Abstract Book 2020

Contents

CW1

The relationship between Cardiopulmonary Exercise Testing (CPET) and muscle volume in liver transplant candidates

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Introduction: Sarcopenia is described as the progressive and generalised loss of skeletal muscle mass and strength, which often accompanies liver cirrhosis. Cardiopulmonary Exercise Testing (CPET) is a key clinical tool used to assess exercise capacity and is key in predicting surgical outcomes. This study sought to investigate the relationship between CT measures of muscle volume and CPET performance in patients undergoing liver transplant assessment. The secondary aim was to investigate the relationship between sarcopenia and post-operative morbidity and mortality.

Methods: A single-centre retrospective cohort study of 400 patients who underwent liver transplant assessment between 1st July 2016 and 1st July 2018 was performed. Routine pre-operative CT scans were used to analyse muscle and adipose tissue which were indexed for height to generate a Skeletal Muscle Index (Cut-off values shown in Table 1). These were compared with CPET variables collected as part of liver transplant assessment work-up. Groups were evaluated using the independent T-test, Chi-squared test and Kaplan-Meier distribution.

Results: Of the 400 patients, 54 met the exclusion criteria, leaving 346 for analysis (121 sarcopenic and 225 non-sarcopenic). Clinical significance was found between sarcopenia and Anaerobic Threshold (AT) (p=0.033), Subcostal Girth (p=0.024), predicted Lung Transfer Factor (TCO) (p=0.010), peak Heart Rate (p=0.030), UKELD score (p=0.003) and transplant suitability (p=0.020) (See Figure 1). There were no significant differences between sarcopenia, Clavien-Dindo complications and mortality.

Discussion: Sarcopenia is shown to be an accurate predictor of poorer CPET performance. Sarcopenia also has value in predicting worse pulmonary function tests (PFT's) and higher UKELD scores, and thus a lower likelihood of being listed for liver transplantation. However, the presence of sarcopenia is unable to predict surgical outcomes following transplantation including long-term survival.

Table 1

An outline of the cut-off values to determine sarcopenia using Skeletal Muscle Index (SMI).

	SMI (cm^2/m^2)	
BMI Category (kg/m^2)	*Men*	*Women*
Underweight (<20.0)	<43	<41
Normal weight (20.0-24.9)	<43	<41
Overweight (25-29.9)	<53	<41
Obese (>30.0)	<53	<41

Figure 1

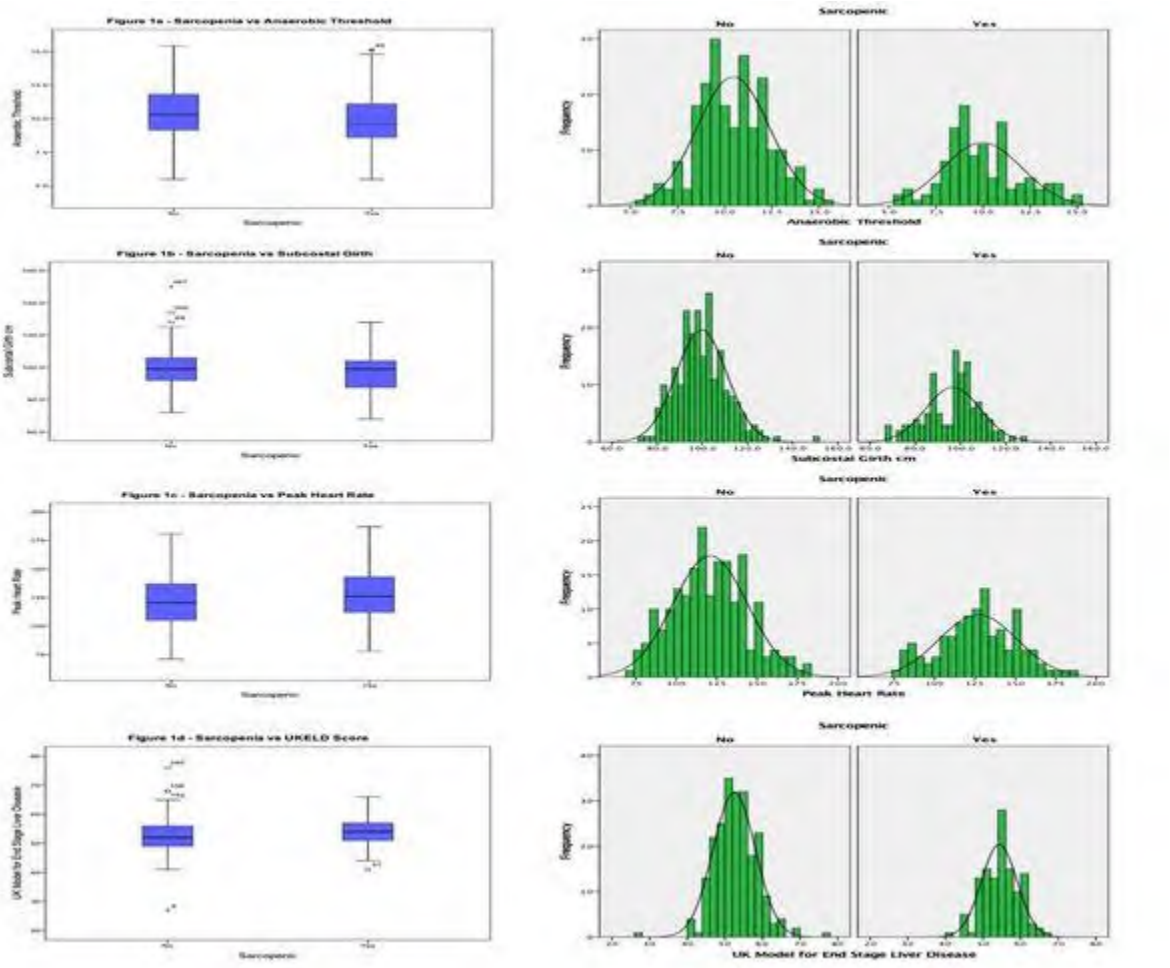
Figure 1a - Sarcopenia vs Anaerobic Threshold
Figure 1b - Sarcopenia vs Subcostal Girth
Figure 1c - Sarcopenia vs Peak Heart Rate
Figure 1d - Sarcopenia vs UKELD Score
Sarcopenic
No
Yes
Frequency
Anaerobic Threshold
Subcostal Girth cm
Peak Heart Rate
UK Model for End Stage Liver Disease

CW2 - withdrawn

Long-term incidence of de novo malignancies in liver transplant recipients and weaning off immunosuppression in tor vergata l: results from an observational study

CW3

Time-trends in patient mortality and graft survival of patients receiving a DCD or DBD liver transplantation in the UK and Ireland between 2008 and 2016

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Introduction: Internationally, the UK is the primary exponent in the transplantation of livers from controlled donation after circulatory death (DCD). However, concerns exist in the efficacy of these grafts. We evaluated the mortality, graft failure and post-operative complications of DCD and DBD donor liver transplantation in successive eras between 2008 and 2016.

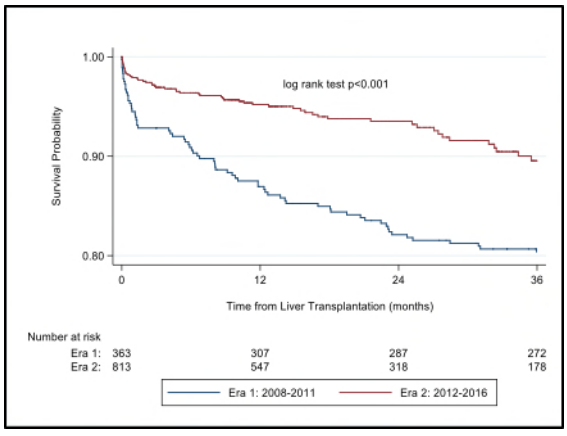
Methods: All first-time elective adult liver transplant recipients in the UK were identified and hazard ratios comparing the impact of era (2008-2011 and 2012-2016) on post-transplant mortality, graft failure and complications were estimated.

Results: 1 176 DCD recipients and 3 749 DBD recipients were included. The use of livers from DCD donors increased from 19.3% in era 1 to 26.7% in era 2. 3-year patient mortality decreased markedly from 19.6% in era 1 to 10.4% in era 2 (aHR:0.43, 95%CI: 0.30-0.62) for DCD recipients but only decreased from 12.8% to 11.3% (aHR:0.96, 0.78-1.19) in DBD recipients. Between eras no improvements in overall 3-year graft failure were observed for DCD (aHR:0.80, 0.61-1.05, p=0.11) or DBD recipients (aHR:0.95, 0.79-0.60, p=0.60) but the rate of re-transplantation increased from 7.2% to 10.1% in DCD recipients (p=0.14) and decreased from 4.8% to 3.7% in DBD recipients (p=0.01). In era 2, there was no difference in mortality between those receiving a DCD or DBD liver (aHR: 0.78, 0.56-1.09, p=0.14) however the incidence of biliary tract strictures increased for both cohorts (5.0% to 6.9% and 3.8% to 4.8%, respectively).

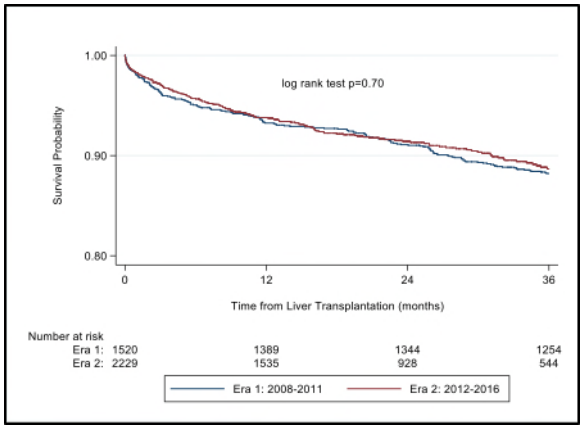
Conclusion: Between 2008 and 2016, mortality more than halved in those who received a DCD donor liver. In the UK, mortality following liver transplantation now appears to be comparable for patients receiving DCD and DBD donor livers.

Figure 1: 3-year patient survival across different eras of transplantation (2008-2011 and 2012-2016) in recipients receiving DCD or DBD livers (n=4 925).

a. DCD (n=1 176)



b. DBD (n=3 749)



CW4
Early anastomotic biliary complications after liver transplantation

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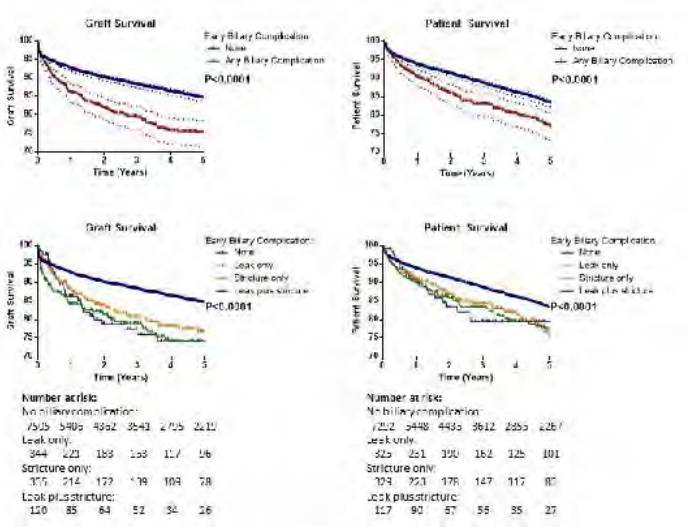
Introduction: Biliary leaks and anastomotic strictures are common early biliary complications (EBC) following liver transplantation. However, their impact on outcomes remains controversial and poorly described.

Methods: National UK data on adult liver transplantation between 2006 and 2017 collected by NHSBT was reviewed (n=8304). Multiple imputations were performed to account for missing data. Adjusted regression models were used to assess predictors of EBC, and their impact on graft and patient survival. 35 potential confounders were included, and backwards stepwise selection enabled unbiased selection of variables for inclusion in final models.

Results: EBC occurred in 9.6% of patients and was associated with significantly worse graft and patient survival (Figure 1). Adjusted cox regression revealed that EBCs have a significant and independent impact on graft survival (Leak HR=1.325; P=0.021, Stricture HR=1.514; P=0.002, Leak plus stricture HR=1.533, P=0.034) and patient survival (Leak HR=1.218; P=0.131, Stricture HR=1.578; P<0.001, Leak plus stricture HR=1.507; P=0.044). Patients with EBC had longer median hospital stay (23 versus 15 days; P<0.001) and increased chance for readmission within the first year (56% versus 32%; P<0.001). On adjusted logistic regression the following were identified as independent risk factors for development of EBC: donation following circulatory death (OR=1.280; P=0.009), accessory hepatic artery (OR=1.324; P=0.005), vascular anastomosis time in minutes (OR=1.005; P=0.032) and ethnicity 'other' (OR=1.838; P=0.011). In addition, biliary stricture was significantly less likely with Roux-en-Y anastomosis (OR=0.558; P=0.001), and biliary leak was significantly more likely with T-tube anastomosis (OR=2.055; P=0.006) and in recipients with higher MELD scores (OR=1.015; P=0.023).

Discussion: EBCs prolong hospital stay, increase readmission rates and are independent risk factors for diminished graft survival and increased mortality in liver transplantation. We have identified factors that increase the likelihood of EBC occurrence; further research into interventions to prevent EBCs in these at-risk groups is vital to improve liver transplantation outcomes.

Figure 1:



CW5

Artificial Intelligence more accurately predicts individual graft survival than traditional modelling: *Artificial Intelligence and Liver Transplant (AI4T)*

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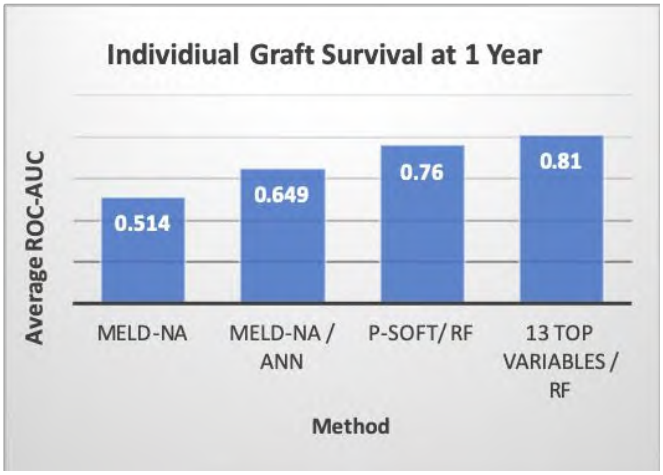
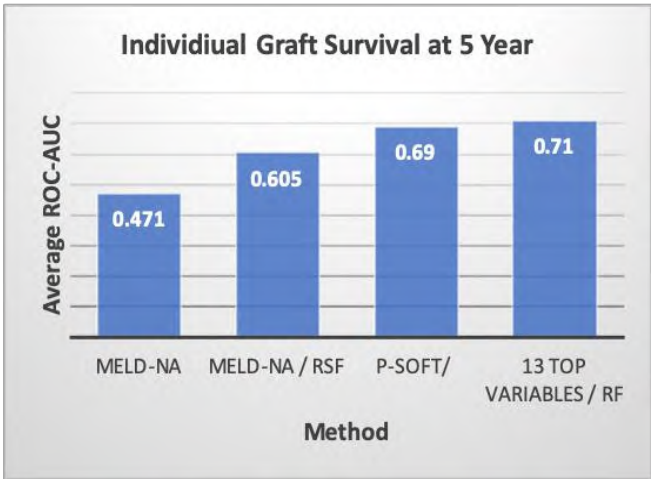
Introduction: Scoring systems predict outcomes following liver transplantation are useful for shared decision making, informed consent and organ allocation. Most scoring (Model for end-stage liver disease (MELD), Survival Outcomes after Liver Transplantation (SOFT)) utilise simple methodology like logistic regression with limited predictive performance. We investigated whether Artificial Intelligence (AI) and Machine Learning (ML) improve outcome prediction in liver transplantation. The aim is to evaluate ML methodology including random survival forests (RSF), artificial neural networks (ANN) and multi-task logistic regression (N-MTLR), compared to liver scoring indices to predict graft survival at 1- and 5-year periods.

Methods: All UK liver transplants in patients 16 years performed January 2000 to December 2016 with outcomes recorded in the National Health Service Blood and Transplant (NHSBT) registry were included (n=10,388 donor-recipient pairs). Several ML models including RFS, ANN and N-MTLR were generated to predict individual graft survival at 1- and 5- years post transplant. Models were compared to traditional regression scores.

Results: A total of 9,560 matched D-R transplants were included. The median donor age was 48 years old (n= 51% male, n=49% female). Using MELD score for survival prediction resulted in an area under the receiver operating characteristic curve (AUC-ROC) of 0.514 at 1 year and 0.471 at five years. The variables used in MELD using ANN resulted in AUC-ROC of 0.649 at 1 year and combined with RSF an AUC-ROC 0.605 at 5 years. P-SOFT variables combined with RF resulted in an AUC of 0.76 at 1 year and 0.69 at five years. Utilising a new 13-variable score with RF technique resulted in AUC-ROC 0.81 at 1 year and 0.71 at five years.

Discussion: ML algorithms can be used to predict liver outcomes at 1 and 5 years, and outperform existing scores. ML may better predict organ outcomes for individual patients allowing for personalised decision-making and individualised consent process.





CW6

Physical frailty predicts liver transplant waiting list mortality: United Kingdom experience

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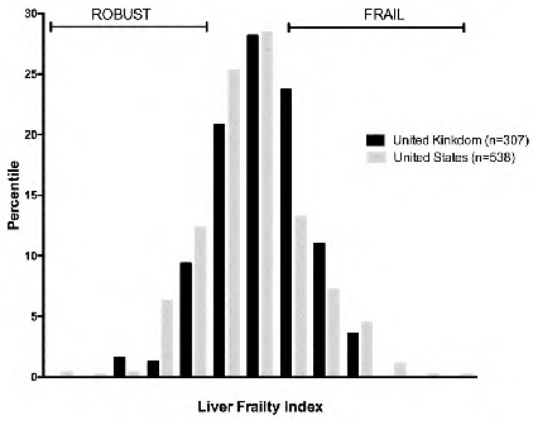
Introduction: Patients awaiting liver transplantation (LT) have reduced physiological reserve and increased vulnerability to health stressors - known as physical frailty. There remains paucity of data of the impact of physical frailty in LT. We aimed to prospectively investigate the incidence and impact of physical frailty in patients awaiting LT.

Methods: Patients were recruited from the LT assessment and waiting list clinics at the University Hospital Birmingham, UK (2018-2019). The Liver Frailty Index (LFI) and Duke Activity Status Index (DASI) (VO_2 peak) were used to evaluate physical frailty. Clinicians were blinded to results omitting any influence on organ allocation or LT waiting list status.

Results: 307 patients (57% male; median age 54 years; UKELD 52; 46% ALD/NAFLD) were recruited. 37% were obese and 27% had metabolic syndrome. During follow-up, 40% underwent LT and 4.6% died whilst waiting. Median LFI was 3.76 (IQR 3.31-4.29), with 20% classified as robust, 65% pre-frail and 15% frail. These parameters are similar to that reported in America (Figure 1) (Lai et al., 2017). Median VO_2peak was 21.9 (IQR 16.6-31.2) ml/kg/min. LFI (alive 3.77 vs. death 4.22; p=0.017) and VO_2peak (22.6 vs. 16.4 ml/kg/min; p<0.001) were significantly associated with waiting list mortality as well as increased intensive care length of stay post-LT (p=0.03). Female sex, age, BMI, hyponatraemia, INR, encephalopathy and ³2 metabolic co-morbidities were significantly (p<0.05) associated with higher LFI. VO_2 peak significantly correlated with LFI (r=0.56; p<0.001). Older age (p=0.003) and hyponatraemia (p=0.016) were independent predictors of physical frailty on multiple linear regression analysis.

Conclusions: A significant proportion of patients awaiting LT are physically frail. Risk factors include female sex, older age, obesity, metabolic syndrome and encephalopathy. Markers of physical frailty, LFI and DASI, predict LT waiting list mortality.

Figure 1:



M1

Transcriptional assessment of human kidneys undergoing machine perfusion reveals potential benefits of haemoadsorption, reducing the expression of a gene signature associated with delayed graft function

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Introduction: Transplantation is the optimal treatment for most patients with end stage kidney disease but organ shortage is a major challenge. Normothermic machine perfusion (NMP) has been used to re-condition marginal organs but the mechanisms by which NMP might benefit transplant kidneys are not fully understood. Furthermore, the question of whether removal of pro-inflammatory mediators from the perfusate might offer additional benefits in optimising kidneys prior to transplantation has not been addressed.

Methods: Using n=5 pairs of human kidneys obtained from the same donor, we compared the effect of NMP with that of cold storage on the global transcriptome of kidneys, and then went on to investigate how the addition of a haemoadsorption (HA) device to the NMP circuit affected gene expression changes in an additional n=5 kidney pairs. To understand the clinical significance of these transcriptional changes, we assessed n=36 samples collected as part of a UK randomised control clinical trial (RCT) of NMP, along with data on a clinically important end-point (length of delayed graft function (DGF)).

Results: Cold storage significantly reduced the expression of inflammatory genes, but also of genes required for energy generation, including oxidative phosphorylation (OXPHOS) enzyme genes. In contrast, during NMP, there was marked upregulation OXPHOS genes, as well as a number of immune and inflammatory pathway genes. The addition of a HA significantly attenuated inflammatory gene expression, and further increased OXPHOS pathway genes. Following NMP, we observed higher expression of immune activation genes and lower expression of OXPHOS genes in kidneys with prolonged DGF. We identified a gene signature associated with more prolonged DGF in these RCT samples, and found that the HA reduced the expression of this signature.

Discussion: Together, our data provide robust evidence that absorption of pro-inflammatory mediators from the perfusate during NMP may represent a useful intervention to reduce DGF.

M2

Risk stratification in antibody incompatible kidney transplantation: can aggressive rejection be avoided?

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Introduction: Our experience in antibody incompatible kidney transplantation, and anecdotal reports, suggest that a specific form of rejection, which we term Early Aggressive Antibody Mediated Rejection (EAAMR), results in grafts loss and mortality, despite being poorly described in the literature. This study aims to risk stratify patients at risk of EAAMR.

Methods: All ABO-incompatible (ABOi) and HLA-incompatible (HLAi) living donor kidney transplants performed between 2005 and 2018 were included. EAAMR was defined as significant rise (>2 times baseline) in either donor specific antibody (DSA) levels or ABO titres within 2 weeks of transplantation along with graft dysfunction and decreased urine output. Patient-level data were examined to identify factors contributing to EAAMR.

Results: Of 172 transplants, 116 were ABOi and 56 HLAi. Three ABOi and six HLAi patients developed EAAMR (2.6% vs 10.7%, p=0.03). All three ABOi patients were treated with eculizumab, with one case of graft loss. Of six HLAi cases, no grafts were lost in three patients treated with eculizumab, while two grafts were lost in three patients treated without eculizumab. In the HLAi cohort, there were no significant differences in the recipient age (45.5 vs 43.5 years, p=0.9), sex (female 67% vs 56%, p=0.7); donor age (36.5 vs 40.5 years, p=1.0), sex (female 50% vs 42%, p= 1.0); antibodies to repeat mismatches (67% vs 64%, p=1.0), DSA fixing C1q compliment (100% vs 50%, p=0.50), median baseline DSA MFI levels (26,465 vs 18,968, p=0.362) and flow cytometric crossmatch positivity (RMF>2.3) (100% vs 96%, p=1.00) between patients with and without EAAMR.

Conclusion: EAAMR is of significant clinical concern, and is more frequent in HLAi transplantation. Baseline characteristics cannot risk stratify these patients. Complement inhibition can be successful in treatment. EAAMR may be due to T or B-cell memory response, and methods to identify this preoperatively would be an important area of future research.

M3
Thrombin fine tunes innate immune cell function in models of localised antigen

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Abstract: Introduction: Thrombin is the main effector protease in the coagulation cascade. It can also affect a wide array of cell types by signalling via protease activating receptors (PAR). The presence of these receptors on the surface of innate immune cells has been well reported but the functional consequence of activation has yet to be defined. This study aims to investigate the role thrombin has on innate immune cell function using contact hypersensitivity (a response to localised antigen) as a model of transplantation.

Methods: Mice were sensitised with oxazolone on the shaved abdomen, 5 days later they were re-challenged with oxazolone on the right ear. Ear thickness difference vs control was measured at 24 and 48 hours. In vitro experiments were conduced with bone marrow macrophages (BMM) cultured with thrombin then analysed by flow cytometry

Results: Inhibiting thrombin signalling via transgenic expression of hirudin on murine CD31 cells significantly reduced ear thickness swelling versus WT. This phenotype was shown to be due to inhibition of thrombin signaling on the monocytes, as WT recipients of transgenic bone marrow had a reduction in ear swelling, reduced CD68 infiltration, granuloma and iNOS expression. This was not seen in transgenic recipients of WT bone marrow. In Vitro, stimulating mature BMM with thrombin did not affect gross markers of macrophage polarisation (iNOS or CD206) but did increase surface expression of CD69 & MHC II and reduced ABCA1. Thrombin stimulated cell supernatants had increased Interferon gamma and reduced IL10. Thrombin treated cells had increased lipid rich microdomains by Cholera Toxin B staining and increased co-localisation of the LPS receptor within the lipid raft. The thrombin stimulated cells were highly sensitive to low dose M1 polarising stimuli.

Conclusion: Thrombin, as well as being a key mediator of coagulation, provides a proinflammatory signal and provides an important target for future cytotopic therapies in transplantation.

M4

Outcomes of livers from circulatory death donors: static cold storage vs in situ normothermic regional perfusion vs ex situ normothermic machine perfusion

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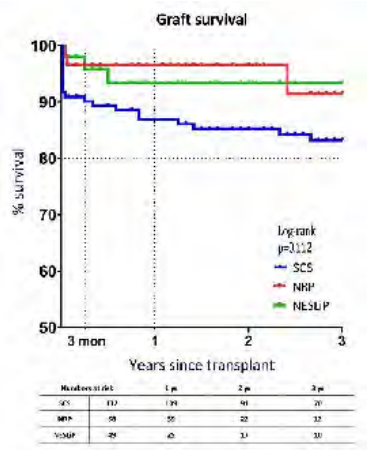
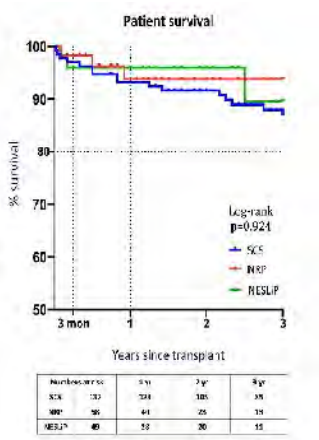
Background: Donation after circulatory death (DCD) has immense potential to be a source of livers though traditionally they have been considered suboptimal based on an increased risk of primary non-function (PNF) and ischaemic cholangiopathy (IC). In this study, we compare the impact of novel strategies used to preserve the function of DCD livers on clinical outcomes.

Method: Retrospective analysis of a prospectively maintained database of DCD livers between January 2011 and August 2019. Clinical outcomes of all patients with static cold storage (SCS), normothermic regional perfusion (NRP) and *ex situ* normothermic machine perfusion (NESLiP) were compared. The primary endpoints were 90-day and 1-year patient and graft survival. Secondary endpoints were early allograft dysfunction (Olthoff criteria [EAD] and Model for early allograft function [MEAF]), acute kidney injury (AKI; peak creatinine ≥2 times baseline), biliary complications, ITU and hospital stay.

Results: 239 DCD liver transplantations (SCS 132; NRP 58; NESLiP 49) were performed. Donor risk index (Feng) was significantly low for NRP livers (2.5 vs 2.2 vs 2.5; SCS/NRP/NESLiP, p >0.001). 8 (6.1%) livers of SCS group were lost due to PNF compared to none in the NRP or NESLiP groups (p=0.035). NRP livers had a significantly lower MEAF score (5.42 vs 3.96 vs 4.11; p=0.001). SCS group had the highest incidence of AKI (48.5% vs. 38% vs. 43%; p=0.386) as well as significant development of IC (23.5% vs. 3.4% vs. 8.5%; p=0.001). ITU stay was the same across the groups but median hospital stay was lower following NRP (19 vs 15 vs 19 days; p=0.017). 90-day graft survival in the three groups was 90%, 96.5% and 96%; and patient survival 97%, 98.3% and 96%. Similarly, 1-year graft survival was 87%, 96.5% and 93%; and patient survival 93.2%, 93.8% and 96% respectively.

Conclusions: NRP and NESLiP are associated with superior outcomes compared to SCS.





M5

NMP as a platform for the delivery of thrombolytic agents to clear the microcirculation of human kidneys

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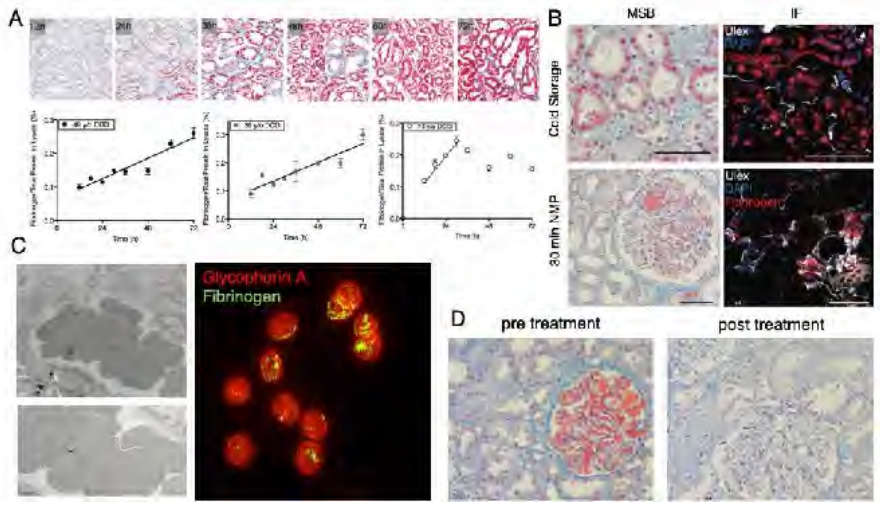
Introduction: Renal normothermic machine perfusion (NMP) provides a platform for the *ex-vivo* delivery of pre-transplant therapies. However, NMP triggers intravascular accumulation of fibrinogen and red blood cell aggregates that plug the renal microcirculation, creating a barrier to efficient delivery of therapeutic agents. The aim of this work was to investigate the mechanisms leading to microvascular obstruction during NMP and to determine if this can be reversed using thrombolytic agents.

Methods: 26 human kidneys discarded for transplant were studied during cold storage and NMP. Kidneys were held in static cold storage in ice for variable periods and biopsied sequentially. Paired human kidneys underwent NMP simultaneously for 1 hour using a red cell-based perfusate and were randomly assigned to receive either plasminogen alone (control) or plasminogen + tissue plasminogen activator (tPA). Renal biopsies were analysed using quantitative microscopy and transmission electron microscopy (TEM). Perfusate plasmin and fibrinogen degradation products were measured as reporters of tPA activity.

Results: We found that cold storage induces tubular epithelia to synthesize fibrinogen in a time-dependent manner that is accelerated in kidneys from older donors (Figure 1A). During NMP this fibrinogen was found to translocate from the tubular epithelial cells into the microvasculature (Figure 1B). TEM and immunofluorescence imaging demonstrated intravascular red cell rouleaux containing high levels of fibrinogen (Figure 1 B and C). One hour of NMP with tPA + plasminogen effectively cleared microvascular obstructions (Figure 1D). tPA + plasminogen increased perfusate levels of plasmin and fibrin degradation products.

Conclusion: This study demonstrates the cold-induced accumulation of fibrinogen in renal tubular epithelium and subsequent renal microvascular obstruction by red cell aggregates. NMP provides a platform for directed pre-transplant fibrinolysis in order to disperse renal microvascular aggregates. This technique has future potential in improving the delivery of therapeutic agents during NMP with the aim of reducing early allograft dysfunction.



M6

Normothermic machine perfusion of the liver to enable transplantation in difficult recipients (NAPLES)

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Introduction: The National Liver Offering Scheme (NLOS) disadvantages high-risk candidates; some never receive offers whilst 25% retrieved organs are discarded nationally. The potential of Normothermic Machine Perfusion (NMP) of marginal grafts to serve high-risk candidates has not been explored before. Here we report early outcomes using marginal Donation after Brainstem Death (DBD) grafts that would otherwise be declined for high risk recipients.

Methods: Patients were consented to receive a marginal NLOS or fast-track (FT) DBD liver after NMP. Back-to-base NMP was performed and the organ transplanted if previously defined viability criteria were fulfilled and outcome data collated and reported as median (interquartile range).

Results: 30 livers (n=23 FT) underwent NMP of which 23(77%) met criteria for transplant. The donor age was 51 (40-67), donor risk index 1.68 (1.28-2.74) and donor BMI 27.7 (24-30). The majority [n=14 (61%)] were re-transplant candidates; the remainder were high risk for other reasons and deemed suitable only for a good DBD graft using standard cold storage. The waiting time was 361 (216-599) days and UKELD 58 (52-59). The NMP time was 750 (527-873) minutes following a cold ischaemic time of 369 (320-424) minutes. There was 100% graft function. One patient required re-transplant 4 days later due to a technical arterial issue. 30-day graft and patient survival were 96% and 100% respectively. 13 (57%) patients developed ≥1 Clavien-Dindo grade 3-4 complications. Currently 21 (91%) patients have been discharged after 4 (3-6) days in ITU and overall length of stay of 15 (10-20) days.

Discussion: NMP expands horizons in liver transplantation such that marginal DBD livers can be transplanted into higher risk patients after viability assessment and overcomes the problem of prolonged cold storage that precludes the use of marginal grafts in patients undergoing complex explants. This approach could minimise organ wastage whilst benefitting those waiting longer for a graft.

M7
Modelling the effects of IL-1β-mediated inflammation using ex vivo lung perfusion

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Introduction: An ongoing shortage of suitable lungs means that many individuals remain on the waiting list for a transplant. One potential method by which to expand the donor pool is through ex vivo lung perfusion (EVLP). EVLP not only allows close monitoring of lung function clinically, but also offers a platform by which to model disease in pre-clinical research. Previous work by Newcastle University has identified IL-1β signature in perfusate of clinical EVLP as a determiner of post-transplant outcome.

Methods: Lung pairs declined for transplant were dissected into individual lungs and perfused concurrently on Medtronic© circuits (n=4). IL-1β was infused as a bolus into one lung from each pair. After 60 minutes, CFSE-labelled neutrophils were infused into both lungs over a minute and then regular perfusate samples were acquired over 120 minutes of perfusion. CFSE+ events were quantified using flow cytometry. Perfusate samples were measured for pro-inflammatory markers via ELISA (R&D Systems). Human pulmonary endothelial cells were stimulated with perfusates *in vitro* and expression of ICAM-1 and VCAM-1 was assessed via flow cytometry. Neutrophil adhesion was measured using a microfluidic flow system (Cellix©).

Results: Lungs with IL-1β added showed consistently lower numbers of neutrophils in perfusate samples relative to the control lung in each pair. Weight gain, lactate level and pCO2 were all higher in the IL-1β-stimulated group (ns). Percentage weight gain correlated with levels of sICAM-1 ($R^2=0.71$, $p=0.0043$) and vWF ($R^2=0.39$, $p=0.07$) which in turn correlated with IL-1β in the perfusate ($R^2=0.50$, $p=0.33$) ($R^2=0.58$, $p=0.017$). Perfusates from the stimulated cohort facilitated greater expression of ICAM-1 and VCAM-1 on HPMECs and enhanced neutrophil binding *in vitro* (ns).

Discussion: EVLP provides a robust and valid means of analysing inflammatory pathways in organs prior to transplantation. Further analysis of samples from our EVLP cohort will provide greater insight into mechanisms of IL-1β-mediated tissue injury.

M8

Comparison of metabolic outcomes after pancreas transplantation between DBD (donors after brainstem death) and DCD (donors after circulatory death) grafts

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Objective: DCD pancreas transplantation has become common with equivalent graft survival as that of DBD grafts, but are the metabolic outcomes similar? Given the lack of marker of graft function, can HbA1C (glycosylated hemoglobin A1C) predict long-term graft function? We aimed to address these questions.

Methodology: Single center retrospective analysis of 160 pancreas transplants performed from 2006 to 2019 was done. After excluding early graft loss (n=20) and missing data (n=17) the remaining 123 grafts (DBD=105/ DCD=18) were included. Functioning graft is defined as remaining insulin independent. HbA1C under 42mmol/mol is defined as normal. Secondary complication is defined as any of the following events post-transplant: myocardial infarction, cerebrovascular accident, minor or major amputations, death. Rejection is either antibody mediated with de novo DSA (Donor specific antibody) or T-cell mediated or mixed and biopsy proven.

Results:

Parameter	DBD	DCD	p value
Median HbA1C at 1 year in functioning grafts	34.50 n=92	38.50 n=16	0.03
Median HbA1C at 3 months in functioning grafts	33 n=104	33.50 n=18	0.87
Median percentage weight gain	5.74%	15.67%	0.006
Percentage of type 2 diabetes	14.29%	11.11%	>0.99
Incidence of rejection	34.29%	27.78%	0.78
Steroid free rate	63.81%	72.22%	0.78
Incidence of secondary complication in functioning grafts	21.69%	18.75%	>0.99

Among the grafts functioning at 1 year, the death censored median graft survival was significantly longer (p=0.0004) for those with normal HbA1C (142 months, n=90) compared to those with abnormal HbA1C (99 months, n=8).

Conclusion: In contrast to the existing literature we noted a higher median HbA1C at 1 year and a higher median percentage weight gain in the DCD cohort. The implication of this is a potential question for further studies. It is evident that HbA1C can predict long-term graft function. The role metabolic evaluation and beta cell scan in functioning grafts with abnormal HbA1C are avenues to explore.

O1

Recipient age, not donor age, impacts on long term outcomes following heart transplantation: a 23-year national analysis from the United Kingdom

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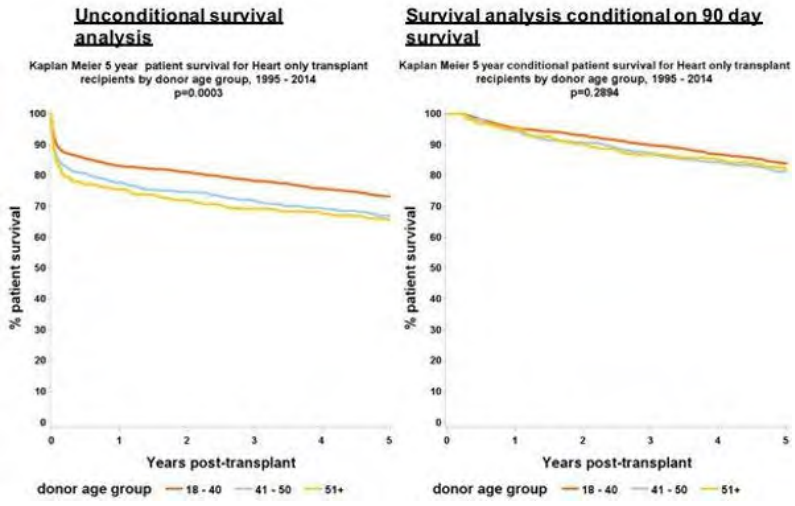
Introduction: The impact of donor and recipient age on outcomes following heart transplantation remains controversial. The aim of this study was to evaluate the impact of donor and recipient age on survival following heart transplantation in the United Kingdom.

Methods: All heart transplants in recipients over 18, performed at the six transplant centres in the UK between 01/01/1995 and 31/12/2018 were included. Data were obtained from the National Health Service: Blood and Transplant database. Recipients were divided into the following groups for analysis: 18-30, 31-40, 41-50, 51-60, 61+ years, and donors: 18-30, 31-40, 41-50, 51-55, 56+ years.

Results: 3161 patients were included in this study. The overall median recipient age was 50, which has remained constant over the study period, but the proportions of transplants in the 61+ and <41 groups have increased over time. The median donor age was 38, with a trend towards more donors >50 years being used over time, although the proportion of donors <40 has increased recently with utilisation of donors after circulatory death. Kaplan Meier survival analysis demonstrated a significant decrease in long-term survival with increasing recipient age post-transplantation that was retained with 90-day conditional survival. Whilst donor age was also correlated with reduced recipient survival, with 90-day conditional survival, there was no such association (Figure 1). The impact of donor age on unconditional survival was particularly significant for recipients <40 years (p=0.002). However, with 90-day conditional survival there was no such association between outcome and donor age even in this young cohort.

Conclusion: In this national dataset, we demonstrate that with 90-day conditional survival, donor age has no impact on long-term outcomes following heart transplantation. However, longer term survival appears more dependent on recipient age. These data support the utilisation of hearts from older donors.



O2

Assessment of cerebral perfusion and activity during normothermic regional perfusion in a porcine model of donation after circulatory death

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Introduction: Normothermic regional perfusion (NRP) is a resuscitation strategy used for transplantation of hearts and abdominal organs donated after circulatory death (DCD) which involves in situ reperfusion of donor organs excluding cerebral circulation. Ethical concerns have been raised in regards to the potential return of spontaneous cerebral activity during NRP due to collateral cerebral circulation. With our study, we sought to determine cerebral perfusion and activity during NRP in a clinically relevant porcine model of DCD.

Methods: Following anesthetic induction in 5 donor pigs, we induced hypoxic circulatory arrest by cessation of mechanical ventilation. This was followed by a 15-minute "hands-off" period (warm ischemia) and subsequent resuscitation with NRP. NRP was performed via central cannulation with the supra-aortic vessels clamped and the anesthetic drugs suspended. We assessed cerebral activity throughout the case using Bispectral Index (BIS) and single lead EEG. We also tested for the presence of brainstem reflexes (including pupillary response, oculocephalic and corneal reflex, and spontaneous respirations) at baseline and during the NRP. Cerebral perfusion was assessed by continuous oximetry using Near-Infrared Spectroscopy (NIRS) and a cerebral angiography, which was performed at baseline and during NRP.

Results: Brainstem reflexes were uniformly absent at all time points following DCD in all cases. BIS monitoring demonstrated absence of cerebral activity during NRP.

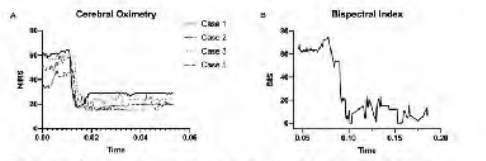

Figure 1. A: Cerebral oximetry measured using Near-infrared spectroscopy demonstrates an acute decrease in cerebral oxygenation during DCD induction and NRP. B: Representative Bispectral Index measurements from Case 4. BIS also demonstrates an acute decline during DCD and remains absent during NRP. Some artifacts are noticed as spikes in measurements.

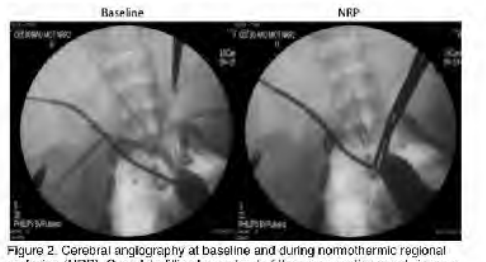

Figure 2. Cerebral angiography at baseline and during normothermic regional perfusion (NRP). Complete filling by contrast of the supra-aortic vessels is seen in the baseline image. During NRP, a cross-clamp is placed over the supra-aortic vessels to exclude cerebral circulation and no contrast is seen.

Discussion: NRP provides rapid donor organ reperfusion, avoiding prolonged warm ischemic times during DCD. Our findings suggest that although occasional collateral brain flow during NRP may occur, this does not lead to significant brain perfusion or return of brain function. We believe NRP is safe to be performed clinically and can enhance DCD donor organ utilization, especially in the field of heart transplantation. Future studies are required focusing on the impact of NRP over DCD organ functional recovery and clinical outcomes.

O3
Mental health after unspecified anonymous living kidney donation: the MEGA study

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Erasmus MC, Rotterdam, Netherlands

Introduction: Unspecified/anonymous living kidney donors donate to an unknown stranger. These donors undergo standardisedpsychosocial assessment to minimize likelihood of psychological harm from donation. The aim of this retrospective interview study was to investigate post-donation psychological symptoms, well-being and psychiatric diagnoses in order to assess the psychological impact of this type of donation.

Methods: All 147 unspecified anonymous kidney donors (2000-2016) in a Dutch transplant center were eligible to participate. The structured interview M.I.N.I. Screen was used to assess psychiatric diagnoses: on indication when symptoms were identified the M.I.N.I. plus was conducted. Questionnaires were used to assess psychological symptoms (Symptoms Checklist) and psychological well-being (Dutch Mental Health Continuum). We also conducted a semi-structured interview about expectations, anonymity, experiences and the support received.

Results: Of the 147 eligible, 11 had died: 114/136 participated (84% participation rate). Fifty-two were male, median age was 66.5 (25-94) years, and the follow-up time was 76.5 (24-178) months. Participants scored higher on positive well-being than the general population when compared to norm scores. Psychological complaints were comparable to the general population. Regarding psychiatric diagnosis, 54/114 (47%) donors had an indication for a diagnosis for which the M.I.N.I. plus was conducted; a lifetime diagnosis was established among 36 (32%). Most common diagnosis were depression and post-traumatic stress disorder.

Discussion: Willingness to participate in this study was high. The rate of psychological symptoms at the time of the interview and life-time psychiatric diagnoses is comparable with prevalence in the general population. Whereas psychological well-being generally is higher than the general population. Qualitative interview data are currently being analyzed. The study was limited by the retrospective design and there was a wide range in time since donation. In order to further examine the burden and gains of unspecified donation prospective studies with >12 months follow-up are needed.

O4

Survey of views & attitudes towards organ donation in the UK Jewish community

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Introduction: Deceased organ donation amongst the Jewish community has been low, partly due to a perception that donation after brainstem death (DBD) is against Jewish Law.[1] There is concern that the change to 'opt-out' in England could lead to a decrease in Jews wishing to donate.[2] We conducted a survey to understand the community's views.

Methods: Google Forms was used to anonymously collect demographics, current attitudes towards organ donation and 'opt-out' and understanding of Jewish Law. The survey was distributed via social media and messenger services. NHS HRA waived ethics approval.

Results: There were 1100 responses, 67.5% female. Denominational split is shown in figure 1. 46% hold an NHS organ donor card whereas 65% indicate they would not opt-out. Figure 2 shows which organs respondents are not comfortable donating. Almost all (90%) would receive an organ but 35% thought that donation could present issues for a Jewish burial. 13% responded that DBD would be murder. If their family member was a cardholder, 74% would agree to donation and over half would agree if they were not registered. 20% did not know the Jewish position on donation and 53% said that it was permissible under certain circumstances. 70% could not recall a Jewish religious leader discussing organ donation.

Discussion: This survey is the largest on this topic. There is a high degree of engagement with heterogeneity in views. There is a lack of religious guidance revealed by significant differences in views on the definition of death and the implications on burial. A majority of respondents will not opt out once the law changes, although there is a need for clearer guidance from religious leaders.

Fig1:

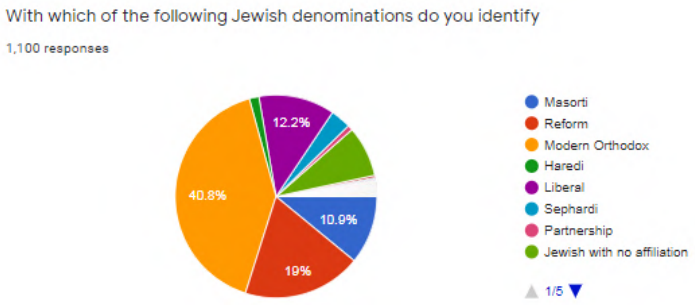
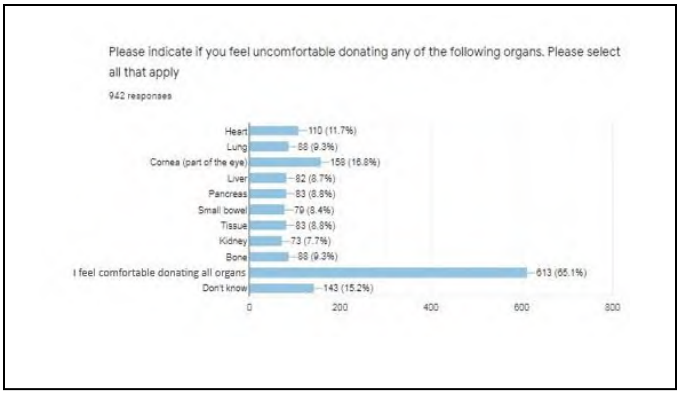


Fig2:



References:

1. https://www.bod.org.uk/wp-content/uploads/2018/02/Briefing-for-website-20-02.pdf
2. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/731913/govt-response-organ-donation-consent.pdf

O5

The impact of cold ischaemia time on living donor kidney transplantation outcomes in kidney paired exchange

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Introduction: End stage kidney disease (ESKD) patients who have an incompatible living donor still have an option to be successfully transplanted through kidney paired exchange (KPE) programmes. However, prolonged cold ischaemia times (CIT) are observed in KPE. We therefore examined the impact of CIT on LDKT outcomes in the UK, comparing KPE and non-KPE LDKT, and focused on the effect of CIT within the KPE-cohort.

Methods: All UK LDKT between 2007 and 2018 were analysed through NHSBT data. We compared outcomes of KPE versus non-KPE LDKT, and studied the effect of a CIT >4 hours within the KPE LDKT.

Results: a total of 9956 LDKT were included in our study, of which 1396 (14%) were KPE LDKT. Compared to the non-KPE group, KPE LDKT had a significantly higher CIT (187 versus 339 mins, $p<0.001$), rate of delayed graft function (DGF) (4.08% versus 6.97%, $p<0.0001$), a worse 1-year graft survival (survival probability = 0.98 versus 0.96, $p<0.01$) and lower graft function at 1 year (eGFR of 57.90 versus 55.25, $p=0.04$) and 5 year (eGFR of 55.62 versus 53.09, $p = 0.01$). Within the KPE-cohort, a CIT >4 hrs resulted in significantly higher DGF rates (4.80% versus 9.26%, $p = 0.02$), and lower graft function at 1 year (55.93 versus 54.56, $p = 0.03$), but no difference in 1-and 5-year graft survival compared to a CIT < 4 hrs. Regression analyses identified risk factors for impaired outcome.

Discussion: Our study shows that KPE LDKT had a higher incidence of DGF and worse 1-year graft survival and function. Within the KPE group, a CIT >4 hours impacted on DGF rate and graft function, but not on graft survival. Strategies should be developed to further improve the KPE LDKT results, such as including CIT in the KPE algorithm or employing machine perfusion during kidney transportation.

O6
DCD outcomes after normothermic liver perfusion

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Introduction: As normothermic machine perfusion (NMP) becomes more widespread in liver transplantation questions remain about its efficacy for DCD livers. There is further uncertainty regarding the potentially detrimental effects of a period of cold storage (SCS) before NMP (postSCS-NMP) in these high-risk organs.

Methods: We compare the outcomes for standard criteria DCD livers transplanted in King's College Hospital, Royal Free Hospital and the Queen Elizabeth Hospital, preserved using continuous NMP (cNMP) from donor to recipient with those from post-SCS-NMP organs. Post-SCS-NMP organs were transplanted provided they met previously described viability criteria. Donor, recipient, machine perfusion and intra-operative and post-operative outcomes were compared as well as six-month graft survival, patient survival and biliary complications

Results: 28 cNMP livers and 22 post-SCS-NMP DCD livers were included. Donor and recipient characteristics were similar for both groups except, as expected, cNMP livers experienced a shorter period of initial SCS compared with post-SCS-NMP livers (133mins vs 386mins; $p<0.01$) but similar durations of NMP (590min vs 582min; $p=0.89$). Better arterial flow was observed during machine perfusion in post-SCS-NMP livers (0.25 ± 0.11 L/min vs 0.41 ± 0.17 L/min; $p < 0.01$). Similar rates of post-reperfusion syndrome were observed (3/28 (10.7%) cNMP vs 2/22 (9.1%) post-SCS-NMP; $p=0.849$). Peak-AST was lower in cNMP livers although this did not reach statistical significance (570 IU/L vs 1243 IU/L; $p=0.068$). Similar rates of early allograft dysfunction were seen (1/28 (3.6%) cNMP vs 2/22 (9.1%) post-SCS-NMP; $p=0.415$). One cNMP liver developed ischaemic cholangiopathy requiring retransplantation. Two post-SCS-NMP livers developed evidence of non-anastomotic hilar strictures which were managed conservatively.

Conclusion: Post-SCS-NMP achieves comparable results to cNMP with regards to graft survival and biliary complications. Post-SCS-NMP organs may incur additional parenchymal injury as a consequence of the extended initial cold ischaemia as demonstrated by higher peak-AST, although this does not appear to impact on patient outcome.

O7

End-hypothermic machine perfusion with oxygenation after static cold storage versus static cold storage alone in ECD kidneys from donation after brain death donors: results of a prospective international randomised controlled trial in kidney transplantation

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Introduction: Previous clinical and preclinical work has shown a beneficial effect of continuous Hypothermic Machine Perfusion (HMP) on graft function and survival in kidney transplantation when compared to Static Cold Storage (SCS). We have now compared the effect of short-term 'in house' oxygenated HMP preservation (END-HMPO_2) following SCS versus SCS alone on 1y graft survival in higher risk ECD kidneys from DBD donors in a prospective, randomised, single blinded, multi-centre trial using a novel kidney perfusion device.

Methods: In a non-paired design, kidneys from ECD donors were allocated by the (inter-)national organ sharing organisation according to standard protocols to recipients and then randomly assigned to either SCS alone or SCS followed by END-HMPO_2 in the recipient centre (minimum MP time of 120min). Primary endpoint was 1y graft survival, with delayed graft function, primary non-function, acute rejection, eGFR, as well as patient survival as secondary endpoints.

Results: Centers in Belgium, Germany, Hungary, The Netherlands and the UK randomised 305 kidneys [median donor age 64y (range 50-84)], of which 262 were successfully transplanted [median recipient age 63y (22-81.2)]. Median cold ischaemia time was 13.2h (range 5.1-28.7) in the END-HMPO_2 group and 12.9h (4-29.2) in the SCS group; median duration of END-HMPO_2 was 4.7h (0.8-17.1); warm ischaemia time was 34min (17-92) and 32min (11-80), respectively. One year graft survival was 92.1% (N=117) in the END-HMPO_2 group vs. 93.3% (N=126) in the SCS group (p=0.7). The secondary endpoint analysis showed similar results in both groups for DGF, PNF, patient survival and episodes of acute rejection.

Discussion: Reconditioning of higher risk ECD kidneys from DBD donors using ‘short term‘oxygenated hypothermic machine preservation immediately prior to transplantation after a period of static cold storage does not lead to an improved survival or better function when compared to simple static cold storage alone.

O8

Evaluation of a home-based education initiative to overcome barriers to living donor kidney transplantation (LDKT) – renal education and choices @ home (reach)

Mr Gabriel Oniscu[1,2], Dr Jennifer Lumsdaine[3], Mrs Orla Hobson[4]

[1]Edinburgh Transplant Centre, Edinburgh, United Kingdom. [2]University of Edinburgh, Edinburgh, United Kingdom. [3]Living Donation Scotland, Edinburgh, United Kingdom. [4]NHS Lothian, Edinburgh, United Kingdom

Introduction: Lack of patient knowledge about living donor kidney transplantation (LDKT) is a barrier to accessing this treatment and is linked to patient disempowerment, reluctance to broach the subject and a perceived lack of a suitable LD. The Netherlands has had success in overcoming this barrier by using home-based education to increase knowledge among patients and their support-network. REACH is single UK centre one-year pilot project aimed at developing a home-education service as a way to overcome barriers to LDKT among UK patients.

Methods: Patients with an eGFR <20 mls/min, who were likely to be suitable for transplant (but had no potential LD being assessed), were visited at home, having been encouraged to invite family and friends to attend. Each visit comprised a baseline assessment of renal replacement therapy (RRT) knowledge and attitudes to LDKT using a questionnaire, followed by an informal education session and discussion. RRT knowledge and attitudes were later re-assessed, along with a patient satisfaction survey.

Results: Fifty patients were visited at home between December 2018 and September 2019. Seventy-three invitees also attended these sessions. Significant improvements were identified in the post-session RRT knowledge and attitudes towards LDKT, both for patients and for their invitees. Forty potential LDs have started the assessment process after a REACH visit and 27 patients (54%) now have at least one potential LD being assessed. Home visits have been extremely well received with excellent feedback provided by patients and their invitees. Feedback from nephrologists, transplant surgeons and co-ordinators has also been positive.

Discussion: Home-based education improves RRT knowledge, and attitudes to LDKT, among patients and their support-networks, in a way that provides excellent patient satisfaction. Enquiries by potential LDs to the LD co-ordinators increased after participation in the REACH project. Home-based education appears to improve the likelihood that a patient will identify a potential LD.

O9
The impact of increasing lung donor age criteria on UK lung utilisation

Miss Gillian Hardman[1,2], Miss Rachel Hogg[3], Miss Sally Rushton[3], Miss Karen Booth[1], Professor John Dark[2], Professor Andrew Fisher[2]

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Introduction: In January 2018, the UK lung donor offering criteria was increased to 74 years (74 years and 364 days) for both DBD and DCD lung donors, where the donor was a life-time non-smoker or had not smoked within the last 10 years. Prior to this, the upper age limit was 64 years for DCD donors and 69 years for DBD donors. This study aims to assess the impact of the UK extended lung donor age criteria on lung utilisation and transplant.

Methods: Data were obtained from the UK Transplant Registry on all lung offers from DBD donors over 69 years and DCD donors over 64 years ('older donors'), between January 2018 and September 2019. Utilisation was defined as at least one lung accepted and transplanted.

Results: One-hundred and seventy-eight donors meeting the criteria for analysis were identified. Of these, 110 proceeded to donation of at least one solid organ. Lungs were offered from 52 potential DBD donors aged 70-74 years and 126 potential DCD donors aged 65-74 years. Six (11.5%) of the 52 DBD lungs were transplanted and 2 (1.6%) of the 126 DCD lungs were transplanted. Recipient age ranged from 50-66 years. One-hundred and seventy older donor lung offers were declined. The most common primary reasons for decline recorded were 'past history' (29%), 'poor function' (20%), and 'age' (19%). The cardiothoracic retrieval team attended 28 of the total 178 older donor offers.

Discussion: Although the utilisation rate from older lung donors is low, expanding the donor age criteria in the UK has resulted in an additional 8 transplants. 'Age' alone continues to be documented as a reason for organ decline. Work is required to improve utilisation rates, including the use of older donors. We will continue to review the impact of expanding lung donor age criteria, including analysis of recipient outcomes from older age donors.

O10

Evaluating the usefulness of the incompatible pairs tool in predicting transplantation via the UK Living Kidney Sharing Scheme (UKLKSS)

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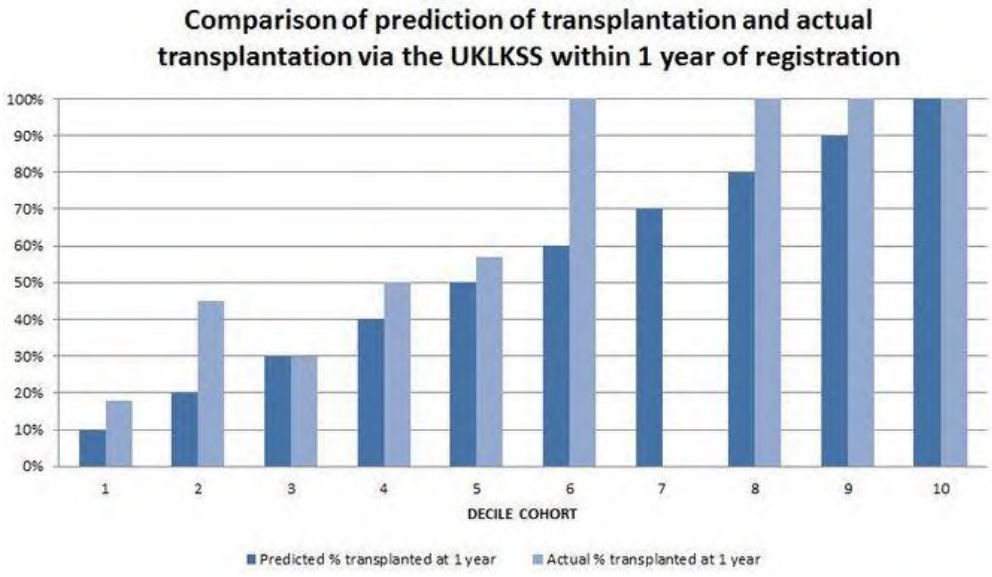
Introduction: UKLKSS identifies pairwise exchanges and altruistic donor chains through quarterly matching runs. The 'Incompatible Pairs tool' predicts percentage chance, in deciles, of getting a match in the UKLKSS. The aim was evaluate this tool's usefulness in predicting outcome for pairs entered from our transplant centre.

Methods: This retrospective observational study included newly registered donor-recipient pairs for all matching runs in 2016-2018 with follow up until October 2019. Recipients who were suspended or died while waiting were excluded. The 'Incompatible Pairs' tool was used to calculate the predicted chance of transplant via UKLKSS. Details of actual transplantation for recipients were acquired from the local transplant database.

Results: 80/86 recipients entered in the UKLKSS received a kidney transplant in the follow up period; 56% were via the UKLKSS. 87% of transplants via the UKLKSS were performed within 1 year of registration. The prediction tool underestimates recipients' chances of receiving a transplant in the UKLKSS at one year (Figure 1). However, there is a correlation between a higher predicted rate of UKLKSS transplant and transplantation at 1 year. The majority of transplanted recipients with a predicted likelihood UKLKSS match at one year of <30% received a kidney transplant from an alternative source (deceased, direct, ABO incompatible or altruistic).

Discussion: The Incompatible Pairs tool consistently underestimates registered recipients' chances of getting a UKLKSS transplant. However, with the exception of one patient who opted for direct transplantation after one UKLKSS run, all recipients with a predicted likelihood >50% received a kidney transplant via the UKLKSS within 12 months of entry. Although the tool provides an underestimate of likelihood of transplantation, it does identify patients who are less likely to receive a match and may allow alternative options to be explored at an early stage for this group.



O11

Prophylactic eculizumab treatment significantly improves renal allograft survival in patients with atypical haemolytic uremic syndrome compared with historic controls

Dr Emily K Glover[1,2], Dr Kate Smith-Jackson[1,2], Dr Vicky Brocklebank[1,2], Dr Edwin Wong[1,2], Dr Sally Johnson[1,2], Dr Michal Malina[1,2], Professor David Kavanagh[1,2], Professor Neil S Sheerin[1,2]

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Introduction: Atypical haemolytic uraemic syndrome (aHUS) is a rare cause of end stage renal failure and has been recognised to have poor outcomes in renal transplantation due to early disease recurrence. Eculizumab treatment has transformed management of the condition in particular, allowing patients with aHUS to undergo transplantation. We report the UK experience of prophylactic eculizumab use in renal transplantation for aHUS.

Methods: We conducted a retrospective case series review of renal allografts for patients with confirmed aHUS. 37 received prophylactic eculizumab treatment from the time of transplantation and 92 transplants in 65 recipients did not receive eculizumab. Both living and deceased donor renal allografts were included. The minimum follow up period was 1 year. Graft survival and reason for failure were collected by review of clinical records and results were censored for patient death with a functioning graft and for functioning graft at the end of the study period. Results were further analysed to compare outcomes in those with pathological mutations in complement pathway genes CD46, CFH, CFB, CFI and C3.

Results: At the end of the study period (1st August 2018), 4 grafts that had received prophylactic eculizumab had failed as had 73 of the historic controls that did not receive eculizumab. Kaplan-Meier survival analysis showed that prophylactic eculizumab treatment significantly improved renal allograft survival in patients with aHUS with improved recurrence-free survival ($p<0.001$). 5-year survival was 88% with prophylactic eculizumab and 32% without eculizumab treatment. In the group who did not receive eculizumab, CFH mutations carried the highest rate of disease recurrence.

Discussion: Prophylactic eculizumab treatment from time of renal transplantation dramatically improves graft survival at 5 years to approach the UK average for all causes of renal failure. With prophylactic eculizumab treatment, renal transplantation has become a viable therapeutic option for those with end stage renal failure caused by aHUS.

O12

Modelling patient outcomes after listing for deceased donor kidney transplantation in the UK: a novel technique

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Introduction: Novel methods of data analysis and communication are needed to aid clinician and patient understanding of clinical outcomes. We aimed to demonstrate patient outcomes from the time of listing for kidney transplantation in the UK, accounting for transplant centre and patient differences, using competing risks methodology.

Methods: Data from the UK Transplant Registry held by NHS Blood and Transplant on adult patients listed for kidney transplantation from 2010 to 2015 were examined. Multivariable Cox proportional hazards models were constructed for separate outcomes from the point of listing: transplantation (regardless of subsequent patient outcome), death on the list and removal from the list, with the residual patients remaining on the list (active and suspended). Patient factors investigated were age, gender, ethnic group, sensitisation status, blood group, matchability score, dialysis status and diabetic nephropathy. These were then fitted to a Fine and Gray competing risks model, with transplant centre added as an additional factor.

Results: Of 13,200 patients registered in this time period, 8,485 (64%) of patients were transplanted, 1,123 (9%) died on the list, 1,716 (13%) were removed from the list, and 1,876 (14%) remained on the list at 5-years post-registration. All tested factors significantly impacted time to transplant on multivariable testing. Parameter estimates and risk-adjusted cumulative incidence functions for each outcome are used to give patients an indication of their outcome on the kidney waiting list given their individual characteristics. Figure 1 depicts outcomes from listing for a patient with 'baseline' characteristics at two UK transplant centres using this model.

Conclusion: This competing risks interactive model has been developed to aid patient and clinician understanding. It is expected that these approaches will be used in the development of an online transplant risk communication tool, which serve as a foundation to aid individualised clinical discussions with patients and their families.

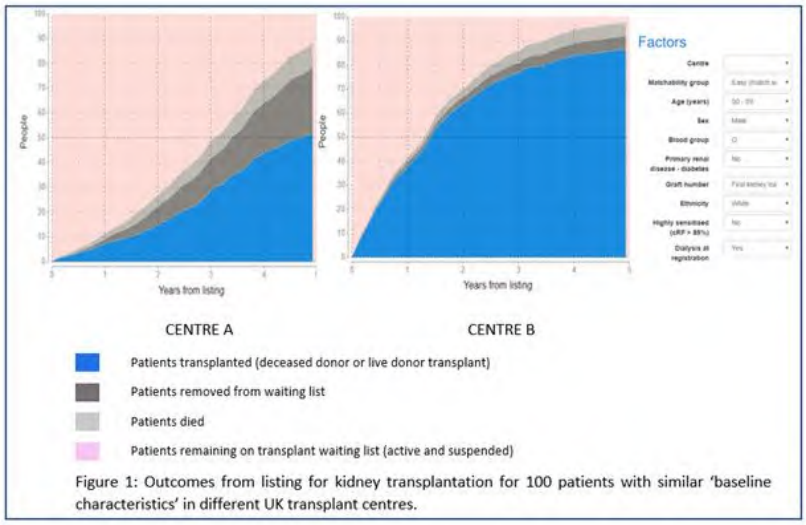

Figure 1: Outcomes from listing for kidney transplantation for 100 patients with similar 'baseline characteristics' in different UK transplant centres.

O13

Patients with a crossmatch negative DSA positive living donor should not wait for a compatible deceased donor, in the absence of other living donor options

Dr Gaetano Lucisano[1], Ms Eva Santos-Nunez[2], Mr Frank Dor[1], Dr Michelle Willicombe[1]

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Introduction: Data from the UK has shown no survival benefit for proceeding with direct HLAi transplantation over waiting for a compatible donor on the deceased donor list, when no other options for living donor transplantation is available. Patients with XM-DSA+, a group where immunological risk remains is not clearly defined, were excluded from that study. We aim to explore the outcome of XM-DSA+ patients who did not undergo transplantation with their prospective donors.

Methods: We analysed 301 potential recipients who were deemed to have at least 1 HLAi living donor following compatibility testing. Of these, we selected patients who were XM-DSA+ only. Patient outcome data was then collected and analysed. Median follow up was 6.60±2.66 years.

Results: 116/301(38.5%) patients were XM-DSA+ and remained on the waitlist for a DDTx. 53/116(45.7%) of these patients received a DDTx, with a median wait time of 19.1(14.4-31.6) months. 24/63(38.1%) of patients not transplanted, were either removed from the wait list or died with a median time of 5.69 (3.5-9.1) years. Patients who were not transplanted were older (median age: 53.0 ±13.2 years, $p<0.01$) and had a higher cRF (median: 93(79-95), $p<0.01$) compared with the transplanted patients. On multivariable analysis, transplantation was associated with better survival (HR:0.072 (0.001-0.57), p-0.013). A comparison analysis was then performed on the transplant outcomes between the 53 patients who received a cDDTx, compared with 54 historic recipients of a LDXM-DSA+ graft without desensitisation. There was a trend to better allograft survival (84.8% versus 66.9%, p=0.31), rejection free survival (69.6% versus 49.2%, p=0.07) and ABMR free survival (89.5% versus 75.8%, p=0.07) in the cDDTx but this did not reach statistical significance.

Discussion: Data from this study does not support deferring a direct LD XM-DSA+ transplant, when there are no other LD options (eg. failure of matching via the UKLDSS).

O14

Outcomes of pregnancy in simultaneous pancreas and kidney (SPK) transplant recipients: a single-centre experience

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

Introduction: The chance of successful pregnancy is low in women with end stage renal disease. In women with type-1 DM, not only are the fertility rates lower, but the proportion of new-borns with congenital malformation are higher than the general population. SPK transplantation improves fertility rates and the chance of a successful pregnancy. Aim of this study is to document pregnancy and allograft outcomes in this cohort.

Methods: All women who underwent SPK transplantation between 01.01.1998 – 01.08.2019 at our centre and then had a subsequent pregnancy are included. Patient records, obstetric records and neonatal discharge summaries were accessed. Maternal complications during pregnancy, fetal, neonatal and graft outcomes were observed.

Results: 13 women were identified to have had 17 pregnancies, 10 women had one pregnancy and three had more than one. Median age at delivery and the median time lag from transplantation to first pregnancy were 35.5 years and 5 years, respectively. There were 11 successful pregnancies. Of the 6 unsuccessful pregnancies, 4 pregnancies were lost due to miscarriage. 83% of the unsuccessful pregnancies were unplanned. One patient lost both pancreas and kidney grafts in pregnancy. Two patients lost their kidney grafts at least 1 year after pregnancy. There were two episodes of transplant ureteric obstruction secondary to extrinsic compression by the gravid uterus, which were managed by nephrostomy and ante-grade stent insertion. Rates of pre-eclampsia and pre-term delivery were 77% and 69%, respectively. Median gestation age at birth was 34 weeks**.** C-section rate was 75%. There were no congenital anomalies or neonatal deaths.

Conclusion: This is a high risk group for grafts and children. Pre-pregnancy planning is vital. Multi-disciplinary approach by obstetric and transplant teams is important pre-pregnancy, antenatally and peripartum.

O15
The Matrix 'Revelations'

Miss Charlotte Brown[1,2], Mr Usman Khalid[1,2], Dr Emma Woods[1], Dr Irina Grigorieva[1], Prof Donald Fraser[1], Dr Gilda Pino-Chavez[1], Dr Robert Steadman[1], Dr Soma Meran[1], Mr Rafael Chavez[1,2]

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Introduction: Ischaemia Reperfusion Injury (IRI) is important in transplantation, where it is associated with delayed function and poor graft survival. Ischaemic Preconditioning (IPC) is a brief, planned period of ischaemia, which reduces IRI by unknown mechanisms. Hyaluronan (HA) is a polysaccharide of the extracellular matrix (ECM). HA is synthesised by HA synthases (HAS1/2/3). When bound to CD44, HA promotes damage, correlating with severity of renal disease. We tested the hypothesis that IPC prevents HA formation and/or assembly in a model of evolving renal fibrosis.

Methods: A rat model of IRI was used, whereby both renal pedicles were clamped for 45 minutes. Lewis rats (n=68) underwent IRI, sham or IPC+IRI. Kidneys were retrieved at 48hrs, 14/28days and assessed histologically. Creatinine was measured at baseline and retrieval. Whole kidney gene-expression was assessed by RT-qPCR and RNA-sequencing.

Results: Acutely, IRI caused marked histological damage and increased creatinine. Key fibrotic mediators of the ECM were significantly increased. Gene Set Enrichment Analysis demonstrated enrichment of fundamental HA genes in IRI at all time points, maximal at 48hrs and attenuated by IPC. Of 50 Hallmark gene sets analysed, CD44 consistently contributed to the Leading Edge driving the enrichment. IPC reduced histology scores, creatinine ($p < 0.05$) and HAS2/CD44 expression ($p < 0.0001$). In IPC, DNA repair pathways were enriched at 48hrs compared to IRI. IPC reduced interstitial HA/HAS2 at 48hrs, and IPC/Sham gene-expression profiles were indistinguishable. By 14d, glycolysis and angiogenesis pathways were enriched in the IPC phenotype, compared to Sham, suggesting restorative processes occurring at this time. By 28d following IRI, renal fibrosis was established. IPC and Sham specimens were indifferentiable by 28d, both histologically and by their gene-expression profiles.

Discussion: IPC is associated with immediate, substantial gene expression changes, including the ECM. This results in significant reduction in renal fibrosis development and could provide fundamental clues to the underlying mechanism of IPC.

O16

Nanostring analysis for the diagnosis of antibody-mediated rejection in renal transplant biopsies

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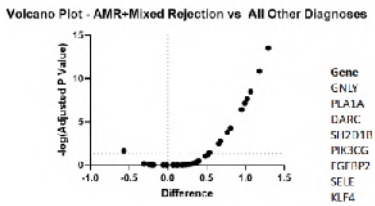
Introduction: According to the Banff Classification for Allograft Pathology, the histological diagnosis of antibody-mediated rejection (AMR) can be improved with molecular testing. The Nanostring® gene expression analysis permits transcript analysis on formalin fixed paraffin embedded (FFPE) biopsy samples, without requiring an extra core of tissue. We investigated the application of Nanostring on human renal transplant biopsy samples to diagnose AMR.

Methods: RNA was extracted from a retrospective cohort of 203 FFPE biopsies with a range histological diagnoses as classified by the 2017 Banff Criteria. Gene expression analysis of 33 transcripts described in the literature as associated with AMR was carried out using Nanostring® analysis. Gene expression was normalised using three housekeeper genes (ACTB, LDHA and HPRT1) and internal positive-control normalisation.

Results: Histological diagnoses in the 203 FFPE biopsies were AMR and mixed rejection, n=42: T-cell mediated rejection/borderline, n=23; NR, n=138 (including cases with BK nephropathy, thrombotic microangiopathy, glomerulonephritis and C4d deposition without rejection). Of the 33 genes, 12 were significantly different (adjusted p<0.05) in biopsies with AMR or mixed rejection, compared to all other diagnoses, 11 upregulated in AMR and 1 downregulated (Figure 1). Hierarchical cluster analysis demonstrated 35/42 AMR+mixed rejection cases in the cluster with high expression of these genes. There was a significant difference in the sum of Z-scores of the 11 upregulated genes between the AMR+mixed rejection group and all other diagnoses (Figure 2, p< 0.0001). To demonstrate the diagnostic accuracy of this gene set for diagnosing AMR + mixed rejection, we generated a receiver operating characteristic curve; area under curve (AUC) was 0.875 (95% CI 0.8225-0.9281, p<0.0001)

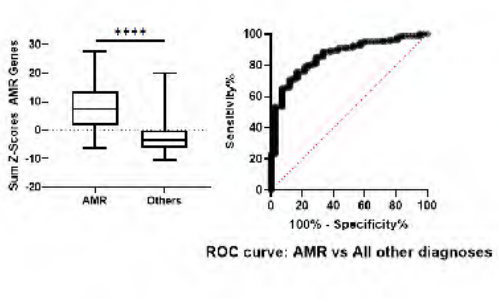
Discussion: Nanostring analysis of gene expression in FFPE biopsy samples can be used to identify an AMR-associated gene score with a high degree of diagnostic accuracy for AMR+mixed rejection, and may be a useful adjunct to histological diagnosis.

Figure 1.



Gene	Difference	Adjusted P Value
GNLY	1.293	<0.000001
PLA1A	1.182	<0.000001
DARC	1.067	<0.000001
SH2D1B	1.023	<0.000001
PIK3CG	0.9926	<0.000001
FGFBP2	0.9491	<0.000001
SELE	0.8058	0.000053
KLF4	0.7653	0.000156
ICAM2	0.6783	0.001738
CXSCR1	0.6551	0.002986
PECAM1	0.5401	0.036048
SOST	-0.5677	0.021317

Figure 2.



O17

Use of RT-qPCR for diagnosis of antibody-mediated rejection in renal transplant biopsies

Dr Frederic Toulza[1], Dr Kathy Dominy[2], Dr Michelle Willicombe[1], Dr Jack Beadle[1], Dr Jack Galliford[1], Prof Terry Cook[1], Dr Adam McLean[1], Dr Candice Roufosse[1]

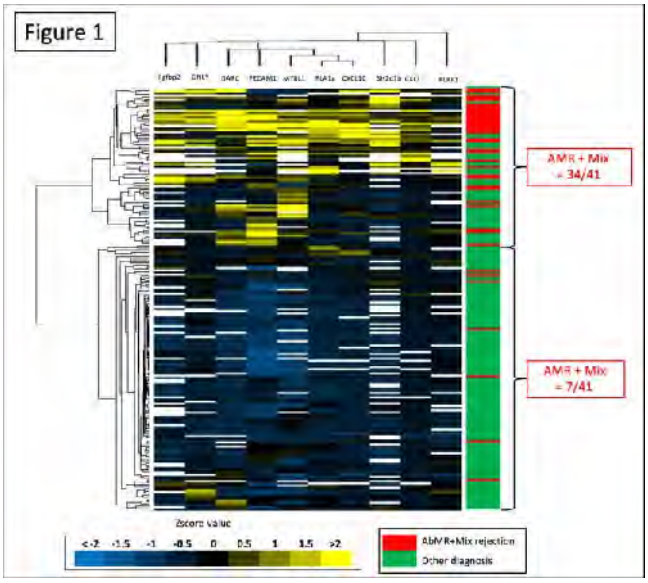
[1]Imperial College, London, United Kingdom. [2]Imperial College Healthcare NHS Trust, London, United Kingdom

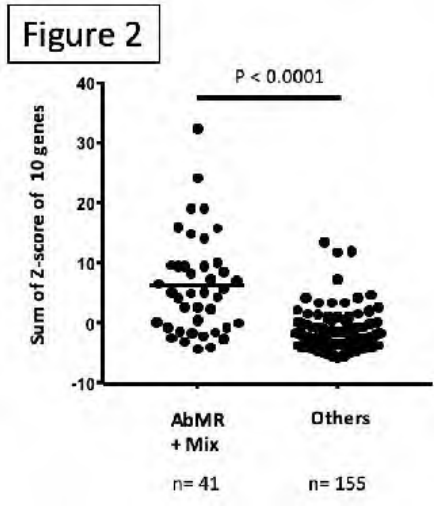
Introduction: Antibody-mediated rejection (AMR) is diagnosed by combining the serological finding of a donor-specific antibody with specific histological findings in a biopsy of the graft. The Banff Classification for Allograft Pathology also permits the use of increased expression of transcripts strongly associated with AMR as a diagnostic feature. We investigate the application of RT-PCR on renal transplant biopsy samples to diagnose AMR.

Methods: RNA was extracted from 196 biopsies preserved in RNAlater. Gene expression analysis of 20 transcripts described in the literature as strongly associated with AMR was carried out using RT-qPCR. Expression was normalised using HPRT as a housekeeping gene and a RNA reference standard (Agilent).

Results: Diagnoses in the 196 samples were as follows: AMR + mixed rejection, n=41; T-cell mediated rejection/borderline, n=27; NR, n = 128 (including cases with BK nephropathy and glomerulonephritis). Of the initial panel of 20 genes, 10 were retained on the basis of 1) a significant difference of expression between AMR and all others diagnoses; 2) good quality RT-PCR data on at least 70% of samples An AMR gene score was calculated from the sum of z-scores of these 10 genes. Using hierarchical clustering we observed 2 main clusters; the cluster with a high AMR gene score contained 34/41 AMR+mixed rejection cases (Figure 1). We also found a significantly different level of expression of the AMR gene score between AMR+mixed rejection and all other diagnoses (Figure 2, p<0.0001). To estimate the diagnostic accuracy of the gene set for a diagnosis of AMR+mixed rejection, we generated a receiver operating characteristic curve; area under curve (AUC) was 0.858 (95% CI 0.79-0.82, p<00001)

Discussion: Theses observations demonstrate that RT-PCR on a sample in RNAlater can generate a diagnostic tool with high accuracy for a diagnosis of AMR. Future work will focus on clinico-histopathological associations and outcome analysis.





O18
The fibrinolytic cascade is activated by renal ischaemia reperfusion injury in human kidneys

Dr Nina Jordan, Dr Sarah Hosgood, Professor Michael Nicholson

University of Cambridge, Department of Surgery, Cambridge, United Kingdom

Introduction: Renal Ischaemia reperfusion (IRI) injury can lead to acute kidney injury and delayed graft function. Experimental studies suggest a role for the fibrinolytic system in the pathogenesis of IRI but there is a paucity of human data. Fibrinolysis involves the conversion of plasminogen into plasmin by plasminogen activators and the cleavage of fibrinogen or fibrin by the plasmin protease (Figure 1). The aim of this study was to investigate the fibrinolytic system in human kidneys during isolated organ perfusion.

Methods: Ethical approval was granted to study a series of human kidneys declined for transplantation. The kidneys were from DCD (n=4) and DBD (n=1) donors with a mean age of 55±7yr and cold ischaemic time of 21.5±4.3hr. To simulate allograft reperfusion, kidneys were transferred to a cardiopulmonary bypass-based isolated organ perfusion system and perfused with oxygenated whole blood at 36-37°C for 4hr. Plasma, urine and tissue samples were collected to assess renal function and biological effects.

Results: All kidneys demonstrated renal dysfunction with low levels of creatinine clearance (1.4 ± 2.4ml/min) and a high degree of tubular injury (mean fractional excretion of sodium 93 ± 54%). Circulating IL-6 levels increased during the 4 hr reperfusion period (P= 0.012). Levels of tissue plasminogen activator (tPA) and tPA- plasminogen activator inhibitor -1 complex (PAI-1) were significantly up-regulated (P=0.035 and P=0.0004, respectively) during the course of reperfusion. Histology revealed a high level of fibrin deposits in the tubular cells and microvasculature in all kidneys. The degradation product D-dimer, which is associated with plasmin cleavage was also highly expressed. Serpine1, the gene coding for PAI-1, was significantly up-regulated.

Discussion: The fibrinolytic cascade is activated during the early reperfusion phase in human kidneys and this may be an important factor in the pathogenesis of allograft injury. Inhibition of fibrinolysis is a potential therapeutic target for future studies.

O19

Inhibition of NLRP3 inflammasome derived interleukin 1β during normothermic machine perfusion of human kidneys

Jenna DiRito[1], Dr. Sarah Hosgood[1], Dr. Rafia Al-Lamki[1], Professor John Bradley[1], Professor Mark Saltzman[2], Professor Jordan Pober[2], Professor Gregory Tietjen[2], Professor Michael Nicholson[1]

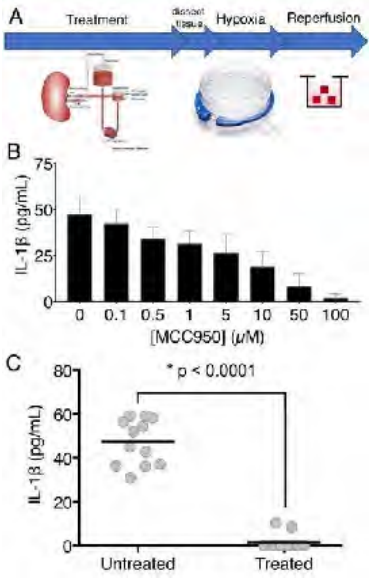
[1]University of Cambridge, Cambridge, United Kingdom. [2]Yale University, New Haven, USA

Introduction: Post-transplant renal ischemia reperfusion injury (IRI) can result in acute kidney injury manifested as delayed graft function. A critical mechanism in IRI is the intracellular assembly and activation of the NLRP3 inflammasome, which triggers production of inflammatory caspases and the maturation of the prototypic inflammatory cytokine IL-1β. MCC950 has been shown to be a potent NLRP3 inhibitor in experimental autoimmune conditions. In this study, we delivered MCC950 to human kidneys during normothermic machine perfusion (NMP) and assessed the response using an organ culture model.

Methods: Human kidneys declined for transplantation were studied. An MCC950 dose-response study was performed using cold stored kidneys (n=4). Subsequently, kidneys were randomly allocated to NMP alone (n=4) or NMP plus MCC950 (n=4). NMP was performed using a red cell-based perfusate at 36-37°C. After 4 hours of NMP sections of renal cortex were divided into 1 mm^3 samples and placed in M199 media for 4h at 37°C. Triplicate samples were then transferred to a hypoxic chamber for 2h at 37°C and finally transferred back into normal media and incubated at 37°C for 2h to simulate reperfusion. Following the reperfusion period, tissue and media were collected and analyzed for IL-1β levels via ELISA (Figure 1A).

Results: Exposure of human renal cortex to MCC950 in concentrations ranging from 0-100 µM demonstrated a clear dose-response relationship between NLRP3 inhibitor concentration and IL-1β levels (Figure 1B). NMP administration of MCC950 at 100 µM (the most inhibitory concentration) led to a highly significant reduction, and in some cases complete inhibition, of IL-1β secretion after subsequent organ culture (Figure 1C; $p < 0.0001$).

Discussion: NMP provides a highly effective platform for the targeted delivery of pre-transplant therapies. Blockade of the NLRP3 inflammasome and downstream IL-1β production is suggested as a therapeutic opportunity in the search for interventions that may improve early allograft function.



O20

Kidneys from AKI donors with poor long-term outcomes present an impaired protein expression for cellular stress and repair

Dr Flavia Neri[1], Ms Maria Letizia Lo Faro[1], Ms Catherine Boffa[1], Tomas Surik[1], Ms Maria Kaisar[1], Dr Edward Sharples[2], Mr James Hunter[1], Dr Jan Lindeman[3], Prof Rutger Ploeg[1]

[1]Nuffield Department of Surgical Sciences, Oxford, United Kingdom. [2]Oxford Transplant Centre, Oxford, United Kingdom. [3]Department of Vascular Surgery, Leiden University Medical Center, Leiden, Netherlands

Introduction: The utilization of kidneys from donors with acute kidney injury (AKI) is often limited by unpredictable post-transplantation outcomes. The aim of our study was to identify protein mediators implicated in either recovery or failure of these donor organs, subject to pre-donation acute ischemic stress.

Methods: Forty kidney biopsies from donors with (20) and without (20) the incidence of AKI (KDIGO criteria) were selected from the QUOD biobank. Each group was then subdivided into further two groups; those that yielded poor outcomes after transplantation (1yr eGFR <45ml/min) and those that yielded good outcomes after transplantation (1yr eGRF≥45 ml/min). Tissue homogenates were analysed by western blot to assess how the levels of 17 pre-selected proteins varied across the groups; G1: AKI poor outcome (n=10), G2: AKI good outcome (n=10), G3: non-AKI poor outcome (n=9), G4: non-AKI good outcome (n=10).

Results: Comparison of AKI versus non-AKI samples showed significantly reduced STAT1 (p=0.035) in comparison to higher TRX1 (p=0.001) and PRX3 (p=0.0005) in the AKI group. Samples from AKI kidneys with a poor outcome showed a four-fold increase in the levels of PPARg and two-fold reduction of STAT1 compared to the other groups (p<0.05). On the contrary, antioxidant enzymes including TRX1 and PRX3 were increased in the AKI kidneys with a good outcome (p<0.05). An opposite trend was observed for the detoxifying enzyme GSTp which was significanlty increased in the AKI group with poor versus good outcome (p<0.05).

Conclusions: The analysis of protein expression indicated a role for pathways of mitochondrial and cellular metabolism, pro-inflammatory, and cellular stress response in donor kidneys with AKI associated with poor allograft outcomes. The differences observed underline the importance of lipid metabolism (PPARg), antioxidant and detoxifying enzymes (TRX1, PRX3 and GSTp) and inflammatory signals (STAT1) in the balance between recovery and failure on acutely injured kidneys accepted for transplantation.

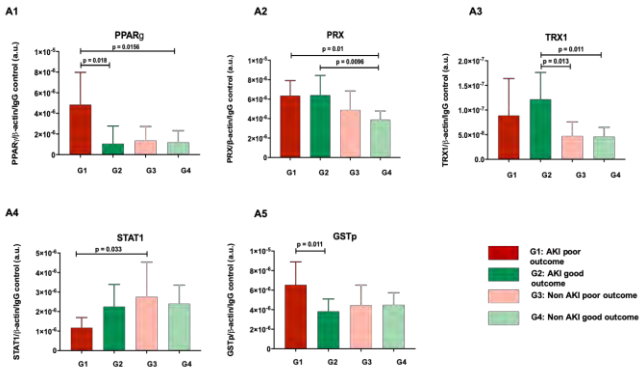


Figure 1: Proteins differently expressed in the four groups (G1-G4); histograms of expression of PPARg (A1), PRX (A2), TRX (A3), STAT1 (A4) and GSTp (A5) with the legend of the groups

O21

Defining cell-enriched microRNAs to support rational biomarker selection in human renal transplantation

Miss Katie Connor[1,2], Mr Oliver Teenan[3], Ms Victoria Banwell[1], Ms Rachel Thomas[2], Miss Sarah Finnie[3], Dr Marie-Louise Monaghan[3], Ms Carolynn Cairns[3], Ms Gillian Tannahil[4], Professor Ewen Harrison[5,2], Dr Bryan Conway[3], Professor Lorna Marson[1,2], Dr Laura Denby[3], Professor Stephen Wigmore[1,2]

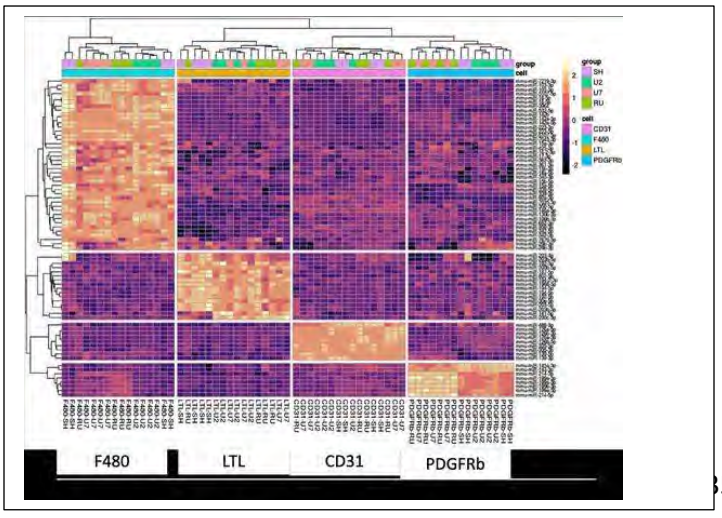
[1]Centre for Inflammation Research, Edinburgh, United Kingdom. [2]Edinburgh Transplant Unit, Edinburgh, United Kingdom. [3]Centre for Cardiovascular Science, Edinburgh, United Kingdom. [4]GlaxoSmithKline. [5]Centre for Medical Informatics, Edinburgh, United Kingdom

Introduction: MicroRNAs are promising biomarkers of renal disease, however the cellular origin of their expression is often unclear limiting their interpretation when measured in renal biopsies and urine. We hypothesised that by defining cell-enriched microRNAs in the kidney, we could select biomarkers based on the expected cellular histological profile with injury.

Methods: Small RNA-sequencing was performed on renal cortex, proximal tubular (LTL), macrophage (F480), endothelial (CD31) and fibroblast (PDGFRb) populations from the reversible unilateral ureteric obstruction (rUUO) murine model. Hierarchical clustering was used to identify cell-enriched clusters. Findings were further validated in a ischaemia reperfusion injury (IRI) model and then translated into urine samples from renal transplant recipients with delayed graft function (DGF (n=10) vs. those with primary function (PF: n=6).

Results: Kidney injury resulted in significant macrophage infiltration and tubular injury which improved upon reversal (rUUO). We identified several microRNAs enriched for each cell type (Figure 1). With injury there was a significant increase across all macrophage ($p<0.0001$), fibroblast ($p<0.01$) and decrease in proximal tubule ($p<0.0001$) enriched microRNAs vs. non-enriched microRNAs. We validated macrophage enriched miR-18a, miR-16 and tubular enriched miR-194 in the IRI model, finding that microRNA expression reflected the renal histological profile. In humans, miR-16 (FC 16.9; $p<0.05$) and miR-18a (FC 10: $p=0.06$) were upregulated at day 2 in urine of patients with DGF; outperforming urinary KIM1 and NGAL expression (Figure 2).

Discussion: To our knowledge this is the first study to profile enriched microRNAs in discrete renal populations during injury and repair. By defining the cellular source of microRNA expression we were able to rationally select miR-16 and miR-18a as promising urinary biomarkers of DGF. Finally to enhance collaboration, we have developed an online platform allowing users to explore this sequencing dataset.



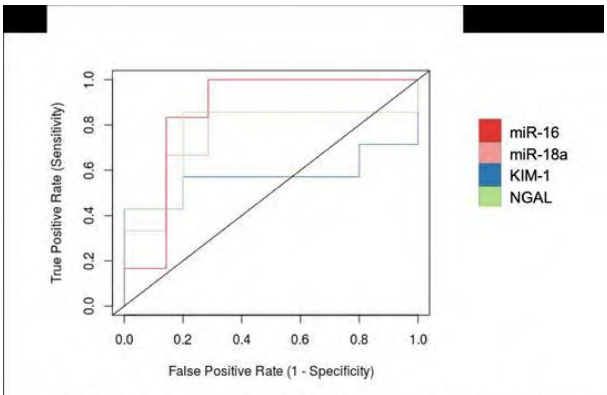


Figure 2: Receiver operating characteristics of urinary biomarkers for the detection of DGF at day 2.

O22

Transmission of Infection of Donor Origin in Deceased Organ Donation – The evolving UK practice

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Introduction: Post-transplant events that may have an impact on allograft recipients must be centrally reported for appropriate investigation and management. In the UK, these events must be reported to the NHSBT Organ Donation and Transplantation directorate (ODT); this should be done as soon as disease transmission becomes a possibility**.** ODT co-ordinates prompt dissemination of information and initiates a systematic investigation. A summary of the outcome of investigations into potential donor-derived transmission of infection during the period 2012-2019 is presented.

Methods: ODT adopted the use of a Quality Management software (Q Pulse®) in 2012. Since then 291 infection-related Incidents have been recorded and investigated. The data was reviewed and a report was prepared for dissemination.

Results: The vast majority of incidents were related to near misses and process errors, with no patient harm (n=247). Forty-four events were investigated as Serious Adverse Reactions (SAR), with donor-derived transmission assigned as proven in 27%, probable in 16% and excluded in 37% of cases. Where donor-derived infection was proven or probable, the agents most commonly implicated were Human Herpes Virus 8>Hepatitis E Virus>Hepatitis C Virus and Herpes Simplex Virus.

Discussion: Transmission of donor infection to recipients of solid organs is likely to occur in <1% of cases. However, unexpected transmission of infection is associated with significant recipient morbidity and mortality. Systems are in place to facilitate co-ordinated real-time acquisition of information and subsequent dissemination of findings. This process is an essential component of best practice in transplantation, whereby a co-ordinated, timely investigation offers the possibility of harm mitigation to recipients, analysis of events, learning and implementation of corrective measures.

O23

The effect of a second period of cold ischaemia after normothermic machine perfusion (NMP) in donation after circulatory death (DCD) kidney transplantation

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Introduction: Kidney transplant NMP was designed to be an intervention performed at the end of the cold storage (CS) period and immediately prior to allograft implantation. Nonetheless, the logistics of kidney transplantation are inherently unpredictable and this leads to a second CS period in some cases. This study examined the impact of the duration of the second cold time after NMP on early allograft function in DCD kidney transplantation.

Methods: Forty-seven DCD kidneys underwent NMP using red cell-based plasma-free perfusate for a period of 1 hour. First warm ischaemic time (from cardiac arrest to *in situ* cold perfusion), first cold ischaemic time (1st CIT; from cold perfusion in the donor to the start of NMP) and second cold ischaemic time (2nd CIT; from end of NMP to removal from CS for implantation) were recorded. The 2nd CIT was categorised as: Group 1 (≤60 minutes; n = 19), Group 2 (61 – 120 minutes; n = 12), Group 3 (≥121+ minutes; n = 16). The main outcome measures were delayed graft function (DGF), defined as the requirement for dialysis in the first 7-days post-transplant, and duration of DGF.

Results: There were no inter-group significant differences in donor or recipient demographics. There were no significant differences in 1st CIT (p = 0.921). The 2nd CITs were: group 1: 36±13, group 2: 94±12, group 3: 276±189min; p <0.001. There were no significant differences in DGF rates (Group 1: 47%, group 2: 50% group 3: 44%; p=0.484). However, duration of DGF was significantly longer in group 3 compared to groups 1 and 2 (6.6±6.1, 1.6±1.1 and 3.3±3 days respectively; p =0.039).

Discussion: Any beneficial effect of NMP may be lost if there is a prolonged 2nd CIT. Every effort should be made to transplant DCD kidneys <120 minutes after completion of NMP.

O24
Saving the planet: reorganising renal transplant follow-up

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Introduction: Renal transplantation is increasing in the UK, and thus follow-up will expand. We analysed the environmental impact of our services' follow-up (12 clinics in first month, 36 in year one), the changes implemented and the possibilities for the future to reduce the carbon footprint of renal transplant follow-up.

Methods: 123 patients from Bristol, Dorset or Gloucester regions over 18 months from January 2018 who received renal transplants in Southmead Hospital were analysed. Carbon footprint was calculated using National Energy Federation's carbon representing an average UK car for each patient travelling to clinic visits, giving kilograms of carbon dioxide emissions (kgCO2e). We assess the KgCO2e of all the clinic visits, the improvement made be repatriation to local follow-up services and the possible reductions for the future.

Results: For the first month, our 35 Dorset patients averaged 176 miles per clinic, 52 kgCO2e per patient, per clinic visit (pp/pc). Since the protocol changed a 75% reduction (6402 KgCO2e) in emissions from 10 patients follow-up locally in the first month; annual reduction of 14,040 KgCO2e. If our 16 Gloucester patients received local follow-up it would be a 74% reduction (6521 kgCO2e). Our 72 patients 'local' to our Bristol unit travelled on average 28 miles pp/pc, 8 kgCO2e pp/pc, a total of 22,657 kgCO2e.

Discussion: The Dorset change has reduced environmental impact and hidden costs such as fuel or time off work for the patient and relatives.Our follow-up protocol is in-line with the UK Renal Association, but NHS England advises tranplant units to "consider local blood tests and telephone follow-up in addition to clinic visits". We have seen GP compliance blood tests for transplant patients in Bristol was 90.9%. Thus modifications could be made to produce a hybrid of telephone and clinic follow-up reducing the burden on clinic, patients and the planet.

O25
Transplant recipient coordinators: burnout vs job satisfaction

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Introduction: Over the past 10 years the UK has seen a 67% increase in deceased organ donors with a subsequent 49% increase in deceased donor transplants. This has resulted in a significant increase in recipient coordinators workload with a dynamic shift in the complexity of work undertaken when on-call. Anecdotal evidence is that workloads are becoming unmanageable with recipient coordinator teams facing burnout.

Methods: The recipient coordinator workforce (n = 15) at a large abdominal transplant centre individually completed both a Modified Maslach Burnout Inventory (MMBI) and a short Minnesota [job] Satisfaction Questionnaire (MSQ). To ensure confidentiality and minimise participant bias, responses were anonymised by a third party before being submitted for analysis.

Results: Responses to the MMBI showed that although they exhibited a modestly high level of emotional exhaustion (43%), most respondents still experienced both a high level of personal accomplishment (82%) and satisfaction with nursing (67%). Areas of concern identified from the MSQ included poor working conditions (67%) and a perceived lack of role/career progression (73%), as well as dissatisfaction with pay (40%), the amount of work they had to do (40%) and the way company policies were put into place (40%). Significant positives identified in the MSQ included satisfaction with the chance to do things for others (93%), the freedom to use their own judgment (73%), the chance to do different things (87%), a sense of accomplishment (80%) and the opportunity to make the most of their abilities (80%).

Discussion: Although the recipient coordinator team exhibited signs of emotional exhaustion and dissatisfaction with certain aspects of their role; in general, it was evident that the role of the recipient coordinator still retains a high level of job satisfaction through autonomy, interest, patient interaction and personal accomplishment.

O26

Understanding patients and family views, preferences and expectations when being asked to consider accepting a Hepatitis C infected kidney for organ donation.

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Introduction: NHS Wales recently approved universal funding for the treatment of hepatitis C (HepC), enabling transplantation from infected donors. We recognised that the attitude of potential recipients was key to considering these transplants.

Methods: All patients on the deceased donor waiting list received written information and face to face discussions took place at the time of clinic appointments. A detailed patient and public (PPI) feedback session was conducted with patients (n=9), family members (n=3), a transplant coordinator, a consultant nephrologist and facilitated by an independent health and social care researcher. Additional context was provided from PPI information open evenings held at the transplant centre and referral unit (50 participants) and verbal feedback from other professionals (n=5).

Results

Participants were concerned about the:

- Potential donor lifestyle – 'what else might they have had if they had HepC'.
- Social contexts of living with a HepC kidney, e.g. insurance (health and travel), welfare, and would 'HepC infected kidney' remain on medical records for life.
- Potential of infecting family members especially grandchildren.
- Potential for treatment failure.

Concerns were alleviated by:

- Potential benefits of improving quality of life and getting off dialysis.
- Attendance at information evenings with peers and professionals.
- Feeling part of something new, that Wales were 'leading the way', there might be more organs available and reduce overall waiting times for Welsh people.
- The high cure rate.

Participants recommended:

- Additional communication with dialysis units to mitigate against mis/inaccurate information from staff or other patients.
- Sharing stories from the first patients transplanted.

Feedback from professionals suggested that potential recipients in the referral unit were much more apprehensive about the initiative than those in the transplant unit.

Discussion: Multiple information strategies have proved crucial in ensuring dissemination of accurate information and increasing enthusiasm of recipients to accept a transplant from a HepC positive donor.

O27
Bridging the gap between donor families and recipients in the letter writing process

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Introduction: In 2018 90% of donor families expressed a wish to receive correspondence from recipients of organs transplanted following their decision to authorise organ donation. The same year 11% of recipients sent a letter to their donor family. This work aims to understand the barriers to letter writing and to attempt to bridge this gap.

Methods: Site visits made to transplant centres exchanging high and low volumes of letters. An understanding of why this discrepancy arises was gained. Bereavement workshops held in which the hurdles experienced by recipient coordinators in relation to letter writing were discussed. Gold standards for practice have been recognised to try and establish a robust system in which information is provided to patients and have been shared.

Results: Site visits highlighted paternalistic nursing staff behaviours, the approach taken to inform patients, the provision of supportive material to aide letter writing and the overall understanding of the nurse as to the positive impact that receiving a letter may have for a donor family were highlighted.

Between 2018 – 2019:
* 2,537 pieces of correspondence that passed through the Donor Record Department (DRD).
* 453 letters from donor families
* 1597 letters from recipients to donor families.
* 487 pieces of correspondence were either kept on file for a multitude of reasons.

Discussion: To bridge the gap between donor family requests and the number of the recipients who write is influenced by the sharing of information. It is important that all recipients are aware that they can write, at any point post-transplant, this should be supported at a time which suits them. There are distinct variations between transplant centres across the UK making standardising practice difficult. haring examples of excellent practice, showing statistics for each transplant centre and challenging paternalistic attitudes has helped health care professionals rethink their current approach to letter writing.

O28
Deconstructing fear-backstage theatre tours for children and families waiting for transplant

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Over 18,500 children and young people come to our Trust for surgery each year, 50% of these will develop procedural anxiety prior to surgery, this may be fleeting and transient or long lasting. This project began two years ago when a young patient declined to come to hospital for their transplant, the impact was enormous. 'Deconstructing Fear' is intended to minimize or mitigate children's fears and anxieties. With the intention of improving therapeutic outcome and enhance their experience of healthcare.

Procedural anxiety has been shown to significantly increase: the need for analgesic drugs, recovery time, nausea and vomiting making patient experience less than optimal. The operating room is prepared to be inviting, promote curiosity and be non-threatening and authentic. Equipment is used as part of play, allowing children to understand why it is used and how it works. The children we support represent the full spectrum of children and young people in the healthcare system along with their complex needs. We permit full and unrestricted access to the theatre environment, theatre and anesthetic room. This requires a dedicated, knowledgeable, sensitive and committed team of multidisciplinary colleagues ranging from Surgeons and Anesthetist's to health care assistant.

To date we have had many satisfying and rewarding successes. Positive feedback from parents and patients indicates they felt better equipped to proceed with surgery and transplant and we are now making "Deconstructing Fear" available to all patients that wish to attend. Over 120 cardiothoracic and renal transplant participants have now attended the backstage theatre tours. The cost of preparing an operating theatre for surgery is not insignificant, delays and cancellations are costly. "Deconstructing Fear" reduces cost, optimizes patient experience and provides a rich and satisfying experience for staff.

O29

Organ donation education in schools significantly increases organ donor registration, knowledge, and family discussion

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Introduction: Over Six-thousand patients are on the transplant waiting list in the UK and two die each day due to a lack of donors. We aimed to assess the effectiveness of a national organ donation educational intervention in schools at increasing organ donor register (ODR) sign-up, knowledge, and family discussion.

Methods: A fifteen-minute non-biased presentation about organ donation was delivered at secondary schools across the UK by individuals from four centres (Bristol, Cambridge, Newcastle, Norwich) from July 2018 to July 2019. An optional questionnaire was then distributed to students.

Results: 1616 students from 25 schools completed the questionnaire. The mean age of students was 14 (SD=2) years. Following the educational intervention, the number of students who were on or intended to join the ODR significantly increased from 8% to 44% ($p<0.0001$), knowledge of organ donation significantly increased from 43% to 79% ($p<0.0002$), and planned family discussion significantly increased from 19% to 42% ($p<0.0001$). These findings were not influenced by location.

Discussion: Organ donation educational interventions delivered to school students significantly increases planned ODR sign-up, knowledge, and family discussion.

O30

Identification of novel drugs that mimic ischaemic preconditioning in the treatment of kidney ischaemia reperfusion injury

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Introduction: Ischaemic Preconditioning (IPC) confers protection from subsequent Ischaemia reperfusion injury (IRI), however, it has not proven effective in clinical trials enrolling individuals at high acute kidney injury (AKI) risk. The purpose of this study was to employ a drug repurposing approach, in an attempt to translate the experimental benefit of IPC into candidate agents for clinical testing.

Methods: IPC regimes were tested iteratively in a rat model of bilateral IRI. Optimised IPC approaches were transcriptomically profiled by RNA sequencing, and a shared protective signature identified. Computational prediction of drug repurposing candidates was performed by Ingenuity Pathway Analysis (IPA). Effects of predicted candidates were evaluated *in vivo*, by renal histology, serum creatinine, and injury markers (NGAL and KIM-1).

Results: Optimum benefit was observed with localised and remote pulsatile IPC employing 3 cycles of 2min ischaemia and 5min reperfusion. Whole kidney transcriptomic profiling was performed across sham, IRI, and IPC/IRI groups (n=6 per group) mapped to 16,780 unique genes, of which 2,193 genes were differentially expressed between IRI and sham, which IPA attributed to a phenotype of AKI and Renal Proximal Tubular Toxicity ($p<0.0001$). A core set of regulators and pathways (related to inflammation, oxidative stress and cell cycle) were identified in IRI and diminished by IPC. Comparison with transcriptomic information available for **2000** compounds contained within the IPA knowledge base was employed and identified 6 compounds exhibiting favourable characteristics for progression to clinical testing. These were further evaluated *in vivo*, and all exhibited histological and functional benefits when administered as a single dose pre-IRI.

Discussion: Our data identify a common protective gene expression signature between localised and remote IPC. These findings provide novel insights into the pathology of IRI injury and protection afforded by IPC. Computational transcriptional analysis using this dataset has identified candidate drugs, which, when tested proved effective in reducing injury.

O31
The role of microRNA-214 in renal ischaemia reperfusion injury and fibrosis

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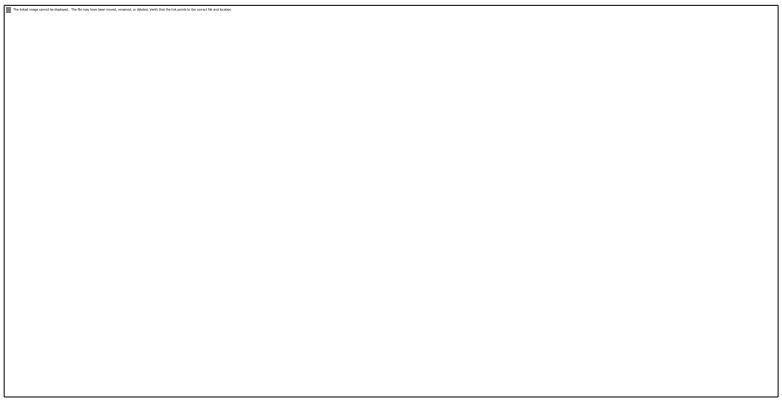
Introduction: Ischaemia reperfusion injury (IRI) is an inevitable consequence of transplantation contributing to chronic allograft damage. MicroRNAs are short non-coding strands of RNA that inhibit gene expression by post-transcriptional repression of target mRNAs. MiR-214 has been shown to be pro-fibrotic in multiple pre-clinical models of renal injury but its role in early IRI injury is not well understood.

Methods: Male C57bl/6 mice were subjected to 18 minutes unilateral IRI and culled at 2, 7, 14, 21, and 28 days. Whole kidney tissue was examined for miR-214 expression, qRT-PCR for pro-inflammatory and pro-fibrotic markers and histology to assess structural injury. Further IRI was performed in miR-214 $^{-/-}$ vs miR-214 $^{+/+}$ male mice and outcomes compared at 2 and 21 days (n=5-7 IRI, n=3 control).

Results: There was significant acute tubular necrosis (ATN) on histology at 2 days, accompanied by elevation in miR-214 during the early phase of injury which remained upregulated at all timepoints as kidneys demonstrated rapid progression towards fibrosis (figure 1). Furthermore, miR-214 was significantly up-regulated in $CD3^+$ T cell populations at 7 days. Absence of miR-214 did not result in significant improvement in ATN at two days. There was however a significant reduction in pro-inflammatory markers and evidence of a reduction in CD4+ populations in miR-$214^{-/-}$ mice compared to miR-$214^{+/+}$ mice. Importantly, there was a 79% reduction in fibrosis on histology (1.9% vs 9.1% 214 $^{-/-}$ vs miR-214 $^{+/+}$ respectively) along with significant reduction of pro-fibrotic gene expression at 21 days.

Discussion: MiR-214 was significantly upregulated at different time points following injury. Knockout studies demonstrated significant reduction in pro-inflammatory markers and a reduction in CD4+ populations. There was also significant reduction in fibrosis at 21 days demonstrating a potential role as a novel therapeutic target in chronic allograft damage.

Figure 1: MiR-214 expression in male C57bl/6 mice following 18 minutes unilateral ischaemia reperfusion injury



O32

Identification and management of barriers to adherence in kidney transplant patients: the role of psychological assessment and personalised intervention

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Introduction: Treatment non-adherence is a critical issue in transplantation, resulting in shortened graft survival, sensitization and graft loss. Despite its seriousness attempts to address it have met with only limited success. This project aimed to better understand risk factors for non-adherence and thus implement an enhanced treatment protocol and tailor-made package of psychological, educational and behavioural interventions to address and improve treatment adherence.

Method: We conducted semi-structured psychological interviews and screening measures with poorly adherent transplant patients identified from a larger related study concerning adherence and electronic pill monitoring.

Results: Fifteen non-adherent patients whose grafts were still functioning were interviewed and who completed self-reported measures around health beliefs, medication taking and mood. A further nine patients were interviewed whose grafts had failed and who had returned to dialysis. Factors associated with poor adherence fell in two main categories. ***Intentional*** factors related to discordant health beliefs such as disagreement about the importance or value of consistent medication taking and their perceived harmful effect on broader wellbeing. For example, one patient believed they would contract another serious illness if they took their medication, another stopped them thinking they were preventing his body from fighting off an infection, another perceived them to be harmful due to preventing the absorption of nutrition. ***Non-intentional*** factors included forgetting, misremembering doses taken, running out of medication, and temporary alterations in routine such as travel involving time zone changes. Additionally, underlying psychological distress and substance misuse issues were found to be the primary contributing factor in some patients.

Discussion: Adherence barriers were variable and often included both intentional and non-intentional reasons. Patients found it helpful to have in-depth exploration of these difficulties and personalised interventions designed to address them. There is a continuing need to better identify non-adherence and to provide ongoing psychological support.

O33

What are the implications of patient's donor choice on the likelihood of receiving a combined kidney and pancreas (SPK) transplant?

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Introduction: After discussion of the risks, patients awaiting an SPK transplant in our centre are offered the option of opting out of certain donor types, namely: donation after circulatory death (DCD) donors, donors with brain cancer, past history of cancer, high risk behaviour. Does opting out of any particular choice impact on the recipient's chances of transplantation?

Methods: Retrospective study of 107 patients transplanted with SPK since January 2015.

Results: A total of 107 patients were transplanted between January 2015 and January 2019.

	DCD	Brain tumour	Past history of cancer	High risk behaviour
Numbers opting out	4	26	17	41
Percentage	3.7	24.2	15.8	38.3

More patients opted out of organs from donors with a history of high risk behaviour than any other criteria. 21 patients opted out of three or more criteria. For 3 patients, the preference for DBD donors was consultant-led (patients awaiting re-transplantation or perceived to be more surgically complex). 10 organs were declined on account of recipient preference from 1002 offers (1%) in the 32 month period, and all declines were for organs from donors with high risk behaviour. All patients who missed out on an offer due to their donor preference were ultimately transplanted. The effect on recipient waiting time will be presented.

Discussion: Patients given the opportunity to opt out of donor groups during the consent process do not jeopardise their chances of transplantation, largely because of the infrequent nature of three of the higher risk donor categories. Recording a recipient preference in advance allows organs to be declined at the point of offering, with minimal impact on cold ischaemia time.

O34

Prophylaxis of wound infections - antibiotics in renal donation (POWAR): a multicentre UK double blinded placebo controlled randomised controlled trial

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Introduction: Postoperative infection following hand assisted laparoscopic donor nephrectomy (HALDN) confers significant morbidity. No modifiable risk factors are known and previous UK guidelines on living kidney donation state the role of antibiotic prophylaxis is unproven. A UK wide NIHR funded multicentre placebo controlled double-blind randomised controlled trial of antibiotic prophylaxis in living kidney donation was therefore conducted.

Methods: The study was powered (90%, α 0.05) to detect a 5% or greater reduction in the 30 day infection rate with a sample size of 142 patients per arm. Eligible donors were randomly allocated to preoperative single-dose intravenous co-amoxiclav or saline. The primary composite endpoint was clinical evidence of any postoperative infection at 30 days, including surgical site infection (SSI), urinary tract infection (UTI), and lower respiratory tract infection (LRTI). The main analyses were by intention to treat. Statistical analyses were by Fisher's exact test and binary logistic regression.

Results: In all, 293 participants underwent HALDN (148 antibiotic arm and 145 placebo arm). Among them, 99% (291/293) completed follow-up. The total infection rate was 40.7% (59/145) in the placebo group and 23% (34 of 148) in the antibiotic group (p=0.001). Superficial SSIs were 20.7% (30/145 patients) in the placebo group versus 10.1% (15/148 patients) in the antibiotic group (p= 0.012). LRTIs were 9% (13/145) in the placebo group and 3.4% (5/148) in the antibiotic group (p=0.046). UTIs were 4.1% (6/145) in the placebo group and 3.4% (5/148) in the antibiotic group (p=0.72). Antibiotic prophylaxis conferred a 17.7% (95% confidence interval 7.2% – 28.1%), absolute risk reduction (ARR) in developing postoperative infection, with 6 donors requiring treatment (NNT) to prevent 1 infection.

Conclusions: Single-dose preoperative antibiotic prophylaxis dramatically reduces post-HALDN infection rates, mainly impacting SSIs and LRTIs. The POWAR study therefore provides good evidence that antibiotic prophylaxis should be a standard of care in donor nephrectomy.

O35
A validated simulation training model for robotic-assisted kidney transplantation

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Introduction: Robotic-assisted kidney transplantation is a promising new technique for implantation of kidney allografts. Safe and effective implementation of this operation requires a method of disseminating robotic surgical skills to transplant surgeons. We have demonstrated a novel hybrid 3-D printed simulation model for the vascular anastomoses of kidney transplantation. We aim to validate this model for training surgeons in this technique.

Methods: A validation process to demonstrate construct validity was developed. Surgeons with varying robotic skill levels from expert to novice were invited to use the simulation model to perform a standardized task. Expertise was defined as experience performing 50 or more robotic surgery cases in any specialty. The task was the performance of a venous and an arterial anastomosis using the Da Vinci operating robot. Participants were allowed one attempt per anastomosis and a time limit was set. Each attempt was filmed and the videos were anonymously analysed to assess time to complete each anastomosis and the error rate per attempt. Errors were defined as excessive force causing needle damage, suture damage and tissue damage. The expert group performance was compared with the novice group to demonstrate content validity.

Results: A total of 50 participants took part in the validation process, 11 experts and 39 novices. Experts were significantly quicker at performing both anastomoses and had significantly fewer errors compared to the novices.

	Novice	Expert	p value
Artery	28.2 mins	11.7 mins	0.0001
Vein	30.6 mins	18.6 mins	0.0148
Error rate	4.59	1.18	0.02

Discussion: This study shows the construct validity of this simulation training model. It can be used to disseminate key surgical skills for the critical stage of robotic-assisted kidney transplantation surgery. This is a seminal study for the development of a training curriculum for this new technique which could potentially benefit many renal patients in the future.

O36

Is seeing believing? Automated, AI-driven image analysis to assess donor pancreata organ quality at the point of retrieval

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Introduction: Pancreas transplantation is the only consistently curative treatment for selected patients with type 1 diabetes. Current donor pancreas quality assessment is a visual, subjective and qualitative process, with multifactorial influences. Effective use of 'marginal' donors with suboptimal characteristics such as a fatty pancreas, or pancreatic steatosis (PS), is key to improve organ utilisation and outcomes. This study aims to harness machine-learning (ML) to develop an automated, quantitative image analysis tool to assess organ quality and additionally evaluate organ quality score consensus between surgeons.

Methods: 6 pre-trained ML models were trained and tested on their ability to assess the organ quality from images of 214 donor pancreata. Each pancreas was labelled with a transplant suitability and PS (binary and multiple classification respectively) consensus score from three surgeons. Inter-observer agreement was calculated with Fleiss' kappa (Fk) and intra-class correlation coefficient (ICC). ML model performance was measured with accuracy.

Results: The highest performing models achieved 55-75% and 78.6% binary classification accuracy in training and testing respectively. Similarly, 48.7-53.8% and 71.4% accuracy for multiple classification in training and testing respectively was achieved. Inter-observer agreement between surgeons was 'fair' for transplant suitability (Fk=0.310, $p<0.0001$) and 'moderate' for PS (ICC=0.716, $p<0.0001$).

Discussion: The increase in accuracy between training and test performance demonstrates a desired generalisability to new pancreas images, which is an important aspect when applying ML models in the real world. Surgeon consensus scores illustrate suboptimal visual assessment agreement, potentially due to differing surgical expertise, training or other human factors. The inherent lack of agreement may impact the robustness of the ML model performance. A ML image analysis method for donor pancreas organ quality assessment is feasible but further augmentation is needed to improve performance.

P1
Arterial conduits retrieved for pancreas transplantation – the achilles heel?

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Introduction: Pancreas grafts for solid organ transplantation require back table reconstruction with vascular conduits (VCs), prior to implantation. There are no established standards or guidelines to inform organ retrieval surgeons on the requirements. We aimed to establish standards for arterial and venous conduits in pancreas transplantation.

Methods: This was a prospective audit of conduits sent to our centre for the purposes of revascularising pancreatic grafts, prior to transplantation. VCs (iliac arteries and veins) were examined, photographed and measured, focusing on length of vessels retrieved, damage and donor disease. In a separate work package, UK pancreas transplant surgeons were questioned via an online data survey regarding their ideas, concerns and expectations around VCs.

Results: 30 UK surgeons responded to the online questionnaire. Most surgeons felt the length of iliac vessels retrieved was adequate (90%), but 53% had been unable to proceed with a transplant due to a damaged or diseased iliac conduit. Other VCs considered suitable included carotid (76%), femoral (60%) or other (30%). In our "snapshot" audit, 5 out of 20 (25%) arteries had severe disease that would have compromised transplantation. The total usable length of the arterial conduits ranged from 3.5 to 16 cm (mean: 10.8 cm ± 3.2) and the venous conduits ranged from 2 to 16 cm (mean: 7.7 cm ± 3.6).

Conclusions: A significant number of surgeons have discarded a pancreas due to damage or disease in the VCs that have been provided. Although most surgeons feel as though VCs are of an adequate length, we found significant variations in the usable lengths of the VCs sent to our centre. Organ retrieval surgeons should critically assess the VCs and if inadequate, retrieve the carotid arteries. Education and training on VC suitability should be a mandatory part of training for organ retrieval.

P2
The effect of cold ischaemia time on normothermic machine perfusion of porcine kidneys

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Introduction: Cold storage preservation is associated with an increased risk of ischaemia-reperfusion injury in marginal kidneys. Normothermic machine perfusion (NMP) is an alternative preservation method that uses warmed, oxygenated blood and could be a potential tool for assessing organ viability. We studied the effect prolonged cold ischaemia time (CIT) had on porcine kidneys during NMP.

Methods: Pig kidneys and autologous blood were retrieved from an abattoir and underwent either 4hrs of CIT (n=5) or 24 hrs of CIT (n=5) followed by continuous NMP. Renal blood flow, intra-renal resistance (IRR) and urine output were recorded hourly. Arterial blood gas samples were taken to measure tissue injury markers such as lactate, aspartate aminotransferase (AST) and lactate dehydrogenase (LDH). All 10 kidney grafts were graded for transplant viability using macroscopic appearance (1-3 points), mean renal blood flow (0-1 point) and total urine output (0-1 points) after the perfusion, with 1 being most viable for transplant and 5 being the least.

Results: Short CIT kidneys had higher renal blood flow (107.0 vs 82.10 ml/min/100g, p=0.0013) (**figure 1**) and lower intra-renal resistance (0.29 vs 0.44 ru, p=0.0043) compared with long CIT kidneys throughout perfusion. Total urine output was higher in long CIT kidneys (41.69 vs 14.81 mL, p < 0.0001) but urine production of kidneys varied greatly in both groups. There was no significant difference in lactate although mean AST was higher in long CIT kidneys (363.3 vs 155.0 U/L, p=0.003) (**figure 2**) while venous HCO3- levels were higher in short CIT kidneys (43.95 vs 32.45 mmol/L, P = <0.0001). All kidneys scored between 1-3 for viability.

Discussion: Despite lower renal blood flow and increased levels of AST prolonged CIT did not have a consistent effect on perfusion parameters or viability assessment compared to short CIT in a slaughterhouse pig model of NMP.

Figure 1:

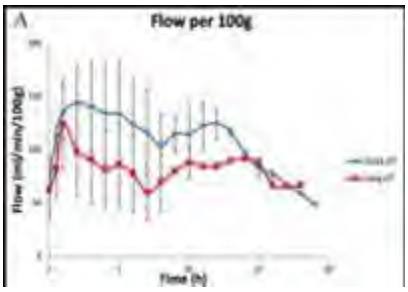
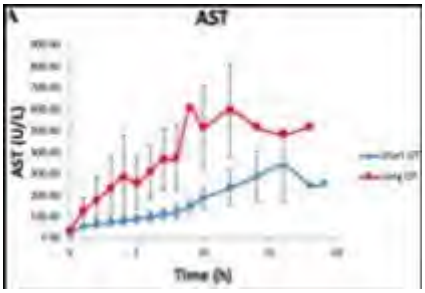


Figure 2:



P3

Resource use impact of regional and machine perfusion technologies in liver transplantation: a 2-year analysis

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Introduction: The increased resource burden associated with Donation after Circulatory Death (DCD) liver allografts in comparison to Donation after Brain stem Death liver allografts has been well documented. We evaluated the impact of Normothermic Regional Perfusion (NRP) and Normothermic Machine Perfusion (NMP) technologies on resource use post DCD liver transplantation (LT) in our centre.

Methods: We performed a retrospective analysis of prospectively collected data from all adult livers transplanted in our hospital over a 2-year period between 1st February 2016 and 1st January 2018. Resource use in our centre was analysed over a 12-month period post LT for all standard DCD (sDCD), DCD-NRP and DCD-NMP transplants.

Results: 68 liver transplants [sDCD (55.9%), DCD-NRP (23.5%), DCD-NMP (20.6%)] were performed during the study. Normothermic Regional Perfusion of DCD livers was associated with a median reduction of 9 days total hospital stay over the 1st year in comparison to sDCD LT alone (DCD-NRP: 14 days vs sDCD: 23 days, p=0.03), however *ex situ* NMP did not significantly reduce total hospital stay over the 1st year (DCD-NMP: 24.5 days vs sDCD: 23 days, p=0.56). *Ex situ* NMP did not significantly reduce any intervention over 12 months post LT [Re-admission rate; Re-laparotomy rate; Magnetic Resonance Cholangio-Pancreatography; Endoscopic Retrograde Cholangio-Pancreatography (ERCP); Liver biopsy; Gastroscopy/colonoscopy and angiography rate] when compared to sDCD transplantation alone. NRP reduced the mean number of abdominal CT (Computerised Tomography) scans performed over 12 months by 48.1% (DCD NRP: 1.056 vs sDCD: 2.067, p=0.02). Following NRP none of the patients required ERCP +/- stent vs 8.6% in the sDCD group (p=0.23); re-laparotomy rates to investigate biliary anastomosis complications were 0% in DCD-NRP group vs 13.5% in sDCD group (p=0.13).

Discussion: This paper provides evidence that *in situ* normothermic regional perfusion may decrease resource use after liver transplantation when compared to standard DCD transplantation.

P4
Urinary C-peptide creatinine ratio as a marker of graft function in pancreas transplantation

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Introduction: Five-year graft survival after pancreas transplantation remains low and is limited by the lack of validated biomarkers for identification of graft dysfunction. Glucose tolerance testing is an effective test; however, it is invasive, inconvenient for patients and expensive at the point of contact. Urinary C-peptide creatine ratio (UCPCR) has been used for the assessment of beta cell function and may offer an alternative whilst also enabling remote assessment.

Methods: 30 pancreas transplant recipients underwent 3 separate 180 minute frequently sampled oral glucose tolerance tests (OGTT) at 3 month intervals. UCPCR samples were collected at 0 and 120 minutes during each OGTT, and after breakfast on 3 consecutive days per month for 7 months. Samples collected at home were sent directly to the laboratory. Results were correlated against OGTT data.

Results: 88 OGTTs were performed in 30 patients, of which 62 were normal and 26 were either impaired or diabetic according to WHO criteria. 554 home UCPCR samples were received. The mean eGFR was 64.3ml/min/1.73m^2 (SD 15.29); 17 patients had mild chronic kidney disease (CKD 1/2) and 13 had moderate/severe CKD (CKD 3/4). Pearson correlation was confirmed between 120 minute UCPCR and both 120 minute serum C-peptide and insulin ($r=0.62$, $p<0.001$; $r=0.57$, $p<0.001$). Regression analysis confirmed no difference between those with CKD 1/2 and those with CKD 3/4 ($p=0.43$). UCPCR was significantly lower in those with diabetic glucose tolerance ($p=0.009$) and ROC analysis confirmed that a UCPCR of 1.165nmol/mmol had a 100% sensitivity and 64.1% specificity for having diabetic glucose tolerance (AUC=0.86, $p=0.002$).

Discussion: UCPCR provides a validated measure of pancreas allograft function. It is simple to perform and can be sent directly from the community to the laboratory to provide a 'real-world' remote assessment of graft function. Further work is required to evaluate its utility in identifying and monitoring graft dysfunction.

P5

Introduction of universal Hepatitis E Virus screening of deceased organ donors – the UK experience so far

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Introduction: The UK Advisory Committee on the Safety of Blood, Tissues and Organs (SaBTO) recommended universal HEV RNA screening of donors of blood, tissues, haematopoietic cells and solid organs; this was implemented by NHS Blood and Transplant in 2017. HEV status is not used to inform donor suitability and centralised testing is done post-transplantation. A positive result informs recipient management.

Method: The Procleix® HEV assay is used to detect the virus in plasma and the AmpliCube®HEV assay is used for RNA quantification. The Wantai® HEV IgG and IgM assays are used for serology. The HEV-ORF2 gene is the target for genotyping and phylogenetic sequence analysis.

Results: Circa 3700 deceased organ donors have been screened to date. Three donors had low level viraemia and negative antibodies, denoting early infection. All 6 recipients of organs from the first two donors became infected with HEV genotype 3C virus. Phylogenetic analysis of viral strains demonstrated common source of infection within each cluster. All cases became persistently infected and required treatment beyond 3 months. Two out of 3 recipients linked to the third infected donor developed HEV infection and are currently being investigated.

Discussion: The observed incidence of HEV viraemia in deceased organ donors is around 1:1200 donors, a frequency that is higher than that found in English blood donors. Detection of donor viraemia triggers notification of transplant centres and prompt testing and monitoring of recipients. Our initial experience demonstrates that despite low level of plasma viraemia in the donor, transmission through solid organs in the early phases of infection is very efficient. An 83% transmission rate with 80% persistency has been observed so far, with prolonged treatment required to achieve viral clearance and sustained virological response. This is a unique opportunity to understand the impact of donor-derived HEV on SOT recipients and optimise patient management accordingly.

P6

Risk factors for retrieved but not transplanted deceased donor livers in the UK: a national registry analysis

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Introduction: On occasion, organs are retrieved but not transplanted (RNT) due to adverse features found at organ retrieval, or logistical or recipient-related issues. This study examines the donor and organ risk factors associated with RNT livers and explores variation in RNT rates between transplant centres.

Methods: UK Transplant Registry data were collected on donor and organ characteristics for all livers retrieved from adult deceased donors for the purposes of transplantation from 2006 to 2017. Logistic regression models were built to determine the factors associated with RNT. Organ risk was quantified using the UK Donor Liver Index (UKDLI – Collett et al, *Transplantation* 2017).

Results: Of the 9203 livers retrieved, 1009 (11%) livers were not transplanted (51% DBD donors, 49% DCD donors). Over time there was an increasing trend in RNT rates and in median UKDLIs for both transplanted and RNT livers. For DBD and DCD donors the following were statistically significant in influencing whether a liver was RNT: steatosis, age, BMI, organ appearance, bilirubin, and accepting transplant centre. Of these, donor type and organ appearance were most important. Livers from DCD donors were far more likely to be RNT compared to those from DBD donors, (OR 4.35; 95% CI 3.80-4.99). Livers from DBD donors with suboptimal appearance compared to healthy livers had an OR 3.91 (95% CI 3.04 - 5.05) for RNT, and for DCD donors OR 5.14 (95% CI 3.63 - 7.26). Among UK transplant centres there were statistically significant difference in UKDLIs for transplanted livers ($p<0.001$) and RNT livers ($p=0.024$).

Conclusions: UK liver transplant centres are increasingly willing to implant higher risk organs, though there is apparent variation in risk appetite. Risk factors associated with liver RNT events have been identified. This study can be used to develop strategies to improve liver utilisation in the UK.

P7

Outcomes of hepatitis C virus (HCV) positive kidneys transplanted into hepatitis C negative recipients without use of direct acting antiviral agents

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Introduction: Kidneys from HCV positive donors are 3.7 times more likely to be discarded than those from HCV negative donors[1]. Historically, HCV positive kidneys have only been transplanted into HCV RNA positive recipients. The availability of nucleic acid testing for HCV RNA (NAT) has allowed transplantation of kidneys from HCV antibody (Ab) positive donors with negative NAT into HCV negative recipients, without documented HCV transmission [2].

Methods: Kidneys transplanted from HCV positive donors were identified from databases at NHSBT and the Royal Free. Donor and recipient demographics were collected using EOS and local records.

Results: Between January 2010 and December 2018, 10 HCV positive donors donated 16 kidneys in the UK. Five were transplanted into HCV positive and 11 into HCV negative recipients. Of these 10 donors, 5 donated kidneys to 7 recipients in our unit. Two donors donated kidneys to four HCV Ab negative recipients in our unit (Table 1). Both donors were DBD and were HCV Ab positive, NAT negative at time of donation. Donor 1 (D1) was 56 and known to have treated HCV genotype 1 infection. Donor 2 (D2) was 52 and known to have treated HCV genotype 3. Donor creatinine was 56 and 60umol/l, respectively, at time of offer. R1 and R2 had delayed graft function. There were no episodes of rejection and all achieved a good function. No recipient showed evidence of viraemia or seroconversion on serial blood tests.

Table 1: Donor and recipient demographics of HCV positive donors and HCV –ve recipients.

Donor	Recipient	HLA mismatch	CIT (hrs)	Cause of ESRF	Age at transplant	RRT modality	Duration of RRT pre transplant (yrs)	6 month eGFR (ml/min)
D1	R1	2-1-1	14	HIV GN	57	HD	3.75	58
D1	R2	2-1-1	19	Diabetes	53	PD	3.1	51
D2	R3	0-0-0	16.5	ADPKD	57	LCC	N/A	55
D2	R4	0-0-0	23	IgA	51	HD	4.4	61

Discussion: Our limited experience shows that transplanting kidneys from HCV Ab positive, NAT negative donors to HCV Ab negative recipients provides good outcomes with no evidence of HCV transmission. HCV Ab positive donors provide an important source of transplantable kidneys. In the era of direct acting anti-virals for HCV, the availability of pre donation NAT testing allows for wider utilisation and risk stratification of this important source of donors.

P8

Recipient memory responses to passenger CMV in the renal allograft could contribute to delayed graft function: a registry case-control analysis

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Introduction: CMV infection is associated with poorer clinical outcome after transplant. Emerging pre-clinical data suggests that passenger CMV reactivation may contribute to ischaemia-reperfusion injury (IRI). No clinical studies have assessed donor CMV serostatus or pre-existing recipient immunity as factors in short-term outcome. We hypothesised that these may represent independent risk factors for delayed graft function (DGF) and acute rejection.

Methods: Primary functioning, non-pre-emptive renal transplants in adults 1/2015-12/2017 were analysed retrospectively using data from the UK Transplant Registry held by NHSBT. Risk factors for donor CMV seropositivity were assessed utilising univariate and multivariate logistic regression. Cases (donor seropositive) and controls (donor seronegative) were matched 1:1 using propensity scoring for DGF risk factors to assess short-term transplant outcome (delayed graft function [DGF] and three-month acute rejection, serum creatinine and graft survival). Mismatched seropositive/seronegative recipient pairs of donor seropositive kidneys were used to assess the impact of pre-existing immunity.

Results: 3991 transplants from 2821 donors were analysed. Seropositive donors had comparable pre-transplant renal function and cold ischaemic time versus seronegative donors. Multivariate analysis revealed donor hypertension, female gender, non-white ethnicity and increasing age were independently associated with donor CMV seropositivity. 1551 cases were matched to controls. Donor CMV seropositivity was not associated with increased incidence or duration of DGF nor poorer three-month outcomes. Paired recipient analysis (466 donors) revealed that pre-existing recipient CMV immunity was associated with increased incidence (25% vs 20%, $p<0.001$) but shorter mean duration of DGF (10 vs 13 days, $p=0.09$).

Discussion: CMV seropositivity is seen in a distinct cohort of kidney donors and is independently associated with donor hypertension and increasing age - both established risk factors for poorer graft outcomes. We conclude donor CMV carriage itself is not associated with an altered response to IRI but recipient CMV memory responses could have a clinically detectable impact on the risk and natural history of IRI.

P9

Variation in unacceptable HLA antigen mismatch listing for deceased donor kidney transplantation

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Introduction: Educational clinical scenarios are distributed annually to UK H&I laboratories as part of the national external quality assessment service. These patient scenarios provide relevant test results and require result interpretation and clinical decisions/advice reflective of agreed policies between laboratories and transplant centres. Scenario responses were used to investigate the consistency of unacceptable HLA antigen mismatch (UA) listing between laboratories.

Methods: Two clinical scenarios since 2013 have required labs to define UA for patients requiring kidney transplantation. Responses were analysed and the ODT cRF tool used to compare UA profiles between laboratories.

Results: Scenario 1: 19 responses (Table 1). Female, two pregnancies. Multiple Class I/II HLA antibodies by Luminex. The number of UA varied (5-10, median 8), giving cRF range 66-87%. There was good agreement on some UA: all laboratories listed HLA-A,B specificities of MFI>2500. Lower MFI and HLA-C antibodies were more varied. Listing was generally based on MFI values above a locally defined threshold.

Table 1: Scenario 1 specificities listed as unacceptable HLA antigen mismatches for kidney transplantation

Unacceptable Antigen	Luminex MFI Range	No. of Labs (n=19)	Unacceptable Antigen	Luminex MFI Range	No. of Labs (n=19)
A2	5497-7879	19	B18	1627-1859	13
B57	2595-6341	19	Cw2	1454-1643	12
B58	2987-4621	19	DQ2	423-1187	10
A69	2676-2710	19	DR9	342-1255	6
B35	2872-3006	19	DR7	881-921	1
Cw4	3489-3758	17	A68	0-475	1

MFI range is the lowest and highest MFI values over several samples

Table 2: Scenario 2 HLA specificities listed as unacceptable HLA antigen mismatches for kidney transplantation

Unacceptable Antigen	Luminex MFI Range	No. of Labs (n=22)	Unacceptable Antigen	Luminex MFI Range	No. of Labs (n=22)
None	-	3	B8 a,b	Negative	6
DR7	1238-3520	18	A80 b	Negative	5
DR9	1557-4242	17	DR52	517-2491	4
DR103	1125-3665	15	DR14	1001-2575	4
DR10	704-2229	12	DQ2 a	Negative	4
DR17 a	930-2527	12	Cw3 b	Negative	4
DR15 a	1102-4948	11	DQ9 b	Negative	3
DR8	1053-3234	8	A1 a	Negative	3
DR51	912-2591	8	DQ8 a	Negative	3
DR13	1069-2710	7	DR1	838-2597	2
DR12	601-2481	6			

a Functioning heart transplant mismatch, b Previous failed kidney transplant mismatch
MFI range is the lowest and highest MFI values over several samples

Scenario 2: 22 responses (Table 2). Transfused male, functioning heart transplant and failed live donor kidney graft. Complex Class II Luminex antibody profile with self-reacting beads. UA listing varied (0-21 antigens, median 5), giving cRF range 0-97%. Three laboratories listed no UA due to the self-reactivity. The remaining 19 laboratories had limited agreement on the UA profile for this challenging scenario. In addition to MFI value, reasons for UA listing included MFI consistency, historic/current detection and handling of self-reactivity. Differences in management of previous mismatches were apparent; some did not list any, others listed if antibody present, while others considered all mismatches as UA regardless of antibody detection.

Discussion: UA definition can be extremely complex. These educational scenarios highlight important differences in UA listing, especially for low MFI antibodies and previous graft mismatches. The differences could have equity of access implications for patients awaiting transplantation.

P10
Excess cold ischaemia time in kidney transplantation: what is the cost?

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Introduction: Delayed graft function (DGF) is a common complication of deceased-donor kidney transplantation affecting up to 40% of all recipients. Cold ischaemia time (CIT) is one of the key modifiable factors shown to be associated with DGF, as well as long term kidney transplant survival. This study aims to quantify the excess incidence of DGF associated with prolonged CIT and estimate the costs that may be saved by reducing CIT.

Methods: A multivariate logistic regression analysis of data from the UK Transplant Registry (2005-2018) for first-time adult kidney transplants was performed to evaluate factors associated with DGF. This was followed by a retrospective review of deceased-donor kidney transplants performed in Addenbrooke's Hospital (Nov 2015 – May 2019) to evaluate additional clinical care associated with a DGF episode. Finally, an excess cost attributable to prolonged CIT was estimated using NHS National Tariff data (2015-20).

Results: 15 361 kidney transplants were identified from the UK registry, with overall DGF incidence of 27.3%. DGF was associated with unmodifiable variables including donor age (> 60 years vs 18-30 years OR: 1.93, 95% CI: 1.62-2.29), and donor type (DCD vs DBD, OR: 2.86, 95% CI: 2.61-3.13). Potentially modifiable variables included CIT (>24 hours vs <12 hours OR: 1.50, CI: 1.26-1.79), recipient obesity (Obese vs Normal BMI OR: 1.58, CI: 1.39-1.79), and HLA match (Level 4 vs Level 1 OR: 1.30, CI: 1.07-1.59). Local data (n=506) associated DGF with median CIT of 15.3h, versus 12.7h without DGF ($p<0.0001$). DGF incidence was 56.2% among deceased-donor recipients, resulting in additional hospital costs of £4,363 per DGF case ($p<0.0001$). By reducing CIT from >18h to <12h, our centre could prevent 7 DGF cases per 100 patients, saving £28,830 per 100 patients.

Discussion: DGF is a common, costly complication of transplantation, and could be reduced by an increased effort to reduce cold ischaemia time.

P11
Outcomes in donor management research: a systematic review

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Introduction: The number of trials into brain dead donor management has increased over the years, however translation into clinical practice has been limited. Any systemic intervention in the deceased donor can affect cardiovascular stability and function of all procured organs. Effects on the donor and each transplanted organ ought to be considered for study results to be generalisable and recommendations to be considered by all intensivists, transplant physicians and surgeons. We set out to assess published outcome measures across RCTs of donor management interventions.

Methods: The systematic review was conducted in accordance with recommendations by the Cochrane Handbook and PRISMA statement. We searched MEDLINE, EMBASE, CENTRAL, Web of Science as well as trial databases from 1980 to July 2019 for RCTs of donor management interventions

Results: Thirty-two RCTs (n = 4723 donors) were included in our analysis. Twenty-four out of 32 (75%) of trials reported a primary outcome relating to a single organ only. Four trials primarily focused on aspects of donor optimisation in critical care. The studies used different systemic treatments, with methylprednisolone (seven studies) and thyroid hormones (six studies) as most common interventions. Only three studies, focusing on single organs evaluated outcomes regarding other organs. No study evaluated recipient health-related quality of life or sought consent from potential organ recipients.

Discussion: Donor management studies use a variety of systemic treatments, however the majority of studies only assessed either single organ outcomes or effects on donor stability in critical care. There was a lack of patient-centred recipient outcomes. Understanding whether treatments that improve donor stability translate into long-term graft outcome improvement might allow insight into how donor pathology contributes to organ function. There is a need for standardisation and reporting of outcome measures for future donor management trials; discussion and collaboration between all involved stakeholders should be at the heart of this process.

P12

Barriers and facilitators to organ donation in people from minority ethnic backgrounds: a logic model

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Introduction: A logic model aiming to visually communicate barriers and facilitators to organ donation in people from Black, Asian and minority ethnic (BAME) backgrounds has been developed.

Methods: Framed within the constructs of social ecological modelling (SEM), an initial logic model was developed. Barriers and facilitators identified and extracted from an updated UK evidence base were mapped to three core SEM levels: 'individual', 'interpersonal' and 'community'. Key determinants associated with each barrier and facilitator, as determined by the evidence, were included for added context. The initial model was presented to people from BAME backgrounds at two local patient and public involvement discussion groups (PPI). Participants were asked to consider the clarity of the model, as well as the importance and absence of any particular barriers and facilitators. The model was then updated based on their input.

Results: In the initial model (Figure 1), three barriers ('knowledge', 'bodily concerns' and 'family/friends') and one facilitator ('altruism') were mapped to the initial model at an individual level. One barrier ('talking with family') and one facilitator ('knowing and meeting others') was mapped at an interpersonal level. Two barriers ('trust' and 'faith/cultural beliefs') and two facilitators ('knowledge exchange' and 'faith and cultural beliefs'). Following input from BAME representatives, the model was updated to include new barriers and facilitators, and reorganised to capture the complexity of relationships and interactions between them (Figure 2).

Discussion: A logic model visualising the current state of evidence concerning barriers and facilitators to organ donation in people from BAME backgrounds has been developed. The model was presented to participants from BAME backgrounds at two PPI discussion groups, and refined based on their input. To our knowledge, it is the first visualisation of the current UK evidence base on barriers and facilitators to organ donation in people from BAME backgrounds.

Figure 1

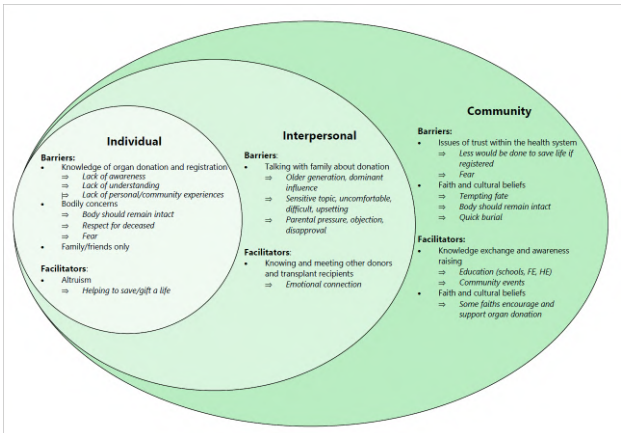
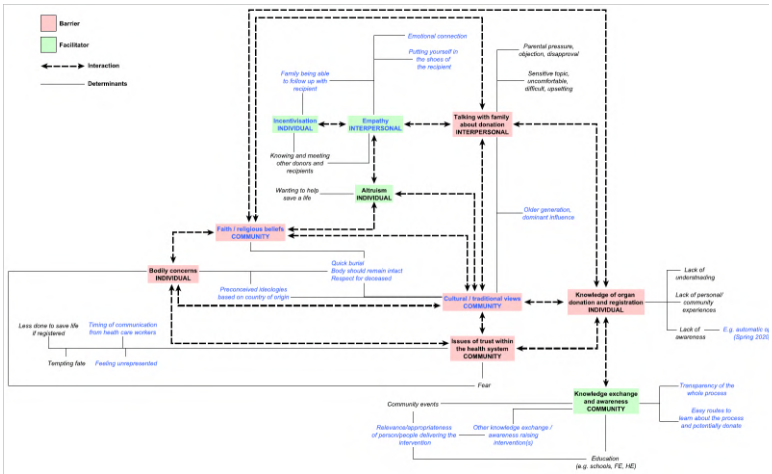


Figure 2



P13

Liver allocation for re-transplantation – impact of early versus late re-transplantation on outcome

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Introduction: Liver re-transplantation (LrTx) is necessary for 5-20% of recipients worldwide. Liver allocation schemes advantage recipients with very early graft failure but the opposite is true for patients needing late re-transplantation. This difference may not be justified. The aim of this study was to assess the effect of early (≤ 30 days) versus late (>30 days) LrTx on 90-day mortality and longer-term survival in our centre.

Methods: A retrospective, single institutional analysis was performed, assessing all consecutive patients ≥ 18 years undergoing LrTx between January 2009 and December 2018.

Results: 1237 adult liver transplants were performed; 112 (9%) of these cases were LrTx: 98 first LrTx, 13 second LrTx and in 1 third LrTx. The three main indications for re- transplantation were: ischaemic biliopathy (25%), hepatic artery thrombosis (HAT, 23.2 %) and primary non function (PNF, 23.2 %). Early LrTx accounted for 44,6 % of cases; median 4 days (range 1-29) after the initial transplant. The 90-day mortality rate was significantly higher in in the early LrTx group at 38% compared to 11.3% for the late LrTx group, $p<0.0008$ (Log-rank test). The main reason for the high 90-day mortality rate following early LrTx was sepsis: 53% of the cases. Analysis of 1 year overall survival demonstrated no additional mortality in the late LrTx group but there were 2 additional deaths in the early LrTx group.

Discussion: LrTx remains the only curative option for graft failure and allocation policies have usually favoured early LrTx for PNF and HAT, granting additional priority due to urgency. This analysis suggests that for early LrTx a cautious selection of recipients is mandatory to prevent futility associated with high 90-day mortality. To the contrary, late LrTx candidates should not be disadvantaged by liver allocation policies.

P14
Named kidney organ offer declines: a pan London collaborative audit

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Introduction: Kidney organ offer decline rates vary between centres in the UK. As part of the pan London collaborative, we undertook an analysis of named kidney offers across five adult and two paediatric transplant centres in London.

Methods: NHSBT provided data on named kidney organ offer declines between August 2018 and July 2019 where one London centre had declined a kidney offer but another London centre had transplanted a kidney from the same donor.

Results: A total of 286 declined kidney offers were made to 233 potential London recipients during the year. The median age (IQR) of the donors was 56 (47-53) years while the potential recipients were 51(42-59) years old. Two-hundred and six (72%) were DBD offers. The top 5 reasons for organ decline were: donor unsuitable – past medical history (21.7%), recipient unfit (14.3%), recipient did not need transplant (11.9%), donor unsuitable – age (11.9%) and recipient refused (10.1%). When considering all the kidneys from donors with a least one offer decline, 316 out of 324 (97.5%) were transplanted. One London centre transplanted 70 (21.6%) of the kidneys and 72 (22.2%) were transplanted outside of London. Ninety day outcome was available for 233 kidneys, where median eGFR was 45(32-59) ml/min and 5(2.1%) were not functioning. At 90 days after the declined offer, 164 (70.4%) patients were still waiting, 64 (27.5%) had been transplanted, 4 (1.7%) had been removed from the list and 1 (0.4%) had died.

Discussion: This analysis provides an insight into reasons for and outcomes of declined named kidney organ offers across a number of centres within a region of the UK. We aim to perform a collaborative meeting where declining centres hear the outcome of the declined kidney by the unit that eventually transplanted it, leading to shared learning and standardisation of organ acceptance.

P15

Transplantation of elderly patients is associated with inferior outcomes and further evidence of the benefit of transplantation in the very elderly is required

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Introduction: Transplantation of older patients is increasing as the number of elderly patients being offered renal replacement therapy (RRT) grows. Which older recipients benefit from transplantation (considering prognosis and quality of life) is not always clear. The aim of this study was to review patient outcomes by age, as a guide to help inform clinicians and patients.

Methods: 1738 patients all receiving Alemtuzumab induction and tacrolimus monotherapy were studied. Transplant outcomes were obtained from a prospectively maintained registry.

Results: 1232 <60, 415>60-70 and 91>70 year-olds were transplanted over a 15 year period. Older patients were more likely to receive a deceased donor transplant and have diabetes ($p<0.01$). Whilst the younger patients were more likely to receive a pre-emptive transplant and have an underlying diagnosis of glomerulonephritis ($p<0.01$). Older patients had a longer median length of stay post-transplant at 9(8-13), 11(8-17) and 12.5(10-20) days, in the <60, 60-70 and >70 groups ($p<0.01$).

Transplant outcomes are shown in the table (all numbers are expressed as a % of survival):

	<60 (n=1232)		60 - 70 (n=415)		>70 (n=91)		p value
	1 yr	5 yr	1 yr	5 yr	1 yr	5 yr	
DWFG	98.9	95.3	97.3	80.7	96.5	80.3	<0.01
Censored GL	96.2	89.5	94.9	86.2	92.1	84.5	<0.01
Patient survival	98.4	93.4	96.6	77.6	95.5	77.4	<0.01
Rejection free	82.9	71.4	84.2	78.3	90.2	79.5	0.03
DSA free*	83.1	77.5	83.4	77.4	86.5	81.0	0.62
Infection free	69.6	57.6	62.8	46.8	52.0	37.9	<0.01

*Younger patients received a significantly better HLA matched kidney.

Discussion: This study shows that transplantation does not offer the same prognosis for the elderly. Despite uniform immunotherapy, older patients were more likely to have an infection but had a lower risk of rejection. Further evidence is needed to determine the best management in terms of RRT modality and tailoring immunotherapy in the elderly.

P16

Five year outcomes for transplants from the Kidney Fast Track Scheme (KFTS) from a single centre

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Introduction: The Kidney Fast Track (KFTS) scheme was developed by NHSBT in 2012 to improve organ utilization and reduce the discard rate. Leeds is one of the eleven centres involved in the KFTS. We summarized our 5 year outcome data for these kidneys.

Methods: We collected data on all Fast track kidneys accepted and implanted between November 2012 and November 2014. We analysed one and 5 year survival for both DBD and DCD KFTS kidneys.

Results: During the study period we performed 114 transplants within the KFTS. There were 46 DBD, 68 DCD. We performed 15 DKT, 3 EKT, 97 SKT. Recipients had a median age 57 years (24-78). Thirty patients had DGF, 2 PNF. 1 year DCGS was 97% for the whole group, with 93% for DBD and 95% for DCD. 5 year DCGS was 95% for the whole group, with 97% for DBD and 93% for DCD. Overall median 5 year GFR was 46 mL/min per 1.73 m, split 46 mL/min per 1.73 m for DBD and 44 mL/min per 1.73 m for DCD.

Discussion: This is the first report of long term follow up for KFTS which shows excellent results. The results are comparable to those of both DBD and DCD kidney transplantation. The results demonstrate the effectiveness of the KFTS scheme, to increase organ utility, as many of these organs may have been discarded.

P17
Striving for quantity and quality of life: survival in older renal transplant recipients

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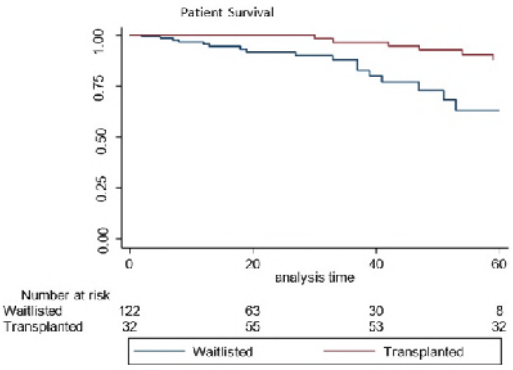
Introduction: The survival benefit of kidney transplantation in older patients with end stage renal disease (ESRD) remains uncertain in Europe, as survival on dialysis is better than in the USA. This study compared the survival of older waitlisted patients who received a kidney transplant with that of candidates who remained on the waiting list.

Methods: Overall, 154 patients aged ≥65 years were waitlisted for kidney transplantation in Northern Ireland between 2010 and 2018. Follow-up occurred until 31 October 2019. Survival was analysed as time from listing to death. Hazard ratios (HR) and confidence intervals (CI) were calculated using Cox regression models with transplant as a time-dependent covariate.

Results: The median age at listing was 69 years. In total, 99 (64%) patients received a transplant.



In the waitlisted group, there were 18 deaths in 273 person-years (6.6 per 100 person-years). In the transplanted group, there were 10 deaths in 305 person-years (3.3 per 100 person-years). This corresponded to a 69% lower risk of death in transplant recipients compared to waitlisted candidates (unadjusted HR 0.31; 95% CI 0.13, 0.72; P = 0.007). Results were similar in adjusted models.

Figure: Kaplan-Meier curve of survival according to transplanted versus waitlisted status.

Table: adjusted hazard ratios for transplant recipients versus waitlisted candidates.

	Covariates	Adjusted HR (95% CI)	P value
Model 1	Age + sex	0.28 (0.12, 0.68)	0.005
Model 2	Model 1 + diabetes	0.27 (0.11, 0.67)	0.004
Model 3	Model 1 + CVD	0.38 (0.15, 0.95)	0.040
Model 4	Model 1 + diabetes + CVD[a] + pre-listing dialysis time	0.31 (0.12, 0.84)	0.022

[a]CVD = cardiovascular disease

Discussion: Kidney Transplantation offers substantial survival advantage to older patients with ESRD in Northern Ireland. This remains significant in patients with diabetes and cardiovascular disease. Such striking survival benefit should be borne in mind when assessing older candidates' suitability for transplantation

P18
Outcomes of 50 years of kidney transplantation in Northern Ireland

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Introduction: The first kidney transplant in Northern Ireland took place in 1968. We report five decades of kidney transplant demographics and outcomes.

Methods: Clinical data has been prospectively collected on all kidney transplants performed since 1968. This includes recipient and donor demographics, cold ischaemic time, HLA match grade, post-transplant complications and graft and recipient outcomes.

Results: There were 2254 kidney transplants between 1968 and 2018. Significant changes have occurred in both donor and recipient populations. Transplant numbers have increased in each decade; twice the number of transplants were performed in 2008-2017 compared to 1998-2007. In the first 40 years, 8% of transplants were from living donors compared to 55% in 2008-2017. In the last decade, 25% of living donor transplants have been ABO incompatible, HLA incompatible or from either altruistic or kidney sharing scheme donors. Donor and recipient age has increased significantly ($p < 0.001$) and recipients have had longer periods of renal replacement therapy prior to transplantation ($p < 0.001$). Currently, >15% of recipients receive a repeat transplant. There has been a reduction in cold ischaemic time for deceased donor transplants in the past decade ($p < 0.001$). There was no significant difference in HLA match over the period. Death-censored graft survival (Figure 1) and recipient survival (figure 2) have improved. Ten year death censored graft survival is currently 89% for living donor transplants and 80% for deceased donor transplants; 10 year recipient survival is 93% for living donor transplants and 76% for deceased donor transplants.

Discussion: There have been significant changes in transplantation over the past 50 years; donors and recipients are older, recipients have spent longer on dialysis and many more are receiving a repeat transplant. Despite this, graft and recipient outcomes have continued to improve. The huge increase in living donor transplantation is the major reason for this.

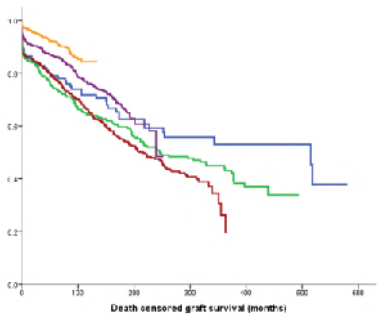

Figure 1

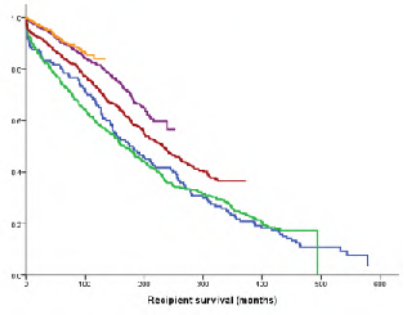

Figure 2

P19

Rabbit anti-thymocyte globulin versus IL-2 receptor antagonist induction therapies in 2DR mismatch renal transplant recipients under tacrolimus-mycophenolate mofetil immunosuppression era

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Introduction: 2DR HLA mismatch indicates high immunological risk renal transplant. Induction therapy with rabbit Anti-thymocyte Globulin (r-ATG) and IL-2 Receptor Antagonist (IL-2RA) resulted in marked reduction of acute allograft rejection rate and improved graft survival. Most studies that compared induction therapies in 2DR HLA mismatch patients were in cyclosporine era. However, the outcomes in 2DR (HLA-DR) mismatched renal transplant recipients (RTRs) in the era tacrolimus-mycophenolate mofetil maintenance immunosuppression remains understudied.

Methods: Using data from the United States organ procurement and transplantation network, all 2 DR mismatched RTRs with panel reactive antibodies <20% maintained on tacrolimus and mycophenolate mofetil immunotherapy between 2000 and 2017 were retrospectively reviewed. Data including age, sex, gender, ethnicity, functional status, diabetes, body mass index, cold ischemia time, number of previous transplants, panel reactive antibodies, donor type, donor age, HLA-mismatches, number of acute rejection episodes, induction therapies, maintenance immunotherapy, recipients and graft survival were collected. Based on induction therapies administered, RTRs were divided into 2 groups: (r-ATG) and IL-2RA groups. Poisson regression analysis was used to assess effect of induction therapies on acute rejection episodes. Cox hazard regression analysis was used to assess effect of different induction therapies on patient and graft survival

Results: 3379 patients received IL2-RA while 3677 patients received r-ATG for induction. There were no significant differences between both groups in terms of acute rejection episodes (95% CI ranges from 0.95 to 1.068, P=0.805) , graft survival (95% CI: 0.91 - 1.06, P=0.712) , or patient survival (95% CI: -0.949 - 1.12, P=0.43) .

Discussion: This study revealed no significant difference in acute rejection episodes, patient or graft survival when utilizing ATG vs IL-2RA in 2DR HLA mismatched renal transplant recipients with PRA<20%, in the tacrolimus-based maintenance immunosuppression era. Therefore, IL2-RA is a safe induction therapy in this group of patients and non-inferior to –ATG induction therapy.

P20

Outcome of high donor-recipient age gap in live-donor renal transplant in tacrolimus era: does it still matter?

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Introduction: High donor-recipient age gap among deceased-donor renal transplant patients leads to worse outcomes. However, the impact of this gap among live-donor renal transplants is unclear. The aim of this study is to assess the effect of this age gap on graft survival and acute rejection rates among renal transplants in tacrolimus-era.

Methods: 14390 live-donor renal transplant patients who received a single organ transplant, had no previous renal transplants, discharged on tacrolimus-based immunotherapy and were registered in the Organ Procurement Transplantation Network from January 2000 till June 2017 were included in the study. Donor–recipient age difference was divided into 5 groups; group A (difference <−10,n=4375), group B (difference from -10 to 10,n=7229), group C (difference between 10-20, n=861), group D (difference between 20–29, n=1406) and group E (difference ≥30 years, n=519). Poisson regression analysis was used to assess effect of age gap on acute rejection rates. Kaplan-Meier survival curves and Cox hazard regression analysis were used to assess this effect on graft survival.

Results: Groups with age difference ≥30 years and between 20-29 years showed a significantly higher risk of graft loss when compared to group with age difference <−10 (HR equals 4.6 and 3.8 respectively). Groups with age difference between 10 to 20 years and between -10 to 10 years showed no significant difference in graft survival when compared to same group (HR equals 1.03 and 0.95 respectively). Groups B,C,D,E were not associated with increased risk of acute rejection episodes when compared to group A (IRR=1.001, 1.001, 1.022, 1.027 respectively).

Discussion: Donor-recipient age difference up to 20 years has similar renal transplant outcomes to those receiving kidneys from younger donors and therefore, should not be precluded from paired kidney donation programs. The donor-recipient age difference above 20 years is associated with worse outcomes in terms of graft survival.

P21

HLA Cw12 in kidney transplant recipients is an independent risk factor for the development of post-transplantation diabetes: a single-centre retrospective study

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Introduction: There are well-defined risk factors for developing post-transplantation diabetes mellitus (PTDM), however, others like HLA typing are heterogeneously reported and lack consistency. The aim of this study was to investigate the association between HLA alleles and PTDM risk.

Methods: Data was retrospectively extracted from hospital informatics systems for all kidney transplant recipients at a single-centre between 2007 and 2018, with patients excluded if they had pre-existing diabetes. Electronic patient records were then manually searched and records linked to various sources (e.g. NHS Blood and Transplant tissue typing, Hospital Episode Statistics, national death registry) to create a well-phenotyped cohort. PTDM classification was aligned with International Consensus recommendations.

Results: Data was extracted for 1,560 kidney allograft recipients, with median follow up 5.4 years (IQR 2.7-8.7 years) up to October 2018. PTDM developed in 243 kidney transplant recipients (incidence 15.6%). Increased risk for PTDM was observed with age (52 versus 45 respectively, $p<0.001$), non-white ethnicity (21.4% versus 12.7% respectively, $p<0.001$) and recipient body mass index (28.6 versus 26.6 respectively, $p<0.001$). A range of HLA alleles were examined (e.g. HLA-A, HLA-B, HLA-Cw, HLA-Bw, HLA-DR and HLA-DQ) but only the presence of HLA-Cw12 allele was associated with risk for PTDM (27.4% versus 14.3%, $p<0.001$). In a logistic regression model, adjusted for baseline variables reported as PTDM risk factors (age, ethnicity, recipient body mass index, polycystic kidney disease as cause of end-stage kidney disease, hepatitis C, donor type), HLA-Cw12 was found to be an independent risk factor associated with development of PTDM (Odds Ratio 1.883 [95% confidence interval 1.194-2.969], $p=0.006$).

Discussion: HLA-Cw12 allele in the kidney transplant recipient is independently associated with development of PTDM. This had not been previously reported and requires validation and investigation to understand the underlying biological mechanism. This can be used to counsel kidney transplant candidates for PTDM risk and to encourage attenuation strategies.

P22

Excellent long-term outcomes in higher immunological risk kidney transplants: a positive crossmatch is not always negative

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Introduction: Highly sensitised patients wait significantly longer for kidney transplantation and risk becoming unfit and dying prior to transplantation. An alternative is a higher immunological risk transplant but concern persists in relation to the outcomes.

Methods: All recipients who received a kidney transplant in the presence of current and/or historic HLA-attributed crossmatch (XM) positivity between 01.01.2010 and 22.11.19 in a single UK region were reviewed.

Results: Fifty-six patients received a kidney transplant with a current or historic positive XM due to donor specific HLA antibodies. Eighteen recipients had a current positive flow XM (FCXM); nine had plasma exchange and alemtuzumab (7) or ATG (2), seven received rituximab and two basiliximab alone. Three were from deceased donors (DD), one never functioned due to donor pathology. Two were additionally ABOi. One third of patients had early AMR and one third had evidence of chronic immunological injury. Five transplants in four recipients had a historic positive CDC XM, one additionally was ABO incompatible (ABOi). Four were DD. Four received alemtuzumab and one rituximab induction. There was no early antibody mediated rejection (AMR), one failed <6 months from non-immunological causes. Fifteen patients had a historic positivity on FCXM alone; one received alemtuzumab, five rituximab, seven basilixumab induction. Seven were DD. No recipient had early AMR, one quarter had evidence of chronic immunological injury at 5 years. Graft outcomes are detailed in the Table.

Conclusions: Carefully selected higher immunological risk kidney transplantation can be an excellent option in highly sensitised patients.

	1-year		**3-year**			**5-year**			
Crossmatch	n	Graft survival	Serum creatinine	n	Graft survival	Serum creatinine	n	Graft survival	Serum creatinine	
Current +ve FCXM	18	94%	140	16	88%	126	8	86%	134	
Historic +ve CDC & FCXM	5	80%	162	5	80%	182	4	75%	161	
FCXM only	15	100%	117	12	100%	118	8	100%	133	

P23

Medium to long term impact of pre transplant DSA on allograft outcomes in deceased donors transplants

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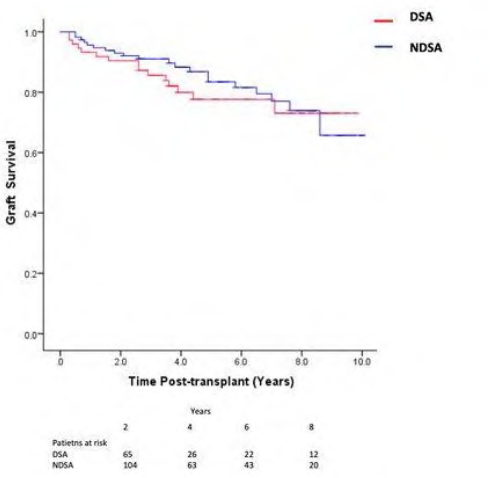
Introduction: 26% of the patients on the waiting list in the UK are highly sensitised, which translates into difficulty in matching of suitable donors and significantly long wait times. This is associated with the risks of developing complications from long term dialysis. To counter this, one approach is transplantation despite high levels of preformed donor specific antibodies (DSAs). We compared medium to long term outcomes of deceased donor transplants between patients with preformed DSAs and non DSAs.

Methods: This is a retrospective analysis of 191 patients from a single centre between March 2008 and March 2016. All patients with ABO compatible transplants during this period with DSA or Non DSA with mean florescence intensity (MFI) of >2000 at day 0 (day of transplantation) were included in the study.

Results: There were 191 patients divided into **DSA-** 76 (40%) and **N-DSA-** 115 (60%) groups. There were more retransplants (46% v 20%), ATG usage (53% v 33%) and cRF of >80% patients (30% v 12%) in DSA group with longer cold ischaemic times (16.6 hours v 15h). DSA group had significantly more acute (29%v10%) and chronic (13%v5%) antibody mediated rejection episodes (ABMR) compared to N-DSA. Overall, 1 year eGFR (46.7%v49.1%); 1,3 and 5 year graft survival (92%, 84%, 79% v 96%,91%, 87%) and 5 year patient survival (96%v93%) rates were not statistically different between DSA and N-DSA groups respectively (p 0.43).

In **DSA subgroup**, if the MFI was >8000, patients experienced more ABMR (p 0.01). 5 year graft survival was inferior with >8000MFI (48% v 99% p0.03) or positive flow crossmatch (80%v85% p0.01).



Conclusion: Overall, long term outcomes are comparable between the two groups. Careful consideration and selection must be made for patients with very high preformed DSAs.

P24

Transplant nephrectomy following allograft failure is a surrogate indicator for fitness for re-transplantation and may explain the improved patient survival in nephrectomised patients

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Introduction: Despite renal transplant failure being one of the leading causes of 'end stage renal disease' and need for dialysis, optimal management of patients is unknown. Evidence suggests that transplant nephrectomy provides a survival advantage, however data often lacks patient level information. This is important to consider as transplant nephrectomy correlates with a significant increase in HLA sensitisation, which may prolong wait time to re-transplantation.

Methods: We analysed all patients who experienced allograft failure from 2351 consecutively transplanted recipients between 2005-2019. Clinical outcomes and events were obtained from a prospectively maintained registry.

Results; 372 patients with failed transplants were studied. 108 of 372 (29.0%) patients died, with a 90-day, 1 year and 5-year survival of 91.0%, 86.6% and 69.5% respectively. Infection (32.4%) and cardiovascular events (24.1%) were the leading cause of death, with a further 24.1% of patients dying suddenly in the community. Patients who died were more likely to be older ($p<0.01$) and diabetic ($p<0.01$) at the time of transplant failure. No transplant related variables (DSA, rejection, mismatch or type of donor) significantly impacted on risk of death.

127 patients underwent nephrectomy at a median time of 1.2 months post-graft failure. Both nephrectomy ($p=0.001$) and being reactivated on the transplant wait list ($p<0.001$) were associated with improved patient survival. However, 86 (67.7%) patients who had a nephrectomy were reactivated compared with 79 (32.2%) patients without nephrectomy, $p<0.01$. On multivariable analysis, age at failure (HR: 1.03(1.01-1.05), $p=0.001$) and diabetes (HR: 1.81(1.23-2.68), $p=0.003$) were associated with patient death, whilst being reactivated was associated with patient survival (HR 0.17 (0.10-0.28), $p<0.001$), irrespective of re-transplantation or nephrectomy.

Discussion: This study highlights the divergent prognosis for patients following transplant failure depending on fitness for re-transplantation. High quality evidence is needed for all patients if outcomes are to improve.

P25

A randomised, double-blind, placebo-controlled trial of vitamin K supplementation to improve vascular health in kidney transplant recipients

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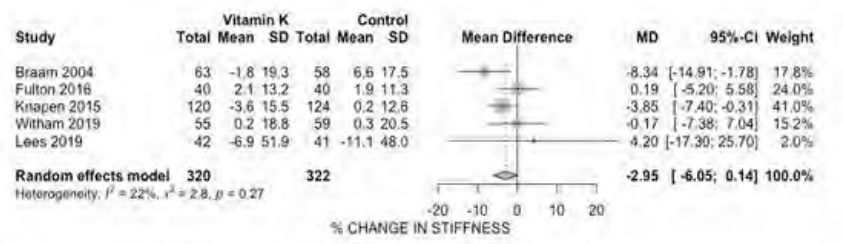
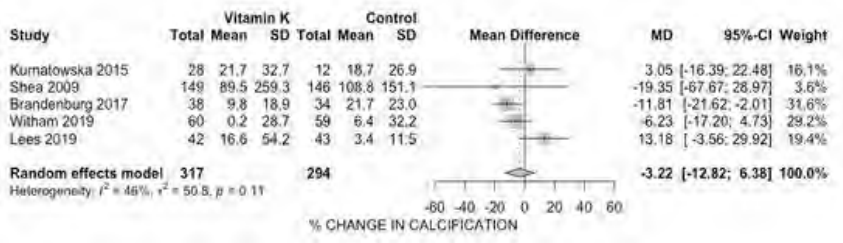
Introduction: Vascular stiffness (VS) and calcification (VC) are markers of cardiovascular disease, are prevalent in kidney transplant recipients (KTR) and associated with subclinical vitamin K deficiency. We tested the hypothesis that vitamin K supplementation would reduce VS and VC in prevalent KTR in the Vitamin K for kidney Transplant Organ Recipients: Investigating vEssel Stiffness (ViKTORIES) trial.

Methods: In a single-centre, phase II, parallel-group, randomised, double-blind, placebo-controlled trial (ISRCTN22012044), KTR were randomised 1:1 to vitamin K (menadiol diphosphate 5mg) or placebo thrice weekly for one year. The primary outcome was between-group difference in VS (ascending aortic distensibility) at 1 year adjusted for the baseline value, age and duration of end-stage kidney disease. Secondary outcomes included VC (coronary artery calcium score), cardiac structure and function, blood pressure, eGFR, proteinuria and quality of life. All outcomes were assessed by intention-to-treat. VS and VC outcomes were combined with other published data in meta-analyses.

Results: Ninety participants were randomised to vitamin K (n=45) or placebo (n=45) and included in the analysis. Baseline demographics, clinical history and immunosuppression regimens were similar between groups: mean age 57.6 ± 9.6 years, 70% male, with median time after transplantation 7.8 (IQR 3.5-13.9) years and eGFR 52.5 ± 21.0 ml/min/1.73m^2. There was no impact of vitamin K versus placebo on VS after 12 months (-0.2 (-0.5 - 0.2) vs -0.3 (-0.6 - 0.1) x10^{-3} mmHg^{-1}; p=0.597), nor on VC (184 (52 - 315) vs 44 (-89 - 177) units; p=0.105), or any other outcome measure. Achieved power was 85%. Combined in meta-analyses with published data, vitamin K supplementation has no observed effect on VS or VC, with relatively few studies available for analysis.

Discussion: In this heterogeneous cohort of prevalent KTR, vitamin K supplementation did not reduce VS or VC over 1 year. Improving vascular health in patients with established kidney disease is likely to require a multifaceted approach.





P26

Are personalised interventions effective to re-engage kidney transplant patients with poor clinic attendance?

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Introduction: Patient non-attendance at transplant clinic is associated with poor long term outcomes. We instigated a monthly multidisciplinary-team meeting (MDT) to review all patients who did not attend clinic for more than 6 months. Each meeting set interventions to re-engage patients and monitor their outcomes.

Method: A cumulative audit over a year assessed the implementation of the non-attendance MDT strategy, interventions and outcomes. Different types of interventions were individualised according to patients' needs, as well as the success rate of re-engaging patients. The interventions were classified as simple (e.g. monitoring of patients attendance, and contacting patients/ relatives or GPs up to two times) or complex (e.g. more than two phone calls, contacting patients by written communication, requiring shared care from the community services, flexible clinic appointments, involving hospital and community pharmacists to review medication and home delivery systems). Patients discharged to different centres were excluded.

Results: Out of a total of 1419 patients, 106 (7.5%) were identified as not having attended clinic for more than 6 months. Forty-eight, (45.3%) required multiple discussions. Simple interventions were implemented in 76 patients (71.7%) while 30 patients (28.3%) required complex interventions; outcomes are outlined in table1. An overall success rate of 74.5% (N=79) of re-engagement was achieved by targeted intervention. There was a 2.8% (N=3) failure rate to re-engage, resulting in transferring care to GP, while 2 patients (6.7%) required shared care with their GP to re-engage.

Table1: Types of interventions with differentiated outcomes.

		Total	Outcomes				
			Attended Clinic	Transfer to GP	Shared Care	RIP	On-going
Type of intervention	Simple	76	N=62 (81.6%)	N=0	N=0	N=11 (14.5%)	N=3 (3.9%)
	Complex	30	N=17 (56.7%)	N=3 (10%)	N=2 (6.7%)	N=0	N=8 (26.7%)

Discussion: An MDT approach and personalised interventions are an effective strategy to tackle poor clinic attendance. The majority of patients required simple interventions; however a quarter required complex interventions to be effective. Further analysis is required to analyse whether a significant number of these patients relapse after re-engagement.

P27

Outcomes of the collaborative Guy's and Leeds program for en-bloc renal transplants from donors less than 2 years of age

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Introduction: In November 2017, Guy's Hospital, London and Leeds Teaching Hospitals were designated by NHSBT as the two national centres for renal transplant from donors less than 2 years of age. A collaborative program was set up between the two centres with sharing of experience and protocols, and ongoing close communication. This study reports the results of this program 2 years after its inception.

Methods: Data on kidney offers from donors less than 2 years of age was obtained from NHSBT. Outcome data was collected prospectively by both centres. A review of previous UK results performed prior to start of the program resulted in an agreement by both centres that the lower donor age limit for the program would be 1 month. All transplants were carried out as en-bloc implants.

Results: Between November 2017 and November 2019 there were 16 offers of en-bloc kidneys from donors between 1 month and 2 years of age. 8 (50%) of these were accepted for transplant by either Guy's or Leeds. 2 of these did not proceed to transplant, one due to damage and one due to prolonged time to asystole.

Of the 6 en-bloc transplants that proceeded, the median donor age was 13.5 months (range 1-23) and median weight was 9.75kg (range 3.6-12). Three were from DCD and 3 from DBD donors. All 6 transplants had immediate function and graft and patient survival is 100% with a median follow-up of 419 days. Median creatinine showed an improvement over time: 129.5 umol/L at 1 month, 102.5 at 3 months and 86 umol/L at 6 months.

Conclusion: Graft outcomes of the collaborative program are excellent, justifying the use of this source of kidneys to expand the donor pool. Further work is required to promote organ donation from this group of patients and refine donor selection.

P28

Sustaining the implementation of a novel algorithm to optimise haemodynamic therapy in renal transplantation

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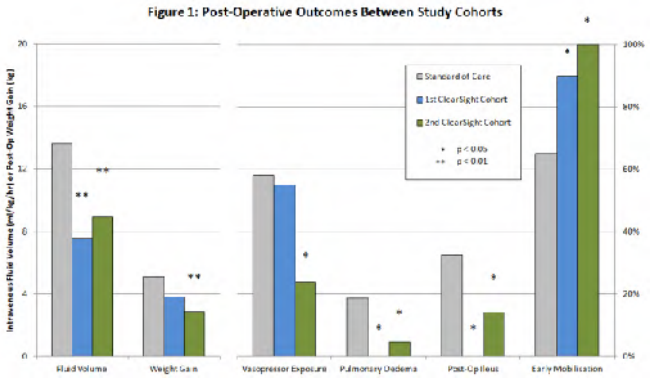
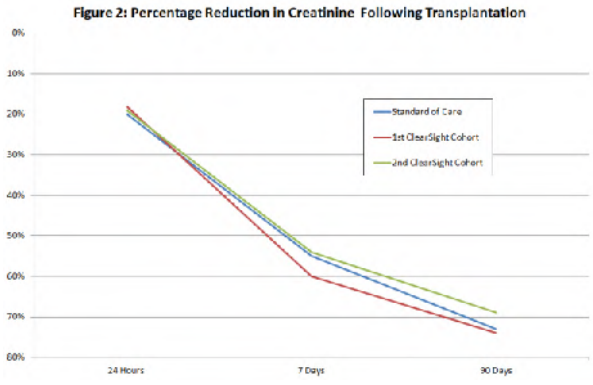
Introduction: Anaesthesia for renal transplantation is critical to optimising graft and recipient outcomes, in particular avoiding hypotension and ensuring adequate blood flow without complications due to excessive fluid administration. Using a quality improvement (QI) approach, we implemented a novel goal-directed haemodynamic therapy (GDHT) protocol. Sustaining change in healthcare is challenging and to support this we have measured and evaluated the improvements made.

Methods: Using the Model for Improvement, we performed an audit of 41 patients who received anaesthetic standard of care, then introduced the Edwards ClearSight™ device as part of a GDHT algorithm. This provides continuous non-invasive blood pressure measurement and markers of cardiac output. Using patient records and electronic data sets, we initially evaluated 20 cases for process and outcome measures and then, 12 months later, a further cohort of 21 cases to ensure patient benefits were sustained. NHS Health Research Authority waived ethics approval.

Results: There were no differences in demographics or comorbidities over the three QI cycles. There was a sustained reduction in intraoperative fluid administration and weight gain over time (figure 1). Additional reductions were seen in vasopressor use, post-operative pulmonary oedema and ileus with greater early mobilisation. There were no differences in immediate graft function or creatinine change up to 90 days post-op in all groups (figure 2). Process and outcome benefits were sustained up to 18 months after protocol implementation.

Discussion: A GDHT protocol supported by a non-invasive cardiac monitor is safe, reduces the volume of fluid administered and results in reduced iatrogenic complications post-operatively. Using QI methodology, the benefits seen were sustained over time by means of educational support and feedback for the multidisciplinary team. Our results support the need for wider dissemination and clinical trials assessing goal-directed approaches to cardiovascular optimisation in renal transplantation.





P29

Impact of obesity in renal transplantation outcomes

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Introduction: Obesity rates are soaring in the UK population which in turn, it has been considered a risk factor affecting outcomes in renal transplantation. We are presenting our experience in renal transplantation aiming to evaluate results in very obese patients.

Methods: From January 2015 to August 2019 a cohort of 512 consecutive patients with at least one complete year of follow-up were retrospectively evaluated. Patients were stratified in three Body Mass Index (BMI) categories: <25 kg/m2; n=210 (41%), 25-34.9 Kg/m2; n=259 (50.5%) and 35+ Kg/m2; n= 43 (8.4%). Graft and patient survival, as well as delayed graft function (DGF), were collected and analyzed from our renal patient database. Statistical analysis was verified through Pearson's Chi-Square test.

Results: Data on BMI was obtained for all 512 patients. One-year graft failure was 2.38%, 6.56%, and 6.98% respectively for each BMI category (NS). One-year patient survival was 98.57%, 96.14% and 97.67% respectively for each BMI category (NS). For DGF, the incidences were: 17.62%, 16.22% and 34.88% respectively (Chi-square statistic: 8.70, $p< 0.01$).

Discussion: One-year graft and patient survival were not different among the different BMI categories whereas DGF periods were significantly longer in very obese patients. Our results suggest that patients with a BMI of over 35 Kg/m2 should not be excluded from renal transplantation on the sole ground of obesity.

P30
The D4/R4 kidney transplant: appropriate matching or system overstretch?

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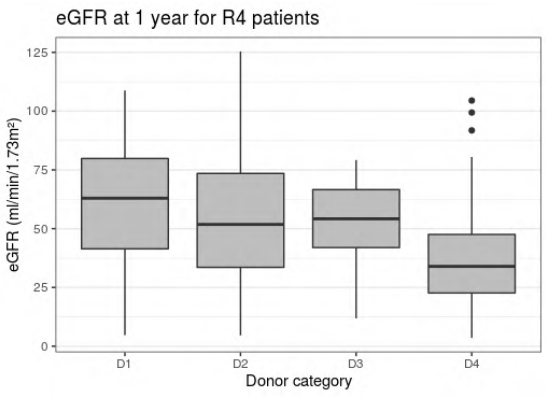
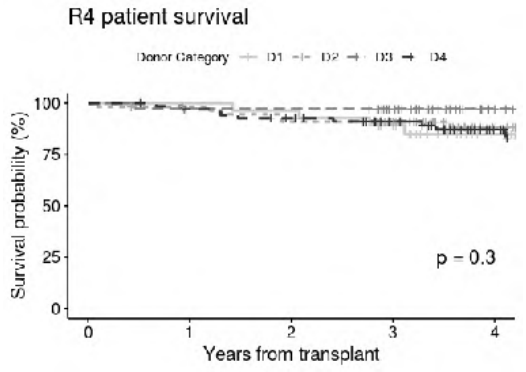
Introduction: The NHSBT kidney matching scheme changed in September 2019, aiming to better match graft and patient survival. Donors and recipients are to be stratified into quartiles based on risk indices. We present data on two years of transplants aiming to highlight the potential impact on higher risk recipients.

Methods: We reviewed all deceased donor transplants in our centre in 2015 and 2016. Recipients and donors were re-classified into the risk index quartiles and endpoint data included total inpatient length of stay in first year, 1 year eGFR and survival.

Results: 196 deceased donor transplants were performed. 144 recipients (73.4%) were in the highest risk R4 category, including 55 with both R4 and D4 (38.1%). Within the R4 group, recipients receiving a D4 graft were associated with a higher rate of DGF vs D1-D3 grafts (41.7% vs 23.2%, p=0.009), longer index admission (median 11 days vs. 8 days) and more readmissions within the first post-operative year (28.5 vs 22.3 total inpatient days). Function at one year was lower with D4 grafts (mean eGFR 35.7, vs. 54.8, p<0.001), but there was no significant impact on R4 patient survival with D4 kidneys vs. D1-D3.





Conclusions: The new allocation scheme is designed to better match graft and patient survival. Our data suggests this will have a significant impact on transplant centres with resource burden front-loaded within the first post-operative year, but despite poorer graft function, patient survival appears to be satisfactory. Novel strategies to mitigate these outcomes may be critical. The potential benefits of the new allocation system may be associated with logistical strain beyond what the current overstretched system can deliver.

P31
Renal transplantation into urinary diversions and reconstructed bladders

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Introduction: Renal failure secondary to urological disorders can necessitate urinary diversion/reconstruction pre/post-kidney transplant. Decisions regarding timing of diversion/reconstruction are affected by living (LD)/deceased (DD) donor options. We assessed our transplant outcomes into urinary diversions/reconstructed bladders.

Methods: Single-centre retrospective review of kidney transplants between 1986-2019. Graft and patient survival (GPS) were calculated, and compared to our general transplant population.

Results: 87 patients (mean age=38.2) had 97 transplants requiring urinary diversion/reconstruction. Mean follow-up 141months.

	Graft survival: 1-year	Patient survival: 1-year	Graft survival: 5-years	Patient survival: 5-years
Pre-formed IC	93%	100%	79%	79%
Post-transplant IC	80%	80%	80%	80%
Cutaneous ureterostomy	94%	94%	67%	78%
Reconstructed urinary tract	94%	100%	83%	98%
Combined diversions & reconstructed urinary tracts (1986-2019)	**92%**	**97%**	**78%**	**88%**
Overall survival in our centre (1986-2018)	**90%**	**97%**	**83%**	**90%**

Cutaneous ureterostomy (CU): 18 transplants; 16 formed at time of transplant. 1 patient required two sequential transplants; first was diverted to CU 3 years post-transplant (for unrecognised neuropathic bladder), the second a planned CU. The other CU was formed 4 years post-transplant for vesico-vaginal fistula from radiotherapy for cervical cancer. Ileal conduit (IC): 15 transplants into pre-formed IC. 7/15 died during follow-up, 4/7 with functioning transplant in-situ. Post-transplant IC: 7 transplants into bladder but subsequent IC diversion (5 for bladder cancer, 1 for spina bifida and 1 for recurrent urosepsis). Reconstructed urinary tract: 57 transplants into augmented bladders using native ureter (4), gastric-segment (1), ileo-caecum (7) and ileum (45). 13 were augmented post-transplant; 2 were undiverted into neobladders post-transplant.

Discussion: Transplantation into urinary diversions and reconstructed bladders appears safe, with similar survival to our general transplant population, and a significant increase in planned living donor transplants for patients with complex urinary tracts. DD kidney recipients with unsafe bladders may require initial CU before undiversion&reconstruction to prevent "dry" augment complications.

P32
Causes of persistent asymptomatic non-visible haematuria in potential living kidney donors

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Introduction: Current guidelines require thorough assessment of the potential living kidney donor with PANVH. We aimed to investigate the causes of PANVH locally.

Methods:A retrospective analysis of all potential kidney donors with PANVH assessed at our centre between 2009-2017. PANVH was defined as having urine dipstick positive for blood (including trace) on at least 2 occasions. Investigations were performed as per BTS guidelines, although the decision to perfor m a renal biopsy was clinician-led.

Results: Of our 161 patients with PANVH, 116(72.5%) were female and 45(27.5%) were male. 48(30%) were aged <40 years. Recorded ethnicity was Caucasian in 123(77%), Black 14(9%), Asian 13(8%) and unknown 10(6%). 15(9%) were on anti-hypertensive agents, 68(43%) were ex or current smokers and mean-BMI was 26.35.

117/161(72%) had a renal biopsy, of which 91/117(77%) were abnormal. Of these 62/117(53%) had thin basement membrane disease, 12/117(10%) IgA+-thin basement membrane disease, 8/117(7%) arteriosclerosis +-fibrosis, 5/117(4%) borderline mesangial hypercellularity, 3/117(3%) diffuse mesangial proliferation and 1(1%) had a segmental podocyte abnormality.

Overall 138(86%) donated their kidney and 23(14%) did not. Reasons for non-donation were exclusion due to renal biopsy findings in 18/23(78%), 3/23(13%) recipients received alternative better kidney offers during donor workup, 1(4.5%) patient withdrew and 1(4.5%) unknown.

160/161(99%) patients had a cystoscopy, 15/160(9%) of cystoscopies showed an abnormality, all of which were benign.

Discussion: Our predominantly Caucasian and female kidney donor experience shows that PANVH does not preclude donation in most patients, although renal biopsy findings are the main reason for non-donation. Thin base membrane disease was the most common cause of PANVH. The use of cystoscopy was universal, despite a significant proportion of donors below the age of 40 and female, which should be re-evaluated.

P33

An evaluation of testicular symptoms following hand assisted laparoscopic donor nephrectomy

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Introduction: Since the advent of laparoscopic modifications to donor nephrectomy, a small number of Orchialgia case reports have been reported. We aimed to assess the frequency and implications of testicular symptoms in a large cohort of donor nephrectomy subjects.

Methods: 431 males undergoing donor nephrectomy (367 left, 64 right sided) were analysed using case records for mention of “testicular pain” or “swelling”. NHSBT donor data capture was searched (terms “testicle”, “testicular” “orchitis” “epididymo-orchitis” “epididymitis” “scrotal” and “scrotum”). Clinical and operative parameters were then assessed for association.

Results: 33 male donors (7.6%) developed testicular symptoms. Mean time to symptom development was 10 days(95% CI 3 - 17). 2/33 donors required inpatient care for pain control. Testicular symptoms were always ipsilateral but occurred with similar frequency in left (28/367, 7.6%) and right (5/64 7.8%) sided procedures (chi2 p=0.956). In 2/28 left sided testicular pain cases clinically apparent hydrocoeles developed of which 1/28 underwent elective operative repair at their base hospital. No patients have required orchidectomy as a result of post donation testicular symptoms. Resolution of symptoms occurred in all but one patient who continued to mention testicular pain two years after donation. Median time to resolution was 3 months (IQR 6 weeks to 5 months). 31/33 were treated with nonsteroidal anti-inflammatories. 11/33 patients received antibiotics for presumed epididymo - orchitis (n=10/11) or a concomitant urinary tract infection (n=1/11). Time to resolution of symptoms was slightly reduced in antibiotic treated patients (median 3.1 v 3.6 months p=0.04). Length of surgery of >3hours was independently predictive of orchialgia (OR 2.9 95%CI 1.1 – 8.5)

Conclusion: Testicular symptoms are a common consequence of donor surgery. Longer surgical times are a surrogate for an increased risk of testicular symptoms. A course of antibiotics may have a role in reducing symptom duration. Males considering kidney donation should be counselled regarding this potential complication.

P34
The advantage to compatible donor-recipient pairs in the UKLKSS

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Introduction: The UK living kidney sharing scheme (UKLKSS) facilitates living donor transplantation for incompatible donor-recipient pairs. Compatible pairs may also be entered into the UKLKSS; these are key to facilitating transplantation for "hard to match" recipients. The benefit to compatible pairs in the UKLKSS is not known, with many clinicians believing these pairs are entered for "the greater good" as opposed to for individual advantage.

Methods: All compatible pairs entered into the UKLKSS from our centre were reviewed. Recipient transplant outcomes were assessed including dialysis status at transplantation, donor age, HLA match and graft function at 1 year. HLA match was assessed according to the number of HLA-A, B and DR mismatched antigens and NHSBT HLA mismatch levels. Transplants within each chain including a compatible pair were reviewed.

Results: 33 compatible pairs were registered; one recipient was entered with two donors. All 32 recipients were transplanted; 24 received UKLKSS transplants and eight were transplanted directly from their compatible donor. Fourteen patients were registered in the UKLKSS pre-emptively and received pre-emptive transplants.

All recipients transplanted via the UKLKSS were conferred benefit. In 23/24 cases, the UKLKSS donor had a more favourable HLA match. On average, UKLKSS donors had two fewer HLA antigen mismatches and were one HLA mismatch level better. In 14 cases, the UKLKSS donor was younger than the direct donor. Mean donor age reduction was 9.6 years. In three cases, the UKLKSS donor was more than 10 years older than the direct donor; these transplants were all better matched. Mean creatinine one year post-transplant was 125 umol/L. The compatible pairs facilitated 63 UKLKSS transplants; six were in highly sensitised patients and two in children.

Discussion: Recipients with compatible donors are advantaged by UKLKSS transplantation. Consideration should be given to registering these pairs when a better quality (immunological or physiological) kidney would be desirable.

P35

The impact of cold ischaemia time on outcomes of living donor kidney transplantation: a systematic review and meta-analysis

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Introduction: Multiple studies have been carried out to investigate the effect of a longer cold ischaemia time (CIT) on the outcome of living donor kidney transplantation (LDKT). There is no unambiguous consensus as to whether it is safe to expose a living donor kidney to a longer CIT. Prolonged CIT is clinically relevant in e.g. kidney paired exchange programmes. We performed a systematic review and meta-analysis to provide a comprehension of the available literature and to provide evidence around the effects of different cold ischaemia times on delayed graft function (DGF), graft survival, patient survival and the incidence of rejection after LDKT.

Methods: Searches were performed in Embase, Medline Ovid, Cochrane CENTRAL, Web of Science and Google Scholar up to 01-03-2019. For this systematic review, all aspects of the Cochrane Handbook for Interventional Systematic Reviews were followed and it was written based on the PRISMA-statement. Articles comparing different CIT in LDKT describing DGF, graft- and patient survival and acute rejection were considered for inclusion.

Results: Twelve-hundred articles were identified, of which 7 were included (describing n=164.179 patients in total). Meta-analyses using random effects models showed significantly lower incidence of DGF (OR = 0.65, 95% CI, 0.45 to 0.75, P = 0.004), and significantly better 1- and 5-year graft survival (respectively, OR = 0.79, 95% CI, 0.62 to 0.99, P = 0.04 and OR = 0.85, 95% CI, 0.76 to 0.96, P = 0.009), for CIT <4 hours. There was no difference in acute rejection and patient survival.

Discussion: Based on our results, a shorter CIT (<4 hours) in LDKT is associated with significantly lower DGF rates and better graft survival compared to a longer CIT (>4 hours). We recommend that the CIT in LDKT should be shorter than four hours, which is especially relevant for KPE programmes.

P36

The heart of the matter: additional cardiac work-up is not required in the majority of older potential living donor

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Introduction: As the age of the prevalence end stage renal disease (ESRD) population increases, so does that of the comparative potential living donor (LD) pool. In assessing older living kidney donors, guidelines are ambiguous and practice varies between units. Additional, potentially unnecessary, testing is costly, could limit access to living donation, and also contribute to donor fatigue.

Methods: All consecutive potential LDs in a single UK region, between 1/7/2009 and 30/6/2019, were retrospectively analysed. Data were extracted from prospectively recorded LD database and patients' electronic care records.

Results: There were 574 LDs in this time period, of whom 74 (13%) were aged at least 60 yr. at the time of donation; 38 were 60-64 yr., 25 were 65-69 yr., 11 were 70 yr. or older (oldest 78 yr). There was no gender preference, 38 (51%) were male. The majority, 63/74 (85%) had no additional cardiac investigation other than an ECG. Of the others, 7 underwent 24-hr. blood pressure monitoring, 2 had an echocardiogram, 2 had both. There were an additional 24 potential older donors assessed in the study period who did not proceed to donation, of whom 2 exited the process due to unacceptable vascular disease on clinical assessment. No LD had an exercise stress test, cardiopulmonary exercise testing or coronary angiogram. Peri-operatively, 1 older donor developed fast atrial fibrillation, which resolved with beta-blockade. There were no recorded complications or major adverse cardiac events. Average length of stay was 3 days (range 2-8 days), with no significant difference between the three age subgroups.

Discussion: Standard assessment methods are sufficient for safe donation in the majority of older LDs. Those aged >60 yr. do not routinely require additional assessment other than an ECG before donation.

P37
Living donors with low iGFR: does this put two patients at risk?

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Introduction: The UK Living Donor Kidney Transplant Guidelines support living donation from donors with iGFR as low as 63 ml/min/1.73m^2. This GFR is lower than accepted by most American transplant centres.

Methods: We reviewed electronic records, correspondence and imaging reports for all living donors in our centre since 2009, and excluded donors worked up or followed-up elsewhere. Isotopic methods were used for pre-donation GFR estimation in all cases. We used renal function by eGFR, blood pressure and re-referral to renal services as primary end-points for donors. Renal function and graft survival were the main endpoints for recipients.

Results: Data was available for 380 living donor transplants. 12 had iGFR in the 60-69 ml/min range, 170 had iGFR 70-89 and 198 had iGFR greater than 90. Donors with the lowest iGFR had lower eGFR at 1 and 5 years after donation (p=0.0003), but there were no significant differences in blood pressure or proteinuria. Donors in the middle GFR group were most likely to be referred back to nephrology, their cumulative rate 10% at 10 years (p=0.013). There was tendency to lower survival in the lowest iGFR group donors, but this was confounded by age (median 64 vs. 53 and 43). Recipients had lower eGFR at 1 and 5 years but these differences were reduced once adjusted for donor age. Transplant and patient survival were unaffected by donor iGFR group.

Donor iGFR	**Post-donation eGFR**	**Recipient eGFR**		
	1 yr	5 yr	1 year	5 years
60-69	50.6 ± 4.8	53.5 ± 8.1	49.6 ± 10.7	40.6 ± 10.7
70-89	62.3 ± 11.1	62.4 ± 15.9	67.2 ± 29.6	62.8 ± 28.4
>90	70.8 ± 12.6	74.0 ± 13.8	76.7 ± 32.3	65.2 ± 25.3

Conclusions: The donors in low iGFR group have reassuring outcome with respect to kidney function and blood pressure. As expected eGFR is lower at 1 and 5 years but not sufficient to warrant referral back to nephrologists. With appropriate donor and recipient selection and counselling, it is appropriate to proceed with such transplants.

P38 - withdrawn

MTH1-A promising drug target for treating the post-transplantation recurrence of hepatocellular carcinoma

P39

Repopulation of functional multilineage human haematopoietic cells in non-irradiated NBSGW mice

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Introduction: Humanised immune system (HIS) mouse models provide a platform to investigate human immune biology *in vivo*, reducing the need for large animal studies. Importantly they enable researchers to overcome biological differences between humans and other species, which have compromised safety in clinical studies. In transplantation research, HIS models have provided pre-clinical evidence for human-specific therapies such as biologics and regulatory T cell therapy, now in clinical trials. Currently used models lack multilineage leukocyte development, limiting accurate representation of the full allo-response in transplantation. To address this, we assessed immune reconstitution and human skin transplant rejection in the NOD, B6.SCIDIl2rγ$^{-/-}$*Kit*$^{W41/W41}$ (NBSGW) mouse, which is capable of long-term haematopoiesis without irradiation.

Methods: Human cord blood CD133+ haematopoietic stem cells (HSCs) were transplanted intravenously into non-irradiated NBSGW mice (*n*=20). Engraftment in blood and lymphoid organs was assessed over 20 weeks. In a separate group, HSC-engrafted mice received allogeneic human skin transplants 10-12 weeks post-injection. At rejection (or after 100 days) blood, spleen, bone marrow (BM) and skin were analysed by flow cytometry and NanoString RNA analysis.

Results: Human CD45+ cell chimerism in the blood, BM and spleen developed reliably after HSC transplantation in a dose-dependent manner. Human myeloid cells, B cells, and T cells at multiple stages of development were identified. I*n vitro* assays demonstrated functional human antigen-presenting cells (APCs), B cells and T cells. Skin grafts rejected in mice with robust multilineage human cell reconstitution. Rejection was associated with RNA markers of upregulated immune function and elevated production of IgG and T helper cell 1, 2 and 17 cytokines.

Discussion: This model utilises adult mice and does not require irradiation, co-transplantation of human haematopoietic stromal tissues, or exogenous human cytokines. By producing functional multilineage immune cells it provides a framework to assess HSC function *in vivo* and to investigate human transplant responses encompassing innate, cellular and humoural immunity.

P40

Abdominal multiorgan retrieval from pigs in a slaughterhouse: a reliable and efficient donation after circulatory death model for ex vivo organ perfusion

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Introduction: Advances in organ perfusion technology have been driven by the increasing necessity to utilise organs from donors after circulatory death (DCD) and marginal donors. Pigs are anatomically and physiologically similar to humans and are an excellent model for translational research. Experimental research is typically limited by ethical and economical issues. Here we describe a reproducible, cost-effective DCD multi-organ abdominal retrieval model of porcine organs from the slaughterhouse.

Methods: Domestic pigs (50-70 Kg) are electrically stunned and exsanguinated through an incision of carotid artery and jugular vein, in accordance with the standard abattoir process. Via a longitudinal midline incision, the thoraco-abdominal viscera are removed en-bloc by incising along the anterior vertebral plane. The visceral block is orientented anatomically on the back-bench and the intestines removed by stapling the mesenteric root distal to the pancreas. The diaphragmatic aorta is cannulated and the abdominal organs (liver, pancreas and kidneys) are perfused. The portal vein is identified outside of the pancreas and a portal perfusion initiated.

Results: The warm ischaemic time is kept between 15 and 30 minutes and all vessels and organs are kept intact. The aortic stump with celiac trunk and superior mesenteric artery is preserved for the pancreas, allowing a perfusion of the whole organ from a common inlet, while the common hepatic artery is used for cannulation and perfusion of the liver. The remaining renal aortic patch is evenly divided between the two kidneys. To date 17 livers, 34 kidneys and 11 pancreases were retrieved through this technique for research on perfusion.

Conclusions: We have described a reliable and reproducible procedure for abdominal multi-organ retrieval from pigs in a slaughterhouse, which integrates seamlessly in the workflow of the abattoir. This model represents an ethically acceptable economically advantageous approach to this rapidly expanding field of translational transplant research.

P41

Targeting the renal tubular epithelium with anti-miRNA therapy: a potential mechanism for minimising ischaemia reperfusion injury

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Introduction: Ischaemia reperfusion injury (IRI) is an unavoidable, significant consequence of renal transplantation and limits the use of deceased donor kidneys. MicroRNAs are small, non-coding RNA molecules that regulate multiple downstream mRNA targets. MiRNA-21-5p and miRNA-24-3p have been previously implicated in IRI. Antisense oligonucleotides (ASOs) block specific microRNAs, with previous work by our group demonstrating their delivery to kidneys using Normothermic Machine Perfusion. Imaging of these kidneys revealed ASO localisation around proximal tubule epithelial cells (PTECs). This project aimed to characterise ASO blockade against miRNA-21-5p and miRNA-24-3p in PTECs.

Methods: HKC8 cells, a human PTEC cell line, were used throughout these experiments. Cells were placed in a hypoxic incubator for 24 hours, followed by 6 hours of reoxygenation to model IRI. HKC8s were transfected with ASOs using lipofectamine. RT-qPCR was used to evaluate expression of protective, antioxidant targets, SOD2 and HMOX1. Western blots were used for protein validation.

Results: MiRNA-21-5p and miRNA-24-3p levels were high throughout hypoxia and reoxygenation. Single blockade with anti-MiRNA-21-5p resulted in a significant increase in its downstream target SOD2. Anti-miRNA-24-3p treatment resulted in no change in either of its downstream targets, HMOX1 or SOD2. This was reflected in the failure of dual blockade to produce a synergistic effect on the expression of the shared target, SOD2.

Discussion: Anti-miRNA-21-5p results in a significant increase of SOD2, which is well characterised as protective during IRI. Anti-miRNA-24-3p appears to have no effect on PTECs, contrary to previous work in other cell types, perhaps suggesting a cell-specific response of microRNAs. Normothermic machine perfusion could be used to deliver dual ASOs; allowing the simultaneous targeting of different kidney cell types.

P42
Flavin mononucleotide as a potential biomarker of organ quality – a pilot study

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Introduction: Machine perfusion (MP) and normothermic regional perfusion (NRP) are used for organ quality assessment and reconditioning prior to transplantation. Flavin mononucleotide (FMN), released from damaged mitochondrial complex I, is a potential marker of reperfusion injury. In the perfusate of hypothermic oxygenated perfusion of liver, it has been suggested to predict severe allograft dysfunction and early graft loss. This pilot study aims to examine whether FMN, measured during MP and NRP, can be used as a biomarker of organ quality.

Methods: The FMN level in the perfusate samples, collected during *ex-vivo* normothermic kidney perfusion (EVNP), abdominal NRP, and *ex-vivo* lung perfusion projects, were measured using fluorescence spectrometry (excitation wavelength 450nm and emission wavelength 525nm). The results were correlated to the available post-transplant clinical outcomes.

Results: In EVNP, 11 donation after circulatory death (DCD) kidneys were perfused for quality assessment. Among 7 transplanted kidneys, the FMN levels at 1 hour of EVNP were significantly higher in the ones that developed delayed graft function (DGF) (p=0.024, area under the curve (AUROC) 1.00, 95% confidence interval (CI) 1.00-1.00) (Figure 1). During NRP, 15 livers from 23 DCD donors were deemed suitable for transplant after NRP. The FMN levels at 30 minutes of NRP of these livers are significantly lower than those that were not retrieved for transplant (p=0.045, AUROC 0.77, 95% CI 0.56-0.98) (Figure 2).

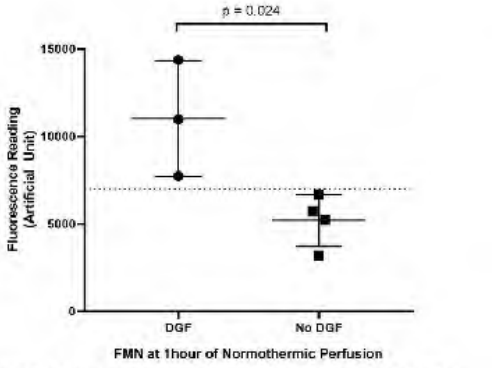

Figure 1. The fluorescence spectrometry readings of FMN concentration in the perfusate samples collected at 1 hour of *ex-vivo* normothermic kidney perfusion.

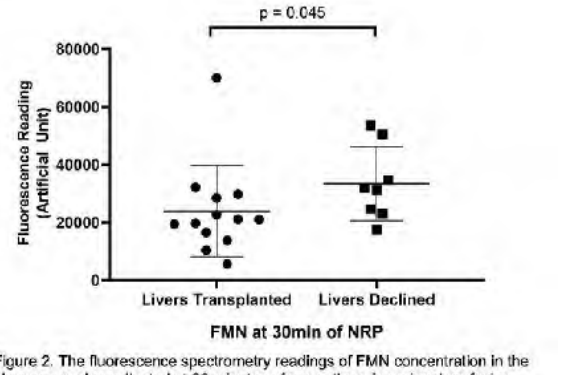

Figure 2. The fluorescence spectrometry readings of FMN concentration in the plasma samples collected at 30 minutes of normothermic regional perfusion.

By contrast, the lungs, with modest metabolic activity, release little FMN. Levels at 1 hour of reperfusion of 8 lungs were uniformly low and unrelated to function.

Discussion: This pilot study, though limited by the sample sizes, showed that FMN analysis during MP and NRP has the potential to predict quality of organs with high metabolic activity. More work needs to be done to validate its role as a novel biomarker to facilitate safe and reliable decision making before transplantation.

P43

What happens when you administer mesenchymal stromal cells during normothermic machine perfusion of porcine kidneys: possible and helpful or not?

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Background: Normothermic machine perfusion (NMP) of donor organs may become an important diagnostic and therapeutic tool to assess organ viability, condition function and initiate repair prior to transplantation. Mesenchymal stromal cells (MSC) have been shown to possess potent anti-inflammatory and regenerative properties ameliorating ischaemia reperfusion injury. The purpose of this study was to determine the dose of MSC needed to allow successful homing in donor kidneys during NMP without adversely affecting renal perfusion dynamics.

Methods: Porcine slaughterhouse kidneys with 20 min warm ischaemia were retrieved underwent 3h hypothermic machine perfusion followed by NMP at 37°C for 7h. An oxygenated, autologous blood-based solution containing albumin, electrolytes and nutrients was used as perfusate. Following 1h of NMP, either a vehicle, 2 x 10^6, 10 x 10^6 or 50 x 10^6 labelled (Qtracker) porcine adipose derived MSC were injected into the cannulated renal artery. Physiological recordings were taken regularly. Perfusate, urine s and biopsies were obtained for biomarker analysis and to locate MSC.

Results: No difference was found in average renal blood flow/100g (p=0.668) or renal resistance (p=0.828) between MSC groups compared to controls. Acid/base balance and urine production remained similar between the groups. Damage markers LDH (p=0.816) and AST (p=0.312) were similar throughout perfusion between the groups. Confocal microscopy demonstrated mainly glomerular localization of MSC (Figure 1), but they were also observed in the capillary network around the tubules.

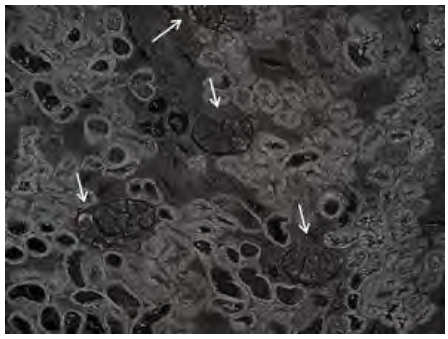

Figure 1. MSCs are found primarily inside glomeruli. Arrows depict Qtracker 655 red fluorescence from MSC.

Discussion: Administration of different doses of MSC to the donor kidney during NMP did not impair renal perfusion dynamics. This model provides us with the opportunity of getting a better insight in the interaction between MSC and the injured donor kidney: where and when do MSC home, how do they affect tissue and which injury markers reflect changes in renal function.

P44
Ex-vivo normothermic kidney perfusion with perfluorocarbon (Oxycyte)

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Introduction: Ex-vivo normothermic perfusion with oxygenated red cell perfusate can reverse the detrimental effects of warm and cold ischaemic injury. The aim of this study was to assess the effect of supplementing the perfusate with perfluorocarbon (Oxycyte).

Methods: Seven pairs of human kidneys were treated with either normothermic perfusion (NP) alone or NP with 2% Oxycyte (NP+PFC) for 1 hour. Renal blood flow, intra-renal resistance, oxygen consumption, renal function, and acid-base balance were measured during this hour. Porcine kidneys (n=6 cold storage control; n=6 NP; n=5 NP+PFC) were then used to model the effects of reperfusion following static cold storage and NP with and without PFC, simulating the 'reperfusion period' that would normally occur following transplantation.

Results: In human kidneys, addition of 2% PFC significantly decreased blood flow (NP=60 v NP+PFC=51 (ml/min/100g); p=0.03), increased intra-renal resistance (NP=123 v NP+PFC=249 (ml/min/mmHg).h; p=0.03), and provided no increase in oxygen consumption during NP (NP=38 v NP+PFC=36 (ml/min/g); p=0.38). Furthermore, urine output was significantly lower in the NP+PFC group (NP=91 v NP+PFC=48 (ml); p=0.03). Following NP, porcine kidneys demonstrated that addition of 2% Oxycyte provided no additional benefit in blood flow, intra-renal resistance, or oxygenation during 3 hours of reperfusion. There were no other significant differences in renal function and acid base balance between the NP and NP+PFC groups for both human and porcine kidneys.

Discussion: NP with 2% Oxycyte reduced blood flow, increased intrarenal resistance and reduced urine output during NP of human kidneys, and offered no benefit during reperfusion. Future research should focus on the effect of alternative perfluorocarbons on blood flow and oxygen consumption.

P45

Introduction of a formalised prescription chart for non-medical prescribers during organ retrieval

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Royal Papworth Hospital, Cambridge, United Kingdom

In 2018/19 the Royal Papworth Retrieval Team attended in excess of 150 cardiothoracic retrievals. During this time, we introduced a comprehensive prescription chart to use during organ procurement in order to standardise practice. As well as standardisation it was hoped that the use of this prescription chart will act as a benchmark for best practice both locally and potentially nationally with the aim of improving safety and confidence within the retrieval teams. Furthermore it will act as a positive service improvement implemented by the Royal Papworth Donor Care Physiologists (DCPs).

DCPs are non-medics and an integral part of the retrieval and Scouting team at Royal Papworth. Some individuals from this team have completed the Non-Medical Prescribing Course in order to take on the role of overseeing drug prescribing throughout the retrieval process. This initiative has been encouraged and supported by the Transplant Service at Royal Papworth.

The DCPs take responsibility for ensuring the correct drugs are administered in line with donor management and protocol, they will validate all medication given throughout the retrieval process and ensure there is documentation available for review post retrieval.

The purpose is to highlight the need for DCPs to not only have the ability to use clinical judgement in terms of donor management but also prescribe medication required using a legal framework, therefore reducing the requirement for a medic to oversee.

This prescription chart is used as a record of quality assurance by ensuring consistent, logical and fundamentally safe practice is maintained throughout the retrieval with the aim to review and audit over a given period.

The prescription chart has been produced by the DCPs who provide a pivotal role in drug administration and maintaining haemodynamic stability throughout the retrieval process.

If this proves to be successful it will reinforce the requirement for DCPs to become Non-Medical Prescribers.

P46

Perfusate glucose reflects hepatocellular glycogenation during normothermic machine perfusion of the liver

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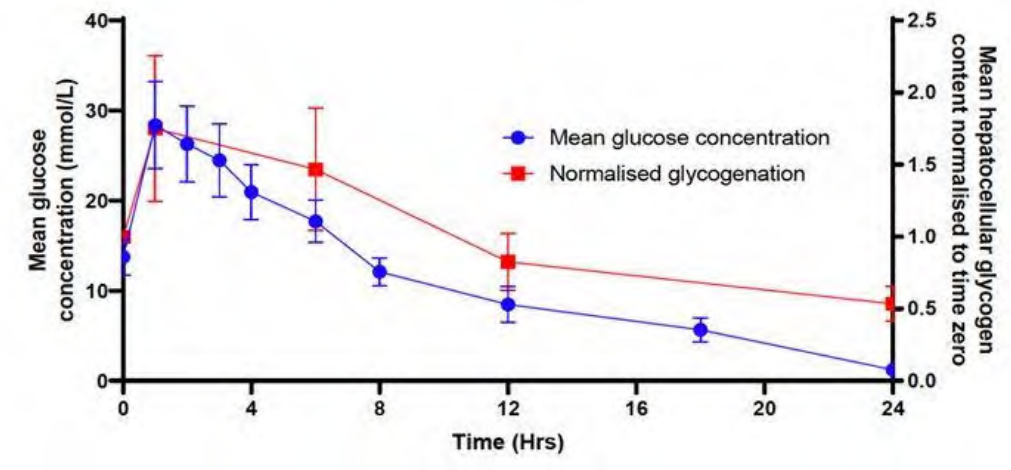
Introduction: Normothermic machine perfusion (NMP) is a novel method of organ preservation that aims to mimic the physiological environment during preservation. This is achieved by perfusing the livers with a blood-based perfusate at physiological inflow pressures and temperature. NMP also permits viability assessment through evaluation of the perfusate flow rates through the portal vein and hepatic artery. In addition to this, biochemical assessment and perfusate gas analysis can be performed to provide an insight into the metabolic activity of the liver.

Methods: Discarded human liver grafts (n=6), were perfused for 24 hours. Core biopsies and perfusate samples were taken from each liver at 5 distinct time intervals: time 0, 1 hour, 6 hours, 12 hours, and 24 hours. Core biopsies were fixed and stained with periodic acid-Schiff (PAS) and analysed with Leica software to provide a quantitative estimate of the hepatocellular glycogen content.

Results: Hepatic glycogen concentration rose during the first hour, followed by a steady decline thereafter until the end of perfusion (Figure 1). Contrary to our initial hypothesis that glucose concentration within the circuit would show an inverse relationship to glycogen stores in the liver cells (as it was used up for glycogenesis), we found that glucose concentration closely followed the same trend.

Discussion: Change in hepatocyte glycogen content provides an important insight into the synthetic function of a liver destined for transplant. Our research suggests that glucose concentration can be used as a surrogate marker for the synthetic function of a liver on NMP and provides valuable information on the glycogen-synthesising capability of the hepatocytes. In future, this could potentially aid the decision-making process with regards to liver graft transplant viability



P47
Wait-listed for transplantation: getting the right messages across at the right time

Mrs Wendy Brown, Mrs Katie Tansey, Mrs Sonia Clarke-Swaby, Dr Phil Webster, Dr Emma Salisbury, Dr Rupert Bright, Dr James Tomlinson, Mrs Dawn Goodall

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Introduction: Successful outcomes post-transplantation demands significant commitment from patients therefore it is crucial that they have a good understanding of what is involved. Our pharmacist raised concerns that many newly transplanted patients had limited knowledge of what their post-transplant treatment required, despite an assumption that they had been fully prepared during their transplant workup. Patients reported similar concerns and this lack of preparation resulted in unrealistic expectations and anxiety in the early weeks post-transplant with potential compromise to clinical outcomes.

Methods: We reviewed our transplant workup processes and realised the excellent information opportunities we had in place focussed on the decision to proceed to transplantation. We were missing the opportunity to prepare patients for what to expect *after* the operation.

We designed a new information-sharing session for patients active on the waiting-list with the aim of empowering patients and improving their engagement and adherence. The sessions focus on:

- what to expect once they received the transplant “call”
- hospital admission
- long-term follow-up
- clinic schedules
- medication regimes
- fluid requirements and dietary modifications.

Seminars are delivered by a multidisciplinary team in small, informal groups with a multi-sensory approach to encourage interaction. Participants are encouraged to attend with family and friends for support, ask questions and voice concerns which allow the team to unpick misunderstandings and allay anxieties.

Results: Feedback has been very positive and to support patients further we are designing post-transplant seminars to reinforce key messages and address new queries and concerns. Sessions are also delivered within our dialysis units to capture those unable to attend due to their dialysis commitments.

Discussion: The anticipated outcome is a more satisfied patient group who feel empowered through better understanding and support throughout their transplant journey. From a clinical perspective, we expect this to translate into improved mental and physical patient health as well as longer kidney transplant survival.

P48
'Writing to your donor family: the management of emotions'

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Introduction: This presentation, which is based on independent PhD research and professional practice, highlights the emotional complexities of organ recipient and donor family letter writing post-transplantation. The aims of the presentation are two-fold. Firstly, it outlines the ways in which a transplant recipient coordinator has identified current issues in practice with the ways in which their clinics currently assist organ recipients with the letter writing process. This is discussed in order to set the agenda on how to improve best practice within the transplant unit through planned research. Secondly, this planned research is supported by the findings of PhD research which identifies the shortcomings of the ways in which letter writing is set out and proposed.

Method: PhD data were collected through an ethnographic approach including qualitative interviews and observational research.

Results: Findings show how organ recipients struggle with what the researcher calls, 'abstract gratitude' and 'personal gratitude'. Recipients are uncertain about writing letters to their donor families because of the formality of the letter and feel that their 'thank you' is impersonal. As a result, they question whether they should write a letter and also feel that letters do not symbolise the end of the transplantation process.

Discussion: These PhD findings are used within the poster which will be used and trialled within the transplant coordinators practice. This will enable transplant coordinator to review their practice and how to offer more streamlined support for recipients enabling recipients to write. This will be done by qualitative interviews to assess the usefulness of the poster. Responses will be audited and data will be disseminated to help provide further guidelines on how to adequately support organ recipients and the letter writing process.

P49
Developing education in readiness for historical legislation change in organ donation

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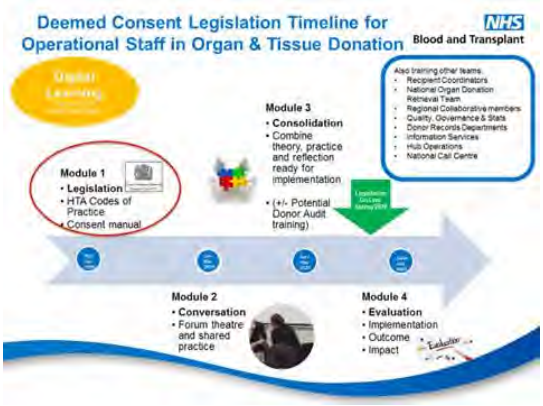
Introduction: The organ donation law in England is undergoing the biggest historical legislative change since the Human Tissue Act (2004). As from spring 2020, the Organ Donation (Deemed Consent) Act (2019) will be enacted, meaning, all adults in England will be considered to be an organ and tissue donor when they die, unless they have recorded or expressed a decision not to donate or are in one of the excluded groups. There will always be a sensitive discussion to support the family and to establish the individuals last known decision regards to donation. All Specialist Nurses will receive education and training to ensure consent is obtained lawfully.

Methods: The aim of the law change is to increase consent for organ donation and ultimately the number of lives saves through transplantation. Spain, Belgium, and Portugal are the top three highest donating countries, and all have opt-out systems. A change in consent legislation is not the singular explanation for their success in increasing organ donation rates; a commitment to training, resources and a good infrastructure are paramount.

Results: NHS Blood and Transplant have developed an evidenced based comprehensive training programme to help ensure Specialist Nurses are knowledgeable and empowered in applying the legislation in clinical practice. The training needs analysis and lessons learnt from the Welsh implementation workshop have provided an evidence base for the education. The process evaluation of the Welsh implementation highlighted that additional modification of processes and on-going training and support was necessary to help embed the legislation.

Conclusion: The education and training (figure 1) has been developed in close collaboration with the Human Tissue Authority whilst updating Codes of Practice in line with the legislative change. The training is being evaluated real time and adapted in response to feedback to ensure quality training.

Figure 1



P50
Enhancing communication and self-awareness using a psychometric tool

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NHS Blood and Transplant, Newcastle, United Kingdom

Introduction: 'Insights Discovery' is a psychometric tool based on Jungian principles of the Collective Unconscious and uses a colour-based model to highlight personality and communication preferences as well as offering insights into the aspects of self that sometimes others see rather than ourselves. It is designed to increase self-awareness to promote effective relationships at work by improving communication. It was introduced to the Organ Donation Service Teams of NHS Blood and Transplant in 2012, and every new specialist nurse joining the Organ Donation and Transplantation directorate of the organisation completes a questionnaire and an Insights Discovery day within the first 6 months of their employment.

Methods: Whilst Insights Discovery was delivered to the whole organisation from 2012, and continued to be offered to new team members by the professional development team (PDT) since, Investment in allowing four PDT members to become accredited facilitators allowed for a review of how it was used within regional teams. We had observed that labelling individuals as a certain colour type and excusing negative behaviour as a characteristic of some colour types was occurring. We wanted to challenge this and re visit the good and bad perceptions of colour types based on perception and utilise it to its potential drawing on team building and communication within regional teams.

Results: There is a continued commitment for all new nurses within ODT to receive initial training. A bespoke day was delivered to the regional management group. Feedback received demonstrated 100% of respondents felt it had positively impacted on their practice. A further three regional teams have now received updates bespoke to their communication or development needs.

Discussion: Once teams have had bespoke training days for their needs nationally, the long-term goal is to empower teams to continuously revisit Insights by provision of simple adaptable training resources they can use independently.

P51
Achieving consistency in debriefing during clinical simulation training

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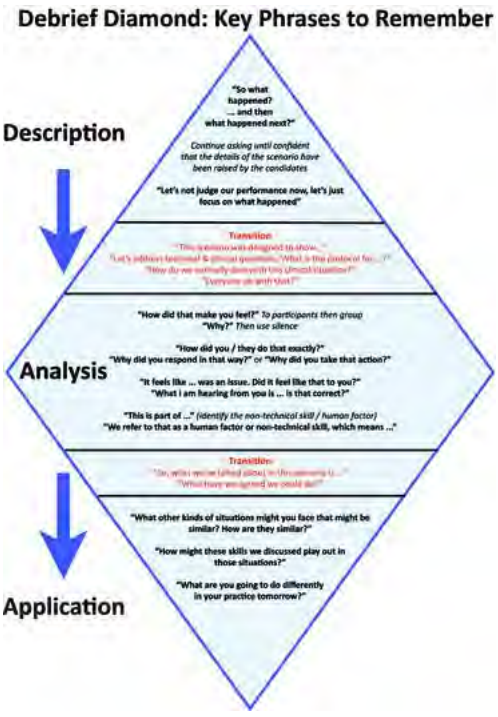
Introduction: Specialist Nurses in Organ Donation (SNOD) attend a donor simulation course within a high-fidelity simulation centre supported by the Professional Development Team. This technology enhanced learning allows the SNODs to identify any gaps in their learning prior to joining the on-call Rota independently. Simulation is a good learning technique, allowing planning to meet the needs of learners and incorporates feedback easily[1]. However, it was identified that inconsistencies with feedback methods varied between facilitators.

Methods: A simulation centre-based learning experience will support between 12-15 trainee SNOD's to allow for the best learning outcomes. Three 'patients' have been created whose stories are shared in real time over the 3 days. The simulations run from the point of referral through to organ retrieval in theatre. In order to provide consistency and quality to our learners, it was agreed that the same debrief model would be used. The 'Diamond debrief' model[2] was adopted after extensive research and the faculty were briefed on it's use, with a visual aid provided.

Results: The use of the 'Diamond debrief' model encouraged a consistent approach to debriefing. The creators recognise that debriefing is the most important element in providing effective learning in simulation[2].Immediate feedback from those participating in the simulations was positive through its consistent use. Faculty felt it kept the focus on debrief, as opposed to direct feedback which could easily be received negatively by delegates if developmental.

Discussion: As a team, we use various simulation centres nationally to deliver this training. Some challenges in the use of the model exist if centres have their own preferred model. Familiarity with other models can make adapting to a new model challenging. However, the use of a specific model is beneficial for newer team members to provide guidance and repeated use will improve our skills in its use.



P52

Collaboration improves likelihood of publication: the fate of abstracts published at the British Transplantation Society Congress

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Introduction: Dissemination of research findings is a fundamental part of scientific practice. Gold standard is presentation at national meetings followed by peer-reviewed publication. Previous studies have proposed evaluating the scientific impact of meetings by analysing their publication rate (PR). This study evaluated the PR for abstracts presented at British Transplantation Society (BTS) Congress and characterised the factors predictive of publication.

Methods: All abstracts presented at 2012 BTS Congress were considered. Systematic search of MEDLINE and Google Scholar was performed using author names and abstract key words. Information recorded included type of presentation, prize session, author gender, number of authors and centres, type of research, organ studied, findings (positive/negative), journal impact factor (IF). Univariate and multivariate analyses were performed to identify factors associated with publication.

Results: Out of 224 abstracts presented at BTS, 69 (30.8%) of abstracts were published as full papers. Of these 6 (8.7%) were published prior to the meeting. The mean publication time of the remaining 52 was 23.4 months (range: 2.2 – 87 months). Oral abstracts were not significantly more likely to be published than posters (OR 1.67; p=0.09). Author gender, positivity of findings and type of research (clinical vs. basic science) also did not significantly influence publication likelihood. On further analysis the only factors associated with increased publication included multicentre research (OR 1.94; p= 0.035 vs. single centre) and organ type (Abdominal [Not Kidney] OR 3.45 vs. Kidney Alone; p=0.001). The manuscripts were published in a total of 38 journals, (IF ranging from 0.26-16.38). The mean IF was higher for prize session research compared to general session (6.20 vs.3.69, p=0.05).

Discussion: The relatively high rate of conversion from abstract to full publication, compared to rates published from other meetings, highlights the quality of BTS presentations. The importance of collaboration in generating superior research has been identified and must be encouraged.

P53

An exploration of interventions used to aid donor family requests for recipient outcome follow-up post organ donation

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Introduction: Donor families are informed on the night of donation that they are entitled to request follow-up information about recipients who benefitted from their authorisation to donate and this can be requested via the Donor Records Department (DRD). Approximately 10% of donor families state that they do not wish receive correspondence.

The DRD set an objective to provide follow-up information within 60 days. This is stipulated as a key performance indicator and monitored regularly. Between April 2018 – March 2019 30% of families received follow-up information within 60 days. This project has explored ways in which to improve this.

Methods: Since September 2019 there are three main initiatives that have been implemented by the DRD to respond promptly to information requests:

- A spreadsheet tracks correspondence received
- A database of contacts to facilitate the retrieval of follow-up data in a more time efficient manner
- Stipulating a deadline for information to be returned to the DRD

Results: 2018 – 2019

- From April 2018 to October 2019 there has been an increase from 30% to 74% in the number of follow-up requests which are reported within 60 days.
- 28 fewer requests were made in 2019 in comparison to 2018.
- The provision of routine follow-up no longer occurs and is now only provided upon request.

Discussion: For the DRD staff this once onerous task to complete has been become more time efficient and has resulted in better job satisfaction. The DRD staff are providing a better service for donor families. The initiatives that have been implemented have resulted in more cohesive working amongst the transplant centres.

P54
Reasons for organ donor register decisions in children after an educational intervention

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Introduction: Six-thousand people are currently awaiting an organ transplant in the UK. Educational interventions have demonstrated mixed results at increasing organ donor register (ODR) sign-up.

Methods: An educational intervention about organ donation was delivered to 29 schools across the UK from October 2016 to July 2019. An optional questionnaire was distributed, and framework analysis was used to categorise reasons for subsequent intent to join the ODR.

Results: 1615 reasons were identified in 20 categories from 1556 students aged 11-18 years. The most common reasons for students intending to join ODR were 'helping others' (66%) and 'body wastage' (16%). In this cohort, there was a significant association between student age and 'body wastage' ($r^2=0.53$, $p=0.04$). The most common reasons for not joining ODR were: 'bodily integrity' (21%); 'immaturity' (12%); 'fear' (6%); 'religious beliefs' (6%); and 'family influence' (6%). In this cohort, there was a significant association between student age and 'bodily integrity' ($r^2=0.85$, $p=0.001$), 'religious beliefs' ($r^2=0.63$, $p=0.02$), 'family influence' ($r^2=0.51$, $p=0.047$).

Conclusions: Following organ donation educational intervention there exists a number of modifiable reasons, despite reasons these being addressed as part of the presentation. This demonstrates the need for repeated education about organ donation to dispel deep seated misbeliefs and for family discussion about ODR decisions.

P55
Lifetime survival projections following solid organ transplantation in the United Kingdom

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[1]RTI Health Solutions, Research Triangle Park, USA. [2]Atara Biotherapeutics, South San Francisco, USA

Introduction: The UK Transplant Registry contains data detailing patient and graft survival for all solid organ transplants (SOT) in the United Kingdom from 1995 onwards. While follow-up extends over 20 years, complete mean estimates of lifetime survival following SOT are not available due to right censoring. We sought to estimate mean patient survival following the most prevalent single SOTs, namely kidney, liver, heart, and lung.

Methods: To account for changes in patient survival due to modern immunosuppression, transplantation data was used starting in 2000. Survival analyses were conducted for both pediatric (<18 years of age) and adult (≥18 years of age) populations where possible. First, parametric survival analyses were carried out using 6 distributions (exponential, generalized gamma, Gompertz, log-logistic, lognormal, and Weibull). Next, flexible cubic splines were fit with 3 parameterizations (log-cumulative hazard, log-cumulative odds, inverse normal) and the number of knots increased until fit statistics (AIC and BIC) did not improve. Goodness-of-fit tests and visual inspection of fitted curves overlaid on Kaplan-Meier plots were used to determine the best-fit models. Extrapolated tails were corrected where general population hazards were greater than those estimated for SOT and if long-term pediatric hazards were lower than adult projections.

Results: Survival data for 33,149 kidney, 11,123 liver, 2,617 heart, and 2,426 lung transplants were analyzed. Flexible cubic splines fit best due to complex hazards. Survival was longest following kidney transplant and shortest following lung transplant. Mean overall survival estimates for pediatric and adult populations were 50.6 and 23.5 years for kidney, 44.2 and 17.5 for liver, and 28.8 and 17.0 for heart transplants. Mean overall survival estimates following lung transplantation (all patients) was 8.7 years.

Discussion: Lifetime survival projections following SOT estimated by this analysis can be used by decision makers where means are preferred over medians (e.g., population projections, budgetary estimates, cost-effectiveness models).

P56

Adopting a personalised approach in the H&I laboratory eliminates delays to deceased donor transplant surgery for 12 months

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Introduction: With increasing numbers of DCD and extended criteria donors, minimisation of cold ischaemic time is key to maximising the number of kidneys suitable for transplantation and optimising outcomes. The availability of a cross match result before a kidney arrives in the transplant centre avoids the need to reship organs in the event of an unexpectedly positive result. In 2018, NHSBT convened a national meeting to address this.

Methods: The local H&I laboratory adopts a personalised approach to potential transplant recipients. There are three pathways:

1. Suitable for virtual cross match
2. Unsuitable for virtual cross match, may proceed with Luminex testing
3. Unsuitable for virtual cross match, requires prospective cross match

The latter categories are used for re-transplant candidates (15% of waiting list), highly sensitised patients, patients for whom higher immunological risk transplantation is being considered and those with invalid Luminex results. For complex patients, surrogate cross matching allows prediction of the cross match result in the event of an offer. All deceased donor transplants performed in a 12 month period were reviewed.

Results: Fifty deceased donor transplants were performed; 39 (78%) proceeded following a virtual cross match. Of the remaining 11 patients, seven were highly sensitised, six were re-transplant patients and two had an invalid Luminex result. Seven transplants proceeded following day of transplant Luminex Single Antigen Bead testing (+/- confirmation of donor type); prospective cross matching was performed in four cases. In all four, this was performed on peripheral blood which was transported to the laboratory prior to organ retrieval. In all cases, the cross match result was available at the time of organ arrival.

Discussion: A personalised approach has eliminated delays to transplant theatre from an immunological perspective. This is a key component of minimising cold ischaemic time, allows timely deceased donor transplantation and optimises transplant outcomes.

P57

Is a retrospective crossmatch necessary for unsensitised patients who had a kidney transplant on the basis of a negative virtual crossmatch? A single centre experience

Ms Sinthujah Jeganathan[1,2], Ms Katie Butler[1,2], Ms Sara Edwards[1,2], Ms Kylara Hassall[1,2], Mr Graham Shirling[1,2], Dr Raymond Fernando[1,2], Dr Henry Stephens[1,2], Dr Mark Harber[2], Mr Neal Banga[2], Dr Gareth Jones[2]

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Introduction: The virtual crossmatch (vXM) is increasingly used to perform pre-transplant immunological risk-assessments prior to kidney transplantation. This risk-assessment is performed on the basis of the donor and recipient HLA types together with the HLA antibody screening history of the patient. If no donor specific antibodies (DSA) are identified, the vXM is deemed negative and the implantation may proceed. The advantages of the vXM include minimising cold ischaemia time (CIT), improving transplant logistics and reducing laboratory testing out-of-hours. In our centre, vXM recipient inclusion criteria are first transplant patients who have screened negative for HLA antibodies over a year, are screened within 3 months of the organ offer and have not experienced a potential HLA sensitisation event since the last screen. For all vXMs, a retrospective crossmatch (rXM) using donor and recipient lymphocytes was performed within 24-48h.

Methods: Data from vXM and rXM over 5 years was analysed together with data regarding de-novo DSA, rejection and graft survival.

Results: During the 5 years, 150 vXM were performed on 150 recipients. None of the rXM were T cell positive. 7 were allo B cell positive; of these, 6 were also auto B cell rXM positive. One patient developed de-novo DSA and one had a biopsy-proven rejection episode. For this cohort, death-censored graft survival was 95% with a mean eGFR of 51 ml/min at last review and the mean (minimum-maximum) follow-up period was 27 (3-60) months.

Discussion: This study demonstrated a good correlation between the vXM and rXM results, in a select group of patients. Performing an rXM did not predict the development of DSA, rejection or graft loss and therefore could be safely omitted. This would negate the need for antibody screening out-of-hours and would have saved £38,328 over 5 years.

P58

A case where antibody-mediated Interference of flow-cytometer crossmatch and Luminex HLA antibody identification assays, undermined the interpretation of results and the pre-transplant immunological risk assessment, in a renal re-transplant patient

Ms Katie Butler[1,2], Dr Raymond Fernando[1,2], Ms Sara Edwards[1,2], Ms Kylara Hassall[1,2], Ms Sinthujah Jeganathan[1,2], Mr Graham Shirling[1,2], Dr Peter Dupont[2], Mr Neal Banga[2], Dr Henry Stephens[1,2]

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Introduction: Pre-transplant crossmatching and the detection of donor specific HLA antibodies (DSA) are essential to perform a valid pre-transplant immunological risk assessment. Here we report a case where the interpretation of the pre-transplant flow crossmatch (FCXM) and Luminex single antigen bead (SAB) assay were compromised by an unknown antibody, potentially masking underlying DSA.

A 22-year-old male was evaluated for renal re-transplantation after his previous graft failed in April 2018. The patient underwent a metallic, aortic and mitral valve replacement in February 2018. During his transplant work-up, high levels of non-specific background were observed in single antigen bead HLA antibody specificity identification assays (SAB). When a flow-cytometric crossmatch (FCXM) was performed, it resulted in an extremely strongly positive allo and auto B cell FCXM.

Methods: Patient serum was pre-incubated repeatedly with Adsorb Out™ (AO) beads (total of x3 absorptions) and re-tested on Luminex SAB. The FCXM was repeated with untreated serum, using New Born Calf Serum (NBCS)-free wash buffer.

Results: Pre-treatment of serum with AO and omission of NBCS from the wash buffer allowed proper interpretation of the SAB and FCXM assays respectively. No DSA were identified and the FCXM was negative.

Conclusion: Our results show that an antibody in the patient's serum, probably induced by his metallic valve replacement, reacted with the blocking agents used in both assays (NBCS in the FCXM and Bovine Serum Albumin (BSA) in SAB). NBCS is added to the FCXM wash buffer, in part to reduce non-specific binding of the detection antibody to cell surfaces. NBCS-free wash buffer resulted in a negative FCXM. Pre-treating serum with BSA-blocked AO beads, eliminated the non-specific background. No DSA was detected. The patient was successfully transplanted despite technically challenging surgery in August 2019. The patient is currently 3 months post-transplant and has an eGFR of 82 ml/min and remains well.

P59

Predictors of complement-dependent cytotoxicity and T-cell flow-cytometry crossmatch positivity in potential live donor kidney recipients with preformed donor-specific antibodies

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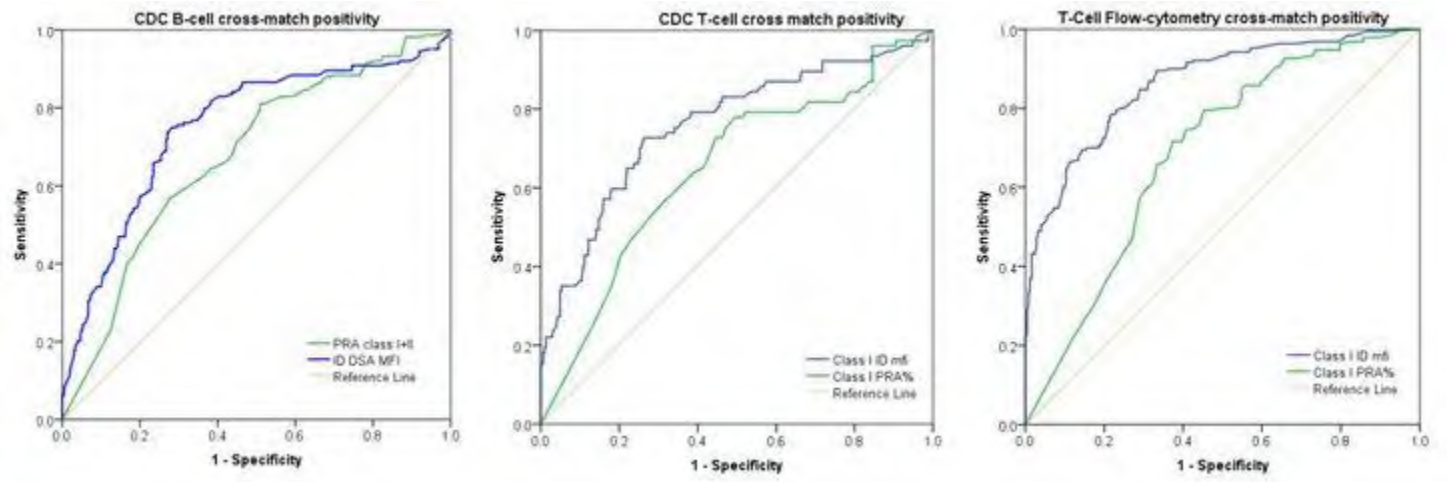
Introduction: prospective physical crossmatch is routinely performed as part of living donor work-up in most Transplant Centres. In light of the high costs compared to a virtual crossmatch, its utility has been recently questioned. However, this has not been extensively investigated in the settings of live donor transplantation workup of recipients with preformed donor-specific antibodies (DSA).

Methods: retrospective analysis of the unseparated (uCDC), B-cell (BCDC) and T-cell Complement-Dependent Cytotoxicity crossmatch (TCDC), and T-cell Flow-cytometry crossmatch (TFXM) between potential live kidney donors and their recipients with a preformed DSA detected by single antigen Luminex assay.

Results: 605 DSA-positive crossmatches for a total of 315 potential recipients were performed between April 2009 and October 2018. The number of DSAs was an independent predictor for uCDC positivity, regardless of the class of the DSA or the combination of DSA classes. The number of class I DSAs, the degree of sensitization expressed as panel reactive antibody (PRA%) against class I HLA and the relationship with the donor, namely mother receiving from child, were highly significant predictors of TFXM positivity. Both the degree of sensitization and the mfi of the immunodominant (ID) DSA positively correlated with uCDC, BCDC, TCDC and FTXM positivity, with ID DSA mfi showing superior diagnostic accuracy compared to PRA% (Figure). The best diagnostic cut-off of the ID DSA mfi was 5,550 for BCDC (any class) and TCDC (class I DSA) positivity, and 3,775 (class I DSA) for TFXM positivity. The best diagnostic cut-off of the PRA% was 82.5% for BCDC (PRA class I+II) and 84.5% for TCDC and TFXM (class I).



Discussion: These findings could help simplifying the process of live donor selection and the stratification of the risk of crossmatch positivity, thus guiding in the choice for virtual versus prospective crossmatch in live donor kidney transplant evaluation.

P60

The risk of allograft rejection according to HLA mismatch level prior to the change in the UK renal transplant matching scheme

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Background: The previous UK renal transplant donor-recipient HLA matching scheme has been operating since 2006. Cadaver donor HLA-A, -B and –DR mismatches (mm) are ranked into 4 levels in the national matching run. Level 1 (000mm) is the best match and Level 4 the worst match, with the algorithm weighted for better matching of broad HLA-DR and –B antigens.

Methods: We retrospectively collected data from 1,327 kidney transplants from the Royal Free Hospital renal unit transplanted between 2006 - 2017, approximately 80% of these grafts were from cadaver donors.

Results: 14.1% of these individuals had at least one episode of biopsy-proven cellular/vascular rejection within the first 6 months of transplantation, despite standard immunosuppression with Basiliximab induction, early steroid withdrawal, tacrolimus and mycophenolate mofetil maintenance. We stratified the relative frequency of rejection episodes according to UK HLA match level 1-4 and tested for association with univariate analyses using the Chi-Square test for heterogeneity to generate Odds Ratios with 95% confidence intervals (CI). Initially a 4x2 comparison of match Levels 1-4 versus the presence or absence of rejection generated a combined Chi-Square of 8.8, P = 0.031 (3 degrees of freedom). Testing the relative frequency of rejection episodes in the better matched grafts (10.6% in HLA match Levels 1 and 2 combined) versus the less well matched grafts (15.9% in Levels 3 and 4 combined) generated an OR of 0.63 (95% CI = 0.44<OR<0.91). Similarly, comparing Level 1 best matched grafts (7.0%) versus the equivalent rejection frequency in Level 4 worst matched grafts (17.7%) generated a significant OR of 0.35 (95% CI = 0.14<OR<0.87).

Conclusion: There is a clear and significant inverse trend between the relative frequency of rejection and better HLA matching as defined by the previous UK renal transplant donor-recipient matching scheme, despite the availability of modern immunosuppressive therapy to control organ rejection.

P61

A population based cohort study to examine the effects of single antigen bead (SAB) assay modifications on the prozone effect when detecting HLA-specific antibody in renal transplant recipients

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Introduction: The prozone effect is a well described phenomenon that can result in false negative reporting of HLA-specific antibody when using SAB testing. Assay modifications have been described including EDTA, serial dilutions and C1q testing. We describe a modification using a Biotin-Streptavidin complex (BSC) and compare it to the standard assay, EDTA, and a fixed 1 in 10 dilution in a population of transplant recipients from a single centre.

Methods: Patients were recruited to the study who were transplanted in our centre between 2009-2014. Prospectively stored post-transplant serum initially underwent a Labscreen assay and those positive for class I HLA-specific antibody underwent SAB testing and the assay modifications described above using the Luminex platform.

Results: Class I SAB, EDTA, BSC and 1 in 10 dilution results from 117 renal transplant recipients, amounting to 11,349 data points, were analysed. Linear regression of the long transformed median fluorescence intensities (MFI) was performed between the standard, EDTA and BSC assays (see figure 1) and 95% prediction limits (PI) calculated. Two hundred and thirty four outlier bead pairs were identified for corroboration with a fixed 1 in 10 dilution for the EDTA assay and 167 for the BSC assay. Linear regression for these outliers showed a R^2 of 0.7505 and 0.6245 for EDTA and BSC respectively when compared to a 1 in 10 dilution. EDTA values were consistently higher when compared to BSC (see figure 2).

Discussion: In a population based study, approximately a third of patients positive for Class I HLA-specific antibody will have a least one result affected by prozone as defined by 95% PIs. EDTA and BSC both appear effective at ameliorating the effects of prozone. Using a fixed 1 in 10 dilution as a non-chemically altered control, EDTA appears to have greater efficacy compared to BSC.

Figure 1:

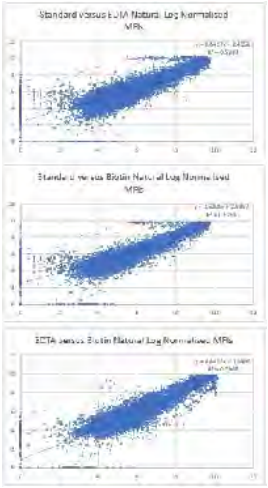
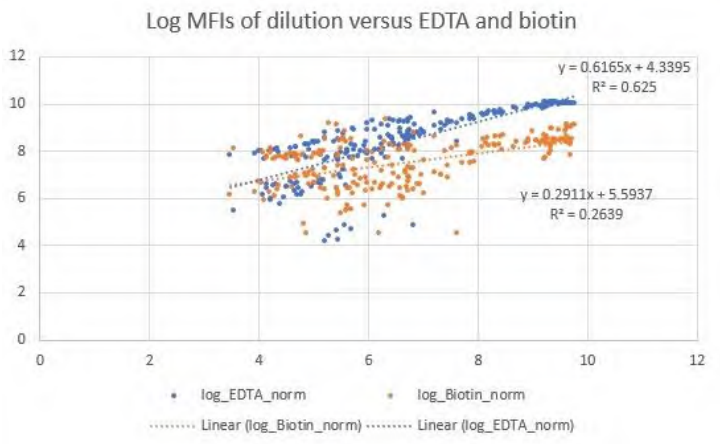


Figure 2:



P62

Influence of human leukocyte antigen status and gender of positive crossmatch patients on long-term survival outcomes of antibody incompatible renal transplantation

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Introduction: Human Leukocyte Antigen (HLA) sensitization is a significant obstacle which limits the use of renal transplantation, but it is an alternative treatment option for patients who are on transplant wait-list since longtime. It is therefore essential to investigate the factors affecting the long-term graft survival, which include type of pre-transplant HLA antibody class and gender of the crossmatch positive subjects.

Methods: 130 patients who underwent HLA incompatible renal transplantation between the years 2003 and 2018 at 'X' hospital only were included in this retrospective, single-center study. Patients were categorized into HLA class-I, class-II, class-I&II and low-level HLA antibody groups to determine the effect HLA antibody class and their levels on the graft survival of the patients. Patients with flow cytometry, microbead and Complement Dependent Cytotoxicity (CDC) positive crossmatches were further divided into two groups based on their gender to determine it's influence on long-term graft survival.

Results: The overall patient and graft survival after 10-years post-transplantation was 69.5% and 67.1% respectively. Graft survival for HLA class-I, class-II, class-I&II and low-level antibody groups after 10-years was 64.6%, 43.9%, 63.2% and 69.7% respectively. The graft survival for flow positive female and male patients after 10-years was 74.3% and 60.5% respectively. The graft survival for microbead positive female and male patients after 10-years was 69.1% and 80.2% respectively. The graft survival for CDC positive female and male patients after 10-years was 15% and 67.1% respectively, *P<0.05.

Discussion: This study concludes that patient's with low HLA antibodies show better long-term graft survival. Whereas, patients with HLA class-II antibodies alone show worse long-term graft survival. CDC positive female patients were observed to show significantly worse long-term graft survival probabilities when compared to that of CDC positive male patients. Presence of preformed DR-Antibody subclass in CDC positive female patients results in very poor long-term graft survival outcomes.

P63

Autosomal dominant polycystic kidney disease is a risk factor for post-transplantation diabetes mellitus: updated systematic review and meta-analysis

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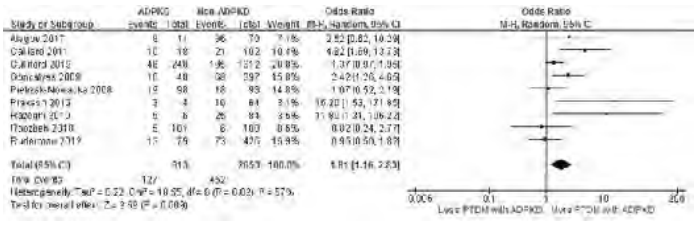
Introduction: Post-transplantation diabetes mellitus (PTDM) is common following kidney transplantation and increases mortality risk. As the fourth leading cause of end stage kidney disease in Europe, autosomal dominant polycystic kidney disease (ADPKD) is present in many kidney transplant recipients. There is currently no consensus whether ADPKD is a risk factor for developing PTDM, with previous studies showing conflicting results regarding any association, which makes well-informed patient counselling difficult. We investigated the incidence of PTDM in a single transplant centre and updated a systematic review and meta-analysis, to ascertain whether an association between ADPKD and PTDM exists.

Methods: We initially performed a retrospective analysis of 1560 non-diabetic kidney transplant recipients between 2007 and 2018 at a single-centre, of whom 248 (15.9%) had a diagnosis of ADPKD. Data was collected from electronic patient records, with PTDM diagnosis established based on international Consensus guidelines. Secondly, an updated systematic review and meta-analysis was undertaken.

Results: At our centre, a significantly increased risk of PTDM was observed in ADPKD vs. non-ADPKD kidney transplant recipients (19.4% vs. 14.9% respectively, p=0.048). This significance was not confirmed after baseline variable adjustment. There were no other differences in clinical outcomes between groups. Systematic review of the literature found 14 relevant cohort studies, 8 of which used international Consensus guidelines to diagnose PTDM. After including our results, we observed increased odds of developing PTDM in ADPKD kidney transplant recipients when all studies were included (Fig.1, OR 1.98, 95% confidence interval 1.43-2.75), and when study inclusion was restricted based on PTDM diagnostic criteria (Fig.2, OR 1.81, 95% confidence interval 1.16-2.83).

Discussion: Patients with a diagnosis of ADPKD aiming to receive kidney transplantation should be counselled about their increased risk of PTDM and measures available to mitigate this risk. Further work is warranted to investigate the underlying pathophysiology behind the association between ADPKD and PTDM.



P64

Late CMV infection is not associated with worse outcomes than early CMV infection after kidney transplantation; case series study

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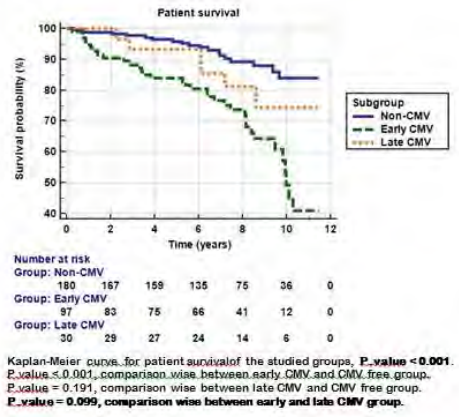
Background: CMV infection remains the most common viral infection post-kidney transplantation. Whether early or late CMV infection has different circumstances as regard predictors and outcomes over kidney transplant recipients is still an area of debate.

Method: We adopted the definition of early CMV as first detected CMV infection episode before 6 months after kidney transplantation, and late CMV as first detected CMV infection episode beyond that. This is a comparative retrospective case series study of (30) kidney transplant recipients who developed late CMV compared to early CMV group (n= 97) and CMV free group (n= 180) within time frame between 1st January 2008 till 31th December 2013. Data was recruited from Sheffield kidney institute patient database, UK. We studied clinical outcomes after kidney transplantation including; hypertension (HTN), DM, malignancies, infections, patient and graft survival. Comparative analysis of these variables was carried out between the three groups. Kaplan-Meier curves were used to assess patient and graft survival.

Results: Our study demonstrated that pre-transplant DM was a significant risk factor for early CMV infection after adjustment of other risk factors. In view of outcomes**,** Late CMV infection showed significantly reduced GFR at 1 and 10 years follow up post-infection when compared to CMV free group (P.value = 0.004, 0.044), respectively. However, there was no significant difference when compared to early CMV group (P.value = 0.490, 0.410), respectively. Furthermore, early CMV group showed significantly reduced patient survival when compared to CMV free group (P.value <0.001), while there's no statistically significant difference when compared to late CMV group (P.value = 0.099). Nevertheless, there's no significant difference between the studied groups as regard graft survival (P.value = 0.759).

Conclusion: Late CMV infection wasn't associated with worse outcomes when compared to early CMV group.

* This work has been made possible through my ISN funded fellowship.



Kaplan-Meier curve for patient survivalof the studied groups, **P_value < 0.001**.
P_value < 0.001, comparison wise between early CMV and CMV free group.
P_value = 0.191, comparison wise between late CMV and CMV free group.
P_value = 0.099, comparison wise between early and late CMV group.

Table: Clinical outcomes of CMV infection/disease over different follow up.

	Non-CMV (n=180)	Early CMV (n=97)	Late CMV (n=27)	P.value
First year				
HTN, n(%)	1 (0.6%)	0	0	1.000
DM, n(%)	3 (1.7%)	0	0	0.673
Malignancy, n(%)	2 (1.1%)	1 (1%)	1 (3.3%)	0.538
Infections, n(%)	134 (74.4%)	74 (76.3%)	14 (46.7%)	0.003*
GFR, ml/min (SD)	57.5 ± 20.8	48.3 ± 22.0	42.9 ± 27.8	< 0.001[1]
Five years				
HTN, n(%)	2 (1.1%)	0	0	1.000
DM, n(%)	5 (2.8%)	4 (4.1%)	0	0.569
Malignancy, n(%)	17 (9.4%)	10 (10.3%)	4 (13.3%)	0.620
Infections, n(%)	109 (60.6%)	57 (58.8%)	23 (76.7%)	0.087
GFR, ml/min (SD)	55.0 ± 24.4	49.1 ± 23.1	44.6 ± 31.8	0.064
Ten years				
HTN, n(%)	1 (0.6%)	0	0	1.000
DM, n(%)	8 (4.4%)	5 (3.9%)	0	0.636
Malignancy, n(%)	23 (12.8%)	12 (12.4%)	2 (6.7%)	0.844
Infections, n(%)	81 (45%)	43 (44.3%)	5 (16.7%)	0.164
GFR, ml/min (SD)	50.5 ± 25.9	43.3 ± 21.0	37.1 ± 20.3	0.006[1]

[1] P.value < 0.001, comparison wise between non-CMV and early CMV group.
P.value = 0.004, between non-CMV and late CMV group.
P.value = 0.490, and between early and late CMV group.

[1] P.value = 0.006, comparison wise between non-CMV and late CMV group.
P.value = 0.092, comparison wise between early CMV and CMV free group.
P.value = 0.410, comparison wise between early and late CMV group.

P65
Kidney transplant recipients with sickle cell trait – is it time for a rethink?

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Introduction: Recent collaborative efforts have resulted in improved renal transplant outcomes for patients with sickle cell disease. However, limited evidence exists on the impact of sickle cell trait (SCT) in renal transplant recipients, with variation in practice in the management of these recipients. A case of primary non-function (PNF) with no obvious aetiology in a patient with SCT led to a review of our institutional data.

Methods: Following the index case, we initiated a retrospective histological review of cases where the aetiology of PNF was unclear. The records of all renal transplants performed between 2009 and 2019 were reviewed to identify recipients with SCT and data collected on patient and graft outcomes.

Results: 25 patients with SCT received a transplant during this period, of which 2 were from living donors. 3/25 (12.0%) patients experienced PNF; two undergoing immediate explant and a third requiring transplant nephrectomy (TxNeph) at 14 days. In the remaining 22 patients, one-year graft survival was 100%, with median eGFR of 41.4 (IQR 38.4-58.8 ml/min/1.73m^2). One-year patient survival was 100%. In the 17/25 patients who achieved 3-year follow-up, graft survival was 88% with median eGFR of 43.2 (IQR 31.8-54 ml/min/1.73m^2).

Histological review of the index case identified sickled red cells in the graft with no other features to account for graft loss. Another of the SCT/PNF patients had similar histological appearances in their TxNeph specimen. We subsequently examined 17 other cases of PNF (with unknown SCT status), and found no evidence of sickled cells in these TxNeph specimens.

Discussion: Review of outcomes in our SCT population suggests a high rate of early graft loss and inferior long-term function. Limited historic data have demonstrated poorer outcomes in SCT, highlighting the need to identify the optimal management of SCT transplant recipients at the time of transplant, and during long term follow up.

P66

Impact of imlifidase on antigen-specific immunoglobulin, memory B cell receptors, and vaccination status.

Dr. Angela Maldonado, Dr. Christian Kjellman, Dr. Sofia Jarnum, Dr. Emma Nordahl, Dr Anna Runstrum, Dr Robert Bockermann, Dr. Markus Roupe, Dr. Lena Winstedt

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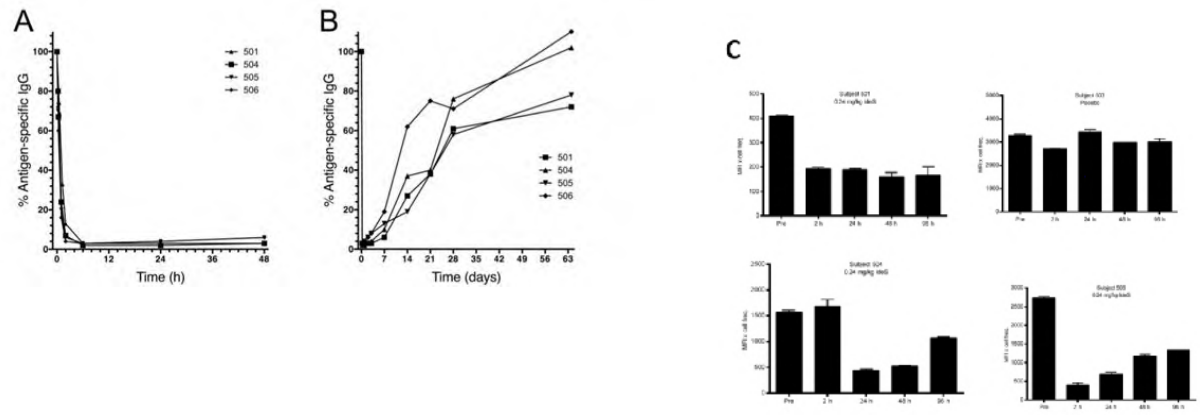
Introduction: Imlifidase cleaves all four subclasses of IgG antibodies into Fc and F (ab')$_2$ fragments resulting in temporary inhibition of IgG-mediated antibody-dependent cellular cytotoxicity and complement-mediated cytotoxicity. Imlifidase cleaves both free IgG and B cell receptors on CD19+/CD27+/IgG+ memory B cells, temporarily rendering them unable to bind and respond to their specific antigen. We aim to assess and clarify the impact of imlifidase on antigen-specific immunoglobulins (ASIgG).

Methods: Post-hoc analysis of healthy male subjects who received imlifidase in a phase I, first in man study were analyzed for recovery of ASIgG as well as IgG-type CD19+ memory B cell receptor cleavage (BCR) and activity. An ELISA assay was developed and used to detect IgG-response against diphtheria, tetanus, pertussis, polio, and Haemophilus influenzae type b (antigens in Pentavac vaccine). PBMCs were stained for CD19 and F (ab') 2/Fc-fragments (CaptureSelect, Jackson, Immunotools) and analyzed using flow cytometry.

Results: All 4 tested subjects demonstrated pre-formed IgG against vaccine components. Imlifidase rapidly and effectively cleaved ASIgG and reappearance of ASIgG followed reappearance of total IgG (Figure A and B). There were no significant differences in the cleavage and recovery of the IgG antibodies against these antigens compared to total IgG. All subjects had fully recovered ASIgG at the time when the IgG pool was back to pre-imlifidase levels. Cleavage of IgG-BCR on CD19+ B cells was observed in all subjects in the BCR analysis shown by a significant loss of the F(ab')2 staining on the surface of CD19+ cells 24 hours postdosing. Intact IgG-BCR started to reappear around day 4 (Figure C).

Discussion: In this analysis, there were no signals indicating a deficiency in the return of ASIgG following imlifidase nor the restoration of IgG-BCR on CD19+ B cells negating the need for revaccination of the studied antigens.



P67

Factors affecting medication adherence in kidney transplant patients, what impact does health literacy play

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Introduction: Kidney transplantation outcomes depend on medication adherence. This study aims to determine factors affecting adherence, focusing on health literacy.

Method: We recruited 68 patients over 12 months post-transplant between 2017 and 2019. They were divided into four categories based on variability of historical tacrolimus levels: very low (LLV; n=6), low (LV; n=28), high (HV; n=19) and very high variance (HHV; n=15). There were equivalent rates of self-medicating across all groups. Patients completed questionnaires, including the Rapid Estimate of Adult Literacy in Medicine – Revised (REALM-R) and Single Item Literacy Score (SILS). These scores identify patients' at risk of poor health literacy with REALM-R score of <6 and SILS responses of 'sometimes/ often/ always needing help to read medical instructions'. The medication adherence report scale (MARS) was used to identify intentional and non-intentional non-adherence (INA; NINA). A hand device was used to monitor tacrolimus dosing schedules.

Results: A higher level of education looks like a significant factor towards adherence: 20% of the HHV group leaving school by age 16 vs 0% in the LLV group. English as a first language is less significant, with 73% of the HHV group being native English speakers. The results show higher REALM-R scores (>6) in patients with higher variability (50-80% of HV and HHV groups). The SILS tool did not show a significant difference in results. As expected MARS showed a lower degree of NINA in the LLV group, however INA did not vary significantly across the groups. Markers of engaging with their health condition, such as internet searches, were greater in the LLV group.

Discussion: Higher levels of education correlated to improved adherence. However, the lack of English as a first language and poor health literacy risk were not associated with poor adherence. This could be related to confounding factors such as better social support in this group.

P68

A single centre experience of conversion from immediate release tacrolimus (IR-Tac) to extended release Envarsus

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Background: IR-Tac is first line maintenance immunosuppression in kidney transplant recipients. Its rapid absorption of 1-2 hours can lead to peak levels (Tmax) within the toxic range and unpredictable tacrolimus metabolism. Envarsus®, an extended release formulation of tacrolimus, utilises Meltdose technology to distribute distally in the gut, leading to 30% lower daily dosage and prolonging Tmax to 6 hours, producing lower variation in levels. We describes patient outcomes following conversion to Envarsus®.

Methods: We retrospectively identified patients converted to Envarsus® from IR-Tac at the Royal Free hospital and analysed the demographics, conversion reason, blood pressures and kidney function.

Results: 132 patients were identified between 2016 and 2019; 44.6% were of African origin, 26.5% caucasian, 20.4% Asian and 7.5% of mixed race. Reasons for conversion included: non-adherence (16.6%), ADRs (21.2%) and high variability in levels or high dose requirements (50.7%). The average conversion factor of IR-Tac to Envarsus was 0.8. Over 3 months, 89 (67%) patients required dose adjustments to remain therapeutic; 64% were down-titrated and 36% were up-titrated. 79% (n=105) had therapeutic levels 1-month post-switch. At 3 months, the average dose of Envarsus® was 0.67mg/day less than the conversion dose; however, 5% of patients had not achieved a steady level. There was no significant difference in blood pressure and renal function at 3 months. Patients converted due to high IR-Tac dose requirements had significant improvement in serum creatinine and eGFR from 170.9µmol/L and 40.9ml/min/1.73m^{2}to 157.6µmol/L and 44.3ml/min/1.73m^2 (p=0.044; 0.045). There was no inter-racial variation. 4 patients developed rejection between 8 and 27 months post-conversion.

Discussion: Envarsus® conversion is safe and not associated with inferior outcomes. Most patients achieved stable dosing within 3 months and subsequently required dose reduction. Although there is no clear impact on blood pressure and eGFR, conversion may benefit patients requiring high doses of IR-Tac who have high peak levels.

P69
Impact of frailty on early and late hospital readmission after kidney transplantation

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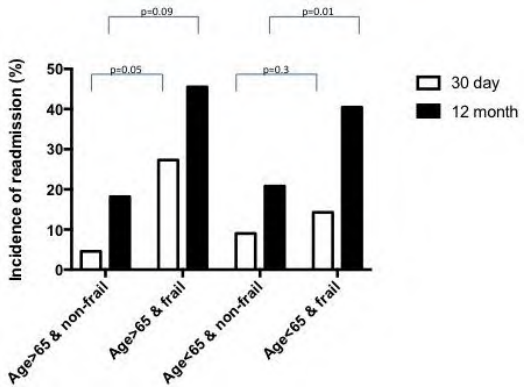
Introduction: Currently there are no tools to predict outcomes after kidney transplantation (KTx). This study assesses whether frailty influences post-KTx complications. Understanding frailty and its effect on outcomes has significant implications for patient education and clinical management, including the listing of patients for KTx as a treatment option.

Methods: We performed a retrospective, observational cohort study of KTx patients in our centre from 2016-2019. The pre-transplant Rockwood Clinical Frailty Score (CFS) was assessed on risk factors covering major domains of functioning and were categorized as follows: 1-3 (non-frail; group 1) and 4-6 (frail; group 2). Outcomes measured were: 30d mortality, 30d and 1yr readmission rates, death-censored graft survival and patient survival.

Results: 219 patients met our inclusion criteria, with mean age at KTx of 50.5 +/- 13.2 (n=166) and 55.7 +/- 13.3 (n=53) in groups 1 and 2 respectively, p=0.01. The median time on dialysis was 2.3yrs (IQR 1.08-4.28) vs 2.6yrs (IQR 1.38-5.07); p=0.14. Two patients died within 30 days in both groups. Overall rates of readmission at 30d and 1yr were 21.7% and 50.6% vs. 32.1% and 70% (p=0.12 and 0.01, respectively); those related to an infective cause at 30 days were 8.4% and 17% (group 1 vs group 2; p=0.07) and 20.5% and 41.5% at 1yr (group 1 vs group 2; p=0.002). Frail recipients, irrespective of their age, were much more likely to experience readmission due to post-transplant infections (30d: 4.5% vs. 27.3% & 12m: 18.2% vs. 45.5%, p=0.05 and p=0.09, respectively for recipients >65 years); see Figure 1. Unadjusted death-censored graft survival was similar for both groups but patient survival at 3yrs was 96.2% and 85.1% respectively (p=0.02, log-rank test).

Discussion: Regardless of age, frailty is a risk factor for post-KTx morbidity. Identifying frail KTx recipients might allow for targeted outpatient monitoring and intervention to reduce hospital readmission rates.

Figure 1. Incidence of infection-related hospital readmission



P70
Outcomes of early versus late rejection in kidney transplant recipients

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Background: Advances in immunosuppression have resulted in significantly improved acute rejection rates and short-term renal graft survival. Several studies have suggested that late rejection (LR) has a poorer effect on long-term graft survival than early rejection (ER). The aim of this study was to investigate the relative impact of ER and LR on graft function.

Methods: We performed a retrospective analysis of 1,327 patients who underwent kidney transplantation at our centre between 2006 and 2017 (excluding ABO incompatible transplants). ER and LR were defined as biopsy-proven rejection before and after 3 months respectively. We compared the following outcomes: overall patient survival, death censored graft survival (defined as return to dialysis or re-transplantation), and change in eGFR.

Results: Of the 1,327 patients, 157 (11.8%) had biopsy proven rejection, with 122 (77.7%) sustaining ER and 35 (22.3%) with LR. There was no significant difference in unadjusted patient survival between the two groups (p=0.66; see figure 1); death-censored graft survival was lower after LR at 10 years (p=0.23; see figure 2). Recipients with ER sustained a lower fall in eGFR from baseline (mean change of -6.4ml/min/m^2vs -16.2ml/min/m^2at 1yr, p=0.002) after 1 year. At 3 years from time of diagnosis, recipients with LR had a 26.9% reduction in their baseline eGFR compared to 10.2% in the ER group (p=0.02).

Conclusion: Rejection occurring beyond three months post transplantation is associated with a significantly greater decline in eGFR one year after an episode of rejection compared with early rejection. This difference is further emphasised at three years. Factors implicated in LR, such as non-compliance with medications, need further investigation. Given the worse outcomes following LR, a greater emphasis needs to be made on efforts to predict and prevent recipients at risk of late rejection in order to avoid subsequent graft failure.

Figure 1

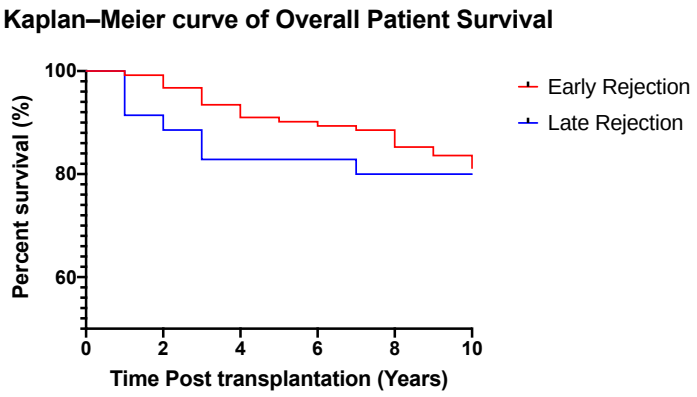
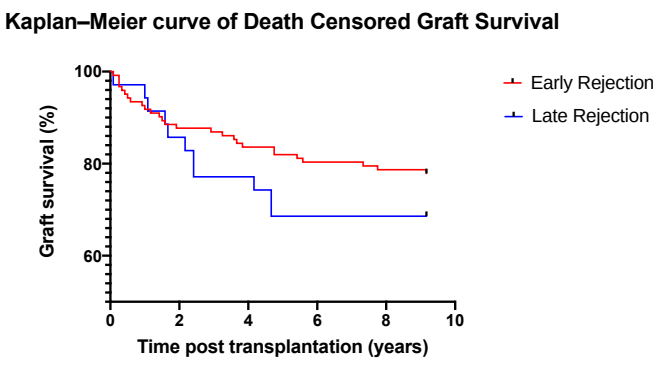


Figure 2



P71

Early post-transplant blood transfusions are common and independently associated with allograft failure: results of a multicentre study

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Introduction: The clinical impact of post-transplant blood transfusions has been inconsistently reported in the literature. Inter-centre variation in clinical practices and patient demographics may contribute to conflicting outcomes. In this study, performed as part of a NHSBT and BTS national working group, we aim to review the incidence of blood product transfusion and allograft outcomes across 4 centres.

Methods: Patients receiving a renal transplant between 2016–2017 at Cambridge, Guys, Imperial and Oxford were included. The blood service at each unit confirmed the transfusion status for each individual up to a year post transplant. The collated data was analysed against nationally collected outcomes by NHSBT statistics department.

Results: 221/723(30.6%) of transplant recipients were transfused, with comparable transfusion rates between the units. 189/723(26.1%) of patients received blood products only, 25/723(3.5%) received both blood and platelets, whilst only 7/23(1%) received platelets alone. Transfusions commonly occurred within the first week post-transplant [median time of 4 days (IQR: 0-12)]. Transfused patients were older ($p<0.01$), female (100/221(45%),$p<0.01$), non-Caucasian (96/221 (43%), $p<0.01$) and waited longer for a transplant ($p=0.001$). They were more likely to receive kidneys from older donors ($p<0.01$) with a higher UKKDRI ($p<0.01$) with a longer cold ischaemic time ($p<0.01$). Graft outcomes were inferior in the transfused group, who were more likely to have delayed graft function ($p<0.01$) and a lower eGFR at 3 and 12-month time points ($p<0.01$). After risk adjusting for recognised factors associated with allograft loss, transfusion was found to be independently associated with graft failure; HR: 3.33 (1.65-6.71), $p=0.0008$, which was further analysed by transfusion with blood-only (HR: 2.69 (1.26-5.72), $p=0.01$), and blood and platelets together (HR:11.13 (4.26 – 29.08), $p<0.001$).

Conclusion: Transfusions are common in the acute post-transplant period and independently associated with inferior outcomes. Further studies are required to delineate the mechanisms associated with adverse outcomes.

P72

BK polyomavirus (BKV) practice patterns in the UK – results from a survey of UK renal centres conducted in 2018

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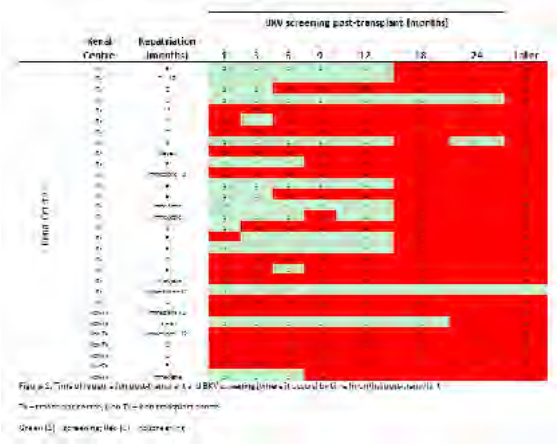
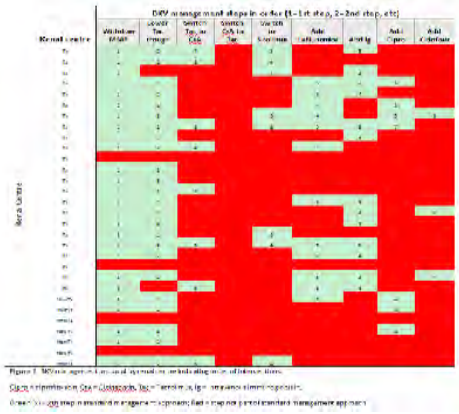
Introduction: BK virus (BKV) reactivation following kidney transplantation can cause the development of an associated nephropathy risking graft damage and loss. Guidelines reflect a lack of evidence on optimal strategies in screening and managing BKV and we sought to assess UK practice patterns.

Methods: A multiple-choice web-based practice pattern survey was circulated to clinical leads at the 71 UK adult renal centres, including 23 transplant centres.

Results: All 23 transplant centres and 7 non-transplant centres returned the survey. For standard risk first transplants (of all donor types):

- most transplant centres used either basiliximab (16/23) or alemtuzumab (Campath) (5/23) induction.
- 17/23 centres used dual maintenance MMF and tacrolimus but steroid regimens varied.
- timing of repatriation to referring centre post-transplant varied considerably (fig 1).
- 16/23 transplant centres performed routine screening (plasma BKV DNA PCR), but timing and frequency varied (fig 1).
- despite all receiving patients repatriated from screening transplant centres, only 2/7 non-transplant centres screened for BKV.
- 17/23 would only biopsy if significant viraemia was associated with graft dysfunction.
- 26 centres had a documented approach to management – all centres lowered immunosuppression with variable use of specific agents (fig 2).





Discussion: Over a third of centres take a reactive rather than screening approach, despite BKV reactivation being detectable in over 90% of cases through screening before signs of significant graft dysfunction are evident. Screening did not always extend beyond 6 months post-transplant despite that episodes occur even beyond one year. In managing BK nephropathy, all centres first reduced immunosuppression and the majority would consider using specific agents despite the lack of evidence. A RaDaR (National Registry of Rare Kidney Diseases) group has been created for patients who have experienced BK nephropathy. National data collection will facilitate disease patterns, effectiveness of interventions and analyse the impact of novel agents and prospective trials.

P73
Innovative annual consent training for specialist nurses in organ donation

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Purpose: Redesigning the Specialist Nurse's (SN) annual consent training for organ and tissue donation, to include dynamic, innovative teaching and education methods to achieve our strategic objectives, saving and improving lives.

Method: Specialist Nurses who approach families for consent to donate organs and tissues undertake mandatory annual consent training led by the education team. Historically the one-day course was dedicated to consent theory, roleplay and hospital engagement. Critical review of the training allowed redesigning of a dynamic three-day course reflecting the evolving needs of the SN.

Redesign focused on understanding the driving forces and motivational factors supporting SN when presented with the dual focus of donors, their families and transplant recipients. Hospital engagement is an integral part of collaborative working across hospitals, thus a full day was spent on advanced communications skills including Clean Language (Grove 1989). Confidence was reinforced in previously acquired legal and regulatory requirement knowledge. Role play was replaced with Forum Theatre (Boal 1950), using clinical and non-clinical scenarios, exploring alternative communication strategies, with supporting medical actors. Health and wellbeing with resilience strategies completed the course with emphasis on professional shared practice, peer support networks and organisational strategies.

Conclusions: The review and redesign resulted in a robust flexible three-day course, (Shared Professional Practice Course -SPPC). It is an ever-evolving progressive course, with a solid blue print, allowing for performance indicators to be incorporated, with SN reflecting on abilities, skills, confidence and daily practice actions. The SPPC links theory and practice with nurses developing growth mindsets, multidisciplinary perspectives, personal impact, empathetic leadership, and, to continue to identify personal development opportunities. Anecdotal evidence shows increasing confidence levels in advanced communication skills, leadership and collaborative working, as well as an increase in personal insight and continuous reflection on meeting critical performance indicators.

P74

Do renal transplant recipients need further help from hcp to ask for a living donor – we asked a sample group at a single centre

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Introduction: Receiving a kidney from a living donor is the optimum transplant option, but are kidney recipients happy to ask their families and friends to be their donor? As Healthcare professionals, we needed to think what we could do to assist recipients wanting to start this conversation.

Method: Post transplant recipients were invited to complete a questionnaire asking them a series of multiple-choice questions. They included demographics, type of transplant received and did they ask family about living donation. Questionnaires were completed by willing precipitants at post-transplant outpatient appointments.

Results: 55% of the questionnaires were completed by females with 57% aged >50yrs. The majority 71% had their renal transplant within the last 5 years with a split of 55/45% living donor recipients to deceased donor recipients. For those who did not have a living donor more than half did not wish to ask a family/friend to donate. Those who did receive a living donor transplant 78% asked their potential donor themselves. However, 56% would have liked a HCP to assist with asking their family/ friend. The person identified to assist with asking was the transplant coordinator.

Discussion: For those who have difficulty starting a conversation with their family regarding living donation further assistance could be offered by the transplant coordination team. Group Transplant Education is done at an early stage in the work up process and potential recipients are encouraged to bring family members with them to learn about transplant options. A leaflet has been developed by the transplant coordination team to share with families and assist in starting living donor transplant conversation.

P75
Reduction in the length of the organ donation pathway

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Introduction: Often the challenges faced in Healthcare are organisational, groups working in silos to achieve their outlined strategies. To successfully change practice for the new organ donation law, true collaboration was required across the organisation. By respecting and recognising the demands of everyone involved would bring about a successful and seamless implementation of a change in practice for Specialist Nurses and external stakeholders.

Methods: Two important factors were required to implement the legislation change for organ donation, an educational programme for staff on what the change means in practice and operational considerations to how the legislation change will impact on service demand, both factors also need to ensure business continuity throughout the change. A team of passionate & enthusiastic Specialist Nurses were appointed, headed by two compassionate leaders; one for Education and Governance, the other for Operations. Compassionate leadership enabled good working relationships, mutual respect and effective communication between the two leaders and the team.

Results: Collaborative team working in a national team of people is difficult to set up and maintain. Some of the team-building, planning and design was through face to face interaction, particularly in the early stages of the project. Tuckman (1965) first identified the stages of group development, for which this team needed to acknowledge and work through in order to be successful; placing honesty, commitment and genuine care for each other at the core.

Conclusion: To reduce the demand on operational teams, training was designed around their ordinary team meeting dates, there was only the requirement to attend one date outside of these dates, as the module provided was designed around sharing practice with national colleagues. External stakeholders have conferences twice yearly, these were utilised to educate participants and all training was provided in collaboration between Education and Operational leads.

P76
Specialist nurse training on the law

Ms Claire Roberts

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Introduction: In Spring 2020, the law around organ and tissue donation changed in England, it was essential all Specialist Nurses (SN) received training to practice lawfully. Collaboration with SN teams in Wales and an education project group were tasked with training SN's and engaging with internal and external stakeholders.

Method: During the planning phases, the essential aspects were measured, considering different pedagogies which could appeal to a variety of learning styles. The training would be delivered in phases, firstly the 'theory of the law'. This entailed reviewing the new Human Tissue Authority (HTA) Codes of Practice (CoP), the current Quality Assurance system was reviewed to reflect the changes required. A module of training was devised using interactive methods, Vlogs of scenarios and technological programmes to engage and motivate staff.

The second module involved the practical elements to how the law impacted on current practice and focused on the conversation's SN's have with donor families. Professional medical actors where used to give feedback and realistic reactions from 'family' members. Using a forum theatre style of role playing allows SN's to practice and try out new phrases and conversations without fear of being watched. Forum theatre allows for discussion and consideration of new communication techniques without the need to use real families.

Results: These training pedagogies were used to ensure the new legislation around organ and tissue donation are taught to SN's taking consent using techniques which appeal to all learning styles and experience of staff were considered. Once completed the initial survey was repeated to evaluate the effectiveness of the training delivered.

Conclusion: It is essential for SN's to comply with legal frameworks provided by the HTA and ensure family experience is enhanced through their experience. Alongside this, transplanting hospitals need to be confident with the expertise of SN's to reduce risk and harm to future recipients.

P77
Experiences at conferences and engaging with stakeholders

Ms Claire Roberts

NHS Blood and Transplant, Leeds, United Kingdom

Introduction: It is of paramount importance that NHS Blood and Transplant (NHSBT) engage with donor hospitals, demonstrating the impact of the Deemed Consent legislation will have on clinical practice. The Legislation Change Project team within NHSBT presented at conferences to deliver their messages. The project team went to a Critical Care Nursing Conference and then an Intensive Care Medicine Conference and used novel ways to present.

Methods: The project team wished to engage with delegates and produce an interactive and interesting session. To do this, a 'choose your own adventure' style demonstration was designed. This incorporated an interactive programme where delegates were posed with questions, guiding how the scene progressed. Professional medical actors played family members and 'real' staff played the Specialist Nurses, 'bedside' Nurse and Doctors. Planning events and rehearsals where scheduled and scripts were written to guide the team.

Throughout the demonstrations the presentations were paused to either 'test delegates knowledge' or allow delegates to 'choose the next step'. A facilitator opened the scene with a narration of what was to occur during the session and ask delegate to sign into the interactive poll to participate. Then an opening scene introduced the patient scenario, pausing at scripted points to allow audience participation.

Results: Moving away from didactic teaching methods and by using an interactive pedagogy allowed important information to be delivered whilst maintaining engagement from delegates. By using professional medical actors and real staff members the experience was as realistic as possible and allowing delegates to guide the adventure ensured participation and a feeling of empowerment for the audience.

Conclusion: With any change to practice, participants of change will embrace and engage if they feel they have had some involvement and choice. By the project team attending these two conferences gave staff in donor hospitals an opportunity to understand the upcoming changes.

P78
Specialist nurse in organ donation (SNOD): training a review and its future

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Introduction: Nurses working within the organ donation field need to be highly skilled and trained to help address the imbalance between the need for organs for transplant and the supply from organ donors. Within NHS Blood and Transplant it was highlighted that there were inconsistencies in training for new SNODs across the country. All SNODs are now recruited and commence employment at the same time, the average training period is six months. During which time SNODs will work in their Organ Donation Services Team and complete a standardised training program. A core competency framework underpins three theory week-long training modules, where SNODs will focus on the key aspects of the donation process supported by the Professional Development team (PDS) and their regional teams.

Methods: Module 1 – Donor Characterisation: Covers donor referral, assessment, reviewing medical information and microbiological testing. This involves quality theoretical and practical training, giving the SNODs a sound initial knowledge base. Module 2 – Approach for Consent / Authorisation: Encompassing advanced communication skills, legislation theory and simulations. Supported by professional actors to give the SNODs the confidence to take these skills into clinical practice. Module 3 – Theatres and Family Care: Focuses on key communication and working with specialist retrieval teams and other key stakeholders. Accurate documentation and packaging of organs for transport. It also incorporates the post donation care given to families. Module 4 – Donor Simulation Course: The SNODs are supported by the PDS Team and participate in scenarios around the donation process within a high-fidelity simulation centre. This technology enhanced learning allows the SNODs to identify gaps in their learning prior to being finally assessed in their regional teams as competent independent practitioners.

Results: Since its implementation in 2015 over 200 SNODs, have successfully completed this modular training.

Discussion: Is modular training the way forward to support all new nurses in the field of organ donation & transplantation?

P79

Designing a new critical care module to support recruitment strategies for nurses working in organ donation

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Introduction: In the United Kingdom the role of specialist nurses in organ donation has evolved over the years. Recruitment came predominantly from nurses with critical care backgrounds due to the required person specification for the role. Nurse vacancies and recruitment challenges offered the opportunity to review the recruitment profile. The new recruitment profile enabled potential applicants to include nurses from non-critical care backgrounds. The design and introduction of the Critical Care Module (CCM) by the Education and Professional Development Team (EPDT) was to ensure our future nurses- Specialist Nurse-Organ Donation (SNOD) and Specialist Requesters (SR) from non-critical care backgrounds were able to develop the necessary critical care proficiencies related to nursing in organ donation.

Methods: A focus group was set up to explore the concept of a CCM, this resulted in workstreams creating course content, guides and competencies. Outputs from a rapid improvement event and focus group recommended an Airway, Breathing, Circulation, Disability and Exposure (ABCDE) approach for the CCM.

Results: A three-day CCM was developed and now run on more than one occasion. The course involves the ABCDE approach using presentations, group work, animations and an adaptation of E to Exposure and Everything else. The CCM is evaluated on each of the three days and post module. The knowledge of the attendees is assessed both pre and post module using a multi-choice questionnaire.

Discussion: Whilst in its infancy, evaluation of the CCM is looking positive from a recruitment perspective, the attendees, the EPDT and organ donation service teams. The CCM will be adapted according to evaluations and requirements of the service. Whilst acknowledging that we are unable to predict our future nursing recruitment pool and financial costs of running the CCM we do have full organisational support to train our nurses to continue to help save and improve more lives through organ donation.

P80
Improving patient engagement towards live kidney donation and renal transplantation

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Introduction: Improving engagement of patients and their families is an essential part of renal transplantation and a well-informed patient often feels empowered to face the challenges in having renal transplantation. Patients do use their consultation along with booklet/DVD/Social media etc. to gather most information and often, express the need for more opportunities to clarify their queries. We organised a patient engagement event (with a multi-professional team including a psychologist and expert patients) to explain all stages involved in live kidney donation and renal transplantation. The patients who are considered suitable for activation in transplant waiting list, potential live donors along with their families are invited to the event. We aimed to share our experience and the impact of this event on our patients.

Methods: Our multi-professional team includes, members delivering various aspects of live donation and renal transplantation, along with a psychologist and expert patients. The programme includes all stages of both procedures. A feedback of the event was collected and the data was analysed to both understand their views and also, improve as warranted.

Results: A total of 250 patients and their families attended the events in the last year and we received feedback from 70.4% (n=176/250) of the attended delegates. Most to the delegates felt a notable improvement of their comprehension of the assessment for live donation and renal transplantation, waiting list, pre-transplant preparation and challenging conversations about live donation.

Discussion: Our format of patient engagement event has improved participation of our patients and their families to their care.

P81

Thymoglobulin (ATG) induction vs Campath vs Simulect in DCD kidneys in UK; the induction choice plays a role after all

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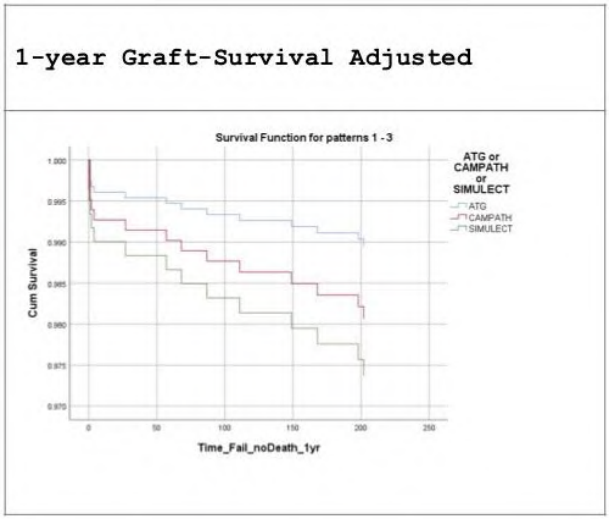
Introduction: DCD kidneys suffer from higher rate of DGF and, often in the UK, come from older donors. **Aim** of this study was to examine the effect of induction immunosuppression in DCD kidneys (ATG vs. Campath vs. Simulect).

Patients and Methods: Raw data of the cohort of DCD patients of the 3C study was obtained from the Sponsor. Prospectively collected data of the patients (140) who received ATG induction for DCD kidneys in a single centre (standard of care in this centre) with the same entry criteria as the 3C were included in the analysis, giving a total of 415 patients. Uncensored for death, 6 month, 1 and 2 years graft survival was the primary outcome, acute rejection and MDRD eGFR secondary outcomes.

Results: There were more male donors in the ATG group (70% vs. 59% in Campath, and 51% in Simulect, p<0.05) and more DR mismatched patients in the ATG (82% vs 71.6% vs. 68%, p<0.05),with no difference in donor, recipient age, CIT. Adjusted, **uncensored for death graft survival**, was higher at 6 months and 1 year in the ATG compared to Campath group (95% CI of **RR of failure or death** for Campath vs ATG at 6 months was 0.86-8.7, p=0.08, and at 1 year 0.85-7.9, p=0.06). 2-year graft survival was 95% in ATG vs. 88% in Campath (**p=0.036**) and 91.5% in Simulect group.

Censored for death graft survival at 1 year is shown below:



Acute rejection was 17% in the Simulect vs. 4.3% in ATG and 6% in Campath group (p<0.001). Donor age >60 (p<0.001), acute rejection (p<0.001), CIT >15hours (p=0.052) were significant for the eGFR at 6 months and 2 years.

Conclusion: ATG induction provides an advantage over Campath in uncensored for death graft survival in DCD transplants and the same advantage as Campath over Simulect in acute rejection.

P82
Setting up a kidney transplant consent clinic

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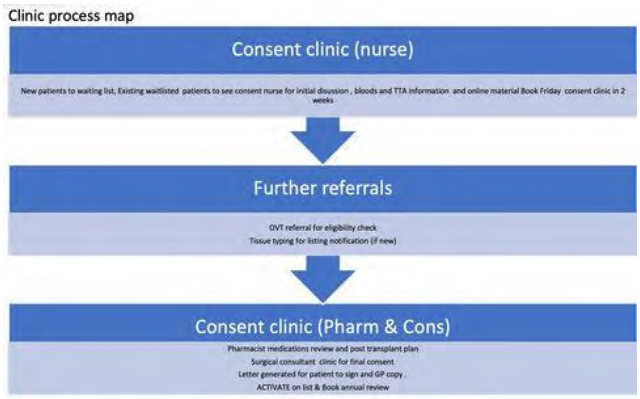
Abstract



Introduction: The UK organ donor pool for kidney transplantation has changed over the past years. While kidney transplantation remains the gold standard treatment of choice in end stage renal disease (ESRD), the risk index of transmissible diseases has also increased. Communicating this risk to patients appropriately early before transplantation is important to allow informed decision making and valid consent.

Methods: A steering group was set up to development a consent clinic. Focus was on delivery of information to all prospective transplant patients (waitlisted and about to be listed) to communicate benefits and risk of transplantation and facilitate a well-informed decision. Information is delivered in clinic consultation discussions, via mini videos and leaflets as well giving out links for patients to read more online. Funding was sourced for mini videos, new patient information leaflets and a new consent pages on electronic system to record patient discussions and wishes. Patients see a nurse in clinic for initial information delivery and take to take away. They are also advised to research more on discussed topics, think and discuss with family before coming back 2-3 weeks later to see a pharmacist for immunosuppression discussions and a consultant surgeon who reassesses patient understanding and record wishes.

Results: Since September 2019, 40 patients have been seen in clinic. Results from a questionnaire found that 72.5% (n=29) of patients found information delivery methods easy to understand for their level of education. 94.6 % (n=35) found information delivered enabled them to participate in decision making for kidney transplantation.

Conclusion: Our experience is that a consent clinic process can facilitate an enjoyable and non-overwhelming process that can aid and support patients in complex decision making for kidney and pancreas transplantation. However further studies on a diverse population are required to get an in-depth understanding of information uptake.

P83
Group consultations are effective for informed consent in renal transplantation

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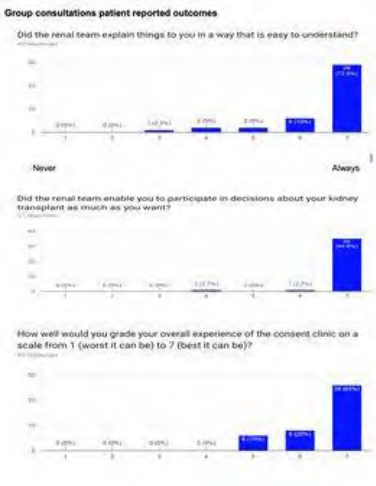
Abstract



Facilitator observed outcomes

Benefits	Non-benefits
Enjoyable for patients	Differences in health literacy levels
More patients can be seen at once avoiding missed appointments and costs	Language barriers leading to poor understanding of discussion points
Reduction in waiting times	Uninterested or disruptive patients
Discussions bounces off other patients' past experiences and knowledge	Potential confidentiality breaches
Family members or friends can attend increasing the chances of living donation	

Introduction: Group consultations are becoming popular within hospitals and primary care sectors of healthcare in the UK. Cost effective and efficacious healthcare delivery methods are particularly important when resources are scarce. We report our outcomes of using group consultation for the purposes of consenting for renal transplantation.

Methods: All patients eligible for the transplant waiting list were enrolled into the consent clinic. The clinic comprises of 3 consultations, initially with a nurse specialist before seeing a transplant pharmacist and a surgical consultant 2 weeks later. The nurse clinic initially saw 4 patients individually, but this changed to a group model, increasing patient numbers to 8 per consultation. Information is delivered and discussed as a group. Blood tests are also taken at this appointment.

Results: Forty patients have been consulted in this clinic to date. Patient reported outcomes were positive. 94.6 % (n=35) found information delivered enabled them to participate in decision making for kidney transplantation while 72.5% (n=29) found information easy to understand. Discussions were enjoyable and reflected off patients' past experiences with information sharing. More patients were seen than previously planned reducing waiting times and missed appointments. Facilitator observed challenges of a group consultation included accommodating for differences in language, health literacy levels and patients with hearing or speech impairments.

Conclusion: Group consultations are enjoyable for participants. They can reduce waiting times and missed appointments are absorbed by the group concept, with financial savings. There is an observed opportunity to recruit living donors as patients bring family and friends to sessions. However, it is difficult to match group participants for information uptake due to language barriers, health literacy differences and hearing or speech impairments. The second appointment of our consent clinics helps in re-assessing individual patient needs before consenting. More research into group consultations is needed to ensure equitable and adequate patient benefits.

P84

The kidney transplant recipient with a failing allograft: focus on preparation for renal replacement therapy

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Introduction: It has been argued that kidney transplant recipients (KTR) with a failing kidney fare worse than transplant-naïve patients approaching renal replacement therapy (RRT). In order to investigate the provision of multidisciplinary care in preparation for RRT, we compared a group of KTRs with failing allografts to transplant-naïve patients with progressive chronic kidney disease at the start of RRT.

Method: We retrospectively reviewed data for all incident new RRT patients between January 2012 and December 2018 at the Sussex Kidney Unit. Patients starting RRT within 90 days of having an eGFR less than 20ml/min were excluded. We looked at counselling for RRT, vascular access on RRT start, and consideration or referral for transplantation workup. T-test and chi-square test were used to compare continuous and non-parametric variables, respectively.

Result: 66 patients with a mean age of 55.4 (+/-14.2) years were included in the KTR group and 871 patients with a mean age of 68.7 (+/-15.3) years in the transplant-naïve group. At the time of RRT start, only 31.8% KTRs were counselled regarding RRT as compared to 62.8% of the transplant-naïve group ($p>0.001$). More transplant-naïve patients started RRT in their chosen modality, (53.4 vs 34.8%, $p=0.004$). 42.4% of KTRs started dialysis on a central line compared to 36.3% ($p=0.004$) and only 47% of KTRs were considered or referred for transplantation workup, compared to 78.4% of the transplant-naïve cohort. ($p<0.001$).

Discussion: It appears that KTRs with failing renal allografts have a high rate of central line use at dialysis initiation; most of them start RRT without counselling and the minority on the modality of their choice. The provision of appropriate multidisciplinary care should be prioritised in KTRs in order to timely prepare this cohort of patients for RRT.

P85

The kidney transplant recipient with a failing allograft: focus on anaemia and bone disease management

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Introduction: It has been argued that patients with a failing kidney transplant fare worse than transplant-naïve patients approaching renal replacement therapy. In order to investigate the management of kidney transplant recipients (KTR) with a failing transplant, we compared their haematology and biochemistry with that of transplant-naïve patients with progressive chronic kidney disease at the start of their renal replacement therapy (RRT).

Method: We retrospectively reviewed haemoglobin, serum calcium, phosphate and PTH for all incident new RRT patients between January 2012 and December 2018 at the Sussex Kidney Unit. Patients starting RRT within 90 days of having an eGFR<20ml/min were excluded. Target ranges for haemoglobin was 100-120 g/l, calcium 2.2-2.5 mmol/l, and phosphate 0.8-18 mmol/l. T-test and chi-square test were used to compare continuous and non-parametric variables, respectively.

Results: 66 patients were included in the KTR group and 871 patients in the transplant-naïve group. Mean age was 68.7 (+/-15.3) years in the LCC group & 55.4 (+/-14.2) years in the transplant group. At RRT start the transplant-naïve group had more patients with a haemoglobin within target than KTR's (42.9 vs 25.8%, p=0.023). Mean haemoglobin (101g/l+/-15.7 vs 94.5g/l+/-21.2, p=0.002), and serum calcium (2.29 mmol/l+/- SD 0.198 vs 2.14 mmol/l +/- 0.256, p<0.001) were higher in the transplant-naïve group whilst serum phosphate was higher (1.69 mmol/l +/- SD 0.547 vs 1.183 mmol/l+/-0.637, p=0.59) and PTH (35.4pmol/l+/-35 vs 61.6pmol/l+/-53, p<0.001) in the KTR group.

Discussion: It appears that transplant-naïve patients approaching renal replacement therapy are better prepared than KTRs in terms of anaemia and CKD-MBD management at RRT start. Management of the complications of progressive transplant failure and timely referral to the appropriate low clearance clinic should be prioritized so that KTR's are not disadvantaged at the start of RRT.

P86
Renal transplant in the over 70s: the belfast outcomes of the first 60

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Introduction: The end-stage renal disease population is increasing, both in number and in age of patients. There were 7756 new starts on renal replacement therapy in 2016, 226 of those in Northern Ireland. The median age of these patients was 66 years old. Previously septuagenarians would not have been considered candidates for renal transplantation.

Methods: All renal transplants from 1st January 2014 until the 31st December 2018 were considered. The data was extracted from the Northern Ireland transplant database, eMED Renal, and the Northern Ireland Electronic Care Summary (NIECR).

Results: There was a total of 581 transplants in the years considered. Of these transplants sixty went to over 70 year-old recipients – 10.3%. (Fourteen going to patients over 75 years old – 2.4%). 1 patient received two transplants as the first was complicated by immediate graft failure. The amount of over 70 recipients has been increasing yearly.

Year	Number >7 0
2014	8 (4 DBD, 2 DCD, 2 LD)
2015	9 (4 DBD, 3 DCD, 2 LD)
2016	11 (0 DBD, 3 DCD, 8 LD)
2017	12 (5 DBD, 2 DCD, 5 LD)
2018	20 (6 DBD, 6 DCD, 8 LD)
Total	60 (19 DBD, 16 DCD, 25 LD)

Table 1: All attempted transplants in >70 in Belfast between 2014 and 2018 inclusive

	Current eGFR					
	>60	45-59	30-44	15-29	<15	TOTAL
2014	2	0	3*	3	0	8
2015	4	1	2*	2	0	9
2016	1	2	5	1	0	9
2017	3	5	1	2	0	11
2018	2	6	9	2	1*	20

Table: Year of transplant and current eGFR of all successful transplant patients <70 years old. *emphysematous E.Coli, initially working however graft subsequently failed and is now back on haemodialysis. ' eGFR at death, cause of death unrelated to transplant

From these transplants, nineteen were donations following brain death (DBD), sixteen were from donation following cardiac death (DCD) and twenty-five were from living donors (LD). In terms of mortality, there have been two deaths among these patients. One died of a gastrointestinal haemorrhage and the other of sudden cardiac death. Regarding morbidity there have been three immediate failed transplants among this group due to a renal vein thrombus in the early post-transplant period and two failure to perfuse. The delayed graft failure was caused by emphysematous E.Coli at the time of transplant.

Discussion: We have seen excellent success with our over 70s transplant population. Carefully selected older patients can benefit from transplantation with good short and medium-term outcomes. At 5 years no living patient had an eGFR below 15. This demonstrates increased quality of life for this population, compared with dialysis. We believe that age alone should not preclude access to renal transplantation.

P87
How big is too big?

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Introduction: Transplantation provides a better survival and quality of life in suitable patients with end-stage renal disease. NICE guidelines in 2018 specified that patients should not be excluded on the basis of BMI alone. Despite this, practice varies throughout the UK and worldwide, with concern regarding outcomes in obese patients. We evaluated outcomes in all patients transplanted in one UK centre with a BMI >40 kg/m^2.

Methods: Records of all renal transplant recipients with BMI >40 kg/m^2 between 01 January 2015 and 31 December 2018 were analysed. The prospectively recorded Renal Transplant Database and electronic care record were interrogated.

Results: There were 484 transplants in this period, 13 (2.7%) of which were in 12 patients with a BMI >40 kg/m^2. Ten (83%) were men, age range 39-61years old. BMI range was 40- 48.4 kg/m^2. Details are outlined below:

Table 1. Mean characteristics

	At transplant	**Post-transplant**				
Age (years)	Weight (kg)	BMI (kg/m^2)	Current weight (kg)	BMI one year post	Total weight loss (kg)	Creatinine one year post Tx (umol/L)
50	139	42.3	129	41.5	62.5	143

There were no cases of primary non-function. Compared to recipients with BMI <40kg/m^2there was an **increase** in**:**

- delayed graft function (67%)
- critical care stay (17%)
- wound complications (3 dehiscence, 4 herniae)
- length of stay (mean 9.3 days)
- new-onset diabetes after transplantation (25%)

There was one early technical graft loss and one sudden cardiac death 5 weeks after transplantation. The majority (73%) of patients lost weight following transplant.

Discussion: Successful transplantation is possible in a carefully selected cohort of patients with BMI >40 kg/m^2. It is associated with increased risk (particularly of delayed graft function and wound complications) which must be balanced with the mortality associated with continued dialysis dependence.

P88

Does renal adjusted prophylaxis predispose to ganciclovir-resistant CMV? Seven years of experience in kidney/SPK transplant recipients

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Introduction: A cluster of ganciclovir resistant CMV cases in kidney and simultaneous pancreas-kidney (SPK) transplant recipients prompted a review of all such cases to identify common factors.

Methods: We conducted a retrospective review recording creatinine clearance, demographics, weight, height, renal function, CMV status, viral loads, resistance detection, transplant type, prophylaxis and immunosuppression regimens, and outcomes. Compliance with local CMV prophylaxis guidelines was audited at initial post-transplant valganciclovir prescription, at hospital discharge and first outpatient appointment.

Results: Our center performs circa 30 SPK transplants and 250 kidney transplants annually. Seven patients developed ganciclovir-resistant CMV between 2012 to 2019, three SPK and four kidney transplants. Six were CMV donor-positive to recipient-negative and developed ganciclovir-resistant virus during their 3 months routine prophylaxis. Close scrutiny indicated that ganciclovir prophylaxis was mostly prescribed according to the manufacturer's guidelines, calculated by Cockcroft Gault (CGCrCl) using ideal body weight. No patient received full-dose prophylaxis, with 5/6 warranting reduced dosage at a frequency of 48 hours or more. All 7 patients had UL97 mutations and one an additional UL54 mutation. Five patients required foscarnet treatment. To date, one has lost their transplanted kidney and another their transplanted pancreas.

Discussion: Despite almost complete guideline adherence, six patients developed resistance while on prophylaxis. Our experience suggests that the recommended doses may not be sufficient for viral suppression, in particular at the 450mg 48-hourly and 450mg twice-weekly valganciclovir regimens recommended at CGCrCl of 25-39ml/min and 10-24ml/min respectively. Based on additional evidence from pharmacokinetic and other studies (Tängdén et al. 2018;57(11) Clin Pharmacokinet.) we propose increasing prophylactic dosing in local guidelines as follows: CGCrCl 15-30ml/min: 450mg valganciclovir daily; CGCrCl >30ml/min: 900mg valganciclovir daily. Potential for cytopenias at these doses can be easily monitored and will be audited.

P89
Enhanced recovery after surgery reduces length of hospital stay in renal transplant recipients

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Introduction: Enhanced recovery after surgery (ERAS) is an established multimodal approach to perioperative care. However, ERAS in renal transplantation isn't common practice. ERAS involving early mobilisation, fluid restriction, opiate minimisation, local anaesthetic wound infiltration and early urinary catheter removal is now implemented in our Unit. The study aim was to assess whether ERAS decreased length of stay (LoS) in renal transplant recipients.

Methods: Outcomes were compared between all consecutive renal transplant recipients in 2010 and consecutive renal transplant recipients in 2018, before and after implementation of ERAS. Data were extracted from a prospectively recorded database. The primary outcome was median LoS in hospital.

Results: There were 73 renal transplants in 2010 and 115 in 2018. Compared to 2010, in 2018 there was a significant increase in donor age (47 vs.54, $p<0.0001$) and donation after circulatory death (0 vs. 29%, $p<0.0001$). Although there was no change in the proportion of living donors (59 vs.50%, $p=0.32$), in 2018 there were more blood group incompatible living donors (0 vs.7%, $p=0.21$). Compared to 2010, in 2018 there was a significant increase in recipient age (43 vs.54, $p=0.0002$), diabetic nephropathy (5 vs.16%, $p=0.03$) and BMI>35kg/m^2 (0 vs.9%, $p=0.02$). Between 2010 and 2018 there was a significant decrease in cold ischemia for deceased donor transplants (1260 vs.669 minutes, $p<0.0001$), and a significant increase in time to graft function across all donor types (10% creatinine drop, 2.6 vs.5.1 days, $p=0.009$). Between 2010 and 2018 there was a significant decrease in LoS from 12 to 7 days ($p<0.0001$). Decreased LoS was observed in the context of a significant increase in discharge creatinine (110 vs.170mmol/L, $p<0.0001$).

Discussion: Implementation of ERAS significantly decreased LoS in renal transplant recipients despite increasingly complex donor and recipient profiles. Poorer graft function at the time of earlier discharge from hospital was not a barrier to reducing LoS.

P90

Urological malignancy in a renal transplant population: outcomes from UK national data analysis

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Introduction: Post-renal transplant malignancy remains a significant cause of co-morbidity and mortality. Urological malignancies, namely kidney, bladder and prostate, contribute significantly to this issue, but to date there is scant evidence in the literature that helps direct management in these often complicated patients. There is also some debate as to the incidence compared to the general population. Our aim was to analyse large scale national data to provide a basis to resolve these issues.

Methods: A total of 22,257 patients undergoing kidney transplantation treated across 20 NHS hospital trusts (no prior urological cancer) were identified from Hospital Episode Statistics APC dataset between 1st April 2008 and 31st March 2019. Longitudinal analysis conducted for 22,122 patients discharged post-transplant (median follow-up 4.6 years, Q1:Q3 3.1:7.4, range 0-11.1yrs). A total of 396,960 hospital admissions from 20,867 patients were recorded. A matched cohort was utilised for comparative analysis. Kaplan Meier analysis used for time to cancer and survival analysis.

Results: Cancer diagnosis were; Prostate 230(1.03% of transplant patients), Kidney 224(1%), Bladder 115(0.52%), upper urinary tract 13(0.05%), unclear urological cancer site 16(0.05%). All-cause mortality was 2456. Urological cancer as main cause for death was 72(3% of deaths). Risk of malignancy was higher in an over 50 age group. Kidney cancer diagnosis was quickest post-transplant, followed by prostate cancer and bladder cancer taking longest to develop. Comparative analysis showed higher incidence of malignancy than the general population.

Discussion: To the best of our knowledge this is the largest cohort of transplant patients with urological malignancy described in the UK. There are some concerns over the accuracy of coding and further work is required to corroborate the incidence data. This provides insights into current incidence and tumour behaviour. It also acts as basis for prospective studies analysing treatments, such as immunosuppression changes, which can affect malignancy.

P91

Removing transplant ureteric stents using the Coloplast Isiris disposable flexible cystoscope and portable monitor

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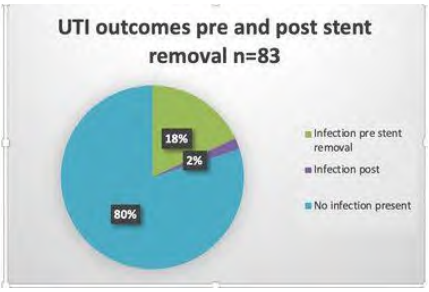

Introduction: In our renal unit, kidney transplant ureteric stents have traditionally been removed in operating theatres using re-usable diagnostic flexible cystoscopes. An ongoing challenge is finding suitable slots between busy elective surgical lists. Delays in stent removals adversely impact urinary tract infection (UTI) rates and unnecessary hospital stays. Our unit pioneered outpatient disposable flexible cystoscope use in a bid to alleviate these issues.

Methods: Kidney transplant recipients had their ureteric stents removed using disposable flexible cystoscopes. Exclusion criteria included patients with complex urethral strictures or peritoneal dialysis catheters scheduled for removal in operating theatres. A cost-benefit analysis of this scheme was conducted. An infection control team assessed equipment and environment suitability for the procedures. Patients are given pre-procedure prophylactic antibiotics and single use flexible cystoscopes are used to remove stents. Ureteric stents are removed by a specialist trained senior nurse or surgical registrar with overall supervision by a consultant transplant urologist. Patients are discharged once they pass urine normally.

Results:
Total stent removals n=102
Coloplast 81% (n=83)
Mounted flexi-cystoscopes 13% (n=13)
Fell out 1% (n=1)
Removed with explanted kidney 3% (n=3)
Removed elsewhere 2% (n=2)
UTI cases pre-stent removal 18% (n=15)
UTI cases post Coloplast stent removal 2% (n=2)
Pain score – average 2.6 out of 10
Urological complications – 0

Discussion: Coloplast disposable stent removals are preferable over day case surgery. There is evidence of less infection, less pain and quicker appointments thereby improving patient experience. Monetary savings are observed on equipment sterilization, appropriate use of theatre slots and staff involved in procedures. Finally, it provides an ideal setting for training both nursing and medical staff for minor procedures. Limitations to the equipment includes the restricted range of movement of the scope (cannot perform full J-manouvre) and therefore may not be used for diagnostic purposes.

P92

Robot-assisted kidney transplantation: first 3 years' experience, including patients deemed too centrally obese for open surgery

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Introduction: Robot-assisted kidney transplantation (RAKT) may improve access to transplantation for obese patients, and result in fewer complications. Our centre has the largest UK experience of RAKT. We analysed our experience, including the use of this technique to transplant obese patients who were deemed too large for open kidney transplantation (OKT).

Methods: We compared the outcomes of RAKT and OKT in patients who received a live-donor kidney with single vessels, performed by the same surgeon. The primary outcome measure was estimated glomerular filtration rate (eGFR) at 3 and 6 months post-transplantation. Secondary outcomes were implantation time, operative time, return to theatre, wound infection and length of stay (LOS).

Results: We have performed RAKT in 16 patients, with 100% graft and patient survival. There was no significant difference in the median eGFR between the groups at 3 months (58.0 vs. 56.5 mls/min, p=0.77) or at 6 months (57.5 vs. 59.5mls/min, p=0.83) despite longer median implantation times (64.0 vs 26.0 minutes, p=<0.0001) and operative times (291 vs 180 minutes, p=<0.0001) in the RAKT group. One patient in each group underwent re-operation. There were no wound infections in either group and there was no difference in median LOS (6.0 vs 5.5 days, p=0.26). Although there was no overall difference in the median body mass index (BMI) of RAKT recipients (26.5, range 22.7-38.3 kg/m^2) compared with OKT recipients (25.1, range 19.5-37.9 kg/$m^{2)}$, p=0.05, two patients undergoing RAKT (with BMIs of 36.6 and 35.9 kg/m^2 respectively) had been deemed too centrally obese for OKT after clinical examination by two surgeons in our institution.

Discussion: We have established the safety and feasibility of RAKT in our institution, and are now able to offer this technique to transplant candidates who are too centrally obese for OKT and have a living donor, with equivalent outcomes.

P93

Does frailty impact on hospital length of stay and early re-admission following renal transplantation?

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Introduction: Frailty is a condition defined by loss of physiological reserve and reduced ability to recover from physiological stress. Renal transplantation is increasingly undertaken in individuals with frailty and is recognised as an emerging risk factor for outcomes. We aimed determine the effect of frailty on hospital length of stay and early re-admission rate in people undergoing renal transplantation.

Methods: Patients with a Dalhousie Clinical Frailty Score (CFS) recorded prior to renal transplantation from November 2017 were included. Length of hospital stay following transplantation (Tx_LoS), the number of re-admissions at 3 months (LoS_3m), 6 months (LoS_6m) and total length of hospital stay (Total_LoS) following transplantation were calculated. CFS '1-3' and '4-7' were used to represent 'fit' and 'borderline fit' cohorts respectively.

Results: 141 patients underwent renal transplantation with a pre-existing CFS. 106 were fit and 35 borderline fit. The median Tx_LoS was 8 days for fit patients compared to 9 days for borderline fit patients. The minimum Tx_LoS across both cohorts was 6 days. Half of all transplant patients required re-admission within the follow up period. 21 patients across both cohorts had DGF which significantly increased Tx_LoS and was not influenced by CFS. DGF ($p<0.001$), diabetes ($p=0.001$) and age ($p=0.05$) were significant predictors of Tx_LoS and Tx_LoS in excess of 6 days in both cohorts. Age alone correlated with LoS_3m ($p=0.001$) and LoS_6m ($p<0.001$) across both cohorts. CFS and age correlated poorly across the cohorts ($r=0.17$).

Conclusions: DGF is the strongest factor influencing Tx_LoS in our transplantation population with age and diabetes contributing. The effect of DGF then diminishes and age alone influenced the re-admission rate in the first 6 months. Our results suggest that pre-transplant CFS does not significantly impact on Tx_LoS or early re-admission rates. This may reflect appropriate patient selection at the time of transplant listing.

P94

Outcomes and implications of "second-reporting" of living kidney donor cross-sectional imaging

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Introduction: All living kidney donors (LKDs) undergo a detailed evaluation of vascular anatomy by cross-sectional imaging prior to donor nephrectomy. Contrast-enhanced Computerised Tomography (CT) scanning is used routinely in our centre, where until 2019, all scans were reported by a single consultant radiologist (CR). Following a serious clinical incident in December 2018, where a significant abnormality was not reported on the CT scan of a LKD, we instituted a policy of "second reporting" of all CT scans by a separate CR. We aimed to assess the value of this second report in picking up abnormalities not seen by the first CR and also to assess the impact of any additional findings on the donor.

Methods: Data were recorded on all potential and actual LKDs from February 2019 to November 2019 using a retrospective analysis of our local database.

Results: Over this 10-month period, 54 potential LKDs underwent CT scanning, of whom 19 (35.2%) proceeded to donation. 12/19 (63.2%) had their CT scans second-reported. Of the second reports, 6/12 (50.0%) described an abnormality not mentioned by the first CR. The discrepancies were: a variance in renal arterial anatomy (1), a potentially abnormal renal cyst necessitating further imaging (1), spinal disc herniation (1), adnexal varices (1), and splenic artery aneurysm requiring discussion in the Vascular MDT (2). None of the abnormalities identified on second-reporting precluded or delayed donation.

Discussion: Second-reporting of CT scans in our centre revealed additional findings in 50% of LKDs who proceeded to donation. In this initial experience, none of the additional findings affected the suitability or timing of donation, although one LKD underwent 2 additional scans at short-notice, which resulted in distress for the donor & recipient, and additional work for the live-donor specialist nurse team.

P95

Reducing transplant ureteric stent time with novel stent removal technologies: a four cycle audit

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Introduction: Ureteric stents have become standard in kidney transplantation. Early removal reduces infection rates. We had an indwelling stent time target of 42 days and aimed to reduce it to 21 days. BlackStar magnetic stents and Isiris single use technology allow portable removal without traditional cystoscopy. We investigated whether the technology could reduce indwelling stent times.

Methods: This was a 4 cycle audit into 407 patients who underwent kidney or SPK transplantation. Magnetic stents were limited to female kidney only transplants. Cycle one (08/11/2017 to 11/08/2018) included 182 patients; 5 were excluded. Cycle two (12/08/2018 to 17/01/2019) included 105 patients. Cycle three (18/01/2019 to 01/04/2019) included 62 patients. Cycle four (02/04/2019 – 02/06/2019) included 58 patients. 4 patients were excluded cycles two to four.

Results: In cycle one 80/183 procedures were by outpatient flexible cystoscopy; mean time to removal 47 days. 46/183 procedures were with Isiris; mean time to removal 43 days. 3/46 (7%) Isiris procedures were unable to remove the stent. 17/183 removals used magnetic stent (31% of eligible patients); mean time to removal 29.5 days. 11/183 patients had removal in theatres under GA / sedation; mean time to removal 48 days. After cycle one, Isiris and magnetic technologies were prioritised. The mean stent time for Isiris cases reduced to 31 days by cycle 4. The mean stent time for magnetic stents reduced to 21 days by cycle 4.

Discussion: Isiris and BlackStar magnetic stent removal technologies reduce time from transplant to stent removal. Blackstar magnetic stent removal achieved our target of 21 days for stent removal but was only used in female patients. Isiris permitted earlier removal but we haven't reached the new target of 21 days. Both technologies permit nurse-led stent removal concurrent with outpatient clinics, reducing the total number of our patients' hospital visits, costs and healthcare burden to our patients.

P96
Third and fourth kidney re-transplants: a 20-year single centre experience

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Introduction: Re-transplantation may be associated with management dilemmas including repeat allocation of limited kidney allografts to same individuals in the face of an increasing waiting list. These individuals are often sensitized and present post-transplant challenges with immunosuppression and rejections. There are also technical challenges of implanting in positions already utilized by previous failed transplants. Could transplant nephrectomy to create space for the subsequent transplant cause increased sensitization?

Methods: This study retrospectively analyses 71 third and 9 fourth transplants out of 3300 *adult transplants* carried out between 1998 and 2017 in a single transplant unit. *Outcomes were evaluated and comparisons made between standard extra-peritoneal and intra-peritoneal routes of implantation; and sensitisation with and without prior allograft nephrectomy.*

Result: Overall patient survival at 1 and 5 years were 98.8% and 96.1% respectively while graft survival at 1 and 5 years were 92.0% and 70.6% respectively. Delayed graft function at 21% was similar in both third and fourth transplants. Acute rejection occurred in 15% of the third transplants and none in fourth transplant group. 50% of the rejection episodes were antibody mediated rejection. 33 out of 80 patients developed perioperative complications, majority of which (75%) occurred in the extra-peritoneal route of implantation. Previous nephrectomy of failed allografts prior to third and fourth transplant did not make any significant difference on patient or graft survival rates. Antibody mediated rejection, though not statistically significant, was found to be higher in those who had prior allograft nephrectomy. *Sensitization increased with successive re-transplants and not necessarily post graft nephrectomy.*

Conclusion: Third and fourth kidney transplants have acceptable outcomes and are therefore justified. Standard extraperitoneal kidney implantation predisposes to higher peri-operative complication rates. Sensitization does not necessarily occur as a result of transplant nephrectomy but rather as a result of exposure to increasing number of mismatched HLA antigens in successive re-transplants.

P97

Comparing surgical and urological complications over time in deceased donor renal transplantation

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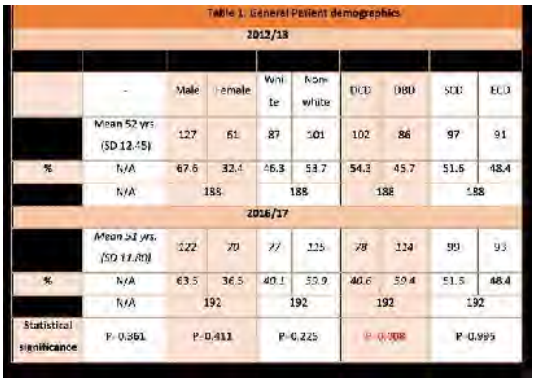
Introduction: Despite advances in perioperative and post-transplant management over time, complications still occur following deceased donor (DD) kidney transplantation. This study aimed to determine the number of complications up to 12months post-operatively over two periods at our Centre.

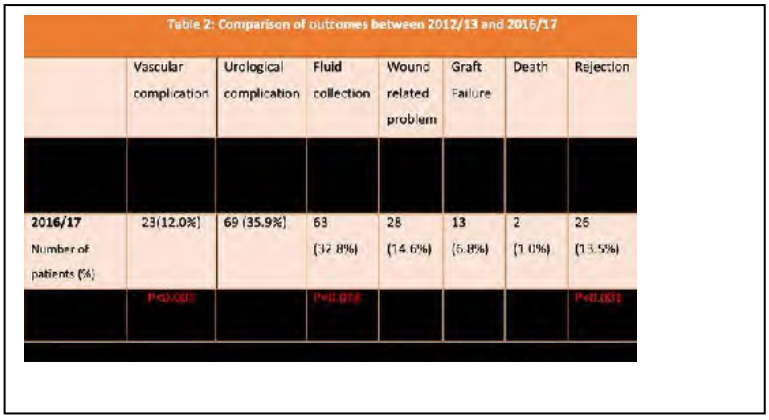
Methods: Data was collected retrospectively from the NHSBT database and local electronic medical records from DD renal transplant recipients in 2012-13 and 2016-17. Patient demographics, donor/recipient characteristics and 12-month post-operative surgical and urological complications were collected. Rejection episodes were also included. Complications were classified according to the Clavien-Dindo (CD) grading system.

Results: N=188 patients were included from 2012/13 and n=192 patients from 2016/17. A total of n=161 (85.6%) patients experienced complications in the first year post-operatively in 2012/13 and n=145 (75.5%) experienced complications in 2016/17 which was significantly less (p=0.013). The most common complication was the need for a blood transfusion in 2012/13 (n=78; 41.5% patients) at a median of 14 days post-transplant, whilst both lymphoceles and urinary tract infections were most common in 2016/17 (n=43 each; 22.3% patients) followed by blood transfusions. The most commonly reported CD grade was CD II in both cohorts (46.4% and 54.7% patients in 2012/13 and 2016/17 respectively). There were no significant differences in graft failure and death rates between both groups (p=0.31 and p=0.18 respectively).

Discussion: Most studies concentrate on early complications. Here we showed that a large number of complications occurred throughout the first-year post-transplant in both cohorts compared to literature findings (15-60%), but there was significantly less in 2016/17. Improvement in surgical technique and peri/post-operative management is likely to account for these differences. Prevention, a high index of suspicion and timely treatment are still essential to ensure the impact of post-operative complications is minimized. Moreover, such longer follow-up studies, help inform patients better about what to expect in the first year following DD transplantation.



		Male	Female	White	Non-white	DCD	DBD	SCD	ECD
	Mean 52 yrs (SD 12.45)	127	61	87	101	102	86	97	91
%	N/A	67.6	32.4	46.3	53.7	54.3	45.7	51.6	48.4
	N/A	188		188		188		188	
	2016/17								
	Mean 51 yrs (SD 11.80)	122	70	77	115	78	114	93	93
%	N/A	63.5	36.5	40.1	59.9	40.6	59.4	51.5	48.4
	N/A	192		192		192		192	
Statistical significance		P=0.861		P=0.411		P=0.225		P=0.995	



	Vascular complication	Urological complication	Fluid collection	Wound related problem	Graft Failure	Death	Rejection
2016/17 Number of patients (%)	23 (12.0%)	69 (35.9%)	63 (32.8%)	28 (14.6%)	13 (6.8%)	2 (1.0%)	26 (13.5%)

P98
First case of simultaneous living related parathyroid and kidney transplantation in a child

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Introduction: Inherited hypoparathyroidism can lead to life threatening episodes of hypocalcaemia as well as to end stage renal failure at a young age. Parathyroid allotransplantation is the only curative option, and in patients receiving immunosuppression for renal transplantation, there is little additional risk involved.

Clinical case: An 11 year-old girl with inherited hypoparathyroidism due to an autosomal dominant mutation in the calcium sensing receptor with Bartter Type V, became haemodialysis dependent at the age of 10. Furthermore, she received PTH continuously via a subcutaneous pump. Her 43-year old father simultaneously donated a kidney and a parathyroid gland to her. The kidney was implanted into the right iliac fossa, followed by implantation of the parathyroid gland into the exposed rectus muscle, after dividing it into multiple 1.5mm pieces. The cold ischemia times were 5h and 7h, respectively.

Results: The kidney graft showed primary function with a Creatinine of 55 umol/L on postoperative day 3. Similarly, calcium infusions were stopped on the same day due to hypercalcaemia. At the time of transplantation, her intrinsic PTH was 3 ng/L. It increased steadily thereafter to reach values in between 40-60 ng/L two months after transplantation, which is when she was also wheaned off her PTH pump. She remained normocalcaemic without calcium supplements.

Discussion: Our case report shows that obtaining a kidney and a parathyroid gland simultaneously is safe and feasible. It can improve the quality of life dramatically for patients with primary hypoparathyroidism and renal failure. No additional risk in terms of immunosuppression is given, and obtaining both organs from the same donor reduces the exposure to different HLA antigens. A handful of similar cases were reported previously but none in the paediatric population. This is the first case of this kind in the UK, approval of NHSBT and HTA were obtained beforehand.

P99
Enhanced recovery pathway in living-donor kidney transplantation – a pilot study

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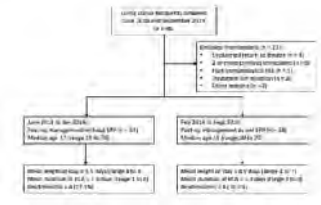
Introduction: Enhanced recovery pathways (ERPs) appear to offer earlier patient mobility, reduced morbidity and shorter hospital stay and are routinely used in certain surgical disciplines. In renal transplantation, there is limited evidence for ERP use with no national consensus on peri-operative management of renal transplant recipients. We report a pilot ERP in renal transplantation, assessing whether it could result in a shorter hospital stay, without impact on complication or readmission rates.

Methods: A prospective study, over 7 months, investigating outcomes of living donor renal transplant recipients after ERP implementation. High-immunological risk and pre-defined complex patients were excluded from the pathway. Specific ERP activities included:

- early patient familiarisation with new post-transplant medication
- early discharge planning
- Preload™ carbohydrate drink pre-operatively
- reduced fasting times; early reinstatement of enteral nutrition
- early post-operative weaning of intravenous opioids
- early goal-directed mobilisation
- urinary catheter removal on day 4 post-surgery

Retrospective comparison was made with equivalent living donor transplant cohort from the 8 months prior to ERP introduction. Primary outcomes were length of hospital stay and readmission rates, using Dr Foster Health Intelligence Portal to verify local data and identify readmissions at any NHS hospitals. Secondary outcomes included withdrawal of patient-controlled analgesia (PCA).

Results:



Conclusions: This pilot study demonstrated a small reduction in length of hospital stay with no increase in readmission rate, suggesting ERP is feasible in living donor kidney transplantation. Our Basiliximab-based induction immunosuppression regimen, with 2nd dose on day 4 post-transplantation, however, currently represents a limiting factor in further reducing length of stay. Careful patient selection is important. Effective staff and patient education and close collaboration with partner hospitals to ensure maximal engagement with the pathway is vital. ERP has potential to include more complex patients, including those undergoing deceased donor transplantation.

P100

Active surveillance for prostate cancer (CaP) in patients being activated for renal transplantation (RT)

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Introduction: Renal transplant (RT) guidelines suggest specific treatments and waiting times following cancer diagnosis. Active surveillance (AS) is an accepted, recommended strategy for low-risk prostate cancer (CaP) in non-RT patients. We assessed AS in CaP patients being considered for RT.

Methods: During assessment for RT (2009 to 2019), men had baseline PSA. A regional RT database was reviewed for men with CaP prior to RT. Low-risk CaP (Gleason 3+3), PSA ≤10ng/ml, ≤T2 on mpMRI options included AS, brachytherapy and RARP. Exceptionally low volume Gleason 3+4 was considered for AS. AS protocol consisted 3 monthly PSA, interval mpMRI +- transperineal biopsy (TPB) every 12-18 months. Patients on AS could be activated for RT.

Results: 33 men (mean 63 years) were identified with new diagnosis CaP during RT assessment. 12/33 had AS (3 pT1a; 9 pT2 CaP; 9 GS3+3; 3 low volume GS3+4; mean PSA 6.4ng/ml; range 2-15).

Mean follow-up 42months (range 6-96 m): one patient declined transplant; 7/12 received a RT (mean time from CaP to RT: 40 months (range 12-101). Mean eGFR post RT 34ml/min. 1/7 RT failed after 100 days; 1 activated on RT waiting list; 3 completing medical RT work-up. To date, no AS patient has CaP progression (mean PSA 4.4ng/ml; range (1.2-10.5).

Discussion: Active Surveillance (AS) for low-risk CaP appears safe in this small cohort being considered for RT. AS may be underutilised compared to other treatments. The major advantage of AS is ability to progress to RT in a timely fashion; providing a treatment most likely to optimise QoL / life expectancy, avoiding treatment morbidities and time delays to RT. We suggest RT can occur with a robust AS protocol. Larger cohorts with longer follow-up will help assess oncological outcomes and compare mortality to those who had alternate CaP treatments.

P101

Atypical blood group antibodies in patients awaiting renal transplantation – prevalence and association with anti-HLA antibody

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Introduction: Sensitisation to HLA antibody is a significant consideration for patients awaiting deceased donor renal transplantation. These patients may also have atypical blood group antibodies (ABGAb), which lengthens the blood crossmatch process. The aim of this project was to delineate the prevalence of ABGAb in this population - to our knowledge this has not previously been assessed.

Methods: Information was collected on all patients, either active or suspended, at a single Renal Transplant Centre on 01/07/2019. Demographic data were collected alongside information on sensitising events and whether ABGAb were present in historic or current samples.

Results: 504 patients were included (294 male (58.3%); 163 white (32.3%); mean age 52.9 years; 238 active, 266 suspended). 288 (57.1%) had at least one recorded sensitising event (previous transplantation, pregnancy or blood transfusion). 127 patients (25.2%) had no group and save (G&S) sample recorded – all of these were under the care of referring Nephrology Units. Of those patients with at least one G&S sample, 30/377 (8.0%) had a history of ABGAb. Those with ABGAb had a significantly higher peak calculated reaction frequency (cRF) than those with no ABGAb (median 93.5% vs. 54%; p=0.009). 25/30 (83.3%) of the ABGAb group had a history of at least one sensitising event and 2/30 (6.7%) had a cRF of 0% (vs. 20.3% in those without ABGAb (p=0.105)).

Discussion: 8% of patients awaiting a renal transplant have ABGAb. These patients have a significantly higher peak cRF, although sensitisation history and a cRF of >0% were not predictors for the presence of ABGAb. 25.2% of patients had no recorded G&S, and it is possible that 8% of these also have ABGAb. Crucially, the presence of ABGAb may limit a patient's suitability to receive a kidney (i.e. via the fast-track scheme) and could lead to significant lengthening of the cold ischaemic time.

P102
Intra-operative drain placement & kidney transplantation utilising a steroid-sparing regimen

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Introduction: Perinephric collections along with wound complications are among the most common complications following renal transplantation. The aim of this study was to evaluate the impact of intra-operative drain placement on the incidence of these complications among a steroid-sparing alemtuzumab induction cohort.

Methods: Three hundred and six renal transplant recipients over a twenty-month period were included in the study. Demographic information along with presence/absence of intra-operative drain, radiological imaging and complications were collected retrospectively from an electronic patient database.

Results: Over a twenty-month period n=303 renal transplants were performed in our institution. Median recipient age was 51 years with 30% suffering from diabetes mellitus. The median recipient body mass index was 26 (17– 47). 72.2% of transplants were deceased donor (DCD/DBD), 10.9% were pre-emptive and 77.3% achieved primary function. An intra-operative surgical drain was placed in the perigraft position in 56.4% of cases. Drains were removed after a median of three days. Perinephric collection within the first three months occurred in 47.4% versus 59.1% of those with or without an intra-operative drain respectively (p=0.0488). Radiological drainage of collection was later required in 2.7% of patients. Wound complications occurred in 20% and 16.7% of patients with or without an intra-operative drain respectively (p=0.7979).

Discussion: Intra-operative drain placement has no effect on the incidence of perinephric collection or wound complications post renal transplantation among an alemtuzumab induction cohort with a subsequent steroid free regime.

P103
Nurse-led transplant ureteric stent removal pathway: learning curve and outcomes

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Introduction: Traditionally, transplant ureteric stents are removed in the operation theatre with flexible cystoscopy. This has cost and time implications. We have previously shown that stents can be safely removed in the transplant clinic setting with added benefits of better patient experience, freeing up theatre slots while maintaining patient safety. We present our experience of Clinical Nurse Specialist (CNS) led stent removal service.

Methods: One dedicated, experienced transplant CNS underwent training over the course of 10 months, which included 3 months of observation, male catheterisation sign off, consent sign off and 7 months of supervised performance of stent removal with two dedicated registrar trainers. Data was collected prospectively for immediate complications and failure rates. We also looked at the efficacy of the one stop stent removal pathway.

Results: There were 55 procedures done in the observation period (phase I), 121 in the supervised training period (phase II) and 122 in the independently performed period (phase III). There were 3 failures in phase I and 4 in phase II, necessitating day case flexible cystoscopic stent removal. In the independent phase, there were 5 instances where assistance by the dedicated registrar trainer was required. Two patients could not tolerate the procedure under topical anaesthetic alone and needed sedation in the theatre. The average time from transplant to stent removal was 49 days (16 - 60) for phase I, 39 (16 - 69) for phase II and 39 (7 - 49) for phase III, which is on average a week quicker than the traditional practice. There were no significant immediate complications observed.

Conclusion: Setting up a nurse-led one stop stent removal service is feasible, safe and has favourable cost implications, along with better resource utilisation. At the same time, it expands the armamentarium of skills at the nurse operator's disposal and expands post-transplant care into a more multidisciplinary effort.

P104

A secondary data analysis of the impact of rejection on the long-term outcomes of human leukocyte antigen antibody incompatible renal transplantations

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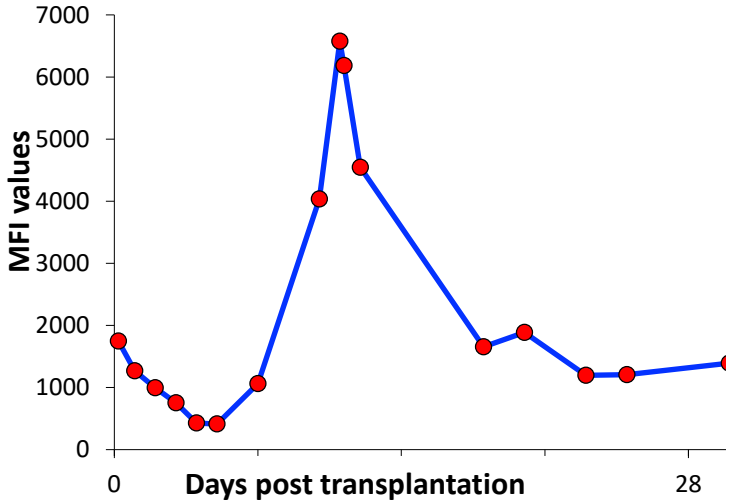
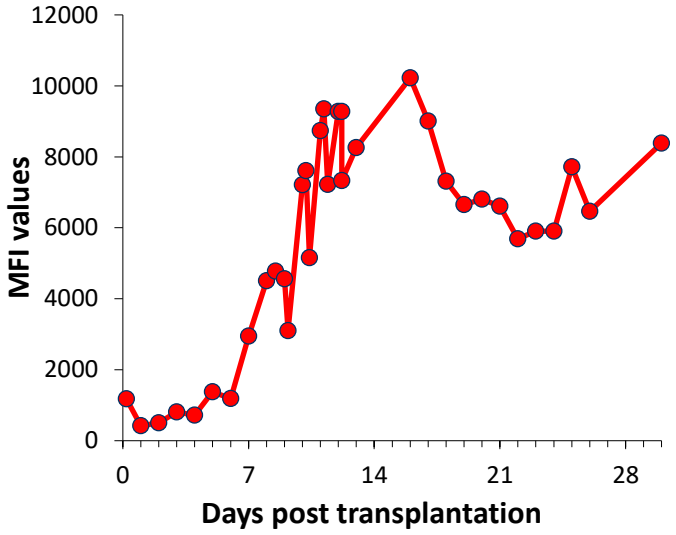
Introduction: Graft rejection is known to be one of the main factors affecting the long-term outcomes of HLA incompatible renal transplantations. Despite desensitization and continued immunosuppression after transplantation, the levels of antibodies produced in response to immunosuppression after transplantation varies among patients.

Methods: 130 patients who had HLA incompatible renal transplantations were analysed retrospectively. The graft survival outcomes of patients were compared based on the incidence of rejection, type of rejection, timing of rejection and number of rejection episodes. Furthermore, rejection was correlated to the antibody response level within the first 30 days post transplantation of patients. Antibody response levels were categorised either as modulated levels or sustained levels (figure 1 and 2).





Results: The 5-years and 10-years graft survival of patients who had rejection was 68.6% and 52.7% compared to 86.2% and 82.3% in patients who did not experience rejection, $p = 0.015$. AMR was the only rejection type that caused a significant decline in graft survival, $p < 0.001$. Only rejection episode(s) that occurred after the first two weeks of transplantation or both within and post-two weeks of transplantation was shown to be associated with a significant reduction in graft survival of patients $p < 0.05$. Antibody response levels within the first 30 days after transplantation; either sustained levels or modulated levels, showed no significant correlation with the occurrence of rejection in the long-term, $p = 0.431$.

Conclusion: Antibody mediated rejection continues to be associated with poor long-term renal graft survival outcomes. Antibody response levels in the first 30 days after transplantation does not predict long term graft survival outcomes in HLA incompatible renal transplantations.

P105

A retrospective assessment of serum donor specific antibodies in patients with graft loss following liver transplantation

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Introduction: The primary study aim was to assess whether the development of *de novo* donor specific antibodies (DSA) was associated with late liver transplant graft loss. The secondary aim was to assess whether positive DSA were associated with the cause of graft failure.

Methods: All recipients with late graft loss (> 12 months post-transplant) due to liver graft failure were identified between 1993 and 2003. Stored serum was tested from the time of transplantation to liver graft failure. A cohort of 26 graft failure patients was identified consisting of 9 with chronic rejection, 5 recurrent primary sclerosing cholangitis, 4 recurrent hepatitis C, 4 hepatic artery thrombosis, 3 biliary complications and 1 recurrent primary biliary cholangitis. 31 controls were identified who had suffered no significant post-transplant complications and had a functioning graft at either the time of study or their death. Testing for IgG HLA class I and II antibodies was performed using LabScreen™ Mixed and Single Antigen bead (One Lambda) kits; a positive DSA was assigned when MFI > 1,000.

Results: There was a significant difference in the presence of *de novo* DSA between graft failure and controls (χ^2, p =0.028), as demonstrated on the table below. When compared with the overall control group, the only aetiology which reached statistical significance was PSC (p = 0.016).

	De-Novo DSA	No DSA	P-value
Graft failure cases	**11**	**15**	**0.028**
• HAT	1	3	0.65
• Biliary	0	1	-
• Chronic rejection	4	5	0.073
• Recurrent HCV	2	2	0.11
• Recurrent PSC	4	1	0.016
• Recurrent PBC	0	1	-
Controls	**5**	**26**	

Discussion: This small, retrospective study suggests an association between the presence of *de novo* DSA and graft loss of any cause. The association was particularly marked for PSC graft failure.

P106

Tertiary care hospital utilization of intraoperative transesophageal echocardiography and a review of non-traditional TEE images to evaluate hepatic vasculature during orthotopic liver transplantation

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Introduction: Utilization of intraoperative transesophageal echocardiography (TEE) during orthotopic liver transplantation (OLT) is growing annually in high volume transplant centers, despite some debate of utility versus potential harm to the cirrhotic patient. Intraoperative TEE is used to gather real-time information on cardiovascular function and intravascular volume status. While there are standardized TEE images as part of the Basic TEE certification, there are nontraditional views described in the literature which have the potential to diagnose pathology that can influence surgical decision making and improve patient care during OLT.

Methods: We retrospectively analyzed the electronic medical records of all OLTs performed at our institution from 2015-2019 to examine the prevalence of intraoperative TEE use. Additionally, we reviewed PubMed literature from 2009-2019 for English-only, peer-reviewed publications discussing use of TEE during OLT with a focus on non-traditional TEE images during OLT and liver resection surgeries.

Results: From 2015-2019, 57.6% of OLT at our institution utilized intraoperative TEE – with annual incremental increases. Anecdotally, no major TEE-related complications were reported. The literature search offered eight publications for analysis, revealing several nontraditional TEE views not included in the Basic or Advanced TEE exam.

Discussion: Intraoperative TEE has grown in popularity due to the high-yield, real-time information it gives to perioperative clinicians. At high volume transplant centers there is likely an annual increase in TEE use during OLT, as evidenced by our institutional data. There is a paucity of literature describing nontraditional use of TEE to evaluate perihepatic vascular structures during OLT or liver resection surgery. These views are not part of the Basic or Advanced TEE certification endorsed by the American Society of Echocardiography and Society of Cardiovascular Anesthesiologists. TEE is a valuable tool to assess hepatic vascular structures critical to allograft function and survival without interruption of the surgical procedure – ultimately improving patient care.

P107
Entecavir therapeutic drug monitoring - why bother? A case report

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Introduction: Patient with short gut, not in continuity, following mesenteric ischaemia assessed for isolated small bowel transplant and found to have active Hepatitis B virus (HBV) infection with undetectable HBV viral load. Optimum management of HBV infection in context of undergoing transplantation (non-liver transplant) was immensely concerning. Significantly no intravenous HBV anti-viral medications available. Post-intestinal transplant recipients are nil by mouth for minimum 10days due to post-operative ileus and high stoma outputs. Entecavir is first line drug treatment. We sought to establish if there was adequate entecavir absorption via remaining native gut on the premise that this would sustain drug absorption early post-transplant.

Methods: A two-dose drug trial was undertaken, and trough levels measured day 7, day 14 via Turin University. Liquid entecavir was used to optimise absorption by avoiding tablet dissolution.

Results:

Entecavir liquid dose		***Trough conc ng/ml***	***Median Trough conc ng/ml***
1mg/day (day 1)	Day 7	0.186	0.215
	Day 14	0.244	
2mg/day (day 15)	Day 21 (day 7 high dose)	0.454	0.4375
	Day 28 (day 14 high dose)	0.421	
Median plasma concentration 0.5mg/day, Italian reference group.	0.384 (IQR 0.297-0.569)		

Conclusion: A higher daily entecavir dose (2mg od) was required to achieve a trough concentration within interquartile range of reference group median concentration. All patients in the reference population achieved viral suppression.

Discussion: This trial demonstrated that with ultra-short gut therapeutic entecavir concentrations are achieved from higher daily dosing (2mg od) without adverse effect. The intention on transplant listing was to commence high dose entecavir to ensure therapeutic levels at time of transplant. However, patient's liver function deteriorated necessitating evaluation for multivisceral transplant. The liver containing graft negates need for entecavir pre- or post-transplant. We have nonetheless used this pharmacokinetic information to support high dose entecavir in another transplant patient with post-operative complications resulting in short gut not in continuity.

P108
Seventh day syndrome following normothermic machine perfusion of a DCD liver graft

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Background: Seventh-day syndrome (7DS) is a sudden and catastrophic immunogenic graft failure that occurs in the first week post-liver transplantation following initial graft function. The incidence of 7DS is reported to be between 0.5%-5%. Here we present a case of 7DS that occurred in a liver graft following normothermic machine perfusion.

Case: A 69M with ALD cirrhosis and HCC underwent orthotopic liver transplantation. The donor was a 29M DCD with dilated cardiomyopathy who had sustained a hypoxic brain injury following a cardiac arrest with a downtime >60mins until ECMO was established. Organ retrieval was uneventful. The liver was machine perfused using the OrganOx Metra system for 8 hours prior to implantation. All published viability criteria were met during perfusion and implantation was unremarkable. Post-operatively the liver initially functioned normally. Immunosuppression was tacrolimus sparing based on the RESPECT trial protocol to maximise renal function. However, on day 6 post-transplant his liver function tests deteriorated and a graft biopsy showed significant necrosis with severe endothelitis, neutrophil and mononuclear inflammatory infiltrate as well as evidence of acute antibody mediated rejection although there were no measurable DSA. The patient progressed rapidly to multiorgan failure despite intravenous steroids and was re-transplanted on day 10. He has subsequently been discharged with no significant sequelae.

Discussion: The aetiology of 7DS is poorly understood and therefore it is important to review cases to better understand and prevent this catastrophic complication of liver transplantation. In this case, we believe the patient developed fulminant rejection secondary to severe donor injury, subtherapeutic calcineurin levels and consequent massive recipient immune activation. Viability testing during NMP is still in its infancy and cannot predict the donor recipient immune interaction. We have changed our viability testing protocol to ensure that all livers are assessed with histology prior to implantation.

P109

Deterioration in renal function at 1 year post isolated liver transplant for polycystic liver disease

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Introduction: Polycystic liver disease (PLD) encompasses a group of disorders with varying renal and liver involvement. Patients can require liver transplant (LT), which is associated with good patient and graft survival, however there is data that renal function can deteriorate post-LT. We sought to describe our experiences of renal function in the early post-LT course.

Methods: All LT for PLD performed at a single centre from 1/1/08 to 31/12/17 were included, simultaneous liver-kidney transplant were excluded. Demographics, clinical and biochemical parameters, immunosuppression strategy and requirement for renal replacement therapy (RRT) were collected. Univariate statistical analysis was performed.

Results: 20 patients were included: mean age 50.4 ± 9.5years, 85% female, 6 previous kidney transplant (KT). Mean renal function at transplant: eGFR 60 ±15.4mL/min/1.73m2, creatinine 95 ±21.9mmol/L. 10 received reduced dose tacrolimus with IL2 receptor antagonist (CNI-sparing). 1 patient required RRT post-LT for 28 days. In 74% there was a decrease in renal function at 1 year post-LT: mean eGFR -6.7 (±13.7, $p<0.05$), creatinine +14.1 (± 25.8, $p<0.05$). Previous KT had similar eGFR and creatinine at LT to native kidneys ($p=0.97$). The mean change at 1 year: eGFR -9.36 in native kidneys, +0.8 in KT ($p=0.16$); creatinine +19.6 in native kidneys, -1.4 in KT ($p=0.12$). Patients receiving CNI-sparing: at transplant lower eGFR (52 v 67.9, $p=0.017$); at 1 year lower eGFR (44.6 v 63.6, $p=0.02$); with no change over 1 year in eGFR ($p=0.82$).

Discussion: We report a large series of patients with PLD who underwent LT and describe a significant reduction in renal function at 1 year post-LT. Strategies to preserve renal function post-LT are important, including CNI sparing immunosuppression strategy and aggressive management of co-morbidities. Further work is needed, but particular attention may be required for patients with native renal function.

P110

Cardiovascular assessment for liver transplant is multi-modality: cardiac catheterisation is a valuable diagnostic tool

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Introduction: Liver transplant (LT) assessment is a multi-disciplinary process where an individual's risk-benefit for undergoing LT is considered. Strict focus on cardiac evaluation assesses perioperative risk and significant co-morbidity that might preclude good long-term outcomes. There is variability between centres in diagnostic paradigms in cardiac evaluation. We sought to describe our experiences, including use of cardiac catheterisation in LT evaluation.

Methods: Adult patients >18 years who underwent LT assessment 1/1/07-31/12/11 at a single centre were retrieved. Super-urgently listed patients were excluded. Demographics, clinical, biochemical and cardiac assessment were extracted from the clinical records.

Results: 1201 patients were evaluated: 779 listed (64.9%); 388 declined (32.3%). Mean age 53.1 years; 67.2% males; mean UKELD 54.4 and MELD 15.4. Co-morbidities included: past history of ischaemic heart disease (IHD, 7.7%); current/ex-smokers (52.4%); hypertension (17%); diabetes (26.9%). ECG changes consistent with cardiac ischaemia in 6.6%. On transthoracic echocardiogram: 3.4% regional wall motion abnormalities (RWMA); 2.4% impaired left ventricular ejection fraction (LVEF). Cardiopulmonary exercise test (CPET) was performed in 56.7%: 20.3% had a poor performance (including an anaerobic threshold (AT) <10 units); 36.1% had a good performance (including AT >10 units). 257 patients (21.4%) underwent cardiac catheterisation. 122 patients were declined due to cardiovascular risk, and on univariate analysis had: IHD ($p<0.01$); smoking history ($p<0.01$); hypertension ($p<0.01$); diabetes ($p<0.01$). They had: ischaemic ECG changes ($p<0.01$); RWMA ($p<0.01$); impaired LVEF ($p<0.01$); poor CPET ($p<0.01$); cardiac catheterisation ($p<0.01$). 55% of these patients were declined without undergoing cardiac catheterisation. 65% of patients who underwent cardiac catheterisation were listed for LT.

Discussion: In our centre over one fifth of patients underwent cardiac catheterisation during their evaluation, and whilst some were declined for LT the majority were listed for LT. Cardiac catheterisation can be used as an adjunct to co-morbidity based stratification and non-invasive cardiac testing in an individualised evaluation for LT.

P111

Positive complement-dependent cytotoxicity crossmatch results do not influence long term graft or patient survival following liver transplantation

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Introduction: Solid organ transplant recipients have typically been screened for the presence of pre-formed anti-donor antibodies with complement-dependent cytotoxicity (CDC) crossmatch testing. There are conflicting reports as to whether CDC crossmatch status is important for outcomes following liver transplantation (LT), hence testing does not routinely alter clinical practice.

Methods: We retrospectively identified all LT operations performed at the Royal Free Hospital, London, between October 1999 and December 2016 from the hospital LT database and identified all associated CDC crossmatch assays from laboratory databases. We compared graft outcomes between those with positive and negative crossmatch results.

Results: 1125 LT were identified during the study period; 1076 (96%) LT had an associated CDC crossmatch result available. 84 (7.5%) recipients had a positive T cell CDC crossmatch, 193 (17%) a positive B cell CDC and 204 (19%) were positive for either or both T cell and B cell assays. Patients were followed up for a median time of 9 years. Positive CDC crossmatch for T cell only, B cell only or either T or B cell assay was not associated with a greater risk of graft loss over time (log rank p = 0.83, 0.27 and 0.34 respectively). Similarly, the overall hazard of graft loss with a positive T and/or B CDC was not raised (HR 1.22 (95% CI 0.93-1.6, p = 0.15)). There was no increase in the rate of re-transplantation with positive crossmatch (p = 0.75) or for mortality (log rank p = 0.19) with a positive T or B cell CDC.

Discussion: This large cohort study demonstrates that the presence of a positive CDC at the time of LT was not associated with greater graft loss or patient mortality in the era of modern immunosuppression protocols. Whether these patients are at higher risk for acute rejection episodes or other adverse outcomes remains unclear.

P112
Methaemoglobinaemia during normothermic machine perfusion of human livers

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Introduction: Normothermic machine perfusion (NMP) can improve early outcomes in liver transplantation and potentially act as a drug delivery platform. Several groups are researching novel therapeutics which require prolonged NMP of suboptimal grafts. Here we describe two cases of methaemoglobinaemia during prolonged liver NMP. MetHaemoglobin (metHb) is the oxidised form of haemoglobin, which is incapable of effective peripheral oxygen delivery. Enzymes within red blood cells (RBC) usually convert metHb back to haemoglobin, preventing accumulation.

Methods: The NMP of two human livers rejected for transplantation are described. One liver was perfused using generic Medtronic™ perfusion equipment and one using the OrganOx metra®.

Results: Methaemoglibinaemia can easily be visualised during perfusion, turning the perfusate cholate-brown, then deep purple (figure 1). The first liver (53yrs DBD) developed methaemoglobinaemia (metHb=2.4%) after 13 hours of NMP, increasing to metHb=19% at 16 hrs. Another liver (45yrs DBD) developed methaemoglobinaemia at 25 hrs (metHb=2.8%), which increased to metHb=28.2% at 38 hours of NMP (figure 2). Oxygen delivery to the liver fell by >66% following development of methemoglobinemia. The following factors were present in both livers: severe steatosis on biopsy, weight over 2.2kg as well as excessive alcohol consumption in the donor (7-9Units/day). Neither liver was able to maintain physiological pH, and perfusate remained acidotic despite large volumes (<60ml) of additional sodium bicarbonate 8.4%. Delivery of two 50mg doses of methylene blue failed to reverse the methaemoglobinaemia.

Discussion: Methaemglobinaemia is a complication of prolonged perfusion of suboptimal liver grafts and is not limited to a single machine or protocol. It severely impairs oxygen delivery and is resistant to pharmacological reversal. We hypothesise that a combination of impaired conversion of metHb into haemoglobin (haemolytic loss of protective RBC enzymes) and increased production (severe oxidative stress) shifts the balance towards accumulation of methaemoglobin.

Figure 1:

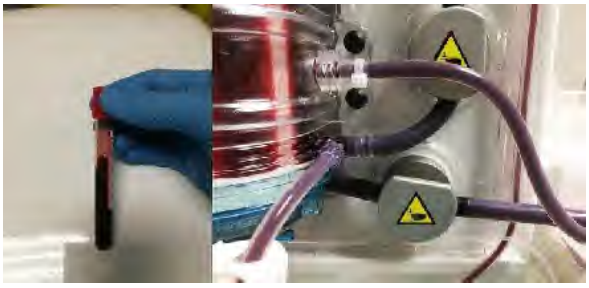

Figure 2:

P113

Reimagining the role of biomarkers to improve cardiovascular risk prediction in renal transplant recipients

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Introduction: Cardiovascular risk prediction models frequently underestimate risk in renal transplant recipients (RTR). This study investigated whether adding Troponin T (TnT) and N-terminal pro B-type natriuretic peptide (NT-proBNP) to a model comprised of traditional cardiovascular risk factors improved its predictive accuracy in RTR.

Methods: Study outcomes were all-cause and cardiovascular mortality. A cohort of 367 RTR were followed up for a median of 16.2 years. Biomarker concentrations were determined from baseline serum samples. Hazard ratios (HR) and confidence intervals (CI) were calculated using Cox proportional hazard regression models. Discrimination metrics were derived to quantify the incremental value of adding biomarker concentrations to a model of established cardiovascular risk factors: C-statistic change, continuous net reclassification index (NRI>0) and integrated discrimination index (IDI).

Results:

TnT (per twofold increase)	**All-cause mortality (N =171)**	**Cardiovascular mortality (N=62)**		
		P value		P value
Adjusted HR[a] (95% CI)	1.44 (1.23, 1.68)	<0.001	1.93 (1.48, 2.50)	<0.001
C-statistic				
Original model	0.763		0.803	
Original+TnT	0.772		0.829	
C-statistic change	+0.009	0.130	+0.026	0.138
IDI (95% CI)	0.029 (0.005, 0.060)	0.018	0.081 (0.015, 0.139)	0.020
NRI (>0) (95% CI)	0.466 (0.120, 0.668)	0.016	0.588 (0.122, 0.942)	0.017

NT-proBNP (per twofold increase)	**All-cause mortality**	**Cardiovascular mortality**		
		P value		P value
Adjusted HR[a] (95% CI)	1.36 (1.22, 1.51)	<0.001	1.53 (1.29, 1.82)	<0.001
C-statistic				
Original model	0.763		0.803	
Original+NT-proBNP	0.781		0.826	
C-statistic change	+0.018	0.020	+0.023	0.265
IDI (95% CI)	0.039 (0.010, 0.076)	0.007	0.075 (0.011, 0.152)	0.017
NRI (>0) (95% CI)	0.372 (0.104, 0.614)	0.010	0.516 (0.020, 0.822)	0.042

[a]Adjustments: age, sex, diabetes, hypertension, cholesterol/HDL ratio, BMI, smoking, history of CVD, eGFR, proteinuria

Discussion: Both TnT and NT-proBNP are strongly associated with all-cause and cardiovascular mortality in RTR. These biomarkers are convenient adjuncts to improve the predictive accuracy of existing cardiovascular risk prediction tools in this population.

P114
Assessing risk factors for progression in PTLD after kidney transplantation

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Introduction: Post-transplant lymphoproliferative disorder (PTLD) is one of the most serious complications of chronic immunosuppression after an organ transplant and the second most common malignancy in adult kidney transplant recipients.

Methods: The aim of our study was to identify factors predictive of response to treatment.

Results: Over a 30-year period, of the 1855 transplants that were carried out and followed-up in our centre, 64 patients developed PTLD of B cell origin (3.4%), including 4 Hodgkin's PTLD. Of 53 evaluable patients, 40 (75%) presented with extranodal disease, the most commonly involved site being the gastrointestinal tract (22 cases; 55 %). Treatment regimens were available in 42 of 60 patients with classical B cell PTLD. All patients received a reduction in immunosuppression (RIS) with a median Vasudev score assessing the burden of immunosuppression of 5 (2-15) at diagnosis, decreasing to 2 (1-9) after 3 months (60% decrease). The majority of patients received either rituximab and/or chemotherapy as well. Neither the lymphocyte/monocyte ratio described in previous literature (1.1, 2, 2.4 or 2.9) at diagnosis, nor the neutrophil/lymphocyte ratio were associated with graft and/or patient survival or response to treatment. Overall 11 patients progressed in spite of treatment (16.1 %). They were more likely to have been transplanted in the recent era of immunosuppression (using tacrolimus, mycophenolate and steroids) (5/10 50%) compared to those who responded to treatment (13/52, 25 %), but this difference was not significant. We tried to determine factors predictive of response to treatment but neither performance status (p=0.32), nor Vasudev score evolution (p=0.24), nor lymphocyte/monocyte ratio were predictive of progression (p=0.14).

Discussion: PTLD often responds well to RIS+/- Rituximab and/or chemotherapy with good graft preservation and patient survival. Vasudev score and/or lymphocyte/monocyte ratio doesn't seem to predict disease progression but a larger study would be needed to verify this.

P115

The utility of tacrolimus concentration/dose ratio as an early dosing guide following renal transplantation: associations with short-term side effects and graft outcomes

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Introduction: Tacrolimus is an essential component of modern maintenance immunosuppression in renal transplantation. However, its narrow therapeutic index and varied pharmacokinetics can result in significant short and long-term toxicity. Identification of inter-individual variation in tacrolimus metabolism may facilitate a nurse-led follow-up programme following early discharge. The aim of this study was to investigate the association of a simple marker of tacrolimus metabolism (concentration/dose [C/D] ratio) with short-term tacrolimus side effects and outcomes after renal transplantation.

Methods: This nurse-led retrospective study included all recipients that underwent deceased donor kidney transplantation with local follow up in 2018. Data was collected from electronic records and included tacrolimus doses and trough levels on day 3 post-transplantation. Patients were divided into fast and slow metabolisers based on a cut-off CD ratio of 1.05. Tacrolimus-associated neurotoxicity was assessed during follow-up using a graded questionnaire. Short term side effects, glucose tolerance and graft outcomes were compared between the two groups.

Results: The study included 38 recipients of which 27 were classed as fast metabolisers based on CD ratio on day 3. Mean tacrolimus doses were significantly higher in this group compared to slow metabolisers (8.3mg +/-1.6 versus 6.4mg +/- 1.6 respectively; P=0.002). No significant difference was demonstrated in mean creatinine at 2-months post transplantation between fast and slow metabolisers (135.5µmol/L +/-45.3 versus 143.7µmol/L +/-105.6 respectively; P=0.7). Blood glucose levels were significantly lower in the fast metabolisers (6.4mmol/L +/-3.5 versus 10.1mmol/L +/- 6.4 in the slow metabolisers; P=0.03). There was no difference in neurological symptoms between the two groups.

Conclusion: Fast tacrolimus metabolisers were associated with lower blood glucose levels when compared with slow metabolisers in this study. There was no clear association between tacrolimus C/D ratio and short-term drug side effects or graft function. A larger sample size may be necessary to detect significant changes in these outcomes.

P116
Service development for diabetes care in renal transplant patients in a non-transplant centre

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Introduction: Renal transplant recipients are at particularly high risk of diabetes mellitus (PTDM) with recognised complexities in care provision. Comprehensive follow-up outside of transplant centres requires coordination between primary, renal and endocrine services, often across geographic and organisational boundaries. Whilst the common 'hub and spoke' service structure promotes cohesive working within renal teams, optimal transplant care requires expansion of the model to integrate local diabetes networks. With these issues in mind, we present audit and quality improvement work from one of the largest UK non-transplant renal units.

Methods: Using a central hub database of renal transplant recipients' electronic patient records (n = 622), data was collated for pre-transplant and current BMI, HbA1c, age, diabetes diagnosis and therapies. PTDM clinical guidelines were developed. Analysis was undertaken to establish local prevalence of diagnosed and undiagnosed PTDM and incidence of New Onset Diabetes after Transplant (NODAT). Distribution of PTDM was evaluated by age, BMI and diabetes therapies. Patients with diabetic nephropathy were excluded due to service needs differing from the general PTDM population.

Results: Prevalence of PTDM was 13% (n = 81) with 5-11% having NODAT (n = 34-69). Up to 20% of patients with PTDM by HbA1c criteria (≥ 48 mmol / mol) did not have a documented diagnosis. Prevalence and incidence increased up to age 50 and then remained relatively constant with increasing age. Most individuals with PTDM were overweight or obese by BMI classification. 40% were managed with oral medications, 25% with insulin.

Discussion: Notwithstanding the barriers to high quality PTDM care, any number of patients without a clear diagnosis and management plan is unsatisfactory. Regions with hub-and-spoke nephrology departments should implement regular audit of services. Improvement measures here included allocation of a lead PTDM consultant, diabetes specialist nurse clinics, coding of PTDM in letters, guideline development and a planned PTDM care pathway.

P117

Discordance of Cytomegalovirus (CMV) IgG serostatus determination - can dual testing minimize risk?

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Introduction: Northern Ireland has a relatively low CMV seroprevalence of 40.1%. Accurate determination of CMV serostatus is critical to appropriate post-transplant management of solid organ transplant recipients. Following a serious adverse event involving misclassification of CMV IgG serostatus in a renal transplant patient, a review of laboratory methods for CMV IgG testing was undertaken. The patient was assigned a CMV positive status, transplanted from a CMV IgG positive donor and had a clinical course in keeping with primary CMV disease. Subsequent testing found the patient to be CMV IgG negative. There is currently no national UK recommendation on dual CMV IgG testing. The aim of this pilot study is to investigate the clinical utility of a dual screening algorithm for determination of CMV serostatus in transplant patients.

Methods: 55 anonymised patient samples with equivocal to low positive CMV IgG screening values (0.55 to 9.95 U/ml) on the Elecys CMV IgG assay (Cobas, Roche) were retested using the same assay after centrifugation. The same samples were then tested using an alternative CMV IgG assay (Vidas, Biomerieux). Differences in results were analysed using a paired t test (significance $p<=0.05$).

Results: There was no difference ($p=0.43$) between the original results and those of the re-centrifuged samples (93% agreement, 4 discordant). By comparison, concordance was considerably poorer between methods (53% agreement) with 26 equivocal to low positive results by Cobas negative by Vidas.

Conclusion: There is a lack concordance for CMV IgG negative results between Cobas and Vidas CMV IgG assays. In the absence of clinical outcomes data, we cannot conclude if the Cobas method has greater sensitivity and lower specificity than the Vidas; however, the patient affected had a positive result on the Cobas assay and a negative result on the Vidas assay. Clinical validation of a dual testing strategy is now being undertaken.

P118

The effect of a dedicated transplant low clearance service on clinical outcomes for people with failed kidney transplants

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Introduction: A dedicated transplant low clearance clinic is recommended to optimise clinical outcomes for people with a failing kidney transplant. We aimed to assess the impact of our service on clinical outcomes for people whose kidney transplants failed.

Method: We collected key clinical data for everyone whose kidney transplant failed from April 2019, including details of RRT commencement and access to transplantation. Specifically, we compared people referred to our dedicated low clearance service with (i) contemporary patients within our unit meeting the same definition (eGFR<20ml/min or within 6 months of RRT) but not referred, and; (ii) a historical cohort from 2014. We explored differences between cohorts using simple descriptive statistics.

Results: Of 1419 prevalent kidney transplant patients in our unit, since the clinic was established in 2017 approximately 105 (7.4%) patients had an eGFR <20ml/min.

Table 1. Key outcomes for people with failed kidney transplants

		Renal Replacement therapy outcomes at graft failure				
Graft failure pathway	Total number of patients	PD	HD	HD via Line	Re-Transplant	Conservative management
Tx LCC clinic	18	22.2% (N=4)	66.7% (N=12)	22.2% (N=4)	5.6% (N=1)	5.6% (N=1)
Not referred to Tx LCC Clinic	4	25% (N=1)	75% (N=3)	50% (N=2)	0%	0%
Total	22	22.7% (N=5)	68.2% (N=15)	27.3% (N=6)	4.5% (N=1)	4.5% (N=1)

Twenty two (21.0%) patients lost their graft, of whom 18 (81.8%) were referred to our service (**Table 1**). Of these 22 people, 6 (27.3%) were active on the transplant list at the time of starting RRT, 12 (54.5%) were permanently unfit for re-transplantation, and 8 (36.4%) were active on the transplant list within 3 months of starting RRT. Compared to a historic cohort of all transplant patients losing their graft in 2014, 59.4% of failed transplant patients started dialysis via line and 75% of patients started dialysis in an unplanned way.

Discussion: Our dedicated service has improved clinic outcomes for kidney transplant patients with failing grafts, facilitating planned start of RRT and reducing the rates of patients starting dialysis via line by 37.2%. Raising the awareness of adequate referrals to this clinic continues to be an area of improvement.

P119

HLA IgE donor-specific antibodies are associated with IgG4 DSA subclasses in patients with chronic antibody-mediated rejection

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Introduction: Different IgG DSA subclasses have been shown to be associated with specific phenotypes of antibody-mediated rejection (ABMR). IgG4 is reported to be associated with subclinical and chronic ABMR lesions compared with the complement-fixing IgG subclasses. Like IgG4, IgE production is dependent upon help by T-helper type-2 cells. HLA specific IgE has been shown to develop during an alloimmune response. In this study, we aim to assess for the presence of IgE DSA in patients with chronic ABMR and determine a relationship with IgG4 DSA.

Methods: We analysed 20 renal transplant recipients with IgG DSA and chronic ABMR, 10 with and 10 without IgG4 DSA, for the presence of IgE DSA. Identification of HLA specific IgE antibodies was performed using a modified protocol for anti-HLA IgG detection using One Lambda SAB kits.

Results: 11/20 patients were found to have IgE DSA. IgE DSA were more common in the IgG4 positive patients (8/10) compared with the IgG4 negative patients (3/10), p=0.029. All patients with IgE and IgG4 also had either an IgG1 or IgG3 DSA, compared with 7/9 of the IgE- patients. There was no difference in time to DSA detection between the 2 groups, with a median of 0.9(0.4-4.6) and 1.5(0.9-3.4) years in the IgE+ and IgE- groups respectively, p=0.41. There was no difference in eGFR at 31.0(21.8-40.4) and 34(28.0-53.0)ml/min in the IgE+ and IgE- groups respectively, p=0.20. Allograft survival following DSA detection was also no difference between the IgE+ and IgE- patients, p=0.48, although only 2 grafts were still functioning with a median follow up of 4.1 (1.1-6.4) years.

Discussion: This study has shown that IgE DSA is common in patients with IgG4 DSA. Further work is justified to determine whether their effector mechanisms are involved in the pathogenesis of ABMR, which may have therapeutic implications.

P120
Management of diabetes in renal transplant recipients

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Introduction: Renal transplant recipients are at increased risk of cardiovascular events. Good diabetic control and management of other risk factors is important to mitigate against this.

Methods: We performed a regional cross-sectional audit of all diabetic renal transplant recipients attending for follow up at the transplant center or referral units. Diabetic patients were identified using the clinical information system with subsequent data extraction. All diabetic patients were also asked to complete a questionnaire, to provide information on the organisation of their care, attendance at screening and diabetic education.

Results: 350 diabetic patients were identified from a total transplant population of 1738 (20%). Diabetic nephropathy was the cause of end stage kidney disease in 132 (37% of diabetics, 7.5 % of total). A complete data set was available for 256 patients. 118 (46%) of these patients had post-transplant diabetes. This equates to 9% of total transplant population from centers with complete data. The median BMI of all diabetic recipients was 29 (Range 16-54). 13% were current smokers. Half of the patient responded to questionnaire. The majority of patients recalled receiving education about diabetes (79%) and dietetic advice (77%) at some point. The achievement of targets to modify cardiovascular risk factors and screening are shown in table 1:

Table 1:

Parameters	Targets (From KDIGO, RA, ABCD & RA, NICE)	% Achieved
Blood pressure	<140/90	50
HbA_1C	52- 58 mmol/mol	50
Cholesterol	< 4 mmol/l	46
Retinal screening (yearly)		87
Foot care (yearly)		59

Discussion: Diabetic control and management of associated cardiovascular risk factors was sub-optimal in over half our renal transplant recipients. We are introducing a service improvement plan, with inclusion of diabetic management in the annual review. This will comprise medical review and treatment intensification together with further education and dietetic involvement, aiming for greater patient understanding and self-management.

P121
Blood transfusion at the time of kidney transplantation – should we worry?

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Introduction: The risks and benefits of blood transfusion following kidney transplantation are uncertain. We undertook a single centre retrospective analysis of the characteristics and outcomes of patients who received a peri-operative blood transfusion.

Methods: Demographic, transplant and biochemical data were collected from the renal database for all kidney transplants performed in 2017. Transfusion within 30 days of transplant was identified from blood bank records. Outcome measures were episodes of biopsy proven rejection and one-year eGFR and graft survival.

Results: There were 85 kidney transplant recipients in 2017. Nine patients were excluded (6 missing blood bank data, 3 early graft thrombosis). 32/76 (42%) patients received blood at a median Hb 78 g/L. The median lowest Hb in the non-transfused group was 85 g/L. Patients receiving blood were more likely to have received a deceased donor kidney and to have had ATG induction immunosuppression. There was more delayed graft function and lower early eGFR but one-year outcomes were similar with less rejection in the transfused group.

	Transfusion (N=32)	Non Transfusion (N=44)	Total (N=76)	
% Male	63%	64%	63%	
Median age (years, range)	54	52	52	
% Live/DBD/DCD kidney	25%/22%/53%	43%/36%/20%	36%/30%/34%	p<0.01
% pre-emptive	13%	14%	13%	
Median ferritin (µg/L)	208	218	218	
Median TSATS %	29	26	28	
Median Hb pre-op (g/L)	111	117	113	p<0.01
Median transfusion Hb vs lowest Hb (g/L)	78	85		
Campath	16%	32%	25%	
ATG	63%	25%	41%	p<0.01
Simulect	16%	34%	26%	
Median eGFR at day 7 (mL/min/1.73 m²)	32	45	43	
% DGF	25%	18%	21%	
% Rejection	3%	11%	8%	
% Graft failure at 1 year	6%	5%	5%	
Median eGFR at 1 year (mL/min/1.73 m²)	60	55	59	
Median length of stay (days)	10	8	8	

Figure 1
ATG - anti-thymocyte globulin; DBD - donor after brain death; DCD - donor after circulatory death; DGF delayed graft function;

Discussion: Predictors of transfusion in our cohort were pre-transplant Hb, DCD transplant and the use of ATG induction though there may be confounding. Blood transfusion at the time of transplant has been reported to stimulate the formation of HLA donor specific antibodies. These were not measured routinely in our practice, but there was no increase in biopsy proven rejection or graft failure in the first year. Reassuringly, despite the increased number of DCD transplants in the transfused group, one-year renal function was comparable to the non-transfused group.

P122

Significant coronary artery disease pre-transplant is an independent predictor of death post-transplant failure but transplant specific factors do not contribute to progressive disease

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Introduction: Recent evidence suggests HLA donor specific antibodies play a role in the development of post-transplant major cardiovascular events. Whether this represents a result of systemic inflammation or adverse effects of treatment is not clear. In this study, we analyse patients who had failed allografts who underwent a coronary angiogram both pre- and post-transplant (for retransplantation assessment or clinical indication), to assess the impact of DSA and transplant specific factors on CAD progression.

Methods: 176 patients were included. For the purposes of this study, significant CAD was defined as that which required intervention (PCI/CABG). Median follow up was 9.3(8.7-9.7) years.

Results: 46/176(26.1%) patients had pre-CAD of which (32 PCI, 14 CABG). Risk factors for CAD in this population was male gender (p=0.013) and diabetes (p=0.01). Pre-CAD+ was associated with inferior patient survival, HR: 1.81(1.05-3.12) p=0.03. 98 patients underwent subsequent angiogram. 30/46(65.2%) pre-CAD+ patients had a subsequent angiogram, compared with 68/130(52.3%) pre-CAD- patients (p=0.05). A total of 22/46(47.8%) pre-CAD+ patients needed a further intervention (15/22(68.2%) from patients requiring clinically indicated angiograms, 7/22(31.8%) from repeat surveillance). From the pre-CAD- group, 14/130(10.8%) required PCI/CABG, which was significantly less than the pre-CAD+ group, p<0.01. Of these, 8/14(57.1%) patients had intervention from clinically indicated angiogram and 6/14(42.9%) from surveillance. Risk of developing progressive disease was not significantly associated with transplant specific risk factors; rejection (p=0.056), DSA (p=0.39), mismatch (p=0.26) or NODAT (p=0.37). Progressive disease was not associated with patient survival. On multivariate analysis of risk factors for death; only need for intervention pre-transplant was associated with death, HR: 2.14 (1.25-3.66), p=0.005.

Discussion: Pre-CAD+ is a risk factor for death following subsequent transplant failure, and these patients are at higher risk of requiring further intervention. No transplant related factors influence progression of coronary artery disease.

P123

A retrospective review of outcomes in renal transplants across DP antibodies – single centre experience

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Introduction: The Kidney Transplant Recipients (KTR's) with DP-antibodies has not been extensively studied in the United Kingdom (UK). This retrospective study investigated the one -year outcomes of patients who had preformed antibodies against class II DP antigen at the time of kidney transplantation.

Methods: Our experience looked at 22 patients transplanted over nine years (2009 to 2017). This study collected data post-transplant at different periods, i.e. seven days, 30 days, three, six and 12 months on various parameters such as creatinine, eGFR, organ type, immunosuppression, and graft outcomes from the medical and electronic case notes.

Results: The median age of our cohort at the time of transplantation was 46 years with, 54% being males. A majority (86%) had a deceased donor transplant. 77% of patients had a positive crossmatch at the time of transplantation. Alemtuzumab used as an induction agent in 69% of the patients. The median serum creatinine was 356 umol/L, which improved to 145 umol/L on day 30. A majority of 13 (59%) had delayed graft function, and six patients had a kidney biopsy between day 7 and 10 (acute tubular necrosis- 5 and acute vascular rejection-1). The post-transplant DP antibodies titres were reduced in 59 %, and 31% had no change in their titres. The total 68% had a working graft at 1-year post-transplant. Of those with graft failure, four died with a functioning graft, 1 - avulsed vein, 1 - rejection (non-compliance), and on the remaining 2 patients, no information was available.

Conclusions: Our data show that despite the higher incidence of delayed graft functions, the one-year graft survival outcome was acceptable. The DP antibodies levels post-transplant either decreased or remained unchanged which may explain the less rejection in this group. This suggests that KTR's can be carefully considered for transplantation across the HLA-DP Donor Specific Antibodies.

P124
Applying a rapid flow cytometric crossmatch assay in renal transplantation

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Prior to renal transplantation a flow cytometric crossmatch (FCXM) assay is performed to assess compatibility between potential donor-recipient pairs. In the deceased donor setting the turnaround time (TAT) of this test can be critical; any delay to transplantation can result in delayed graft function and poorer long-term outcomes.

The Royal College of Pathologists key performance indicator (KPI) for this test is 8 hours; with the majority of UK laboratories reporting within 6 hours. Our laboratory already out-performs this, with a KPI of 3 hours, and an average TAT for deceased donor FCXM of 2 hours 50 minutes. However, with a national drive to increase organ donation stretching our available resources, further improvements to our TAT and efficiency would be beneficial. To this end we have developed a rapid FCXM assay.

Optimisation of the rapid FCXM assay allows for shortened incubation and wash times without compromising quality or sensitivity. In comparison tests (n=10), assessing median channel florescence shift values for T-cells ($CD3^+$ cells) and B-cells ($CD19^+$ cells), the values revealed excellent concordance (R^2: >0.95).

Introduction of this rapid test would reduce the local TAT by approximately one hour. This would further improve the service provided to our clinical teams, provide potential benefits to patient care and reduce the on-call contribution required by the laboratory.

This method is equally applicable in the live-donor setting, increasing productivity and capacity without the need to purchase equipment or recruit staff, allowing for improved service without compromising the quality of care offered to our patients.

P125

A retrospective analysis on the outcome of expanded criteria donor kidneys in marginal recipients

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Introduction: Kidney transplants are the most sought after treatment for those with End Stage Renal Disease. Due to the ever-growing demand for kidneys, some patients are waiting years for donor kidney availability. Expanded Criteria Donor (ECD) kidney transplantation has been found to have shorter graft survival compared to healthy Standard Criteria Donor (SCD) kidneys. However, ECD kidneys have been shown to increase average life expectancy by 5 years compared to those remaining on dialysis. Hence, the importance on the use of ECD kidneys has much increased in recent years.

Aim: To look at the outcome of ECD Kidneys in marginal renal transplant recipients as compared to non-marginal recipients, by monitoring graft survival and patient survival at 1, 2 and 3 years post-transplant.

Methods: This was a retrospective analysis of 120 patients. 60 were renal transplant recipients and 60 were their corresponding donors. Donors were categorised into ECD and SCD groups and Recipients were separated into marginal and non-marginal groups using electronic records. Follow up data on yearly blood creatinine was obtained to calculate eGFR using the MDRD equation as an indicator of long term graft function. Graft failure was classified by return to dialysis (eGFR < 15 mL/min/1.73m²).

Results: Kaplan Meier analysis showed a 4.8% reduction in survival in marginal transplant recipients as compared to non-marginal recipients after 2 and 3 years (P = 0.42), however *graft* survival was 9.0% and 3.8% greater in marginal recipients after 2 and 3 years respectively (P = 0.52).

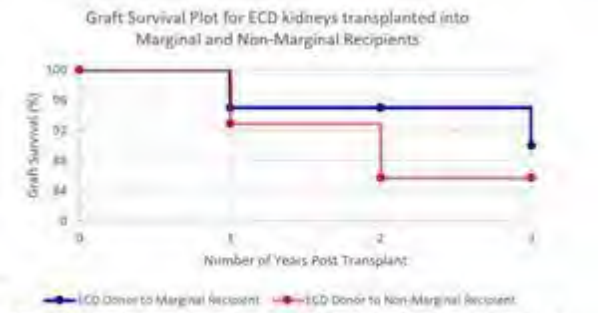

Figure 1: A graph comparing graft survival in Marginal vs Non-Marginal Recipients

Discussion: The results showed increased graft survival in marginal recipients compared to non-marginal recipients, however marginal recipients were shown to have increased follow up mortality. T-test analysis showed no statistically significant relationship between graft and patient survival for either group and hence more research is required; for a longer follow up period and specifically accounting for age and race.

P126
Skin cancer awareness in renal transplant patients

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Introduction: It is well established that renal transplant recipients are at increased risk of developing skin cancer. We aimed to determine whether our renal transplant patients have adequate knowledge in skin cancer risks and skin cancer preventative methods.

Methods: Two sets of questionnaires were given to patients between October-November 2019 who had received either living or deceased donor renal transplant. At-the-time of Transplant Questionnaire was completed by patients within 72 hours of their surgery. The Follow-up Post-Transplant Questionnaire was given to patients who had their surgery between 3 weeks to 24 years ago.

Results: A total of 13 patients completed the At-the-time of Transplant Questionnaire. All knew about the increased risks of skin cancer post-transplantation. 76.9% intended on using SPF 30+ and 23.1% intended on using none. 23.1% thought that sunscreen should be reapplied every 2 hours. 64.3% believed that transplant recipients should wear sunscreen on cloudy days and that they should check their skin monthly. Only 14.3% of patients correctly identified factors that reduce skin cancer risks. There were 25 patients who completed the Follow-up Post-Transplant Questionnaire. 48% never use sunscreen and only one patient reapplied sunscreen every 2 hours. 56% thought that sunscreen need not be applied on cloudy days and 44% used sunscreen with both UVA and UVB protection. 56% do not reapply sunscreen after swimming, 60% never check their skin and 16% sunbathe. 16% do not wear sun-protective clothing and 36% do not avoid sun exposure between 11am-3pm. None use sunbeds.

Discussion: The study demonstrated that transplant patients' knowledge of skin cancer risks and skin cancer preventative methods is suboptimal. It appears that patients' skin cancer awareness decreases with time and they do not follow written guidelines. We aim to introduce a nursing checklist for all transplant recipients after 12 months of surgery to remind patients of the risks.

P127

Long term outcomes of patients utilising ureteric stents for management of ureteric strictures following renal transplantation

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Introduction: Stenosis in the transplant ureter can be challenging to manage. Treatment options consist of; i) open ureteric re-implantation ii) endourological management (e.g. strictureolplasty, dilatation) or iii) long term ureteric stenting. Multiple factors are considered when deciding on patient centred plans. There is a paucity in the literature regarding long term outcomes of patients managed with stents and our aim was to provide data to help shared decision making.

Methods: A retrospective cohort study was performed for all renal transplant patients requiring long term ureteric stenting for ureteric stenosis between January 2004 and January 2019. Case identification was via a prospectively maintained database. Data was abstracted from clinical records. A long term stent is invariably considered only after endourological management, if appropriate.

Results: 21 patients with mean age 47 at transplantation. 2.2:1 male to female ratio. 8 were from live donors. The location of the stricture was; distal n=8, mid n=2, Proximal n=4, Extensive n=6. The reason for long term stenting was patient choice (53%) and not felt suitable for re-implantation (47%). On average there were 2.09 stent changes/year with a mean LOS of 1.47 days. Mean follow up time with stent was 78 months (range8-408). 80% maintained their renal function over the observation period. There were 12 emergency admissions (8 patients with 1), 16 expedited stent change (10 patients with 1) and 52% had more than one infection. Yearly cost analysis is for maintain ureteric stent is underway.

Discussion: Within our cohort the number of stent changes per year was low with a good day case rate. However patients who opt for long term stents do need to be aware of the risks of emergency admission, urgent stent changes and urinary infections. Pleasingly a large proportion of patients maintained their graft function.

P128

When polycystic kidneys are problematic: what nephrologists need to know about nephrectomy outcomes

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Introduction: Polycystic kidney disease (PKD) accounts for 7.4% of incident dialysis patients in the UK. Such patients are typically suitable for transplantation. Suitability for transplantation may be compromised if both kidneys are extremely large, or if there are recurrent cyst infections. The need for nephrectomy in such cases is clear, but what is less certain is the method and timing of such surgery. Traditionally open nephrectomy was the only option however, the adoption of hand-assisted laparoscopic nephrectomy (HALN) has reportedly reduced complications. Associated morbidity may be reduced in the setting of self-supporting renal transplant function compared to dialysis dependency, and may avoid the need for dialysis entirely by allowing pre-emptive living donor kidney transplantation. The potential for HLA sensitisation by blood transfusion is also of relevance in the pre-transplant cohort.

Methods: Patients with PKD who underwent unilateral or bilateral nephrectomy from May 2013 to October 2018 were identified by reviewing clinical admissions with a diagnosis of nephrectomy and polycystic kidney disease. Data were retrospectively collected from the NI Electronic Care Record.

Results: There were 15 patients with PKD who had a nephrectomy in this period, see Table 1.

Table 1

Technique		No of patients	Age (mean)	Complications				
				None	Transfusion	ICU Admission	Conversion	Other*
Open	Unilateral	2	42	2	0	0		0
	Bilateral	2	48	0	2	2		2
Total (open)		4	45	2	2	2		2
HALN	Unilateral	9	57	7	1	1	2	2
	Bilateral	2	52	1	1	1	1	1
Total (HALN)		11	55	8	2	2	3^	3
Total (all)		15	50	10	4	4	3	5

*splenic lacerations in three cases (one splenectomy), adrenal bed laceration, wound infection
^kidney size in two (anticipated conversion may be required), bleeding in one

Table 2

eGFR	Number of patients	Complications (as per Table 1)
<15	6	3
15-29	2	1
30-44	4	1
45-59	0	0
>60	3	0

There were no deaths. The complication rate was 33% over all, but was more likely in open surgery (50% v. 27%). Four patients required an ICU/HDU admission (mean length of stay 1 day) and 4 blood transfusion. The level of renal function at time of surgery was an important factor in outcome, details in Table 2 (5 were performed post-transplant).

Discussion: Nephrectomy is essential for some patients with PKD and has good outcomes, particularly with unilateral hand-assisted laparoscopic nephrectomy. In this cohort, blood transfusion requirement is low (11%). The complication rates increase with more advanced renal impairment. This may be an important consideration when deciding on the timing of surgery in relation to future transplantation.

P129

The role of a multi-additive perfusion solution in reducing postoperative complications following living-donor kidney transplantation

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Introduction: The optimum choice of perfusion fluid during living-donor renal transplantation (LDRT) remains unclear. The aim of this study was to determine whether using a multi-additive perfusion solution (Marshall's solution containing heparin, insulin, dexamethasone and benzylpenicillin) reduces postoperative complications and improves graft survival following LDRT.

Methods: This single-centre retrospective study included recipients undergoing LDRT over a one-year period. Patients were divided into two groups; those perfused with a multi-additive solution (Group 1), and those perfused with Marshall's solution alone (Group 2). Postoperative immunological, infective and vascular complication rates, long-term serum creatinine and graft survival were compared between the two groups.

Results: Of 117 patients included in this study, 73 were in Group 1. There was no significant difference in length of inpatient stay and total ischaemia time between the two groups. Operation time was significantly longer in Group 1 (mean 294±32 min vs. 247±21 min in group 2, $p<0.01$). Rates of rejection, infection and vascular complications were comparable between the two groups as were mean creatinine levels at 3, 6 and 12 months. No significant difference in graft survival was demonstrated.

Discussion: A multi-additive perfusion solution did not confer an advantage in postoperative complication rate or long-term graft function following living-donor renal transplantation in this study. This outcome should guide clinical practice with particular consideration for future cost saving.

P130
Single centre early experience of the new UK deceased donor kidney allocation scheme

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Introduction: In July 2019 the Kidney Advisory Group on behalf of NHSBT published a new transplant offering scheme for deceased donor kidneys. The new scheme was introduced to address some of the inequities in the offering process and aims to better match patient with graft life expectancy and facilitate greater priority for difficult to match patients in terms of their blood and HLA type. We present our unit's experience of the new scheme since its inception.

Methods: We retrospectively interrogated our local database from the date of the new scheme (11th September 2019) to present (12th November).

Results: Since commencement of the new scheme, 13 DBD and 7 DCD donors with median age 41.5 years [IQR 30-54.5]) were transplanted into 20 recipients with a median age of 53 years (IQR 37.5-60.3). The median waiting time on the transplant list was 2.15 years (IQR 1.78-4.11), with 80% of recipients from BAME background. Overall, the recipients had a median of 9.5 HLA mismatches at the HLA-A, B, Cw, DR and DQ loci, and included 5 tier A patients and 15 tier B patients with median matchability scores of 10 and 8 respectively. None of the tier A patients had biopsy-proven rejection, but 20% of tier B patients, who had a median of 8 HLA mismatches, developed either cellular (n=2) or antibody-mediated (n=1) rejection.

Discussion: This preliminary study gives an indication of the age, matchability and complexity of patients that have been transplanted as a result of the new national kidney offering scheme. More time and data are required to further understand the long-term implications of the new allocation scheme, but the early data implies BAME recipients might achieve more equitable access to transplantation. This is of particular importance for our centre, where BAME patients account for 60% of our centre's current waiting list.

P131
Indications and outcomes of “upside-down” renal transplants in an adult population; single center experience

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Introduction: Patients with complex vascular/urological anatomy can make implantation of the renal transplant (RT) challenging. To enable transplantation, the option to alter the normal positioning of the allograft may need consideration in such patients.

Methods: Single-centre retrospective review of upside-down RTs (UDTx) between 2012-2019; describing indications, operative complexity and clinical outcomes.

Results: 1816 adult RTs were performed in the 7-year study with 9 (0.5%) UDTx recipients. Mean UDTx age was 54Yrs (range 20-73 yrs); 6/9 UDTx were first transplants, (range; 1st-3rd transplant). 7/9 were deceased donors kidneys (3/9 left donor kidneys) and 7/9 were sited in the right iliac fossa, all performed with an extra-peritoneal approach. 2/9 were pre-planned UDTx orientation, 6/9 were decided peri-operatively and 1/9 was accidental (aUDTx). 6/9 UDTx indications allowed ureter to reach conduit or skin, 2/9 for vascular anastomoses and 1/9 aUDTx. 5/9 UDTx ureters had a cutaneous ureterostomy formed, 1/9 was anastomosed to an ileal conduit, 2/9 uretero-native ureteric anastomosis was performed and one ureter was anastomosed to the bladder. Mean UDTx follow-up 27 months (range; 4-92 months). After UDTx mean eGFR was: 34 (range: 6-89) at 1-week; 51 (range: 7-102) at 1-month and 49 (range: 25-70) at 1 year/most recent (minimum 4 months). 7/9 had complications: Clavien-Dindo Grade 3a (1), 3b (4) and 4 (2) including 3 major surgical complications within 1 week post-operatively. 5/9 had ureteric complications; 1 had percutaneous drain of urinoma, one required endo-urological ureteric dilatation and 3/5 experienced ureteric necrosis and revision surgery.

Discussion: UDTx offers an alternate allograft position to mitigate against difficult technical or anatomical situations that transplant surgeons may encounter. There were overall good functional outcomes but with high complications rates especially urological. UDTx is a technique that transplant surgeons should have in their armamentarium, ideally with this option being considered in pre-operative planning to facilitate appropriate consent.

P132

Experience in two London centres of nephrectomy in adult polycystic kidney disease peri-transplantation

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Background: There is no consensus in the management of patients with symptomatic polycystic kidneys in adult polycystic kidney disease (ADPKD). We examined practice and outcomes in 2 different renal transplant centres, Royal London Hospital (RLH) and Royal Free Hospital (RFH).

Methods: All patients who underwent a nephrectomy procedure for ADPKD between January 2013- August 2018 were reviewed for medical and surgical complications, use of blood transfusion, timing to transplantation and sensitisation.

Results: 39 patients underwent 45 nephrectomy operations, with mean age of 54 years, male/female distribution (24/16) and mean BMI of 31. 17 of 18 patients in RLH had a bilateral nephrectomy; 25 of 27 patients in RFH had a unilateral nephrectomy. Of these, 6 proceeded to contralateral nephrectomy (pain, infection and malignancy). 5 patients were diabetic and 11 were pre-renal replacement therapy. Mean length of surgery was 210 minutes. Indications were haematuria (20%), pain (40%), space (38%), malignancy (11%) and infection (49%). There was no 30-day mortality; 4 patients in the series died at 6, 17, 22 and 30 months. All were unrelated to the nephrectomy episode except one which was due to multiple complications. 20% developed post-operative complications (collections, infection and thromboembolic disease)- 3 underwent reexploration and 4 had an interventional radiology guided drainage. 40% developed post-operative infections managed with antibiotics. 40% nephrectomy cases required blood transfusion perioperatively (mean 2 units). 14 patients were subsequently transplanted during this period;1 developed weak class II DSA antibodies with MFI<2000 following the nephrectomy, and 1 developed cellular rejection at day 3; both patients did not receive any blood transfusion. In this period, 14 other patients were transplanted pre-nephrectomy. None had new DSAs or rejection.

Discussion: Both approaches are associated with minimal transfusion without evidence of sensitisation.

P133
The uncertain significance of elevated transaminases after renal transplantation

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Introduction: Following a cluster of unexplained marked elevations of serum ALT in a group of patients within 1 week of renal transplants, with negative imaging and viral investigations, we sought to determine the frequency of "transaminitis" after renal transplantation. We wished to better understand this before starting transplants from hepatitis C positive donors into negative recipients.

Methods: We reviewed laboratory and imaging results for patients transplanted between January 2012 and September 2019 in our centre.

Results: Data was obtained on 1170 recipients. 547 had an elevation of serum ALT in the first week after transplant; 172 (15%) had levels in excess of 100 IU/l (2.5x upper limit of normal), 48 (4%) greater than 200 IU/l and 17 (1.5%) greater than 300 IU/l. There were associated rises in AST, with mean AST: ALT ratio 0.96, but only 7 (0.6%) patients had bilirubin greater than twice the upper limit of normal. There was no relationship between peak ALT level and donor type, cold ischaemic time or DGF. Ultrasound scans of liver were performed in 22 cases, with abnormalities found in only 4, including two cases of parenchymal disease, one with cysts and one with mild biliary dilatation at 6mm. Otherwise all scans reported normal liver echogenicity, biliary tree and hepatopetal portal venous flow. 71% of patients with a peak ALT greater than 100 in the first week had a level of less than 100 by 14 days, and 95% had ALT less than 100 by 30 days.

Conclusions: Marked elevation of transaminases is common after kidney transplantation and may be of renal origin following ischaemia-reperfusion injury. In our experience, elevations settled after a few days without specific treatment. An early elevation of ALT in a recipient of a kidney from a hepatitis C positive donor may not be indicative of viral disease.

P134
Effect of ischaemic times – cold, warm and composite on one year graft function

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Introduction: Ischemic injury can have direct and indirect effects on the short and long term outcomes of renal allografts hence by reducing these, the long term outcomes can be improved. Cold and warm ischemic times (CIT, WIT) have been shown to independently affect graft function. We aimed to measure the effects of these in isolation as well as the effects of a composite of both on DGF and one year graft function.

Methods: This is a retrospective analysis of all the transplants performed in a single centre between April 2017 and March 2018. Donor and recipient factors were calculated through the electronic patients records. For the analysis, the CIT was divided into <18/<15 h and >18/15h, and WIT was divided into <35, 35-45 and >45 minutes. Composite ischaemic times were divided into sets of low (<18h CIT, <35) and high (>18h, >35 minutes).

Results: There were a total of 131 transplants (Live donors 36, DBD 69, DCD 21, SPK 4). Majority of the patients were on HD (57%, PD 28% and 13% pre-emptive). There were no differences in the recipient characteristics against ischemic times for the age, length of dialysis and dialysis modality. There were more patients with short cold ischemic times in the IL-2 induction arm. Rates of DGF were not different across groups of CIT and WITs separately. 12 month serum creatinine levels were similar across CIT groups (with 12, 15 and 18 hour cut offs). The 12 month Cr levels were statistically lower in the >35mins WIT cohort (p0.006). For the composite of CITs and WITs, although 12 month creatinines were worse with longer composite times, these were significantly worse with composites of longer WITs.

Conclusion: In our cohort, longer WITs were shown to be strong indicators of worse one year graft function both in isolation and composite with CITs.

P135

The use of Clavien-Dindo classification in adult kidney transplantation and identifying factors which are associated with minor and major complications

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Introduction: The Clavien-Dindo classification has been described for grading complications following surgical procedures. We sought to use it as a means to record complications in an objective and reproducible manner, and to identify factors associated with greater and more frequent complications.

Methods: A retrospective analysis was performed of the 130 adult kidney transplants in a single centre from April 2017-April 2018, with 1 year follow up. Complications were graded according to the Clavien-Dindo classification at 7 and 30 days. A minor complication was considered Grade 0-2, and major complications Grade 3 and above.

Results: A cold ischaemia time of >18 hours was associated with major complications at 30 days ($p=0.004$) but not at 7 days; no correlation was observed with warm ischaemia times of greater or less than 35 minutes. Recipients with immediate graft function were less likely to develop major complications at 7 days ($p=0.035$). No other associations were observed with slow or delayed graft function at 7 or 30 days. Types of donor (SCD, ECD, DCD, LD), status at time of transplant (HD, PD, pre-emptive), induction agent (ATG, IL-2RA) and recipient age (60) did not appear to have impact on grade.

Discussion: Recipients with cold ischaemia time <18 hours and immediate graft function are less likely to develop major complications. This, and the absence of correlation between aforementioned factors and complications should be considered in resource allocation ie. access to operating theatre and developing early recovery pathways. Secondly, donor and recipient selection should not be influenced by concern of complications. Further work is required to determine other factors which predict major complications and long-term outcomes.

P136

Influence of intrapersonal tacrolimus level variations on cadaveric renal transplant graft function

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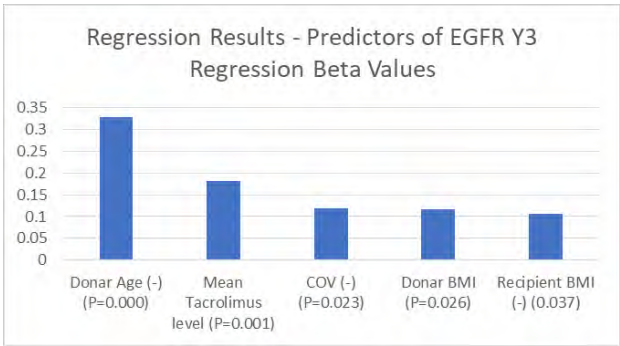
Introduction: To review predictors of renal transplant graft function, specifically whether intrapersonal tacrolimus variations during the first 3 months after transplant affected the EGFR at year 1, 3.

Method: Review of the prospective renal transplant data base over a period of 5 years from January 2010 to December 2014 and included cadaveric renal transplant recipients only.

Results: From 409 patients, a 327 (80%) patients with complete data were included for the study.

	Mean
Recipient Age(years)	54 (18-79)
Recipient BMI	27(18-42)
Donor Age(years)	53 (11-80)
Donor BMI	26(14-53)
Donor Creatinine	79 (28 -352)
Cold Ischaemic Time	13 hours(3-36)



Discussion: The mean levels of tacrolimus was 8 (SD, 1.5) and coefficient of variation (CV) was 21% (SD 10%). The CV represents the relative variability of tacrolimus levels within each individual, vary from their own mean tacrolimus level and obtained by division of SD by mean tacrolimus levels(CV=SD/mean). Our study we used 5 consecutive tacrolimus levels readings four weeks after surgery. The regression model showed that, donor age (P<0.001), mean tacrolimus level (p<0.001), CV (p=0.023), recipient BMI (P=0.037) and donor BMI (p=0.026) were all significant predictors of EGFR at year 3. Patients were further divided into 4 groups, DBD/SCD, DBD/ECD, DCD/SCD and DCD/ECD. In the DBD/SCD patients, tacrolimus levels (mean 8.18; SD 1.602) was found to have a statistically significant positive relationship (P<0.001) with EGFR, at year 3 and CV (22.68%; SD 12.78%) had a statistically significant negative (P=0.045) relationship with EGFR at year 3. These findings were not found in other patient subgroups in statistically significant manner. Higher intrapersonal variation of tacrolimus levels does negatively impacts the renal transplant graft function, particularly in the DBD/SCD group. We hypothesise in DCD/ECD patients other variables have stronger impact on renal graft function.

P137

Does streamlining antibody screening improve compliance with national histocompatibility and immunogenetics standards and decrease kidney transplant cold ischaemic time?

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Introduction: The multidisciplinary team perceive poor compliance with 3 monthly tissue typing sampling from patients registered on the kidney transplant list across the region. Sampling non-compliance was thought to be associated with delays to surgery, increased cold ischaemic time (CIT), unnecessary out of hours working and additional departmental costs. Our aim was to investigate the incidence of sampling non-compliance against National histocompatibility and immunogenetics standards, implement changes in practice to improve compliance and review effectiveness and to review sampling non-compliance and impact on CIT.

Methods: Tissue typing 3 monthly sampling from patients registered on the kidney transplant list across the region was retrospectively reviewed between April and September 2018. Thereafter the same data was collected prospective;y after a change in practice between October 2018 and March 2019. The data was sourced from the local kidney transplant database. Patients were excluded if they had been removed from the list within the 6 month timeline due to ill health, death, patient choice or received a transplant. Secondly, the crossmatch method (retrospective versus prospective, donor blood versus donor material) and subsequent CIT was reviewed from kidney transplants performed between January 2016 and March 2019 in one transplant centre. Data was collected from patient records.

Results: All cadaveric transplanted kidneys from a single centre during the time frame assessed were included (n=433). Streamlining the point at which patients underwent sampling for tissue typing failed to produce a statistically significant improvement in compliance ($p=0.6789$) although numerically there was potentially an improvement in compliance for patients active on the transplant waiting list. Patients requiring a wet crossmatch had extended CIT ($p<0.001$).

Conclusion: Despite improving administrative processes and communication between units, we are still to minimise out of date samples. Patient involvement in maintaining accurate testing may be the next step in improving this aspect of the patient journey.

P138

Is injury to the donor graft associated with disease recurrence in FSGS in paediatric transplantation?

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Introduction: Focal segmental glomerulosclerosis (FSGS) is a significant cause of end-stage renal disease (ESRD) in children. Disease recurrence post-transplantation is common and leads to early graft loss in up to 60% of cases. The exact mechanism underpinning disease recurrence in the transplanted organ remain elusive. However suggested risk factors for recurrence include, younger age at disease onset, rapid progression to ESRD and proteinuric circulating factors amongst others. We aimed to assess the association between donor graft injury (e.g. procurement injury, capsular tear, biopsy site) and early disease recurrence.

Methods: Retrospective analysis of all paediatric transplants for primary FSGS between 2006 and 2019, performed at the Royal Hospital for Children, Glasgow. Electronic and case notes were reviewed, including procurement documentation, for evidence of graft injury. Endpoint data included recurrence of proteinuria, recurrence diagnosed on biopsy, and timing of disease recurrence.

Results: Ten renal transplants were performed in children where primary FSGS was the cause of ESRD during this period. Four donors were deceased donors and 6 were living-related donors. A total of 4 cases had documented evidence of donor graft injury prior to transplantation; 3 such cases developed early disease recurrence within 3 days (mean 2.7, range 1 - 3). Six cases had no documented evidence of injury to donor organs, and 2 patients subsequently developed FSGS recurrence at days 1 and 8 post-transplantation.

Discussion: FSGS recurrence in the post-transplant phase is a significant risk factor for graft loss and treatment is challenging. This dataset is small. There is, however, a possibility of an association between donor graft injury and early disease recurrence. To our knowledge, this has not been reviewed or refuted in current literature. More work is necessary to extend this to a larger patient cohort to determine whether this trend is clinically significant.

P139
The effect of gender on delayed graft function in renal transplants

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Introduction: Delayed graft function (DGF) is associated with various donor and recipient factors and can lead to poor renal outcomes. Previous experimental studies have revealed sex-specific susceptibility to ischaemic reperfusion injury in the kidney. We sought to determine whether donor and recipient gender were associated with DGF.

Methods: We performed a retrospective analysis of adult renal transplant patients between 2016-2018, and recorded donor and recipient risk factors. DGF was defined as dialysis need within 1 week from transplant. Four donor recipient groups were formed based on donor-recipient gender combinations: male recipients of male donors (MR/MD), female recipients of male donors (FR/MD), male recipients of female donors (MR/FD) and female recipients of female donors (FR/FD). A multivariable logistic regression analysis was used to analyse the data.

Results: Of the 303 renal transplants, 88(29%) had DGF. There was a significant downwards trend towards lower DGF risk with female donors.

Table 1. Multivariable analysis

	Odd Ratio	95% CI	p-value
MR/MD	Baseline		
FR/MD	0.44	0.18-1.05	0.065
MR/FD	0.35	0.15-0.77	**0.009**
FR/FD	0.31	0.12-0.76	**0.011**
Recipient age	0.96	0.92-1.01	0.21
Donor age	1.02	0.99-1.04	0.115
DBD	Baseline		
DCD	2.97	1.53-5.75	**0.001**
Living donor	0.09	0.018-0.45	**0.004**
Cold ischaemic time(hr)	1.06	0.99-1.12	0.071
RRT			
Pre-emptive	Baseline		
PD	0.4	0.06-2.81	0.364
HD	2.23	0.67-7.42	0.192
Ethnicity			
White	Baseline		
Asian	1.38	0.49-3.92	0.542
Black	2.58	0.62-10.68	0.19
Other	1.53	0.77-3.06	0.22
Unknown	6.02	0.38-93.5	0.199

Discussion: Our data indicates that the female renal transplant donor may be protective in preventing DGF. A larger study is required with more donor and recipient variables to validate this finding.

P140
The development of transplant outreach clinics

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WHY: Increasing numbers of transplanted patients. SALFORD ROYAL HOSPITAL covers a large area and some patients struggle to attend Salford if relying on public transport.

- To try and cut down on the number of patients who do not attend.
- To reduce the time some patients have to take off work.
- Easier access for patients.

We looked at Bolton Renal Unit to trial our first outreach clinic, it would consist of:

- Consultant clinic
- Registrar clinic
- Specialist Nurse clinic and annual review clinic
- Amenities for weight, B/P, urine and blood test would have to be made available.
- The structured working week would be changed to accommodate MDT for the extra clinic.

Initially there were teething problems as with all new ventures, would there be enough staff available and also rooms. Is the waiting area big enough to accommodate the extra patients attending. We need to provide a safe environment for patients to be seen. Also a safe clinical area would be required for initial observations and the taking of blood samples. But with team meetings that included Drs, nursing staff, admin and managers in these areas we were able to find solutions to these problems. Immunosuppression is to be made available for the patients to pick up locally and to be ready in time to coincide with their clinic appointment. It's not a surprise to discover most were due to a lack of knowledge in respected areas, understanding and communication.

Feedback from the patients has been very positive resulting in the setting up of a further 2 outreach clinics, one at Oldham Hospital and at Wigan as the graph below shows with the number of patients attending.

Salford	399 patients
Bolton	109 patients
Oldham	118 patients
Wigan	85 patients
TOTAL	**711 PATIENTS**

P141

Antiplatelet therapy improves the short term outcome of combined kidney and pancreas transplantation

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Introduction: Pancreas transplantation is an effective therapy for diabetes mellitus, however the short-term outcome is still nowadays impaired mainly by allograft thrombosis (AT), which causes the majority of early graft failure. The aim of our study was to assess the impact of pre-transplantation treatment with aspirin load on the early pancreas graft outcome.

Methods: From January 2015 to December 2018 we collected retrospectively demographics of donors and recipients, and data on the outcome of the pancreas transplantation, and compared the 90-days pancreas survival, the rate of allograft thrombosis, pancreatitis, delayed kidney graft function (DGF), and pancreas long-term survival between the recipients treated with aspirin load before the transplantation versus those without.

Results: In the considered time-period 241 pancreas transplantation were performed at our Center, 36 with pre-operatory aspirin load and 205 without. The percentage of early pancreas losses was reduced to 2.8% in the aspirin loaded group versus 11% in the other recipients, although this result was not statistical significant. Pre-operatory antiaggregation was showed to be protective in reducing the rate of DGF (from 33.1% to 22.1%) at both univariate and multivariate analysis p=0.016). No difference was detected in the amount of blood units administered during and after surgery.

Discussion: The pre-operative aspirin load seems to be protective on the early pancreas graft loss, although the relatively small numbers of such recipients may have impaired the statistical significance. In addition, the beneficial effect of antiaggregation extends also to the kidney early function, without increasing the risk of hemorrhagic complications.

P142

Single vs multiple dose alemtuzumab for induction in SPK transplantation: systematic literature review and meta-analysis

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Introduction: Alemtuzumab (Alem) is commonly used as induction agent in simultaneous pancreas-kidney (SPK) transplantation worldwide. Although it is commonly administered in divided multiple doses, reports of single dose induction have shown similar efficacy and safety. In this study, we compared single vs multiple dose Alem regimens in terms of patient and graft survival, rejection, CMV and systemic infection rates.

Methods: We performed a systematic review of the literature in the modern era of SPK transplantation, from 2000-2017, according to PRISMA statement. Search strategy included common bibliographic databases.

Results: 12 studies were selected for analysis. Seven studies (n=325 SPKs; 3 prospective randomised and 4 retrospective) reported on single dose Alem and five studies (n=659 SPKs; all retrospective) on multiple dose Alem induction. The methodological quality was generally low. None of the studies included a direct comparison between single and multiple dose Alem, thus comparisons were made between either single or multiple Alem vs alternative induction regimens (Alt) in a random-effects model. Overall, patient survival was similar between single and multiple Alem dose regimens (97% vs 99%). Pancreas graft survival rates at 1-year post-SPK were also similar [single Alem: OR 0.64 (95%CI 0.26-1.59); multiple Alem: OR 1.60 (95%CI 0.90-2.85), vs Alt] (Fig. 1). Overall rejection rate within 1 year from SPK was not different either (20% vs 21.1%). CMV viraemia/infection rate was, however, significantly lower in the single dose Alem group [OR 0.48 (95%CI 0.25-0.91) vs Alt] compared to multiple dose Alem [OR 2.67 (95%CI 1.61-4.42) vs Alt] (Fig. 2). Both groups had similar systemic infection rates compared to alternative induction, although a higher event rate was noted in the single Alem group.

Discussion: Although robust studies are lacking, single dose Alem induction in SPK transplants seems to be adequate and safe, with lower CMV viraemia/infection rates, compared to multiple dose regimens.

P143

Should all simultaneous pancreas and kidney (SPK) transplant recipients have a jejunostomy placed at time of transplant?

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Introduction: Given most of our recipients have a history of gastroparesis, requiring nutritional support post operatively, will they benefit from jejunostomy insertion to avoid total parenteral nutrition (TPN) and associated risks/implications?

Methods: Data reviewed of all SPK recipients 29/07/17 – 29/06/18.

Results: 21 SPK transplants performed; one had transplant pancreatectomy on day zero (thrombosis). 18 of the 21 (86%) had a jejunostomy tube inserted. Of the others, one had a naso jejunostomy (NJ), one had a nasogastric tube and one had no enteral feeding tube. The 20 that had enteral tubes were fed for between 2 and 19 days with an average of 7 days. Highest peripheral blood glucose was noted for the entire transplant admission and of the 20 patients, 10 had recordings of 9 mmol/l or above, 4 of those were on TPN at the time and 2 were solely being enterally fed. Of the 20 that were fed enterally, 5 required TPN; 2 had jejunostomies removed at reoperation, 1 had a blocked jejunostomy, 1 had NJ removed and 1 required TPN alongside jejunostomy feed as unable to tolerate adequate volumes. 10 recipients had one or more abdominal CT scans during transplant admission. 9 indicated for low haemoglobin or suspected pancreatitis. Only one of those was indicated for raised blood glucose, they were found to have a minimal thrombus in the distal superior mesenteric vein.

Discussion: Our protocol states all recipients should have a jejunostomy tube inserted at time of transplant. All recipients were fed via their jejunostomy tubes without any complications. All jejunostomy tubes that were removed were done due to reoperation. Of all that were fed via their jejunostomy, only one was unable to tolerate enough feed to meet nutritional requirements. This supports our evidence based practice: SPK recipients should have a jejunostomy tube placed at time of transplant.

P144
Arrhythmias after heart transplantation

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Objective: to estimate the frequency of arrhythmias after heart transplantation (HTx) and to define factors that impact on their development.

Methods: From January 2010 to February 2019 it was performed 114 HTx (mean age – 47±14 year-old; 84 – male). All recipients were managed with immunosuppression: tacrolimus, mycophenolic acid or everolimus, steroids, induction (Basiliximab – n=94; Thymoglobulin – n=20). We retrospectively estimated post-transplant outcomes plus ECG and 24-Holter ECG results.

Results: Thirty-day after HTx 2 patients died due to ventricular fibrillation, asystole. After HTx sinus tachycardia occurred in 95% (n=108), RBBB in 83% (n=95) and LBBB – in 24,5% (n=28). During early-term follow-up atrial fibrillation (AFib) was diagnosed in 28% (n=32) of recipients and atrial flutter - in 3.5% (n=4). In 11 cases AFib development could be associated with an acute rejection (2R/3A). We found positive correlations between early AFib development and time on ventilator support (0.328; $p<0.001$). Moreover, 57 recipients required temporary cardiac pacing (6.2±0.8 days) and in 1 case permanent pacemaker (PP) was implanted. During 1st year SCD occurred in 2 patients. In long-term AFib developed in 2 recipients with chronic cellular rejection, cardiac allograft vasculopathy (CAV) and positive HLA sensibilisation: n=1 - underwent 3 RFA with no effect. Both of patients died from myocardial infarction, asystole while waiting for re-transplantation. More than 1 year after HTx 2 patients underwent PP implantation. Ventricular extrasystoles were diagnosed in 10 cases (n=1 – associated with amiodarone-induced thyrotoxicosis) and supraventricular extrasystoles – in 6. There was no difference in the fact of HLA sensibilisation prior to HTx, donor-recipient gender mismatch and immunosuppressive drugs (mycophenolic acid / everolimus) on the development of arrhythmia ($p>0,05$). Standard antiarrhythmics were effective on allograft.

Conclusion: Management of post-transplant arrhythmias is important for decreasing mortality. Standard antiarrhythmics are effective on allograft. Arrhythmias in late post-transplant follow-up are associated with rejection, CAV, HLA sensibilisation and can lead to worse outcomes.

P145
Where do donors hear about living donor kidney transplantation?

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Background: Developing future strategies to increase the pool of living kidney donors requires awareness of current practice and impact. We aim to increase both directed and non-directed (altruistic) donor numbers which will require a variety of information sharing strategies. To examine the current situation we reviewed 100 donors to explore where they had first heard about living kidney donation.

Method: All living kidney donors are asked routinely on the healthcheck questionnaire where they first heard about living donation. A casenote review was performed examining the responses for 100 donors (50 directed and 50 non-directed). Additional information concerning blood donation history was also gathered.

Results: The majority (61%) of non-directed donors had heard about living kidney donation via the media. In contrast, 58% of directed donors had heard from either the recipient or family/friends with only 14% directly via the media. Twenty six percent of directed and 10% of non-directed donors had been made aware by a General Practitioner/Hospital. A large percentage (84%) of non-directed donors had been or currently were attending blood donor sessions, compared with 36% of directed donors.

Conclusion: Though not unexpected, these results provide evidence to plan future publicity and education strategies. Media is a valuable tool to raise awareness of non-directed donation: a recent YouGov survey demonstrated that 30% of those asked had never heard of living kidney donation, so there is scope to improve awareness. The high number of non-directed donors who also have been blood donors suggest opportunity for further work in this area. Media is also important to inform family/friends and recipients, especially with reported instances of patients' expectations of increased organ availability from deceased donors due to opt-out law changes. Perhaps a more important question in relation to directed donation is where the recipient first heard about the benefits of living kidney donation.

P146

The relationship between CT body composition variables, sarcopenia, and creatinine rise following living kidney donation

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Introduction: "Sarcopenia" and "myosteatosis" are used in computed tomography body composition (CT-BCA) to denote low muscle mass and radio-density respectively. In cancer, these findings indicate worse outcomes, including inability to tolerate chemotherapy, and early death. Cut-points delimiting "normal" and "sarcopenic" or "myosteatotic" were originally derived from a cancer dataset, it is unclear how these apply to a non-cancer population. It is similarly unclear whether CT-BCA can predict non-cancer outcomes. This study aimed to find the prevalence of sarcopenia in live kidney donors, and to assess whether CT-BCA related to postoperative differences in creatinine.

Methods: Between August 2009 and December 2015, the CT scans of 208 donors (M:F 111:97) were assessed using validated semi-automated CT-BCA software, giving values for Skeletal Muscle Index (SMI) and Density (SMD). Preoperative, post-discharge, and 1-year creatinine (Cr) levels were measured.

Results: As seen in Table 1, males tend to be taller, heavier, have higher SMI and muscle SMD, and reduced rates of sarcopenia compared to females. Linear modelling revealed SMI and SMD related to discharge, and 1-year creatinine rise (See Table 2).

Discussion: The increase in Cr with increasing SMI is expected, however increasing Cr with increasing SMD is a new finding. Prevalence of sarcopenia in donors was higher than previously reported (28-50% vs 4-8%), and cancer-derived cut-points may not apply to healthy patients. It appears important to understand donor CT-BCA for interpretation of post-donation creatinine.

Table 1	**Demographics**	**Male (n=111)**	**Female (n=97)**	**p**
Age	Mean	48.5	52.2	0.081
Weight		81.8	67.8	<0.001
Height		176.5	162.5	<0.001
SMI		52.2	40.8	<0.001
SMD		44.2	41.8	0.010
CT Muscularity	Normal	83	47	<0.001
	Low	28	50	

Table 2	**Linear Modelling**	**Adjusted R-Squared**	**p**
SMI			
	Discharge	0.16	<0.001
	Cr Difference vs preop	0.04	0.03
	1yr Cr	0.378	<0.001
SMD			
	Discharge	0.03	0.02
	Cr Difference vs preop	0.025	0.03
	1yr Cr	-0.01	0.893

P147
"Robotic assisted donor nephrectomy. Results from a pilot study"

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Introduction: Laparoscopic donor nephrectomy (LDN) is currently accepted as the gold standard procedure for living donor nephrectomy. The first robot-assisted laparoscopic donor nephrectomy (RALDN) was performed in 2000 at the University of Illinois Chicago and since then a number of centres across the world have started performing RALDN. In the UK there are currently two centres offering the procedure. We present the results of a pilot program funded by two grants and a comparison with the hand assisted laparoscopic donor nephrectomy technique (HALDN) performed during the same period.

Methods: All RALDN performed at Guy's Hospital from December 2018 to November 2019 were analysed. Sex, age, BMI, pain scores and CRP on post-operative days 1-3, length of stay, duration of operation, as well as post-operative complications were recorded. The pilot study inclusion criteria specified left sided nephrectomies with single vessels, and therefore a comparison with only left HALDN is outlined here.

Results: 12 RALDN performed at Guy's Hospital in the study period. 5 were male; median age 40.4 years; median BMI was 25. The mean warm ischaemia time was 3.5 minutes and mean operative time was 231 minutes. Only one donor presented with a post-operative complication of left leg neuropraxia. This was most likely due to patient positioning on the operating table. Compared to the HALDN group, WIT was longer in the RALDN (3.5min vs 2.58min p= 0.006) and operative time was longer (231min vs 196min p= 0.009). The recipient graft function was comparable between the two technics within the limitations of short follow up.

Discussion: Despite remaining on the learning curve for RALDN our initial results are encouraging Having progressed through the learning curve we are now including right sided nephrectomies and donors with multiple vessels. A randomized control trial comparing RALDN to LDN is required to determine benefits of the robotic approach.

P148
Performance of GFR estimation equations in living kidney donors - a single centre study

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Introduction: CKD-EPI is routinely used to determine estimated glomerular filtration rate (eGFR). For potential living kidney donors (PLD) accurate assessment of kidney function is essential, and is achieved by measured GFR (mGFR) using plasma clearance of either crEDTA or Iohexol. At our renal unit Cystatin C is also routinely measured in PLD. We aimed to assess the role of Cystatin C eGFR (CySC) and combined CKD-EPI and CysC eGFR (Epi-CysC), versus CKD-EPI alone, against mGFR in a cohort of PLD.

Methods: Data were retrospectively collected from 113 PLD between 2015-18. Epi-CysC was calculated using the NKF-KDIGO application. Statistical analysis was performed using PRISM and Excel. We analysed accuracy of eGFR equations within ±30% (P30) and ±10% (P10) of mGFR. Ethics approval was obtained from the Health Research Authority.

Results: Correlation analysis (eGFR vs mGFR) with Pearson's r coefficient was; 0.59 (P <0.001) for CKD-EPI; and 0.43 (P <0.001) for CySC. Corresponding R^2 values on regression analysis were 0.35 and 0.19 for CKD-EPI and CySC vs mGFR, respectively. Accuracy (P30) was; 90.2% for CKD-EPI (n=113); 80.6% for CySC (n=108); and 89% for Epi-CysC. Accuracy (P10) was; 42% for CKD-EPI; 33.3% for CySC; 37.4% for Epi-CysC. Mean (SD) bias (eGFR-mGFR); CKD-EPI 2.3 (16.3); CySC 4.1 (20.6); Epi-CysC 3.7 (17.4). Precision (Root-Mean-Square-Deviation): CKD-EPI 16.2; CySC 20.3; Epi-CysC 17.1.

Discussion: CKD-EPI correlated better with mGFR than CySC in PLD. Both equations demonstrated acceptable P30 accuracy values, with CKD-EPI being superior to CySC. Both equations showed poor accuracy assessed by P10 values. Combined Epi-CysC did not improve the accuracy of eGFR. CKD-EPI demonstrated lower bias compared to CySC and Epi-CysC. CKD-EPI and CySC eGFR equations showed significant correlation with Iohexol mGFR, but neither demonstrates acceptable accuracy to replace mGFR in PLD. Cystatin C does not add value to the accuracy of eGFR equations in PLD.

P149

Deemed consent legislation – are the lesson's learned in wales transferable to England considering the differing diversity of each territories population

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Introduction: In December 2015, the Human Transplantation (Wales) Act 2013 came into effect with a system of Deemed Consent for Organ Donation. In Spring 2020, England introduces similar legislation, the Organ Donation (Deemed Consent) Act 2019. Following the introduction of the legislation the combined consent rate for Organ Donation in Wales has increased to 81.5% from 59%. According to the England and Wales Census in 2011, Wales has a 4.4% population of Black, Asian and Minority Ethnic (BAME) individuals compared with 13.4% on average in England. There are regional differences within England with BAME individuals accounting for 40.2% of the population in London compared to 4.6% of the population in the South West of England. Data from NHS Blood and Transplant highlights a vast difference in consent rates between the White British (70.5%) and BAME population (41.7%) when approached for Organ Donation. At the same time, 79% of individuals who have Opted Out of Organ Donation are from the BAME population. A team of Professional Development Specialist's (PDS) responsible for training Specialist Nurse's – Organ Donation (SNOD's) in the English legislation questioned whether it is likely we will see a similar consent rate increase in England based on a difference in ethnic populations in the two territories.

Method: The public awareness campaign targets certain demographics, and engagement with diverse cultural groups to understand how we can effectively implement the legislation to these communities.

Results: We can adopt learning from Wales with regards to the operational implementation of the legislation change and the practicalities for SNOD's in their communication with families and donating hospitals, however there is no real benchmark for working with more diverse communities.

Conclusion: An ongoing focus on data and experiences related to BAME population's during and after implementation will be imperative to learning and developing on any success.

P150

Barriers, facilitators and interventions concerning organ donation in people from minority ethnic backgrounds: updating the evidence base

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Introduction: The NIHR previously funded a programme of work (DonaTE) seeking ways to increase the acceptability and rates of organ donation among people from black, Asian and ethnic or mixed (BAME) backgrounds. This work involved a systematic review of the barriers to organ donation, and a review aiming to identify characteristics of effective interventions. Both reviews were published in 2013. We updated and expanded these reviews to provide an up-to-date evidence base on the barriers, facilitators and interventions concerning organ donation in BAME people.

Methods: The update review eligibility criteria were based on those used in the original reviews, and expanded to capture facilitators as well as barriers. Any study of any design conducted in a community setting was eligible for inclusion. As per the original reviews, the update search was limited to English language UK and US studies published from 2010 onwards. The searches were conducted in February 2019.

Results: The update searches identified 4162 records. Following deduplication, 3066 records were screened by two reviewers. Detail on six barriers and four facilitators were extracted from 16 included studies. Barriers included 'knowledge of organ donation and registration', 'bodily concerns', 'donating to friends and family only', 'talking with family about donation', 'issues of trust within the health system' and 'faith and cultural beliefs'. Facilitators identified included 'altruism', 'knowing and meeting other donors and recipients', 'knowledge exchange and awareness' and 'faith and cultural beliefs'. Five additional included studies (four from the UK and one from the US) reported details of an intervention.

Discussion: The evidence base on barriers, facilitators and interventions concerning organ donation in people from BAME backgrounds has been updated. Six barriers and four facilitators were captured. Further, the results showed that the majority of currently available (and evaluated) interventions were education and/or media-based, and that their effectiveness was often reported as limited.

P151
Recent trends in reasons for families not supporting organ donation

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Introduction: There is concern that as publicity has increased surrounding opt-out legislation there has been an increase in the number of cases where *"Patient expressed a decision not to donate"* (*Expressed opt-out*) is cited as the reason not to support organ donation.

Methods: Data have been obtained from the national Potential Donor Audit (PDA) on all eligible donor approaches between 1 January 2013 and 31 August 2019.

Results: Of families not supporting donation, the proportion of expressed opt-outs has increased from 18% in 2013 to 24% in the first eight months of 2019 (**Figure 1**). As a proportion of all approaches this has remained unchanged, at 8%.

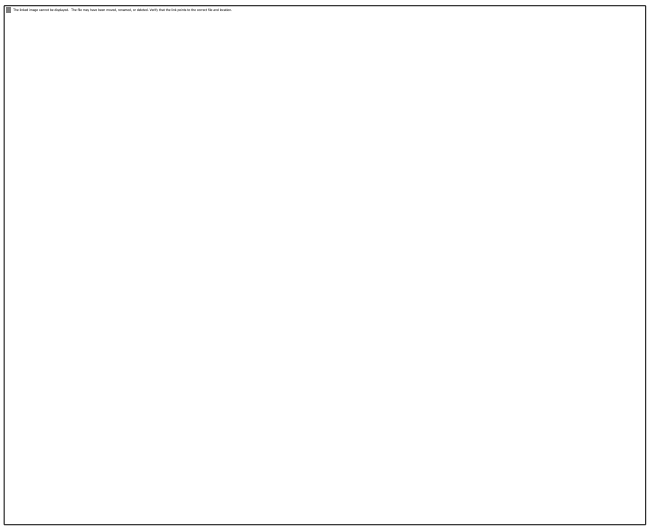

Table 1 Summary of reasons for not supporting donation, January 2013 to August 2019

Reason for family not supporting donation	2013 - 2015		2016 - 2019	
	N	%	N	%
Patient previously expressed a decision not to donate	738	18.4	917	22.3
Family were not sure whether the patient would have agreed to donation	592	14.8	659	16.0
Family concerns over post mortem intervention	549	13.7	592	14.4
Family felt the length of time for donation process was too long	454	11.3	493	12.0
Other	347	8.7	332	8.1
Family felt the patient had suffered enough	312	7.8	280	6.8
Strong refusal - probing not appropriate	288	7.2	146	3.5
Family were divided over the decision	216	5.4	186	4.5
Family felt it was against their religious/cultural beliefs	169	4.2	229	5.5
Family did not believe in donation	157	3.9	162	3.9
Family concerned that organs may not be transplanted	70	1.7	48	1.2
Family wanted to stay with the patient after death	60	1.5	46	1.1
Family had difficulty understanding/accepting neurological testing	25	0.6	12	0.3
Family concerned that other people may disapprove/be offended	16	0.4	10	0.2
Families concerned about organ allocation	7	0.2	7	0.2
Patients treatment may be or has been limited to facilitate organ donation	6	0.1	1	0.0
Refused virology testing although patient wished to donate	1	0.0	0	0.0
Total	**4007**	**100.0**	**4119**	**100.0**

Comparing reasons, in the UK, for not supporting donation pre and post implementation of opt-out legislation in Wales (**Table 1**), "*Expressed opt-out"* was the most common across both periods (18.4% and 22.3%). The proportion of *"Strong refusal"* declined over the two time periods (7.2% vs 3.5%).

Further analysis, not presented here, showed for the recent period the most common reason for overruling the patient's ODR opt-in decision was *"Length of donation too long"* (30.8% vs 10.3%). *"Strong refusal"* (2.8% vs 6.1%) and *"Other"* (5.5% vs 16.4%) were less likely when a SNOD was present, but *"Length of donation too long"* was more common (12.9% vs 8.9%). Families of DBD patients were more likely not to support donation because, *"Family felt it was against their religious/cultural beliefs"* (10.0% vs 3.0%) and *"Family concerns over post mortem intervention"* (18.7% vs 11.9%). Families of DCD patients were more likely to cite *"Length of donation too long"* (16.0% vs 4.9%).

Discussion

Over time there has been an increase in the proportion of *"Expressed opt-outs"* to 24% in the first eight months of 2019, 8% of all approaches, and there has been a decrease in cases of *"Strong refusal"*.

P152

It's now or never. A retrospective audit of patients suspended from the deceased donor transplant list

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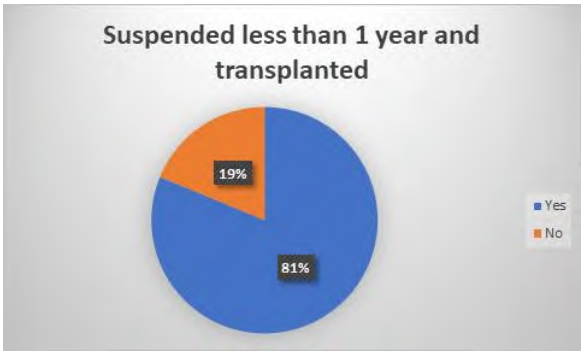
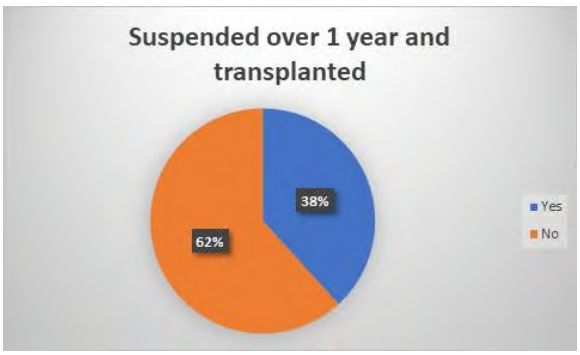
Introduction The primary purpose was to evaluate the outcomes of patients suspended from the deceased donor renal transplantation list in Northern Ireland in a three year period. The primary outcomes measures were to assess the proportion of patients who were alive and had been transplanted. Secondary outcomes were to measure the duration and reason for suspension.

Methods: A list of patients suspended from the deceased donor transplant list on 28thOctober 2015 was obtained from the regional transplant centre and regional medical databases were used to extract relevant data.

Results: Of 56 patients on the original list, 41 patients (73%) were alive at the end of follow-up, 14 (25%) were deceased and 1 (2%) unknown. 30 patients (53%) had received a renal transplant, 25 patients (45%) had not, with 1 (2%) unknown outcome. The three most common causes for suspension were: the patient was medically unfit, the patient was awaiting a specialist opinion or investigation and suspension on patient request. Mean time suspended was 665 days and from original listing to transplantation was 805 days. In patients suspended for under one year, 11 of 14 patients were transplanted (79%), however in patients suspended for over one year, only 13 of 34 patients were transplanted (38%). Patients suspended as they were medically unfit had the lowest rate of transplantation (6/20). All patients suspended on patient request, awaiting radiological investigation or due to obesity were transplanted (12). Two patients suspended due to poor compliance were not transplanted.

Discussion: In a three year follow-up period, most patients who had been suspended in October 2015 were alive and transplanted. Patients suspended for over one year had a significantly lower rate of transplantation (p=0.0045). Regular multi-disciplinary review is required to try to minimise the duration of suspensions.





P153
Cinacalcet in renal transplant recipients with hyperparathyroidism: is there an indication?

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Introduction: Cinacalcet is not licensed for use in renal transplant recipients (RTRs) in the UK. However, studies have shown efficacy and we and others have used it, usually as a bridge to parathyroidectomy or as short/medium-term therapy.

Methodology: A retrospective analysis of RTRs receiving cinacalcet in our centre.

Results: Sixty-three out of a total 1402(4.5%) RTRs were on cinacalcet. Five were excluded for incomplete data. 34/58(59%) were male; mean age 58.9 years (SD +/- 12.2). Median time since transplantation was 2202 days (IQR 716.5-3445.8). Median eGFR was 49/min (IQR 30.8-67). Median duration of treatment was 1183 days (IQR 315-2169). At initiation of treatment, 87.7% were hypercalcaemic, 59.6% hypophosphataemic and 98.2% had elevated parathyroid hormone (PTH). NICE criteria for cinacalcet in End-Stage Renal Disease patients were met in 5/57(8.8%) and for primary hyperparathyroidism in 18/57(31.6%). Hypercalcaemia was PTH-dependent (thus autonomous or 'tertiary') in 54/57(94.7%). In 3/57(5.3%) PTH elevation seen with normal or low calcium ('secondary'). Daily doses of cinacalcet were 15mg (8.8%), 30mg (70.2%), 60mg (15.8%), 90mg (1.8%), 120mg (1.8%) and 180mg (1.8%). Serum calcium and/or PTH fell in most patients (Figure 1). 27/58(46.6%) had had a trial of withdrawal or dose-tapering. 42/57 had not been referred for surgery. Reasons for non-referral and not proceeding to surgery after referral (14/42) are presented in Figure 2. The average annual cost of treatment was £2499.37 per patient, compared with £2685.68 for surgical parathyroidectomy.

Discussion: Cinacalcet reduces calcium and PTH in RTRs with the biochemical phenotype of autonomous hyperparathyroidism. Studies on clinical outcomes are needed, and protocols for appropriate initiation, monitoring and surgical referral are recommended to maximize cost-benefit.

Figure 1: Comparison between pre-treatment and post-treatment Serum PTH and Corrected Calcium

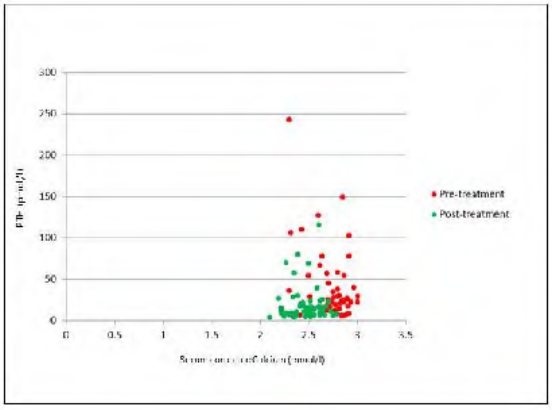
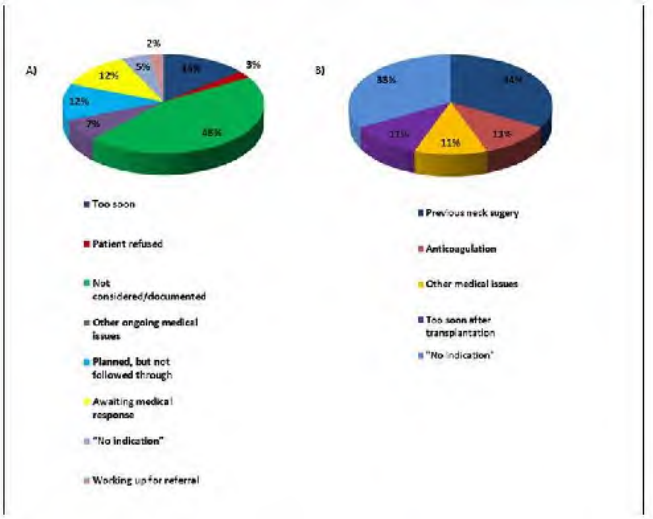


Figure 2: A) Reasons for non-referral for parathyoidectomy (n=42)
B) Reasons not to proceed with parathyroidectomy after referral (n=14)



P154

A retrospective and prospective service evaluation of perioperative hyperkalaemia in renal transplant recipients

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Introduction: Hyperkalaemia commonly complicates renal transplantation. Local practice recommends pre-operative dialysis if it has not occurred in the last 24hrs, or serum potassium above 6 mmol/L. This service evaluation aimed to determine whether local changes could reduce perioperative hyperkalaemia.

Methods: Two iterations of this project were undertaken retrospectively to determine the frequency of hyperkalaemia and factors associated with its occurrence, and prospectively to assess treatment complications. All adult patients who underwent renal transplantation were included. The retrospective data were taken from 2015 and prospective from March-July 2019. Hyperkalaemia was defined as potassium above 6 mmol/L within 24hrs of transplantation. In both cohorts demographic were collected along with dialysis, transplant, and surgical data. Univariate regression analyses were undertaken on the retrospective cohort, and if significant were included in multivariate models. Significance was taken as a $p<0.05$. Due to low numbers statistical analysis was inappropriate for the prospective cohort.

Results: The retrospective cohort included 122 patients. Hyperkalaemia occurred in 39.3% with average increase in serum potassium of 1.35 mmol/L. Factors associated with hyperkalaemia were last serum potassium pre-operatively (4.27 vs. 4.65, p=0.0057), theatre time (3.02hrs vs. 2.7hrs, p=0.0264), and cold ischaemic time (6.18hrs vs. 12.98hrs, p=0.0002). Deceased donors conferred an increased odds ratio of hyperkalaemia. On multivariate analysis only serum potassium pre-operatively remained significant with minimal clinical effect ($R^2 = 0.15$). The prospective cohort included 35 patients. 51.4% patients were hyperkalaemic. Standard treatment strategies were used for hyperkalaemia. One patient suffered a myocardial infarction on haemodialysis post-operatively.

Discussion: Perioperative hyperkalaemia was common, and serum potassium rises by an average of 1.35 mmol/L following transplantation. Pre-transplant serum potassium minimally predicts post-operative values. No modifiable factors predict perioperative hyperkalaemia. Treatment of perioperative hyperkalaemia does carry risk of harm.

P156

Troponin T, B-type natriuretic peptide, and infection-related mortality in renal transplant recipients

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Introduction: Biomarkers of cardiovascular disease are strongly associated with all-cause mortality in renal transplant recipients (RTR). Infection is a leading cause of death among RTR but biomarkers for predicting infection-related mortality do not currently exist. This study explored whether Troponin T (TnT) and N-terminal pro B-type natriuretic peptide (NT-proBNP) were associated with infection-related mortality in RTR.

Methods: The study outcome was infection-related mortality. The cardiovascular biomarkers were measured in the baseline serum samples of 367 RTR. C-reactive protein (CRP) was measured simultaneously. Follow-up occurred for a median of 16.2 years. Survival time and cause of death were obtained from the Northern Ireland Kidney Transplant Database. Cox proportional hazard regression models were used to calculate hazard ratios (HR) and associated confidence intervals (CI). Biomarkers were modelled as continuous variables following log-base2 transformation.

Results: There were 171 deaths, 37 (21.6%) of which were attributable to infection. TnT and NT-proBNP were highly correlated (Spearman's rho 0.575, P <0.001).

			Model 1[a]		**Model 2**[b]	
	Unadjusted HR (95% CI)	**P value**	**Adjusted HR (95% CI)**	**P value**	**Adjusted HR (95% CI)**	**P value**
TnT						
Per 2-fold increase	1.64 (1.30, 2.07)	<0.001	1.45 (1.10, 1.92)	0.009	1.38 (1.03, 1.85)	0.031
NT-proBNP						
Per 2-fold increase	1.65 (1.38, 1.98)	<0.001	1.61 (1.31, 1.99)	<0.001	1.51 (1.22, 1.86)	<0.001

[a]adjusted for age, history of cardiovascular disease, diabetes, eGFR, time post-transplant
[b]adjusted for Model 1 + C-reactive protein

When both biomarkers were added to a fully adjusted model, only NT-proBNP remained independently associated with infection-related mortality (TnT: adjusted HR 1.08; 95% CI 0.76, 1.54; P = 0.677. NT-proBNP: adjusted HR 1.48; 95% CI 1.17, 1.87; P = 0.001).

Discussion: TnT and NT-proBNP are associated with infection-related mortality independent of CRP in RTR. The exact pathophysiological pathways underlying these relationships are unclear. Further studies are warranted to investigate the potential clinical implications of these findings.

P157

Cytomegalovirus infection is associated with reduced patient survival after kidney transplantation; single center experience

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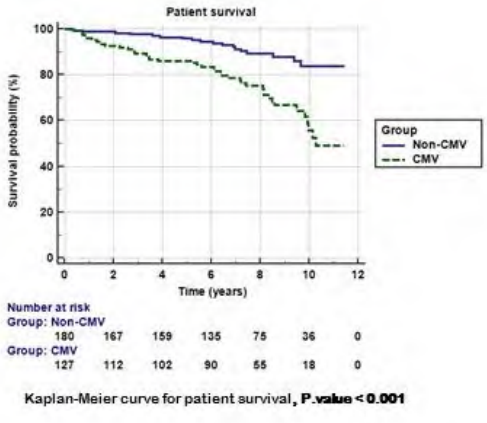
Background and objective: Cytomegalovirus (CMV) is the most common viral infection after solid organ transplantation. Great innovations have been made in terms of CMV screening, antiviral prophylaxis and antiviral treatment. This study shows short term (1 year post-transplantation) and long term (10 years post-transplantation) outcomes of CMV infection/disease after kidney transplantation in view of the modern era of these innovations.

Methods: We reviewed records of 320 kidney transplant recipients between 1st January 2008 till 31th December 2013 from patient database of Sheffield Kidney Institute, UK. We studied clinical outcomes of CMV infection after kidney transplantation including development of post-transplant hypertension (HTN), DM, malignancy, infections and effect on GFR, as well as patient and graft survival at 1, 5 and 10 years follow up after kidney transplantation. Comparative analysis of all the studied variables was carried out with a matched control group. Kaplan-Meier curves were used to assess patient and graft survival of the studied groups.

Results: From 320 kidney transplant recipients, 123 recipients had CMV infection (40%), while only 4 recipients had CMV disease (1.3%). Kaplan-Meier curves for patient survival showed significantly reduced patient survival in CMV group compared to control group (P.value < 0.001). Moreover, there was a significant reduction of GFR over time in CMV group compared to non-CMV group at 1, 5 and 10 years follow up after kidney transplantation (P.value = 0.001, 0.027, 0.007), respectively. However this wasn't associated with significant reduction of graft survival, P.value = 0.576. Moreover, there was no significant difference between the studied groups as regard incidence of clinical complications after kidney transplantation (namely; HTN, DM, malignancy and infections).

Conclusion: CMV infection after kidney transplantation was associated with reduced patient survival and worse kidney functions when compared to matched control group.

*This work has been made possible through my ISN funded fellowship.



Kaplan-Meier curve for patient survival, **P.value < 0.001**

Table: Clinical outcomes of CMV infection/disease over different follow up:

	Non-CMV	CMV	P.value
First year			
HTN, n(%)	1 (0.6%)	0	1.000
DM, n(%)	3 (1.7%)	0	0.270
Malignancy, n(%)	2 (1.1%)	2 (1.6%)	1.000
Infections, n(%)	134 (74.4%)	88 (69.3%)	0.115
GFR, ml/min (SD)	57.5 ± 20.8	47.1 ± 23.5	< 0.001*
Five years			
HTN, n(%)	2 (1.1%)	0	0.522
DM, n(%)	5 (2.8%)	4 (3.1%)	0.741
Malignancy, n(%)	17 (9.4%)	14 (11%)	0.487
Infections, n(%)	109 (60.6%)	80 (63%)	0.146
GFR, ml/min (SD)	55.0 ± 24.4	48.0 ± 25.4	0.027*
Ten years			
HTN, n(%)	1 (0.6%)	0	1.000
DM, n(%)	8 (4.4%)	5 (3.9%)	0.776
Malignancy, n(%)	23 (12.8%)	14 (11%)	0.797
Infections, n(%)	81 (45%)	48 (37.8%)	0.900
GFR, ml/min (SD)	50.5 ± 25.9	42.2 ± 20.9	0.007*

P158

The efficacy of BK nephropathy screening in a kidney transplant population at a non-transplanting centre

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Introduction: BK polyomavirus is a small DNA virus that establishes lifelong infection in the renal tubular and uroepithelial cells. In most cases infection is benign. In the immunocompromised, BK virus can reactivate and cause BK nephropathy. BK reactivation is frequently subclinical, although may manifest with AKI and is a risk factor for premature graft loss. Screening for reactivation is recommended for all kidney transplant recipients. For those with clinically significant reactivation, reduction of immunosuppression is typical.

Methods: We decided to screen all recipients at 3 months post-transplant. We then undertook a review of records for those transplanted between January 2016 and December 2018. We identified those with evidence of BK reactivation, assessed by BK virus PCR screening, what action was undertaken and renal outcome was at 6 months.

Results: During this 3 year period, 133 patients received kidney transplants. 36 did not have BK samples taken (27.1%). Of the remaining 97, 10 (10.3%) returned positive, 87 (89.7%) were negative. Of the 10 positives, no action was taken in 6 as the titre was low ($<10^4$ copies/ml). In the remaining 4, 1 patient had a 50% reduction in Mycophenolate Mofetil (MMF) dosage and titre became negative; a 2nd patient had MMF and steroid doses reduced and titre became negative; a 3rd patient had Tacrolimus level reduced and titre became negative; the final patient had no action taken following a repeat titre that returned negative. No patient sustained graft dysfunction.

Discussion: In those who had BK testing, 10 were affected by BK viraemia. Four patients had effective reduction in immunosuppression to ensure nephropathy did not result. The other 6 patients were thought to have subclinical disease. It is disappointing we did not achieve 90% standard for BK screening in our post-transplant population. We conclude BK screening is worthwhile and leads to management change to aid graft preservation.

P159

Induction therapy with rabbit anti-thymocyte globulin (rATG) in higher immunological risk patients undergoing renal transplantation: a single centre experience

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Introduction: IL2-receptor blockade is the mainstay ofinduction therapy in the UK. However no consensus exists regarding management of higher immunological risk patients. Our centre has implemented a rATG induction regimen (2mg/kg days 0 and 4) for patients with pre-formed DSAs; CRF>80% orsecond/subsequent transplants. We describes our initial experience.

Methods: All patients transplanted January 2016-December 2018 with rATG induction were included (minimum 1year follow-up). Data were retrospectively obtained from our prospectively collected database: basic demographics; cRF; DSAs; adverse events; graft and patient survival; complications (infections, malignancy, rejection).

Results: 30 patients (median age: 50±9yrs; 47% male) received rATG. This reflects 6.5% of the overall transplant population (n=460). 83% (n=25) had at least one prior transplant. 13 patients (43%) had cRF >95% and 10 patients had pre-formed DSA. Two were transplanted across positive flow crossmatchs. 1year graft and patient survival were 93% and 97% respectively. Two patients had primary non-function. There were three additional graft losses (ABMR, BK nephropathy, death with functioning graft) during the follow-up period (median: 997 days). Median creatinine at 1 year was 122±62µmol/L. Two patients had adverse reactions to rATG (cytokine release syndrome necessitating ITU admission); both made a full recovery. 33% (n=10) developed transient profound leucopenia. Infectious complications included: multidrug resistant UTI (9); BK viraemia (3); CMV infection (2); HSV (1); PCP pneumonia (1). Two patients developed skin cancer. No PTLD was observed in our cohort. There were three cases of ABMR. Three patients (10%) developed de novo DSAs post-transplant; all pre-formed DSAs are now at lowerserum levels than pre-transplant.

Conclusions: Whilst clearly it is not appropriate to draw direct comparisons with the overall transplant population, we have demonstrated near equivalent short-term graft and patient outcomes in this highly complex cohort. This comes with the additional risks of augmented immunosuppressive regimens.

P160

Incidence of post-transplantation diabetes in kidney transplant recipients based upon donor type: a single-centre retrospective study

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Introduction: The type of transplant donor has been historically cited as a risk factor for post-transplantation diabetes mellitus (PTDM), but the association is unclear in the contemporary era. The aim of this study was to investigate the association between donor type and PTDM risk.

Methods: Data was retrospectively extracted from hospital informatics systems for all kidney transplant recipients at a single-centre between 2007 and 2018, with patients excluded if they had pre-existing diabetes. Electronic patient records were then manually searched and records linked to various sources (e.g. NHS Blood and Transplant, Hospital Episode Statistics, national death registry) to create a well-phenotyped cohort. PTDM classification was aligned with International Consensus recommendations.

Results: Data was extracted for 1,560 kidney allograft recipients, with median follow up 5.4 years (IQR 2.7-8.7 years) up to October 2018. PTDM developed in 243 kidney transplant recipients (incidence 15.6%). Deceased-donor versus living-donor kidney transplant recipients had an increased incidence of PTDM (17.8% versus 12.4% respectively, p=0.005). Incidence of PTDM in recipients receiving donors after cardiac versus brain death was 19.1% versus 17.4% respectively. In a logistic regression model, adjusted for baseline variables reported as PTDM risk factors (age, ethnicity, recipient body mass index, polycystic kidney disease as cause of end-stage kidney disease, hepatitis C, HLA-Cw12), deceased-donation was not found to be an independent risk factor associated with development of PTDM (OR 1.161 [95% CI 0.824-1.635], p=0.393). In an extended model, donation after cardiac (OR 1.348 [95% CI 0.832-2.183), p=0.226) or brain (OR 1.107 [95% CI 0.771-1.588], p=0.582) death were not identified as independent risk factors for PTDM.

Discussion: Recipients receiving deceased-donor kidneys are not at increased risk for PTDM after adjustment for confounding baseline variables. However, our study is limited as a single-centre analysis and analysis of registry data is warranted if robust definition of incidence of PTDM can be accurately captured.

P161

Comparison of single-dose vs double dose Alemtuzumab in Renal Transplant recipients-A single centre experience.

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Introduction: Alemtuzumab is used as an induction agent at our centre for higher immunological risk kidney transplants. Aim of this study was to compare the effects of single-dose and two-dose Alemtuzumab on rejection and infection rates.

Methods: Patients receiving Alemtuzumab between 1st April 2015 to 19th November 2018 were included. As per protocol, patients <60 years received two doses **(Group 1)** and ≥ 60 years received single-dose **(Group 2)** Alemtuzumab. The maintenance immunosuppression was similar in both groups (Tacrolimus and Mycophenolate Mofetil). Primary endpoints were biopsy-proven rejection and infection rates (viral (CMV, BK and EBV) and urine infections) at one year. Descriptive statistics and parametric survival analysis (Weibull distribution) to account for the reducing risk of rejection and infection overtime after transplant.

Results: 231 Renal Transplant recipients received Alemtuzumab with 158 (68.4%) and 73 (31.6%) patients receiving double and single-dose, respectively. The mean age of recipients was 46.6 years (95% CI 45.2-47.9) and 66.9 years (95% CI 64.9-60.1) in Group 1 and 2 respectively. There was no difference in rejection rates between the two groups (Table 1). There was also no difference between the groups either with regards to infection rates (Table 1).

Table 1: Unadjusted 1-year rejection and infection rates, HR (95% CI), P-value

	Number of events N (%)	Unadjusted HR (95% CI)	P-Value
Rejection			
Group 1	20 (12.65)	-	0.83
Group 2	8 (10.9)	0.91 (0.40-2.07)	
All cause infection			
Group 1	74(46.83)	-	0.94
Group 2	30(41.09)	1.01 (0.77-1.33)	
CMV			
Group 1	14 (8.86)	-	0.99
Group 2	6 (8.22)	0.99 (0.38-2.59)	
BK			
Group 1	42 (26.58)	-	0.91
Group 2	17 (23.29)	0.97(0.55,1.70)	
Urine			
Group 1	40 (25.32)	-	0.75
Group 2	17(23.29)	0.91 (0.51,1.61)	

Discussion: For patients requiring Alemtuzumab induction, due consideration should be given to switching to single-dose as the rejection and infection rates are comparable.

P162
I'm not too big to transplant

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Introduction: There are increased risks associated with renal transplantation in obese individuals. Despite national guidance advising that obesity itself should not preclude consideration of transplantation, there may be inequity of access to transplantation for such patients (whose prevalence is increasing) because of concern in relation to the outcomes. We wanted to gain better insight into patient perspective for those transplanted with a body mass index (BMI) of >40 kg/m^2.

Methods: A telephone patient survey was conducted with all transplant recipients whose BMI was >40 kg/m^2 at time of transplant in one UK centre over a four-year period. The questions were:

- Do you think transplantation has improved your quality of life?
- Would you undergo transplantation again?
- Do you think there should be a cut off BMI for transplant?
- Do you feel an increased risk was explained to you?
- If you had not underwent transplantation, do you think you would still be alive today?
- Would you have undergone bariatric surgery to facilitate transplantation?

For questions 1 – 4 answers were given on a likert scale (below), and questions 5 – 6 answers were given as Yes/No/unsure.

Strongly Disagree Disagree Neither Agree nor Disagree Agree Strongly

Results: There were 12 patients who fulfilled the inclusion criteria. One patient was deceased, all other patients completed the survey. The majority felt strongly that their quality of life had improved and would undergo transplantation again. All felt the increased risk had been conveyed to them and many felt that they would not be alive today had they been denied transplantation.

Discussion: Obese patients have insight into the increased risks of transplantation, and are willing to accept these given an awareness of their own mortality with continued dialysis therapy.

P163
Renal transplantation and urinary tract infection, the bugbear

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Introduction: Urinary tract infection (UTI) is common after renal transplantation. If left untreated, UTI can lead to graft pyelonephritis, bacteraemia, and compromise graft function. This study aims to define the incidence of bacteriuria in the first 6 weeks post-transplant and identify the risk factors.

Methods: All consecutive adult renal transplant recipients in a single UK region in 2018 were included in analysis. Prospectively recorded data in the Kidney Transplant Database and retrospective extraction of data (on bacteriuria by 6 weeks) from patients' electronic care records were analysed.

Results: There were 111 renal transplants performed, 39 (35%) developed bacteriuria, only 14 (36%) caused symptoms. 3 patients developed pyelonephritis. 18 out of 38 (47%) females were affected compared to 21 out of 73 (29%) males, however this was not statistically significant (p=0.14). There was no difference in age between those who developed bacteriuria (mean 55.7 years) and those who did not (mean 50.8 years) (p=0.14). The primary cause of renal failure did not influence the incidence of bacteriuria (p=0.86), nor did donor type (p=0.55). A comparable number patients had induction therapy 51 (46%), almost all with basiliximab, as had prednisolone, tacrolimus and mycophenolate mofetil only, 60 (54%). There was no significant difference between the two groups (p=0.50). 90 (81%) patients had a transplant ureteric stent inserted. This did not predispose to bacteriuria; 28 (31%) of those who were stented developed bacteriuria, compared to 11 (52%) who were not (p=0.08).

Discussion: Approximately one-third of renal transplant recipients developed bacteriuria in the first 6 weeks post transplant. Age, sex, primary cause of renal failure, donor type, enhanced immunosuppression or the presence of a transplant ureteric stent did not increase this risk.

P164

Who supervises the diabetic management of kidney transplant recipients?

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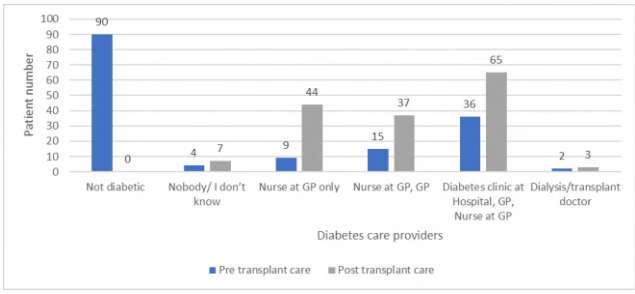
Introduction: Diabetes is a significant risk factor for cardiovascular disease, which is the leading cause of mortality in kidney transplant recipients. We performed a cross sectional audit of the organisation of diabetic care for recipients attending a transplant center and its referral units.

Methods: All diabetic recipients were identified by searching the renal clinical information system, and asked to complete a questionnaire about their care, including primary contact for diabetic management, surveillance for complications and education about self-management, including dietary and weight advice and current smoking status. Diabetic control (HbA_1C) was assessed for each patient.

Results: 350 diabetic patients were identified from a total transplant population of 1738 (20%). A complete data set was available for 256 patients. 118 (46%) of these patients had post-transplant diabetes. 50 % of the 256 patients completed the questionnaire. The location of provision of diabetic care pre and post transplant is shown below in figure 1.

Figure 1:



There was no difference in diabetic control between recipients receiving supervision from primary or secondary care, summarised in the table 1 below.

Table 1:

All diabetic transplant recipient's patient		Post-transplant Diabetes Mellitus	
Average HbA_1C (mmol/mol)	Primary contact for diabetes care post-	N	Average HbA_1C (mmol/mol)
57	No body/ I Don't know	1	53
63	Nurse at GP only	31	64
61	GP, nurse at GP	56	64
67	Diabetes clinic at Hospital, GP, Nurse at GP	28	64
57	GP, Dialysis/transplant doctor	2	57
		Key	Primary care
			Secondary care
			Both

Discussion: Patients with both kidney disease and diabetes are at uniquely high risk of cardiovascular disease. This audit has provided a baseline to inform future service development, focused on improved patient education and supported self-management.

P165
ICU admission after renal transplantation: who, when, why?

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Introduction: limited data exists on renal transplant recipients admitted to Intensive Care (ICU) post transplantation. This single centre study aimed to establish the number and outcomes of adult recipients admitted to ICU.

Methods: A retrospective review of electronic notes of all renal transplant recipients admitted to ICU between August 2014-August 2019 was completed.

Results: 596 recipients were transplanted between August 2014-August 2019. Of these, 30 required ICU admission (5%). 21 (70%) were admitted within 7 days of transplant, 7 (23%) were admitted day 7-30 post-transplant (intermediate group) and 2 (7%) were admitted greater than 30 days (late group). The commonest reason for ICU admission in the early group was hypotension requiring inotropes (29%), surgical complications (43%) in the intermediate group and sepsis in the late group (100%) (see *table 1*). The median length of ICU stay was 1 day (range 1-14 days). 12(40%) of recipients required ventilation. The overall mortality rate was 10%. This increased to 17% if ventilation was required. 22 (73%) recipients still have functioning grafts and 5 recipients (19%) are on renal replacement therapy.

Discussion: There is a low admission rate to ICU for our renal transplant population. The majority of ICU admissions occur during the first seven days with hypotension requiring inotropes being the commonest reason for ICU transfer. Sepsis is the commonest reason for ICU admission in the later post-transplant phase.

Table 1: Reasons for admission to ICU according to time post-transplant

Reasons for admission	Early group	Intermediate group	Late group
Hypotension requiring inotropes	6 (29%)	1 (14%)	0
Elective due to pre-transplant risk	4 (19%)	0	0
Surgical complication	3 (14%)	3 (43%)	0
Respiratory issue	3 (14%)	1 (14%)	0
Cardiac complication	4 (19%)	1 (14%)	0
Neurological issue	1 (5%)	0	0
Sepsis	0	1 (14%)	2 (100%)

P166
Tacrolimus intra-patient variability (IPV) a year post-transition predicts poor outcome

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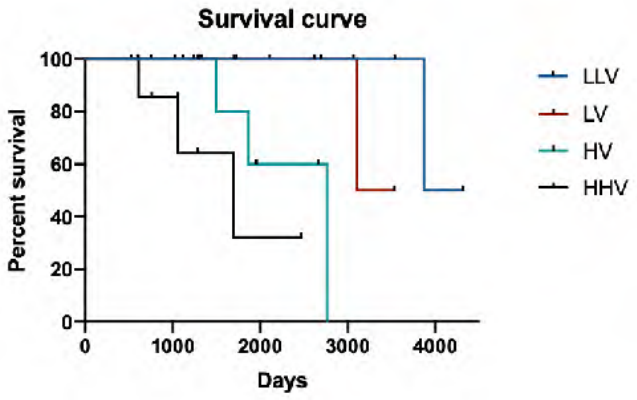
Introduction: An integrated transition clinic has been shown to improve managing young adults with kidney transplantation (KTx), who are moving from paediatric to adult services. Since 2008 KTx patients from GOSH underwent formal transition to the Royal Free. High Tacrolimus intra-patient variability (IPV) is known have negative impact towards allograft survival. This study assessed whether IPV can predict outcome following transition.

Methods: We performed a retrospective analysis on patients with KTx, referred from GOSH since 2008. Tacrolimus IPV were measured using the coefficient of variance (COV) with following formula: COV = Standard deviation/Mean x 100. Median of cohort with associated interquartile range were determined to allocate them into lowest variability (LLV) (< 1stquartile), low variability (LV) (between 1stquartile & median), high variability (HV) (between median & 3rdquartile) & highest variability (HHV) (>3rdquartile). Outcomes measured were late rejection, rate of chronic antibody mediated rejection (AMR) & graft survival.

Results: A total of 41 young adults, 68% male, (4 second transplants) 80% (33/41) of the patient were on Tacrolimus. Mean age at first KTx of 11.34 ± 4.5 & mean age at transition of 17.85 ± 1.02. 12 patients (29.2%) had graft failure in 4.36 years (3-7.5) after transition. The rate of biopsy proven chronic AMR was 4/33 (12%). Graft survival at 1, 5, 10 years post transplantation were 100%, 100%, 93.5% & at 1, 5, 10 years post transition were 100%, 77.2% & 52.2%. The median COV 1-year post transition was 34.62 % (24.50 % - 50.01%) with an even spread between those with LLV (8/33), LV (9/33), HV (8/33) & HHV (8/33). Graft survival curve for patients on Tacrolimus in relation to Tac-IPV can be found below.

Conclusion: Our experience is that adolescence & transition remain high risk in terms of graft loss despite a transition clinic. IPV may offer a simple tool for targeting those at highest risk for greater intervention for both the paediatric & adult units.



P167

Inferior graft survival in second and subsequent renal transplants can be eliminated by living kidney donation

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Introduction: Failed kidney transplant recipients benefit from a new graft as the general incident dialysis population, although additional challenges in the management of these patients are often limiting the long-term outcomes.

Methods: Retrospective analysis of the outcomes of repeated kidney transplantation at our institution from 1980 to 2019. Data were extracted from a prospectively maintained database and stratified according to the number of transplants: 1st, 2nd or 3rd+. The main outcomes were graft and patient survivals, recorded from time of transplant to graft failure (return to dialysis) and censored at patient death-with-a-functioning-graft.

Results: A total of 2395 KTRs were analysed: 2062 (83.8%) with the 1st kidney transplant, 279 (11.3%) with the 2nd graft, 46 (2.2%) with the 3rd+. A difference in death censored graft survival by number of transplants was seen, with a median graft survival of 328 months for recipients of the 1st transplant, 209 months for the 2nd and 150 months for the 3rd+ (p=0.038). The same difference was seen in deceased donor kidneys (p= 0.048), but not in grafts from living donors (p=0.2). Patient survival was comparable between the three groups (p=0.59).

Conclusion: In repeated kidney transplantation, the quality of the donor is beneficial to determine graft survival, and kidney retrieved from living donors provide comparable outcomes of those from single graft recipients.

P168
Importance of patient selection in ABO incompatible renal transplantation, a case study

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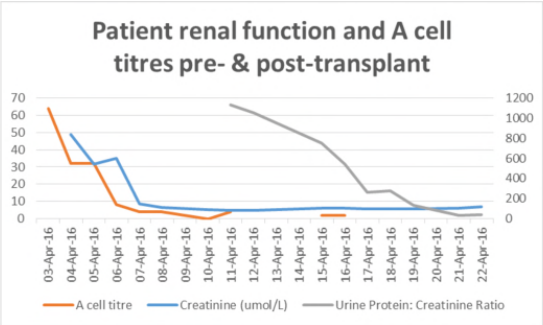
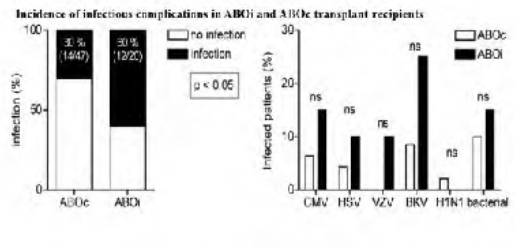
Introduction: Kidney transplantation is the optimal replacement therapy for end-stage renal disease (ESRD), but the median waiting time to transplant is over 2 years and prolonged dialysis impacts negatively on transplant outcome. Increasing the living donor pool may address donor short-falls, but 20% of these are blood group incompatible (ABOi), which has historically been an absolute contraindication to transplantation. Pre-transplant desensitisation may circumvent this problem, but significantly increase post-transplant infection rates. This case study highlights potential pitfalls in appropriate patient selection for ABOi transplantation.

Methods: Several induction and maintenance immunosuppressive regimens exist to reduce the immunogenicity of ABOi transplantation, including plasmapheresis, immunomodulation with intravenous immunoglobulin and B-lymphocyte depletion with rituximab.

Results: We report the case of a 36 year old female with a 4 year history of ESRD secondary to FSGS who was offered a 1-2-1/AO mismatched kidney from her husband. The patient was desperate to conceive and, following counselling, underwent transplantation with immunoadsoprtion and rituximab treatment. An immediate FSGS recurrence required increased immunosuppression with the Necker protocol. A month post-transplant the patient was readmitted with a febrile illness and respiratory failure and sadly died secondary to sepsis.





Discussion: Registry data shows superior patient and graft survival in antibody-incompatible living donor transplantation compared to antibody-compatible deceased donor transplantation. However, even with current desensitisation protocols, meta-analyses show patient mortality significantly higher in first 5 years post-transplant in ABOi groups vs ABOc group, this increased early mortality being largely due to higher infection rates.

This case highlights the importance of careful patient selection, especially when a pre-existing condition with a high post-transplant relapse rate requiring increased immunosuppression exists. ABOi renal transplantation is an excellent resource with good long-term outcomes, but higher risks of early adverse outcomes must be weighed against the long-term outcomes. We discuss whether other transplant options may have been preferable.

P169

Efficiency of two-stage evaluation of live donors for kidney donation

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Introduction: Living kidney donation is an important aspect of renal transplantation and offers excellent graft function to the fortunate transplant recipient. A streamlined assessment pathway will assist the potential live donors and also, may improve engagement towards live donation. We have developed a two-stage process with four visits to complete all needed to ascertain the donor fitness and intend to share our experience from a single renal transplant centre in United Kingdom.

Methods: We in a single renal transplant centre, encountered a notable number of potential live kidney donors at various stages of evaluation, refused to proceed to donation. Therefore, we developed a two-stage assessment process with two visits in each stage and they are detailed as follows;

Stage -1	**Stage-2**
Visit-1: Education/discussion about kidney donation, routine urine & blood tests for donation, chest X-ray and ultrasound of kidneys	Visit-3: Nephrology review
Visit-2: NM GFR	Visit-4: CT abdomen, Surgical review

All the patients at the completion of each stage discussed at our multidisciplinary meeting and proceed in a timely manner.

Results: The data collected in the last year and a total of 204 potential live donors for 141 recipients contacted our team and 86.2% (n=176/204) completed visit-1 and 83.5% (n=147/176) completed stage-1. In stage-2, 49.4% (n= 87/176) were reviewed by nephrologist and proceeded to further evaluation. The median duration for completion of both stages is 7.8 weeks (55 days). Our conversion rate from referral to donation has improved to 15.1% which is a modest increase in the last 24 months.

Discussion: Our two-stage process of evaluating potential live donors has contributed to increase in the referral rate, number of renal transplantation from live donors and increased our pre-emptive renal transplant rate in our centre.

P170
Can Procalcitonin predict infective complications following laparoscopic donor nephrectomy?

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Introduction: Patients undergoing donor nephrectomy are generally in robust health. Despite this up to 1 in 3 will encounter a perioperative complication with potential for significant morbidity. Stratifying those at risk of complications would therefore be advantageous. Published data in cardiac studies has suggested a role for the early postoperative measurement of serum Procalcitonin (PCT) as a sensitive and specific biomarker for postoperative infection. Its role in kidney donors remains as yet unascertained.

Methods: 52 live kidney donors underwent venesection at 6 perioperative timepoints (preoperatively, 1 hour postoperatively and POD 1,2,3,30). All samples were batch analysed using commercially available Enzyme Linked Immunosorbent Assay (ELISA) kits with precoated antibody (east biopharma LtD CK-E90192). PCT kinetics were established. Data on donor demographics and surgical complications including postoperative infections were charted. Perioperative PCT kinetics were defined and adjusted for pre and postoperative GFR as PCT is subject to renal excretion. Receiver operating characteristics (ROC) were developed to assess PCT's predictive accuracy for postoperative complications.

Results: Study patients were 60% male. The mean age was 46 years (SD 11.8). 17/52 patients developed a postoperative infection, 2 required re operation and 10 required readmission. Following surgery, GFR adjusted PCT levels rose in all patients analysed. The peak rise was observed at Day 1 (mean 754 pg/ml SD 133 v pre op 56pg/ml SD 77, p=0.01). Peak Day 1 PCT levels exhibited no correlation between day 1 / day 2 CRP (p=0.12) or WCC (p=0.27) levels. ROC AUC analysis revealed 0.49, 0.53, 0.27 values for Day 1,2,3 PCT levels respectively when assessing postoperative infection. Accuracy for predicting readmission was similarly poor.

Conclusion: Analysis of PCT kinetics in living kidney donors demonstrates indiscriminate postoperative rises in PCT levels. PCT is unable to predict post donor nephrectomy infective complications. PCT is a non-specific biomarker in the context of the postsurgical inflammatory response.

P171
Analgesia prescription in laparoscopic living donor nephrectomy

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Introduction: Excellent pain management is critical to achieve optimal outcomes in laparoscopic live donor nephrectomy (LLDN). Opiates are effective analgesics, but are associated with a number of complications that increase length of stay and reduce patient outcomes. The aims of this audit were to assess the range of analgesic prescription across the trust over the past 2 years, analyse the association of analgesics with length of hospital stay, and to identify reasons for delayed discharge.

Methods: The drug charts and in-patient notes of LLDN patients (n=60) were retrospectively analysed to collect the aforementioned data.

Results: There was a high degree of variance between analgesic prescription; 38% received a fentanyl patient-controlled analgesia (PCA), 30% received oxycodone PCA, 20% received morphine PCA and 12% received spinal anaesthesia as their primary analgesic agent on day one. On the ward, 71% of patients had prescriptions altered, with the most common change being the addition of regular tramadol (37%), oral morphine (17%) and codeine (13%) for inadequate pain control. Ibuprofen was also not given in spite of being written up in, due to ward concerns over NSAID use in renal patients (n=2). Patients stayed on average 3.8 days (95% CI 2.5-6 days), meaning 72% were delayed in discharge per the local protocol. Reasons for this included inadequate pain control (18%), nausea and vomiting (8%), lower respiratory tract infections (8%) and post-operative ileus (8%). There was no significant difference in length of stay between oxycodone, morphine, or fentanyl PCA, nor spinal anaesthetic on ANOVA.

Discussion: This audit demonstrates the plethora of analgesia prescribed after LLDN and highlights the need for a protocol to optimise post-operative pain management whilst reducing the incidence of opioid side effects, to prevent delayed discharge. Therefore, it is recommended that a local guideline be developed to standardise analgesia by consulting local experts and best available evidence.

P172

Outcome analysis of ECD kidney transplantation into marginal recipients. A retrospective analysis

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Introduction: Kidney transplants have been the treatment of choice for patients with End Stage Kidney Disease. Due to growing demands for kidney transplants, ECD kidneys have become a desirable method of treatment. Although ECD kidneys increase risk of delayed graft function and rejection, recipients have improved survival outcomes in comparison to wait-listed dialysis patients, making ECD kidneys an important resource.

Aim: To study outcomes of ECD transplants in marginal patients in comparison to standard patients by analysing length of hospital stay, Primary Graft Failure, Delayed Graft Function and Rejection.

Methods: This study was a retrospective analysis of 200 patients. Data was used to identify 91 SCD and 84 ECD donors. Of these 84 ECD kidneys, 38 were transplanted into marginal recipients and 46 to standard recipients. Once the patients had been classified, outcomes were measured by looking at length of hospital stay, PGF (kidney does not work from outset), DGF (need dialysis in the first 3 months) and Rejection.

Results: Data shows that ECDs have detrimental outcomes in both category of recipients, however this is more observable in the Marginal recipients. Delayed graft function occurred in 21.74% of Standard recipients, in comparison to 55.26% of Marginal recipients. Urinary Tract Infections were also shown to be significantly more common in marginal recipients.

Outcomes	Marginal Recipients (38)	Standard Recipients (46)	P-Value
PGF	2 (5.26%)	1 (2.17%)	0.422646497
DGF	21 (55.26%)	10 (21.74%)	0.000031577
Mean Length of Stay	7.13 (4-13)	6.54 (0-25)	0.421883166
Rejection	10 (26.32%)	12 (26.09%)	0.152196159
Wound Infection	6 (15.79%)	4 (8.70%)	0.144927605
UTI	10 (26.32%)	5 (10.87%)	0.007685412

Discussion: Data shows ECDs have detrimental outcomes in both category of recipients, however this is more observable in the Marginal recipients. T-test showed a significant relationship between marginal recipients and increase risks of DGF and UTIs in comparison to standard recipients.

P173
Nephrology involvement in deceased kidney donor organ offers: a national survey

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Introduction: The decision to accept a deceased donor kidney offer is a complex process involving consideration of both donor and recipient factors. Acceptance can sometimes be made with limited information, by clinicians who may not know the recipient. We undertook a national survey of nephrologists to investigate their desire to be involved in the organ offer process.

Methods: We undertook an electronic survey of nephrologists in all renal units across the UK and asked questions regarding willingness to participate in the organ offer process.

Results: We received 176 responses from nephrologists in 47 different renal units. Fifty-nine percent worked in a transplanting unit and 12.4% were the first responder for organ offers. When asked about their transplanting unit, 73% felt they were involved in organ offer decisions but only 50% were made aware of organ declines for their recipients. Sixty-seven percent felt they had sufficient involvement in the offer process while 39% wanted more and 14% did not wish to be involved at all. When considering specific offers, 32% felt they should always be involved, 53% only when there are specific issues and 15% were happy for the transplanting centre to make the decision. The desire for involvement increased with greater complexity of the donor or recipient. When asked about who should be contacted, 40% wanted the consultant looking after the recipient during daytime but during the night, the most common answer was the on call nephrologist in the recipient centre (34%), followed by the nephrologist in the transplanting centre (30%) or surgeon alone (20%). We asked about an email system informing nephrologists of organ offers for their patients, 61% felt it would be useful.

Discussion: Our survey revealed that most nephrologists are happy with their involvement in deceased donor organ offers but there is variation in willingness to be involved.

P174
True collaboration to deliver legislation change

Ms Claire Roberts[1], Mr Phil Walton[2]

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Introduction: Often the challenges faced in Healthcare are organisational, groups working in silos to achieve their outlined strategies. To successfully change practice for the new organ donation law, true collaboration was required across the organisation. By respecting and recognising the demands of everyone involved would bring about a successful and seamless implementation of a change in practice for Specialist Nurses and external stakeholders.

Methods: Two important factors were required to implement the legislation change for organ donation, an educational programme for staff on what the change means in practice and operational considerations to how the legislation change will impact on service demand, both factors also need to ensure business continuity throughout the change. A team of passionate & enthusiastic Specialist Nurses were appointed, headed by two compassionate leaders; one for Education and Governance, the other for Operations. Compassionate leadership enabled good working relationships, mutual respect and effective communication between the two leaders and the team.

Results: Collaborative team working in a national team of people is difficult to set up and maintain. Some of the team-building, planning and design was through face to face interaction, particularly in the early stages of the project. Tuckman (1965) first identified the stages of group development, for which this team needed to acknowledge and work through in order to be successful; placing honesty, commitment and genuine care for each other at the core.

Conclusion: To reduce the demand on operational teams, training was designed around their ordinary team meeting dates, there was only the requirement to attend one date outside of these dates, as the module provided was designed around sharing practice with national colleagues. External stakeholders have conferences twice yearly, these were utilised to educate participants and all training was provided in collaboration between Education and Operational leads.

P175
The Human Tissue (Authorisation) (Scotland) Act 2019

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[1]Scottish Government Opt Out NHS Manager, Edinburgh, United Kingdom. [2]NHS Blood and Transplant, Falkirk, United Kingdom

Introduction: The Human Tissue (Authorisation) (Scotland) Act 2019 will introduce an opt-out system of organ and tissue donation for deceased donors in autumn 2020. The implications and approach to training a wide range of NHS staff will be explored in this presentation.

Method: The Human Tissue (Authorisation) (Scotland) Act 2019 amends the existing Human Tissue (Scotland) Act 2006 by introducing a new, additional form of authorisation for transplantation called 'deemed authorisation'. This means that a person aged 16 or over may be subject to certain safeguards be deemed to have been authorised donation if they have not opted out. The Act also introduces additional requirements on clinical staff to ensure transparency around the pre death procedures required to support donation in those who are not yet dead.

Results: Scottish Government are also working in partnership with NHS Education Scotland to develop an online tool which will be publicly available to support the learning of those less familiar with Scottish Authorisation (for example retrieval surgeons attending to a Scottish donor or someone who has missed training due to a period of extended leave). The tool will be hosted on the NHS Education Website on their Turas learning platform.

Discussion: There are around 25 groups of professional staff working in the NHS whose role will be impacted by the legislation. Scottish Government are working in partnership with NHS Blood and Transplant and NHS Boards in Scotland to ensure all operational staff have their needs met. This requires a tailored approach from masterclass training to awareness training and the support of Subject Matter Experts (SME) trained in the new legislation who are familiar with the Scottish national training slideset.

P176
Pushing boundaries - case study of a paediatric DCD heart donor

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Introduction: Best practice had been followed and an early notification had been received from a paediatric intensive care unit at a level 1 hospital. The Specialist Nurse Organ Donation (SNOD) was invited for end of life discussions with the parents of a teenage boy. These discussions lead to questioning the policies, Management Process Descriptions (MPDs), Standard Operating Procedures (SOPs) to allow the extraordinary to happen and shape future practice.

Method: A teenage male, 60kg, had been referred as he had an un-survivable hypoxic brain injury. Discussions around end of life and the option of organ donation with the SNOD, were supported by the pragmatic family. However, during the consent conversation, the mother questioned why heart donation wasn't possible. Current policies, MPDs and SOPs were carefully reviewed. Despite fulfilling the DCD heart inclusion weight criteria on one document, other documents would exclude on age. Early discussions were commenced with the on-call Regional Manager to present the facts and the inconsistencies within the guidance. Advice and support was sought from the Medical Director and the Director of ODT, resulting in the donation process continuing.

Outcome: Huge logistical challenges ensued due to multiple donation activity nationally, along with time limitations to secure theatre space within the donor hospital. Full support was given by the paediatric unit and the consultant to push these boundaries within donation, to fulfil the family's wishes. Ultimately, donation proceeded but the NORS teams should be credited with excellent resource sharing and collaboration to allow this to happen. An adult female successfully received the gift of a heart transplant.

Discussion: Sometimes it takes a family to ask a question and teamwork to overcome the challenges and make it happen. This resulted in probably the first successful paediatric DCD heart donation and transplantation; and a change in future SNOD practice.

P177

Impact of weekly review of refused donor offers in organ acceptance: a single centre experience

Mr Rajesh Sivaprakasam, Mr Muhammad Khurram, Mr Ben Lindsey, Mr Ismail Mohammed, Dr Raj Thuraisingham, Dr Ravi Rajakariar, Dr Hamish Dobbie, Miss Cinzia Sammartino

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Introduction: Organ acceptance by a transplant unit is a combined decision taken made by the clinical team and patient, yet, with increasing use of increased risk (such as Extended criteria, with past infections etc) donors; it can pose a challenge to all involved. Donor refusal audit and the data sent to the centre by NHSBT is useful to learn; but, it doesnot contribute to timely reflection by the team. We review the refused offers both by the centre and patients within a week, by a multidisciplinary team and intend to present the impact of this initiative on our organ acceptance.

Methods: We review all the refused kidney offers in our multidisciplinary meeting the following week and the data collected are; all donor variables offered by NHSBT, recipient variables such as age, sex, duration on the transplant waiting list and reasons for refusals- donor or recipient factors, including non-clinical factors. All refused offers are qualified as either appropriate or needs further discussion- which warrants early outcome of the refused kidney. All data were collected prospectively, and data was analysed using SPSS 25.0

Results: A total of 270 organ offers were refused in the last 12 months and it was discussed in our meeting and there was a notable increase in use of kidneys from higher risk donors. We found 92.93% (n= 251) were deemed appropriate refusal by the team and 7.03% (n=19) offers were identified as warranting further discussion.

Discussion: Weekly review of refused donor offers enabled us to learn from refused kidney donor offers and address issues raised in a timely manner. There was a notable convergence in the team's approach to accepting high risk donors and remains an excellent educational opportunity to our trainees.

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The offers we declined; a single centre study looking into the outcome of deceased donor kidney offers which were declined by University Hospital Plymouth

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Introduction: Kidney transplant is the best form of Renal Replacement Therapy for patients with ESRD. Some patients get kidney transplants from family/friends but those without a living donor, are put on national waiting list to receive a kidney from deceased donors. Kidneys that get declined by one transplant centre are offered to other Hospitals. We wanted to find out the outcome of the deceased donor kidney offers which were declined by University Hospital Plymouth.

Methods: We collected 18 month data (January 2018 - June 2019) using:-

- EOS (Electronic offering system): National system for donor details
- Local electronic renal database entries including multi-disciplinary team (MDT) decisions, recipient details, recipient/consultant reasons
- Phone calls and emails to other transplant units

* eGFR after 3 & 6 months post transplant were used as outcome.

Reasons for declining kidney offers were divided into different categories (Figure 1).

Results: Only 44% of the offers that we declined were used for transplantation elsewhere. Most of the kidneys were accepted by Bristol, Manchester, Oxford and Hospitals in London. Main reasons for declining these kidney offers were age of donor, significant donor co-morbidities, infections and malignancy. 25% of these kidneys which we would have ideally accepted were declined because of recipient issues or the significant age difference between donor and recipient. Kidneys used by other centres for transplantation were divided into four categories based on their eGFR (figure 2). Average eGFR of declined DBD kidneys was 39.5. DBD kidneys over the age of 70 had average eGFR of 26.

Discussion: We conclude that Plymouth has lower offer declining rates as compared to national average. We should be cautious with DBD offers above 70 years of age though healthy/pristine 70+ donors should be considered. Due to our reasonably smaller waiting list we probably should avoid high risk donors unless there are pressing recipient issues.