Abstract Book – INS 2018 Meeting
Free Communications Session Friday 9th March
**FC-1: Monocyte Subset Dysregulation in Chronic Kidney Disease (CKD) and Association with CKD Progression**

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**Background:** Monocytes are innate immune cells with three subsets defined by CD14 and CD16 surface expression: Classical (CD14⁺⁺/CD16⁻⁻), Intermediate (CD14⁺⁺/CD16⁺⁺) and Non-Classical (CD14⁻⁻/CD16⁺⁺). Our group has recently demonstrated a further subdivision within the conventionally defined intermediate monocyte (IM) population based on differential HLA-DR surface expression. Intermediate monocytes express either moderate or high levels of HLA-DR and are termed DRmidIM or DRhiIM, respectively. We investigated alterations in monocyte subset numbers in people with CKD compared to healthy adults. We also investigated associations between specific intermediate monocyte subset numbers and subsequent rate of decline in renal function.

**Methods:** From 2014-2016, peripheral blood samples were collected from outpatient attendees with CKD stages 1-5 (n=154) and from healthy adults (CKD 0, n=33). Major circulating leucocyte populations were quantified in whole blood by flow cytometry. Fresh mononuclear cells were prepared and analysed by 7-colour flow cytometry to quantify individual monocyte subsets. A follow-up analysis calculated the rate of eGFR decline from study enrolment. Multiple-linear regression analysis was performed to identify associations between baseline numbers of immune cell populations and persons’ clinical characteristics including eGFR and rate of eGFR decline. Non-linear regression modelling adjustment for age and gender was performed.

**Results:** Total blood monocyte and neutrophil (but not lymphocyte) numbers increased progressively from CKD 0 through to CKD 1-5, both correlating strongly with eGFR. Among the monocyte subsets, intermediate and classical monocytes were higher in CKD 1-5 compared to CKD 0. Only intermediate monocytes showed a significant association with eGFR. Selective, numerical expansion of DRhiIM but not DRmidIM was identified in CKD 1-5 compared to CKD 0 (Figure). In addition, a positive correlation was observed between DRhiIM...
numbers at baseline and rate of decline in renal function (P=0.001) as calculated prospectively from serial CKD-EPI eGFR measurements over a mean follow-up period of 25.4 ± 9.2 months.

**Discussion:** The results demonstrate monocyte subset dysregulation in CKD and identify a novel intermediate monocyte subpopulation as having a specific association with current eGFR as well as subsequent rate of decline of eGFR.

**Figure 1:** Sequential increase in DR$^\text{hi}$IM monocytes numbers in CKD stages 0-5

ns= p>0.05, *p<0.05, **p<0.01, ***p<0.001, ****p<0.0001.
FC-2: Title: Polygenic risk score as a determinant of risk of non-melanoma skin cancer post-renal transplantation

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Background: Non-melanoma skin cancer (NMSC) is a common post-transplant complication with renal transplant recipients having a 33-fold increased risk of developing NMSC compared to non-transplanted age-matched controls. Polygenic risk score (PRS) was defined as the sum of all alleles associated with a trait weighted by the effect size of that allele as determined by a previous genome-wide association study (GWAS). We tested whether PRS, calculated using a GWAS of NMSC in a non-transplant population, can be used to determine risk of developing and time to NMSC post-transplant.

Methods: Genetic variants, reaching pre-defined p-value thresholds (pTs), were chosen from published squamous cell carcinoma (SCC) and basal cell carcinoma (BCC) non-transplant GWAS. Using these GWASs, BCC and SCC PRSs were calculated for each sample across three European-ancestry renal-transplant cohorts (n=889) and tested as predictors of case:control status and time to NMSC post-transplant.

Results: BCC PRS calculated at pT1x10⁻⁵ was the most significant predictor of case:control status of NMSC post-transplant (OR (odds ratio per 1 standard deviation increase of normalized PRS) =1.65; adjusted P (Padj) =0.0008). SCC PRS pT1x10⁻⁵ was the most significant predictor of time to post-transplant NMSC (Padj=8.15x10⁻⁷; HR=1.42).

Conclusions: PRS of non-transplant NMSC is predictive of case:control status and time to NMSC post-transplant and so could be a useful tool alongside the well-known clinical predictors of NMSC post-transplant. Continued efforts to develop predictive models of post-transplant NMSC will facilitate tailored immunosuppression regimens to reduce risk of malignancies.
FC-3: Alkylation Histone Deacetylase Inhibitor treatment in experimental MPO-ANCA Vasculitis

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Background: Current strategies for treating ANCA vasculitis (AAV) include the use of cyclophosphamide and corticosteroids. Despite successfully inducing remission in most patients, these medications are associated with severe adverse effects. Recently, histone deacetylase inhibitors (HDACi) were shown to act synergistically with a diverse range of pharmacological agents, including cyclophosphamide. EDO-S101 is an alkylating HDACi fusion molecule which combines the strong DNA modulating effect of bendamustine, with a fully functional pan-HDACi, vorinostat.

Methods: We investigated the effects of EDO-S101 in two well established rodent models of AAV: a passive mouse model of anti-myeloperoxidase (MPO) IgG-induced GN and an active rat model of MPO-ANCA microscopic polyangiitis: experimental autoimmune vasculitis (EAV). To investigate the cellular mechanisms, we compared the effect on B cell growth kinetics of each component of the fusion molecule with that of EDO-S101.

Results: Although pre-treatment with EDO-S101 reduced circulating leukocyte populations, it did not prevent development of passive anti-MPO IgG-induced GN in mice. On the other hand, treatment of established EAV with EDO-S101 significantly reduced the degree of glomerulonephritis and lung haemorrhage. EDO-S101 treatment in EAV also significantly depleted B and T cells compared with vehicle-treated controls, suggesting a selective effect on the adaptive immune response. EDO-S101 reduced the growth and survival of a cultured B cell line much more effectively than vorinostat and bendamustine at equivalent molar concentrations.

Conclusions: Taken together, EDO-S101 is a promising novel therapy for treatment of AAV that operates primarily through its effects on the adaptive immune response to the autoantigen MPO.
FC-4: Screening Candidate Genes for Diabetic Kidney Disease in *Danio Rerio*

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**Background:** Diabetic kidney disease (DKD) is the leading cause of end stage renal disease (ESRD) and organ failure worldwide. Current therapies are inadequate at best slowing progression of disease but not arresting or reversing. Defining the genetic architecture of DKD is critical to unravelling the underlying mechanisms, therapeutic targets and dynamic biomarkers of susceptibility and response. As members of the GENIE consortium, we are engaged in the largest ever search for genetic associations with DKD. We have identified several genetic associations but causation is difficult to infer without robust screening tools to interrogate candidate genes. Reproducing complex disease in vitro is fraught with artefacts and murine models of DKD have well documented limitations. In contrast the zebrafish, *danio rerio*, has emerged as a useful organism for the study of renal pathophysiology owing its structural and genetic homology to the mammalian kidney. Here we describe a robust and versatile *in vivo* experimental screening tool in *danio rerio* to facilitate high throughput screening of genetic candidates emerging from our genetic studies.

**Methods:** Genetic candidates were identified by genome wide association studies using a case (n=2,861 individuals with T1DM) vs. control (n=12,418 individuals with T1DM and no renal disease 15 years post-diagnosis) approach. Genetic candidates reaching genome wide significance p<1x10^-8 were included for functional follow-up. A pilot study of one candidate in a zebrafish model of glomerular filtration barrier integrity was undertaken. Initially activity of the candidate gene was screened in a proteinuria assay in transgenic zebrafish, followed by molecular characterisation using standard gene and protein expression techniques. Functional and molecular data from the zebrafish model was integrated with transcriptomic data from human renal biopsy tissue to provide human relative context.

**Results:** Tg(l-fabp:DBP:EGFP) transgenic fish express a circulating fluorescent plasma protein which can be easily quantified in retinal vessels. Impaired glomerular barrier integrity or “proteinuria” can be measured indirectly as a loss of retinal fluorescence. The candidate gene was knocked down in zebrafish larvae using morpholino technology. There was a significant loss of retinal fluorescence in control injected vs knockdown groups (n=50) equivalent to that of our positive control CD2AP. Furthermore knockdown of the candidate gene resulted generalised edema when compared to control further supporting a role for this gene in kidney function. Downstream targets of this gene as well as kidney specific markers in this model were analysed using gene expression and Western blotting analysis respectively. Interrogation of human renal biopsy data revealed the expression of this genetic candidate is increased in progressor vs non progressor CKD patients over a 3-5 year follow up as assessed by serum creatinine.

**Conclusions:** This screening tool using Tg(l-fabp:DBP:EGFP) transgenic zebrafish is a versatile and comprehensive method to investigate alterations in glomerular function associated with DKD in humans and provides both functional and molecular information about probable genetic candidates.
FC-5: Whole exome sequencing identifies the causative mutation in 50% of families with adult-onset chronic kidney disease (CKD)

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2 Department of Nephrology, Beaumont Hospital, Dublin, Ireland
3 Department of Genetics, Yale University School of Medicine, New Haven, Massachusetts, USA
4 Trinity Health Kidney Centre, Tallaght Hospital, Dublin, Ireland
5 Department of Medicine, Royal College of Surgeons in Ireland, Dublin, Ireland

Introduction: Over 250 monogenic causes of chronic kidney disease (CKD) have been identified (Nat Rev Nephrol 12:133, 2016), mostly in pediatric populations. However, the frequency of monogenic causation in adult-onset CKD has not been extensively studied.

Methods: We conducted whole exome sequencing (WES) in 16 Irish families (27 cases) with CKD. Selection criteria were: A positive family history of CKD (n=12 families) and/or history of extra-renal disease manifestations (n=8 families). Individuals with ADPKD or Alport’s syndrome were excluded.

Results: WES identified a causative mutation in one of 250 known monogenic CKD genes in 50% of families (n=8/16 families, 12 individuals). Six of the 8 families had no prior diagnosis of the cause of CKD. The 8 families in whom a causative mutation was identified included nephronophthisis (n=4, IFT140, NPHP1, BBS9, DYNC2H1), autosomal-recessive polycystic kidney disease (n=1, PKHD1), congenital abnormalities of the kidneys and urinary tract (n=1, PAX2), Lowe’s syndrome (n=1, OCRL) and interstitial nephritis (n=1, FAN1). In 3 families, in whom known CKD genes were excluded, 2 different potential novel candidate genes were identified.

Conclusions: This study establish that WES can detect specific causative mutations in 50% of families with adult-onset CKD. Furthermore, WES allows the identification of novel candidate genes. WES is therefore an important diagnostic tool to establish an etiologic diagnosis in an adult-onset CKD.
Free Communications Session
Saturday 10\textsuperscript{th} March
FC-6: Diagnosis of renal vasculitis flare using urine sCD163: a multi-centre prospective study


Background: urinary soluble CD163 displays excellent potential for active renal vasculitis detection at AAV diagnosis. The clinical utility of usCD163 is in the diagnosis of renal vasculitis flare, potentially obviating the need for biopsy and detecting active renal vasculitis prior to further injury.

Methods: AAV patients were prospectively recruited with potential renal vasculitis flares from a multicentre longitudinal cohort. Physicians judged the flare probability as High or Possible. An independent committee adjudicated on flare diagnosis (BVAS major criteria: RBC casts &/or 30% increase in creatinine or renal biopsy). Urine creatinine-normalised sCD163 levels were measured by ELISA.

Results: 56 patients were prospectively recruited, 32% with renal flare. Creatinine was 217umol/L (IQR 115-445umol/L, 80.3% increase on baseline) and 134umol/L (IQR 104-173umol/L, 3.2% increase), respectively (p=0.02). Median usCD163 levels were significantly higher in patients with adjudicated renal flare (469.6 ng/mmol (IQR 363.8-2974)) compared to no flare (25.4 (IQR 3.9-80.8), p<0.0001)). Median usCD163 levels were not elevated in potential renal flare mimics, including sepsis (62.1ng/mmol IQR 27.8-155.3), acute kidney injury (22.4ng/mmol IQR 0-78.7) or systemic flare (22.4ng/mmol, IQR 21-107.7).

Conclusion: usCD163 is diagnostic of renal vasculitis flare in prospectively observed patients with AAV, and is superior to initial physician assessment and BVAS major renal criteria.

<table>
<thead>
<tr>
<th>Biomarker Characteristic</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>PLR</th>
<th>NLR</th>
<th>PPV</th>
<th>NPV</th>
<th>AUC</th>
</tr>
</thead>
<tbody>
<tr>
<td>usCD163 &gt;300ng/mmol</td>
<td>94.7%</td>
<td>97.3%</td>
<td>30.5</td>
<td>0.05</td>
<td>94.7%</td>
<td>97.3%</td>
<td>0.94</td>
</tr>
<tr>
<td>Physician High Probability</td>
<td>78.95</td>
<td>70.3%</td>
<td>2.7</td>
<td>0.3</td>
<td>57.7%</td>
<td>57.7%</td>
<td>0.68</td>
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<tr>
<td>BVAS WG Major Criteria</td>
<td>68.8%</td>
<td>75.8%</td>
<td>2.8</td>
<td>0.41</td>
<td>57.9%</td>
<td>68.1%</td>
<td>0.71</td>
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Table 1: Biomarker characteristics.

PLR= Positive Likelihood Ratio. NLR=Negative Likelihood Ratio. PPV=Positive Predictive Value. NPV=Negative Predictive Value. AUC=Area Under the Curve
FC-7: Title: Hyperkalaemia – get kitted out!

Authors: Noel Sharkey, Paul Hamilton, Sharon O'Donnell, Peter Maxwell. Belfast Health and Social Care Trust, Belfast, Northern Ireland.
Corresponding email address: noel.sharkey@belfasttrust.hscni.net

Background: Hyperkalaemia is a common electrolyte disorder in hospitalised patients and is associated with patient harm and death. True hyperkalaemia can constitute a life-threatening emergency but complications arising from its treatment may also be hazardous. There are published UK hyperkalaemia guidelines. To minimise errors in management a “Hyperkalaemia Kit” was developed in Northern Ireland and is universally available in hospital wards. This study assessed hyperkalaemia management in hospitalised patients to identify good practice and/or highlight areas for improvement.

Methods: A daily clinical chemistry report of U&E samples, with serum [K+] ≥5.5mmol/L, was generated for the Belfast HSC Trust over a 3-week sampling period. Inpatients with hyperkalaemia were identified and data on clinical context, ward location, clinical chemistry results and staff involved in managing hyperkalaemia were collated in an electronic database. Adherence to national clinical guidelines (GAIN Guidelines at www.rqia.org.uk) and appropriate use of the “Hyperkalaemia Kit” protocol was audited.

Results: 74 consecutive cases were examined - 56.8% serum [K+] 5.5-5.9mmol/L; 35.1% serum [K+] 6.0-6.4mmol/L; 8.1% serum [K+] >6.5mmol/L. Dialysis was necessary for 14 individuals and a further 8 individuals were treated only with the kit. Almost half (45.9%) of hyperkalaemia cases were in nephrology wards, 39.2% in medical wards and 13.5% in surgical wards. 44.6% samples were from patients who had diabetes (69.7% of these patients were insulin-dependent). 37.5% of cases with a serum [K+] >6mmol/L had an ECG performed at the time of identification of hyperkalaemia. In all instances where hyperkalaemia was treated medically, the kit was used without deviations from the treatment protocol, with high quality documentation to corroborate this. There was considerable variability in the frequency of monitoring of blood glucose levels following treatment with the kit.

Conclusions: Recognition and management of hyperkalaemia in hospitalised patients take place across various hospital departments and is mostly undertaken by doctors who are in their early years of training. The Hyperkalaemia Kit is an effective initiative in safely standardising emergency management of hyperkalaemia, and thereby reducing potential errors brought about by operator variability in administration of treatment and the risks associated with incorrect insulin dosing. Areas for improvement include prompt performance of ECG tracing at time of hyperkalaemia identification and educating staff about the rationale for stringent blood glucose monitoring following medical treatment of hyperkalaemia.

References
**FC-8 Title:** Applying novel Kidney Failure Risk Equations applications to new patient referrals in St Vincent’s University Hospital; a six-month retrospective review.

**Authors:** Laura Slattery, Darran McDonald, Alan Watson, John Holian. **Institution:** St Vincent’s University Hospital Dublin. **Correspondence:** lauraslattery@svhg.ie

**Background:** Chronic kidney disease represents a significant health and economic burden. An estimated 20% of Irish people over the age of 45 have CKD, and approximately 4,000 patients have end-stage kidney disease. Current staging systems based on eGFR tend to overestimate the number and severity of patients with CKD. Timely speciality referral is imperative to slow CKD progression and enable expedient planning for dialysis or transplant workup where appropriate. Tangri et al. developed a 4-variable kidney failure risk equation that was validated in Canada using age, sex, eGFR, and urinary albumin/protein to creatinine ratio. These risk equations showed high discrimination when validated in 31 multinational cohorts.

**Methods:** The study involved a retrospective chart review of new patient referrals to the Renal Service in SVUH over six months (June-December 2016). The four variable KFRE was used to predict the 2 and 5 year probability of ESKD incorporating age, gender, uPCR/ACR, creatinine and eGFR.

**Results:** Of the 178 new referrals (92 males, 87 females) 137 patients had complete data for KFRE. 13.9% had eGFRs >90mL/min/1.73sq.m, 21.22% had eGFR 60-89mL/min/1.73sq.m, 45.25% had eGFR 30-60mL/min/1.73sq.m, 12.8% had eGFR 15-30mL/min/1.73sq.m and 2.79% had eGFR < 15mL/min/1.73sq.m.

<table>
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<tr>
<th></th>
<th>Number of patients</th>
<th>Discharged at first review</th>
<th>Discharged within one year</th>
<th>% under ongoing follow-up</th>
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<tbody>
<tr>
<td>Low risk</td>
<td>59</td>
<td>13</td>
<td>21</td>
<td>42</td>
</tr>
<tr>
<td>Intermediate risk</td>
<td>13</td>
<td>3</td>
<td>1</td>
<td>69</td>
</tr>
<tr>
<td>High risk</td>
<td>65</td>
<td>6</td>
<td>5</td>
<td>83</td>
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**Conclusions:** The KFRE has significant implications for design, delivery and resourcing of clinical services. From the results of this review, 59 patients stratified as low risk by the KFRE (43%) would not have required referral to Nephrology Clinic; a low-risk letter detailing the explanation for same could be forwarded to referring GPs. In cases where the risk is borderline, the 6 variable KFRE could be applied. Applying the KFRE to CKD referrals may afford greater discrimination regarding discharge of patients. A limitation of this tool is applying it to all new referrals as decreased eGFR is not the only indication for referral. In this study 22 patients were referred for investigation of recurrent stones, microscopic haematuria and optimisation of hypertension. Application of a risk based triage scheme would lead to both an improvement in wait times and expedite access to patients at highest risk of progression to ESKD.
The treatment of vasculitis using an empirically derived cyclophosphamide nomogram

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Introduction: In the Pulse vs Daily Oral Cyclophosphamide for Induction of Remission in Antineutrophil Cytoplasmic Antibody-Associated Vasculitis (CYCLOPS) trial, intravenous cyclophosphamide dosing was reduced for impaired renal function and advanced age. The cut-off for renal function was creatinine >300μmol/L and age of >60 and 70 years, leading to relative overdosing of age 30-60 and creatinine 150-300μmol/L. Patients with vasculitis suffers from significant treatment related side effects. Using data from EUVAS trials, a cyclophosphamide normogram was developed and used in clinical setting. The best fit line is a hyperbolic curve (Y - Bmax x X/Kd + X), which was then used to develop a nomogram allowing continuous and precise alteration of dosing based on estimated glomerular filtration rate (eGFR) and age.

Methods: We audited 47 consecutive patients across 2 centres with treatment based on the nomogram and review the efficacy and adverse events over a year and compared that to the intravenous cyclophosphamide arm of the CYCLOPS trial.

Results: The mean age of patients are 60 ± 3.3 years, mean renal function was 35 ± 7 ml/min/1.73m² and baseline BVAS was 14 ± 2.2. The diagnosis was MPA in 23 patients, GPA in 17 patients, EGPA in 2 patients and 5 other diagnoses. The median calculated dose for the nomogram is 82.5mg less per cyclophosphamide dose compared to CYCLOPS trial. The nomogram calculates a lower cyclophosphamide dose in 42 patients, same dose in 1 patients, and a higher dose in 4 patients compared to CYCLOPS trial. The median leukopenia score is 0 (Range 0 – 4), and median infection score of 2 (0 – 6), with corresponding score of 0 (0-3) and 0 (0-7) in the CYCLOPS trial. The adverse event score and remission probability are broadly similar to CYCLOPS trial but this audit was not designed to demonstrate non-inferiority.

Conclusion: The use of a nomogram allows a more precise dosing in the treatment of vasculitis. It may decrease overdosing and adverse events related to treatment toxicity.
Title: Tolvaptan for ADPCKD in an Irish population.

Authors: Louise Ryan, Abigail O'Reilly, Eabha Ring, Declan deFreitas, Beaumont Hospital

Background: Autosomal Dominant Polycystic Kidney Disease (ADPCKD) is the most common hereditary kidney disease in Ireland. Tolvaptan, a selective oral vasoressin V2-receptor antagonist, has been shown to slow the increase in total kidney volume and the decline in renal impairment in ADPCKD in the TEMPO 3:4 trial. The REPRISE trial demonstrated that tolvaptan slowed the decline in renal impairment in patients with more advanced CKD, eGFR > 25ml/min. The aim of our study was to assess the number of patients who would be eligible for tolvaptan therapy in our nephrology department and the resulting impact on outpatient clinics for a future business case.

Methods: A comprehensive review of the Kidney Disease Clinical Patient Management System (KDCPMS) was carried out to identify all patients with ADPCKD attending our nephrology department. Patients on renal replacement therapy, with either a renal transplant, peritoneal dialysis or haemodialysis, were excluded. Data was collected from the KDCPMS and laboratory system relating to demographics, symptoms, renal function and frequency of outpatient clinics. Data was analysed using Microsoft Excel.

Results: 541 patients with ADPCKD attend our nephrology department. 331 patients were excluded due to a history of renal transplantation. 66 patients who were undergoing haemodialysis and 10 patients receiving peritoneal dialysis were also excluded. 15 patients were identified as eligible for tolvaptan therapy based on the ERA-EDTA guidelines. A further 12 patients were eligible based on the REPRISE trial criteria. The mean age of eligible patients was 41 years (24-61) and mean eGFR was 62.7ml/min. The median follow up interval for the cohort of eligible patients was 9 monthly. Based on the discontinuation rate in the TEMPO 3:4 trial we estimate that 21 patients would tolerate tolvaptan therapy. Based on pricing in the BNF, the daily drug cost for this cohort is €5601 (N=21). The annual number of outpatient clinics and phlebotomies required for monitoring this cohort is predicted to increase from 26 to 84 and from 26 to 252 respectively.

Conclusions: Among our cohort of non-RRT patients with ADPCKD 20% were eligible for treatment with tolvaptan. Patients prescribed tolvaptan would need to triple their outpatient clinic appointments.
Moderated Posters
PO-1: Death on Dialysis

Authors: Dr Michael Corr¹, Dr Jennifer Hanko², Dr Emma Borthwick²
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2. Regional Nephrology Unit, Belfast City Hospital, Belfast, Northern Ireland
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Background: Haemodialysis (HD) patients are increasingly elderly with more comorbidities. For patients older than 75 years, median survival is only 2.5 years¹. In addition, HD treatment is associated with poorer quality of life². It is, therefore, important to assess the appropriateness of initiating HD treatment; for those patients on HD, timely decisions should be made to switch to conservative care when HD treatment becomes burdensome.

Methods: Retrospective study of all deaths in prevalent HD patients from 2016-2017 at Belfast City Hospital, Northern Ireland. Data was collected from the electronic record system EMed and compared to national data from the UK Renal Registry¹. Five predictive factors of death according to the Marie-Curie end of life Renal report² (hypotension, Albumin <25, ≥2 acute admissions, active malignancy and 10% weight loss in 6 months) were investigated. For the subset of patients who died less than a year after commencing HD, records were reviewed to see whether conservative care had been considered before initiating dialysis.

Results: A total of 67 patient records were identified. Median Time on Dialysis: 39 Months. Mean age upon death: 74 years old. 45% of patients had dialysis withdrawn prior to death and the median time from HD withdrawal to death was 11 days. Age, cause of death, and place of death were all similar to national averages. Of those patients who had died 37% had an albumin <25, 22% had a 10% weight loss, 45% had 2 or more non-elective admissions within that year, 16% had an active malignancy, 31% were hypotensive, 31% had none of the above. 20% of patients who died in 2016-2017 were on dialysis for less than one year. Their average age at death was 66. 46% of these patients had conservative care discussed with them before initiating dialysis. 23% had an albumin <25, none had a 10% weight loss, 27% had 2 or more non-elective admissions within that year, 31% had an active malignancy, 23% were hypotensive.

Conclusions: In this population, the patient factors that are meant to help predict mortality on HD do not appear to have a strong correlation with an individual patient’s death. Of interest, almost half of the patients who died within a year had discussions regarding conservative care which may indicate that the nephrologist had significant concerns re prognosis on HD. Clinical teams must use their experience and judgment to identify and help guide patients who are ‘deteriorating despite dialysis and not rely solely on ‘predictors’. Ongoing studies into the utility of advance care planning in elderly co-morbid HD patients may provide us with evidence of how best to guide patients and their families in approaching end of life.
PO-2: PATTERNS OF VASCULAR ACCESS USE AMONG INCIDENT HAEMODIALYSIS PATIENTS DURING THE FIRST YEAR OF DIALYSIS: A NATIONAL COHORT STUDY

Wael Hussein1, 2, Gasim Ahmed1, 2, Leonard Browne1, 2, Liam F. Casserly1, Cornelius J. Cronin1, Michelle Gaffney1, Liam Plant4, Austin G. Stack1, 2, 3

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Background: Although arteriovenous fistula (AVF) confers superior benefits over central venous catheters (CVC) in haemodialysis patients, utilisation rates are low among incident cohorts. Little is known about the evolution of vascular access use in the Irish health system. The aim of this study was to explore patterns in vascular access use among incident haemodialysis patients during their first year of dialysis.

Methods: Data were obtained from the National Kidney Disease Clinical Patient Management System (KDCPMS). All adult patients who started haemodialysis in 2015 and 2016 at units with full KDCPMS implementation were included. Patients on haemodialysis for less than 90 days were excluded. The primary vascular access in use was recorded for each patient at 30-day intervals from day 90 (D90) to day 360 (D360) following dialysis initiation. Descriptive statistics were used to describe proportions of patients with vascular access at monthly time points. Multivariable cox regression explored the risk of conversion from CVC at D90 to AVF at D360 and was expressed as hazard ratios (HR) and 95% confidence intervals (CI).

Results: A total of 610 incident haemodialysis patients were included. The median age was 65 years (IQR 53-75) and 65.1% were male. At D90, 23.3% of incident patients were dialysed by an AVF, and this percentage increased modestly to 41% at D360.

In multivariable analysis, the adjusted HR of AVF at D360 (vs CVC) was 1.65 (CI: 1.01-2.71) for patients with hypertension, 0.45 (CI: 0.21-0.96) for patients aged >78 years (vs <65 years), and varied significantly by primary cause of ESKD (P<0.001). Centre-based comparisons adjusting for case-mix revealed significant variation in conversion rates with Centre 5 experiencing the highest rate of conversion [HR 2.18 (CI: 1.12-4.23)] and Centre 1 experiencing the lowest rate of conversion [Centre 2: HR 0.25 (CI: 0.09-0.75)] compared to the referent Centre 1 [HR 1.00].

Conclusion: The utilisation of AVF is low among incident haemodialysis patients in the Irish health system. Conversion rates from CVC to AVF are low in the first year following initiation of dialysis and are associated with measurable patient characteristics and location of medical supervision. Further investigation of patient-level and facility-level factors that underpin these statistics warrant further investigation.
**PO-3 POST TRANSPLANT HYPOPHOSPHATEMIA ASSOCIATED WITH IMPROVEMENT GRAFT SURVIVAL**

Authors: Julio Chevarria, Patrick Kelly, Donal Sexton, Adeel Chaudhry, Susan L Murray, Claire Kennedy, Yvonne Williams, Peter Conlon. Beaumont Hospital. Julioleonelchevarria@Beaumont.ie.

**BACKGROUND:** The serum phosphate concentration generally is low in transplant patients during the firsts months; its clinical implications in graft function are unclear. Our study assesses the relation ship between the serum phosphate during the first year and graft failure.

**METHODS:** This is a longitudinal single centre cohort study, we analyse 1611 first transplant recipients, since 1991 to 2016. Our data was prospectively collected in the national kidney transplant registry. The primary outcome was graft failure, and the association with low serum phosphate on transplant day, 1, 6 and 12 months after. We include patients with first transplant, immunosuppression MMF + CNI + steroids, and older than 18 years. We categorized the phosphate as low or normal, the analysis was descriptive and inferential, we use Kaplan Meier and cox regression models.

**RESULTS:** We analyses 1611 patients and 171198 phosphate measurements, the mean age was 47.9 years (SD13.9), donor age 43.2 (SD13.3), 64.4% male, 59% HD, 29.5% PD, and 10.1% pre emptied, 6.8% received ATG, 60.1% Simulect, HLA mismatch mean 3.35 (SD1.5), time to fail 8.2 years (SD5.0). 297 grafts failed (18.4%), 85.1% had low phosphate the first year 0.52 mmol/L (SD0.15), reached at 26.9 (SD46) days post transplant. Kaplan Meier analysis show increase graft failure with low phosphate the transplant day (p:0.03), and improvement of graft with low phosphate at 1, 6 and 12 months (p: 0.014, 0.04, 0.004 respectively). In multivariable Cox regression the lowest phosphate at 1st month was associated with a lower risk of graft failure (HR 0.65; 95% CI 0.44 to 0.96 per 1 mmol/L) adjusted for main variables. Table 02.

**CONCLUSIONS:** The hypophosphatemia is frequent after transplantation and develops mainly in the first month. The post transplant hypophosphatemia is associated with favourable long-term graft failure outcome. Futures trials will investigate if phosphate supplementation would be a risk factor in these patients.

Table 01. Laboratory characteristics.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cold Ischaemic time</td>
<td>15.9</td>
<td>5.1</td>
</tr>
<tr>
<td>Phosphate pre transplant (mmol/L)</td>
<td>1.3</td>
<td>0.5</td>
</tr>
<tr>
<td>Minimum phosphate (mmol/L)</td>
<td>0.5</td>
<td>0.2</td>
</tr>
<tr>
<td>Phosphate at 6 months (mmol/L)</td>
<td>0.9</td>
<td>0.2</td>
</tr>
<tr>
<td>Phosphate at 12 months (mmol/L)</td>
<td>1.0</td>
<td>0.2</td>
</tr>
<tr>
<td>Time to low phosphate (days)</td>
<td>27.0</td>
<td>46.4</td>
</tr>
</tbody>
</table>

Table 02. Cox regression model for graft failure.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Sig.</th>
<th>Exp(B)</th>
<th>95.0% CI for Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Phosphate (mmol/L)</td>
<td>0.502</td>
<td>0.865</td>
<td>0.567</td>
</tr>
<tr>
<td>Recipient age (years)</td>
<td>0.001</td>
<td>1.034</td>
<td>1.023</td>
</tr>
<tr>
<td>PGEN (%)</td>
<td>0.04</td>
<td>1.006</td>
<td>1.0</td>
</tr>
<tr>
<td>Creatinine 1st month (mmol/L)</td>
<td>0.019</td>
<td>1.003</td>
<td>1.001</td>
</tr>
</tbody>
</table>

*Variables off: donor and recipient sex, donor age, smoke status, dialysis, HLA, donor type.
PO-4: Recognition and management of acute kidney injury in hospital inpatients

S. McGrath¹, P. McGing², F. Ryan¹, D. Sadlier¹, Y. O’Meara¹, M. Fitzgibbon², A. O’Riordan¹. Renal¹ & Clinical Biochemistry² Departments, Mater Misericordiae University Hospital, Dublin. Corresponding author contact: aislingoriordan@mater.ie

Background: Acute kidney injury (AKI) is associated with increased morbidity and mortality. Alerts generated by laboratory algorithms prompting clinical input have demonstrated improvements in renal recovery and reductions in AKI severity.

Aim and methods: This project aimed to utilise the established NHS laboratory algorithm¹ to retrospectively identify inpatients with AKI and then to evaluate clinical recognition, AKI management and clinical outcomes. Over a 1-month period in 2017, inpatients with at least 2 creatinine (SCr) measurements were identified and stratified into AKI stages 1-3, excluding patients from the chronic dialysis unit, outpatient clinics and primary care. Demographic and clinical data was collected from an electronic patient record including information on investigations, management, clinical outcomes, discharge summary documentation and coding of AKI diagnosis, nephrology, radiology and high dependency or intensive care unit involvement along with renal outpatient follow up. National Institute for Health Care Excellence AKI guidance was used to benchmark good practice. SPSS was used for analysis.

Results: The algorithm identified 239 patients. Of these a further 76 (32%) were excluded as they were inpatients on chronic dialysis, had fluctuating chronic kidney disease (CKD) rather than AKI or were day cases. This left 163 patients for further clinical evaluation. Eight percent of inpatients developed AKI (stage 1 - 65%, stage 2 - 15%, stage 3 - 20%). 65% of AKI 3 patients needed renal replacement therapy. Acute on CKD was noted in 44%. The median age was 73 years and 61% were males. Comorbidity was observed in 95% but only diabetes significantly impacted on AKI progression (p < 0.005). The aetiology was pre-renal in 76%. A diagnosis of AKI was coded in only 46% of discharge summaries and was significantly (p < 0.005) less likely to be documented in AKI 1 (28%) versus 2-3 (58%). A renal ultrasound or CT was performed in 44% of patients, of whom only 21% had this within 24 hours of the AKI episode. Nephrology input was sought in 34% of all patients, increasing to 74% for AKI 3. A referral to renal outpatients was made for 44% of eligible patients (those with AKI 3, CKD 4-5 and incomplete renal recovery). Increasing AKI stage had a negative impact on length of stay, need for high dependency or intensive care unit admission, renal recovery to baseline and patient survival (all p < 0.05).

Conclusion: AKI is associated with poor clinical outcomes. There are shortcomings in AKI documentation and management compared with established guidance. Those with AKI can be reliably identified using a laboratory algorithm and this could be used to implement an electronic alert to prompt improved recognition and management.


Entries for the J.P. Garvey Prize (For interns and medical students)
PO-5: Indirect ISE versus Direct ISE Measurement of Serum Sodium Concentration During the Management of Profound Hyponatraemia ([Na⁺] ≤ 120 mmol/L)

Authors: Ryan P¹, Rakovac-Tisdall A¹, Rashid A¹, Redha M¹, Crowley VEF¹
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Email: ryanp25@tcd.ie

Background:
When measuring serum sodium concentration [Na⁺], two laboratory techniques are at the clinician’s disposal: indirect and direct ion-selective electrodes (ISEs). Indirect ISE is used in most major laboratories, and assumes a constant distribution between water and the solid phase of serum. Direct ISE, used in point-of-care devices such as blood gas analyzers, does not make this assumption. This fundamental difference can lead to differing results if the techniques are used interchangeably. Analytical variability of ± 3.89 mmol/L inherent to the techniques—known as Relative Change Value (RCV)—must also be considered when interpreting any result.

This project sought to compare contemporaneous indirect and direct ISE measurements of [Na⁺] to determine the degree of discordance between the two methods in a cohort of patients with profound hyponatraemia ≤ 120 mmol/L.

Methods:
The laboratory information system (LIS) was searched for all [Na⁺] ≤ 120 mmol/L over a 12 month period. All episodes measured using both techniques were compared, and the difference (ΔISE) correlated with total protein and albumin concentrations.

Results:
ΔISE varied from -8.7 mmol/L to 8.6 mmol/L, with a mean difference of 0.32 ± 2.61 mmol/L. This was not statistically significant (p>0.1). However, statistically significant differences existed between normoalbuminaemic (ΔISE -0.77 ± 2.58 mmol/L) and hypoalbuminaemic states (ΔISE 1.18 ± 2.46 mmol/L) (p<0.001), as well as normoproteinaemic (ΔISE -1.4 ± 2.81 mmol/L) and hypoproteinaemic states (ΔISE 1.16 ± 2.62 mmol/L) (p<0.001). This difference was greatest when both albumin and total protein were low (ΔISE 1.43 ± 2.78 mmol/L) (p<0.0001). A total of 23 ΔISE (12.78%) fell outside of the ± 3.89 mmol/L range dictated by the RCV.

Conclusions:
Significant differences exist between indirect and direct ISE measurement of [Na⁺] in low albumin and total protein states. In order to negate these differences and avoid potential error in interpreting changes in serum sodium concentration, clinicians should select one method when correcting and monitoring profound hyponatraemia in any given patient.
PO-6: SERUM POTASSIUM AND MORTALITY IN CHRONIC KIDNEY DISEASE: SYSTEMATIC REVIEW AND METAANALYSIS

Authors: Natalie M. Hsiao-Fang-Yen1, Leonard Browne1, Wael F. Huessin1,2, Rose Galvin3,4, Austin G. Stack1,2,4.

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2 University Hospital Limerick, Nephrology, Limerick, Ireland,
3 University of Limerick, Department of Clinical Therapies, Limerick, Ireland,
4 Health Research Institute, University of Limerick, Limerick, Ireland.

Background: Abnormalities in serum potassium concentrations are a frequent occurrence in patients with chronic kidney disease (CKD). The exact nature of the relationship between serum potassium levels and mortality among patients with CKD is unclear. This systematic review and meta-analysis explored associations of serum potassium with mortality in non-dialysis-CKD and dialysis-dependent CKD patients.

Methods: According to the pre-specified protocol that was registered with PROSPERO (No. CRD42017081084), we searched systematically in PUBMED, EBSCO, EMBASE, and the Cochrane Library for studies up to August 2017. We included prospective and retrospective cohort studies, which reported mortality as a primary outcome according to serum potassium levels for patients with non-dialysis-CKD (estimated glomerular filtration (eGFR) < 60 mL/min/1.73m²) and for patients undergoing haemodialysis or peritoneal dialysis. Pooled hazard ratios (HR) with 95% confidence interval (CI) were calculated across categories of serum potassium and a 2-stage random-effects dose-response meta-analysis was used to assess for nonlinear relationships incorporating restricted cubic splines.

Results: Seven studies were identified, that included 161, 734 CKD patients; 266, 136 HD patients, and 11,354 PD patients. Serum potassium exhibited a U-shaped pattern of association with mortality, but the shape differed significantly between CKD and dialysis subgroups. For non-dialysis CKD patients, mortality risks were highest at very high and very low potassium concentrations (Figure 1). Pooled hazard ratios (HR) were 2.39 (95% CI 1.64-3.50) and 4.73 (3.65-6.12) for serum potassium of 6.5 mEq/L and 2.5 mEq/L respectively compared to referent, 4.5 mEq/L. In contrast for dialysis patients, mortality risks were modestly higher at potassium concentrations at the upper and lower extremes compared to referent group (Figure 1) but were substantially lower than HR for non-dialysis CKD, HR of 1.35 (1.21-1.51) and HR 1.23 (1.05-1.44) for corresponding potassium values, respectively. Differences in mortality risk were also noted between haemodialysis and peritoneal dialysis (P for heterogeneity=0.015).

Conclusion: Serum potassium exhibits a U-shaped association with mortality among non-dialysis CKD and dialysis-dependent patients. Mortality risks appear to be far greater in non-dialysis CKD than in dialysis patients. Whether this reflects differences in adaptive physiology or in clinical care provision deserves further study.
P0-7: Title: Audit of Influenza and pneumococcal vaccination rates in an Irish haemodialysis population: Merlin Park University Hospital, Unit 7

Authors: Ms Eleanor Connolly, Dr Conor Judge, Ms Maria Geraghty, Dr Donal Reddan, National University of Ireland, Galway and University Hospital Galway
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Background: The influenza virus is one of the most common and contagious causes of viral respiratory tract infections. Some chronic diseases can predispose a patient to a severe course of the disease and increase the risk of complications and death. Patients with end-stage renal disease (ESRD) have a high risk of infection due to their immunocompromised state. Infection is the second most common cause of death in this population following cardiovascular causes. Immunization is simple, cheap and effective strategy for prevention of infectious morbidity and mortality in patients with kidney failure. It is indicated for patients with chronic kidney disease, both during conservative treatment and renal replacement therapy. Pneumococcal vaccine is a vaccine against Streptococcus Pneumonia which causes a broad spectrum of disease including pneumonia, meningitis, and otitis media, and is one of the most important vaccine-preventable infections. Patients with chronic kidney disease suffer increased mortality and morbidity from pneumococcal disease, being up to 10-fold for those treated with dialysis. This audit highlighted that there was a need to educate patients of the need for influenza and pneumococcal vaccination and to set up a strategy to improve rates of vaccination.

Methods: The audit sample were all the patients in the Haemodialysis service in Merlin Park University Hospital, Unit 7 between 2/1/2018 and 12/1/2018. The data was collected using a paper based 17 question anonymous survey which was administered by Haemodialysis Staff and was manually inputted into database on Project RedCap.

Results: 52 haemodialysis patients were surveyed. 71.2% of the patients were male and 28.8% female. The percentage of patients who did not receive the influenza vaccine was 23.1%, of these patients the majority (36.4%) believed that flu shots were not necessary. 44.2% of patients did not receive the pneumococcal vaccine and 38.5% of the haemodialysis population were not aware that they were a high risk patient and the pneumococcal vaccine was recommended. 15% of the haemodialysis patients did not receive the pneumococcal nor Influenza vaccine. 32.7% of patients did not know the main symptoms of Influenza and what symptoms to be aware of if they were to contract the virus.

Conclusions: The original aims of the audit were to measure the rates of vaccination for both influenza and pneumococcal in the haemodialysis population in Merlin Park University Hospital Galway. The rates aimed for are 100% for both vaccinations. The results of this audit aids Merlin Park Hospital and Haemodialysis centres across Ireland to invest in re-education of the patients and allow greater access to vaccinations. The low rate of pneumococcal vaccine is an area that should be addressed in the haemodialysis unit, with a further audit to find the exact rate of pneumococcal vaccination by involving GP with a view to improving rates and educating patients. We plan to re-audit in 12 months to access the intervention.
PO-8: Audit of the Care Pathways of Adults with Diabetes undergoing Haemodialysis for End Stage Renal Failure (ESRF).

Louise Collins¹, Dr. Liam Plant²,
¹College of Medicine and Health, University College Cork, Ireland,
²Department of Renal Medicine, Cork University Hospital, Ireland (108551804@umail.ucc.ie)

Background:
Management of diabetes in patients with ESKD is complex, requiring intervention from multiple disciplines.

Aims & objectives
Assess Current Care Pathways of all patients with Diabetes undergoing Haemodialysis in CUH to establish whether management is concordant with the Guidelines of the Joint British Diabetes Societies and Renal Association

Methods
Structured patient interviews to assess availability and utilisation of diabetes-specific services. Structured interviews with medical, dietetic and nursing staff to assess therapeutic management interventions. Review [HbA1c] over a six month period. The findings were compared with the designated Guidelines.

Results
49/51 patients took part in interviews. 73% had not attended their G.P. for diabetes specific care in previous 6-months. 35% have never attended a Hospital Diabetes Clinic. 37% had not undergone a foot examination in previous 12 months. 80% followed Renal and Diabetes diets. 84% attended regular retinal screening.
Management of Glycaemic Control: diet alone (n=12), oral hypoglycaemic agents/insulin (n=39). Recommended [HbA1c] is 58-68mmol/mol. 67% of patients had mean [HbA1c] <58mmol/mol. 5% had mean [HbA1c] > 80mmol/mol.
Interviews with health care staff revealed: 1) an annual review of each patient by disciplinary teams involved in care was not available as recommended by guidelines. 2) absence of routine foot inspection of this high-risk patient group.

Conclusion
Overall, Care Pathways may not effectively manage the complex needs of this group. Dietary and ophthalmologic management is concordant with recommendations. However, management of glycaemic control and foot complications is fragmented, with the burden of care falling primarily on the Haemodialysis Service due to low attendance at G.P. and Diabetes Services.
PO-9: Concordance within Families for Age at ESRD in Irish Patients with ADPKD

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S Murray (susanmurray@beaumont.ie), K Yachnin (kevinyachnin@hotmail.com), PJ Conlon (peterconlon@beaumont.ie)

Introduction: Aspects of the family history typically guide prognostication in autosomal dominant polycystic kidney disease (ADPKD). We aimed to review a large cohort of Irish families with ADPKD and determine concordance within families for age at end-stage renal disease (ESRD) onset.

Methods: Clinical data were collected on consecutive patients with a clinical diagnosis of ADPKD. Those families with at least two members with ESRD, whose ages at ESRD were known, were included for analysis. The maximum difference in age at ESRD between family members was calculated and plotted on a frequency distribution.

Results: Patients were recruited from all regions of Ireland. 74 families, with 227 individuals who had reached ESRD, were included for this analysis. The mean age difference at ESRD within families was 14 years (median 12 years, range 1-45 years). 27% of families had a maximum difference in age at ESRD of over 20 years between family members.

Conclusions: Prognostication relies heavily on family history yet there is discordance within families regarding age at ESRD onset in ADPKD. We plan to study the genotype of those with a high level of discordance to see if interacting gene mutations play a role.
**PO-10: Title: Renal elastography – a non-invasive assessment of renal fibrosis?**

**Authors:** Eithne Nic an Riogh (1), Mary C. Frates (2), Carol B. Benson (2), Gearoid M. McMahon (2).

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1 UCD, Belfield, Dublin 4; 2 Brigham and Women’s Hospital, Boston, MA, US.

**Background:** The extent of interstitial fibrosis (IF) on renal biopsy is an independent predictor for progression of chronic kidney disease (CKD). Non-invasive techniques for measuring IF could reduce the need for kidney biopsy thus lowering the risk to the patient while providing valuable prognostic information. Ultrasound shear wave elastography (SWE), is a non-invasive technique which has been shown to effectively and reproducibly estimate liver fibrosis by measuring parenchymal stiffness. The aim of this study was to determine whether SWE can accurately estimate fibrosis in individuals undergoing a kidney biopsy.

**Methods:** 23 patients (mean age 49 ± 17.7 years, 9 female) underwent a native kidney biopsy at the Brigham and Women’s Hospital. Prior to the biopsy, SWE was performed at a single point in the renal cortex as close to the lower pole as possible. Five parallel and five perpendicular readings were taken with the median value recorded for each patient. The SWE readings were compared using correlation coefficients with a variety of clinical and histological parameters including percentage fibrosis, glomerulosclerosis and eGFR.

**Results:** The most common diagnosis was glomerular disease (16/23) while the remaining individuals had interstitial or vascular disease. Mean eGFR was 46.4 ± 32.3 ml/min/1.73m². Mean interstitial fibrosis was 34% (range 0-90%) while mean glomerulosclerosis was 24.7% (range 0-75%). Mean SWE was 5.24 ± 2.57 kP (perpendicular) and 6.19 ± 2.5 kP (parallel). Perpendicular and parallel readings of SWE were highly correlated ($r^2=0.63$, $p=5.96\times10^{-6}$). There was no association between perpendicular SWE and interstitial fibrosis ($r^2=8.3\times10^{-5}$, $p=0.97$, Figure 1) or glomerulosclerosis ($r^2=0.04$, $p=0.385$). There was an unexpected positive association with eGFR ($r^2=0.19$, $p=0.04$) that was not significant after accounting for multiple testing. Similar results were seen for parallel SWE.

**Conclusion:** In a study of the association between biopsy findings and SWE, there was no correlation between the findings on elastography and histopathologic and clinical markers of renal disease. Thus, SWE does not appear to be a useful non-invasive marker of renal disease.
**Title:** Exploring the attitudes and barriers to Home Haemodialysis in end-stage kidney disease patients.

**Authors:** Shet, S.¹, Clarke, S.², Durack, L³, Madden, C.⁴, O’Connor, P.⁵, Reddan, D.⁶

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5. Department of Psychology, National University of Ireland, Galway
6. Group Clinical Director of Medicine at SAOLTA hospital group, Ireland

**Background:**

Home Haemodialysis (HHD) has recently become available as an alternative to in-centre Haemodialysis (HD). In addition to being more convenient and being associated with improved clinical outcomes, HHD is more cost-effective than in-centre HD. In spite of these advantages, uptake remains low.

The aim of this research project is to gain an understanding of a range of stakeholders’ perceived barriers to, and enablers of, HHD. An improved understanding of such perceptions will help to identify patients that are suitable for HHD, and how these patients can be better supported, and encouraged to opt for HHD.

**Methods:** The study utilized qualitative semi structured interviews from two groups; Home HD patients (n=5) and in-centre HD patients (n=7). Interviews were transcribed and later thematically analysed.

**Results:** The most common barriers to HHD found were, fear of needle use, desire to keep home and hospital separate and no security of healthcare professionals. The most common enablers of HHD were increased flexibility, time saved, ability to continue working as well as reduced need for travel.

**Conclusion:** Although in-centre patients recognised the benefits of HHD, the barriers listed above prevented them from opting for it. Such barriers must be addressed in order to promote higher uptake of HHD. This could be done by devising effective strategies to improve patient knowledge and technical skills, thus reducing associated fears and uncertainty surrounding HHD.
Basic Science Posters
PO-12: Renal Transcriptomics and Human Target Validation Identify Osteopontin as a Key Treatment Responsive Gene in Experimental Diabetic Kidney Disease.

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³ Investigative Medicine, Imperial College London, United Kingdom.

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Background: We assessed the relative impact of gastric bypass surgery (GB) and intensive diet and pharmacotherapy-based intervention on diabetic kidney disease (DKD) in the Zucker diabetic fatty (ZDF) rat. We sought to compare biochemical, histological and ultrastructural changes in the kidney and identify candidate changes in gene expression that could translate to pathophysiology and treatment of the disease process in humans.

Methods: Adult ZDF rats underwent sham surgery (n=15) or GB (n=9). Nine sham-operated rats were calorie restricted and received insulin, liraglutide, metformin, ramipril, rosuvastatin and fenofibrate for 2 months (MB). Zucker fa/+ rats acted as healthy controls throughout (n=6). Bodyweight, glycaemia, albuminuria, podocyte number, density and ultrastructure were assessed at follow up. Renal transcriptomes were compared by RNA-sequencing. Using Nephroseq, the molecular signature of the diabetic ZDF rat kidney was compared to human DKD transcriptome datasets.

Results: GB and MB resulted in 20-30% weight loss, normalized glycaemia and albuminuria and reduced indices of glomerular injury, specifically podocyte injury (foot process effacement). The inflammatory cytokine osteopontin was identified as one of the most upregulated genes in the diabetic kidney and its importance in human disease was validated by interrogation of human DKD datasets. Osteopontin was significantly reduced by both interventions.

Conclusion: Equivalent improvements in DKD are obtained following GB and matched MB interventions. Osteopontin, through its effects on podocyte structure and function is reported to play a role in the development of albuminuria. These studies compliment published functional studies and validate osteopontin as a promising target in novel approaches to the treatment of DKD.
Background: ANCA Vasculitis (AAV) patients are at increased thrombosis risk and vasculitis lesions are characterised by fibrin deposition. Neutrophil Extracellular Traps (NETs) are key drivers of thrombus formation. MPO-DNA complexes are a surrogate blood marker of NETs. MTND3 is a marker of mtDNA and UCP-1 of nuclear DNA, both of which are recognised by the innate immune system as DAMPs. Citrullination leads to histone decondensation and the eventual rupture of the neutrophil membrane and NETosis. We hypothesised that the degree of NETosis associated with an active vasculitic process could be detected by measurement of Citrullinated Histone 3 (Cit H3) levels, MPO-DNA complexes and mtDNA in plasma.

Methods: Plasma from AAV patients in remission and active states, and from healthy and disease controls, were obtained from the Rare Kidney Disease Biobank. Cit H3 and MPO-DNA were detected by ELISA. MTND3 and UCP2 free DNA levels were quantified by RT-PCR (QiAamp DNA blood mini kit).

Results: Cit H3 levels were significantly elevated in active vasculitis patients, with a median of 3.4ng/mL (IQR 2.7-7.0ng/mL), compared to remission (median 1.9, IQR 1.3-2.8) and healthy control patients (median 1.5, IQR 0.9-2.7) (Fig 1A). We observed no significant difference in MPO-DNA complexes between subgroups (Fig 1B). This coincided with a significant increase in nuclear DNA in the serum of active patients (Fig 1C). Contrary to expectation, the mtDNA:nucDNA ratio was reduced in patients with active AAV (Fig 1D).

Conclusion: Cit H3 levels and free nuclear DNA levels are increased in active AAV patients when compared to remission and healthy controls. Further validation in additional cohorts is required to determine if Cit H3 and cell free DNA are specific markers for thrombotic risk in AAV patients.
**PO-13a: Title of abstract**: Targeted next generation sequencing for the molecular characterisation of hereditary renal disease

**Authors**: KA Benson1, C Kennedy2, S Murray2, K Yachnin3, G Cavalleri1, P Conlon2

**Affiliations**: 1. Molecular and Cellular Therapeutics, RCSI Dublin, 2. Department of Nephrology, Beaumont Hospital, Dublin, 3. School of Medical Sciences, Örebro University, Sweden

**Background**: A recent study from our centre demonstrated >30% of patients presenting with kidney failure have a family history of kidney disease. It is becoming apparent that a significant proportion of patients with kidney disease have an underlying genetic mutation contributing to their condition and to date, >200 genes have been identified to contribute to monogenic kidney disease. Utilising the Rare Kidney Disease Registry and Biobank (RKDB) with >620 samples representing >370 families we applied targeted sequencing to a subset of these patients.

**Aim**: This project aims to establish the utility of targeted NGS technologies in determining the molecular aetiology of hereditary renal disease.

**Methods**: We initially developed an NGS panel targeting 11 genes including *PKD1*, *PKD2* and *PKHD1* using Roche HeatSeq technology. This panel was used to sequence 88 hereditary renal disease patients and 3 healthy controls. A second panel using Roche SeqCap technology was developed to target 227 renal disease genes including all genes known to cause PKD. This panel was applied to re-sequence 8 PKD patients. Sequencing for this project was conducted on an Illumina MiSeq. All data was analysed using a custom bioinformatics pipeline and variants were classified according to the internationally recognised ACMG guidelines. Potential molecular diagnoses were discussed at a multi-disciplinary team meeting.

**Results**: The Roche HeatSeq panel provided a molecular diagnosis in 27% (24/88) of patients while the larger Roche SeqCap panel provided a molecular diagnosis in 60% (5/8) of PKD patients. Coverage of difficult to sequence genes *PKD1* and *MUC1* were much improved using the Roche SeqCap panel and proved adequate for variant calling. Identified variants from the combined sequencing efforts include 19 likely pathogenic/pathogenic variants in *PKD1* and *PKD2*, 6 of which were novel.

<table>
<thead>
<tr>
<th>Clinical Diagnosis</th>
<th>Number of Patients included for HeatSeq Panel (n=88)</th>
<th>Number of Molecular Diagnoses (n=24)</th>
</tr>
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<tbody>
<tr>
<td>PKD</td>
<td>57</td>
<td>15 (26%)</td>
</tr>
<tr>
<td>Alport Syndrome</td>
<td>11</td>
<td>3 (27%)</td>
</tr>
<tr>
<td>UMOD</td>
<td>10</td>
<td>6 (60%)</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>
**Conclusions:** Our custom Roche SeqCap panel is suitable for the sequencing of known renal disease genes including *PKD1*. This revised panel successfully identified a molecular diagnosis in >50% of patients. We now aim to conduct further sequencing of 200 patients from the RKDB using this Roche SeqCap 227 gene panel.
Background: IgA nephropathy (IgAN) is the most common form of glomerular nephritis in the world. Difference in prevalence between ethnicities and familial inheritance patterns indicate a strong genetic component. The advent of next generation sequencing has accelerated the discovery of risk variants underlying familial disorders. We set out test whether damaging variants in known kidney disease genes explain a proportion of cases diagnosed with IgAN.

Methods: We recruited and performed exome sequencing in 8 Italian and 10 Irish families with at least one case of biopsy proven IgAN and at least one other 1st degree relative with either biopsy proven IgAN or end stage renal disease. Candidate causal variants were identified based on 1) being shared between affected family members, 2) frequency in the general population, 3) function and 4) predicted pathogenicity. Qualifying variants were confirmed using Sanger sequencing.

Results: We identified candidate causal variants in three of the Irish families. In one family, we identified a pathogenic variant (according to American College of Medical Genetics standards) in COL4A5 (known to cause Alport syndrome). The variant was present in two of the three sequenced affected family members and segregated with the disease in five other family members indicating that there may be two similar diseases present in the one family. In another family, we identified a likely pathogenic variant in COL4A3. This variant segregated with the disease in two unaffected and two affected family members. In the third family, we identified a variant in LMX1B, a gene associated with Nail-patella syndrome. This variant also segregated with the disease however, its significance remains uncertain. The same variants associated with kidney disease were not present in the Italian families.

Conclusions: Exome sequencing is a powerful tool for diagnosing unexplained disease. We identified a number of pathogenic and likely pathogenic variants in 18 families who were originally diagnosed with IgAN. This suggests that exome sequence may help improve diagnosis in patients with familial IgAN.
Title: A Donor and Recipient Genome-wide Association Study of Renal Allograft Function

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Institutions: Department of Molecular and Cellular Therapeutics, Royal College of Surgeons, Dublin, Ireland\textsuperscript{1}; UK and Ireland Renal Transplant Consortium and the Wellcome Trust Case Control Consortium 3\textsuperscript{2}; International Genetics & Translational Research in Transplantation Network\textsuperscript{3}; Department of Nephrology, Beaumont Hospital, Dublin, Ireland\textsuperscript{4}

Corresponding author email: caraghstapleton@rcsi.com

Background: Previous studies suggest common genetic variation influences renal transplant outcome. Our aim was to expand on this research and examine single variant effects of both donor and recipient genotypes on graft function (using estimated glomerular filtration rate (eGFR) as a proxy) taking a genome-wide association study (GWAS) approach.

Methods: We meta-analysed donor and recipient genetic variants across four cohorts screened for European ancestry. We performed both donor and recipient GWAS of eGFR at 1 year (donors, n=3,679; recipients, n=5,220) and 5 years (donors, n=2,505; recipients, n=2,851) post-kidney transplantation and examined change in eGFR between 1 and 5 years (\(\Delta\) eGFR; donors, n=1,974; recipients, n=2,228). For the 1-year and 5-year analysis, where eGFR was missing due to death/graft failure the last known eGFR was used and death/failure was included as a covariate in the analysis. Samples with death/failure before 5 years were excluded in the \(\Delta\) eGFR GWAS. Other covariates included the first eight principal components, donor and recipient age, donor gender and type (living/deceased). SNPs with a minor allele frequency <5% were removed.

Results: No genome-wide significant associations were found in any of the donor or recipient GWAS. We had 80% power to detect variants that explain approximately 1% or more of the outcome variation.

Discussion: It is unlikely that a single common genetic variant explains greater than 1% of the variance in 1-year, 5-year or \(\Delta\) eGFR post-kidney transplant. It is possible that there are SNPs associated with eGFR post-transplant that explain less than 1% of the outcome variance but this study was underpowered to detect these. This study focused specifically on common genetic variation, therefore it is possible that rare variation in the donor and/or recipient genotype is influencing allograft function, but further work is required to answer this question.
Clinical Science
**PO-16: Genotype-Phenotype Correlation in a Cohort of Irish Patients with ADPKD**

C Kennedy, K Benson, S Murray, P O’Hara, K Yachnin, D McMahon, O Waldron, CP Stapleton, C Foley, L Casserly, M Griffin, P Lavin, MA Little, G Cavalleri, PJ Conlon

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**Introduction:** Family history and radiological findings provide the basis for both diagnosis and prognostication in autosomal dominant polycystic kidney disease (ADPKD). Knowledge of the pathogenic mutation can facilitate more detailed prognostication, which is particularly helpful in those without a family history. We aimed to identify the pathogenic mutations in a cohort of Irish patients with ADPKD.

**Methods:** Clinical data and DNA samples were collected on consecutive patients with a clinical diagnosis of ADPKD and stored in the Rare Kidney Disease Registry and Biobank respectively. Nineteen unrelated samples were analysed (see Poster X for detailed molecular methods). Basic genotype-phenotype correlation was performed.

**Results:** Six of nineteen pathogenic mutations had not been reported previously. Thirteen mutations were in the PKD-1 gene and six were in the PKD-2 gene. Age at ESRD was available for 33 affected family members. The median age at ESRD onset was lower in those with more damaging PKD-1 mutations compared to those with non-synonymous single nucleotide variants (SNVs) or PKD-2 mutations (see Figure).

**Conclusions:** Genotyping and limited genotype-phenotype correlation has been completed in a pilot cohort of Irish patients with ADPKD. We plan to extend this to a larger cohort to facilitate more detailed genotype-phenotype correlation.
PO-17: Introducing the Irish Familial Kidney Disease Clinic

C Kennedy, S Murray, D Connaughton, K Benson, CP Stapleton, P Lavin, SA Lynch, MA Little, G Cavalleri, PJ Conlon

kennedyclaire@gmail.com

Introduction: Personalized, genomic medicine is fast becoming standard of care. There remains resource scarcity, with limited access to formal clinical genetics services. We identified the need for timely, streamlined assessment of Irish patients with familial kidney disease.

Methods: The RCSI Familial Kidney Disease Research Group is a collaborative effort between genetic scientists, clinical geneticists and nephrologists. Following registration with Orphanet, this group established the Irish Familial Kidney Disease Clinic in 2016. Referred families were reviewed at clinic, pedigree data was collected, DNA was stored in the Rare Kidney Disease Biobank, and genetic testing was performed as indicated.

Results: Clinic activity during the first year is summarised in Table 1. The main indications for clinic referral were familial kidney disease of unknown aetiology and atypical cases of cystic kidney disease. Several potential living donors with first-degree affected relatives were reviewed.

<table>
<thead>
<tr>
<th>Referral</th>
<th>Families (members)</th>
<th>Diagnoses / Causative gene mutations identified (number of families)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familial CKD, unknown aetiology</td>
<td>17 (47)</td>
<td>Alport Syndrome (1), IFT-140 (1), PAX-1 (1)</td>
</tr>
<tr>
<td>Cystic Disease</td>
<td>9 (17)</td>
<td>PKD-1 (2), PKD-2 (1), HNF1B (2)</td>
</tr>
<tr>
<td>AD-TKD</td>
<td>4 (18)</td>
<td>MUC-1 (1), UMOD (1)</td>
</tr>
<tr>
<td>Tubular Disease</td>
<td>4 (6)</td>
<td>Lowe Syndrome (1), Dent Disease (2)</td>
</tr>
<tr>
<td>LRD</td>
<td>2 (4)</td>
<td>PKD (1), Alport Syndrome (1)</td>
</tr>
<tr>
<td>Familial C3GN</td>
<td>1 (10)</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Summary of clinic activity during the first year of operation (CKD = chronic kidney disease, AD-TKD = autosomal dominant tubulo-interstitial kidney disease, C3GN = C3 glomerulopathy, PKD = polycystic kidney disease, LRD = Living Related Donor)

Conclusions: Several families have received a formal genetic diagnosis as a result of referral to this clinic. Importantly, two potential donors proceeded following reassuring genetic testing. The Irish Familial Kidney Disease Clinic is happy to accept referrals and enter academic collaborations.
Background: Hereditary mutations in the MUC-1, UMOD, HNF-1B and REN-1 genes cause renal tubular atrophy, interstitial inflammation and fibrosis with progressive renal impairment including end-stage renal disease (ESRD). A recent KDIGO consensus report advocated the unified term autosomal dominant tubulointerstitial kidney disease (ADTKD), with subclassification by genetic mutation.

Methods: Clinical data and DNA samples were collected on consecutive patients with a suspected diagnosis of ADTKD and stored in the Rare Kidney Disease Registry and Biobank respectively. Genetic analysis was undertaken in RCSI Molecular and Cellular Therapeutics Laboratory and the Nephrology Department in the Wake Forest School of Medicine. Patients were sub-categorised as ADTKD-MUC1, ADTKD-UMOD, ADTKD-HNF-1B or ADTKD-NOS based on the identification of a mutation in the patient or an affected relative. Only patients meeting KDIGO criteria for a definite diagnosis of ADTKD (i.e. identified mutation in a patient or relative OR compatible family history AND compatible native renal biopsy findings in at least one relative) were included in this analysis.

Results: We identified 46 patients meeting KDIGO criteria for definite ADTKD: 19 ADTKD-MUC1 (3 families), 14 ADTKD-UMOD (3 families), 5 ADTKD-HNF-1B (1 family) and 8 with ADTKD-NOS (5 families). Seventeen patients in this cohort are currently living with ESRD. Ten of the ADTKD-MUC1 group had genetic testing identifying a cystosine insertion in the VNTR region of the MUC1 gene (Ch 1q22). Seven of the ADTKD-UMOD group had genetic testing identifying with three different mutations found in each family (p.Y274C, p.C223Y and p.C106Y). One individual in the ADTKD-HNF-1B group had a mutation found in exon 6 of the HNF-1B gene (p.A445fs). Six other individuals have suspected ADTKD based on KDIGO criteria. To date 35 renal transplants have been performed for 30 patients, including 6 living donor grafts (1 via paired kidney exchange).

Discussion: We are currently testing all individuals with ADTKD-NOS, and individuals with suspected ADTKD group for MUC1, UMOD and HNF1B mutations. Identifying the pathogenic genetic mutation is important as it facilitates genetic screening of other family members e.g. if relatives wish to become living donors.
PO-19: Title: Acute Kidney Injury and Progression of CKD in Patients with Diabetic Foot Ulcers.

Authors: Darran Mc Donald, Laura Slattery, Mary Barry, Niamh Williams, Edel Kelleher, Eoin Feeney, Alan Watson, John Holian. Institution: St Vincents University Hospital. Correspondence: darranmcdonald@gmail.com

Background: Type 2 diabetes mellitus is one of the most common chronic diseases, diabetic foot ulcers are a common complication and may go unnoticed until they are at an advanced stage due to neuropathy and arteriopathy. Previous studies have shown the risk of developing a diabetic foot ulcer is independently associated with the stage of CKD. (1) What is less clear is how the development of an infected diabetic ulcer impacts on renal function. The Diabetic Foot Pathway is an integrated, MDT initiative launched in SVUH in 2016 to streamline the care of patients with infected diabetic foot ulcers. This study aimed to examine the incidence of AKIs and changes in eGFR from baseline in the patients group.

Methods: The study included all patients who were managed within the Diabetic Foot Pathway between April 2016 and October 2017. Creatinine at baseline, presentation and at 3-6 months follow up were recorded. Using KDIGO guidelines the proportion of AKIs for each stage of CKD were calculated. (2) eGFR at baseline and 3-6 months follow up were compared using the Wilcoxon Signed Ranked Test. The change in eGFR at 3-6 months from baseline between those with and without AKIs was then assessed using the Mann Whitney U test.

Results: Over the 18 month period, 117 patients were managed on the Diabetic Foot Pathway (85% male, mean age of 66). 84 patients had a Cr at baseline and presentation while 74 also had a follow up Cr at 3-6 months. 29% of patients were found to have an AKI at presentation, of these 13% were Stage 2 and 9% were Stage 3. The percentage of patients with an AKI increased with stage of CKD.

<table>
<thead>
<tr>
<th>Baseline eGFR</th>
<th>Percentage of Patients (%)</th>
<th>Percentage of Patients with AKI (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;90</td>
<td>36</td>
<td>7</td>
</tr>
<tr>
<td>60-90</td>
<td>30</td>
<td>24</td>
</tr>
<tr>
<td>30-59</td>
<td>27</td>
<td>50</td>
</tr>
<tr>
<td>15-30</td>
<td>5</td>
<td>75</td>
</tr>
<tr>
<td>&lt;15</td>
<td>2</td>
<td>100*</td>
</tr>
</tbody>
</table>

* Excludes 1 patient on haemodialysis

Median eGFR for the group decreased from 74 to 69 ml/min/1.73m² at 3-6 months (p=.0002). In those who had AKIs there was a trend to have larger reductions in eGFR at 3-6 months that in those without; -6.7 versus -3.9 ml/min/1.73m² (p=0.17).

Conclusions: This study supports the hypothesis that diabetic foot infections may contribute to a decline in renal function, particularly when associated with an AKI. The decline in renal function may indeed be more significant than this study demonstrates as eGFR is often over-estimated post discharge due to loss of mean muscle mass.
PO-20: Title: Recognition and initial management of Acute Kidney Injury

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1Transplant Urology and Nephrology Directorate, Beaumont Hospital
2Department of Information Technology, Beaumont hospital
3Department of Chemical Pathology, Beaumont Hospital

**Background:** Acute Kidney Injury (AKI) is independently associated with increased mortality and prolonged length of stay. We aimed to assess the initial assessment and management of AKI in the hospital in July 2016 by clinicians using adapted criteria from the NCEPOD AKI audit recommendations. We also aimed to retrospectively quantify the incidence of AKI in this hospital and patient outcomes (mortality and morbidity) amongst patients that sustain an AKI.

**Methods:** Cases of AKI that occurred in all patients admitted in July 2016 were identified using coding data where the search terms ‘AKI’, ‘Acute Kidney Injury’ and ‘acute renal failure’ were used. Identified cases were categorized into AKIN 1, 2 and 3. In parallel, an algorithm was developed to identify possible cases of AKI in the hospital that month, based on differences in creatinine values. Medical charts were reviewed to obtain details regarding the assessment and initial management of all coded AKIs.

**Results and Discussion:** 38 cases of AKIN 2-3 were identified from 1445 emergency admissions. 36 charts were reviewed. 93.5% had an assessment of volume status, medications were reviewed in 80.6% of patients, imaging was considered in 51.6%, urinalysis was documented in 41.9% and a risk factor assessment was performed in 83.9% of cases. Of the initial 38 patients, 26.3% died, 5.3% were dialysis dependent on discharge, 18.4% recovered to a new baseline CKD and 50% recovered to baseline renal function. Mean length of stay (LOS) for all admissions was 8 days. In patients with AKI that survived to discharge, mean LOS was 18.9 days (AKIN 2) and 17.6 days (AKIN 3). A further 187 possible cases of AKI were identified using laboratory data. Of the AKIN 2-3 cases identified using laboratory data, 35 (60.3%) had not been coded.

**Conclusions:** The initial assessment and management of AKIN2 and AKIN3 is sub optimal with scope for optimization in the area of basic assessment. The majority of AKI diagnosed in hospital occurs on or very shortly after admission. The initial assessment is most frequently done by the medical SHO on call. Therefore teaching interns and SHOs would likely be of benefit. A comparison of AKI identified by coding data (where AKI is documented by the clinician) versus cases identified by comparison of laboratory data suggests under recognition of AKI and that there is a burden of ‘missed’ AKI that could be preventable.
Introduction: Acute Kidney Injury (AKI) is an increasingly common clinical problem faced by nephrologists and other hospital physicians, surgeons and general practitioners. AKI is associated with increased morbidity and mortality and is now recognized as a major public health concern as it impacts on mortality, length of hospital stay and healthcare cost. Thus, the importance of recognizing AKI followed by appropriate diagnostic work up and treatment cannot be understated.

Objective: To assess the epidemiology of AKI in patients who were admitted via the emergency department of a tertiary care university hospital during acute unselected medical take, with particular focus on initial recognition and diagnostic work up of AKI and appropriate management.

Methodology: All patients who were admitted to hospital during acute unselected medical take over a three-week period in October were included. Each patients laboratory biochemistry on admission was reviewed and was categorized by investigators as having AKI or not having AKI following Kidney Disease in Global Outcomes (KDIGO) definition. A further analysis was undertaken which examined 8 main parameters; (1) if AKI was diagnosed by medical staff within (2) if a cause for AKI was suggested (3) if urinalysis was performed (4) if intravenous fluids were prescribed (5) if urinary output was recorded (6) if nephrotoxic medications were withheld (7) if a renal ultrasound was ordered and (8) if referral to renal physician was made.

Results: A total of 554 patients were included in initial analysis. AKI was present on admission in 94 patients (Total AKI group; 17%) and diagnosed by medical staff in 50 patients (53.1%; AKI diagnosed group). There was a male preponderance (56%; 44% respectively) and mean age was 63 years. 69 (70%) had known Chronic Kidney Disease (CKD), 18 (26%) were not known to have CKD and 11 (11.2%) had an unknown baseline. 2 patients were commenced on haemodialysis within 24 hours of admission. Etiology of AKI included volume depletion / circulatory shock in 68% (n=65), sepsis in 23% (n=24) sepsis, analgesic nephropathy in 3.1% (n=3), 1 as a consequence of newly diagnosed multiple myeloma and 1 as a result of ANCA vasculitis. 64 patients (66%) of the total AKI group (n=94) were routinely taking a potentially nephrotoxic medication at the time of admission. These were held in 43.5% (n=27) of cases of patients in the total AKI group and in 61% (n=25) of the AKI diagnosed group. Urinalysis was performed in 38.7% (n=38) of the total AKI group and 84% (n=42) of the AKI diagnosed group. Fluids were prescribed in 76.5% (n=72) of the total AKI group and in 84% (n=42) of the AKI diagnosed group. Urine output was recorded in 47.8% of the total AKI group (n=45) and 82% (n=41) of the AKI diagnosed group. Renal ultrasonography was booked in 14.9% (n=16) of the total AKI group and 18% (n=9) in the AKI diagnosed group. Referral to renal physician on admission was made in 11.7% (n=11) of the total AKI group and 18% (n=9) in the AKI diagnosed group.

Conclusion: There are significant shortcomings in AKI recognition and management within acute unselected medical take. Where AKI is recognized and diagnosed on admission, management is improved. As seen in other studies, the implementation of an AKI alert.
system and care pathway can result in earlier recognition, appropriate management and prompt for renal referral where necessary. A care pathway or “AKI bundle” has been produced as part of this study.
PO-22: Contrast induced Acute Kidney Injury among patients who underwent computed tomography pulmonary angiograms in an Acute Medical Unit

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Background: Contrast induced Acute Kidney Injury (CI-AKI) is a complication of intra-vascular administration of contrast media. Many clinical trials have focused on elective outpatient populations in determining the incidence of CI-AKI including the recent AMACING trial. The aim was to determine the incidence of CI-AKI in an inpatient group, the rates of implementation of prophylactic hydration strategies as well as the incidence of pulmonary embolism (PE) in this population after computed tomography pulmonary angiograms (CTPAs).

Methods: A retrospective review was conducted, of patients that underwent CTPAs in the Acute Medical Unit, St. James’s Hospital, Dublin between January 2015 and February 2017. CI-AKI was defined as an increase in serum creatinine of ≥44µmol/L (≥0.5mg/dL) or a 25% increase from baseline value measured up to six days post exposure to the iodinated contrast medium. Baseline creatinine, creatinine at day 2-6 post contrast and day 26-35 post contrast were recorded for each patient in line with the recent AMACING trial. Medical notes were retrieved for the 20 patients who developed an AKI to determine if there was any concomitant risk factors other than contrast exposure that may have precipitated an AKI. The number of patients with a confirmed PE on CTPA reports was recorded.

Findings: Data for 254 patients was analysed. Creatinine values were available at day 2-6 for 191 patients (75%) and at day 26-35 for 59 patients (23%). 20 patients developed an AKI between days 2-6 post CTPA (10.5%). Of the 16 (out of 20) for whom drug kardexes were available, only 6 were pre-hydrated (30%) and only 5 (25%) received post-hydration. Of the 20 patients who developed AKI, at least 17 (85%) had other risk factors for AKI. 27 patients (10.6%) were diagnosed with a PE.

Conclusion: CI-AKI trials based on outpatients represent a very different cohort to inpatient populations who often have multiple risk factors for AKI. Policy development in each hospital to highlight risk factors for CI-AKI would be valuable. To date it is not clear whether prophylactic hydration with isotonic fluids is of benefit. However, until larger trials are available, implementing a prophylactic hydration policy for inpatients undergoing contrast scans is advisable. Re-audit should be performed once a defined policy is in place to determine if there is any benefit. Strict indications for performing CTPAs should be adhered to, to limit unnecessary exposure to radiation as well as CI-AKI.
PO-23: Attitudes towards administration of Intravenous Contrast in Acute Emergency Settings

**Authors:** Bróna Moloney, Brian Gibney, Denise Sadlier, Yvonne O’Meara, Aisling O’Riordan and Peter McMahon

**Affiliations:** Nephrology Department & Radiology Department, Mater Misericordiae University Hospital, Dublin.

**Aims:** Computed Tomography (CT) is an important imaging modality often used in emergency settings for diagnosis where delay in imaging can have a negative impact on outcome (e.g.: Major Trauma and Acute Ischaemic Stroke). To accurately obtain a diagnosis, CT imaging often requires the administration of Intravenous Iodinated Contrast (IVIC) but often concern over contrast induced nephropathy (CIN) delays or prevents IVIC being administered in emergency settings. Recent studies have found a lack of association between significant CIN and IVIC in emergency settings. Therefore, the aim of this study was to examine opinions on the approach to administration of IVIC with a national survey.

**Methods and materials:** A survey was prepared with seven clinical scenarios where the use of IVIC is important in increasing the diagnostic yield of critical CT imaging and where renal function at the time of CT imaging was not available. The clinical scenarios were constructed to mimic real clinical decisions, mostly focused on urgent and emergent scenarios, when the use of contrast may be most helpful, but decisions are often time-sensitive. In each scenario the respondents were asked whether to proceed with IVIC, delay until renal function available or not give IVIC. Other imaging options were intentionally omitted to encourage a decision on whether to administer IV contrast. Surveys were sent to both Radiologists and Nephrologists, both online (SurveyMonkey) and paper surveys were available. Data was recorded and analysed on an Excel spreadsheet.

**Results:** 

**Radiology Results:** to date 135 radiologists have completed the survey, of these 61.5% (n = 83) were from Consultants and 38.5% (n = 52) were from Registrars with 24 hospitals represented.  

**Nephrology Results:** to date 33 nephrologists have completed the survey, of these 39.4% (n = 13) were from Consultants and 61.0% (n = 20) were from Registrars with 20 hospitals represented. 16.3% (n = 22) Radiologists compared to 18.2% (n = 6) Nephrologists would administer IVIC immediately in all cases. In acute severe stroke presentation within established thrombolysis/thrombectomy window 89.9% (n = 121) Radiologists and 93.9 % (n = 31) Nephrologists would scan immediately with IVIC when renal function is unknown.

**Conclusion:** This survey examines attitudes towards the risk/benefit of IVIC with respect to CIN using clinical scenarios encountered daily. In an emergent setting, where there is significant benefit to patient outcome, the majority of both Radiologists and Nephrologists agree with administering IVIC irrespective of renal function. Where the benefit is less clear, the Radiologists are less confident in administering IVIC than Nephrologists. Education on recent evidence and post IVIC management may help reassure Radiologists in the future.
PO-24: Haemodialysis Catheter Insertion – Is it an Interventional Radiologists Game

E McKenna CT3 trainee in Nephrology

C Harron Consultant Nephrologist

Antrim Area Hospital Antrim Northern Ireland

**Background:** Data from the UK Renal Registry in 2013 revealed for every 100 patients started on haemodialysis (HD) during that year period 58 required insertion of either a temporary or tunnelled central venous catheter (CVC) (1). CVCs are associated with numerous complications both during the time of insertion and thereafter. One complication includes the line misplacement either during insertion or afterwards due to line tip migration. It is therefore important to ensure that your line tip is where you think it is prior to commencing HD. Some renal units are beginning to move away from CVC insertion and have handed the reigns over to our colleagues in interventional radiology while some units still insert their own lines but will only do so under radiological guidance or fluoroscopy.

**Case:** HB is a 35 yo female with a history of nephrotic syndrome secondary to minimal change disease. She was on Prednisolone and Tacrolimus as maintenance therapy. She developed pancreatitis secondary to Tacrolimus, required a lot of IVFs as per pancreatitis management and subsequently became overloaded. This in combination with an AKI caused by her pancreatitis meant she required to start HD. She had an existing right subclavian line to facilitate daily bloods, a PCA and antibiotics. A left sided RIJ CVC was inserted in a procedure bay in the renal unit and was conducted without complication. There was no resistance on insertion and both line lumens had excellent flows. She was sent for check CXR as per policy. The line was not where we had expected it to be, i.e. the junction between IVC and right atrium but appeared to be somewhere in the left side of her chest, see image 1. The image was reviewed by the consultant radiologist on duty who advised the line had made its way into a normal variant of the left accessory hemiazygos vein. He advised given the calibre of the vessel if would not be safe to proceed with HD and as such the line was removed and a RIJ line was inserted. If the check CXR had not been performed in this case there is the potential that had the patient been put straight onto HD she may have come to harm.

**Discussion:** This case has highlighted to me the importance of obtaining a check CXR following all CVC insertions prior to using the line. It has also raised the question that given the potential complications should all these procedures be performed under radiological guidance. Given that not all centres have this facility we have concluded that where possible interventional radiology should be used to insert CVCs either by the interventional radiology or the nephrologist however if this service is not available great care should be taken to ensure line position is checked prior to line usage.

**References:**

Background: Observational data demonstrated high ultrafiltration rate (UFR), interdialytic weight gain (IDWG), short haemodialysis session duration (HSD) and low albumin are independent markers of increased mortality in chronic haemodialysis population. They should become part of a regular performance assessment of a dialysis unit.

Objectives: To assess the performance of a regional dialysis unit against the markers of mortality (UFR, IDWG, HSD, albumin) in a cohort of prevalent haemodialysis patients, with review of associated literature. To observe if an association exist between HSD and albumin (marker of all-cause mortality).

Methods: This is a cross-sectional analytical study in which data was collected from a regional cohort of 59 prevalent chronic haemodialysis patients using a national electronic database (eMED). Patients were categorised based on UFR ≤ 10ml/hr/kg or >10ml/hr/Kg, IDWG%(a ratio of absolute IDWG to dry weight) <4 or ≥4, HSD < 240 minutes or ≥240 minutes, and albumin <40g/L or ≥40g/L. Statistic models were used to demonstrate a relationship between HSD and albumin. The data was compared and analysed with available evidence base using PubMed and Medline.

Results: 59 patients with mean age of 66±16 and median dialysis vintage of 24 months were studied. HSD<240 minutes in 50.80%, UFR>10ml/hr/kg in 16.90%, IDWG%≥4 in 13.60% and albumin <40g/L in 50.80% of the patients was noted. Mean value of UFR 7.88 ml/hr/kg±2.73, IDWG% 2.74±1.44, HSD 221min±20.32 and albumin 39g/L±4.12. Standard regression model demonstrated a cross sectional association between longer HSD and higher serum albumin (p<0.05). Literature review supported HSD<240 minutes, IDWG%≥4, UFR>10ml/hr/kg, and albumin<40g/L was associated with increased mortality in chronic haemodialysis population.

Conclusion: Majority of the prevalent dialysis patients at the regional unit are achieving goals of management based on available evidence. Longer HSD had a cross sectional association with higher serum albumin (p<0.05). Literature review supported HSD<240 minutes, IDWG%≥4, UFR>10ml/hr/kg, and albumin<40g/L was associated with increased mortality in chronic haemodialysis population.
Background: A well-functioning vascular access (VA) is a mainstay for efficient haemodialysis (HD). Of the three main types of access, native arteriovenous fistula (AVF) remains first choice for chronic HD as has traditionally been associated with and has lowest association with morbidity and mortality. There is evidence to suggest that wide variation in provision exists between HD centres with some national UK reports finding up to 70% of HD starters at some centres used a venous catheter as their first access with little improvement at three months. We examined the VA of all patients receiving maintenance HD at an outpatient HD unit and determine whether VA can be optimized for current and future patients of the unit.

Methodology: All current and new outpatient maintenance HD patients from October 2017 to January 2018 were included. The data collected covered basic demographic information and specific facts about the patients VA including; (1) current VA, (2) any previous types of VA (3) type of access at first dialysis, (4), type of access at 6 months and one year, (5) whether the patient was known to our renal service before commencing HD, (6) whether the patient had a planned HD start or an emergency start (7) if a referral to vascular surgeon was made at any point pre HD or after HD.

Results: A total of 94 patients were included in the audit with a predominance of male patients (59.5% n=56). Mean age was 67 years. 44 patients (47%) have had AVF created at some stage, 18 patients (19.2%) currently have active and useable AVF with a further 2 patients awaiting AVF maturation. Therefore; 76 (80%) of patients are currently dialyzing using central venous catheter (CVC). 15 patients (16%) commenced HD using AVF. Of the 79 patients who commenced HD using a CVC, 12 had AVF formed within the next 6 months, and a further 16 had AVF formed within a year, with the remaining patients in whom AVF was formed (n=11) being created a year or more from their first HD date. Of those in whom data was available (n=82), 53 (64.6%) were referred by a member of renal team to vascular surgeon for AVF assessment with 35 (66%) being referred after HD had commenced. 44 patients (47%) commenced HD as an emergency admission and remainder had a planned start. 75 (79.7%) of all our HD patients were known to our renal service prior to commencing HD and of those 32 (42.6%) commenced HD as an emergency.

Conclusion: Patient care is individual and surgical intervention is not suitable for every HD patient. However, improvements can be made to optimize VA planning in suitable patients approaching end-stage kidney disease (ESKD). Timely referral to vascular surgeon seems largely doctor dependent and a VA care pathway could benefit both doctor and patient with regards planning for AVF. To that end, a VA care pathway for this HD unit has been developed following this audit.
Introduction: Vascular access is essential to provide life-prolonging haemodialysis treatment to patients with End Stage Renal Disease (ESRD) but may itself result in significant morbidity. Arteriovenous fistulae are generally accepted as superior to tunnelled dialysis catheters (Permcath®) due to the risk of Catheter Related Blood Stream Infection (CRBSI) associated with dialysis catheters. We report a series of three patients who developed metastatic infection of the spine (osteomyelitis or epidural abscess) while receiving maintenance haemodialysis via dialysis catheter.

Case 1: A 47-year-old male with ESRD due to IgA Nephropathy and a previously failed transplant required right femoral dialysis catheter after thrombosis of his left femoral arteriovenous graft. One month later he became febrile and unwell on dialysis. Blood cultures grew *Staphylococcus aureus* sensitive to methicillin. He refused removal of the dialysis catheter and was treated with cefazolin and vancomycin administered on dialysis via the right femoral catheter. Two weeks into treatment he complained of severe back pain. MRI spine was concerning for a focus of vertebral osteomyelitis. The femoral catheter was removed and he was treated with 8 weeks of intravenous flucloxacillin.

Case 2: A 38-year-old male with ESRD due to chronic reflux nephropathy, 2 failed renal transplants and failed arteriovenous fistulae in both upper limbs complained of ongoing back pain. He was receiving maintenance haemodialysis via a right internal jugular catheter. MRI Spine was arranged and demonstrated L5-S1 discitis with an overlying epidural abscess. Peripheral blood cultures and cultures from the dialysis catheter grew *Staphylococcus epidermidis*. He was treated with intravenous ceftriaxone and vancomycin, the dialysis catheter was exchanged antibiotics were later changed to daptomycin administered on dialysis. Both symptoms and follow-up imaging improved.

Case 3: A 76-year-old male with ESRD due to hypertension and a background history of rheumatoid arthritis was admitted under the orthopaedic team with ongoing back and right hip pain. He received maintenance haemodialysis via a right internal jugular line. He became febrile while undergoing investigations for a suspected hairline fracture of the right hip and was initially treated with intravenous Piperacillin-Tazobactam. Blood cultures grew *Enterococcus faecalis* (peripheral and from dialysis line). MRI spine demonstrated an epidural abscess. He was then treated with intravenous ceftriaxone. There was significant improvement in his pain and after a complex hospital course he was discharged to a rehabilitation facility.

Discussion: These cases highlight the importance of a “Fistula First” policy whenever feasible. Nephrologists should maintain a high index of suspicious for blood stream and metastatic infection in haemodialysis patients.
PO-28: Title: The Cost of Obesity in a Single Centre Haemodialysis Unit

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Background:
Obesity has become a worldwide epidemic with approximately 35% of the world adult population having a BMI greater than 30kg/m² and its prevalence is projected to grow. Patients suffering from end stage kidney disease are no exception to this and are high risk candidates for the development of obesity as they may have co-morbidities such as diabetes and hypertension.
The cost per annum of dialysis for a patient is estimated at €58,750 while a renal transplant is calculated to cost of €74,000 initially followed by €10,000 per annum for transplant patient care. For each successful renal transplant, the Exchequer saves up to €50,000 per patient per annum after the first year.

Methods:
All dialysis patient’s BMIs were calculated and patients with BMI ≥ 30kg/m² were included in a chart review. These patient’s were then subject to exclusion according to the renal Transplant Workup Criteria.

Results:
Of the 450 patients currently undergoing haemodialysis in the Trinity Health Kidney Centre Group, approximately 25% of the patient cohort were found to have a BMI ≥ 30kg/m². Of this group, in 12 patients, the only exclusion criteria preventing them from progressing to the transplant waiting list was a BMI ≥30kg/m². The combined annual haemodialysis cost for these 12 patients is €705,000 per annum.

Conclusions:
The results show that a number of patients who would otherwise be eligible for renal transplant are excluded based upon their BMI. There is enormous cost in quality of life to the patient, in life expectancy, whilst also costing the health service and straining an already full capacity system. With demand for haemodialysis projected to increase by 22% by 2023 as well as the increase predicted in the prevalence of obesity, this problem is not going away and needs to be addressed. If this cohort of patients had access to a specialist bariatric surgery service, surgery could be the solution to make them eligible for transplant.

The evidence demands immediate and collaborative action to implement a new specialist bariatric surgical service in Dublin to cater for these patients, increase their access to renal transplant which in turn will improve patients’ quality of life, life expectancy and reduce costs to the HSE.
PO-29: All On Board: a person-centred, holistic approach to caring for haemodialysis patients with diabetes.

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**Background & Methods:** Almost one third of our chronic haemodialysis population has diabetes. An audit of diabetic patients was carried out to evaluate attendance at diabetic outpatient clinic, retinal screening and podiatry. Reasons for non-attendance were identified. The initial results showed that within the last year 28% of patients had not attended a diabetes review, 37% had not attended for retinal screening and 18% had not had a foot assessment. Reasons given for non-attendance were difficulty in getting to appointments, appointments clashed with their haemodialysis session and many patients found that after haemodialysis they were just too exhausted to attend any further appointments. Patients also reported that they would like to have their diabetes care provided at the same time as haemodialysis was delivered.

**Results:** A consultant led, multidisciplinary, multiprofessional mobile diabetes clinic has been established. This has brought diabetic management to the patient's bedside whilst they are on haemodialysis. The patients are reviewed routinely by diabetic team which includes diabetes specialist nurses a consultant diabetologist and dietician. Haemodialysis nurses in the unit refer patients on admission, assist in glycaemic monitoring, reinforce education and provide support to the patients. A foot assessment tool has been designed and introduced by haemodialysis nursing staff in collaboration with the podiatry department. This involves the haemodialysis nurses carrying out a monthly foot check and providing patients with education on how to care for their feet. Podiatrists and vascular surgeons will come to the unit and review any acute issues to ensure early intervention to prevent further complications. The Ophthalmology Service has become involved and retinal screening was offered to those 46%. This was provided in the dialysis unit and allowed patients to attend either immediately before or after their haemodialysis appointment. For the small group of patients who could not attend this appointment the retinal screening service came to the unit again and trialled retinal screening whilst the patients were on dialysis using a mobile device.

**Conclusion:** This patient-centred, innovative, multidisciplinary, holistic approach has greatly improved the diabetes care provided to our haemodialysis population. It has been co-designed with patients which is why it is so successful. The team is highly motivated and enthused by the early successes that have been achieved. Haemodialysis nursing staff have noted improved glycaemic control and now have systems in place to try to prevent diabetes related complications in relation to foot care and retinal screening. It is a “one stop shop” that means patients do not have any extra appointments to attend. This in turn means that the time not at haemodialysis can be spent doing things they enjoy, leading to an improved quality of life.
PO-30: Title: A Review of Safety, Efficacy and Outcomes for Patients receiving Citrate Saline CVVH Protocol in Beaumont Intensive Care Units

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Background: Continuous renal replacement therapy is established as the standard form of renal replacement therapy in the intensive care setting for patients with acute kidney injury and for haemodialysis patients who are too unstable for intermittent haemodialysis. The most common protocols involve citrate or heparin anticoagulation. For it to be effective, clotting of the circuit needs to be avoided. Patients in intensive care are often at increased risk of bleeding and regional citrate circuits are becoming more popular to prevent bleeding. In our unit we use a simple mixed citrate saline protocol as standard first line treatment renal replacement therapy. This avoids using the complicated commercially available preparations

Methods: We introduced a new protocol in Beaumont Hospital intensive care units for patient who required renal replacement therapy and were unsuitable for intermittent haemodialysis. We recorded indications, protocol type, rates of hypercalcaemia, rates of metabolic acidosis, citrate toxicity, filter life and filter clotting from July 2017 to January 2018. We also followed patients up until discharge from intensive care or death.

Results: 25 patients were identified, 3 of which had multiple admissions to ITU. Hypocalaemia (ionised Ca <0.9mmol/litre) occurred in 14.28%. Alkalosis occurred in 35.71 %. Thrombocytopenia occurred in 39.29%. Filter life was affected by clotting in 25% if patients. Other factors affecting filter life including holding CVVH for radiological investigations or for transfer to theatre. 36% died in ITU, 30.77% recovered renal function prior to discharge from ITU. 34.62% were switched to intermittent dialysis on or prior to discharge from ITU. 3 patients were switched to haemosol, 2 due to repeated clotting of filters and 1 due to lactic acidosis. There were no episodes of bleeding reported.

Conclusions: This protocol is safe and effective as a form of renal replacement therapy in intensive care patients. High rates of alkalosis is reported however most appears to be respiratory alkalosis. Further analysis comparing this group to an equivalent group who received Haemosol protocol is needed.
PO-31: SERUM PHOSPHATE CONTROL AMONG MAINTENANCE HAEMODIALYSIS: COMPLIANCE WITH KDIGO GUIDELINES IN A CENTRE BASED STUDY

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Background: Hyperphosphatemia is associated with increased morbidity and mortality. The KDIGO guidelines have set targets for serum phosphate levels in haemodialysis patients. The goal of this audit was to assess compliance with KDIGO targets for phosphate control in chronic haemodialysis patients attending the Mid-West region.

Methods: We recruited a cohort of 179 patients who received maintenance haemodialysis in the Mid-West region. We excluded patients who were on haemodialysis for less than 90 days as of the 1st of December 2017. Pre-dialysis serum phosphate levels for each patient were assessed on the first dialysis session in December 2017. The optimal target levels for the serum phosphate were 1.13 – 1.78 mmol/L according to KDIGO guidelines.

Results: A total of 179 patients were on haemodialysis for > 90 days as of the 1st of December 2017, 90 of which were in University Hospital of Limerick (UHL) dialysis unit and 89 patients in its satellite unit. A total of 107 patients (60%) had their serum phosphate levels within desired target. 34 patients (19%) had serum phosphate < 1.13 mmol/L with the majority being from the UHL centre, 26 patients (29%) vs 8 patients (9%), p<0.001. The total number of patients with serum phosphate > 1.78 mmol/L was 38 (21%) with no significant difference between the two centres.

Conclusion: A substantial proportion of haemodialysis patients examined failed to meet the KDIGO guidelines targets for serum phosphate. Further studies are needed to examine the factors associated and how to address them.
PO-32: ASSOCIATION OF SERUM URIC ACID WITH MORTALITY IN THE IRISH HEALTH CARE SYSTEM

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Background:

Hyperuricaemia is common in the general population and emerging evidence suggests strong biological and epidemiological links with several chronic diseases. The aim of this study was to evaluate the relationship of serum uric acid (SUA) concentrations with mortality in the Irish health system.

Methods: We established a retrospective cohort of 102,239 patients who had a SUA concentration recorded on first entry to the health system between 2005 and 2013. Data were extracted from clinical information systems in the Midwest and Northwest regions and linked with national mortality files. Patients were followed until death, lost to follow-up or December 31st 2014, whichever occurred first. Sex-specific hazard ratios (HRs) of mortality were estimated according to quintiles of serum uric acid using Cox hazard models stratified by cohorts with age as the time scale. In addition uric acid was modelled with restricted cubic splines to assess its non-linear relationship with mortality.

Results: During 487,921 person-years of follow-up, we documented 8,090 deaths. The overall mortality rate had a U-shaped association with SUA levels in men, and a J shaped association in women. In multivariate analysis, following additional adjustment for serum albumin, hemoglobin, serum calcium, serum phosphorous and estimated glomerular filtration rates (eGFR), the association between SUA levels and mortality remained, exhibiting a significant U shape and J shape for men and women. Optimal values of SUA associated with lowest mortality were 340 μmol/L in men and 253 μmol/L in women respectively (Figure 1).

Conclusion: Serum uric acid is independently associated with mortality among patients in the Irish health system and the pattern of association differs for men (U shaped) and women (J-shaped). The highest levels of serum uric acid were associated with increased mortality in both men and women. However, optimal values associated with reduced risk differed by sex suggesting that target thresholds for treatment in clinical settings should be modified accordingly.
PO-33: BURDEN OF METABOLIC COMPLICATIONS OF CHRONIC KIDNEY DISEASE IN THE IRISH HEALTH SYSTEM

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Background: The prevalence of Chronic Kidney Disease (CKD) in the Irish health system has increased in recent years. However, few studies have reported on the prevalence of CKD-related metabolic complications in this setting. The goal of the study was to describe the burden of metabolic complications of CKD and assess correlations with kidney function.

Methods: Utilising data from the National Kidney Disease Surveillance System, we conducted a cross sectional study of adult patients with valid serum creatinine measurements and recorded metabolic indicators in 2014. The Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) equation was used to calculate estimated glomerular filtration rate (eGFR). Anaemia was defined as haemoglobin less than 10 g/dL; hyperkalaemia as potassium greater than 5.5 mmol/L; acidosis as serum bicarbonate (CO₂) less than 18 mmol/L, and hyperphosphatemia as phosphorus level greater than 1.5 mmol/L. Logistic regression was used to explore associations of eGFR with metabolic complications. Age and sex-adjusted models were constructed to evaluate the association of eGFR with each metabolic complication.

Results: We identified 185,447 adults with valid creatinine measurements. Average age was 62 (±18), eGFR was 74.3 (+26.0). Among these 9.2 % had metabolic acidosis, 8.1% anaemia, 6.7% hyperphosphatemia and 3.5% were hyperkalaemic. A lower eGFR was associated with higher rates of metabolic complications. In multivariate models adjusting for age and sex each 5mL/min/1.73m² fall in eGFR was associated with anaemia, AOR 1.18 (95% CI; 1.18-1.19); hyperkalaemia, AOR 1.15 (95% CI; 1.14-1.15); metabolic acidosis, AOR 1.13 (95% CI; 1.12-1.13) and hyperphosphatemia, AOR 1.27 (95% CI; 1.26-1.27).

Conclusion: The burden of CKD-related metabolic complications is high within the Irish health care system. Patients with low eGFR are at increased risk for several serious but treatable metabolic complications and are easily identified from a passive surveillance system. The impact of both individual and combined metabolic complications on health outcomes warrants further exploration.
Background: Severe hyponatremia is defined as a serum sodium concentration less than or equal to 120mmol/L and can be associated with mild symptoms (e.g. decreased concentration) to more severe life-threatening symptoms (e.g. seizures and coma). Patients with severe symptomatic hyponatremia should be managed with hypertonic saline to correct their serum sodium and reduce the morbidity and mortality associated with this condition. In this retrospective study, the aetiology, management and outcomes of severe hyponatraemia were examined over a 12-month period.

Methods: All patients admitted to a tertiary referral hospital with serum sodium ≤120mmol/L were identified through the biochemistry laboratory database from January – December 2017 inclusive. Patient data was extracted from hospital records and included age, gender, presenting complaint, co-morbidities, medications, clinical exam findings, treatment received, laboratory results, length of stay, nephrology consult and in-hospital mortality.

Results: A total of 119 patients met the inclusion criteria, 44.5% (n=53) were male, 24.4% (n=29) were aged >80 years. There were no instances of hypertonic hyponatremia. The commonest causes were hypovolaemia (21.8%, n=26), Syndrome of Inappropriate ADH secretion (18.4%, n=22) and medication induced (19.3%, n=23), of which thiazides were the most common. The most common symptoms were GI upset (9.2%, n=11), confusion (9.2%, n=11) and falls (7%, n=8). 7% (n=8) presented with seizures. While 26.1% (n=31) of patients met criteria for hypertonic saline administration, only 8.4% (n=10) received this treatment. Of the patients who presented with seizure, only 37.5% (n=3) received hypertonic saline. Patients who received hypertonic saline did not have an adverse outcome related to that treatment. Mortality over the 12 months was 21.8% (n=26) and the average length of stay for these patients was 22.15 days.

Conclusion: Severe hyponatraemia is associated with significant symptoms, length of stay and 1-year mortality. Hypertonic saline is indicated in the treatment of severe symptomatic hyponatremia and is proven to be a safe therapy, but only a minority of patients received this important treatment. Further education is required in order to improve the management and outcomes in this patient group.
PO-35: Vancomycin Toxicity Successfully Treated with Haemodiafiltration

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Introduction: Vancomycin is an extremely powerful antibiotic with increasing clinical usage. It is a glycopeptide with known ototoxicity and nephrotoxicity necessitating monitoring of drug levels to ensure treatment is within the therapeutic range (10-20mg/L). Monitoring guidelines and dose adjustments vary but generally require monitoring after the 3rd dose and subsequently. Monitoring is also required after dose adjustment.

Case: A 48 year old woman with baseline normal renal function (creatinine 55μmol/L) attended the emergency department of her local hospital with leg pain, for which she had been taking non-steroidal anti-inflammatory drugs (NSAIDs), and was treated for cellulitis. On microbiology advice she was treated with Vancomycin, Piperacillin/Tazobactam (PT) and Clindamycin. Initially Vancomycin was started at a dose of 1 gram twice daily. Following the third dose levels were found to be sub-therapeutic at 4.2 mg/L and the dose was increased to 2 grams twice daily, outside of normal protocol. Clinically the cellulitis improved. Over the subsequent four days the patient developed oliguria and worsening bilateral leg oedema. Results were not checked for four days after the dose was increased, rather than the recommended 18 hours/three doses. Subsequent tests revealed an AKI stage 3 with serum creatinine of 411μmol/L. No Vancomycin level is available from this time. Antibiotics were stopped at this point and three days later creatinine had continued increase to 547μmol/L; Vancomycin level at this time was elevated at 44.7 mg/L, despite no dose for three days. Renal function continued to deteriorate, reaching a creatinine of 693μmol/L necessitating transfer to our hospital for renal replacement therapy (RRT). At transfer Vancomycin level was 35mg/L six days following last dose. The patient was treated with four sessions of haemodiafiltration (HDF) on consecutive days – see figure 1. The patient was subsequently discharged with a creatinine of 382μmol/L and an undetectable Vancomycin level for outpatient follow up. At three month review the patient’s renal function had returned to normal (serum creatinine 88μmol/L).

Figure 1 – Vancomycin and creatinine trends

![Graph showing creatinine and Vancomycin levels over time]
**Discussion**

This case highlights the importance of recognising Vancomycin as a risk factor for AKI. This patient was at high risk due to the presence of sepsis and NSAID use. Her risk was then compounded by being prescribed PT, which is associated with a higher rate of AKI when co-prescribed with Vancomycin. This patient was given a high dose of Vancomycin (≥4g/day), which has been shown to have both a higher rate, and a more rapid onset of AKI. Trough levels several days following last dose remained high (44.7mg/L). Levels above 35mg/L are associated with an 81.8% incidence of AKI. HDF was chosen over haemodialysis (HD) as the mode of RRT due to the pharmacokinetics of Vancomycin. Vancomycin is a large glycopeptide compound with a molecular weight of ~1450 Da and is protein bound. Drug clearance is enhanced with HDF compared with HD. Given the increased use of Vancomycin, in clinical practice, we feel there is likely to be an increase in the incidence of Vancomycin toxicity resulting in AKI.
Background: Several studies suggest that aortic valve abnormalities occur with increased frequency in a dialysis population, and moreover, it appears the rate of progression of calcific aortic stenosis is more rapid in this cohort. However, to date, this has not been studied in an Irish dialysis population.

Methods: An analysis, through review of electronic echocardiograph reports, where available, of all patients undergoing haemodialysis at Cork University Hospital (n=167) was carried out. Dialysis patients with either aortic stenosis (AS) or sclerosis (ASC) were identified. Demographic data collected included date of diagnosis of AS/ASC, valve area, peak and mean gradients across the aortic valve, follow up echo interval, and date of first dialysis.

Results: Of these, 167 (72%) of patients had had an echo performed during the period Jan 2011 – Jan 2018. A total of 47 patients (29%), were noted to have aortic valve calcification, 36 patients with aortic valve sclerosis and 11 patients with mild, moderate or severe aortic stenosis. Amongst those patients with aortic stenosis, the average valve area was found to be 1.61 cm$^2$, when measured by planimetry on echo Doppler. The average peak gradient across the valve was 23 mmHg, and the average mean gradient was 12 mmHg. Of those identified to have aortic valve sclerosis or stenosis, only 21 patients (or 44%) had had a follow up echo to date. None of the patients in this cohort have had an intervention on their valve (either surgical aortic valve replacement, or transcatheter aortic valve replacement) to date.

Conclusion: This study highlights the prevalence and importance of follow up of aortic valve pathology in an Irish dialysis cohort, particularly in light of recent opinion papers proposing that the guidelines for surgical referral in this population should be revised.
PO-37: Mineral bone disease in post renal transplant patients in a regional renal unit: A cross-sectional descriptive study

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Background: Post transplant bone disease is a major cause of morbidity in kidney transplant recipients and carries a significant risk of fractures, as well as increased costs, hospitalization and mortality. Contributing factors include, pre-existing CKD-MBD, in addition to increased bone loss due to immunosuppressant use, alterations of PTH-vitamin D fibroblast growth factor 23, and changes in mineral metabolism. The aim of this study was to survey the frequency of monitoring, detection and treatment of abnormalities related to mineral bone disease in kidney transplant recipients attending nephrology service in the West of Ireland.

Methods: All kidney transplant patients attending Galway University Hospitals and Mayo General Hospital outpatient clinics (n = 211) between February 2016 and February 2017 were identified. Data were obtained from the electronic data base (e-med renal), radiology (PACS system) and patients medical records. Most recently recorded results for bone-related laboratory indices (Ca, PO4, PTH, 25 hydroxyvitamin D, Mg, ALP/GGT), DEXA scan results and medications were reviewed. Overall completeness of monitoring and frequencies of abnormal results were assessed. The recipients were divided into five categories according to the duration of time post-transplant ( <1 year, 1-5 years, 5-10 years, 10-20 years, and >20 years).

Results: The cohort was 62% male with mean age 51.6 years. Durations post-transplant were: <1 year: 25(11.8%); 1-5 years: 54(25.6%); 5-10 years: 57(27.0%); 10-20 years: 55(26.0%) and >20 years: 20(9.5%). During the 12-month study window, all patients has at least one measurement of serum Ca, PO4, ALP/GGT and PTH. Serum magnesium was measured in 87% and 25 hydroxyvitamin D in 58%. A locally-performed DEXA scan result was available in only 8%. In regard to laboratory abnormalities: 20.8% were hypercalcaemic and 3.3% were hypocalcaemia; 18.5% were hypophosphataemic and 2.4% were hyperphosphataemic; 13.82% of those screened had very low vitamin D levels (< 25nmol/L), 42.3% had low levels (26-50nmol/L), 22.8% had low normal levels (51-75nmol/L) and 22.0% had levels >75nmol/L; 12% had high iPTH levels (> 200pg/ml) and 54% had mildly increased iPTH levels (65-200pg/ml); 27.3% of those screened as hypomagnesaemia (<0.65mmol/l).

Regarding therapy: 18(8.5%) of patients were recorded as receiving a calcium supplements, 28(13.27%) a vitamin D supplement, 18(8.5%) alfacalcidol, 17(8%) cinacalcet, 4(1.89%) a bisphosphonate and one patient (0.47%) denosumab.

Conclusions: (a) Some bone-related laboratory indices (Ca, PO4, iPTH) are monitored more frequently than others (vitamin D and magnesium) - regardless of time post-transplant. (b) Laboratory abnormalities for bone-related indices are frequent both early and late post-transplant. (c) Relatively small proportions of kidney transplant recipients are documented to be prescribed medications for prevention/treatment of bone disease – this may be compounded by poor local availability of DEXA scanning.
PO-38: A review of Symptom Burden in patients attending the Low Clearance Clinic in the South East

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Introduction: Patients with end stage kidney disease (ESKD) on dialysis are well known to experience a high symptom burden which negatively impacts on quality of life. Previous studies suggest that patients with advanced CKD (Stages 4–5) report similar numbers of symptoms of comparable severity to ESKD patients. Our pilot study aims to identify and measure the prevalence, frequency and severity of symptoms in patients attending our Low Clearance Clinic in collaboration with our Palliative Care colleagues.

Methods: We used our electronic health record database (EmedRenal) to identify all low clearance patients attending our Department. Our study tool was a questionnaire containing 20 questions based on two validated questionnaires the “Dialysis Symptom Index” (DSI) and the palliative Edmond Symptom Assessment System. Symptom severity was determined using a self assessment scale ranging from 1-5.

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<th>During the past week did you experience this symptom?</th>
<th>If “Yes”: How much did it bother you?</th>
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<td>1. Nausea NO</td>
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Results: In our pilot sample of n= 31 patients, 19 were male and 12 female. The average age was 60 with age ranging from 25 to 87 years. The three most commonly reported symptoms were fatigue (n=26), worry (n=24), and trouble sleeping (n=22). The symptoms with the highest severity (a score of 5) were fatigue (n=8), itch (n=7) and trouble sleeping (n=6). The three least commonly reported symptoms were vomiting, restless legs and numbness or tingling in the feet.

Conclusions: Patients with advanced CKD who are not yet requiring renal replacement therapy have a significant symptom burden. This pilot study identifies the type and severity of symptoms in this cohort. These initial results will help us to develop a strategy in collaboration with our palliative care colleagues to address this unmet need in our Low Clearance patients.

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Background: Falls are frequently viewed as a harbinger of emerging frailty. Frailty is a clinical state characterised by decreased reserve across multiple physiological systems leading to increased vulnerability to adverse health outcomes. Frailty is more prevalent in elderly patients with chronic kidney disease [CKD] than those with normal renal function [1]. Impaired renal function also has implications for management of bone health and medication dosing in this population.

Methods: We retrospectively analysed data from 86 patients seen in the Falls clinic from April 2017 to January 2018. Clinic data was exported from the Filemaker database to Excel. Laboratory results were entered into Excel. We used SPSS Statistics for data analysis. eGFR was calculated using the MDRD and Cockcroft-Gault equations. Frailty assessments were conducted using the Fried Frailty Phenotype.

Results: Of the 86 patients, 66 were female and 20 were male. The median age was 80 years (interquartile range 75 – 84 years). CKD was listed as a comorbidity for 13 of the 86 patients however, 12 of these patients had an eGFR ≥ 59 ml/min/1.73m². Results of creatinine were available for 80 patients. Insufficient weight and height data limited calculations of eGFR to 71 patients. The median CrCl was 61 mL/min and median eGFR was 63 ml/min/1.73m². The compared mean eGFR to mean CrCl was 66 ml/min/1.73m² +/- 22 to 61 mL/min +/- 23 (p = 0.012).

<table>
<thead>
<tr>
<th></th>
<th>CrCl ≥ 60 mL/min (N= 36)</th>
<th>CrCl ≤ 59 mL/min (N=35)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Frail</td>
<td>18</td>
<td>17</td>
</tr>
<tr>
<td>Frail</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>Orthostatic Hypotension</td>
<td>13</td>
<td>6</td>
</tr>
</tbody>
</table>

Conclusion: There was a significantly higher prevalence of impaired renal function than predicted in this cohort of frail community-dwelling patients attending a falls clinic. Chronic kidney disease was poorly recognised and underestimated. The implications for this frail population include inappropriate drug dosing and suboptimal bone health management. Interestingly orthostatic hypotension was not higher in the group with CrCl ≤ 59 mL/min.
PO-40: TITLE: Effect of a Modified Renal Diet on Serum Phosphate in Haemodialysis Patients

AUTHORS: Byrne FN\textsuperscript{1,2}, Gillman B\textsuperscript{3}, Gleeson BM\textsuperscript{2}, Scannell G\textsuperscript{2}, Long EB\textsuperscript{1} Eustace JA\textsuperscript{1,2}

Cork University Hospital Cork\textsuperscript{1}, HRB Clinical Research Facility Cork\textsuperscript{2}, Mater Misericordiae University Hospital, Dublin\textsuperscript{3}   Corresponding Author: j.eustace@ucc.ie

BACKGROUND: The restriction of dietary phosphorus (P) intake in haemodialysis (HD) is important but challenging. Additional potential strategies for reducing dietary P intake and absorption, include the use of protein sources with lower P bioavailability such as pulses and whole-grains, and increased focus on, the P to protein ratio and the avoidance of phosphate additives. The benefits of a modified diet using the above strategies are unknown.

The aim of this study was to conduct a pilot trial investigating the acute post-prandial effect of a modified (M) low P diet vs. standard (S) low P diet on serum phosphate [PO\textsubscript{4}], potassium [K] and intact parathyroid (iPTH) levels in prevalent anuric HD patients.

METHODS: We conducted a randomised controlled crossover feeding trial on 8 HD patients, mean (sd) age 66.9 (7.8) years who were admitted to a Clinical Research Facility on a non-dialysis day on two consecutive weeks. They were provided with and monitored eating, 1 of 2 meal plans. Blood samples for [PO\textsubscript{4}] mmol/L, [K] mmol/L and iPTH ng/L were taken on arrival (fasting), pre-prandial, and hourly for 4 hours. Samples were immediately centrifuged, frozen at -80 and analysed in batch in a university hospital laboratory within 1 month. Both diets were individualised to provide 1.1g protein / kg IBW over the day. 80% of daily protein was consumed at the main meal. The main meal of diet M included beef, pulses and nuts and was predicted to have 28% less total P, with 30% of this coming from phytate containing foods with reduced bioavailability. The main meal of diet S included salmon and cake. Results are expressed as mean (sd) and compared using Wilcoxon signed rank test with a 2-sided type I error rate of 0.05.

RESULTS: The mean pre-prandial [PO\textsubscript{4}] with Diet M vs. S was 1.4 (0.17) vs. 1.1 (0.22) mmoles/L. The mean change in serum [PO\textsubscript{4}] (4 hours postprandial [PO\textsubscript{4}] minus pre-prandial [PO\textsubscript{4}]) with diet M vs. S was -0.16 (0.14) vs. 0.43 (0.15) mmoles/L, (p=0.01) The mean change in serum [PO\textsubscript{4}] (postprandial [PO\textsubscript{4}] minus pre-prandial [PO\textsubscript{4}]) was lower at all 4 postprandial time points on diet M. The mean change in serum [K] (4 hours postprandial [K] minus pre-prandial [K]) was -0.16 (0.61) vs. 1.5 (0.55) mmol/L, p=0.01. Median (4 hours postprandial [iPTH] minus pre-prandial [iPTH]) on diet M vs. S was 47.1 vs. 141.6, p=0.07.

CONCLUSION: A modified low P diet resulted in significant reductions in postprandial [PO\textsubscript{4}] and [K] levels as compared to standard dietary recommendations.
**PO-41: Title:** Permanent Hypoparathyroidism in an Irish Patient Population: An audit of Adherence with ESE Guidelines. **Institution:** St Vincents University Hospital. **Authors:** Darran Mc Donald, Laura Slattery, Rachel Crowley, Malachi McKenna, Alan Watson. **Correspondence:** darranmcdonald@gmail.com

**Background:** Hypocalcaemia in hypopTH results primarily from increased Ca\(^{2+}\) excretion but also decreased gastrointestinal absorption and bone reabsorption. Treatment consists of high dose Ca\(^{2+}\) and Vitamin D in an effort to increase serum levels and prevent symptomatic hypocalcaemia. This approach represents a therapeutic challenge: calcium supplementation in the absence of PTH’s anti-calcuric effect may produce hypercalcuria which in turn can give rise to nephrocalcinosis, renal calculi and renal impairment. \(^{(1)}\) It is therefore recommended that serial serum Ca\(^{2+}\) and urine excretion rates are monitored to guide therapy and maintain serum Ca\(^{2+}\) at the lowest asymptomatic level.

**Methods:** A database of all patients with permanent hypoparathyroidism attending St Vincent’s University Hospital was created compiling patient’s most recent serum bone parameters and urinary calcium excretion measurements (24hr urine collection or calcium creatinine ratio) were recorded. These results were then compared to the European Society of Endocrinology Guidelines on Hypoparathyroidism (2015).

**Results:** A total of 33 patients were identified; 72% were females with a mean age of 47. 57% of patients were found to have an ionised Ca\(^{2+}\) above the recommended limit. 58% were found to have hypercalcuria either on 24hr collection or Ca\(^{2+}\)/Cr ratio. Due to a lack of sex specific reference ranges for 24hr collections, two women were incorrectly labelled as having normal calcium excretion. 30% of patients did not have urine calcium excretion measurements within the past 2 years as is recommended.

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Recommendation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>iCa(^{2+}) (mmol/L)</td>
<td>&lt;1.15</td>
<td>1.17 +/- 0.12</td>
</tr>
<tr>
<td>Male 24 hr collection (mmol/24hr)</td>
<td>&lt;7.5</td>
<td>6.9 +/- 2.64</td>
</tr>
<tr>
<td>Female 24 hr collection (mmol/24hr)</td>
<td>&lt;6.25</td>
<td>8.9 +/- 6.9</td>
</tr>
</tbody>
</table>

ESE guidelines recommend that all patients with renal impairment have renal imaging. Of the 9 patients with renal impairment; 1 had nephrocalcinosis, 1 had bilateral renal calculi while 3 had no imaging.

**Conclusion:** Strict monitoring of urine Ca\(^{2+}\) excretion in addition to serum Ca\(^{2+}\) levels is required to tailor supplemental therapy and reduce the risk of renal complications of hypercalcuria.
PO-42: Linkage of spatio-temporal data streams to explore environmental influences on autoimmune disease

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Trinity Health Kidney Centre, Trinity College Dublin, REDDYBR@tcd.ie
ADAPT Centre for Digital Content, Trinity College Dublin
School of Computer Science and Statistics, Trinity College Dublin

Background: We have previously described spatial clustering of anti-GBM disease cases in Donegal, and a temporal cluster in the southeast during 2012. We now seek to explore potential environmental contributors to these clusters. There is an ongoing challenge as to how best manage and understand such ‘big data’ challenges in precision medicine settings. The specific challenge in this project is linking very large datasets with vastly different spatial and temporal dimensions.

Methods: We describe an approach which leverages Semantic Web technologies to integrate and transform multiple heterogeneous datasets into a Linked Data representation, using vocabularies and the Resource Description Framework (RDF) model. This approach has advantages in terms of data sharing, provenance and subsequent analysis.

Results: We have established:

1. a model for how multiple standalone heterogeneous data models from both clinical and environmental settings can be transformed into a single data model (RDF) that follows the “FAIR” (Findable, Accessible, Interoperable, Reusable) principles for scientific data management and stewardship;
2. how this transformed data can be queried effectively, shared with outside parties, be more easily understood by multiple stakeholders using standardized vocabularies, as well as incorporating provenance metadata and supporting temporo-spatial reasoning.

Conclusions: Using this strategy, we are analysing the impact of local environment factors (weather, pollution and infection patterns) over time on the occurrence of anti-GBM disease. Future work will apply this to prospective monitoring of patients with ANCA vasculitis in an attempt to derive algorithms that predict flare
PO-43: The benefit of revascularisation in a patient with bilateral atherosclerotic renal artery stenosis

Broadhurst AGB; Griffin B; McEniff, N; St James's Hospital; alistairbroadhurst@gmail.com

Background: The ASTRAL and CORAL trials found no clinically significant benefit to revascularisation and medical treatment compared with only medical treatment in all subgroups of patients with atherosclerotic renal artery stenosis. This case demonstrates the benefit of revascularisation in a patient that would have fallen outside of the inclusion criteria for both trials.

Methods: Retrospective chart review and data collected from electronic patient records.

Results: CM is a 40 year old man with a 30 pack year smoking history and a history of alcohol excess who presented with an extensive right MCA CVA which was thrombolysed. He was found to have persistently elevated blood pressures (~180/120) post-procedure, and on investigation for secondary causes of hypertension, was found to have bilateral renal artery stenosis on MRA. Both kidneys were normal in size, with near-complete stenosis of the right renal artery and approximately 50% stenosis on the left. The images were reviewed by two consultant radiologists at St James’s Hospital who favoured the diagnosis of atherosclerosis over fibromuscular dysplasia. The patient’s renal function was normal with a creatinine of 80umol/l and GFR of 105ml/min and no pathological proteinuria. The patient required three antihypertensives to control his blood pressure at 140/90. He had a DMSA scan performed which showed 41% function in the right kidney. In light of the patient’s near-occlusive stenosis of the right renal artery with a morphologically normal right kidney with good function, as well as the outside possibility of FMD, the clinical decision was made to opt for revascularisation over medical treatment.

The patient had a right renal artery angioplasty and stent placement without complication. During angiography, it was estimated that the right renal artery was 80-90% stenosed, and the left renal artery was 50-60% stenosed. He was commenced on dual anti-platelet therapy for 6 weeks following the procedure. His blood pressure was successfully controlled on one agent (Amlodipine 5mg OD) after the procedure.

Conclusions: The ASTRAL trial excluded patients with a “high likelihood” of requiring revascularisation within 6 months, and patients were withdrawn from the CORAL trial based on the decision of their physician. Renal artery revascularisation was the chosen treatment based on the pre-occlusive stenosis of the patient’s right renal artery and threatened infarction, the preserved structure and function of his right kidney and his sub-optimal blood pressure control on three agents. Despite major evidence that medical treatment is as effective at treating renal artery stenosis, the ASTRAL and CORAL trials do not encompass the full spectrum of atherosclerotic renal artery stenosis. Patients with significant renal artery stenosis should be assessed on a case-by-case basis especially if they are deemed to benefit from revascularisation within six months.
PO-44: **Title:** Audit of Chronic Kidney Disease–mineral and bone disorder (CKD-MBD) biochemical parameters in Tallaght Hospital Peritoneal Dialysis (PD) population, 2017

**Authors:** Smith O.¹, Coen M.¹, Wall C.², Mellotte G.², Lavin P.², Griffin B.², Khilji S.²  
¹Department of Clinical Nutrition and Dietetics, ²Trinity Health Kidney Centre, Tallaght Hospital, Dublin. Correspondence Oonagh.Smith@amnch.ie

**Background:** Renal replacement therapy patients experience increased risks of mortality and cardiovascular morbidity that are not fully explained by more traditional cardiovascular risk factors. Numerous studies suggest that the CKD–mineral and bone disorder (CKD-MBD) is involved in the pathogenesis of this higher risk. International and subsequently unit guidelines have attempted to set target values for individual parameters in an effort to ameliorate the consequences of this systemic and often progressive disorder. The purpose of this audit is to compare the CKD-MBD biochemical parameters of our PD population against local target levels, benchmark our performance against UK standards, using the UK Renal Registry (UKRR) Annual Report of 2015 and identify areas that require improvement.

**Methods:** 36 peritoneal dialysis patients were included in this audit. Each patient's last monthly serum Ca²⁺, P0⁴⁻ and iPTH of the final quarter of 2017 were recorded.

**Results:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Tallaght Median</th>
<th>Tallaght Lower Quartile</th>
<th>Tallaght Upper Quartile</th>
<th>UKRR Median</th>
<th>UKRR Lower Quartile</th>
<th>UKRR Upper Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corr Calcium (mmol/L)</td>
<td>2.4</td>
<td>2.2</td>
<td>2.5</td>
<td>2.4</td>
<td>2.3</td>
<td>2.5</td>
</tr>
<tr>
<td>Phosphate (mmol/L)</td>
<td>1.5</td>
<td>1.2</td>
<td>1.7</td>
<td>1.5</td>
<td>1.3</td>
<td>1.8</td>
</tr>
<tr>
<td>PTH (pg/ml)</td>
<td>288.5</td>
<td>206.8</td>
<td>412.3</td>
<td>282.9</td>
<td>160.3</td>
<td>499.8</td>
</tr>
</tbody>
</table>

Table 1: Summary statistics for Tallaght PD & UKRR PD population.

<table>
<thead>
<tr>
<th>Target Level</th>
<th>Tallaght (%)</th>
<th>UKRR (%)</th>
<th>NI (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corr Calcium</td>
<td>77.8 (77.8)</td>
<td>61.1 (61.3)</td>
<td>63.9 (63.6)</td>
</tr>
<tr>
<td>Phosphate</td>
<td>11.1 (7.4)</td>
<td>5.6 (7.5)</td>
<td>16.7 (22.6)</td>
</tr>
<tr>
<td>PTH</td>
<td>11.1 (14.8)</td>
<td>33.3 (31.2)</td>
<td>19.4 (13.9)</td>
</tr>
</tbody>
</table>

Table 2: Percentage of Tallaght patients meeting unit targets vs UK average with UKRR targets.

<table>
<thead>
<tr>
<th>Target Level</th>
<th>PD</th>
<th>UKRR</th>
<th>NI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simultaneous control of all 3 parameters</td>
<td>33.3</td>
<td>33.1</td>
<td>33.3</td>
</tr>
</tbody>
</table>

Table 3: Percentage of patients meeting Unit targets vs UK & Northern Ireland average

**Conclusions:** Median values and percentage of patients meeting targets are reassuringly similar to the UK average. It was seen to be positive that a smaller proportion of patients had serum Ca²⁺ levels above target (11.1 vs 14.8%) and PTH levels below target (16.7 vs 22.6%, respectively) than their UK counterparts. The percentage above PTH range can be explained by the UKRR broader target range. However, there is room for improvement; when individual biochemical components are considered in combination only 33% of patients met all parameters. In order to improve control it is recommended that specific focus be
given to phosphate management in this patient group. With increased dietetic staffing in this area we endeavour to improve these parameters in the coming months.
PO-45: Audit of the dietetically led management of biochemical parameters for Chronic Kidney Disease – Mineral Bone Disorder (CKD-MBD) in Tallaght hospital haemodialysis patients 2017

Authors: Coen M. 1, Wall C. 2, Griffin B. 2, Mellotte G. 2, Lavin P. 2. 1Department of Clinical Nutrition and Dietetics, 2Trinity Health Kidney Centre, Tallaght Hospital, Dublin.
Correspondence: martina.coen@amnch.ie

Introduction: Secondary hyperthyroidism (SHPT), a contributory cause to cardiovascular disease (CVD), is very common in end stage kidney disease (ESKD). SHPT can result in elevated calcium (Ca\(^{2+}\)), phosphorous (PO4) and intact parathyroid hormone (iPTH) levels and Vitamin D metabolism abnormalities. Vascular and valvular calcifications are strongly associated with CVD morbidity and mortality. Treatment of SHPT in this cohort is focused on correcting biochemical and hormonal abnormalities to limit their consequences. This can be achieved by intensive dietary education, monitoring and support alongside tailored drug therapy. CKD-MBD management is a multi-disciplinary approach co-ordinated by the diettian in Tallaght Hospital. The aim of this audit is to benchmark our CKD-MBD biochemical parameters against The Tallaght Hospital Adult Medicines Guide 2018 targets. Serum Vitamin D levels were also included in this audit.

Methodology: 81 haemodialysis patients’ last available blood results in the last quarter 2017 were included in this audit. Values were compared to the agreed local targets and to those achieved in the UK/NI using the Renal Registry (UKRR) Annual Report of 2015.

Results

Table 1: Percentage (%) of patients meeting local targets vs % of UK/NI patients meeting UKRR targets

<table>
<thead>
<tr>
<th>Simultaneous control of all 3 parameters</th>
<th>Tallaght HD 2017 (n =81)</th>
<th>2015 UK</th>
<th>2015 NI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>33.3</td>
<td>27.6</td>
<td>27.4</td>
</tr>
<tr>
<td>Meeting 0 parameters</td>
<td>2.5</td>
<td>4.6</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Table 2: Percentage (%) of patients meeting local targets vs % of UK/NI patients meeting UKRR targets

<table>
<thead>
<tr>
<th></th>
<th>Ca(c)</th>
<th>PO4</th>
<th>iPTH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tallaght HD 2017</td>
<td>2015 UK</td>
<td>2015 NI</td>
</tr>
<tr>
<td>Within target %</td>
<td>85.2</td>
<td>79.3</td>
<td>79.3</td>
</tr>
<tr>
<td>Below target %</td>
<td>13.6</td>
<td>10.6</td>
<td>10.6</td>
</tr>
<tr>
<td>Above target %</td>
<td>1.2</td>
<td>10.1</td>
<td>10.6</td>
</tr>
</tbody>
</table>

Conclusions and Recommendations
33.3% of our HD patients met all 3 targets which is above what is achieved in both the UK and NI respectively (27.6%, 27.4%). As the methodology was changed this year to align with UKRR methodology, there are limitations in drawing comparisons to previous year’s results on the unit. There are a higher number of our patients achieving Ca(c) levels within target than in UK and NI, however our target range is broader than that used in UKRR.
Reassuringly there is a very low number of patients with Ca(c) above target. Patients achieving PO4 within target is marginally above the UK and NI averages. However, ongoing improvement is required in reducing phosphate levels in those patients above target (42%). An improvement should be expected this year, as there was a significant service downtime during 2017 due to staffing changes. The percentage of patients achieving iPTH within target is higher than that achieved in the UK and NI, despite their higher upper limit. To note, for those with iPTH below target, 6.2% of our patients have a history of a parathyroidectomy and a further 11.1% were not on active treatment to lower iPTH. This audit will be repeated for 2018 to compare year on year trends.
PO-46: Renal Outcomes in a small cohort of patients who underwent Transcatheter Aortic Valve Insertion

Authors: Rosemary Lucey¹, Sean Fitzgerald², Peter Kelly², Joe Eustace¹, Cork University Hospital. luceyrj@tcd.ie. 1. Department of Nephrology. 2. Department of Cardiology

Background: Transcatheter Aortic Valve Insertion (TAVI) is increasingly being used as an alternative to Surgical Aortic Valve Replacement (SAVR) in patients with severe symptomatic Aortic Stenosis. The risk of Acute Kidney Injury and the possibility of permanent renal impairment are factors to consider in selecting suitable patients. Recent trials have demonstrated TAVI to have lower rates of acute kidney injury at two years compared with SAVR. The aim of the audit was to determine renal outcomes of patients who underwent TAVI at Cork University Hospital.

Methods: A retrospective analysis was conducted of twenty-four patients who underwent TAVI at Cork University Hospital from 2016 to 2018. Baseline demographics, aetiology of aortic valve disease, indication for TAVI, renal function pre and post procedure, presence of hypercalcaemia as well as morbidity and mortality outcomes were recorded. Patients were divided into 5 groups according to pre-TAVI-estimated glomerular filtration rate (eGFR): group I (eGFR ≥90), n = 1, group II (eGFR 60-89), n =8, group IIIa (eGFR 45-59), n =6, group IIIb (eGFR 30-44), n=8, group IV (eGFR 15-29), n=0, and group V (<15/dialysis), n =1.

Results: Twenty-two patients had severe Calcific Aortic Stenosis (n=9 males (37.5%), (n=13 females, (54.2%)) and two had severe Aortic Regurgitation (n=2 males (8.3%)). Post TAVI: One patient progressed from group II to IIIa. Two patients progressed from group IIIb to group IV. Seven did not have a creatinine recorded at more than one month post TAVI so were excluded in renal outcome evaluations. Two patients (group IIIb and V) had a calcium-phosphate product >4.0 mmol/L. No patient was hypercalcaemic. Only one patient (group V) had a PTH level recorded. One patient (group II) developed Contrast Induced Nephropathy (AKIN1). Three patients developed access site bleeds (group II, group II, group IIIa) and two patients developed gastrointestinal bleeds (group II and IIIb). One patient developed a left subdural haemorrhage within 12 days post TAVI and died (group 1). One patient (group II) developed new Atrial Fibrillation and two patients (group II and V) required permanent pacemakers.

Conclusions: More trials are needed to evaluate renal outcomes in patients undergoing TAVI and SAVR especially in patients with Chronic Kidney Disease. Detailed diagnostic workup is important to determine the underlying aetiology of calcific aortic valve disease. Future trials should include quality of life indicators pre and post intervention to help stratify patients who are most likely to benefit from the procedure.
PO-47: Chronic Kidney Disease in an ageing cohort of persons with Haemophilia

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¹Dept. of Nephrology, St. James’s Hospital, Dublin
²National Coagulation Centre, St. James’s Hospital, Dublin

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Introduction: As a result of improved life expectancy in persons with Haemophilia, conditions associated with ageing, such as chronic kidney disease (CKD), are increasing among this patient population. In this retrospective, single-centre study, we seek to determine the prevalence of moderate to severe CKD and its associated risk factors in an ageing cohort of persons with Haemophilia.

Methods and Materials: Using the National Haemophilia Electronic Health Record, data was reviewed on patients with a registered diagnosis of Haemophilia A or B, aged 50 years or older who attended the National Coagulation Centre between 2000 and 2017. In each case, we reviewed serial serum creatinine measurements and documented relevant medical history (hypertension, HIV, Hepatitis C, inhibitor status, gross haematuria and acute kidney injury). Moderate-severe CKD was defined as an estimated glomerular filtration rate (eGFR) of <60ml/min/1.73m² as determined by the CKD EPI equation on at least two occasions three months apart.

Results: 123 patients with a diagnosis of haemophilia A or B were identified, of whom 69 had mild and 54 had moderate or severe factor deficiency. The median age of patients in this cohort with CKD was 68.5 years (IQR: 59-72). CKD, as defined above, was identified in 16 cases, representing 13% of the patient population. The median eGFR in CKD cases was 47ml/min/1.73m² (IQR: 39 – 51). HIV/Hepatitis C co-infection was observed in 62.5% of cases of CKD, all of whom had moderate or severe factor deficiency. A documented history of hypertension and diabetes mellitus was observed in 56.2% and 31.3% of cases of CKD, respectively. A history of AKI was only observed in one case.

Conclusions: In this cohort of patients, we identified moderate to severe CKD, as defined above, in 13% of the haemophilia population over 50 years of age. Our data suggests that there is an association between CKD in haemophilia and hypertension and Hepatitis C/HIV co-infection.
PO-48: The national incidence of post solid organ transplant malignancies.

Sexton DJ, O’Neill JP, O’Kelly P¹, Murray S³, Deady S³, O’Leary E³, Egan JJ,¹ McCormick A,⁵ Morris PG⁶, Moloney FJ,⁷ Conlon PJ¹,

Department of Nephrology & Transplantation, Beaumont Hospital Dublin, Royal College of Surgeons Ireland, Dublin, Ireland & the Post transplant cancer research group.

Introduction: The landscape of cancer incidence post transplant in Ireland has not been well characterised to date. We aimed to report national standardised incidence ratios (SIRs) for malignancy post transplant compared to the general population stratified by various solid organ categories.

Methods: Databases containing clinical information from each solid organ transplant program in Ireland were linked with the national Irish Cancer Registry to capture episodes of malignancy over follow up. Standardised incidence ratios were calculated in comparison to the general population using the Irish census data as the denominator, and using ICD10 coding for malignancy diagnosis. Only the first cancer diagnosis at each site is considered when calculating SIRs.

Results: See table 1 for SIRs for malignancies by grouping category for each solid organ transplant.

Conclusions: This study provides national data on cancer incidence following solid organ transplantation in comparison to the general population in Ireland. These increased rates of cancer in transplant patients emphasise the need for careful long-term management.

<table>
<thead>
<tr>
<th>Site</th>
<th>Kidney Transplant</th>
<th>Heart Transplant</th>
<th>Lung Transplant</th>
<th>Liver Transplant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SIRs</td>
<td>Total cases</td>
<td>SIRs</td>
<td>Total cases</td>
</tr>
<tr>
<td>Invasive Cancers excluding NMSC</td>
<td>1.68(1.49-1.88)</td>
<td>297</td>
<td>1.64(1.13-2.29)</td>
<td>34</td>
</tr>
<tr>
<td>By grouping</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colorectal</td>
<td>1.42(0.98-2)</td>
<td>33</td>
<td>1.65(0.53-3.85)</td>
<td>5</td>
</tr>
<tr>
<td>Trachea, bronchus and lung</td>
<td>1.47(1.2-2.09)</td>
<td>31</td>
<td>2.46(0.99-5.07)</td>
<td>7</td>
</tr>
<tr>
<td>Female genital</td>
<td>1.8(1.03-2.92)</td>
<td>16</td>
<td>.(.-)</td>
<td>0</td>
</tr>
<tr>
<td>Category</td>
<td>Mean (95% CI)</td>
<td>Count</td>
<td>Mean (95% CI)</td>
<td>Count</td>
</tr>
<tr>
<td>---------------------------</td>
<td>---------------</td>
<td>-------</td>
<td>---------------</td>
<td>-------</td>
</tr>
<tr>
<td>Male genital</td>
<td>0.91 (0.64-1.27)</td>
<td>36</td>
<td>1.42 (0.65-2.7)</td>
<td>9</td>
</tr>
<tr>
<td>Urinary</td>
<td>3.9 (2.79-5.31)</td>
<td>40</td>
<td>5.79 (2.49-11.42)</td>
<td>8</td>
</tr>
<tr>
<td>Urology</td>
<td>1.55 (1.22-1.94)</td>
<td>75</td>
<td>2.26 (1.32-3.62)</td>
<td>17</td>
</tr>
<tr>
<td>Melanoma</td>
<td>2.21 (1.26-3.6)</td>
<td>16</td>
<td>. (.-)</td>
<td>0</td>
</tr>
<tr>
<td>NMSC BCC</td>
<td>8.39 (7.64-9.2)</td>
<td>458</td>
<td>8.21 (6.13-10.76)</td>
<td>52</td>
</tr>
<tr>
<td>NMSC SCC</td>
<td>27.65 (25.35-30.11)</td>
<td>530</td>
<td>20.19 (15.21-26.29)</td>
<td>55</td>
</tr>
<tr>
<td>Haematology (blood and lymph cancers)</td>
<td>3.18 (2.4-4.13)</td>
<td>56</td>
<td>2.41 (0.78-5.62)</td>
<td>5</td>
</tr>
</tbody>
</table>
A study of the prevalence of BK viraemia in a transplant population,

D'Arcy S, Liang Goh T, Browne E, Fitzgerald E, Scott J, Wall C, Lavin P

**Background:** BK viraemia is a recognised early complication post renal transplantation and it poses a significant threat to the transplanted kidney. BK viraemia is associated with the development of an interstitial injury which can lead to, the worst cases, graft loss. This study was to review the prevalence of BK viraemia in the transplant population of a given centre and to assess the response to treatment patients may have had. The authors also reviewed pre-disposing risk factors in terms of immunosuppression and its role in the development of BK viraemia.

**Method:** A retrospective study of all transplant patients over the years 2013 to 2017 and the BK levels taken as screening tools in outpatients clinic was carried out. Of all 281 transplant patients screened, 29 tested positive at at least one point during this five year period. The treatment plan was then derived from patient letters and clinical notes. This clinical picture was then compared to serum creatinine levels.

**Findings:** Of all 281 transplant patients screened, 29 tested positive at least once during this five year period for BK viraemia. 16 of these patients were found to have levels greater than a log of three, which is deemed clinically significant. No grafts were lost due to BK viraemia however two patients developed acute kidney injury sufficient to warrant a transplant biopsy. Neither of these biopsies demonstrated changes consistent with BK nephropathy. All but one case was diagnosed within one year of transplantation. Of all 16 patients with clinically significant BK levels, mycophenolate doses were decreased. In seven cases it was stopped transiently. Five of these sixteen patients cleared the virus from their bloodstream permanently. The remainder eleven patients did not clear the virus however, all of these patients, dropped to levels less than log three within 9 months of reduction of their mycophenolate dose. Ten of the thirteen patients with a BK level of less than log three cleared their serum levels with observation only. The remainder did not progress to a clinically significant level. Fourteen of the patients with BK viraemia received induction with basilixumab. Two received no immunosuppresion and seven had no documentation of the same.

**Conclusion:** Overall, levels of BK viraemia are demonstrated to be approximately 1 in 10 transplanted people. As demonstrated, its early, prompt diagnosis proves efficaceous to avoid long term consequences in terms of graft function. It is easily remedied by a reduction in the dosing of mycophenolate. Follow up times were not sufficient to determine long term outcomes of BK viraemia, however no clear trend was apparent to suggest that low levels of BK viraemia pose a threat to the graft. Ultimately, it suggests that BK viraemia can be efficiently and safely treated by a reduction in immunosuppression. It therefore remains important that it is regularly screened for and promptly addressed.
PO-50: Short, long and ultra long-term patient and graft survival following kidney transplantation is progressively improving: the Irish experience

DJ Sexton, P O’Kelly, Y Williams, D Little, CM O’Seaghdha, M Denton, DG deFreitas, M Keogan, C Magee, PJ Conlon.

Department of Nephrology and Kidney Transplantation, Beaumont Hospital, Dublin

**Introduction:** It is often quoted that while short term graft survival in kidney transplantation has improved in recent years it has not translated into a commensurate improvement in long term and ultra-long term patient or graft survival (here defined as greater than 15 years post transplantation). This has not been our experience. We set out to review the entire experience of more than 5000 kidney transplants performed at the Irish Kidney transplant programme over the past 52 years. Our programme is unique in that we have maintained a prospective long-term kidney transplant registry that is more than 99% complete in terms of follow up.

**Methods:** We analysed patient and graft survival for all adult first deceased donor kidney transplant recipients in Ireland. Of 5,000 kidney transplants in the Irish programme, N=3260 recipients were first adult deceased donor transplants and were included in this study. Kaplan-Meier methods were used to estimate survival at each time period post transplant for the various eras of transplantation.

**Results:** Uncensored graft survival expressed as a percentage are presented in Table 1.

**Discussion:** Contrary to reports from many kidney transplant programmes, Ireland has experienced a progressive improvement in both early, long and ultra-long term patient and graft survival following kidney transplantation.

**Table 1.** Uncensored graft survival (expressed as a percentage) post kidney transplantation at different eras over the last 40 years.

<table>
<thead>
<tr>
<th>Era transplanted</th>
<th>Number of recipients</th>
<th>Year post transplant</th>
<th>% Survival</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>2011 - 2015</td>
<td>548</td>
<td>97%</td>
<td>88%</td>
</tr>
<tr>
<td>2006 - 2010</td>
<td>524</td>
<td>96%</td>
<td>86%</td>
</tr>
<tr>
<td>2001 - 2005</td>
<td>481</td>
<td>93%</td>
<td>69%</td>
</tr>
<tr>
<td>1996 - 2000</td>
<td>456</td>
<td>88%</td>
<td>74%</td>
</tr>
<tr>
<td>1991 - 1995</td>
<td>481</td>
<td>86%</td>
<td>68%</td>
</tr>
<tr>
<td>1986 - 1990</td>
<td>369</td>
<td>86%</td>
<td>66%</td>
</tr>
<tr>
<td>1981 - 1985</td>
<td>195</td>
<td>68%</td>
<td>55%</td>
</tr>
<tr>
<td>1976 - 1980</td>
<td>129</td>
<td>59%</td>
<td>46%</td>
</tr>
<tr>
<td>1971 - 1975</td>
<td>77</td>
<td>38%</td>
<td>26%</td>
</tr>
</tbody>
</table>
Impact of Biopsy-Proven Acute Graft Pyelonephritis Within the First Year of Kidney Transplantation on Patient and Graft Survival.

HM Gunning¹, P O’Kelly¹, A Dorman³, S Murray¹, D Sexton¹, P Conlon¹,²
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Background: Urinary tract infections (UTIs) are the most common infection after kidney transplantation. Incidences reported vary widely from 26% to 76% and they are most common within the first-year post-transplantation. Studies have shown that UTIs post-kidney transplantation may be associated with acute cellular rejection, impaired graft function, increased risk for graft loss, and patient death. In contrast, other studies contradict this and suggest no impact on graft function, survival or patient survival. Most studies to date investigating the impact of UTIs and acute graft pyelonephritis (AGPN) on patient and graft outcomes have been based on clinical diagnoses with varying definitions of UTI. Further to this data on AGPN is sparse. In this study, we aimed to assess the association of biopsy-proven AGPN on these outcomes.

Methods: We performed a retrospective multicentre study using the Irish renal transplant database to identify patients undergoing renal transplantation between 1979 and 2015 and selected those with biopsy-proven AGPN within the first year of transplantation. Information was collated on patient characteristics, graft function, and graft and patient survival during follow-up. We used a multivariable Cox proportions hazards model to evaluate the impact of biopsy-proven AGPN within the first year of transplantation.

Results: There were 4,194 kidney transplants, 98 (2.3%) had at least one episode of biopsy-proven AGPN within the first year of transplantation, 71 (72%) had simultaneous biopsy-proven acute rejection (BPAR). The ten-year patient survival rate in those with biopsy-proven AGPN within the first-year of transplantation was 74.5% (95% CI: 61.9-83.4), while the 20-year survival rate was 77.3% (95% CI: 75.6-78.8) with no significant difference detected between the two groups, (p=0.864). Ten-year death censored graft survival for patients with biopsy-proven AGPN within the first-year of transplantation was 53.2% (95% CI 40.4-65.6) compared to 75.2% in those without AGPN (95% CI 73.6-76.7, p<0.001). Median graft survival was 11 years [95% CI 9-14years] in APGN group compared to 23 years [95% CI 21-25years]. In a Cox proportional hazards multivariable model, the effect of APGN on graft survival became insignificant.

Conclusion: In this study of biopsy-proven AGPN we found no significant association with patient survival. There was association between AGPN and graft survival, however this was lost with multivariable Cox regression. 72% of biopsies had simultaneous BPAR, this could reflect an association between AGPN and acute rejection or represent the difficulties in histopathological discrimination. Further study is required, an association between AGPN and patient outcomes may lead to more aggressive antimicrobial treatment of UTIs and asymptomatic bacteriuria in high-risk populations.
PO-52: Title: The Association between Pre-Renal Transplant Malignancy and Death from Malignancy Post Renal Transplant.

Authors: Clince M\textsuperscript{1}, Sexton DJ\textsuperscript{1}, O'Kelly P\textsuperscript{1}, Murray S\textsuperscript{1}, O'Leary E\textsuperscript{2}, Conlon PJ\textsuperscript{1}

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Corresponding email: michelle.clince@ucdconnect.ie

Background: Renal transplant recipients who have pre-transplantation malignancies must wait between 2-5 years depending on the type of malignancy before transplantation. It is not clear if these waiting times help reduce death from malignancy post transplant. These patients appear to have poorer survival compared to renal transplant recipients without pre-transplantation malignancies.

Methods: The Irish National Kidney Transplant Service (NKTS) database was accessed for the years 1996-2014 and all recipients with available data were included in the analysis. These data were linked with the National Irish Cancer Registry data to capture episodes of malignancy pre-transplantation and survival rates post transplantation.

Results: There were a total of 101 episodes of pre-transplant malignancy identified in 84 patients. 8 patients had 2 or more episodes of malignancy pre-transplant. The most common cancers were renal cell cancer (27.72%), cervical cancer (13.86%) and prostate cancer (8.91%). Pre-transplant malignancy had a hazard ratio of 1.95 (CI 95% 1.29-2.95), suggesting this group are twice as likely to die from malignancy post transplant. 10 year survival from all malignancies was 60.18% in renal transplant recipients with pre-transplant malignancies with compared with 81.84% in renal transplant recipients who had no pre-transplant malignancy. The longest time from diagnosis to transplantation was 18.41 years and the shortest time was 0.44 years.

Conclusions: Survival in renal transplant recipients with a history of pre-transplantation malignancy is reduced when compared to those without pre-transplant malignancy. There is a wide range of waiting times which or may not be related to the malignancy. Advancing age of renal transplant recipients also appears to be association reduced survival. Despite the mandatory “waiting period" pre-transplant these patient's survival is reduced.
Title: Does the incidence of Non-Melanoma Skin Cancer vary by treatment modality in those receiving multiple kidney transplants?

Authors: Clince M¹, Sexton DJ¹, O'Kelly P¹, Murray S¹, Deady S², O'Leary E², Egan JJ³, Houlihan D⁴, McCormick A⁴, Morris PG⁵, Moloney FJ⁶, O'Neill JP⁷, Conlon PJ¹.
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3. National Lung Transplantation Center, Mater University Hospital Dublin, Ireland.
4. National Liver Transplant Center, St Vincent’s University Hospital, Dublin, Ireland.
5. Department of Oncology, Beaumont Hospital, Dublin.
6. Dermatology, Mater Misericordiae University Hospital, University College Dublin, School of Medicine.
7. Department of Otolaryngology, Head and Neck Surgery, Beaumont Hospital.

Background: Non-melanoma skin cancer (NMSC) is common after renal transplant. Whether the risk of skin cancer development varies as treatment for ESKD varies is not well described. We evaluated whether this risk is attenuated during periods of graft loss with a return to dialysis in those who receive multiple kidney transplants.

Methods: The Irish National Kidney Transplant Service (NKTS) database was accessed for the years 1994-2015 and all recipients with available data were included in the analysis. These data were linked with the national Irish Cancer Registry data to capture episodes of malignancy over follow up. Incidence rates and rate ratios were calculated with modality of treatment for ESKD varying over time between transplantation and dialysis.

Results: 3,672 deceased and living donor adult kidney transplants were assessed comprising 2,310 (62.9%) male and 1,362 (37.1%) female recipients. Periods of treatment with a functioning transplant had a higher incidence of skin cancer diagnosis [adjusted incidence rate ratio (fully adjusted) 2.41 (1.72, 3.38), P<0.001]. Other risk factors for NMSC in the fully adjusted model included IRR (95%CI): a graded association with increasing age, 20.7 (5.78, 10.9) for age ≥ 65 (vs age < 18 as reference), male sex 2.34 (2.05-2.66), and number of renal transplants 1.18 (1.05-1.34). Tacrolimus use was associated with a lower risk compared to cyclosporin use [IRR (95%CI): 0.40 (0.35-0.45)].

Conclusions: The incidence of NMSC was higher during periods defined by a functioning renal transplant and lower during subsequent periods of dialysis following graft failure. It is likely that periods defined by graft failure lead to lower overall immunosuppressive burden over follow up. The lower risk associated with tacrolimus may have been due to a period effect, with longer follow up and therefore higher ascertainment in the ciclosporin group.
PO-54: The Influence of a Conversion to Sirolimus-based Immunosuppression on Non-melanoma Skin Cancer Incidence in Kidney Transplant Recipients over Long Term Follow Up.

Daly, FE¹, O’Kelly, P¹, O’Neill JP,², Murray S¹, Deady S³, O’Leary E³, Egan JJ,⁴ McCormick A,⁵ Houlihan D, ⁵ Morris PG⁶, Moloney FJ,⁷ Sexton DJ¹, Conlon PJ¹.

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5. Hepatology & Liver Transplant Department, St Vincent’s University Hospital, Dublin, Ireland.
6. Department of Oncology, Beaumont Hospital, Dublin.
7. Dermatology, Mater Misericordiae University Hospital, University College Dublin, School of Medicine.

**Background:** The CONVERT trial found a reduced incidence of malignancy amongst renal transplant recipients over 2 years of follow up with a conversion from calcineurin inhibitors to sirolimus based immunosuppression. Common reasons for considering this switch are calcineurin inhibitor toxicity and high skin cancer burden. Whether this strategy results in reduced skin cancer incidence over longer term follow up, has not been extensively characterised.

**Methods:** A retrospective study of sirolimus conversion within the Irish National Kidney Transplant programme from 1994 to 2015. These data were linked with the Irish National Cancer Registry to determine the incidence of non-melanomatous skin cancer (NMSC) amongst these recipients.

**Results:** 127 renal transplant recipients were transitioned to sirolimus based immunosuppression. The incidence of NMSC before switching was 89 per 1000 patient years with an incidence of 45 per 1000 patient years after switching. Incidence rate ratio [Sirolimus vs Standard] 0.50 (0.34, 0.74) P<0.001. See Figure 1.

**Conclusions:** Conversion of maintenance immunosuppression to sirolimus in clinical practice, outside of a randomized trial context, did in fact appear to reduce the incidence of NMSC skin cancer in kidney transplant recipients.
Background: Merkel cell carcinoma (MCC) is a rare, aggressive, malignant neuroendocrine carcinoma that arises from Merkel cells, mechanoreceptor cells in the basal layer of the epidermis. Its incidence is thought to be five to ten times greater in patients with solid organ transplants than in the general population. Despite this, it remains a very rare tumour. Outcomes are thought to be worse in patients with solid organ transplants who develop MCC. We aim to determine the prevalence and behaviour of MCC in the solid organ transplant population.

Methods: We reviewed the renal transplant database for recorded episodes of MCC occurring in the renal transplant population. We cross-referenced solid organ transplant database with the National Cancer Registry Ireland (NCRI) for incidence of MCC occurring in any solid organ transplant. Follow up for NCRI data began on 1/1/1994 and finished on 31/12/2014. Patients were considered to be at risk from date of transplantation or 1/1/1994, whichever came later.

Results: 3825 renal transplants took place between 1994 and 2014. Of these, seven patients developed MCC. Mean follow up after developing MCC was 81 months (Range 8 to 173). All seven patients were male. The median age at diagnosis was 65 (Range 49-74). Four of seven patients were deceased. MCC was the direct cause of death in two of these cases. Median time to diagnosis after transplant was 8.85 years (range 5.9-19.2 years) On cross-reference with the NCRI there were 10 instances of Merkel Cell Carcinoma reported in solid organ transplants between 1994 and 2014, nine occurred in renal transplant patients and one occurred in a heart transplant patient. All occurred in male patients. The SIR in patients with a solid organ transplant when compared to the non-transplant population was 79.46 (38.0-146.1; p <0.001)

Discussion: MCC remains a rare cancer, but does occur more frequently in the renal transplant population. It has a poorer outcome compared to other forms of skin cancer. In our population there was a male preponderance.
PO—56: Survival in Post Cancer in Solid Organ Transplant Patients
Murray S¹, O’Kelly P¹, Deady S², O’Leary E², Egan JJ,³ McCormick A,⁴ Morris PG,⁵ Moloney FJ,⁶ O’Neill JP⁷ Sexton DJ¹, Conlon PJ¹

¹Department of Nephrology & Transplantation, Beaumont Hospital; ²National Cancer Registry Ireland; Respiratory Department & Lung Transplantation Programme, Mater Hospital; ³Hepatology & Liver Transplant Department, St Vincent’s Hospital; ⁴Department of Oncology, Beaumont Hospital, ⁵Department of Dermatology, Mater Hospital; ⁶Department of Otolaryngology, Head & Neck Surgery, Beaumont Hospital
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Introduction:
It is well known that transplantation is associated with an increased risk of malignancy. Survival post cancer in Ireland has not been well characterised in the transplant population. We aimed to study survival in invasive and non-invasive cancers across organ transplant type when compared to the general population.

Methods:
We linked data from the National Cancer Registry Ireland with the databases of the four solid organ transplant programmes (kidney, heart, lung, liver). Follow up was from 1/1/1994 until 31/12/2014. Transplant recipients were considered at risk beginning at transplantation. For those transplanted before the beginning of registry coverage, patients were considered to be at risk from 1/1/1994. ICD10 coding was used to determine cancer diagnosis. Survival was compared to all patients in the NCRI with a diagnosis of malignancy but no history of transplantation.

Results:
In total, there were 3825 kidney transplants, 764 liver transplants, 311 heart transplants and 284 lung transplants. On multivariate analysis, survival was worse in organ transplant patients in both NMSC and invasive carcinoma. Hazard of death from invasive cancer when compared to the general population was 1.5 in kidney transplant; 1.3 in heart; 1.9 in lung and 1.2 in liver transplant patients.

Conclusion:
For those with invasive and non-invasive cancer, those with solid organ transplants are at increased risk of death compared to those who have never been transplanted.
Multiple Skin Cancers in the Renal Transplant Population

Murray SL¹, Sexton DJ¹, O’Kelly P¹, Williams Y¹, Deady S², O’Leary E², Egan JJ³, McCormick A⁴, Morris PG⁵, Moloney FJ⁶, O’Neill JP⁷, Conlon PJ¹

¹Department of Nephrology & Transplantation, Beaumont Hospital; ²National Cancer Registry Ireland; ³Respiratory Department & Lung Transplantation Programme, Mater Hospital; ⁴Hepatology & Liver Transplantation Department, St Vincent’s Hospital; ⁵Department of Oncology, Beaumont Hospital, ⁶Department of Dermatology, Mater Hospital; ⁷Department of Otolaryngology, Head & Neck Surgery, Beaumont Hospital

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Background: Non-melanomatous skin cancers (NMSC) remain both the most common cancer in the Republic of Ireland, accounting for 27% of all cancers (n = 60764) between 1994 and 2008, and also the most common form of skin cancer in the post organ transplant population. Some reports show the incidence of NMSC to be 65 times higher than in the general population. However, little is known about the risk of developing subsequent NMSCs. We aim to describe the incidence of second and subsequent NMSC in an Irish renal transplant population.

Methods: We used data from National Cancer Registry Ireland database and cross-referenced it with data from the Irish Renal Transplant Database to perform a retrospective review of all patients who underwent renal transplant and who developed NMSC. Follow up was from 1/1/1994 until 31/12/2014. Transplant recipients were considered at risk beginning at transplantation. For those transplanted before the beginning of registry coverage, patients were considered to be at risk from 1/1/1994.

Results: Of 3595 patients who received a renal transplant, 813 (22.5%) developed one or more NMSC. Of these, 304 developed second or subsequent skin cancers. 8% of the transplanted population developed more than one NMSC, however 37.5% of patients who developed a first NMSC went on to develop one or more further NMSC. 1% of patients who developed a single skin cancer would go on to develop more than 10 skin cancers. The risk of developing multiple skin cancers was higher in males (IRR 2.5; p<0.001). It decreased with use of tacrolimus over cyclosporin (IRR 0.49; p 0.015).

Conclusions: NMSC is the most common form of cancer in the transplant population. A third of those who develop a first skin cancer will go on to develop a second skin cancer. Male sex increases the risk of developing multiple skin cancers. Use of tacrolimus over cyclosporin is protective.
Title: Cervical screening awareness and uptake in renal transplant recipients

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Background: Female renal transplant recipients are at a significantly higher risk of cervical cancer compared to the general population. Therefore, annual cervical screening is recommended.

Methods: The eMed national renal database was used to identify female renal transplant recipients with a functioning transplant aged 18-60 years. Clinic letter and appointment records were used to identify patients under regular colposcopy follow up, prior hysterectomy or gynaecological malignancy in order to exclude these patients. A questionnaire was administered via telephone interview and assessed awareness of the requirement for an annual cervical smear, whether the participant had received a smear within the last 12 months, whether they received an annual reminder from the cervical check program and the route by which the patient had been enrolled in the annual smear schedule.

Results: Of a total of 60 eligible transplant recipients aged 18-60, 33 patients (55%) responded. Of the patients who responded, 24 patients (72.7%) were aware of the annual requirement for a cervical smear. 23 patients (69.7%) received annual smears. Of the patients who were not up to date with their smear tests, 3 patients were on a 2 yearly or 3 yearly smear schedule as per their national cervical screening program invitations.

Conclusions: In this centre, cervical screening uptake amongst eligible women is suboptimal. It suggests that greater awareness is needed of the annual screening requirement amongst both physicians and patients. This can be accomplished via reminders at transplant follow up clinics and by communicating with Cervical Check to ensure that annual invitation letters are sent to all eligible female renal transplant recipients.
**Title:**
BK Nephropathy in a bone marrow transplant recipient

**Authors:**
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**Background:** BK viral nephropathy is an important cause of allograft dysfunction in renal transplant recipients. BK viral infection in bone marrow transplant (BMT) recipients more commonly associates with haemorrhagic cystitis. Acute kidney injury post BMT typically is attributed to nephrotoxic drug exposure, calcineurin inhibition and recurrent sepsis. BK viral nephropathy in BMT is rarely described.

**Methods:** A review of case notes and laboratory data was performed.

**Results:** A 39-year-old female received an allogeneic DQ-mismatched BMT for relapsed Acute Myeloid Leukaemia. The immediate post-transplant course was complicated by Graft Versus Host disease and Cytomegalovirus reactivation. She developed haemorrhagic cystitis and ureteric obstruction in the presence of high urinary BK viral titre. Despite treatment with intra-vesical and systemic cidofovir and leflunomide, her symptoms did not improve. Retrospective measurement of blood BK titre demonstrated persistent high levels. Over the following months she developed progressive kidney injury culminating in ESKD 7 months post engraftment. A renal biopsy prior to initiation of dialysis demonstrated classic features of BK viral nephropathy. The patient was commenced on haemodialysis, immunosuppression is being gradually withdrawn and she is receiving IVIG in an attempt to suppress further viral replication.

**Conclusions:** This case highlights the importance of a histological diagnosis in this complex patient with prior severe GVHD, as the mainstay of BK nephropathy treatment is reduction in maintenance immunosuppression.
Rapidly Progressive Glomerulonephritis secondary to cryoglobulinaemia in a Hepatitis C/HIV co-infected patient

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A 49 year old man presented to the Emergency Department with a two week history of nausea and headache. On admission to hospital, he was severely hypertensive with blood pressure 215/130mmHg, generalised oedema and had a non-oliguric acute kidney injury with a serum creatinine (sCr) of 598umol/L. Dipstick urinalysis performed at triage was positive for both protein and blood.

His past medical history was significant for HIV, Hepatitis C and syphilis. He had been poorly compliant with combined antiretroviral therapy previously and had been abstinent from IV drug use for 10 months prior to presentation. He had never received treatment for Hepatitis C.

He had no history of renal disease and was not taking any nephrotoxic medications. His first urinary protein creatinine ratio (uPCR) was 1,120 and urine microscopy demonstrated red cell casts. An immunology panel, comprising rheumatoid factor, ENA, anti-dsDNA Ab, ANCA and Anti-GBM Ab, was normal apart from a low C4. The measured Hepatitis C viral load was 1,117,255 IU/ml – The genotype will be important and should be on computer IV. HIV-1 RNA was 1,586 copies/ml. #see below.

An urgent percutaneous renal biopsy was performed which demonstrated immune-complex deposition disease with a membrano-proliferative pattern of injury. Immunofluorescence showed positivity for IgM, IgG and C3, suggestive of a cryoglobulinaemic glomerulonephritis.

The patient received high dose oral corticosteroids and four sessions of plasma exchange. He was also commenced on treatment for Hepatitis C infection with ribavirin and ombitasvir/paritaprevir/ritonavir and early ACE inhibition. He never required dialysis. Steroid therapy was tapered slowly over a period of 6 months.

Six months post discharge from hospital, the patient’s renal function had improved with sCr of 206umol/L and uPCR of 141. He had a sustained virologic response post treatment of Hepatitis C.

This case suggests a role for high dose corticosteroids and PEX in the treatment of cryoglobulinaemic glomerulonephritis in patients with Hepatitis C/HIV co-infection.
Apoliprotein A-1 (ApoA-1) related amyloidosis is a rare, autosomal dominant disorder characterised by extracellular deposition of insoluble amyloid fibrils, predominantly affecting the kidneys, myocardium, and liver. Renal disease manifests as slowly progressive renal impairment with proteinuria. Pathologically, whereas other systemic amyloidosis are characterised by glomerular and vascular lesions, renal involvement in ApoA-1 can be limited to the renal medulla. We describe a case of Apo A-1 amyloid in a 52 year old man presenting with a history of non-proteinuric chronic kidney disease and testicular discomfort. The diagnosis of Apo A-1 amyloid occurred 7 years after presentation by a testicular biopsy, following an initially negative kidney biopsy. Subsequent analysis of his renal biopsy specimens, from a nephrectomised kidney for renal cell carcinoma, revealed interstitial aggregates of amorphous pink material within the deep medulla. Genetic testing confirmed a Gly50Arg variant consistent with ApoA-1 amyloid. Hereditary ApoA-1 amyloidosis is a rare, easily missed diagnosis. Without a high degree of clinical suspicion, and an adequate biopsy specimen examining the renal medulla, the diagnosis can prove elusive.
PO-60: Case report of glomerulonephritis with positive anti-glomerular basement membrane antibodies following alemtuzumab treatment of relapsing-remitting multiple sclerosis

Authors: Eoghan White, Alan Watson, John Holian, Chris McGuigan, Sean O’Riordan. St. Vincents University Hospital. eoghanwhite83@gmail.com

Abstract

Introduction: Potential adverse events associated with Alemtuzumab (AL) therapy for relapsing remitting multiple sclerosis (RRMS) include secondary autoimmune disorders such as autoimmune thyroiditis, immune thrombocytopenia and anti-glomerular basement membrane (anti-GBM) disease, which has been identified in less than 0.3% of cases.

Background: 30 year old white female with highly active RRMS who received two standard courses of alemtuzumab (total 96mg) 1 year apart who developed anti-GBM disease 5 months from last dose. Notably, serum creatinine and urinalysis were normal 3 weeks prior to symptom onset.

Case: Anti-GBM disease diagnosed 5 months after second AL infusion. Treated with 20 sessions of plasmapheresis; 2 courses of rituximab 375mg/m² , intravenous methylprednisolone, followed by slow taper of oral prednisolone. Despite therapy patient progressed to end stage kidney failure requiring haemodialysis. Clinical course was complicated by Posterior Reversible Encephalopathy Syndrome (PRES) and secondary thrombotic microangiopathy (TMA).

Discussion: Other reported cases have described anti-GBM disease following AL treatment and, like our patient, not all demonstrate abnormal serum creatinine or urinalysis prior to rapid onset of symptoms despite compliance with monthly blood and urine testing. PRES has been previously reported following AL use for other disorders in the absence of renal disease. A rare association between anti-GBM disease and TMA has also been reported. It is unclear as to how AL results in secondary autoimmunity, however some research indicates that patients with higher levels of IL-21 are at higher risk, and IL-21 may therefore serve as a biomarker for developing secondary autoimmunity.

Conclusion: It is unclear if recommended pharmacovigilence for AL involving monthly serum creatinine and urinalysis for 4 years from last AL infusion would identify anti-GBM disease, routine anti-GBM measurement may also have a role. Clinicians should maintain high index of suspicion and test for anti-GBM disease in patients receiving alemtuzumab who become unwell. Future diagnostic efforts should focus on development of predictive markers to identify patients at higher risk of developing autoimmunity with AL therapy.
PO-61: Life-threatening Thrombocytopenia in a Renal Transplant patient with Miliary Tuberculosis

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Background: Thrombocytopenia in Tuberculosis is multifactorial. It may result from defective platelet production due to bone marrow infiltration, thrombotic thrombocytopenic purpura, histiophagocytosis, disseminated intravascular coagulation, immune mediated platelet destruction or as a side effect of anti-tuberculous therapy.

Methods: A review of the patient's medical notes and laboratory results was conducted.

Results: We describe the case of a 34 year old man who presented with a two week history of fever and cough. He was diagnosed with Miliary Tuberculosis and commenced on Rifampicin, Isoniazid, Pyrazinamide and Ethambutol (RIPE). He had a background of End-stage Kidney Disease thought to be secondary to Haemolytic Uremic Syndrome (HUS) in childhood and received a Living Related Donor renal transplant seven years prior. He had splenomegaly prior to transplantation and his living Related Donor had a history of Idiopathic Thrombocytopenic Purpura. He developed Immune Reconstitution Inflammatory Syndrome (IRIS) and was commenced on high dose steroids. Two weeks after starting RIPE, he became thrombocytopenic and subsequently pancytopenic with neutropenia. Mycophenolate was stopped. His Bone Marrow biopsy showed reactive changes with granulomatous inflammation and megakaryocytes present. At one month, he was profoundly thrombocytopenic (platelets <10x10^9/L) with elevated LDH and schistocytes on blood film. He had two doses of IVIG but did not respond. He was maintained on tranexamic acid. Tacrolimus was stopped and he recommenced Haemodialysis. At two months, he had persistent thrombocytopenia with ongoing epistaxis and melena. He had HLA antibodies so required HLA matched platelet transfusions. Rifampicin and Ethambutol were stopped. Cycloserine was added. He had two further doses of IVIG. He was commenced on thrombopoietin and Rituximab. His platelets finally normalised. He was then diagnosed with a left above knee Deep Vein Thrombosis. He was commenced on therapeutic Low Molecular Weight Heparin. His ADMATS13 was low (34 IU/dL). An atypical HUS screen is pending.

Conclusions: Rifampicin induced immunologic platelet destruction was felt to be the most likely aetiology of thrombocytopenia in this case. Withdrawal of Rifampicin and treatment with Rituximab, after a failed response to steroid therapy alone, was successful.
PO-62: BV-Negative Post Transplant Lymphoproliferative Disorder (PTLD) in Kidney Transplant recipient. ESKD secondary to Sickle Cell Nephropathy: A complicated case highlighting the newly recognised prevalence of EBV Negative PTLD and the intricacies of its management.
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Introduction: PTLD is a heterogeneous group of diseases, characterized by abnormal lymphoid proliferation following transplantation and is one of the most detrimental complications of organ transplantation [1]. It is a disease of the immunosuppressive state and while it was originally considered to be uniformly driven by EBV, more recent evidence reveals that up to 50% of PTLD cases are not associated with EBV [2]. In this setting the pathogenesis is less well understood. EBV negative PTLD shares significantly more genomic features with DLBCL in immunocompetent patients than EBV positive cases and may be considered a coincidental lymphoma occurring in a transplant recipient [2]. At present, however the mainstay of treatment remains to be withdrawal of immunosuppression, Anti-CD20 therapy and chemotherapy.

Case: We discuss the case of a 39 year old African lady who presented with persistent nausea and vomiting and acute kidney injury. This was on a background of Cadaveric Renal Transplant 7 years previously for end stage kidney disease secondary to sickle cell nephropathy, with other complicating co-morbidities including haemachromatosis, premature ovarian failure, marked osteoporosis and slowly progressive CKD within the graft. The initial impression of gastroenteritis was quickly replaced by the diagnosis of symptomatic gastric outlet obstruction secondary to probable PTLD. This was suggested by the presence of a prominent epigastric mass in a transplant recipient on long-term immunosuppression (Tacrolimus/azathioprine/prednisolone). The diagnosis of monomorphic DLBCL/PTLD was subsequently confirmed on gastric biopsy at OGD, and further detailed as Stage IV on CT TAP and PET CT with diffuse involvement of stomach, left lobe liver, multiple sites in small bowel and right femur. Interestingly EBV and CMV were both negative serologically and on tissue biopsy in this case. Azathioprine and tacrolimus therapy were stopped in the first instance. The patient was then commenced on R-CHOP chemotherapy at shorter intervals than routine regimens due to the debatable poor prognosis of EBV negative PTLD. This was initially complicated by a stable GI bleed, febrile illness and herpetic lip lesions all of which needed management within the limitations of CKD and sickle cell disease. Beyond this the patient tolerated the first two cycles well and is due for repeat imaging to assess initial response and guide ongoing management thereafter.

Conclusion: PTLD is a complicated and potentially devastating disease. Our case reflects the complexities involved in managing this disease. In particular it raises the difficult question of ongoing immunosuppressive therapy specifically in EBV negative PTLD; weighing the risk of disease progression/resistance versus graft failure in this cohort. New research highlights the need for better understanding of EBV negative disease pathogenesis and is likely to spark debate as to whether current treatment practices for these patients should be modified.