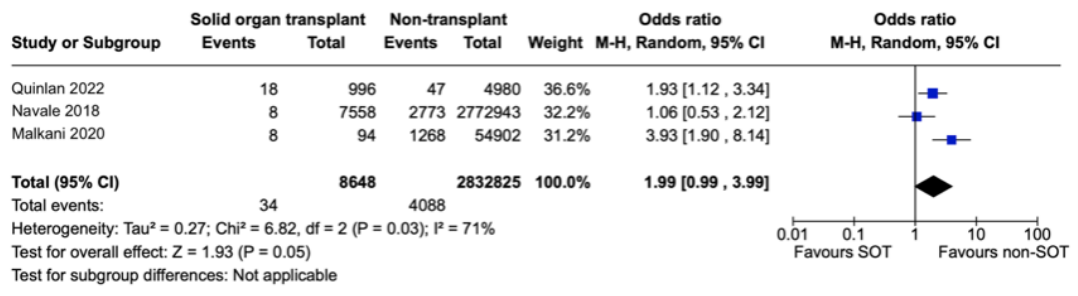
Revision



Infection (PJI/ SSI)



All-cause mortality (12 months)



Introduction: Solid organ transplantation (SOT) is rising, with improvements in surgical technique and immunosuppressive therapy increasing patient survival. Age-related degeneration and long-term steroid therapy in SOT recipients lead to higher incidence of osteoarthritis and osteonecrosis. Total hip arthroplasty (THA) is offered in the elective setting for these indications. This meta-analysis assessed THA-related complications in SOT versus non-SOT recipients, reporting revision, infection rates, and all-cause mortality.

Methods: This review and meta-analysis was carried out using the PRISMA framework, and was prospectively registered on PROSPERO (CRD42023429850). A literature search of Medline, Embase, Transplant library, and Cochrane Library was carried out on 09/06/2023. Full text articles were screened against inclusion criteria. Quality assessment was performed using the Newcastle-Ottawa Scale. Summary statistics for outcomes of interest underwent meta-analyses to a confidence interval (CI) of 95% and are presented as Forest plots for Odds Ratio (OR).

Results: Literature search returned 1164 unique titles and abstracts across. 36 met our inclusion criteria; 6 were retrospective cohort studies. Meta-analysis of 5 studies showed no evidence of significant increase in revision rates with prior SOT, OR=0.67 (95%CI: 0.36-1.23, p=0.19). Meta-analysis of 6 studies did not show a significant increase in infection (prosthetic joint/surgical site) infection with prior SOT, OR=1.18 (95%CI: 0.40-3.50, p=0.77). Meta-analysis of 3 studies showed a significant increase in all-cause mortality over 12 months post-arthroplasty, OR=1.99 (95%CI: 0.99-3.99, p=0.05). We also report the above summary statistics for the remaining case series included. Subgroup analyses were conducted to assess impact of type of transplant.

Discussion: We conclude that there is no significant increase in revision and infection rates for THA in SOT recipients. Consideration of a significant increase in all-cause mortality must be noted prior to offering this procedure to SOT recipients. Further work with prospective, well-designed studies is needed to assess risks and benefits of THA in SOT recipients.

Category: Living donation (living donor and recipient selection (all organs) options for donation - donor care - outcomes)

P0106: Intestinal transplant recipients' hospital length of stay review for the period 2015-2022

Mrs Rebecca Smith

Cambridge University Hospitals NHS Foundation Trust, Cambridge, United Kingdom

Introduction: Intestinal transplant recipients have historically been associated with exceptionally long length of stay (LoS) owing to the huge complexities of such transplants. The patient group are often very frail pre-operatively and progress can be slow. Earlier, timely discharge home can mean better motivation and mood, which is a particular challenge in this patient group.

Methods: LoS data was collected from patients transplanted between January 2015 and December 2022. The average length of stay was calculated for each calendar year for comparison. LoS was analysed against surgical technique and comorbidity.

Results: Average LoS was 38% lower for 2022 compared with 2015 and this also mirrors shorter average ICU length of stay. Reasons for this reduction may be attributed to improved surgical technique and reduced surgical complexity, where a greater number of isolated small bowel transplants are now being performed as opposed to the number of liver containing grafts where numbers remained relatively unchanged. In 2015 average LoS was 125.33 days, in part attributable to two highly complex patients. Both these patients had hospital stays >200 days owing to comorbidities such as T1DM and complex social support needs. Data for 2020 shows a lower average LoS than any other year in the data set, perhaps attributable to the COVID-19 pandemic. During this period transplant activity reduced and the general push was to discharge patients as soon as possible. Figures for 2022 show an average LOS of 77.69 days.

Conclusions: Overall, we have seen a reduction in average LoS. Patient numbers are small and therefore one or two extraordinarily LoS make a significant impact. The trends do however demonstrate that as understanding and techniques improve, a greater number of less 'complex' transplants are taking place and that patients do have a shorter LoS.

Category: Case study submission (may include individual cases or shared learning experiences)

P0107: NGAL as an intra-operative biomarker of Acute Kidney Injury in Orthotopic Liver Transplantation

Miss Esther Platt, Mr Ali Al-Rashed, Mr Riko Klootwijk, Mr Francis Robertson, Prof Alan Salama, Prof Brian Davidson

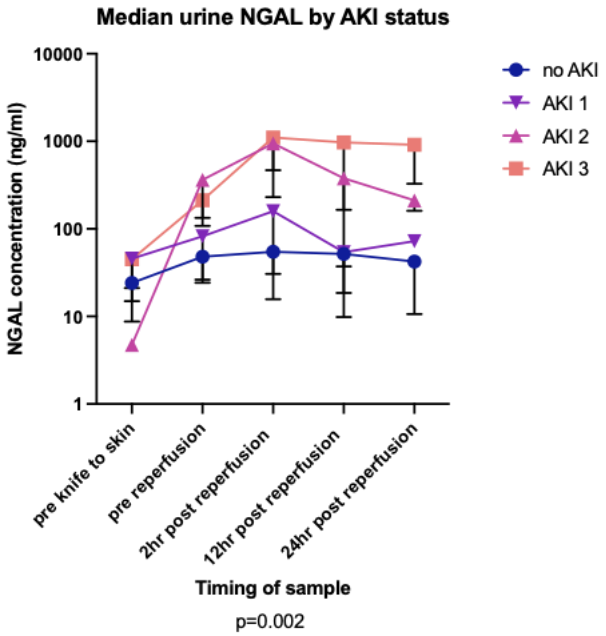
UCL, London, United Kingdom

Background: Acute Kidney Injury (AKI) affects 50% of patients undergoing OLT and is associated with increased mortality, early allograft dysfunction and long-term renal compromise. Neutrophil Gelatinase Associated Lipocalin (NGAL) is an established biomarker of AKI. We previously showed that recipient urine NGAL measured at the end of OLT predicts post-operative AKI. The purpose of this study was to measure NGAL levels during OLT to determine the time course for elevation and association with renal injury and to evaluate the influence of normothermic machine perfusion.

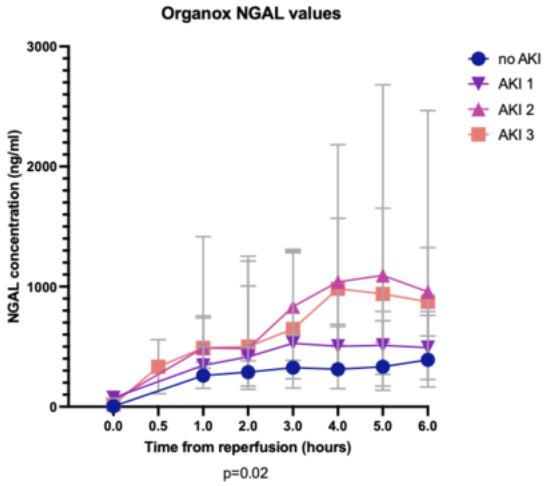
Methods: 32 adult patients undergoing OLT were recruited. Serum and urine samples were collected at multiple intra- and post-operative time points. For donor livers reperfused extra-corporally on Organox, samples were also collected hourly for the first 6 hours. NGAL was measured by ELISA. Outcome data were collected from hospital records. AKI was defined using the KDIGO criteria. Friedman's test was used to calculate differences between the NGAL groups. Results were analysed according to those who developed or did not develop post operative AKI.

Results:

- Serum NGAL concentrations were elevated but did not clearly identify those who developed AKI
- Urine NGAL concentrations identified those developing AKI throughout surgery and even prior to graft reperfusion (figure 1a)
- Blood perfusate NGAL concentrations increased during NMP with higher levels associated with development of AKI (figure 1b)



(a)



(b)

Figure 1: Changes in NGAL during and following OLT in (a) urine and (b) Organox perfusate. Median values and inter-quartile ranges provided.

Conclusions:

Two novel findings that change our understanding of AKI in OLT.

- NGAL in Organox perfused livers demonstrates correlation to post-operative AKI. Possible role as prognostic marker or measure of therapeutic intervention in organ resuscitation.
- The ability of Urine NGAL to identify AKI risk prior to organ reperfusion is novel and suggests that mechanism of AKI development is earlier than previously considered.

Category: Basic and translational science (as per category - all science)

P0108: A human in-vitro model to study the molecules mediating Acute Kidney Injury (AKI) following Liver Ischaemia Reperfusion (IR) injury in Orthotopic Liver Transplantation (OLT)

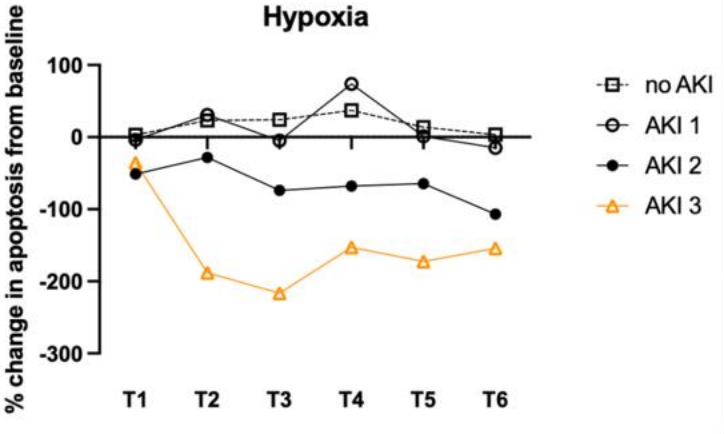
Miss Esther Platt, Miss Carmen Cusack, Mr Riko Klootwijk, Mr Francis Robertson, Prof Brian Davidson, Prof Alan Salama

UCL, London, United Kingdom

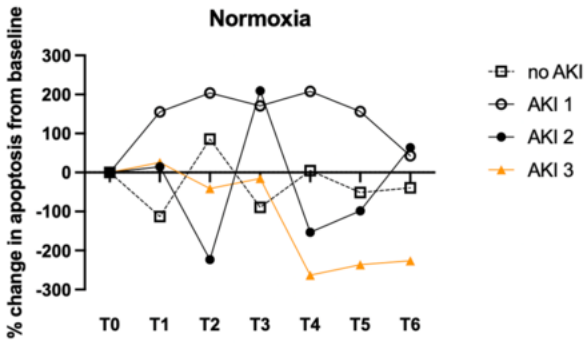
Background: AKI post OLT is associated with IR injury of the donor graft clinically, but a molecular link has not been established and mediators of AKI following liver IR are unknown. The purpose of this study was to develop a human in-vitro model using clinical samples from patients, to allow investigation of molecules involved in the transmission of injury from liver to kidney.

Methods: OLT patients receiving Organox perfused donor livers were recruited. Organox perfusate was sampled hourly for the first 6 hours of reperfusion. Patients were followed up to evaluate post-operative AKI status. Experiments were performed in triplicate. HK2 cells (immortalised proximal tubular cells) were grown to confluency on 96 well plates, then primed with 24 hours hypoxia. Organox perfusate samples were added at a concentration of 10%. Plates were normoxia incubated for 24 hours and individual wells tested for apoptosis (Caspase 3/7 assay) and cell numbers (Cyquant). In vitro findings were correlated to patient outcomes.

Results: Increasing severity of clinical AKI outcome was associated with significantly different in vitro readouts over the course of liver reperfusion (figure 1). Both less apoptosis and higher cell numbers (indicating cell proliferation compared to control) were observed in AKI 2 and 3.



(a)



(b)

Figure 1: Graphs demonstrating apoptosis/cell, expressed as % change from T0 (pre liver reperfusion sample), normalised to baseline apoptosis in the plate (control). Median values are shown. (a) HK2 cells primed by hypoxia with (b) Normoxia as a control. AKI groups 0,1 and 3 had 3 patients, AKI 2 had 2 patients.

Conclusions: This study is the first to use clinical samples from patients undergoing OLT in an in vitro model and demonstrate a difference between AKI groups.
Since greater cell survival in vitro is associated with worse clinical AKI further work investigating mediators overcoming this protection in vivo are needed.

Category: Basic and translational science (as per category - all science)

P0109: Developing local guidance to support DCD heart retrieval including withdrawal in the anaesthetic room

Mrs Alison Mitchell, Dr Sam Ley

University Hospital Monklands, Airdrie, United Kingdom

Introduction: University Hospital Monklands is a district general hospital with a small number of potential organ donors. Historically, withdrawal of treatment has taken place in ICU which is adjacent to theatres. Since the introduction of DCD heart donation it has been acknowledged that it is important for ICU and theatre staff to be aware of the processes required to facilitate a smooth retrieval.

Methods: To facilitate this, it was agreed a SOP should be created. An MDT meeting was arranged, with ICU and theatre staff representation. The rationale for treatment withdrawal in close proximity to theatre was discussed. A member of the local cardiothoracic retrieval team explained the process for DCD heart retrieval and shared some of the requirements.

Results: Staff were very keen to support the needs of the retrieval team. ICU and theatre staff identified areas which they would be responsible for and agreed how this could be achieved. There was further discussion around how the family would be supported in the anaesthetic room during and after withdrawal of support to asystole. There were some key considerations around logistics, such as ensuring the doctor designated to confirm death would be available for the entire duration from withdrawal of treatment to asystole.

Discussion: The key points and agreed practices were written into a SOP. This document and its background was shared at a recent Collaborative meeting and generated a lot of interest from other ICU clinicians, who were keen to developing something similar. Some areas have opted for a less formal document and have created a flow chart laying out the main considerations and roles and responsibilities for staff. The guidance document for Monklands is bespoke and is designed to meet the local needs of this hospital. The principles may be transferrable to other hospitals.

NHS Lanarkshire

STANDARD OPERATING PROCEDURE
NHS Lanarkshire Theatres

Implementation Date	**Donation after Circulatory Death Heart (DCD) Retrieval Monklands ICU and Theatres**	
SOP Number	Version	Review date
1	1	

Aim:	This SOP is to provide guidance on the instance of organ donation following circulatory death.
Statement:	DCD, formally known as "non-beating heart donation" refers to the retrieval of organs for the purposes of transplantation from patients whose death has been confirmed using cardio-respiratory criteria.
Location:	ITU and Theatres, University Hospital Monklands

Category: Deceased donation (donor selection and optimisation - donor care - donor family care)

P0110: The roadmap to DCD donation in India

Mrs Clare Fletcher

NHS Blood and Transplant, Newcastle upon Tyne, United Kingdom

Ex CLOD is founding member of a charity that supports a village Hospital in India. Health professionals attend the hospital annually to provide an education programme as well as performing many surgeries to the local population. Following this years trip 2 members of the team travelled North to a City following an invitation to present at the Transplant Hospital. The team members are a current Specialist Nurse Organ Donation/Specialist Requester and an ITU Consultant/Ex CLOD. Donation after Brain Death (DBD) is common practice in India, however there have only been a handful of donations following the Donation after Circulatory Death process (DCD).

Although there is a growing interest in procuring more organs by adopting a DCD programme, there continues to be concerns about how decisions to withdraw life sustaining treatment are made. The presentations sought to offer reassurance about this along with how the family experience can differ between the DBD and DCD process. The presentation was attended by local Transplant Clinicians along with their transplant coordinator. Our attendance sparked further interest and commitment in developing a DCD programme in the future and also a desire to attend the UK to observe practice. Whilst they still wait for legislation to support the practice of DCD, if successful developing a new programme there is the potential to significantly improve the donation rates in India.

Category: Education and promotion (education: patient - public - healthcare professional; promotion: public - donation).

P0111: An In Vitro cell model to assess the effects of complement inhibition on Ischemia-Reperfusion injury in Cholangiocytes

Mr Callum Hulme[1,2], Mr Balaji Mahendran[1,2], Mr Abdullah Malik[1,2], Mrs Emily Thompson[1,2], Professor Neil Sheerin[3], Professor Simi Ali[3], Dr Jeremy Palmer[3], Miss Lucy Bates[3], Miss Rebecca Hand[1,2], Mr Colin Wilson[2]

[1]Newcastle University, Newcastle-upon-Tyne, United Kingdom. [2]NIHR Blood Transplant Research Unit, Newcastle/Cambridge, United Kingdom. [3]Translational and Clinical Research - Newcastle University, Newcastle-upon-Tyne, United Kingdom

Background: Liver transplantation is the definitive procedure for end-stage liver failure but is limited by a shortage of viable donor organs. IRI is an unavoidable consequence of transplantation, triggering damage via several pathways, including complement activation. Development of an in vitro cell model of IRI with addition of complement allows analysis of cholangiocyte cellular stress response and whether this response can be attenuated by eculizumab, a complement inhibitor.

Methods: H69 cholangiocytes were subject to anoxic incubation for 4 hours and subsequent normoxia for 24 hours, before addition of complement to the system. Complement was provided from perfusate taken from liver normothermic machine perfusion (NMP). Analysis of cellular response was then carried out at different stages of simulated IRI.

Results: Eculizumab-treated perfusate significantly increased cell proliferation compared to untreated perfusate ($p<0.0001$). Addition of complement to the model increased cellular oxidative stress and inflammation. Eculizumab-treated perfusate significantly decreased production of GDF15 ($p<0.0001$), an oxidative stress marker, in cholangiocytes. Despite a significant increase, compared to the normoxic control, IL-10 and IL-8 production showed no significant difference between cells treated with control NMP perfusate or eculizumab-treated perfusate. VEGF gene expression was upregulated in the context of eculizumab-treated perfusate.

Discussion: The in vitro model successfully simulates IRI and addition of perfusate leads to increased production of markers of inflammation and oxidative stress. Complement-depleted perfusate significantly reduced GDF15 production, suggesting amelioration of cellular oxidative stress, by eculizumab; however, we cannot conclude with the current data that complement-depleted perfusate attenuates the effects of IRI in this model.

Category: Basic and translational science (as per category - all science)